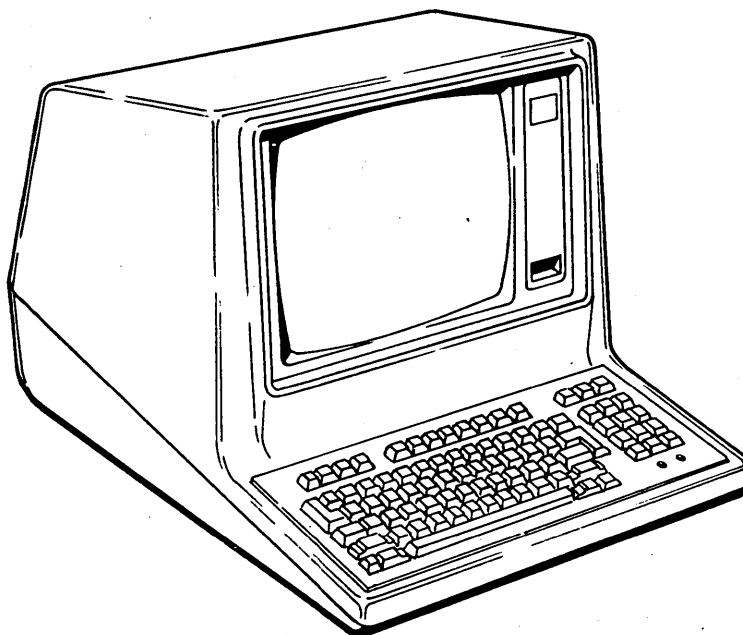

**CDC® 722-10/20 DISPLAY TERMINAL
CC628-A**





REVISION RECORD

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LIST OF EFFECTIVE PAGES

New features, as well as changes, deletions, and additions to information in this manual are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

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	J				



TO THE OPERATOR

The CDC® 722-10/20 Display Terminal Operators Guide/Installation Instructions Manual consists of the following sections.

- General Description
- Operator Controls and Indicators
- Crating
- Uncrating
- Relocation and Preinstallation
- Installation
- Equipment Care
- Troubleshooting
- Generating Commands - Advanced/752 Mode

This publication assumes that the user is familiar with the general features and functions of a display terminal.

Any application information not contained in this manual can be found in the 722-10/20 Display Terminal Reference Manual, publication number 62940001. Also, any installation information not contained in this manual can be found in the 722-10/20 Display Terminal Hardware Maintenance Manual (Site Information), publication number 62940003.

Additional copies of this publication and the previously mentioned publication may be ordered from:

Control Data Corporation
Literature and Distribution Services
308 North Dale Street
St. Paul, Minnesota 55103



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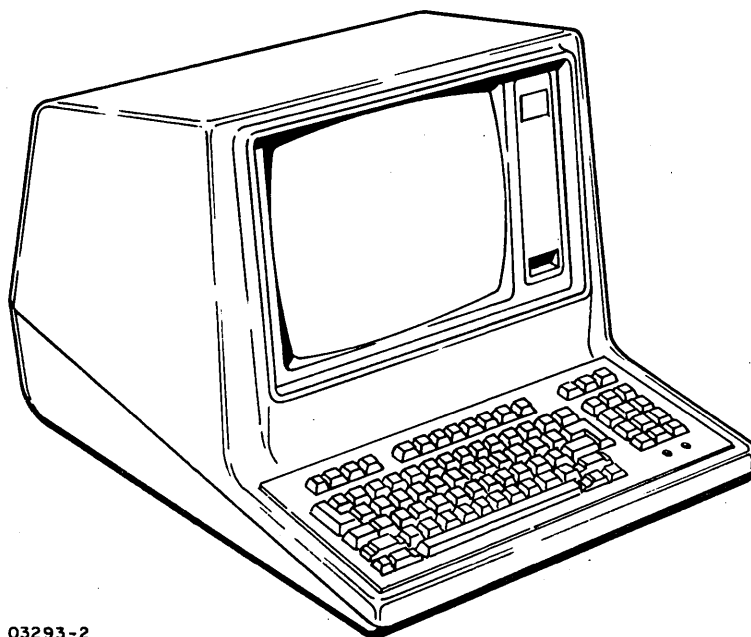
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GENERAL DESCRIPTION

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GENERAL DESCRIPTION

This section provides a functional and operational description of the display terminal (figure 1), which is a portable, self-contained, input/output (I/O) device that allows the user to perform local control or online communications to the central computer.



03293-2

Figure 1. Display Terminal

The terminal uses a 12-inch (diagonal measurement) cathode-ray tube (crt) to display information in a format of 24 lines of 80 characters each. Display size is approximately 6 inches (152.4 millimetres) high by 8.5 inches (215.9 millimetres) wide. Each character displays within an 8- by 10-dot matrix, nominally 0.219 inch (5.56 millimetres) high by 0.1 inch (2.54 millimetres) wide.

An 85-key keyboard provides for operator entry of specific symbol and control codes, which are displayed or transmitted as directed by the HALF DUP/FULL DUP and ON LINE/LOCAL switches. Terminal function keys are provided in addition to the alphanumeric and control-code entry keys. The keyboard has the capability of generating all 128 ASCII X3.4 codes, plus 46 command-coded sequences. Refer to the Operator Controls and Indicators section for additional information.

GENERAL DESCRIPTION

The basic display terminal 722-10 has the RS-232-C/CCITT modem interface while the 722-20 display terminal is configured for current-loop operation. The current-loop, RS232 interface selection is possible in the field but requires adjustments by a field service engineer. The display terminal may be ordered from the factory configured for either operating mode.

The user selects, via an internal switch (see figure 9), 120 V/220 V/240 V, 50/60 Hz operation of the terminal. Also, a printer connector is supplied for attachment of an RS-232-C printer.

OPERATOR CONTROLS AND INDICATORS

- Introduction
- External Controls
- Keyboard Data-Entry and Control Keys
- Keyboard/Interface Commands
- Self-Test Feature

OPERATOR CONTROLS AND INDICATORS

INTRODUCTION

This section describes the external controls, keyboard data-entry and control keys, keyboard/interface commands, and self-test feature. The purpose of this section is to provide the terminal operator with a brief overview of the operations and functions that can be performed by the terminal. Detailed information on communications, keyboard/interface command codes, and external controls is in the 722-10/20 Display Terminal Reference Manual (publication number is listed in the To The Operator section).

EXTERNAL CONTROLS

The external controls consist of the Power On/Off switch (figure 2), TEST/NORMAL switch (figure 9) and controls behind the operator access door. Figure 2 shows the switches located behind the operator access door and the decal for interpreting the DATA RATE SELECT switches and MODE SELECT switches. External controls not commonly used by the operator are described in the terminal reference manual.

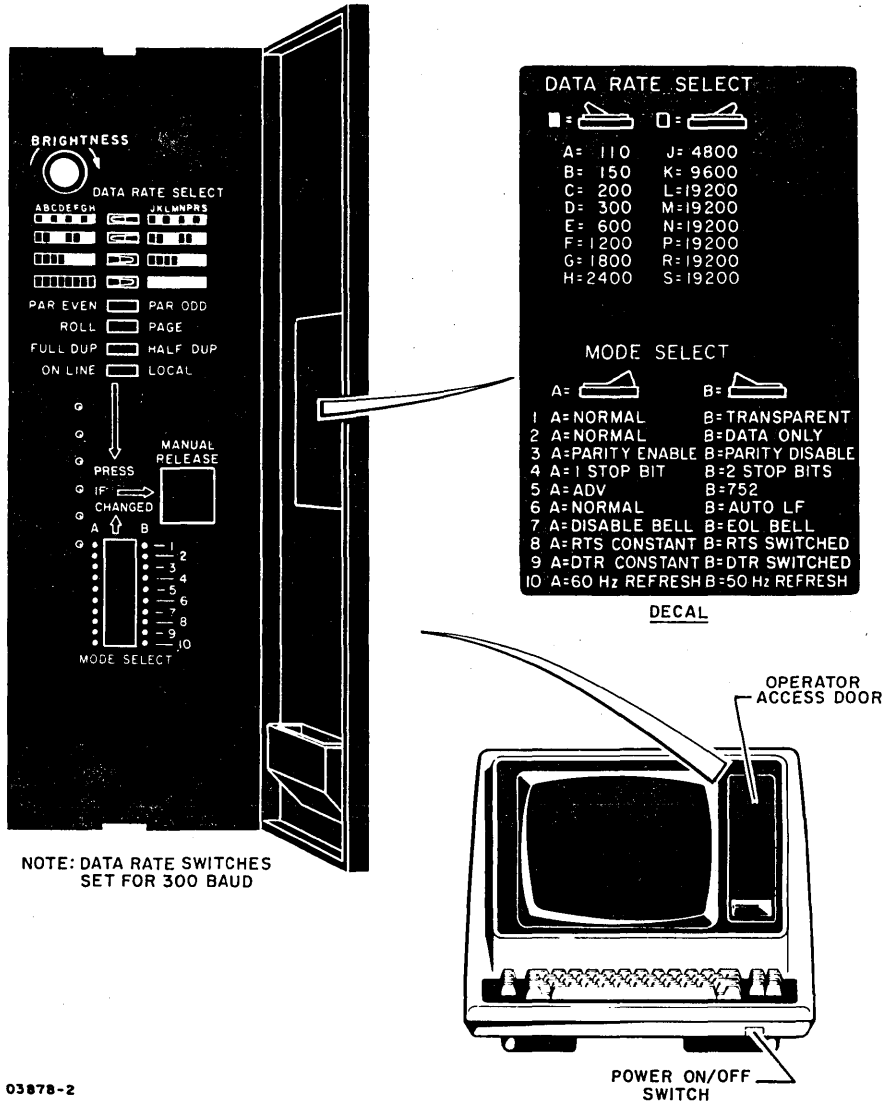
POWER ON/OFF SWITCH

The Power On/Off switch (figure 2) is on the right front of the display terminal, immediately below the keyboard. This switch controls primary power to the terminal. The following power-on/off procedures assume that the display station is plugged into the site ac outlet.

- Apply power by pulling forward on Power On/Off switch. A red-orange stripe on top of switch becomes visible when switch is pulled forward for power on.
- Remove power by pushing back on Power On/Off switch. Red-orange stripe on top of switch is not visible when switch is in power-off position.

Following application of power, the display terminal runs self-test routines that check the basic operating capabilities of the display terminal logic circuits. Refer to Diagnostic Self-Test Routines paragraph found later in this section for additional information.

OPERATOR CONTROLS AND INDICATORS



03878-2

Figure 2. Operator Access Door

OPERATOR CONTROLS AND INDICATORS

TEST/NORMAL SWITCH

The TEST/NORMAL switch is a slide switch on the rear of the terminal. When positioned to the TEST position, it connects the RS-232-C/CCITT V.24 interface signals together such that transmitted data is looped back as received data. Proper online operation of the terminal in half duplex mode results in two characters displayed for each alphanumeric character entered. Operation in full duplex mode results in a single character entry. No data transfers to the modem with the switch positioned to TEST.

Placing the switch in the NORM position restores the terminal to normal operations.

BRIGHTNESS CONTROL

The BRIGHTNESS control allows the operator to adjust the video intensity to ambient-lighting conditions.

ON LINE/LOCAL SWITCH

This switch allows the operator to place the keyboard offline to check the operation of the terminal without transmitting data to the modem. When this switch is in the ON LINE position, keyed-in data transfers to the modem as keys are pressed. When the ON LINE/LOCAL switch is in the LOCAL position, keyed-in data transfers to the terminal memory and displays on the display screen.

DISABLE BELL/EOL BELL SWITCH

This switch, in the operator access panel, allows the operator to choose disabling or enabling the EOP/EOL audible alarm used for an indication of the cursor movement to the 73rd-character position from the 72nd-character position and entry into the 24th line from the 23rd line. The audible alarm sounds when one of the preceding conditions exist and the switch is in the EOL BELL position.

OPERATOR CONTROLS AND INDICATORS

KEYBOARD DATA-ENTRY AND CONTROL KEYS

Figure 3 shows the layout of the keyboard. The keys on the keyboard provide operator entry of data and/or control codes. Some of the keys perform special functions and are described in greater detail in the following paragraphs. The BREAK, DEL, and ESC keys are applications oriented and are not described in this manual. Command code sequences entered from the keyboard are shown in tables 3 and 4.

NOTE

A list of all command code sequences that can be entered from the keyboard will be found in the Reference and HMM Site manuals. See, To the Operator, (front page) of this manual.

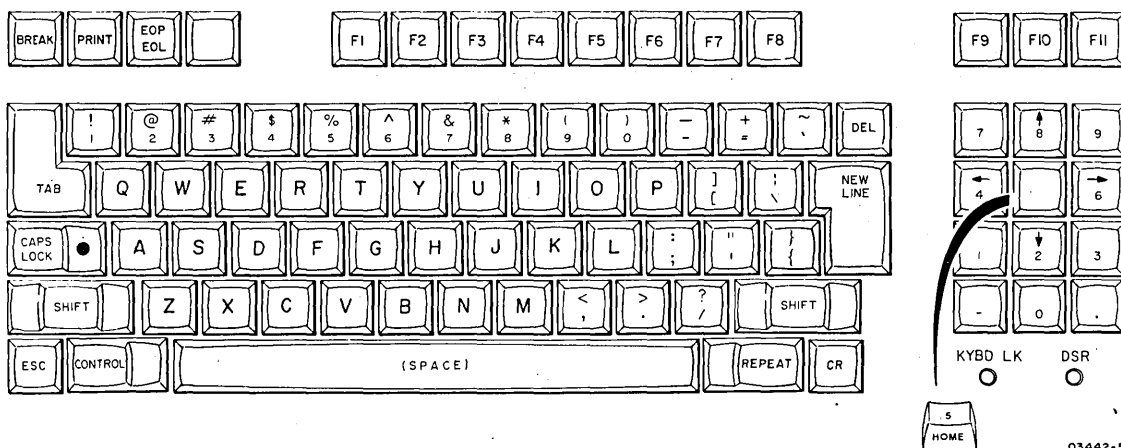


Figure 3. Keyboard Layout

PRINT KEY

The PRINT key transfers data from the display screen to the printer for a printout. After pressing this key, all the data from the current line to the end of the page transfers to the printer and is automatically reformatted to print as it appeared on the display screen. Printing may be aborted by pressing the MANUAL RELEASE switch. If in the 752 mode, pressing the PRINT key has no effect; keyed-in data automatically displays and prints simultaneously while the terminal is in the 752 mode of operation. The print key may be disabled in ADV mode by positioning the ROLL/PAGE switch to the ROLL position.

OPERATOR CONTROLS AND INDICATORS

EOP/EOL (END OF PAGE/END OF LINE) KEY

This key causes data to be cleared either a line at a time or the entire screen. Pressing this key while unshifted causes the data to be cleared from the cursor position to the end of the current line (cursor position stays unchanged). Pressing this key in conjunction with the SHIFT key causes the entire screen to be cleared and the cursor to reset at the home position. Refer to Cursor Control Keys paragraph for the definition of home position.

SPECIAL FUNCTION KEYS

F1 through F11 are applications oriented and generate a specific code sequence to be transferred to the central computer. This code sequence is unique to the individual function key whether it is used in conjunction with the SHIFT key, CONTROL key, combination of the SHIFT and CONTROL keys, or the individual key unshifted. One blank key is also available for use as a special function key; however the codes generated by this key are not altered if used in conjunction with the CONTROL key. Table 1 may be filled in by the operator as specific operations of the individual function and blank keys are defined for online operations. Note that pressing the F1 key in local mode of operation disables the communications alarm, while pressing the F1 key again enables the audible alarm.

TAB KEY

The TAB key in online or offline mode of operation has no effect but to transmit a code.

NEW LINE KEY

The NEW LINE key causes the cursor to relocate without affecting displayed data. Pressing the NEW LINE key while in 752 mode resets the cursor to the first character position of either the same line or the next line. The latter applies if the NORMAL/AUTO LF switch behind access door is set to the AUTO LF position. If in ADV mode, pressing the NEW LINE key resets the cursor to the first character position of the next line.

OPERATOR CONTROLS AND INDICATORS

TABLE 1. ONLINE OPERATION OF SPECIAL FUNCTION KEYS

KEY	FUNCTION			
	DATA KEY	DATA KEY PLUS SHIFT	DATA KEY PLUS CONTROL	DATA KEY PLUS SHIFT AND CONTROL
Blank			Not used	Not used
F1				
F2				
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				
F11				

OPERATOR CONTROLS AND INDICATORS

CURSOR CONTROL KEYS

The cursor control keys move the cursor up or down a line, back or forward a character position, or to the cursor home position* without altering displayed data. The cursor control keys consist of the cursor up, cursor down, backspace, skip, and HOME keys. These keys are in the numeric pad and are activated by pressing the appropriate cursor control key in conjunction with the SHIFT key.

CAPS LOCK KEY/INDICATOR

The CAPS LOCK key/indicator disables the generation of lowercase alpha characters. The CAPS LOCK key/indicator, when pressed and the indicator is illuminated, causes the generation of uppercase alpha characters only. The remaining data keys (special symbol, function, and numeric keys) are not affected by the CAPS LOCK key.

SHIFT KEYS

When held down, the SHIFT keys permit access to the uppercase characters and symbols of the data-entry keys.

CONTROL KEY

The CONTROL key is used in conjunction with a data-entry key or combination of data-entry key and SHIFT key to generate specific control codes. These codes perform control functions, such as cursor movements and highlighting commands.

*Home position is the first character position of the first line unless the terminal is in the 752 mode and the ROLL/PAGE switch is in the ROLL position. In this case, home position is the first character position of the last line.

OPERATOR CONTROLS AND INDICATORS

REPEAT KEY

The REPEAT key permits any keyboard character or symbol to be repeatedly generated at a rate of approximately 15 characters per second in the local mode of operation, or at a rate not greater than the transmission rate during online mode.

To repeat any character in this manner, press and hold the REPEAT key and then press the key(s) required for the character or symbol to be repeated. Releasing the REPEAT key stops the repeat function.

CR (CARRIAGE RETURN) KEY

The CR key resets the cursor to the beginning of the current line without altering displayed data. If in 752 mode of operation with the AUTO LF switch enabled, pressing this key causes the cursor to be positioned to the beginning of the next line.

LOCK (KEYBOARD LOCKED) INDICATOR

This indicator, below the numeric pad on the keyboard, illuminates during a page print operation. The keyboard is also locked and the indicator illuminated if the display terminal is unable to transmit data due to loss of control signals from the communications interface while online and ready to send. The keyboard unlocks and the indicator extinguishes when the print operation is completed, communications is reestablished, or the MANUAL RELEASE switch is pressed.

KEYBOARD/INTERFACE COMMANDS

The following paragraphs describe some of the keyboard/interface commands that can be initiated during normal terminal operation.

NOTE

These commands are applications oriented that can either be keyed in from the keyboard or generated from the central computer. For specific coding sequences, refer to the reference manual, that is listed in the To The Operator section.

OPERATOR CONTROLS AND INDICATORS

CHARACTER HIGHLIGHTING COMMANDS

The character highlighting feature allows for characters to be displayed at reduced intensity, to blink from a normal to low intensity, or to be underlined. Character highlighting is a line-at-a-time format in 752 mode and character-at-a-time format in ADV mode.

LINE GRAPHICS COMMAND

Line drawing symbols can be used for generating forms, graphs, etc. on the display terminal. The terminal responds to the line graphics mode after receipt of a specific coding sequence followed by the individual symbols only while in ADV mode of operation. The terminal remains in line graphics mode until a command to exit is received from the central computer.

PAGE PRINT COMMAND

After receipt of the page print command, all data displayed on the display screen transfers to the printer, the keyboard locks and KYBD LK indicator illuminates, and received data is ignored until the printing operation is completed. Printing may be aborted by pressing the MANUAL RELEASE switch. The page print command is acknowledged while in ADV mode of operation only.

INSERT LINE COMMAND

This command causes all data on the current line to be relocated one line down, the bottom line to be lost, and the current line to be cleared for additional data input. The insert line command is acted upon only while in ADV mode of operation.

DELETE LINE COMMAND

This command causes all the data on the current line to be deleted and all succeeding lines below the current cursor position to be moved one line up. The bottom line on the display screen clears for entry of additional data. The terminal responds to the delete line command while in ADV mode of operation only.

OPERATOR CONTROLS AND INDICATORS

FIELD SCROLL COMMANDS

The field scroll commands cause the data in a specified area of the display screen to scroll up or down. The scrolled line is lost and, depending on the scroll command, field scroll up results in the bottom line of scroll field to be cleared or field scroll down results in the top line of the scroll field to be cleared. The terminal responds to these commands only while in ADV mode of operation.

PRINT I/O COMMAND

Receipt of the print I/O (input/output) command causes the terminal to direct all received data, all transmitted data in half duplex, or any displayed data in local mode to the printer interface.

DIAGNOSTIC SELF-TEST ROUTINES

The display terminal contains three internal self-test routines that test the basic operating capability of the logic circuits. The first test routine (power on) is initiated immediately following a power-on application. The second routine (system level) is initiated upon receipt of an Initiate Test command at the communications interface. The third routine (transparent mode) is initiated by manually pressing the front panel MANUAL RELEASE switch when the display terminal is in transparent mode.

POWER-ON TEST

The power-on test is initiated immediately following a power-on application and consists of the following routines:

- Processor Routine - checks internal RAM and the processor. A message of CPU TEST OK or CPU TEST FAIL is displayed at test completion (assuming the failure mode does not prevent display).

OPERATOR CONTROLS AND INDICATORS

- Program Memory Routines - determines if the internal program coding is as intended. Proper coding results in a LRC B0 OK LRC B1 OK message being displayed. Improper coding causes display of a LRC B0 FAIL or LRC B1 FAIL message.
- Program Revision Routine - causes two numerals representing the program revision level to be displayed in the first line of the crt as follows: REV 1.1, REV 1.2, etc.
- Internal Loopback Routine - determines if a problem exists in the communication logic. The displayed messages resulting from this routine are INT LOOP OK or INT LOOP FAIL.
- Alarm Routine - the audible alarm is momentarily activated upon completion of the power-on test routines.

SYSTEM LEVEL TEST

The system level test is initiated upon receipt of an Initiate Test command (036g, 026g) only when the terminal is in ADV mode. All of the routines of the power-on test are performed but are first preceded by a program memory test. The program memory test consists of a write followed by a read to compare sliding alpha patterns shifted 256 times. Completion is indicated by a RAM TEST OK or RAM TEST FAIL message being displayed on the crt. Automatic responses are provided to the communication interface to indicate successful completion or failure of the test.

TRANSPARENT MODE TEST

The transparent mode test is initiated by pressing the MANUAL RELEASE switch when the display terminal is in transparent mode (NORMAL/XPARENT switch behind door in XPARENT position). This test causes all of the routines described in the previous tests to be executed, plus the following routines.

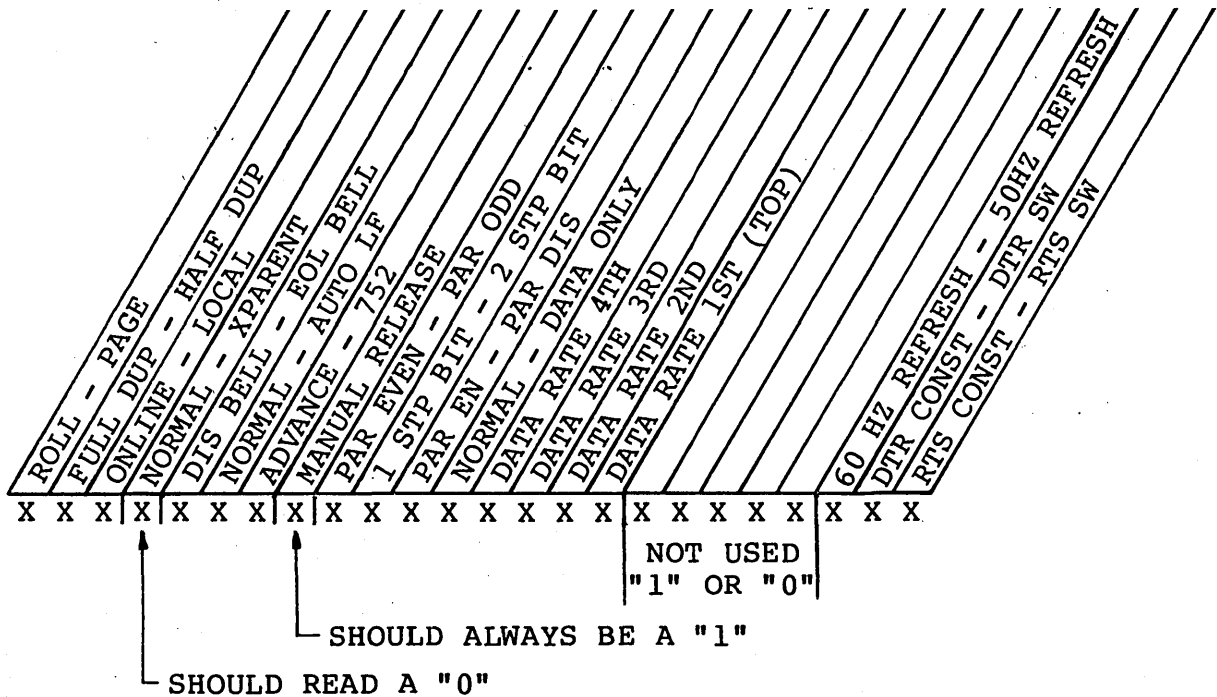
- The system level RAM test is modified to halt on error with the cursor positioned to the error location. Continuation of the test following a failure is accomplished by pressing the MANUAL RELEASE switch. After the RAM test, the routines of the power-on test execute, then the next described routine.

OPERATOR CONTROLS AND INDICATORS

- Switch Panel Routine - switch positions display on the crt as a series of 1 and 0 patterns; the order of presentation is shown in the attached figure (see figure 5). Operating the front-panel switches cause the character to be a 1 if the switch is positioned to the left. Exit from this test is accomplished by pressing the MANUAL RELEASE switch.
- Keyboard Routine (722-10 voltage interface only) - this section of the transparent mode test must be run with the TEST/NORMAL switch (at back of terminal) set to TEST. In this routine, pressing any key causes each character position on the crt to be filled with the data word or control code entered. Function keys cause the entry of characters corresponding to the control code transferred during normal communication activities. Exit from this routine is accomplished by pressing the MANUAL RELEASE switch and setting the TEST/NORMAL switch to NORMAL. This returns the terminal to an idle transparent mode.

NOTE

The terminal is not responsive to communications or keyboard activity except as noted during testing.



04031

Figure 5. Switch Panel Test Presentation Order



CRATING

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CRATING

To protect the display terminal from damage during transit, always prepare it for shipment using only approved materials and procedures. Proper materials may be obtained by saving the initial packing materials that were used in shipping the terminal or by contacting the nearest CDC representative or:

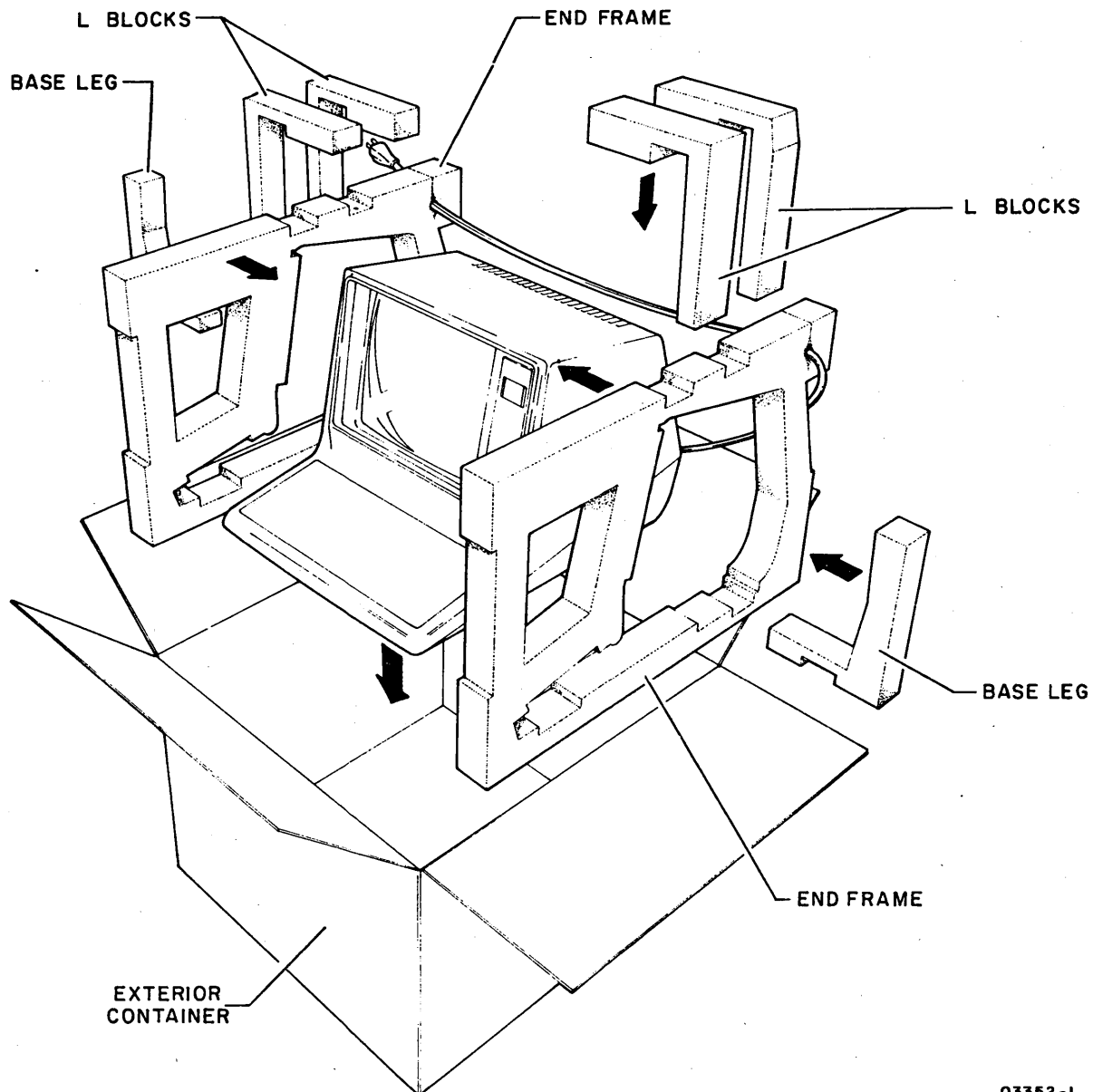
Control Data Corporation
Corporate Traffic
8100 34th Avenue South
Minneapolis, Minnesota 55440

To crate the display terminal, perform steps listed in figure 6.

CRATING

NOTES

1. USE PREFABRICATED SHIPPING MATERIALS (CDC P/N 41037500) FOR PACKAGING.
2. INTERLOCK FOAM BASE LEGS WITH END FRAMES.
3. PLACE END FRAMES WITH BASE LEGS ON DISPLAY TERMINAL.
4. PLACE DISPLAY TERMINAL WITH END FRAME CUSHIONING INTO EXTERIOR CONTAINER.
5. LOCK L BLOCKS IN POSITION.
6. SECURE POWER CABLE IN SLITS OF END FRAMES. (DO NOT LET PLUG DANGLE).
7. CLOSE AND SEAL EXTERIOR CONTAINER WITH 3-in REINFORCED BOX-SEALING TAPE.

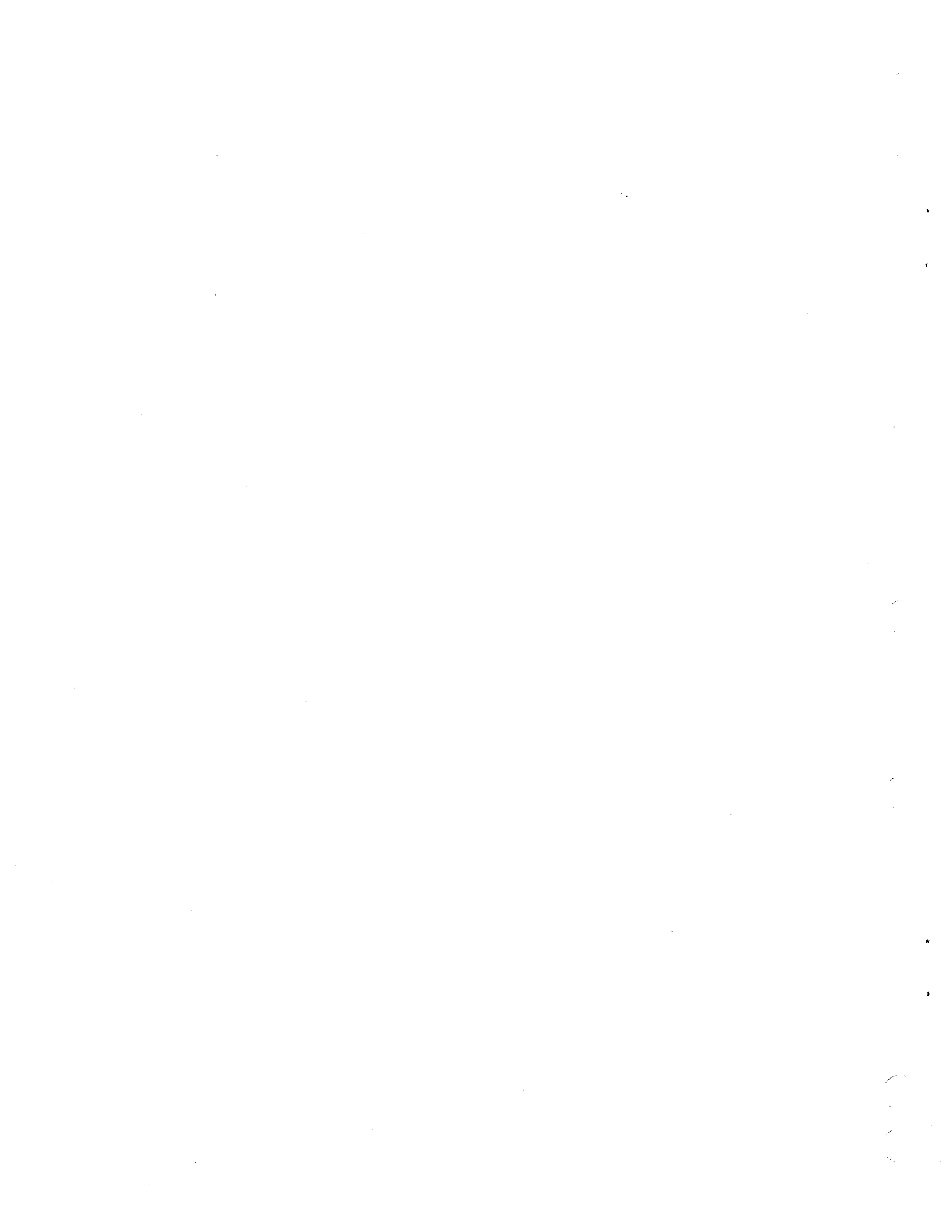


03352-1

Figure 6. Display Terminal Crating Instructions

UNCRATING

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UNCRATING

To uncrate the display terminal, refer to figure 6 and perform the following steps.

1. Open top of exterior container and lift cables secured in frame slits of packaging material.
2. Remove L blocks interlocked in the frames.
3. Remove terminal, with end frames attached, from exterior container.
4. Remove end frames and any remaining packaging material from terminal.
5. Inspect display terminal for any shipping damage.

NOTE

Save original packing materials for future use, such as relocating or reshipping the terminal.

NOTE

Interconnecting cable(s) are packaged separately.



RELOCATION/PREINSTALLATION

62940002 D

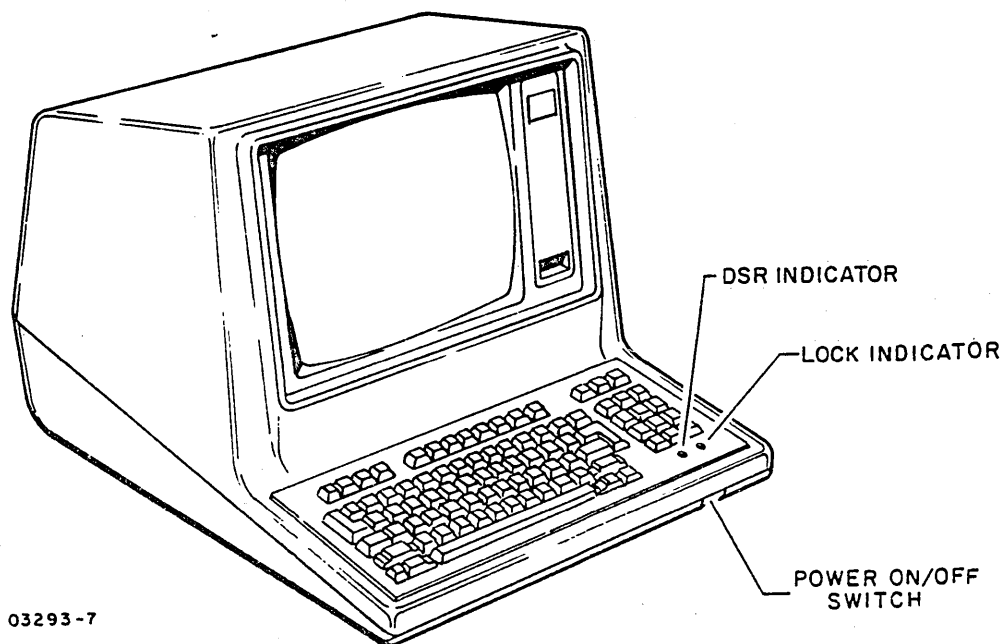
RELOCATION

This section provides the user with instructions for relocating the terminal. To relocate the display terminal, perform the following steps.

1. Disconnect power from printer and modem, if applicable.
2. Push terminal Power On/Off switch in so that red-orange stripe is not visible (figure 7).
3. Disconnect terminal ac plug from site outlet.
4. Remove appropriate connections between terminal and communication channel, and if used, remove cable from printer. Connector receptacle on terminal (figure 9) has securing screws for mating connector; remove cables via these screws (2 each).
5. Crate terminal per crating instructions described previously in this publication.

NOTE

After packaging the terminal, include communications cable in exterior container, if feasible.



03293-7

Figure 7. Power On/Off Switch

PREINSTALLATION

Before installation, the user selects desired operating modes per systems level requirements. A typical selection is noted in the installation section, paragraph 8. Consult the Data Site Manager for assistance in determining the correct operating mode switch settings.

Use figure 8 to pre-plan the individual terminal mode/switch selections and to provide a historical record of the correct switch selections in case of operational difficulties. This figure can also be used by maintenance personnel to verify that operating mode switch selections are correct.

A copy of this figure should be kept with each unit.

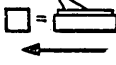
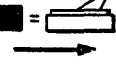


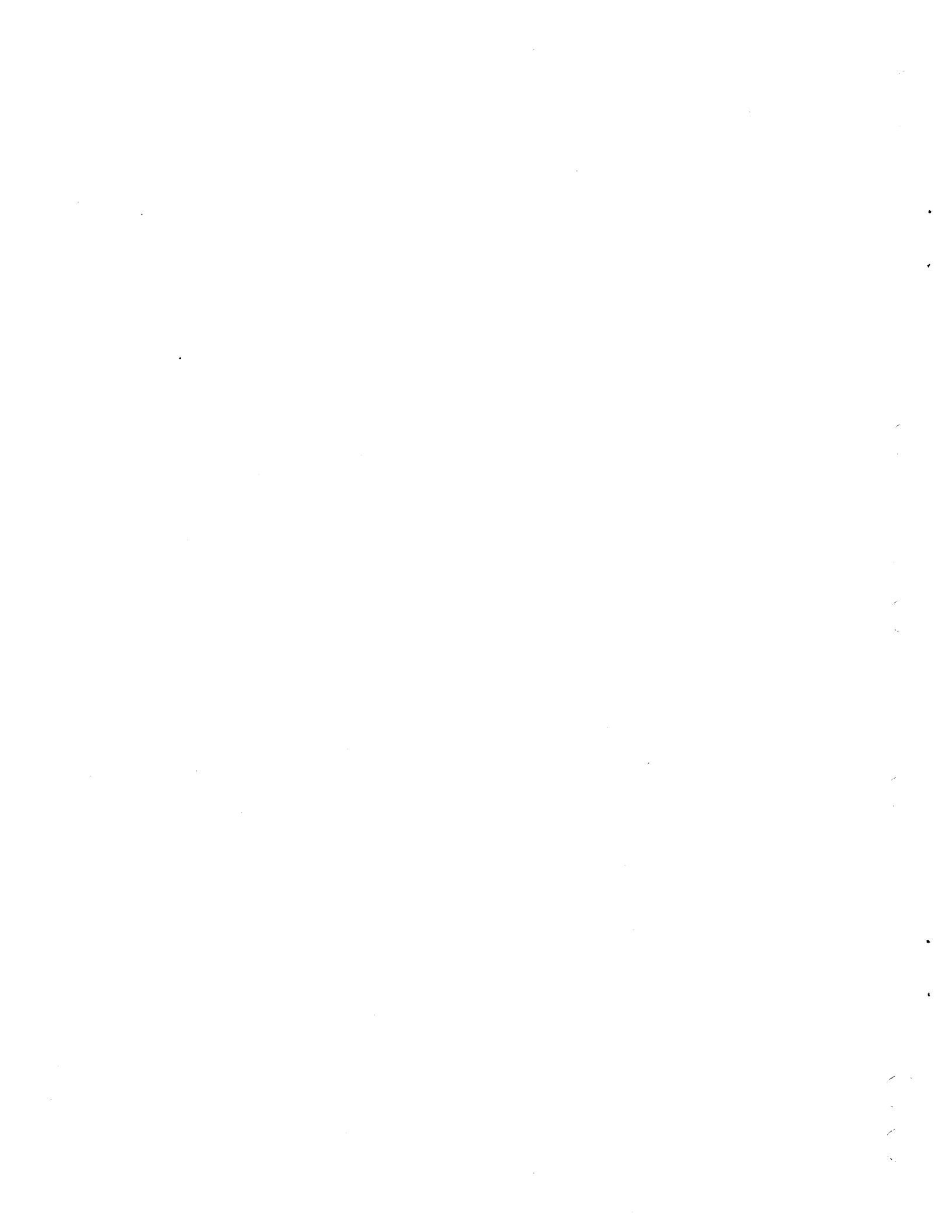
SWITCH NAME	DATA RATE SELECT												POSITION			
	10	150	200	300	600	1200	1800	2400	4800	9600	19200	19200	19200	19200	19200	 =  ← →
DATA RATE (TOP) 1ST	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
DATA RATE 2ND	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
DATA RATE 3RD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
DATA RATE (BOTTOM) 4TH	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
PAR EVEN - PAR ODD																
ROLL - PAGE																
FULL DUP - HALF DUP																
ON LINE - LOCAL																
MODE SELECT	POSITION															
	A = 							B = 								
NORMAL - XPARENT																
NORMAL - DATA ONLY																
PAR EN - PAR DIS																
1 STP BIT - 2 STP BIT																
ADVANCE - 752																
NORMAL - AUTO LF																
DIS BELL - EOL BELL																
RTS CONST - RTS SW																
DTR CONST - DTR SW																
60 HZ REFRESH - 50 HZ REFRESH																

Figure 8. Operating Mode Switch Setting Record

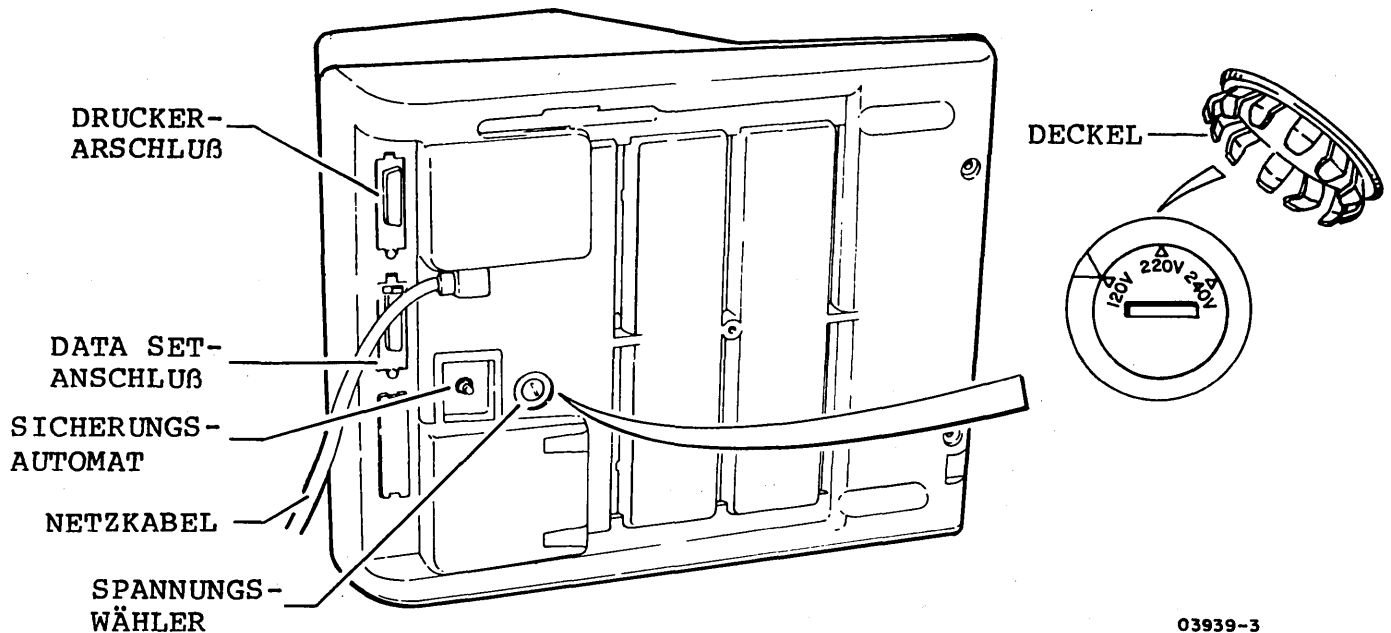
BETRIEBSANLEITUNG/INSTALLATION

62940002



INSTALLATION UND INBETRIEBNAHME

1. Das Terminal ist für den Anschluß an Schuko - Steckdosen mit einem entsprechenden Netzkabel (Teile Nr. 15165426) ausgerüstet.
2. Die Netzanschlußdose muß in der Nähe des Terminals und für den Operator leicht zugänglich sein.

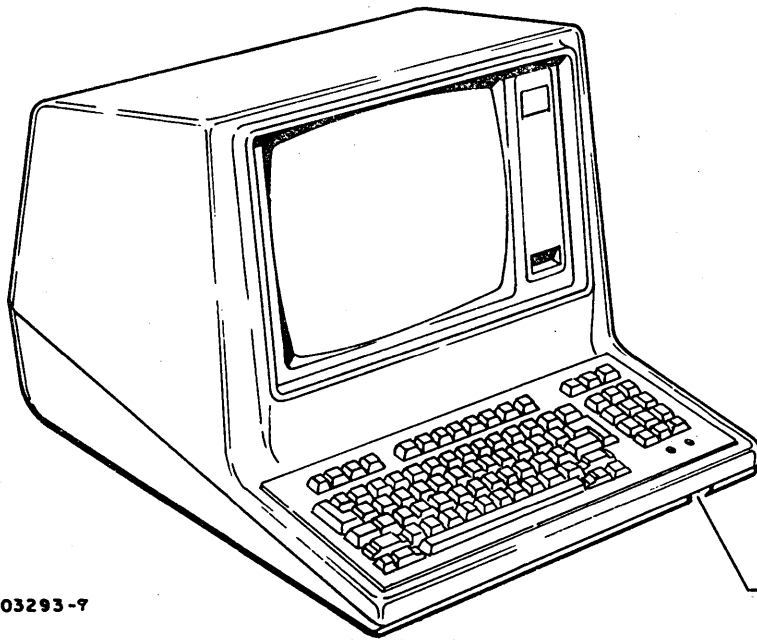


3. Vor Inbetriebnahme des Terminals muß der an der Unterseite befindlichen Spannungswähler auf die richtige Netzspannung eingestellt werden.

Auf dem Typenschild sind entsprechend alle anderen Spannungsangaben unkenntlich zu machen.

4. Es ist darauf zu achten, daß der Knopf des Sicherungsautomaten eingedrückt ist.
5. Der Netzschalter befindet sich rechts vorn unterhalb der Tastatur.

Zum Einschalten des Terminals muß er herausgezogen werden. In dieser Stellung wird eine rot-orange Markierung sichtbar.



03293-7

NETZSCHALTER

6. Die Bushsen für Data Set- und Drucker - Anschluß befinden sich ebenfalls an der Unterseite des Terminals. Die Kabelstecker sollten mittels der beiden Sicherungsschrauben festgezogen werden.
7. Ca. 30 Sek. nach Einschalten des Terminals wird eine automatische Selbstprüfungsroutine initiiert, deren Ergebnisse auf dem Bildschirm und durch akustisches Signal angezeigt werden.
8. Die Helligkeit ist richtig eingestellt, wenn der Cursor und die Testergebnisse deutlich in der linken oberen Ecke des Bildschirms sichtbar sind.
9. Im Fehlerfall soll das Terminal ausgeschaltet, der Netzstecker gezogen und der Technische Dienst benachrichtigt werden.

Eingriffe in das Terminal dürfen nur von hierfür speziell geschultem Personal vorgenommen werden.

INSTALLATION

This section is provided for user installation. Before installing the display terminal, observe the following installation requirements.

- Check that enough cable slack is provided to allow moving display station approximately 3 feet (1 metre) to permit servicing.
- Avoid direct sunlight on display screen.
- Allow a 4-in (101.6 mm) minimum air space at top and sides of display terminal to provide adequate cooling.
- Avoid installing display terminal in areas of high electromagnetic interference. Such areas may exist near a radio-frequency source, such as radio transmitting antennas (AM, FM, TV, and two-way radio), radar (FAA and military), certain industrial machines (rf induction heaters, rf arc welders, and insulation testers), time clocks, certain electrical heating systems, and high-energy power lines.
- Avoid installing display terminal where particulate, liquid, and gaseous atmospheric contaminants exist, such as those found in some process industries. Such environments can cause corrosion of copper and other metals that may result in terminal failures.
- Separate I/O cable from other electrical wiring (100 or 235 volts, 50 or 60 Hz) by a minimum of 2 in (51 mm). Unshielded, high-power, or high-energy wiring may require a larger separation. Some cabling may be run in the same conduit as telephone lines.
- Support I/O cable, both horizontally and vertically, every 10 ft (3.05 m).
- Ensure that primary power has adequate circuit overload protection devices to limit maximum current flow to 20 amperes. Also, the installation site must be designed in such a manner as to allow the operator easy access to the primary power outlet.

INSTALLATION

To install the display terminal, perform the following steps.

1. Remove terminal from packing container (refer to uncrating instructions), if applicable, and move to desired location.
2. Remove snap-in cover and place Voltage Select switch in proper voltage position for required site power (figure 9). Changing position of switch is accomplished by using flat-tip screwdriver, inserting tip of screwdriver in slot on switch, and turning switch to desired voltage.

If primary power is between 104 V and 128 V, select 120-V switch position; if primary power is between 191 V and 235 V, select 220-V switch position; or if primary power is between 208 V and 256 V, select 240-V switch position. Replace snap-in cover.



3. Make appropriate connections between terminal and communication channel, and if used, attach cable for RS-232-C printer (figure 9). For RS232 I/O cable lengths other than that furnished with display terminal, see figure 10.1 and tables 1.1 and 1.2 for fabrication instructions. Connector receptacle on terminal accepts securing screws from mating connector; secure cables via these screws (2 each).
4. Install printer, if applicable, before plugging in terminal to ac power outlet or attempting to turn terminal power on.
5. Ensure that ac power is connected. If site outlet is Schuko type, order CDC Part Number 15165426 for 220-V/240-V power cord.
6. Pull terminal power switch out so that red-orange strip appears. Self-test feature is initiated upon power on. Results from test display (figure 4) and audible alarm sounds (terminal warm-up period is approximately 30 seconds after application of power). To initiate additional tests, refer to Operator Controls and Indicator section in this manual.
7. Adjust BRIGHTNESS control until cursor and test results are clearly viewed in top left-hand corner of display screen.

INSTALLATION

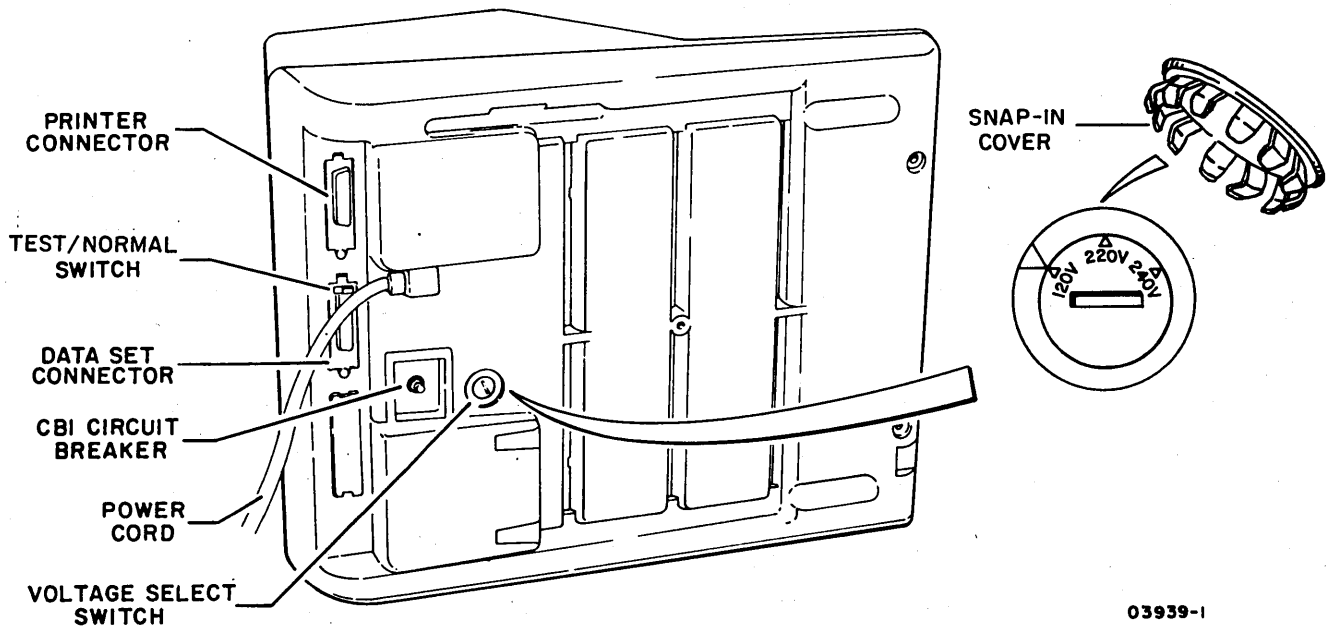
8. Select desired operating modes per systems level requirement. A typical telecommunications system with a data rate of 300 baud would be:

- PAR EVEN/PAR ODD switch - PAR EVEN position
- ROLL/PAGE switch - ROLL position
- FULL DUP/HALF DUP - HALF DUP position
- ON LINE/LOCAL switch - ON LINE position
- MODE SELECT switches (note that numbers and letters enclosed in parentheses denote labeling of switches on the operator access panel)
 - NORMAL/TRANSPARENT switch (1) - NORMAL position (A)
 - NORMAL/DATA ONLY switch (2) - NORMAL position (A)
 - PARITY ENABLE/PARITY DISABLE switch (3) - PARITY ENABLE position (A)
 - 1 STOP BIT/2 STOP BITS switch (4) - 2 STOP BITS position (B)
 - ADV/752 switch (5) - 752 position (B)
 - NORMAL/AUTO LF switch (6) - NORMAL position (A)
 - DISABLE BELL/EOL BELL switch (7) - EOL BELL position (B)
 - RTS CONSTANT/RTS SWITCHED switch (8) - RTS CONSTANT position (A)
 - DTR CONSTANT/DTR SWITCHED switch (9) - DTR CONSTANT position (A)
 - 60 Hz REFRESH/50 Hz REFRESH switch (10) - 60 Hz REFRESH position (A) for United States and Canadian systems or 50 Hz REFRESH position (B) for European systems

Figure 2 shows position of DATA RATE SELECT switches for system operation at 300 baud.

9. With MODE SELECT switches and DATA RATE SELECT switches set, turn terminal power off, then on, or press MANUAL RELEASE switch.

INSTALLATION



03939-1

Figure 9. Display Terminal (Bottom View)

10. Fill out customer reply card (figure 10) within 10 days of initial display terminal installation. This card is enclosed in product manual package, which is shipped with each terminal.

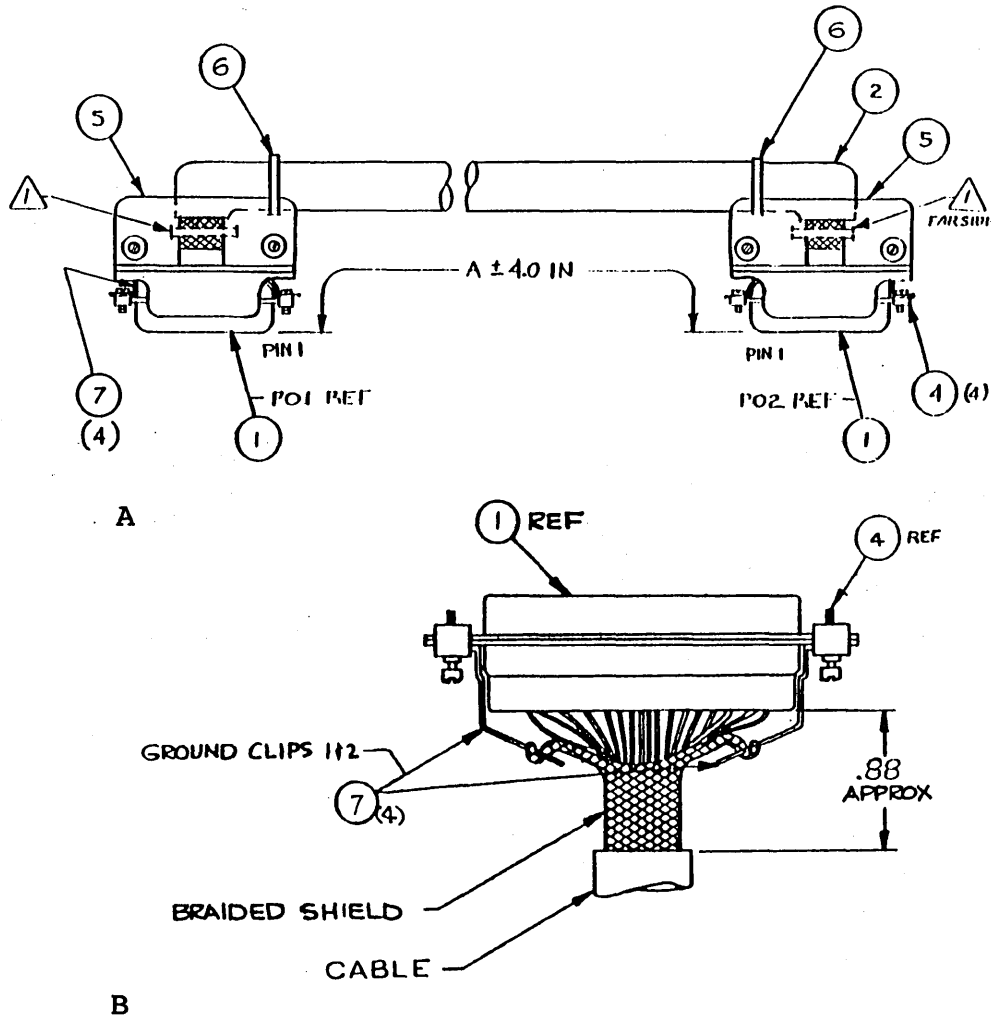
Please respond to the following within ten (10) days:		Date _____	
Originator's Name _____		Company _____	
Originator's Phone Number _____		Yes	No
Did the shipment arrive free of damage?		_____	_____
Did the shipment arrive complete?		_____	_____
Was the installation completed without problems?		_____	_____
Did your manual contain enough information to adequately prepare and install the terminal?		_____	_____
Terminal Serial Number _____		Equipment Identification Number _____	
Indicate your satisfaction by marking a "P" and "M" on the chart below. "P" = Terminal Performance and "M" (if applicable) = Timeliness of Maintenance/Repair Call Response.			
Dis-satisfied	Minimally Satisfied		Satisfied
Very Satisfied		Exceeded Expectations	
0	1	2	3
4	5	6	7
8	9	10	
Comments: _____			
<u>TTY</u> _____			

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Figure 10. Customer Reply Card

INSTALLATION

11. The following information is provided to fabricate the RS232 I/O cable assembly. It is intended for use when a cable length other than the one supplied with the display terminal is desired.



SHIELD WIRING VIEW
OF CONNECTOR'S P01 & P02
FIND NO 5 - HOOD
NOT SHOWN

\triangle 1 CABLE TIE FURNISHED WITH CONNECTOR. BRAID SHALL BE EXPOSED UNDER CABLE TIE.

Figure 10.1 RS232 I/O Cable Assembly

INSTALLATION

TABLE 1.1. PARTS DESCRIPTION FOR RS232 I/O CABLE ASSEMBLY

FIND NUMBER	CDC PART NUMBER	QUANTITY	DESCRIPTION	VENDOR(S)	PART NUMBER
1	10129658	2 each	Connector plug 25 pin	Amp	207464-1
2	51908501	Length Reg.	Cable, shielded 25 conductor 300 volt	Montrose Phald Rome-Cable Brand-Rex Mohawk-Wire	per spec " " " "
3	62013802	50 each	28-24 gauge pin strip	Amp	205310-2
4	44673392	2 pair	Locking device	Amp	205980-1
5	71493138	2 each	Hood, Connector	(None)	--
6	94277400	2 each	Strap, cable tie type 1" to 5/8"	Panduit Thomas- Betts Heyco	PLT-1M TY-23M NT-70
7	71491967	4 each	Clip, ground (copper/tin plating)	(None)	--

INSTALLATION

TABLE 1.2. ASSEMBLY INSTRUCTIONS FOR RS232 I/O CABLE

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.
1	2	26	970		Po1	1	3	Po2	1	3
2			5			2			2	
3			6			3			3	
4			7			4			4	
5			8			5			5	
6			9			6			6	
7			90			7			7	
8			91			8			8	
9			92			9			9	
10			93			10			10	
11			94			11			11	
12			95			12			12	
13			98			13			13	
14		26	910			14			14	
15		24	4			15			15	
16		26	920			16			16	
17			930			17			17	
18			940			18			18	
19			96			19			19	
20			950			20			20	
21			97			21			21	
22		26	960			22			22	

INSTALLATION

TABLE 1.2. ASSEMBLY INSTRUCTIONS FOR RS232 I/O CABLE (CONTD)

CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX)	ORIGIN	ACCESS FIND NO.	DESTINATION	ACCESS FIND NO.		
23	↓	24	2	↓	↓	23	↓	23		
24	↓	24	1	↓	↓	24	↓	24		
25	2	24	3	↓	Po1	25	3	Po2	24	3
26*	2			↓	GND CLIP	1	9	GND CLIP	1	9
	2			↓	GND CLIP	2	9	GND CLIP	2	9

*Braided shield. Terminate shield per figure 10.1B.

EQUIPMENT CARE

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EQUIPMENT CARE

Regular cleaning plays an important part in the service life of the display terminal. Not only does cleaning contribute to trouble-free operation of the terminal, but it also keeps the equipment looking neat and attractive, which promotes a pleasant and businesslike atmosphere. Cleaning should be scheduled for that time when power to the terminal is turned off. A good time to clean the terminal, then, is either just before system startup or just after system shutdown for the day. Discussed in the following paragraphs is a general cleaning procedure for the display terminal and cleaning/replacing procedures for the glare shield.

DISPLAY TERMINAL GENERAL CLEANING PROCEDURE

Perform the following steps weekly under normal operating conditions, such as those found in most modern offices.

CAUTION

Do not use solvents to clean the keyboard of the display terminal. Solvents can cause keyswitches to become defective.

1. Remove dust from keyboard with a soft-bristled brush.

CAUTION

Never use cleaners that contain ammonia or bleach as these cleaners discolor finished surfaces.

2. Clean cabinet exterior with a damp, lint-free cloth. Moisten cloth with a mild soap-and-water solution to remove any stubborn grime or smudges.

CAUTION

Do not spray glass cleaner directly on display screen as glass cleaner may run between display screen and cabinet and may cause possible damage to internal electronic assemblies.

3. Clean display screen with a CLEAN, soft-cloth and a name-brand glass cleaner (any grit on cloth will scratch screen). Spray glass cleaner into cloth.

EQUIPMENT CARE

GLARE SHIELD CLEANING/REPLACING PROCEDURE

Depending on display terminal environment and usage, the glare shield (figure 11) may become dirty or damaged. Cleaning and/or replacing the glare shield is the responsibility of the user. The following paragraphs describe how to clean and/or replace the glare shield.

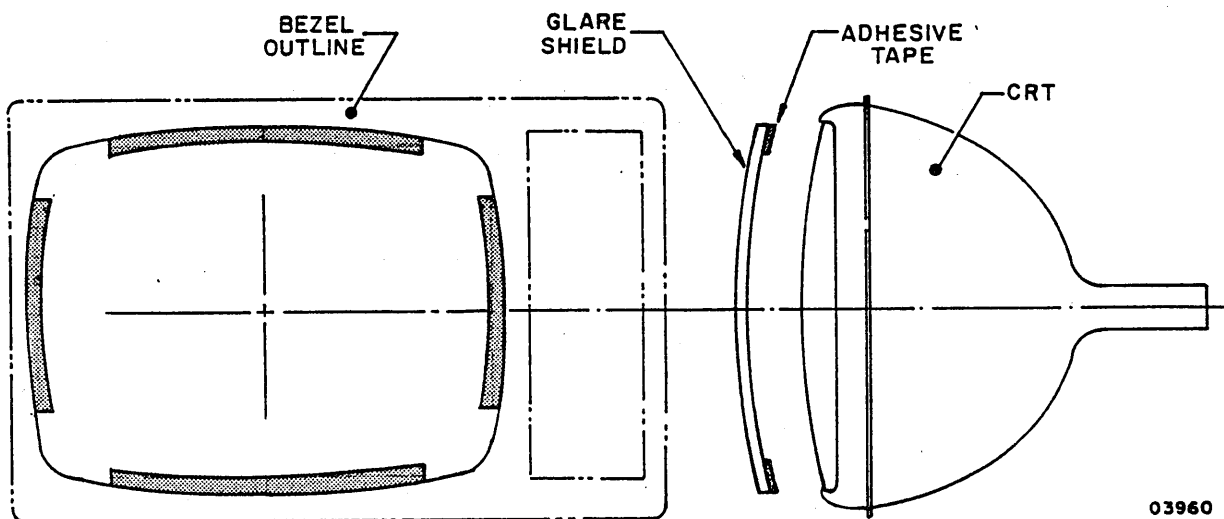


Figure 11. Glare Shield Cleaning/Replacing

To clean the glare shield, perform the following steps.

1. Push terminal power switch in so that red-orange stripe is not visible.

EQUIPMENT CARE

CAUTION

Do not pull on operator access door as door may be dislodged from bezel.

2. Remove bezel from around display screen by opening operator access door, grasping frame of bezel with your fingers, and pulling gently.

CAUTION

In steps 3 and 5, Do not use any sharp objects to remove glare shield as they may scratch the shield and/or display screen.

3. Remove glare shield by grasping upper corners and gently pulling shield from face of display screen.
4. Place glare shield face down on CLEAN, soft-cloth (any grit on cloth will scratch shield).

CAUTION

Do not allow isopropyl alcohol to run between display screen and cabinet as it may cause possible damage to internal electronic assemblies.

5. Remove any remaining adhesive tape from glare shield and/or display screen with isopropyl alcohol and soft, lint-free cloth. Pour alcohol into cloth.

CAUTION

In steps 6 and 9, do not allow glass cleaner to run between display screen and cabinet as it may cause possible damage to internal electronic assemblies.

6. Clean glare shield (side that faces display screen) and display screen with a CLEAN, soft, lint-free cloth and a name-brand glass cleaner (any grit on cloth will scratch the shield and/or display screen). Spray glass cleaner into cloth.

EQUIPMENT CARE

7. Reapply double-back adhesive tape using strips approximately 1/8-inch wide by 6-inches long to glare shield (side that faces display screen). Placement of adhesive tape is shown in figure 11.

NOTE

Use Scotch-brand No. 465 double-back adhesive tape or equivalent.

8. Remove protective covering from tape, align glare shield with face of display screen, and press into position by applying pressure with finger tips along tape paths.
9. Clean face of glare shield with a CLEAN, soft, lint-free cloth and name-brand glass cleaner (any grit on cloth will scratch the shield). Spray glass cleaner into cloth.
10. Replace bezel by aligning it with display screen opening and pressing it gently but firmly into position.

To replace glare shield, perform the following steps.

NOTE

When glare shield needs to be replaced, contact your nearest CDC representative and order CDC Part Number 51918291.

1. Unpack glare shield and inspect shield for any shipping damage.
2. Place glare shield face down on CLEAN, soft-cloth (any grit on cloth will scratch shield).
3. Push terminal power switch in so that red-orange stripe is not visible.

EQUIPMENT CARE

CAUTION

Do not pull on operator access door as door may be dislodged from bezel.

4. Remove bezel from around display screen by opening operator access door, grasping frame of bezel with your fingers, and pulling gently.

CAUTION

Do not use any sharp objects to remove glare shield as they may scratch the shield and/or display screen.

5. Remove glare shield by grasping upper corners and gently pulling shield from face of display screen.
6. Discard old glare shield.

CAUTION

Do not use any sharp objects to remove display screen.

CAUTION

Do not allow isopropyl alcohol to run between display screen and cabinet as it may cause possible damage to internal electronic assemblies.

7. Remove any remaining adhesive tape from display screen with isopropyl alcohol and soft, lint-free cloth. Pour alcohol into cloth.

EQUIPMENT CARE

CAUTION

In steps 8 and 10, do not allow glass cleaner to run between display screen and cabinet as it may cause possible damage to internal electronic assemblies.

8. Clean glare shield (side that faces display screen) and display screen with a CLEAN, soft, lint-free cloth and a name-brand glass cleaner (any grit on cloth will scratch the shield and/or display screen). Spray glass cleaner into cloth.
9. Remove protective covering from tape, align glare shield with face of display screen, and press into position by applying pressure with finger tips along tape paths.
10. Clean face of glare shield with a CLEAN, soft, lint-free cloth and name-brand glass cleaner (any grit on cloth will scratch the shield). Spray glass cleaner into cloth.
11. Replace bezel by aligning it with display screen opening and pressing it gently but firmly into position.

TROUBLESHOOTING

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TROUBLESHOOTING

This section provides helpful hints that may allow the operator to correct minor problems or to eliminate possible causes with the display terminal before calling the next level of assistance (for example, supervisor or service representative). Table 2 describes the symptoms, probable causes, and actions required by the operator when troubleshooting the display terminal.

The following procedure establishes whether the terminal or printer is malfunctioning.

1. Push terminal Power On/Off switch in so that red-orange stripe is not visible.
2. Turn printer power off.
3. Disconnect cable from Data Set Connector on base of terminal.
4. Disconnect printer I/O cable at printer and connect it to Data Set Connector on base of terminal.
5. Set external controls, behind operator access panel on terminal, to:
 - a. HALF DUP
 - b. LOCAL
 - c. 752
6. Pull terminal Power On/Off switch out so that red-orange stripe is visible and ensure that power-on test is successful.
7. Press several alpha keys.
 - a. If duplicate characters appear on display screen for each keyed-in character (first character was keyed in and second character was echoed back through cable connection), printer is malfunctioning.
 - b. If display screen shows no character, one character, incorrect character, or two different characters, either terminal is malfunctioning or cable is bad.
8. Set controls behind access panel to ADVANCE and PAGE, then press MANUAL RELEASE switch.
9. Press PRINT key and observe cursor on screen. If cursor advances from current line to end of page, then to home position, problem is in printer. Otherwise, problem is in terminal.

TROUBLESHOOTING

10. Return terminal and printer to normal operating condition.
 - a. Remove power from terminal.
 - b. Replace I/O and data set cables to their original connections.
 - c. Reselect desired operating modes.
 - d. Reapply power to both units, if applicable.

TABLE 2. TROUBLESHOOTING CHART FOR DISPLAY TERMINAL

SYMPTOM	PROBABLE CAUSE	ACTION
<p>Power switch pulled out but cursor and self-test results do not appear on display screen.</p>	<ol style="list-style-type: none"> 1. Terminal ac power cord is not plugged into site power outlet. 2. Power cord is not plugged into terminal. 3. Site power is not available. 4. Main power circuit breaker (CB1) tripped. 5. BRIGHTNESS control too low. 6. Fault is not operator correctable. 	<ol style="list-style-type: none"> 1. Ensure that ac power cord is plugged into site power outlet. 2. Ensure that power cord is plugged into terminal. 3. Ensure that site power is turned on. 4. Reset (push in) circuit breaker on rear of terminal. 5. Adjust BRIGHTNESS control so that displayed data is viewed clearly. 6. Call next level of assistance.
<p>Self-test results display on screen but indicate failing routine.</p>	<ol style="list-style-type: none"> 1. Terminal malfunction. 2. Fault is not operator correctable. 	<ol style="list-style-type: none"> 1. Reinitialize terminal. 2. Call next level of assistance.
<p>Self-test okay but communications not established at system level.</p>	<ol style="list-style-type: none"> 1. System malfunction. 2. External controls, behind operator access panel, selected incorrectly for online operation. 	<ol style="list-style-type: none"> 1. Reinitialize per system requirements. 2. Ensure that external controls are set properly for online operation.

TROUBLESHOOTING

TABLE 2. TROUBLESHOOTING CHART FOR DISPLAY TERMINAL (CONTD)

SYMPTOM	PROBABLE CAUSE	ACTION
<p>Malformation of displayed data.</p> <p>No keys work, cursor appears on display screen, and KYBD LK indicator is illuminated.</p>	<ol style="list-style-type: none"> 3. Loss of communication with central computer. 4. Fault is not operator correctable. 1. Fault is not operator correctable. 1. Page print operation is being performed. 2. Loss of communication with central computer. 3. Fault is not operator correctable. 	<ol style="list-style-type: none"> 3. Reestablish communication with central computer. 4. Call next level of assistance. 1. Call next level of assistance. 1. Ensure that printer is operating. Pressing MANUAL RELEASE switch aborts printing request. 2. Reestablish communication with central computer. 3. Call next level of assistance.
<p>Power switch pulled out but no data displays when in online mode.</p>	<ol style="list-style-type: none"> 1. System malfunction. 2. Loss of communication with central computer. 3. Baud rate is selected incorrectly for online operation or communications control switches are incorrectly set. 4. Malfunction of baud rate switch or communications control switches are incorrectly set. 5. Fault is not operator correctable. 	<ol style="list-style-type: none"> 1. Reinitialize per system requirements. 2. Reestablish communication with central computer. 3. Ensure correct baud rate and control switches are selected for online operation. 4. Perform self-test as outlined in Operator Controls and Indicators section in this manual and ensure baud rate and control switches are operable. 5. Call next level of assistance.



GENERATING COMMANDS
ADVANCED/752 MODE

62940002 H

TABLE 3. GENERATING ASCII CONTROL CODES FOR ADVANCED MODE COMMANDS

COMMAND	CODE MNEMONIC	KEY SEQUENCE	OCTAL CODE
Print Form	SOH	CONTROL and A	001
Page Print	DC1	CONTROL and Q	021
Print I/O	RS, F	CONTROL and +/=, then SHIFT and F	036, 106
Blind Printer	RS, DEL	CONTROL and +/=, then DEL	036, 177
Start Blink	SO	CONTROL and N	016
Start Underscore	DC4	CONTROL and T	024
Start Dim	FS	CONTROL and /Reverse Slash	034
Stop Blink	SI	CONTROL and O	017
End Underscore	NAK	CONTROL and U	025
End Dim	GS	CONTROL and]/[035
Enable Blink	ETX	CONTROL and C	003
Disable Blink	EOT	CONTROL and D	004
Roll Enable	DC2	CONTROL and R	022
Roll Disable	DC3	CONTROL and S	023
Set Scroll Field	RS, W	CONTROL and +/=, then SHIFT and W	036, 127
Field Scroll Up	RS, U	CONTROL and +/=, then SHIFT and U	036, 125
Field Scroll Down	RS, V	CONTROL and +/=, then SHIFT and V	036, 126
Tab	RS, EOT	CONTROL and +/=, then CONTROL and D	036, 004

TABLE 3. GENERATING ASCII CONTROL CODES FOR ADVANCED MODE COMMANDS (CONTD)

COMMAND	CODE MNEMONIC	KEY SEQUENCE	OCTAL CODE
Clear Field of: - All data	RS, P	CONTROL and +/=, then SHIFT and P	036, 120
- All data except low intensity areas	RS, @	CONTROL and +/=, then SHIFT and @/2	036, 100
- Only low intensity areas	RS, ?	CONTROL and +/=, then SHIFT and ?/Slash	036, 077
Delete Line	RS, Q	CONTROL and +/=, then SHIFT and Q	036, 121
Insert Line	RS, R	CONTROL and +/=, then SHIFT and R	036, 122
Line Drawing	RS, FS	CONTROL and +/=, then CONTROL and /Reverse Slash	036, 034
Basic Character	RS, GS	CONTROL and +/=, then CONTROL and]/[036, 035
Read Cursor Address	ENQ	CONTROL and E	005
Write Cursor Address	DLE	CONTROL and P	020
Initiate Test	RS, SYN	CONTROL and +/=, then CONTROL and V	036, 026
Read Status	RS, DC4	CONTROL and +/=, then CONTROL and T	036, 024
Read Parameter	RS, DC3	CONTROL and +/=, then CONTROL and S	036, 023
Read Data	RS, DLE	CONTROL and +/=, then CONTROL and P	036, 020
Read Attribute	RS, SO	CONTROL and +/=, then CONTROL and N	036, 016
Alarm	BEL	CONTROL and G	007
Add Delimiter	RS, ENQ	CONTROL and +/=, then CONTROL and E	036, 005

TABLE 4. GENERATING ASCII CONTROL CODES FOR 752 MODE COMMANDS

COMMAND	CODE MNEMONIC	KEY SEQUENCE	OCTAL CODE
Alarm	BEL	CONTROL and G	007
Reduced Intensity	SO	CONTROL and N	016
Blink	ETB	CONTROL and W	027
Stop Highlight	SI	CONTROL and O	017
X-Y Positioning	ESC, 1	ESC, then 1	033, 061
Backspace	BS	SHIFT and /4	010
Line Feed	LF	SHIFT and /2	012
Carriage Return	CR	CR or NEW LINE	015
Line Clear	SYN	CONTROL and V	026
Page Clear	CAN	SHIFT and EOP/EOL	030
Home	EM	SHIFT and HOME/5	031
Cursor Up	SUB	SHIFT and /8	032
*	NUL	CONTROL and @/2	000
*	SOH	CONTROL and A	001
*	STX	CONTROL and B	002
*	ETX	CONTROL and C	003
*	EOT	CONTROL and D	004
*	ENQ	CONTROL and E	005
*	ACK	CONTROL and F	006
*	HT	TAB	011
*	VT	CONTROL and K	013
*	FF	CONTROL and L	014
*	DLE	CONTROL and P	020
*	DC1	CONTROL and Q	021

TABLE 4. GENERATING ASCII CONTROL CODES FOR 752 MODE COMMANDS
(CONTD)

COMMAND	CODE MNEMONIC	KEY SEQUENCE	OCTAL CODE
*	DC2	CONTROL and R	022
*	DC3	CONTROL and S	023
*	DC4	CONTROL and T	024
*	NAK	SHIFT and /6	025
*	ESC	ESC	033
*	FS	CONTROL and / Reverse Slash	034
*	GS	CONTROL and]/[035
*	RS	CONTROL and +=	036
*	US	CONTROL and /-	037
*	DEL	DEL	177

*Only code transmission occurs.

COMMENT SHEET

MANUAL TITLE: 722-10/20 Display Terminal Operators Guide/
Installation Instructions

PUBLICATION NO.: 62940002

REVISION: J

NAME: _____

COMPANY: _____

STREET ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

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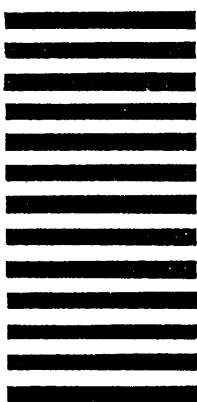
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