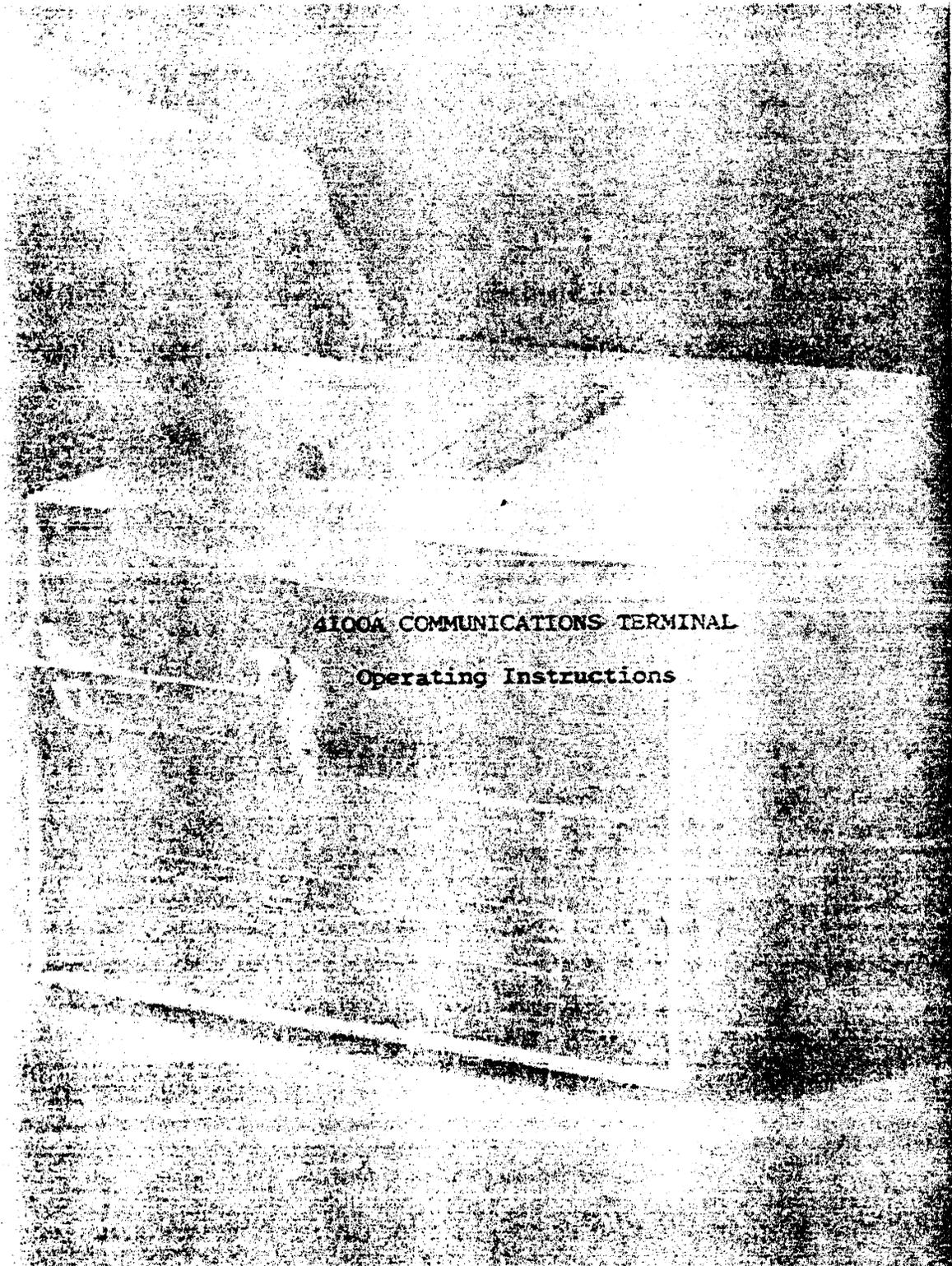


# TECHTRAN INDUSTRIES

TECHTRAN INDUSTRIES, INC. ■ 780 JEFFERSON RD. ■ ROCHESTER, NEW YORK 14623 ■ PHONE (716) 271-7953



*Specialists in data transmission*

## Table of Contents

A.	Introduction	1
B.	Outstanding Features	2
C.	Unpacking Instructions	3
D.	Compatibility	4
E.	Installation	5
F.	Front Panel Indicators	6
G.	Front Panel Controls	7
H.	Rear Panel Controls	9
I.	Speed and CR Delay Adjustments	10
J.	Inserting the Cassette and Transport Maintenance	11
K.	Operation	
	SETUP	12
	READ	13
	WRITE	14
L.	Record Protection	15
M.	Optional Features	16
N.	Interface Specification	22
O.	Physical and Electrical Characteristics	24

## A. Introduction

The 4100 Communications Terminal is a cassette loaded magnetic tape terminal incorporating both a TERMINAL and a LINE interface, and is operationally compatible with ASCII coded communications and data processing equipment. The 4100 Terminal provides the capability to function as a stand-alone batch processing station; as a companion unit to update existing operator terminals with cassette storage capability; as minicomputer memory; as an input/output station for data processing to remote computer systems; for local and on-line message preparation; for linking of high and low speed data communication facilities; and, for linking of on-line and off-line data processing equipment. 4100 interfaces are plug compatible to standard data processing and communications equipment and include selectable transmission speeds to accommodate both high and low speed devices. Features are available to provide Data Edit, High Speed Search, Remote Control and interfaces for USASCII, System 360 and off-line "wired" systems.

Equipment such as the Model 33, 35, 37 & 38 Teletypes, GE TermiNet 300 & 1200, Datapoint 2200, 3000 & 3300 CRT's, Anderson Jacobson 630, TI 700 Series Printers and other data devices using standard communication interfaces can be plugged directly into the 4100 Terminal. Their ability to freely converse both directions to the communications line has been maintained without degradation, so that interactive applications can be accommodated where operator inputs and tape stored inputs are intermixed. To an on-line system, the 4100 operates exactly as a paper tape or built-in cassette unit would operate that might be attached directly to the side of these terminals, if such were available.

This instruction manual has been prepared to acquaint you with the operating features and controls of the 4100 Communications Terminal.

B. Outstanding Features

Standard features of the 4100 Communications Terminal are:

1. Plug compatible dual interfaces - Communications Line and Operator Terminal; EIA RS-232B compatible.
2. Capable of full on-line and off-line operation, stand-alone operation and store-and-forward.
3. Reusable magnetic tape cassette storage; Philips Type.
4. Dual speed to 300 baud, incremental.
5. Both Read and Write capability.
6. Unique recording technique provides high density storage to 70,000 characters, single pass.
7. Independent Read/Write speeds - record at one speed, playback at any other.
8. Guaranteed deck to deck tape compatibility - tapes recorded on one unit can be read on any other.
9. Human engineered controls and indicators for utmost in simplicity and clarity.
10. Direct replacement for paper tape systems.
11. Portable; can be located to suit the application.

Optionally available features for the 4100 Communications Terminal include:

1. Remote Code Controlled Operation; both interfaces.  
(User selected codes)
2. Data Edit.
3. High Speed Search (Forward Only or Bi-Directional).
4. Teletype Current Interfaces.

5. 600 to 2400 baud speed.
6. Built-in modems, both low and high speed.
7. Special interfaces and features for unique applications.

Other models available:

Model 4120 - IBM 2741 Compatible

Model 4130 - Computer oriented model with one parallel interface for the computer and one serial interface for attachment of an operator terminal.

C. Unpacking Instructions

Carefully remove the 4100 Terminal from its packing case and examine the exterior for damage during shipping. Remove the two screws securing the cover to the lower chassis. These are located on the rear panel and are the two outside-lower screws as viewed from the rear (one on each side). With a firm backwards and lifting motion, remove the cover. Remove any packing material securing the boards and motors within the transport and examine the interior of the unit for damage, including broken or loose wires and dislocated or loose components.

D. Compatibility

The 4100 Communications Terminal is a stand-alone terminal completely compatible with present time-sharing and computer systems using the USA Standard Code for Information Interchange (USASCII).

The TERM I/O interface of the 4100 was designed to conform to the Electronic Industries Association (EIA) RS-232B standard and a Teletypewriter (TTY) current interface, switch selectable. The TTY interface (optional) is directly compatible with Teletypewriter devices wired to interface acoustic couplers of the General Electric TDM-114 or TDM-115 and Carterfone DM-328 types. To interface Teletypewriters wired for any other interface, an adapter cable may be required. These cables are available upon request. Data devices that can be attached to this interface include: Keyboard-Printers, CRT display terminals and tape reader/punch combinations.

The LINE I/O interface of the 4100 was designed to conform to the EIA RS-232B standard; therefore it is compatible with all BELL System or equivalent datasets and most acoustic couplers. Also see Paragraph N.

C A U T I O N

BEFORE CONNECTING any data device to the TERM I/O interface, always place the TERM I/O control, located on the rear of the 4100, to the position corresponding to the type device (TTY or RS-232) being attached. Physical harm to the 4100 and/or the interfacing device can result if this warning is not heeded; and, ALWAYS determine the interface configuration of the Teletypewriter being attached before connection of that device is made, to determine whether the interface is compatible and whether an adapter cable is required. Also see Paragraph N.

E. Installation

The 4100 Communications Terminal is styled to be office installed, either operating alone or in conjunction with other data processing equipment. No equipment or systems modification should be required to interface the 4100 to other devices.

The installation of the 4100 is simple; only 115 VAC and connection to a data device (keyboard-printer, CRT or tape reader/punch combination) and/or a dataset is required for off-line/on-line operations and only 115 VAC and a dataset or acoustic coupler of your choice is required for stand-alone on-line operation.

For operation:

1. Connect the Power Cord of the 4100 to a 115 VAC wall plug.
2. For off-line only operation, select the desired data device and connect it (using its Line Interface cable) to the 4100 TERM I/O interface.
3. For on-line operation, select a dataset or acoustic coupler which has an EIA RS-232B interface and will operate at the baud rate at which the 4100 will be used. Use the LINE I/O cable of the 4100 to connect to the dataset. On-line operation can be performed with or without a data device connected to the 4100 TERM I/O interface.
4. See Paragraphs G and H for a description of the various 4100 controls and their proper settings.

F. Front Panel Indicators

The indicator lights of the 4100 Communications Terminal have been designed for simplicity and clarity. Some include dual-function indications performed by having both a BLINKING and a STEADY ON condition, to provide the ultimate in operator signalling.

The indicators are:

1. READ            -a STEADY ON condition indicates the Read Mode has been activated and that characters are being read from the tape.  
                  -a BLINKING condition indicates reading has been stopped.
2. WRITE           -a STEADY ON condition indicates the Write Mode has been activated and that characters sent to the 4100 (from the source selected) will be recorded onto the tape.  
                  -a BLINKING condition indicates the Write Mode has been de-activated.
3. LINE DATA      -a STEADY ON condition indicates that data received through the LINE I/O interface has been selected for recording onto the tape.
4. TERM DATA      -a STEADY ON condition indicates that data received through the TERM I/O interface has been selected for recording onto the tape.
5. ONLINE           -a STEADY ON condition indicates that on-line operation has been activated.  
                  -a BLINKING condition indicates that a CB (Clear to Send) signal is present from the dataset but the ONLINE control has not been depressed.  
                  -an OFF condition indicates that a CB signal is not present.
6. PRINTER          -a STEADY ON condition indicates that the TERM I/O interface is activated for input and output of data.  
                  -an OFF condition indicates that the TERM I/O interface is de-activated.

G. Front Panel Controls

The front panel controls of the 4100 Communications Terminal have been designed for simplicity and clarity. Generally, these controls are those that will be used during day-to-day operations of the 4100.

The controls are:

1. POWER (On/Off) -depressing this control causes activation of ac power to the 4100, if the Power Cord is connected to a source of 115 VAC power.
2. EDIT (On/Off) -depressing this control causes the Edit Mode to be activated. When in Edit Mode, data blocks will be written onto the tape whenever a CR operation takes place. When in Edit Mode, reading will stop whenever a CR code is read. Write Mode can then be activated to re-write the next line.
3. ONLINE (On/Off) -depressing this control causes the LINE I/O interface to be activated for data input and output, if the CB signal is present from the dataset (ONLINE indicator is ON).  
-releasing this control causes the LINE I/O interface to be de-activated, allowing off-line operation (ONLINE indicator is OFF or BLINKING).
4. PRINTER (On/Off) -depressing this control causes the TERM I/O interface to be de-activated (if previously activated) or be activated (if previously de-activated). PRINTER indicator will be ON if interface is active; OFF if inactive.
5. SOURCE (Line/Term) -depressing this control selects code controlled operation (if incorporated) and directs writing onto the tape (Write Mode active) to originate from the LINE I/O interface (if previously TERM I/O) or to originate from the TERM I/O interface (if previously LINE I/O). TERM DATA indicator will be ON if TERM I/O interface is selected, and LINE

DATA indicator will be ON if LINE I/O interface is selected.

6. SINGLE (Read) -depressing this control causes a single character to be read from the tape.
7. READ (On/Off) -depressing this control causes the Read Mode to be activated and continuous reading of characters from the tape (if previously de-activated) or causes the Read Mode to be de-activated and reading to be halted (if previously activated). READ indicator will go to a STEADY ON condition when Read Mode is activated, and will be BLINKING when de-activated.
8. ENDMODE -depressing this control causes the Write Mode or Read Mode to be terminated without tape rewind, providing the mode had been de-activated (READ or WRITE indicator BLINKING). When in Write Mode, allows artificial blocking of data to be performed since buffer contents will be written onto the tape upon an ENDMODE command.
9. REWIND -depressing this control causes the tape to be rewound at a speed of 40 inches per second, providing the Read or Write Mode has been de-activated or terminated. This operation will terminate the mode if it had been de-activated. Data in the 4100 buffers will be written onto the tape prior to a Rewind when in the Write Mode.
10. WRITE (On/Off) -depressing this control causes the Write Mode to be activated, enabling received data to be written onto the tape (if Write Mode was previously de-activated) or causes the Write Mode to be de-activated, inhibiting the writing of data onto the tape (if Write Mode was previously activated). WRITE indicator will be STEADY ON when mode is active, and will be BLINKING when mode is de-activated.

H. Rear Panel Controls

The rear panel controls of the 4100 Communications Terminal are those that would generally be used during setup of the 4100, but would not generally be used during day-to-day operations.

The controls are:

1. TERM I/O (TTY/RS232) optional  
-TTY - selects Teletype compatible current interface for the TERM I/O connector.  
-RS232 - selects an EIA RS-232B compatible interface for the TERM I/O connector.
2. CR DLY (On/Off/Dup) optional  
-ON - provides a momentary delay in reading the next character from the tape whenever a Carriage Return (CR) character is read.  
-OFF (center) - disables the delay.  
-DUP - provides a Transparent Reading Mode for tape duplication purposes in which all 4100 function codes are disabled except the NUL code which is sensed as a STOP READ command.
3. ECHO (On/Off/Auto)  
-ON - signals received from the TERM I/O interface are echoed-back to that interface on the Transmitted Data line to provide full-duplex operation.  
-OFF (center) - echo is disabled.  
-AUTO - signals received from the TERM I/O interface are echoed-back when in the Off-line situation only. When on-line, echoes will normally be received from the remote system.
4. SPEED  
-selecting the appropriate switch position causes the 4100 Terminal internal clocking circuits to be activated for the speed selected.
5. MODEM (Send/Out/Rcv) optional  
-SEND - sets the 202 Modem Controller so that calls originated by the local 4100 station will be reacted to by the 4100 initially coming up with its Transmit Line connected to the Primary Channel of the 202 Modem.  
-OUT - de-activates the 202 Modem Controller so that incoming and outgoing data will be handled on a half-duplex asynchronous basis

without channel priority. A 202 Modem should NOT be connected to the 4100 in this operating mode.

-RCV - sets the 202 Modem Controller so that incoming calls will be responded to by the 4100 initially coming up with its Receive Line connected to the Primary Channel of the 202 Modem.

## I. Speed Adjustment

Unless specified prior to delivery, the internal clocks will be set at the factory for rates of 110 and 300 baud (bits per second) and 1200 and/or 2400 baud if the High Speed feature is included. If other speeds are desired, these can be set as follows:

1. Connect an oscilloscope probe to CLK test post on printed circuit board, position 2 (1001005). Connect oscilloscope ground to GND post on the same board.
2. Turn power ON to the 4100 Terminal.
3. Insert a blank cassette and activate the Read Mode. This will allow the clocks to free run.
4. Adjust the potentiometers on this circuit board for the desired speeds to correspond to settings desired for the panel controls. 110 baud corresponds to a clock period of 9.2 milliseconds (ms); 300 baud corresponds to 3.3 ms; 1200 baud corresponds to 0.83 ms; 2400 baud corresponds to 0.415 ms.
5. De-activate the Read Mode by depressing the READ control and then the ENDMODE control. Rewind the cassette and replace all covers.

### CR Delay Adjustment

The potentiometer located on printed circuit board position 3, is used to adjust the delay time of the CR Delay Circuit. Clockwise rotation shortens delay.

### J. Inserting the Cassette and Transport Maintenance

To insert a cassette, swing the tape transport door open by applying pressure to the center-lower portion of the door. The top should swing out allowing a tape cassette to be inserted into the guides provided. The cassette should be inserted with its front (large tape spool on left) facing towards the front of the 4100 Terminal. After inserting the cassette, the door should be closed.

#### C A U T I O N

Use only a high quality certified tape cassette designed for Digital Recording, such as those supplied by TECHTRAN INDUSTRIES or K/Tronic, Inc., 10601 Saratoga-Sunnyvale Road, Cupertino, California 95014, Part Number 102-16.

The following regular maintenance should be performed on the tape transport.

#### 1. Daily Read/Write Head Cleaning

Daily cleaning of the Read/Write head must be performed using a small soft cotton swab dampened in alcohol. Neglecting this maintenance may cause abnormal tape wear, read/write errors or transport damage.

K. Operation

- SETUP
1. Select proper settings for the SPEED, ONLINE, TERM I/O, CR DLY and ECHO controls. TERM I/O selector should be placed to RS232 position when no data device is attached to that interface. Also see Paragraphs G and H.
  2. Select the desired data device and/or dataset or acoustic coupler and interface to the 4100.
  3. Turn power ON by depressing POWER control. TERM DATA, PRINTER and (ONLINE & LINE DATA if on-line operation has been activated prior to turn on) indicators should be ON or BLINKING.
  4. LINE DATA indicator will be ON if the 4100 is conditioned for on-line operation at the time power is applied.

C A U T I O N

Do NOT allow the 4100 power to stay ON if the indications as described in Step 3 above do not conform.

Always REWIND the tape cassette prior to turning power OFF.

AVOID rapid turn-on and turn-off of the POWER control as there are internal reset circuits which require 2-3 seconds to restore following a turn-off command.

READ

1. Activate Read Mode by depressing READ control. Readout will be delayed momentarily while the tape is moving off the leader. READ indicator should be STEADY ON.
2. Reading may be stopped by depressing READ control a second time. READ indicator should go to BLINKING.
3. Reading will be stopped whenever a STOP READ code is read on the tape. READ indicator should go to BLINKING.
4. Single characters may be read using the SINGLE control. READ indicator should be in a BLINKING condition.
5. To rewind tape, depress REWIND control. Both LINE DATA and TERM DATA indicators should go to BLINKING during this operation.
6. To terminate Read Mode without rewinding, depress ENDMODE control after Step 2 or 3 above.
7. To select the Transparent Reading Mode (DUP), place the rear panel control to DUP position and proceed with reading as above. All codes except NUL will be transmitted.
8. Simplified Instructions - READ
  - a) Depress READ control or send START READ command.

- WRITE
1. Activate the Write Mode by depressing WRITE control. Writing must be delayed momentarily while tape is moving off leader. WRITE indicator should be STEADY ON. Data previously recorded onto the tape will be written over when in the Write Mode.
  2. Writing to the tape is controlled by whichever interface (LINE I/O or TERM I/O) has been selected by the SOURCE control.
  3. After recording the desired data, a STOP READ code MUST be written onto the tape. See Paragraph M under Remote Operation section for proper code. This code is sensed in the Read Mode to stop tape readout in much the same manner as that used in paper tape systems to stop the tape reader.
  4. Writing may be de-activated by depressing the WRITE control a second time. WRITE indicator should go to BLINKING.
  5. To rewind tape, depress REWIND control. Both LINE DATA and TERM DATA indicators should go to BLINKING during this operation.
  6. To terminate Write Mode without rewinding, depress ENDMODE control after Step 4 above.
  7. Simplified Instructions - WRITE
    - a) Depress WRITE control or send START WRITE command.
    - b) Record data.
    - c) Record STOP READ code.
    - d) Depress WRITE control or send STOP WRITE command.
    - e) Depress REWIND control or send REWIND command.

L. Record Protection

To protect data that has previously been written onto a cassette, break off the plastic tab located on the top left portion of the cassette. The 4100 Communications Terminal will sense this condition and not allow the Write Mode to be activated, thus preventing data on that cassette from being written over.

W A R N I N G

Care should be exercised not to subject tape cassettes containing recorded data to strong magnetic fields, as these may cause data to be destroyed and, cassettes should never be subjected to high temperature environments.

M. Optional Features

The 4100 Communications Terminal may be equipped with several additional features to further enhance its capabilities and operational usefulness. These are features that may not be required for every application but will provide users who desire them, with extremely versatile operations at minimal cost.

Teletype Current Interface

The Teletype Interface allows the TERM I/O interface to accommodate directly, Teletypewriter devices which have been wired to interface acoustic couplers. See Paragraph D, H and N.

High Speed Search - (Forward Only Option)

The High Speed Search feature provides the capability to store and selectively retrieve up to 100 different data records stored on the cassette. Search rate is approximately 1000 characters per second. For this operation, each record when recorded, is preceded by a single RECORD ADDRESS code followed by a two-digit numeric address. Records are ended with a STOP READ code.

To search for a particular record, the RECORD ADDRESS command is entered from the keyboard followed by the two numerics corresponding to the record desired, followed by a START READ command. The tape will be automatically searched at high speed for the desired record and readout of that record will take place when it has been located.

If records located earlier in the tape are to be searched for, the tape must be first rewound (using a REWIND command).

An ENDMODE or BREAK command will reset the Search Counter if the command to perform the search was entered incorrectly.

When searching for records, the RECORD ADDRESS and two-digit numeric addresses will be suppressed, so that printing of these characters does not take place. Print out will occur, however, during normal reading of the addresses.

#### Example of Recorded Data Record

RECORD ADDRESS Code  
Two-digit Numeric Address  
Record (any length)  
STOP READ Code

#### Example of Search Procedure for Record Number 3

Enter RECORD ADDRESS Command  
Enter 0 (Zero)  
Enter 3  
Enter START READ Command

#### High Speed Bi-Directional Search

On units equipped with the High Speed Bi-Directional Search feature, the capability is provided to store and selectively retrieve up to 100 different data records stored on the cassette, searching in either direction from any point on tape. The feature operates similarly to the High Speed Search option except commands are available to search in both forward and reverse. When locating records in reverse, the two-digit address will be transmitted.

Example of Recorded Data Record

RECORD ADDRESS Code  
Two-digit Numeric Address  
RECORD ADDRESS Code  
Record (any length)  
STOP READ Code

Example of Search Procedure - Forward

Enter RECORD ADDRESS Command  
Enter Two-digit Numeric Address  
Enter START READ Command

Example of Search Procedure - Reverse

Enter REVERSE SEARCH Command  
Enter Two-digit Numeric Address  
Enter START READ Command

Limitations - Reverse Search, Normal Recording Mode

1. MUST be at least 200 characters between where the tape rests (when Reverse Search is commanded) and the beginning of the Record being searched.

Limitations - Reverse Search, EDIT Mode

1. Same as No. 1 above.
2. DO NOT reverse search for FIRST record on tape.

Care should be taken that there is actually a Record to be searched for (on tape) when searching in either direction, otherwise abnormal operations will result.

### Remote Interrupt

On units equipped with this feature, the capability for remote starting and stopping of the Read Mode is provided, using the DC1 (Cntrl Q) and DC3 (Cntrl S) codes respectively. To function properly, the SOURCE control should be in TERM DATA and the CR Delay/Dup switch should be in the center OFF position.

### Data Edit

The Data Edit feature provides the capability to selectively correct or re-write previously recorded data as a line editing function. Complete lines of data can be deleted, rewritten character-for-character, shrunk and even expanded, easily and without disturbing lines of data on either side of the correction.

When in the Edit Mode (EDIT control depressed), and in the Write Mode, data blocks will be written to the tape at 100 character intervals or whenever a CR (Carriage Return) operation takes place. Blanks will be recorded for later use in expanding data lines if the full 100 characters has not been used for a data block. After a CR operation, data should NOT be sent to the 4100 until after the tape transport has completed its operations (tape movement has stopped).

When in the Edit Mode, reading will stop whenever a CR code is sensed on the tape. Re-reading or activation of the Write Mode may be performed at that time to respectively read or re-write the following line.

To abort a line being written, de-activate the Write Mode (using the WRITE control) and key a CR operation. No data will be written onto the tape. Re-activate the Write Mode for continuing recording.

To enter a STOP READ code onto the tape when in the Edit Mode, send the appropriate STOP READ code followed by a CR operation from the keyboard.

When writing an edit tape, a CR operation should be keyed PRIOR TO the first line of data on the tape so that the first line may be easily found in either the Write or Read modes, for re-recording or reading respectively.

Lines initially recorded at LESS THAN 100 characters should NOT be re-recorded at GREATER THAN 100 characters as internal operations handled by the 4100 Data Edit feature will not automatically compensate for this increase. For this same reason, lines initially recorded at GREATER THAN 100 characters should NOT be re-recorded at LESS THAN 100.

The Edit Mode should NOT be used when recording data from the LINE I/O interface unless a sufficient delay (1-2 seconds) is provided by the transmitting system whenever a CR code is sent.

The Erase Code (normally Shifted "O") is used as a Backspace-Cancel function. Upon receipt of this code, the 4100 will cancel the last previous character it received. Up to fifty (50) characters may be cancelled in this manner. The Backspace-Cancel feature is NOT available on units equipped for 2400 baud operation.

Remote Code Controlled Operation

The Remote Operation feature provides the capability to remotely control all operations of the 4100 using codes generated from the communications line or the data device attached. The following 4100 functions (with their associated STANDARD codes) may be controlled:

<u>Code</u>	<u>4100 Function</u>
Cntrl A (SOH)	Record Address (used during Search)
Cntrl B (STX)	Start Write
Cntrl C (ETX)	Stop Write
Cntrl E (ENQ)	Endmode
Cntrl F (ACK)	Start Read
Cntrl N (SO)	Printer Off
Cntrl O (SI)	Printer On
Cntrl U (NAK)	Stop Read
Cntrl W (ETB)	Rewind
Cntrl X (CAN)	Reverse Search
Shifted "O" (←)	Erase (Backspace-Cancel)
Cntrl-Shift P (NUL)	Stop Read (DUP Operation Only)
BREAK	Stop Read (When tape in motion)

The above codes are programmable and may be easily changed by the User should conflicts occur with interfacing devices or systems of his choice.

N. Interface Specification

Signal Characteristics - EIA RS-232B

1. Receive
    - a. Mark -3 to -25 volts
    - b. Space +3 to +25 volts
  
  2. Transmit
    - a. Mark -7 volts with 3K load
    - b. Space +6 volts with 3K load
- Maximum short circuit current 500 ma  
Terminating Impedance 3K to 7K

Signal Characteristics - Teletype Current

When using the Teletype Model 33 or similar data device, the data device MUST be set up to operate in the full-duplex, 20 milliamp neutral configuration. Refer to the related equipment manual for instructions.

Pin Assignments - LINE I/O

<u>Pin</u>	<u>Function</u>
1	Protective Ground
2	Transmitted Data (4100 Data Out)
3	Received Data (4100 Data In)
4	Request to Send
5	Clear to Send
7	Signal Ground
20	Data Terminal Ready

The LINE I/O interface cable and connector conform to EIA standard RS-232B and is a 25-pin (DB-25P) connector. The mating connector located on the dataset or coupler should be a DB-25S or equivalent. Signals to pins 4 and 20 are supplied by the 4100.

Pin Assignments - TERM I/O, EIA RS-232B

<u>Pin</u>	<u>Function</u>
1	Protective Ground
2	Transmitted Data (4100 Data In)
3	Received Data (4100 Data Out)
5	Clear to Send
6	Data Set Ready
7	Signal Ground
8	Data Carrier Detector
25	Long Function

The TERM I/O interface connector conforms to EIA standard RS-232B and is a 25-pin (DB-25S) connector. The mating connector (DB-25P) and necessary interconnecting cables between the 4100 and interfacing data device are provided by the customer. The interconnecting cables should not exceed 50 feet in length if the RS-232B mode is used or 25 feet if the Teletype Current mode is used. Signals to pins 5, 6 and 8 are supplied by the 4100.

Pin Assignments - TERM I/O, Teletype Current

<u>Pin</u>	<u>Function</u>
2	Transmitted Data (4100 Data In)
3 & 9	Received Data (4100 Data Out)
10	Signal Ground (4100 supplies -24V)

O. Physical and Electrical Characteristics

Size:	11" Wide x 8½" High x 15½" Deep (Carrying Handle included)
Weight:	21 pounds
Mounting:	Desk Top
Data Storage Medium:	Standard Philips tape cassette, 300 feet length using 0.15" wide, 0.7 mil thickness tape, certified digital quality.
Recording Density:	800 bits per inch
Tape Capacity:	70,000 characters, single pass
Recording Format:	Bit serial modified NRZ, dual-track
BOT/EOT Sensing:	Automatic
Record Length:	Variable, fixed by placement of STOP READ code on tape.
Temperature:	+50 to +110 degrees Fahrenheit
Power Requirements:	115VAC <u>±</u> 10%, 60 Hz, 150 Watts 3-wire grounded.
TERM I/O Interface:	EIA RS-232B or 20 ma current, DB-25S connector
LINE I/O Interface:	EIA RS-232B, DB-25P connector with 8-foot cord.

REMOTE OPERATION CODES

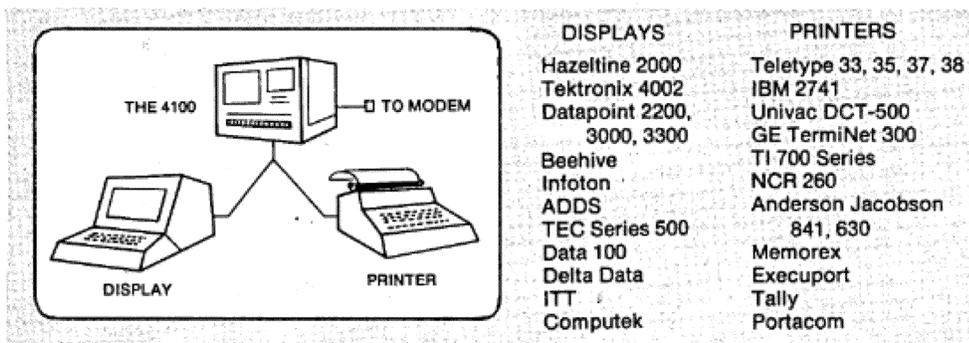
4100 COMMUNICATIONS TERMINAL S/N \_\_\_\_\_

Cntrl _____	_____	Record Address
Cntrl _____	_____	Start Write
Cntrl _____	_____	Stop Write
Cntrl _____	_____	Endmode
Cntrl _____	_____	Start Read
Cntrl _____	_____	Printer Off
Cntrl _____	_____	Printer On
Cntrl _____	_____	Stop Read
Cntrl _____	_____	Rewind
Cntrl _____	_____	Reverse Search
_____	_____	Erase (Backspace-Cancel)

February, 1973

# Super Compatible.

Below are only some of the data terminals to which the "super compatible" Techtran 4100 Terminal now adds High Speed communications and Cassette Storage capabilities on a plug-in basis.



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CIRCLE 61 ON READER CARD