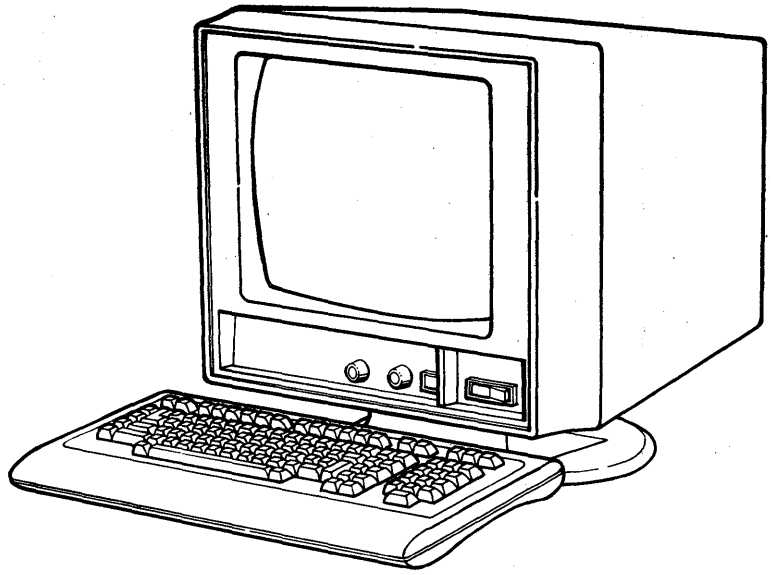
62950101

CONTROL DATA CORPORATION

CDC® 721
ENHANCED DISPLAY TERMINAL



OPERATOR'S GUIDE/INSTALLATION INSTRUCTIONS

REVISION RECORD

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A (08-03-83)	Manual released. Manual reflects revision 4.0 terminal firmware.

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or use Comment Sheet in the back of this manual.

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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PREFACE

This manual contains operating and installation information for the CDC® 721 Enhanced Display Terminal. This information is for the operator of the terminal and the person who installs it. The 721 Enhanced Display Terminal may be either an:

- Enhanced production model (known as a CC634-B or CC638-B Display Terminal)
- Earlier built model (known as a CC634-A or CC638-A Display Terminal) with an enhanced firmware option installed (the option is known as the YR109-A Enhanced Firmware Option)

The operating information provided specifically covers how to operate the terminal in CYBER mode. That mode is for operations with CDC CYBER computer systems such as those of the 120 or 170 series. This is accompanied with general information such as:

- A general description of the terminal
- A description of operator controls and indicators
- How to start up the terminal and run its self tests
- Instructions on cleaning the terminal
- Error recovery and fault isolation procedures and information on how to turn in terminal components to a CDC repair service center

This general information is to supplement manuals which cover the operation of the terminal in other than CYBER mode.

The installation information covers the procedure for installing the terminal and checking it out for operation.

The following list of associated manuals is divided into groups which cover the enhanced model terminals and the original model terminals.

ASSOCIATED MANUALS FOR ENHANCED MODEL TERMINALS:

Title	Publication Number
721 Display Terminal Unpacking/ Packing Instructions	62940038
721 Enhanced Display Terminal Reference Manual	62950102
721-101 1200/1200 Baud Modem Hardware Installation Instructions (applicable to enhanced production model terminals only)	62950119
721-220 Graphics Board Hardware Installation Instructions (applicable to enhanced production model terminals only)	62950118

ASSOCIATED MANUALS FOR ORIGINAL MODEL TERMINALS:

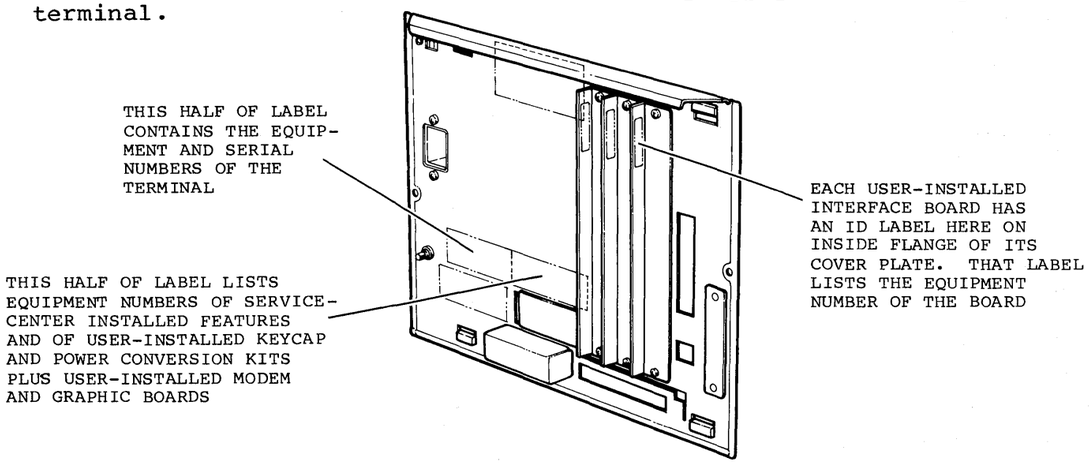
721 Display Terminal Operator's Guide/ Installation Instructions	62940019
721 Display Terminal Unpacking/ Packing Instructions	62940038
721 Display Terminal Reference Manual	62940020

All manuals may be ordered from:

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

CONFIGURATION SHEET

This sheet is for keeping a record of the optional features installed in your display terminal. To fill out this sheet, refer to the Equipment Identification (ID) labels on the rear panel of the terminal. These labels are shown below, however, not all may apply and be on your terminal.



Serial number of the terminal is _____ and its equipment number is (check the one that is applicable):

NOTE

The CC634-A and CC638-A model terminals listed below are assumed to have the later listed YR109-A enhanced firmware option installed. If you have a CC634-A or CC638-A terminal that does not have that option, you should not use this manual. Instead, you should use the operator's guide/installation instructions manual that is listed in the preface for the original model terminals.

-- CC634-A or CC634-B, which has no factory-installed optional features

-- CC638-A or CC638-B, which has optional graphics board and touchpanel installed at factory

Service-center installed features include (check if applicable):

-- XA358-A graphics board and touchpanel

-- XA369-A touchpanel

-- YR109-A enhanced firmware option (applicable only to CC634-A or CC638-A model terminals)

User-installed features include (check if applicable):

-- XA360-A 1200/1200 baud modem*

-- XA368-A graphics board*

-- YR101-A dual asynchronous-interface board

-- YR102-A parallel-interface board

-- YA274-A United Kingdom keycap kit

-- YA274-B Spanish keycap kit

-- YA274-C German keycap kit

-- YA274-D French keycap kit

-- YA274-E Swedish/Finnish keycap kit

-- YA274-F Danish/Norwegian keycap kit

-- YA275-A power conversion kit

*These items are user installed in the CC634-B and CC638-B model terminals only.

This portion of the configuration sheet is for recording installation parameter entries in case reentry becomes necessary. The applicable spaces provided below are to be filled in by the person who installs the terminal. This is covered in appendix A. The values listed immediately below each entry point of a parameter entry field are factory preset (or default) values.

TERMINAL INSTALLATION PARAMETER ENTRIES

	F CONFIG 2	F CONFIG 3	F CONFIG 4	F CONFIG 5	F AS X Y 6	F L ID 7	F PORT A 8	F PORT B 9	F instl 10
	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - -	- - - -	- -	- -	mode
CC634-A/B	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0	0 0 0 0 0	0 6	A 6	
CC638-A/B	0 1 0 0 0 0 0	0 0 1 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0	0 0 0 0 0	0 6	A 6	

MODE INSTALLATION PARAMETER ENTRIES

	F CONFIG 2	F CONFIG 3	F CONFIG 4	F CONFIG 5	F OPR DF 6	F A-DIAL 7	F A-DIAL 8	F DF T R 9	F ACCESS 10
MODE 1 CYBER	- - - - - -	- - - - - -	- - - - - -	- - - - - 0	- - - -	- - - - - -	- - - - - -	-- - -	- - - -
	1 0 0 0 0 0	0 0 0 1 1 0	0 0 0 0 0 0	0 1 0 0 0 0	4 C 0 4	0 0 0 0 0 0	0 0 0 0 0 0	00 6 6	0 0 0 0
MODE 2 PLATO	- - - - - -	- - - - - -	- - - - - -	- - - - - 0	- - - -	- - - - - -	- - - - - -	-- - -	- - - -
	1 0 0 1 0 0	0 0 0 1 1 0	0 0 0 0 0 1	0 0 0 0 0 0	6 C 2 4	0 0 0 0 0 0	0 0 0 0 0 0	08 6 6	0 0 0 0
MODE 3 ---- C P / M	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - - -	- - - - - -	- - - - - -	-- - -	- - - -
	1 0 0 1 1 0	0 0 0 1 0 0	0 0 0 0 0 0	0 0 0 0 0 0	6 C 2 5	0 0 0 0 0 0	0 0 0 0 0 0	00 6 6	0 0 0 0
MODE 4 ---- D I S K	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - - -	- - - - - -	- - - - - -	-- - -	- - - -
	1 0 0 1 1 0	0 0 0 1 1 0	0 0 0 0 0 1	0 0 0 0 0 0	6 C 2 4	0 0 0 0 0 0	0 0 0 0 0 0	00 6 6	0 0 0 0
MODE 5 ---- C 1 2 0	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - - -	- - - - - -	- - - - - -	-- - -	- - - -
	1 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	4 4 2 1	0 0 0 0 0 0	0 0 0 0 0 0	00 9 9	0 0 0 0
MODE 6 ----	- - - - - -	- - - - - -	- - - - - -	- - - - - -	- - - -	- - - - - -	- - - - - -	-- - -	- - - -
	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	00 0 0	0 0 0 0

NOTE

The following information is repeated
later in this text in English.

BETRIEBSANLEITUNG: CDC 721 DISPLAY TERMINAL

Das " Display Terminal " ist für eine Betriebsspannung von

120 V	50/60 Hz; 1.3 A und
220/240 V	50/60 Hz; 0.71 A

konstruiert.

Die erforderliche Netzumschaltung wird an der Rückseite nach Lösen der Schraube am Netzumschalter vorgenommen.

Das Netzanschlußkabel ist mit einem Schutzkontaktstecker versehen.

Auf richtige Netzspannung ist zu achten, da im anderen Falle das Gerät zerstört wird.

Die Netzwandsteckdose ist unmittelbar und leicht zugänglich, in der Nähe des Gerätes zu montieren.

Netzschalter:

Der Netzschalter befindet sich an der Frontseite.

Stellung gedrückt - O - AUS
Stellung gedrückt - I - AN

Der Gerätesicherungsautomat an der Rückseite, ist durch Eindrücken zu betätigen.

Weitere Bedienungseinrichtungen für

Reset
Kontrast
Helligkeit

befinden sich an der Frontseite.

Nach Einschalten der Netzspannung dauert es ca. 15 Sekunden bis der Bildschirm aktiviert ist.

Das Öffnen des Gerätes ist nur von qualifiziertem Fachpersonal nach Abschalten der Stromzufuhr zum Gerät, vorzunehmen.
Beachten Sie die Wartungs- und Garantiebestimmungen.

Umgebungstemperatur:

10°C bis 40°C

Temperaturwechsel:

10°C innerhalb 1 Stunde

Relative Feuchtigkeit:

20% bis 80%

Gewicht:

inkl. Keyboard - 21.8 kg

Weitere Informationen entnehmem Sie dem Geräte - Manual CDC Nr: 62 95 01 01

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A. INSTALLATION AND CHECKOUT

B. 1200/1200 BAUD INTERNAL MODEM

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2. OPERATOR CONTROLS AND INDICATORS

4. OPERATING IN CYBER MODE

This section gives an overview of the terminal, summarizes its standard and optional features, and lists its specifications and operator supplies.

OVERVIEW

The terminal (figure 1-1) is a versatile input/output device that may be configured in a communications network, be connected via telephone line to a remote computer, or be cabled directly to a local computer. The terminal may also be locally configured with a character printer or graphics printer. The data displayed by the terminal can be in the form of alphanumeric characters (domestic or foreign) and/or graphic symbols or drawings.

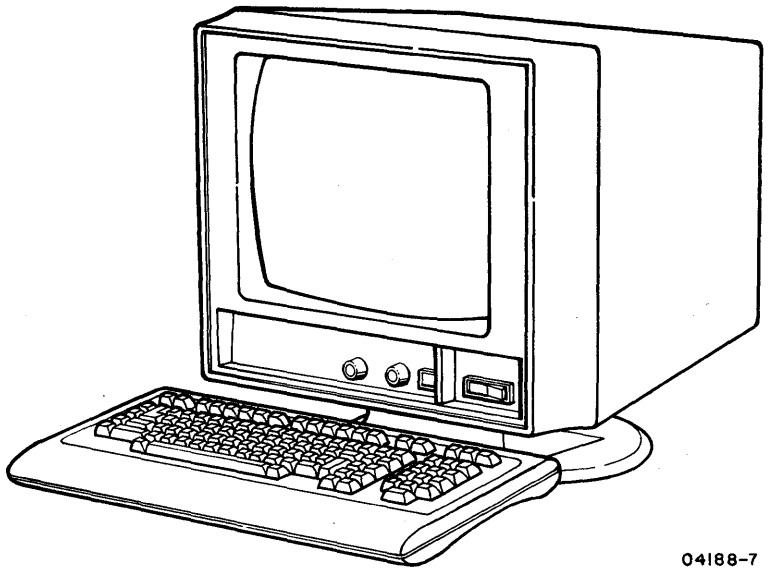

Figure 1-1. Terminal

The versatility of the terminal results from the available optional features and the capability of loading operating-mode programs into terminal memory. Such programs can be loaded from the host computer or from a memory module (read-only memory pack) plugged in the back of the terminal. These capabilities are also supplemented by a permanently stored (resident) program that enables operations in CYBER mode. CYBER mode is for operating with CDC CYBER computer systems such as those of the 120 or 170 series.

Many operating characteristics of the terminal are determined by selectable parameters. Parameters are initially selected during installation and are stored in nonvolatile memory.* These parameters condition the terminal for the operating modes to be used and the communication facilities at the site.

The parameters stored in nonvolatile memory can be changed if necessary, but only by qualified personnel (such as the personnel who install the terminal). Certain parameters, however, can be temporarily changed without making changes to nonvolatile memory. These temporary changes may be made by either the operator or the host after the terminal has been placed in the operating mode.

STANDARD FEATURES

The standard features of the terminal include:

- Tiltable display with a 380-mm (15-in) cathode-ray tube (crt) and low-glare faceplate
- Programmable display set of 256 symbols including 95 domestic alphanumeric characters, 32 control-code symbols, 1 special parity-error symbol, 32 line-drawing symbols, 32 foreign language characters, and 64 special symbols or 64 host-loaded symbols

*Nonvolatile memory provides permanent storage. The memory for parameter storage is nonvolatile because it receives power from a battery when terminal power is off.

- Display format of 80 or 132 characters per line with 24 or 30 display lines
- Display cursor that may be an underline or a block and may blink or be steadily illuminated
- Page or roll display
- Programmable character positions that may be blanked, dimmed, underlined, protected, blinking, be in inverse video (dark characters on light background), or any combination
- Detached keyboard that can be placed in a flat or tilted position
- Resident programs for operating in CYBER mode, for self-test diagnostics, and for loading other operating-mode programs. The loading of other operating-mode programs may occur from a memory module or from a host that uses ASCII* communications such as the Control Data Shared Network
- 64K of random-access memory (RAM) for loading and operating memory
- Parameter selection made via keyboard with parameter storage in nonvolatile memory
- Asynchronous RS-232-C/CCITT V.24** host interface with selectable receive/transmit speeds up to 19 200 bps
- 120-V ac, 60-Hz operation

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*ASCII is an abbreviation of American Standard Code for Information Interchange, which is the type of coding used by the Control Data Shared Network.

**RS-232-C is the Electronic Industries Association standard for signal interchange between data terminal equipment and data communication equipment. CCITT V.24 is a comparable European standard.

OPTIONAL FEATURES

Optional features of the terminal include:

- Graphics feature for full-vector graphic displays
- Touchpanel (requires that graphics feature be installed)
- Internal 1200/1200 baud (bit-per-second) modem with auto-dial and auto-answer capabilities. Refer to appendix B for more detailed information on the internal modem.
- Parallel interface for attaching parallel-communication devices
- Dual serial interface with asynchronous RS-232-C/CCITT V.24 ports for attaching serial-communication devices
- Power conversion kit for 220/240-V ac, 50-Hz operation
- Keycap kits with United Kingdom symbols, German symbols, French symbols, Spanish symbols, Swedish/Finnish symbols, or Danish/Norwegian symbols.

With a CC634-B or CC638-B terminal, all options are user installed except the touchpanel, which must be installed at a CDC repair service center. (A number such as CC634-B or CC638-B identifies the type of terminal you have and appears on a label at the rear of the terminal.) With a CC634-A or CC638-A terminal, all options are user installed except the touchpanel, the graphics feature, and the internal modem.

SPECIFICATIONS

The next paragraphs describe the electrical, environmental, and physical specifications for the terminal.

ELECTRICAL SPECIFICATIONS

The electrical specifications for the terminal are:

- 120 V ac, 60 Hz, single phase, at 1.3 A maximum
- With power conversion kit installed - 220/240 V ac, 50 Hz, single phase, at 0.71 A maximum

ENVIRONMENTAL SPECIFICATIONS

The environmental requirements of the terminal are:

- Operating:

  Temperature: 10°C to 40°C (50°F to 104°F)
  Temperature Change: 10°C (18°F) per hour
  Relative Humidity: 20% to 80%
  Humidity Change: 10% per hour
  Maximum Altitude Above Sea Level: 3000 m (9850 ft)
  Heat Dissipation: 416 Btu per hour

- Nonoperating

  Temperature: -40°C to 60°C (-40°F to 140°F)
  Temperature Change: 20°C (36°F) per hour
  Relative Humidity: 5% to 100%
  Humidity Change: 10% per hour
  Maximum Altitude Above Sea Level: 3000 m (9850 ft)

PHYSICAL SPECIFICATIONS

The overall dimensions of the terminal and keyboard are shown in figure 1-2. The terminal weighs 19.5 kg (43 lb) and the keyboard weighs 2.3 kg (5 lb).

OPERATOR SUPPLIES

The only operator-supply item required is a replacement for the terminal battery. When the terminal is turned off, this battery keeps installation parameters stored in memory. The terminal automatically checks the voltage of the battery following each power on or reset and displays a message when battery voltage is getting low. When this occurs, the battery needs to be replaced (section 3 contains instructions).

The battery to be used is an Eveready* Number 522 or equivalent. This is a 9-V alkaline-type battery that is readily available at most stores. A battery normally lasts about a year.

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*A registered tradename of Union Carbide Corporation.

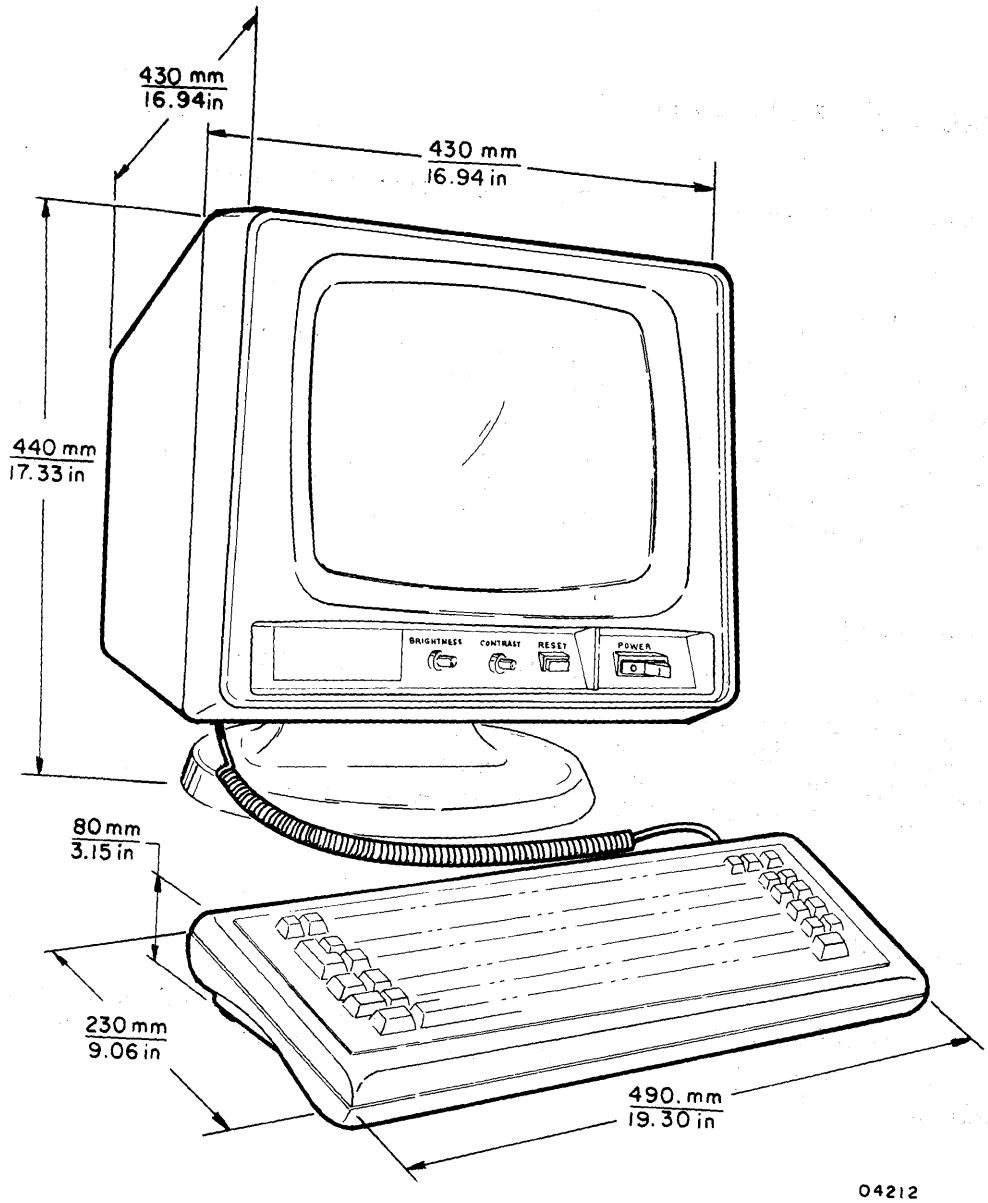


Figure 1-2. Terminal Dimensions

This section describes the controls, indicators, and input devices of the terminal and its positioning adjustments. The order of this information is as follows:

- Controls
- Indicators
- Alarm
- Keyboard
- Touchpanel option
- Positioning adjustments

CONTROLS

Figure 2-1 shows the location of the terminal controls and table 2-1 defines their function.

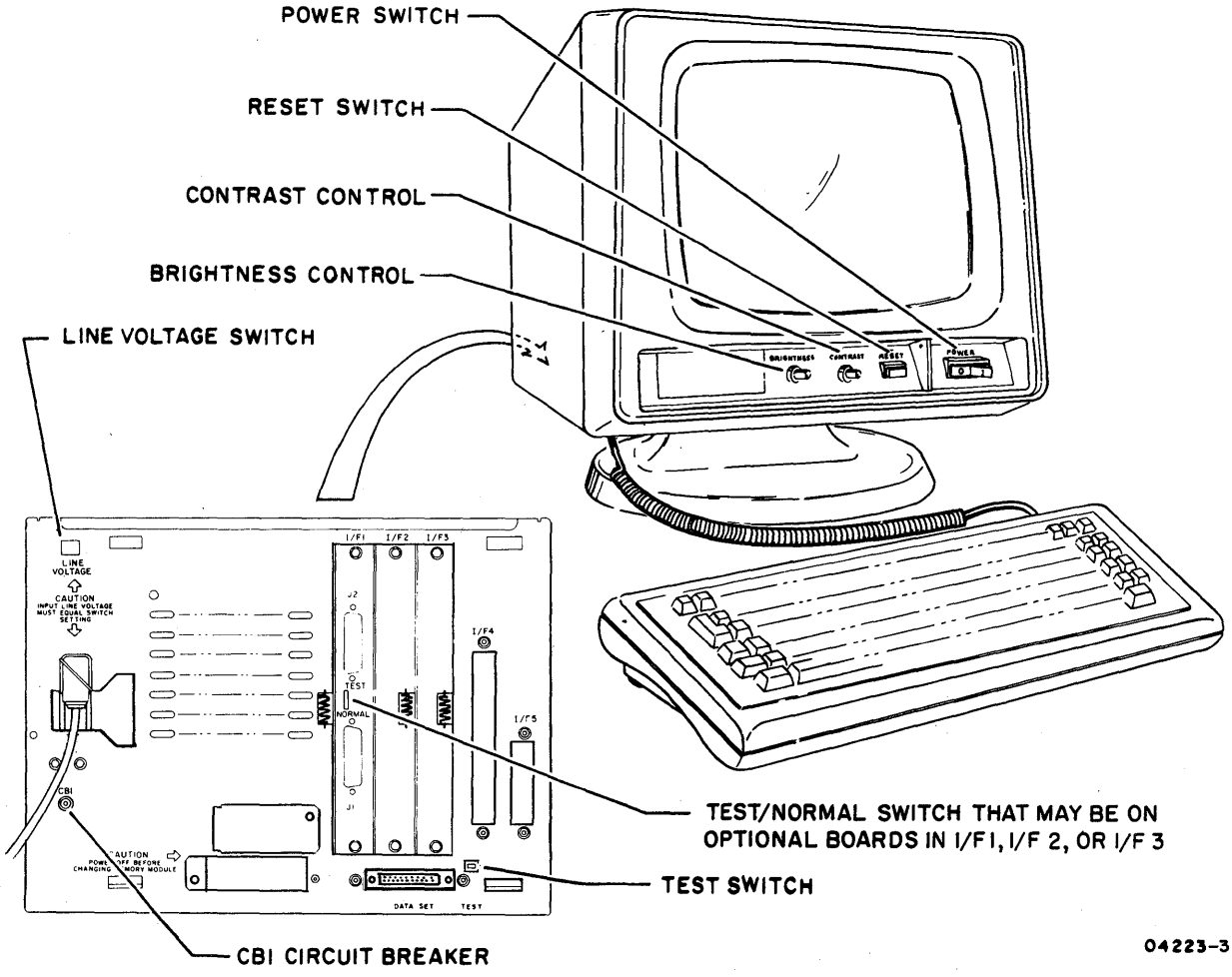


Figure 2-1. Terminal Controls

TABLE 2-1. FUNCTION OF CONTROLS

CONTROL	FUNCTION
POWER Switch	Controls power to terminal. Pressing side of switch marked with the 1 turns power on and initiates startup process outlined in section 3. Pressing side of switch marked with the 0 turns power off.
RESET Switch	Pressing this switch clears the terminal and reinitiates startup process.
CONTRAST Control	Controls contrast between data and background on screen. Rotating control clockwise increases contrast; counterclockwise decreases contrast.
BRIGHTNESS Control	Controls brightness of lit areas on screen. Rotating control clockwise increases brightness; counterclockwise decreases brightness.
TEST Switch	Allows communication and keyboard-support circuits to be tested offline. This is described under Operator-Intervention Test in section 3. For normal operation, switch must be pushed in.
TEST/NORMAL Switch (may be on optional boards in I/F 1, I/F 2, or I/F 3)	Used with above described TEST switch to check communication circuits in operator-intervention test.
LINE VOLTAGE* Switch	Conditions terminal for voltage at site. Is set at factory for 120-V ac, 60-Hz operation. That setting is only changed when power conversion kit is installed for 220/240-V ac, 50-Hz operation.
CB1 Circuit Breaker	Provides overcurrent protection for terminal. If breaker trips, wait 15 to 20 seconds and press breaker in to reset it.

CAUTION

* If LINE VOLTAGE switch is not set correctly, damage to terminal may result.

INDICATORS

Figure 2-2 shows the indicators on the terminal and table 2-2 defines their meaning.

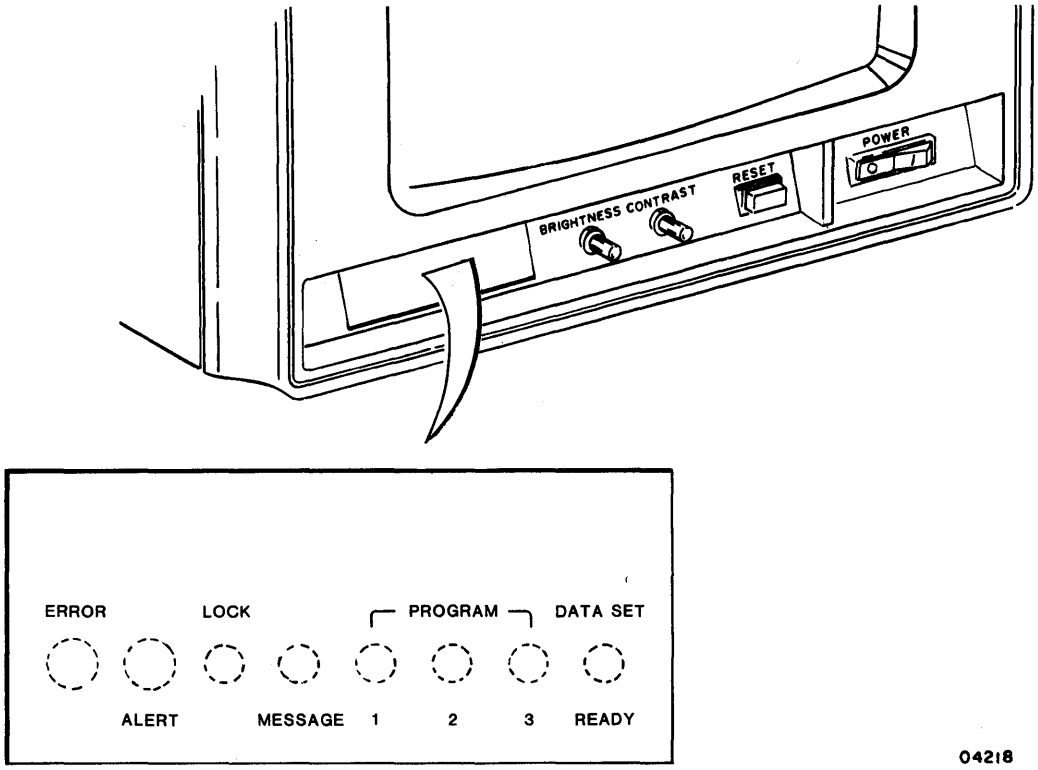


Figure 2-2. Terminal Indicators

TABLE 2-2. MEANING OF INDICATORS

INDICATOR	MEANING WHEN LIT
ERROR	An error has occurred in terminal self tests or in the loading of the operating-mode program (corrective actions are described in section 6).
ALERT	Dependent on host.
LOCK	Keyboard is locked to prevent input. This occurs when: • A page-print operation is done in CYBER mode • A block of data is being transmitted in CYBER mode • Host commands that keyboard be locked • Terminal is unable to transmit data because modem is not ready • The output buffer to the host is full

TABLE 2-2. MEANING OF INDICATORS (CONTD)

INDICATOR	MEANING WHEN LIT
MESSAGE	Dependent on program being run..
PROGRAM 1, 2, 3	Dependent on program being run.
DATA SET READY	Data Set Ready signal is being received from modem.

ALARM

The terminal has a two-level (loud/soft) audible alarm that sounds for the following conditions:

- At completion of the self test that follows a power on or reset. This sounding of the alarm alternates soft, loud, then soft
- If a keyboard entry in a protected position is attempted*
- If a keyboard entry is attempted while the keyboard is locked
- If an improper keyboard entry is attempted during parameter selection or during startup
- When instructed by host
- If enabled by parameters**, when keyboard entries advance the cursor to the eighth position from end of line or advance the cursor into the last line

Whether the alarm sounds loud or soft depends upon parameter selection**. The only exception to this is when the alarm alternately sounds soft and loud for the first listed condition.

---

*In CYBER mode, the host can enable automatic tabbing which will not sound the alarm when an entry is attempted in a protected position. Instead, the terminal tabs the entered character into the next unprotected position. This is described under Automatic-Tabbing Protection Mode in section 4.

**In CYBER mode, the parameters for these features may be temporarily changed by the operator. This is described under Operator Parameters in section 4.

KEYBOARD

The next paragraphs describe the various keycap configurations of the keyboard and its operating characteristics.

KEYCAP CONFIGURATIONS

Figures 2-3 through 2-9 show the variety of keycap configurations that may be used with the terminal. These include the:

- Keyboard with standard keycaps (figure 2-3)
- Keyboard with United Kingdom keycap option (figure 2-4)
- Keyboard with French keycap option (figure 2-5)
- Keyboard with German keycap option (figure 2-6)
- Keyboard with Swedish/Finnish keycap option (figure 2-7)
- Keyboard with Danish/Norwegian keycap option (figure 2-8)
- Keyboard with Spanish keycap option (figure 2-9)

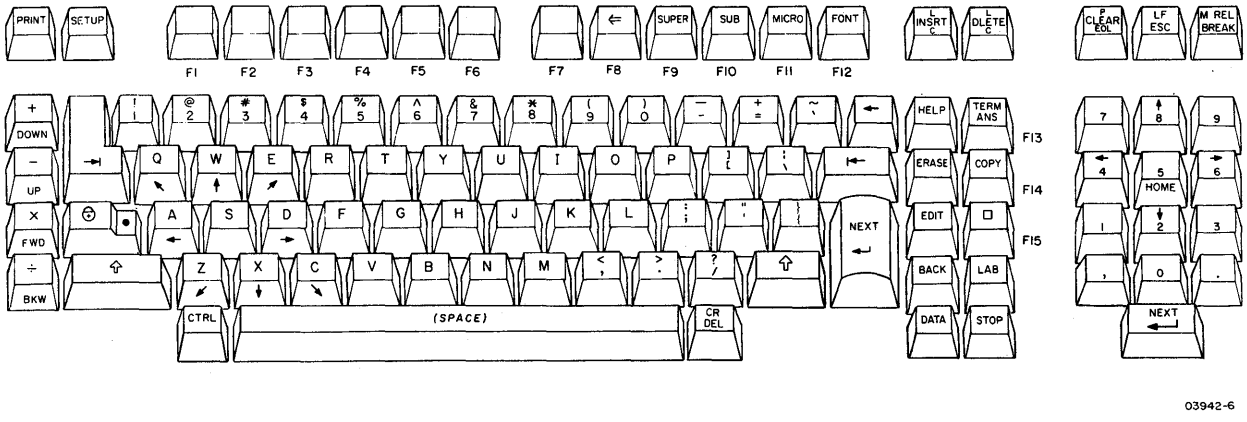
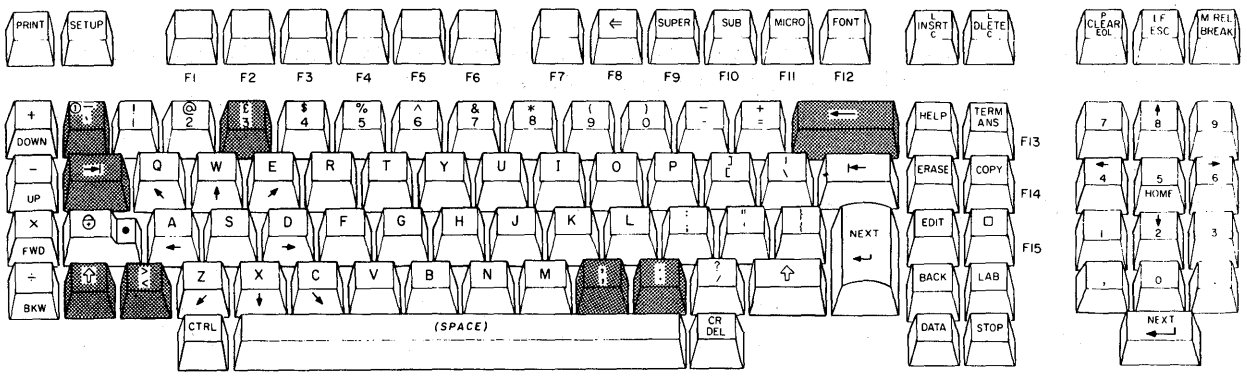


Figure 2-3. Keyboard with Standard Keycaps



NOTES:
OPTIONAL KEYCAPS ARE SHADED FOR ILLUSTRATING PURPOSES

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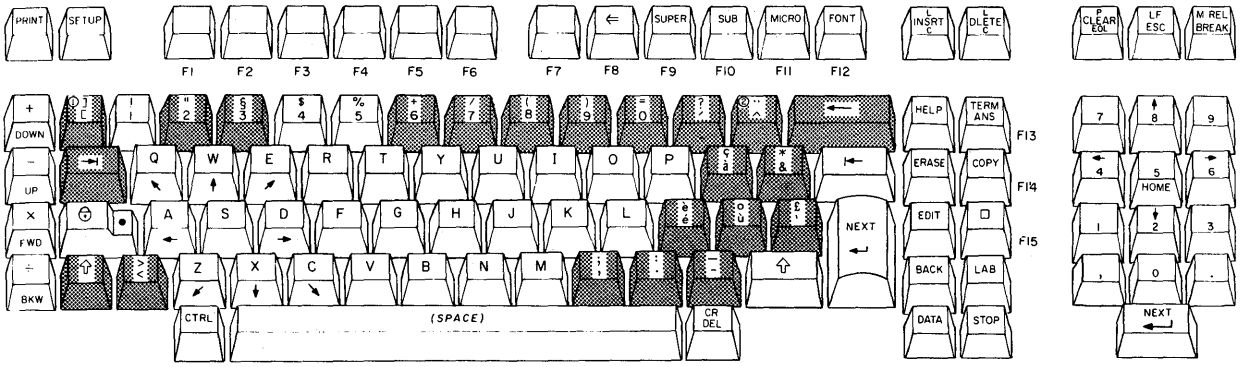
Figure 2-4. Keyboard with United Kingdom Keycap Option



NOTES:
OPTIONAL KEYCAPS ARE SHADED FOR ILLUSTRATING PURPOSES

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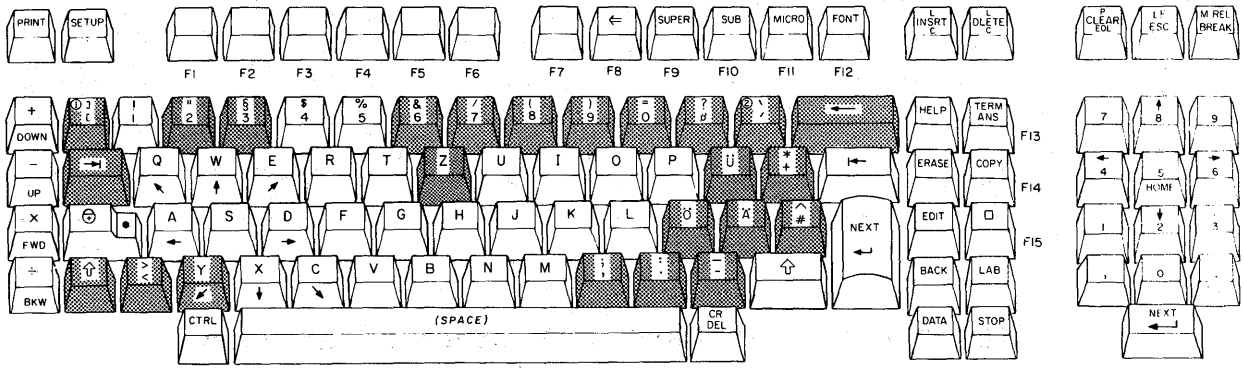
Figure 2-5. Keyboard with French Keycap Option



NOTES:
OPTIONAL KEYCAPS ARE SHADED FOR ILLUSTRATING PURPOSES

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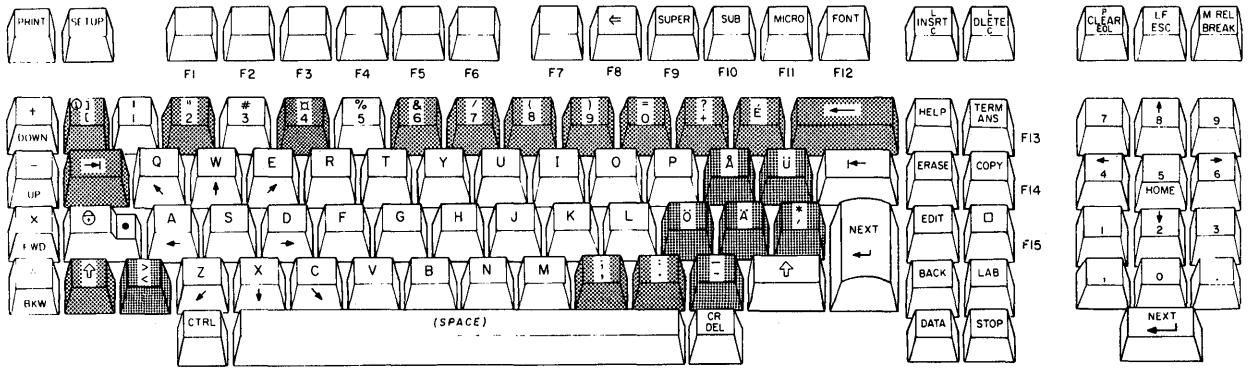
Figure 2-6. Keyboard with German Keycap Option



NOTES:
OPTIONAL KEYCAPS ARE SHADED FOR ILLUSTRATING PURPOSES

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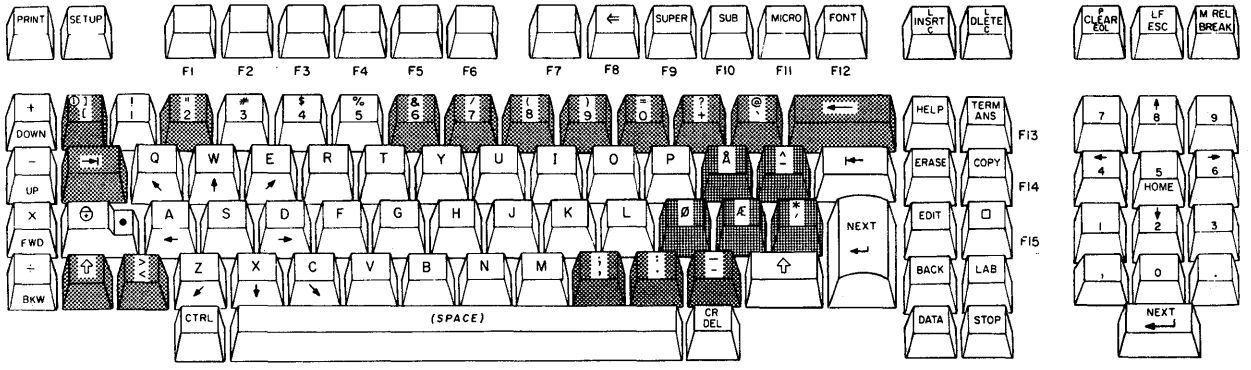
Figure 2-7. Keyboard with Swedish/Finnish Keycap Option



NOTES:
OPTIONAL KEYCAPS ARE SHADED FOR ILLUSTRATING PURPOSES

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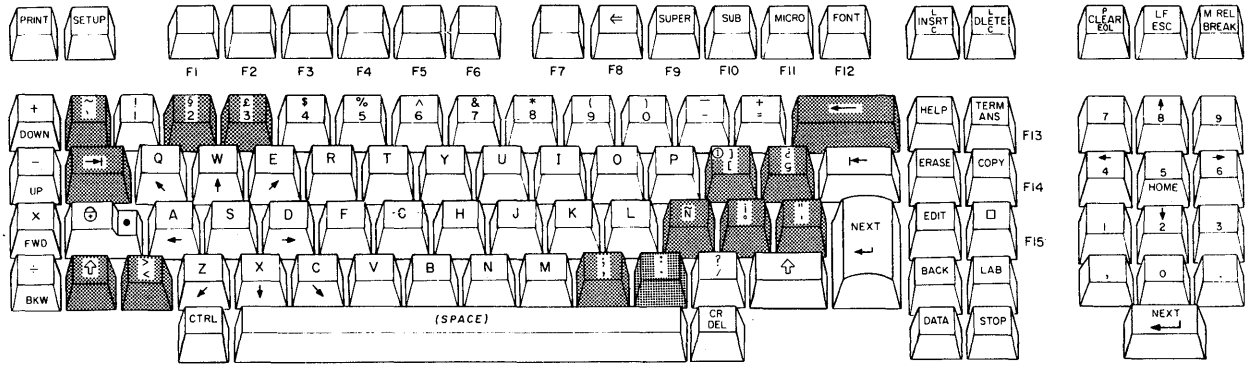
Figure 2-8. Keyboard with Danish/Norwegian Keycap Option



NOTES:
OPTIONAL KEYCAPS ARE SHADED FOR ILLUSTRATING PURPOSES

03942-30

Figure 2-9. Keyboard with Spanish Keycap Option

The keyboard has the following basic operating characteristics. Details on the use of the keyboard when operating in CYBER mode are given in section 4.

- The keyboard has three categories of keys:
  - Data-entry keys for alphanumeric characters, symbols, and punctuation marks
  - Control keys for editing data and controlling the display cursor
  - Special keys that perform functions that vary with the operating mode and/or host
- Keys in the data-entry and control categories may be made typamatic through the parameters established during installation. If they are, they start repeating when pressed for longer than a second. The repeat rate is 15 characters per second.
- In operating modes that use control codes and command sequences, the CTRL (Control) key is used in conjunction with other keys to modify their function and code output.
- There are two Shift (⇧) keys, one on each side of the main key cluster.
- The Lock (⇪) key/indicator can be conditioned through parameters* to function as a normal shift lock or to limit only alphabetical characters to uppercase. With either function, the indicator lights until the Lock key is pressed a second time to release the lock.
- The 13 keys in the numeric pad group on right side of keyboard can be conditioned through parameters* to operate in both lowercase and uppercase or uppercase only.

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*In CYBER mode, the parameter for this feature may be temporarily changed by the operator. This is covered under Operator Parameters in section 4.

OPTIONAL TOUCHPANEL

The optional touchpanel (figure 2-10) is an auxiliary input device that has 256 square areas overlaid on the display screen. In modes supporting touchpanel input, these square areas are touch sensitive. A common use of the touchpanel is the input of an item choosen from a number of items appearing on the screen. This is done by touching the area where the choosen item appears.

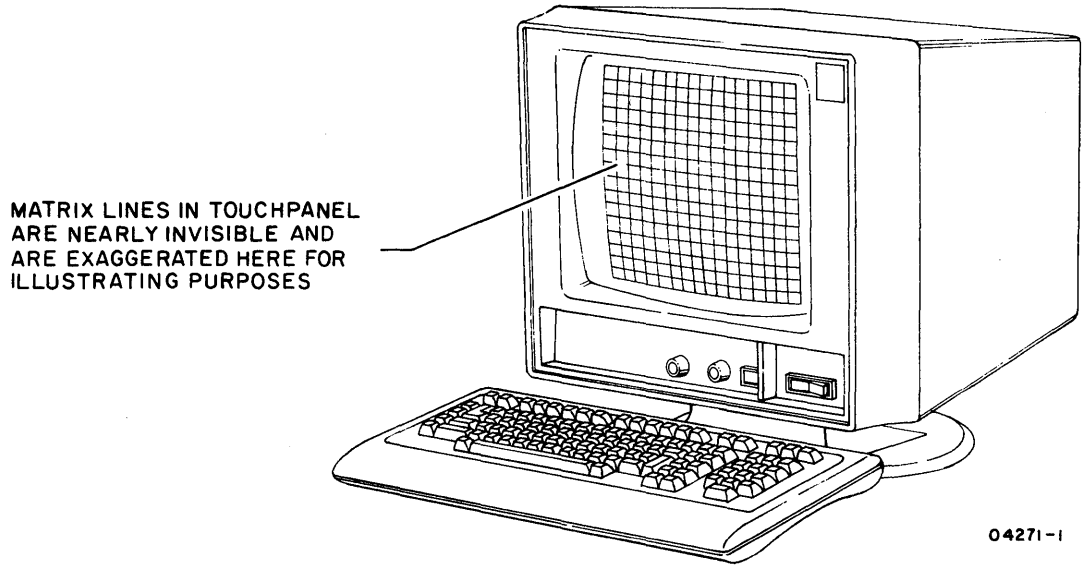


Figure 2-10. Optional Touchpanel

POSITIONING ADJUSTMENTS

Figure 2-11 shows the positioning adjustments available on the terminal and keyboard.

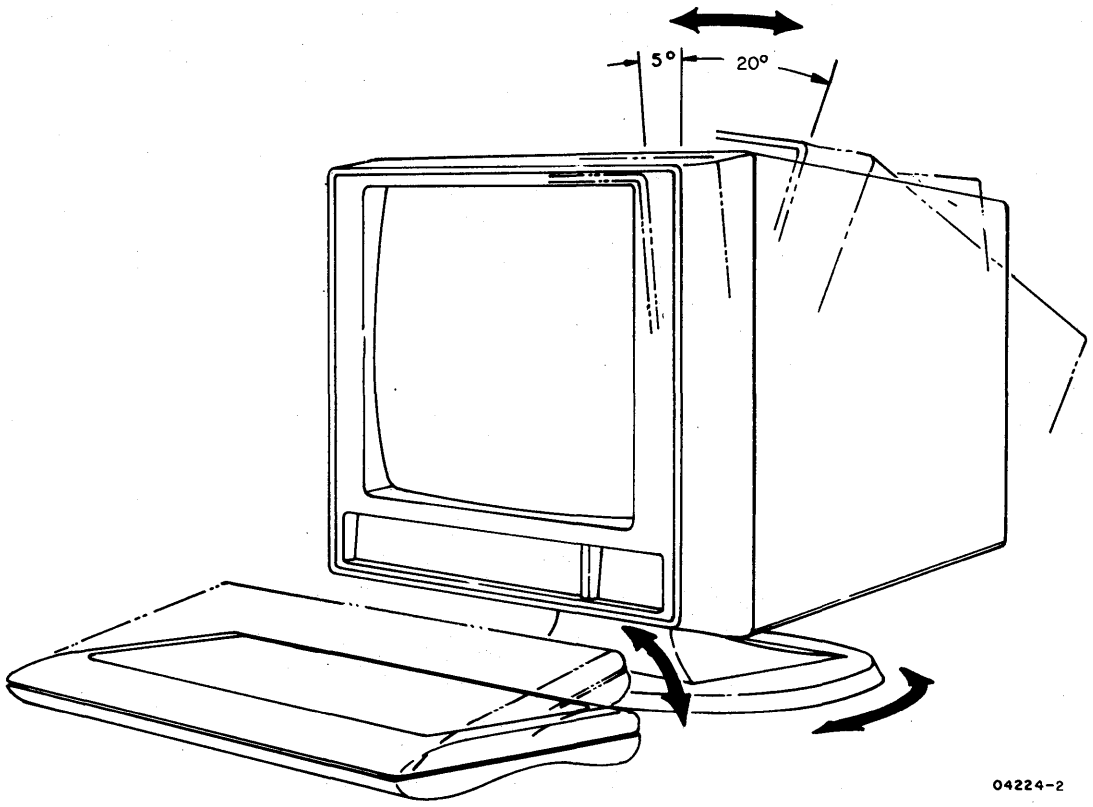


Figure 2-11. Positioning Adjustments

This section contains instructions on:

- Starting up terminal for operation
- Running terminal self tests
- Installing a memory module
- Replacing battery

STARTING UP TERMINAL

To start up the terminal, do as follows:

NOTE

The startup process for the terminal varies with parameters established during installation. For the first startup, have your supervisor go through the process with you.

1. Check that:

   - All cables between terminal and other equipment are securely connected
   - Power cords for equipment are plugged into proper electrical outlets
   - TEST switches shown in figure 3-1 are set for normal operation

2. If program loading is required from a memory module that has not been installed yet, install module per instructions near end of this section. (This is not applicable for CYBER mode.)

CAUTION

Never install a memory module while terminal power is on. Doing so may damage the terminal and/or the memory module.

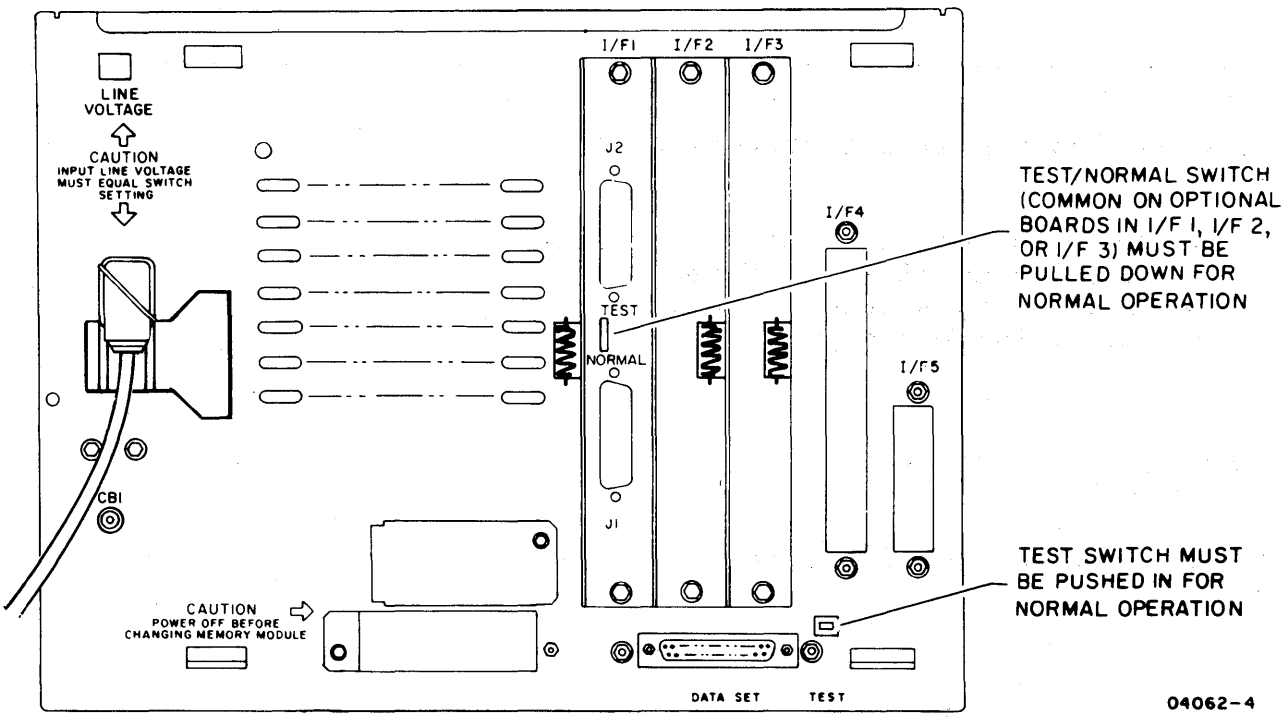


Figure 3-1. Checking TEST Switches

NOTE

If terminal is cabled directly to a computer, the power-on sequence in the next step has to be done in conjunction with the power-on sequence for the computer.

3. Turn on peripherals connected to terminal. Then turn on terminal and any connected communications equipment (for terminal, press the side of POWER switch marked with the 1).

   With power applied, the terminal automatically does a power-on self test. This test checks the major elements of the terminal. Test execution takes up to 15 seconds with an internal modem installed or approximately 5 seconds without an internal modem installed. When the test ends the audible alarm sounds in a soft/loud/soft sequence.

NOTE

The crt warms up within 10 to 15 seconds after the test. If the screen is completely dark, the BRIGHTNESS or CONTRAST control may be set too far counterclockwise.

If the test detects a fault, the ERROR indicator lights and the item(s) that failed are listed on the screen. Figure 3-2 shows the various possible listings and notes the appropriate action should they appear.

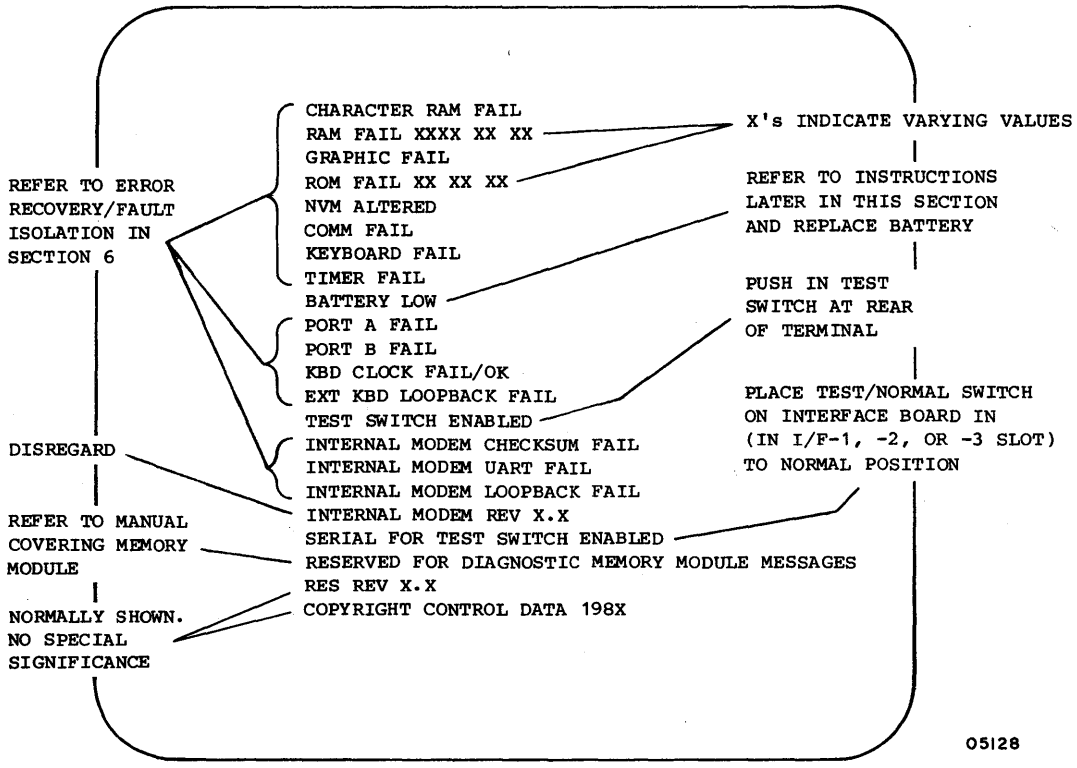


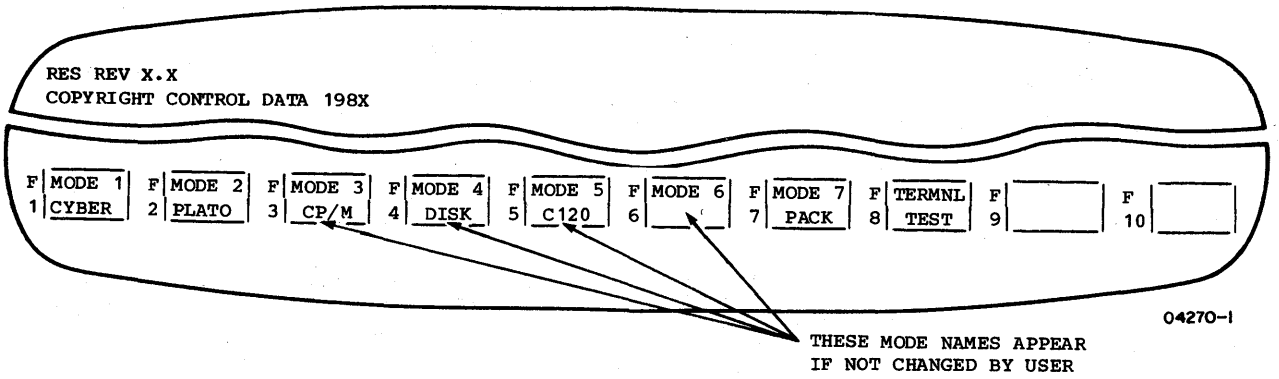
Figure 3-2. Failure Messages for Power-On Test

4. If the mode menu in figure 3-3 appears, do the following:

   a. Determine the mode to be used from selection on screen:

      - MODE 1/CYBER - Represents resident CYBER mode
      - MODE 2/PLATO - Represents PLATO mode, which only exists if a load source is available
      - MODE 3/CP/M, MODE 4/DISK, and MODE 5/C120 represent preassigned modes for commonly used applications. Each such mode may be replaced with a user assigned mode having a different name.

- MODE 6 - For mode that was user assigned during installation
- MODE 7/PACK - Reserved for functions stored in a memory module
- TERMNL TEST - Runs operator-intervention self test (instructions for running test are given later in this section)



NOTE: IF TERMINAL IS SET UP FOR AUTOMATIC MODE SELECTION, PULLING TEST SWITCH OUT AND PRESSING RESET SWITCH WILL SHOW MODE MENU AND AN ASTERISK (*) WILL BE DISPLAYED IN THE BLOCK FOR THE AUTO SELECT MODE.

Figure 3-3. Mode Menu

b. Indicate chosen mode by pressing the numbered function key that appears adjacent to the mode listing in the menu. (For example, for CYBER mode, press the F1 key.)

c. If alarm sounds and FAILURE LOADING MODE appears, the mode chosen is either invalid or disabled or a loading problem has occurred. Find out the correct mode and repeat step b.

d. If ENTER ACCESS CODE appears, enter the assigned four-digit code through keyboard. As each digit is entered, an X replaces one of the four segments in the inverse-video block that follows the prompt. If code is entered wrong, SORRY is displayed and step b must be repeated.

5. If SELECT LOAD SOURCE > DISK HOST ROM appears, the source for the program load must be indicated by either:
   - Pressing the NEXT key. This automatically selects the default load source that was assigned during installation.
   - Pressing the D key for disk, the H key for host, or the R key for ROM pack (memory module).
6. If ENTER PHONE NUMBER or SELECT FILE NO. _ appears, use the following applicable method to enter the phone number to be dialed or the program file number to be loaded.

- If the default phone or file number (assigned during installation) is the number to be dialed or the file to be loaded, simply press the NEXT key. The default phone number then automatically dials or the default file loads. Telephone-call or file-load status information appears on the terminal display screen as either of these load methods progress.

- If the default phone or file number is not desired, key in the desired phone number (0_{16} to F_{16}, see appendix B for more details) or file number (two digits between 00_{16} and $3F_{16}$), and press the NEXT key after the entry is complete. Correct any entry errors using the ERASE key and reenter the number. Call or file status information appears on the display screen as described above.

7. If HOST NOT CONNECTED appears, terminal is ready to load from host, but does not detect any communications activity. For a terminal connected to communications equipment having a telephone, this is a normal condition that requires the following actions:

   a. Dial phone number of host manually.

   b. When answer tone is heard, switch telephone line to terminal. (Depending on the arrangement, this may be accomplished by pulling up an exclusion key on the phone, pressing a DATA button on the phone, placing the phone handset on an acoustic coupler if using an external modem, or simply hanging up the phone if using the internal modem in non-autodial mode.)

8. Entry into CYBER mode or successful loading is indicated by the following:

   - Entry into CYBER mode - Screen clears and cursor resets to home position (lower- or upper-left corner of screen). For information on operating in CYBER mode, refer to section 4.

   - Successful load from host - Typical load takes about 3 to 4 minutes. During this time, hexadecimal numbers representing the file and block being loaded appear on the screen. When loading is done, this is replaced with a message such as TERMINAL READY.

   - Successful load from memory module - Takes less than a second and the display shown on the screen depends on the program.

   If loading fails, press RESET switch and retry. If that attempt fails, refer to section 6 for corrective action.

RUNNING SELF TESTS

The self tests of the terminal include the automatic power-on test (described earlier under Starting Up Terminal), an operator-intervention test, and a CYBER-mode test. The next paragraphs cover the latter two tests.

OPERATOR-INTERVENTION TEST

This offline test checks items that require operator intervention. These items include symbol and highlight display features, the front-panel indicators, the keyboard, the optional touchpanel, and sending and receiving circuits. In addition, the test shows a border on the screen for checking display alignment. The test relies on the operator to verify that results are correct. If any item does not perform correctly, refer to section 6 for corrective action.

To run the test, do as follows:

1. Make mode menu appear (figure 3-3) by doing the applicable actions that follow:

   - If operating in CYBER mode, press SETUP key, then F10 key twice. If keyboard locks, press the M REL/BREAK key to unlock keyboard and retry.

   - If not in CYBER mode and terminal is conditioned for manual selection of operating mode, press RESET switch (menu appears after power-on test).

   - If not in CYBER mode and terminal is conditioned for automatic selection of operating mode, pull out TEST switch at rear of terminal, then press RESET switch. This shows a TEST SWITCH ENABLED message with menu. Disregard message and push TEST switch back in.

2. Press F8 key to select TERMINAL TEST mode from menu. This initiates the following:

   - If optional graphics feature is installed, a display of vertical lines appear with the lines alternately going on and off near the bottom of the screen. To progress on, press any key. This brings the next described display on the screen.

   - A display with seven lines of different symbols within an alignment border (figure 3-4). Following the symbols is a line with the words BLINK, DIM, UNDERSCORE, INVERSE and BLANK (which should not be seen). Each of these words are displayed with corresponding highlighting; that is,

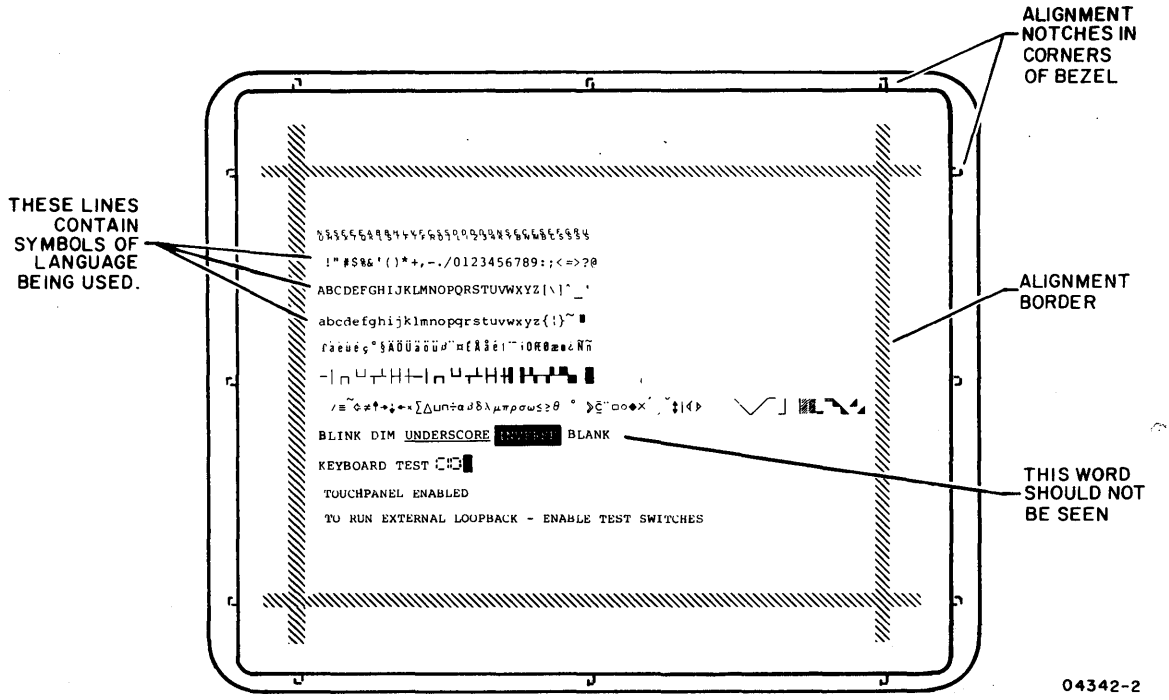


Figure 3-4. Operator-Intervention Test Display

the word BLINK blinks, DIM is at dim level, etc.

If display alignment is correct, the alignment border appears in line with the notches in the bezel as shown in figure 3-4. If incorrect, have your supervisor realign crt per appendix A.

- Each front panel indicator momentarily lights. This lighting sequentially goes from left to right and continues throughout the test.

3. To check the keyboard, do the following:

   a. Hold a key down and look at the two-digit hexadecimal code that appears on the screen after the words KEYBOARD TEST.

   b. Refer to figure 3-5 and compare the displayed code with the value given for the key when down.

c. Release the key and refer to figure 3-5 for the correct value when key is up. This should be the code now being displayed.

d. Repeat steps a through c for each key to be checked.

4. If present, a touchpanel may be checked by touching the effective area* of the panel when the screen shows TOUCHPANEL ENABLED. This moves the cursor to where the touch was made. This can be repeated as often as desired.

5. To check sending and receiving circuits, do the following:

   a. If a parallel-interface graphics printer is connected to the terminal, verify printer is powered on and its PRINT switch is lit. The printer must be powered on for at least 20 seconds before doing step c or an invalid failure may be indicated.

   b. If a board containing a TEST/NORMAL switch is in I/F-1 through I/F-3 slots at rear of terminal, place switch in TEST position.

   c. Pull out TEST switch at rear of terminal. This disables keyboard input and begins internal cycling of test data. If applicable, this is accompanied by a communications exchange with the connected parallel-interface graphics printer. The results of these activities appear on the screen as follows:

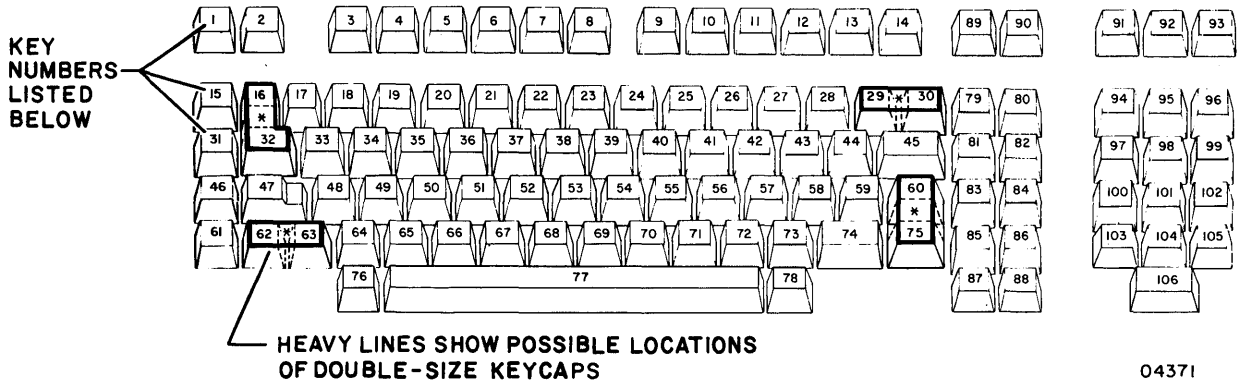
      - KBD CLOCK OK (FAIL if error occurs)
      - If a parallel-interface graphics printer is included in testing - PARALLEL PORT OK (FAIL if error occurs)
      - COMM RUNNING (FAIL if error occurs)
      - KEYBOARD RUNNING (FAIL if error occurs)
      - If a TEST/NORMAL switch has been set to TEST - PORT A RUNNING and PORT B RUNNING (FAIL if error occurs)

   d. When end of testing is desired, push TEST switch in and place TEST/NORMAL switch to NORMAL if present.

6. Exit from test by pressing RESET switch.

---

*The effective (touch sensitive) area of the touchpanel is smaller than the screen. The area is approximately 203 mm (8 in) square and in the middle of the screen.



KEY NUMBER	DISPLAYED CODE** DOWN	UP	KEY NUMBER	DISPLAYED CODE** DOWN	UP	KEY NUMBER	DISPLAYED CODE** DOWN	UP
1	10	90	41	63	E3	76	25	A5
2	18	98	42	6B	EB	77	2D	AD
3	20	A0	43	73	F3	78	35	B5
4	28	A8	44	7B	FB	79	6E	EE
5	30	B0	45	7F	FF	80	36	B6
6	38	B8	46	12	92	81	77	F7
7	40	C0	47	1A	9A	82	6F	EF
8	48	C8	48	22	A2	83	5F	DF
9	50	D0	49	2A	AA	84	55	D5
10	58	D8	50	32	B2	85	5D	DD
11	60	E0	51	3A	BA	86	56	D6
12	68	E8	52	42	C2	87	45	C5
13	70	F0	53	4A	CA	88	4D	CD
14	78	F8	54	52	D2	89	7D	FD
15	11	91	55	5A	DA	90	75	F5
16*	19	99	56	62	E2	91	6D	ED
17	21	A1	57	6A	EA	92	37	B7
18	29	A9	58	72	F2	93	1D	9D
19	31	B1	59	7A	FA	94	16	96
20	39	B9	60*	67	E7	95	1E	9E
21	41	C1	61	14	94	96	26	A6
22	49	C9	62*	1C	9C	97	17	97
23	51	D1	63*	24	A4	98	1F	9F
24	59	D9	64	2C	AC	99	27	A7
25	61	E1	65	34	B4	100	4F	CF
26	69	E9	66	3C	BC	101	47	C7
27	71	F1	67	44	C4	102	3F	BF
28	79	F9	68	4C	CC	103	4E	CE
29*	7E	FE	69	54	D4	104	46	C6
30*	76	F6	70	5C	DC	105	3E	BE
31	13	93	71	64	E4	106	3D	BD
32*	1B	9B	72	6C	EC			
33	23	A3	73	74	F4			
34	2B	AB	74	7C	FC			
35	33	B3	75*	66	E6			
36	3B	BB						
37	43	C3						
38	4B	CB						
39	53	D3						
40	5B	DB						

*These keys may be covered with double-size keycaps. Pressing a double-size keycap displays the code for only one of the keys.

**Keycodes displayed during test are used internally and are not the same codes transmitted when online.

Figure 3-5. Key Values Shown During Test

CYBER-MODE TEST

This test can only be run when the terminal is in CYBER mode. This test is similar to the power-on test, except that it runs differently and can be initiated by the host or be initiated locally via the keyboard. In addition, the CYBER-mode test omits parts of the power-on self test that check the optional internal modem because they would break communications with the host.

Host Initiated CYBER-Mode Test

Upon receiving an initiate-test command from the host, the terminal reruns its power-on self test (minus some parts for the optional internal modem). The terminal returns a response to the host indicating whether the test ran with or without a detected fault. No error message appears if a fault occurred. The screen clears after the test is completed.

Locally Initiated CYBER-Mode Test

Holding down the CTRL (Control) key and pressing the = key, and V key while offline in CYBER mode causes the terminal to continuously run its power-on self test (minus some parts for the optional internal modem) until a fault is detected or the RESET switch is pressed. If a fault is detected, the terminal halts the test and displays the error message for the fault (error messages for power-on test are described earlier in this section under Starting Up Terminal). This method of test execution may be of use in detecting an intermittent fault.

INSTALLING MEMORY MODULE

To install a memory module, refer to figure 3-6 and do as follows:

CAUTION

Never install or remove a memory module while terminal power is on. Doing so may damage the terminal and/or the memory module.

1. Press terminal POWER switch to the 0 position.

2. Use a screwdriver and remove screw securing memory-module cover.

3. Remove memory-module cover.

4. A memory module can only be inserted one way. Carefully insert module in exposed connector.

5. Replace memory-module cover and secure with screw.

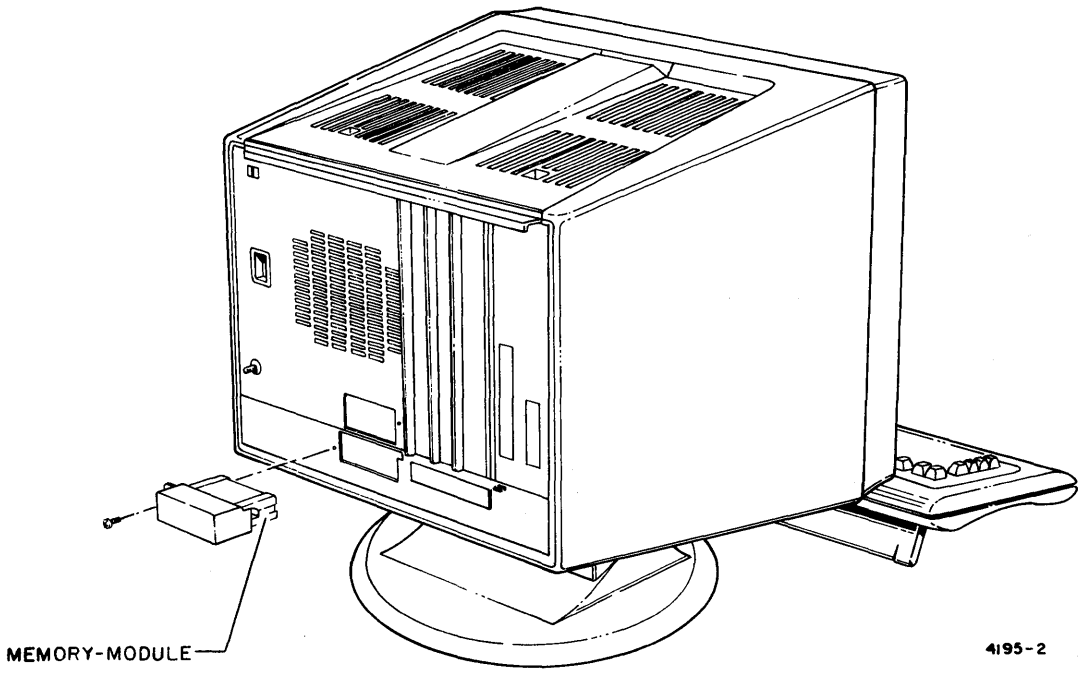


Figure 3-6. Installing a Memory Module

REPLACING BATTERY

The battery in the terminal must be replaced when the power-on test detects that battery power is getting low (BATTERY LOW displayed). The battery keeps parameter data stored in nonvolatile memory when terminal power is off. The terminal cannot function without this data. Information on the type battery required is in section 1 under Operator Supplies.

To replace the battery, refer to figure 3-7 and do as follows:

CAUTION

Always leave terminal power on while removing and replacing the battery. Otherwise, stored parameter data will be lost when the old battery is removed and NVM ALTERED will display following the power-on test. Should this occur, refer to table in section 6 that covers Power-On Test Problems.

1. Keep terminal power on and use a screwdriver to remove screw securing battery cover.
2. Remove battery cover.
3. Pull battery out from compartment and pull cap off battery terminals.
4. Cap can only go on terminals of battery one way. Snap cap on new battery and place battery in compartment. Make sure cap wires are inside compartment.
5. Replace battery cover and secure with screw.

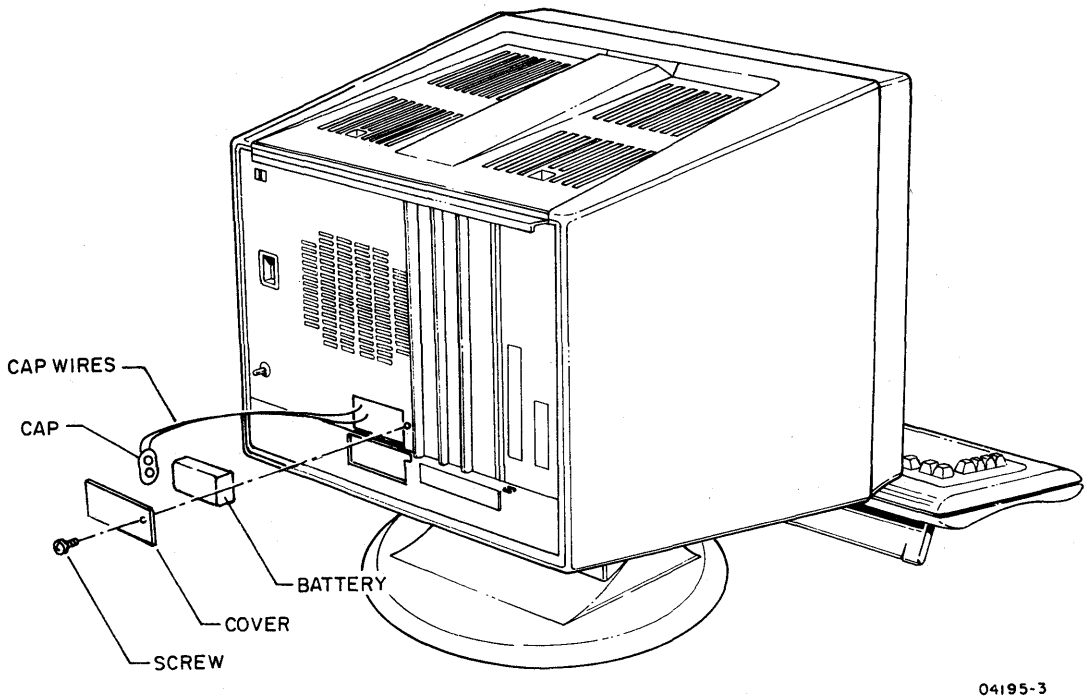


Figure 3-7. Replacing Battery

This section describes the operation of the terminal in CYBER mode. Contents include:

- Operator parameters
- Protected screen positions
- Character/block-transmit modes
- Keyboard functions
- Host controlled functions

OPERATOR PARAMETERS

Operator parameters in CYBER mode allow the operator or host to temporarily change certain operating characteristics. These changes override corresponding parameters in nonvolatile memory until the RESET switch is pressed or power is turned off.

Table 4-1 defines the operator parameters, and the following steps cover how changes are made.

NOTE

All operator parameters except characters per line (CHR/LN) or lines per display (LINES) can be changed without losing any displayed data. Changing the CHR/LN parameter or LINES parameter causes all data on screen to clear.

NOTE

Incorrect parameter selections can cause errors. If you are not sure about a parameter selection, check with your supervisor.

1. Press SETUP key while in CYBER mode. This temporarily replaces any data on last two lines of screen with first set of operator parameters (figure 4-1) and disables all but the F1 through F10 function keys.

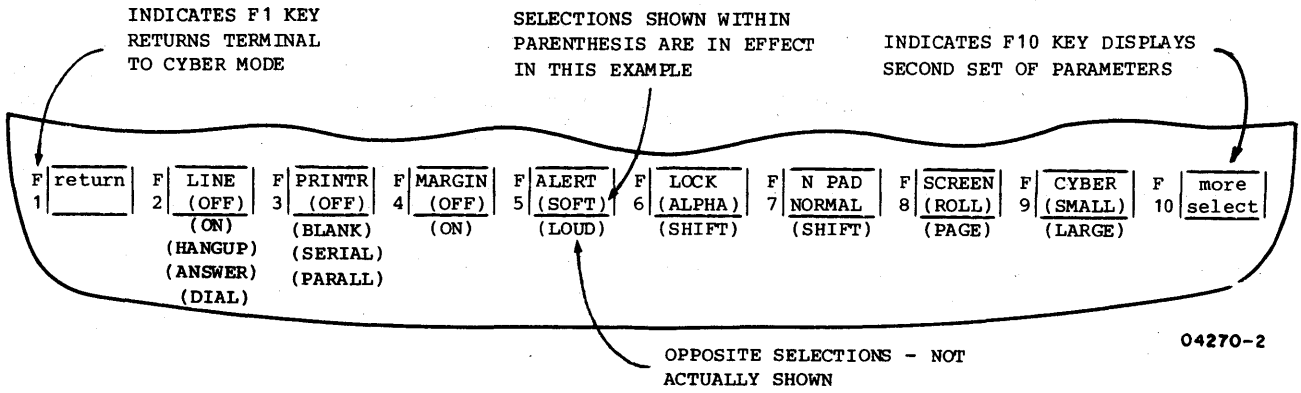


Figure 4-1. First Set of Operator Parameters for CYBER Mode

TABLE 4-1. OPERATOR PARAMETERS FOR CYBER MODE

PARAMETER LISTED ON SCREEN*	DEFINITION
LINE (OFF, ON, HANGUP, ANSWER, or DIAL)	Determines whether operations are online (ON) with host or offline (OFF) to do local printing or testing. With offline operation, transmission to host is disabled. In addition to ON and OFF, the selections HANGUP, ANSWER, and DIAL are available if the internal 1200/1200 baud modem is installed. The ON, OFF, HANGUP, ANSWER, and DIAL selections are stepped through by pressing the F2 key. Selecting HANGUP breaks the current telephone connection. Selecting ANSWER places the terminal in auto-answer mode. Selecting DIAL starts a telephone call sequence without the normal loading process occurring when the telephone connection is made. (For more details on auto-answer mode or calling a telephone number without loading, refer to appendix B.)
PRINTR (OFF, SERIAL, PARALL or blank)	Determines whether data in online operations is sent to printer for printing (SERIAL or PARALL) or not sent to printer (OFF). SERIAL is displayed as a selection if a serial-interface printer is installed; likewise, PARALL is displayed if a parallel-interface printer is installed. If both type printers are installed, designate the printer which is to do online printing by pressing the F3 key until the appropriate selection appears. The selection made has no affect to offline operations. With offline operations, print data is sent to the printer which is ready. If both type

TABLE 4-1. OPERATOR PARAMETERS FOR CYBER MODE (CONTD)

PARAMETER LISTED ON SCREEN*	DEFINITION
PRINTR (OFF, SERIAL, PARALL or blank) (Contd)	printers are installed and ready, the offline print data will go to the serial-interface printer. If terminal or mode installation parameters indicate no printer is installed, this field will remain blank and no changes can be made to it.
MARGIN (OFF or ON)	With MARGIN ON, alarm sounds when keyboard entries advance display cursor to either eighth position from end of line or to last line. With MARGIN OFF, alarm does not sound for these conditions.
ALERT (SOFT or LOUD)	Determines if alarm sounds LOUD or SOFT.
LOCK (ALPHA or SHIFT)	Governs operation of the Lock key (⊖). With SHIFT selected, Lock key functions as a normal shift lock. With ALPHA selected, Lock key limits only alphabetical characters to uppercase.
N PAD (NORMAL or SHIFT)	Governs operation of the 13 keys of the numeric pad group, which are on the right side of the keyboard. With NORMAL selected, these keys operate in lowercase or uppercase as applicable. With SHIFT selected, the keys only do uppercase functions as if a Shift (⇧) key is in use.
SCREEN (ROLL or PAGE)	Determines whether cursor movement beyond last line causes display to ROLL up one line or causes cursor to reset to home position (PAGE).
CYBER (SMALL or LARGE)	SMALL selection is for operating with CYBER 120 series systems, while LARGE selection is for operating with CYBER 170 series systems.
more select	Indicates pressing F10 key displays second set of operator parameters.
BACKGD (DARK or LIGHT)	Determines whether screen shows light characters on DARK background or dark characters on LIGHT background.

TABLE 4-1. OPERATOR PARAMETERS FOR CYBER MODE (CONTD)

PARAMETER LISTED ON SCREEN*	DEFINITION
CURSOR (LINE or BLOCK)	Determines whether cursor appears in the form an underline (LINE) or a BLOCK.
CURSOR (BLINK or SOLID)	Determines whether cursor is shown blinking (BLINK) or steadily illuminated (SOLID).
BAUD (75 through 19.2)	Governs the transmit and receive rate used in host communications. Each operation of the F5 key steps the transmit/receive rate to the next higher value between 75 and 19.2K bps. Operation of this key when the rate is set to 19.2 selects the slowest rate (75 bps). Set this value to 1200 for terminals using the internal 1200/1200 baud modem for communications.
DUPLEX (HALF or FULL)	Governs routing of keyboard data within terminal. With HALF selection, keyboard data is displayed simultaneously as it is transmitted. With FULL selection, keyboard data must be echoed back by host before being displayed.
CHR/LN (80 or 132)	Determines whether 80 or 132 maximum characters are displayed per line. When optional graphics feature is used, CHR/LN must be set for 80.
LINES (24 or 30)	Determines whether screen uses 24 or 30 lines for displaying characters.
XPARNT (OFF or ON)	Governs a test feature that causes received and keyboard-entered control codes to be displayed for monitoring instead of the control functions being performed. With ON selection, this feature is enabled; with OFF selection, operation is normal.
mode select	Indicates pressing F10 key displays mode menu.

*Parameters are divided in two sets that appear separately on screen.

2. Parameter selections in effect appear within blocks on screen. If a change is to be made, press the numbered function key that appears adjacent to the block. This places the opposite selection in effect. For example, if the fourth block shows MARGIN (OFF), pressing the F4 key will change the parameter to MARGIN (ON).

3. To display second set of parameters, press the F10 key.

4. If a parameter in second set is to be changed (figure 4-2), make change per step 2.

5. Press F1 key to return to CYBER mode. This clears parameters from screen.

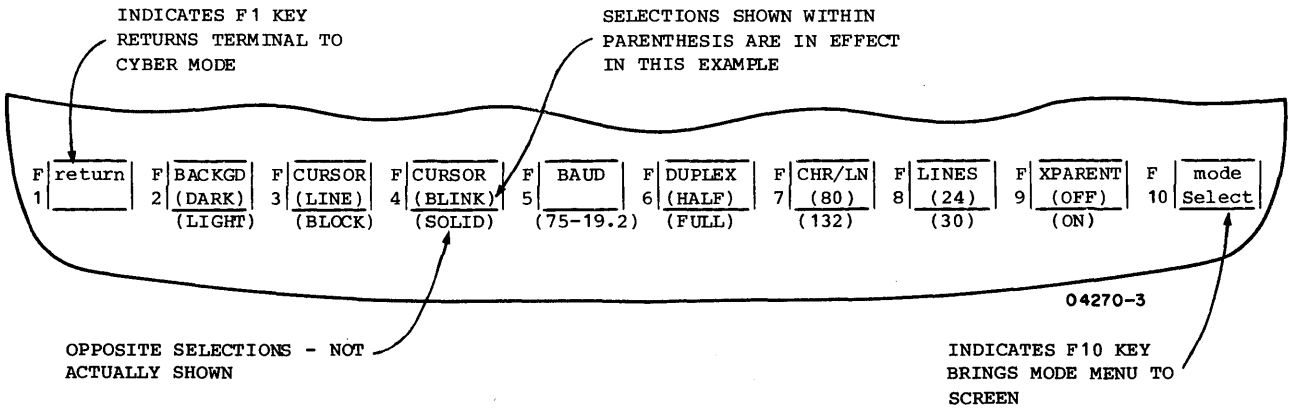


Figure 4-2. Second Set of Operator Parameters for CYBER Mode

PROTECTED SCREEN POSITIONS

The host may designate any character position on the screen as protected. The contents of protected positions can only be changed by the host. Normally, protected positions are identified by their characters being highlighted. The type of highlighting used is determined by the host. The highlighting may be characters that are dimmed, underlined, blinking, or be characters shown in inverse video (dark characters on light background).

The next paragraphs describe the normal and automatic-tabbing modes of protection which the terminal can perform.

NORMAL PROTECTION MODE

The normal mode of protecting designated positions is in effect unless the host sends a command to enable automatic tabbing. The normal protection mode has the following characteristics:

- The cursor can be moved either horizontally or vertically into a protected position on the screen using the keyboard.
- Any attempt to alter or enter data in a protected position from the keyboard results in no action except sounding the alarm.

AUTOMATIC-TABBING PROTECTION MODE

If the host enables automatic tabbing, the terminal protects the designated positions on the screen in the following ways:

- The cursor cannot be advanced or backspaced into a protected position using the keyboard. The cursor automatically skips past the protected position and goes to the next or preceding unprotected position as applicable.
- The cursor can be moved up or down into a protected position using the keyboard. However, any attempt to enter a character in a protected position results in the character being tabbed into the next unprotected position.

CHARACTER/BLOCK-TRANSMIT MODES

In CYBER mode, data may be transmitted to the host either character by character (character-transmit mode) or by block (block-transmit mode).

CHARACTER-TRANSMIT MODE

This mode of transmission is in effect unless the host sends a command to enter the block-transmit mode. In character-transmit mode, the code for a pressed key is transmitted immediately. That is if operations are online and the cursor was in an

unprotected position on the screen. In addition, the character for the pressed key displays immediately if half-duplex routing is being used, or with full-duplex routing, displays when the corresponding code is echoed back by the host.

BLOCK-TRANSMIT MODE

Block-transmit mode can only be entered through a command from the host. In this transmit mode, keyboard entries display immediately (regardless of half/full-duplex routing) and are stored for subsequent transmission. This storage is done on a page basis, which allows the screen to be filled and edited before transmission occurs. The only exceptions to this are:

- When the L INSRT C (Insert-Line/Insert-Character) key is used with a Shift key. This causes an immediate transmission of the codes for an insert-line function, and the function is not performed until the codes are echoed or sent back by the host.
- When the L DLETE C (Delete-Line/Delete-Character) key is used with a Shift key. This causes the same type action for the delete-line function.

When entries and editing are done, pressing one of the keys shown in figure 4-3 will start the block transmission. During the transmission, the keyboard locks (LOCK indicator lights) and the cursor moves through the displayed data as it is transmitted. If the host instructed the terminal to send to the current position, the transmission includes the unprotected data from the top left of the screen up to, but not including, the position the cursor occupied before transmission. If no instruction to send to current position is received, the transmission includes all the unprotected data on the screen. When the transmission is completed, the cursor returns to the position it occupied before transmission.

The significance of the codes from the keys shown in figure 4-3 varies with the host and application. Check with your supervisor as to which key should be used to start a block transmission.

The block-transmit mode stays in effect until the host commands the terminal to exit from the mode. In addition, in some applications, the host may enable the terminal operator to exit from the mode by pressing a Shift key and the P/CLEAR/EOL key. If so, this also clears all data from the screen (including protected data).

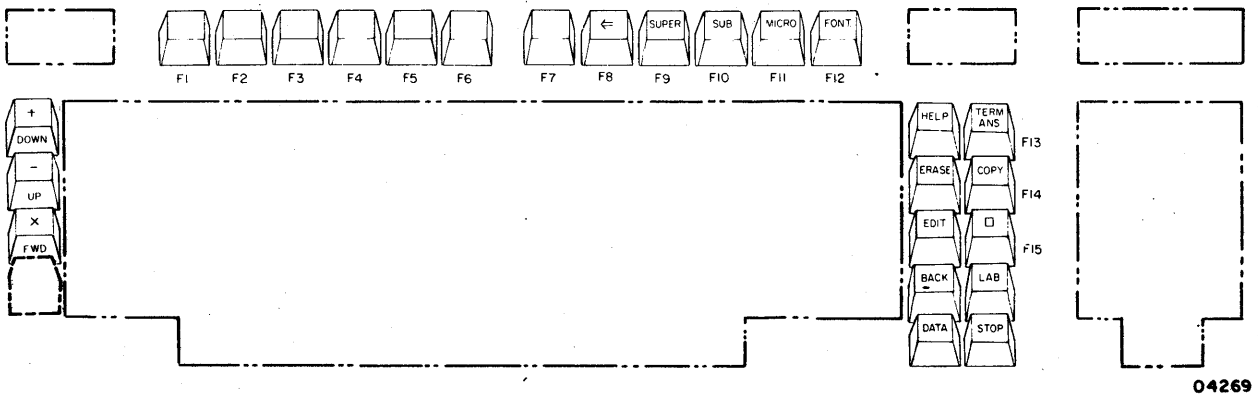


Figure 4-3. Function/Special Keys that Start Block Transmission

KEYBOARD FUNCTIONS

This portion of the section describes keyboard functions as they apply to CYBER mode. In CYBER mode, the host may assign special functions or codes to the keys identified in figure 4-4. These keys function as described here unless changed by the host.

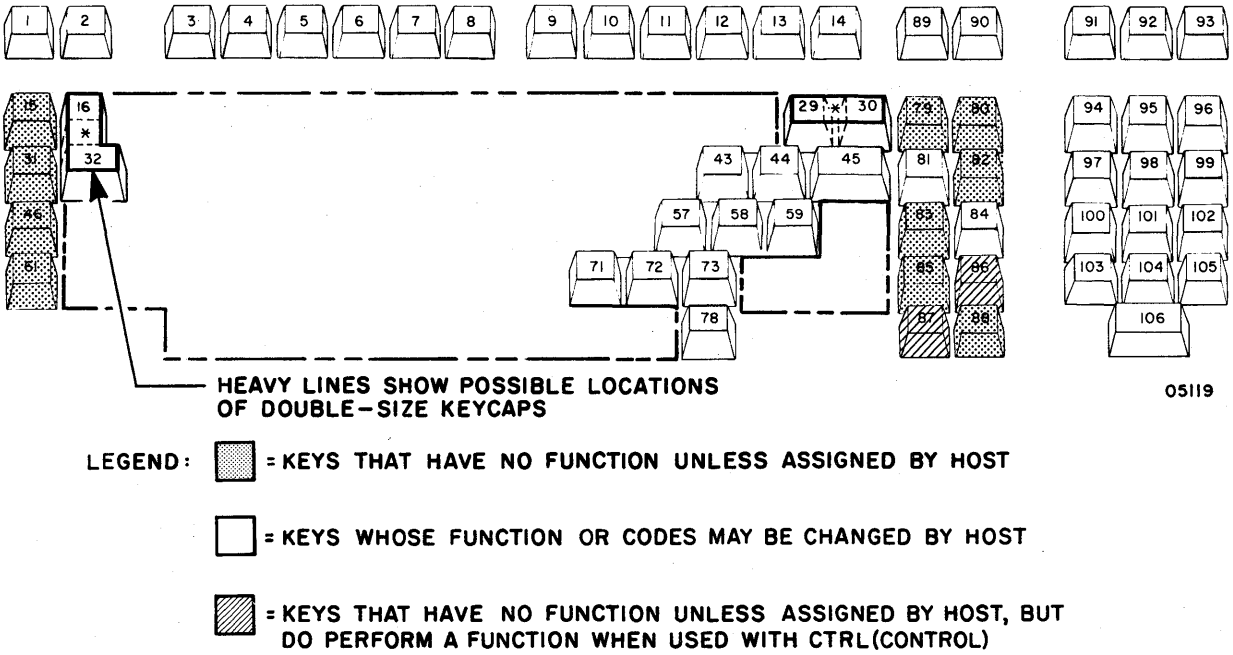


Figure 4-4. Keys Whose Functions May Change

Keyboard functions are divided into the following categories:

- Altering keyboard entries
- Entering special symbols
- Moving cursor
- Tabbing
- Editing
- Controlling communications and printing

ALTERING KEYBOARD ENTRIES

Keyboard entries are altered by the Shift keys, the Lock key, and the CTRL key.

Shift Keys

Pressing one of the Shift keys (⇧) and a alphanumeric key generates the uppercase character or control function for the alphanumeric key. When two symbols share a key, the upper symbol or control function is active while either Shift key is actuated.

Lock Key

The Lock key (⇪) can be conditioned through operator parameters to function as a normal shift lock or to limit only alphabetical characters to uppercase. First pressing of the Lock key initiates the conditioned function and lights the indicator in the key. Second pressing of the key halts the function and extinguishes the indicator.

CTRL Key

The CTRL (Control) key is used with other keys to generate special code sequences. The use of special code sequences depends on the host and the application.

In CYBER mode, the host can direct the terminal to display different groups of special symbols in place of the characters on the keycaps. This does not change keycodes, but does cause certain keys to display special symbols. The special symbols made effective may be:

- Line-drawing symbols that display in place of the punctuation and numeric characters listed in table 4-2.

- Special symbols that display in place of the lowercase/uppercase alphabetical characters. This correlation is listed in table 4-3.

- Host-loaded symbols that display in place of alphabetical characters in a manner similar to the special symbols, but which are undefined. This is because each host-loaded symbol consists of a specific pattern that is loaded into terminal memory prior to normal operations.

TABLE 4-2. CORRELATION BETWEEN CONVENTIONAL CHARACTERS AND LINE-DRAWING SYMBOLS

COLUMN A CONVENTIONAL ENTRY FOR ALL KEYCAP SETS UNLESS OTHERWISE NOTED		COLUMN B CORRESPONDING LINE-DRAWING SYMBOL	
A	B	A	B
(Space)	—	0	┘
!	|	1	┐
"	┌	2	└
£ (United Kingdom or Spanish or French keycaps)	┐	3	├
# (Other keycap sets)	┐	4	┤
$	└	5	┼
¤ (Swedish/Finnish keycaps)	└	6	┃
%	┘	7	┃
&	┬	8	▄
' (Apostrophe)	┴	9	▄
(	├	: (Colon)	▐
)	┤	; (Semicolon)	▙
*	┼	<	▪
+ (Plus)	═	=	▬
, (Comma)	‖	>	(Space)
- (Minus)	╒	?	▮
. (Decimal Point)	╕		
/	╘		

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TABLE 4-3. CORRELATION BETWEEN CONVENTIONAL CHARACTERS AND SPECIAL SYMBOLS

COLUMN A CONVENTIONAL ENTRY FOR ALL KEYCAP SETS UNLESS OTHERWISE NOTED		COLUMN B CORRESPONDING SPECIAL SYMBOL	
A	B	A	B
à (French keycaps) É (Swedish/Finnish keycaps) § (Spanish or German keycaps) @ (Other keycap sets)	(Space)	T	μ
A	/	U	π
B	≡	V	ρ
C	~	W	σ
D	⇦	X	ω
E	≠	Y	≤
F	↑	Z	≥
G	→	° (French keycaps) Ä (Swedish/Finnish or German keycaps) ¡ (Spanish keycaps) Æ (Danish/Norwegian keycaps) [(Other keycap sets)	θ
H	↓		
I	→	ç (French keycaps) Ö (Swedish/Finnish or German keycaps) Ñ (Spanish keycaps) Ø (Danish/Norwegian keycaps) / (Other keycap sets)	(Space)
J	×		
K	Σ		
L	Δ		
M	∪		
N	∩		
O	÷	§ (French keycaps) Å (Swedish/Finnish or Danish/Norwegian keycaps) ° (Spanish keycaps) Ü (German keycaps)] (Other keycap sets)	○
P	α		
Q	β		
R	δ		
S	λ		

TABLE 4-3. CORRELATION BETWEEN CONVENTIONAL CHARACTERS AND SPECIAL SYMBOLS (CONTD)

COLUMN A CONVENTIONAL ENTRY FOR ALL KEYCAP SETS UNLESS OTHERWISE NOTED		COLUMN B CORRESPONDING SPECIAL SYMBOL	
A	B	A	B
Ü (Swedish/Finnish keycaps)	(Space)	o	(Space)
^ (Other keycap sets)		p	\
_ (Underline)	»	q	\
é (Swedish/Finnish keycaps)	¯	r	/
´ (Grave accent on other keycap sets)		s	/
a	..	t	–
b	□	u	_
c	o	v	|
d	◆	w	|
e	×	x	▨
f	´	y	▨
g	´	z	=
h	v	e´ (French keycaps)	=
i	↕	ä (Swedish/Finnish or German keycaps)	=
j	|	æ (Danish/Norwegian keycaps)	=
k	<	ç (Spanish keycaps)	=
l	>	{ (Other keycap sets)	=
m	(Space)		
n			

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TABLE 4-3. CORRELATION BETWEEN CONVENTIONAL CHARACTERS AND SPECIAL SYMBOLS (CONTD)

COLUMN A CONVENTIONAL ENTRY FOR ALL KEYCAP SETS UNLESS OTHERWISE NOTED		COLUMN B CORRESPONDING SPECIAL SYMBOL	
A	B	A	B
ù (French keycaps)		¨ (French keycaps)	
ö (Swedish/Finnish or German keycaps)		ü (Swedish/Finnish keycaps)	
ñ (Spanish keycaps)		¯ (Overbar on British or Danish/Norwegian keycaps)	
ø (Danish/Norwegian keycaps)		β (German keycaps)	
¦ (Other keycap sets)		~ (Other keycap sets)	
è (French keycaps)		DEL (Delete)	◢
å (Swedish/Finnish or Danish/Norwegian keycaps)			
¿ (Spanish keycaps)	◣		
ü (German keycaps)			
} (Other keycap sets)			

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MOVING CURSOR

The functions listed in table 4-4 allow the cursor to be moved without affecting displayed data.

TABLE 4-4. MOVING CURSOR

CURSOR MOVEMENT*	PRESS KEY(S)
Left one character position (backspace) unless the position is protected and automatic tabbing** is in effect. If so, cursor skips past the protected position to the preceding unprotected position.	← or ⇧ + 4

TABLE 4-4. MOVING CURSOR (CONTD)

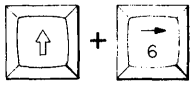
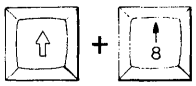
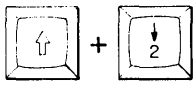
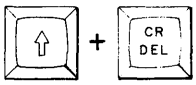
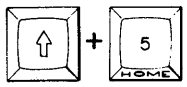
CURSOR MOVEMENT*	PRESS KEY(S)
Right one character position unless the position is protected and automatic tabbing** is in effect. If so, cursor skips past the protected position to the next unprotected position.	Space bar or 
Up one line in same column	
Down one line in same column	
If automatic line feed*** is in effect, to first character position of next line; if automatic line feed is not in effect, to first character position of present line. If the first position is protected and automatic tabbing** is in effect, cursor skips past the protected position to the next unprotected position.	
In large CYBER operations with automatic line feed*** or small CYBER operations, move cursor to first position of next line. If that position is protected and automatic tabbing** is in effect, cursor skips past the protected position to the next unprotected position.	
In large CYBER operations without automatic line feed***, move cursor back to first position of current line. If that position is protected and automatic tabbing** is in effect, cursor skips past the protected position to the next unprotected position.	

TABLE 4-4. MOVING CURSOR (CONTD)

CURSOR MOVEMENT*	PRESS KEY(S)
To home position designated in operator parameters unless the home position is protected and automatic tabbing** is in effect. If so, cursor skips past the protected position to the next unprotected position.	

*With full-duplex routing, cursor movement does not occur until codes for keys are echoed back by host.

**Automatic tabbing is described earlier in this section under Automatic-Tabbing Protection Mode.

***Automatic line feed is a mode installation parameter.

TABBING

The tabbing functions available through the keyboard are listed in table 4-5. These functions are similar to the tab set function on a typewriter.

TABLE 4-5. TABBING FUNCTIONS

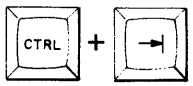
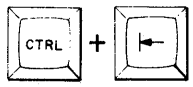
TAB FUNCTION*	PRESS KEY(S)
Set column that cursor is in as a tab stop**	
Clear column that cursor is in as a tab stop**	
Tab forward. This automatically advances cursor as follows: • With no protected positions on screen, to position immediately following next field of dimmed characters or to next tab stop, whichever comes first. If neither is present, cursor advances to home position.	

TABLE 4-5. TABBING FUNCTIONS (CONTD)

TAB FUNCTION*	PRESS KEY(S)
• With protected positions on screen, to beginning of next unprotected field or next unprotected tab stop. If neither is present, cursor advances to home position. If home position is protected and automatic tabbing is in effect, cursor advances to beginning of next unprotected field or next unprotected tab stop. (Automatic tabbing is described earlier in this section under Automatic-Tabbing Protection Mode.)	
Tab backward. This automatically moves cursor backward until a position is reached that meets the criteria described for tab forward.	

*With full-duplex routing, tab functions do not occur until codes for keys are echoed back by host.

**These functions cannot be performed if cursor is in a protected position.

EDITING

Table 4-6 lists the editing functions available in CYBER mode.

TABLE 4-6. EDITING FUNCTIONS

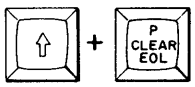
EDITING FUNCTION*	PRESS KEY(S)
Clear data from present cursor position forward to end of line or until a protected position is encountered, whichever comes first.	
Clear all unprotected positions on screen and move cursor to home position. In addition, host can enable this function to clear protected positions and switch communications from block-transmit mode to character-transmit mode (this is described earlier in this section under Block-Transmit Mode).	

TABLE 4-6. EDITING FUNCTIONS (CONTD)

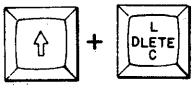
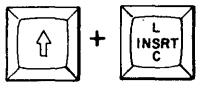
EDITING FUNCTION*	PRESS KEY(S)
In small CYBER operations, clears present line forward and backward to end of unprotected field or to beginning or end of line, whichever comes first. In conjunction with this, cursor moves back to where backward clearing stopped (beginning of unprotected field or beginning of line). In large CYBER operations, backspaces cursor, and if the new position is unprotected, the position is cleared. If the new position is protected and automatic tabbing is in effect, cursor skips past the protected position to the preceding unprotected position and the unprotected position is cleared. (Automatic tabbing is described earlier in this section under Automatic-Tabbing Protection Mode.) If cursor is in a protected position, use of the ERASE key results in the alarm sounding. No other action is taken.	
Delete character at present cursor position and shift characters right of cursor one position left. If protected positions are right of cursor, shifting stops at those positions.	
Delete present line of characters and shift lower lines up one line. This shifting continues until a line with protected positions is encountered or until bottom line has been shifted.**	
Shift character at present cursor position right and insert a space in that position. This shifting continues to end of line or until a protected position is encountered, whichever comes first.	

TABLE 4-6. EDITING FUNCTIONS (CONTD)

EDITING FUNCTION*	PRESS KEY(S)
Shift present line down and insert a line of spaces. Shifting of lines progresses down screen until a line with protected positions is encountered or until bottom line rolls off screen.**	

*With full-duplex routing, editing functions do not occur until codes for keys are echoed back by host.

**In block-transmit mode, these functions do not occur until codes for keys are echoed or sent back by host.

CONTROLLING COMMUNICATIONS AND PRINTING

The keyboard functions that control communications and printing in CYBER mode are listed in table 4-7.

TABLE 4-7. CONTROLLING COMMUNICATIONS AND PRINTING

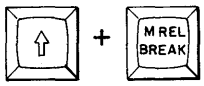
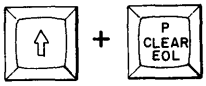
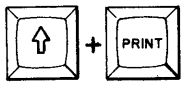
FUNCTION	PRESS KEY(S)
Do a manual release. This aborts all host communications and print transfers, and if keyboard is locked, unlocks the keyboard.	
Start a block-mode transmission	Refer to description of Block-Transmit Mode earlier in this section.
Switch communications from block-transmit mode to character-transmit mode if enabled by the host. For further details, refer to description of Block-Transmit Mode earlier in this section.	

TABLE 4-7. CONTROLLING COMMUNICATIONS AND PRINTING (CONTD)

FUNCTION	PRESS KEY(S)
Transfer to printer all displayed data on the screen. In this transfer, control and command codes are replaced with spaces and a carriage return and line feed are inserted at the beginning of transfer and at end of each line. During transfer, keyboard locks (LOCK indicator lights) and received data is temporarily ignored.	
Same type print transfer just described except dimmed data is replaced with space codes.	
Transmit a break signal.	
Transmit a delete code.	
Transmit an escape code.	

HOST CONTROLLED FUNCTIONS

In CYBER mode, the host can direct the terminal to:

- Load a program from host
- Load up to 64 separate symbol patterns from host
- Perform special functions and/or generate special codes for designated keys
- Make changes to operator parameters
- Protect designated screen positions from keyboard entries

- Highlight designated positions by showing characters dimmed, underlined, blinking, or in inverse video
- Display line-drawing symbols, special symbols, or host loaded symbols in place of correspondingly coded alphanumeric characters
- Enable/disable touchpanel use
- Enable/disable transmission to host
- Perform a self test similar to power-on test and notify host whether a failure occurred or not
- Light ALERT indicator, MESSAGE indicator, or PROGRAM indicators
- Transfer data to printer or stop transfer to printer
- Switch from CYBER mode to a new designated operating mode (mode 3 through 7)

This section contains instructions on cleaning the keyboard and the cabinet and screen.

CLEANING KEYBOARD

1. Turn off terminal by pressing side of POWER switch marked with the 0.

CAUTION

Do not use solvents to clean keyboard. Solvents can cause defective key operation and damage keycaps.

2. Dust keyboard with soft-bristled brush.

CLEANING CABINET AND SCREEN

1. Turn off terminal by pressing side of POWER switch marked with the 0.
2. Wipe exterior of terminal cabinet using a soft, damp, lint-free cloth.
3. Clean screen or touchpanel using a soft, lint-free cloth dampened with a mild soap and water solution. Do not allow cleaning solution to run down screen or enter keyboard.

This section contains error-recovery/fault-isolation information, and covers how terminal components are turned into a repair service center.

NOTE

If you have changed an operator parameter, make sure that is not the cause of problem before proceeding. If you are not sure about a parameter selection, check with your supervisor. To revert all operator parameters back to their original selections, press the RESET switch or change them with the keyboard as described under Operator Parameters in section 4.

ERROR RECOVERY/FAULT ISOLATION

This portion of the section describes the actions to take when a problem is encountered in operating the terminal. This is done with tables that list various symptoms with recommended corrective actions. Some actions may require assistance from supervisory personnel.

The type problems covered are listed below with their corresponding table number. The tables assume that the terminal has been installed and checked out per appendix A and that the terminal battery has kept installation parameters stored in nonvolatile memory (loss of installation parameters is described above). If the problem experienced is not covered in the tables, confer with supervisory personnel and if necessary, call the hotline number recorded on the Repair Service tag.

TABLE 6-1. POWER PROBLEMS

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED
Terminal does not come on when side of POWER switch marked 1 is pressed in	1. Check that BRIGHTNESS and CONTRAST controls are not turned too far counterclockwise. 2. Verify that power cord is not pulled loose from terminal or from power outlet. 3. Wait at least 15 to 20 seconds after trying POWER switch, then press in CB1 circuit breaker at rear of terminal and retry POWER switch. 4. Check outlet for power by connecting a different device to outlet. If that device does not operate either, notify building electrician. If device operates OK, basic terminal unit and power cord need maintenance attention.*
CB1 circuit breaker on terminal has tripped more than once	1. If 50-Hz power is being used, verify that LINE VOLTAGE switch at rear of terminal is set for 220/240 V.** 2. Basic terminal unit needs maintenance attention.*

*If items requiring maintenance attention are to be turned in to a CDC repair service center, refer to the latter portion of this section for instructions.

** CAUTION

If LINE VOLTAGE switch is set for incorrect voltage, damage to terminal may result.

TABLE 6-2. POWER-ON TEST PROBLEMS

FAILURE MESSAGE	PROBLEM/CORRECTIVE ACTION
None - power-on test never completed (alarm never sounded) or test did complete, but with an improper display instead of mode menu	Check that terminal has power (for power problems, refer to table 6-1). If it has power, do the corrective actions listed in table 6-6 for meaningless-or-no-data-displays symptom.
CHARACTER RAM FAIL RAM FAIL XXXX XX XX (Note: Xs above represent hexadecimal digits in message) GRAPHIC FAIL XXXX XX XX (Note: Xs above represent hexadecimal digits in message) GRAPHIC FAIL ROM FAIL XX XX XX (Note: Xs above represents hexadecimal digits in message)	Basic terminal unit needs maintenance attention.*
NVM ALTERED	Have your supervisor re-enter and copy all installation parameters into non-volatile memory (refer to Entering Parameters in appendix A and to parameter entries recorded on foldout Configuration Sheet near front of manual). Then press RESET switch to rerun power-on test. If NVM ALTERED displays again, basic terminal unit needs maintenance attention.*
COMM FAIL KEYBOARD FAIL TIMER FAIL KBD CLOCK FAIL EXT KBD LOOPBACK FAIL	Basic terminal unit needs maintenance attention.*

TABLE 6-2. POWER-ON TEST PROBLEMS (CONTD)

FAILURE MESSAGE	PROBLEM/CORRECTIVE ACTION
BATTERY LOW	Battery needs to be replaced. Instructions are in section 3.
PORT A FAIL PORT B FAIL	Dual asynchronous-interface board installed in I/F 1, I/F 2, or I/F 3 at rear of terminal needs maintenance attention.*
TEST SWITCH ENABLED	TEST switch at rear of terminal is pulled out for testing. Push TEST switch in for normal operation.
INTERNAL MODEM CHECKSUM FAIL INTERNAL MODEM UART FAIL INTERNAL MODEM LOOPBACK FAIL	Basic terminal unit needs maintenance attention.*
SERIAL PORT TEST SWITCH ENABLED	TEST/NORMAL switch on dual asynchronous interface board in I/F 1 through I/F 3 is in the TEST position. Set switch to the NORMAL position for normal operation.

*If items requiring maintenance attention are to be turned in to a CDC repair service center, refer to the latter portion of this section for instructions.

TABLE 6-3. HOST LOADING PROBLEMS

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED*
HOST NOT CONNECTED shows on screen and communications with host are over telephone lines	1. If terminal DATA SET READY indicator is lit, go to number 2; if not lit, check that modem/terminal power is on and that all cable connections are secure. If DSR remains unlit,

TABLE 6-3. HOST LOADING PROBLEMS (CONTD)

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED*
	modem is probably at fault. If another external modem cable is available, this may be further tested by replacing cable between terminal and modem (with power off) and retrying load. 2. If internal modem, have supervisor check for correct parameter entries (refer to Appendixes A and B). 3. If external modem, verify that phone line has been switched to terminal. 4. Check that host computer, network equiment, and local phone equipment are operational (manual dial and listen). 5. Basic terminal unit needs maintenance attention.**
NO REPLY shows on screen and ERROR indicator lights	1. If screen shows block 0 loading and then NO REPLY appears, verify that a valid file number is being entered. 2. Verify that host computer and communications network are operational. 3. Enter operator-intervention test and check transmit and receive circuits using TEST/NORMAL and TEST switches (section 3 contains instructions and a table later in this section lists corrective actions if an error occurs). 4. Notify network personnel of problem.
HOST LOADING FAILURE momentarily shows on screen and ERROR indicator lights	1. Verify that host computer and network are operational. 2. Enter operator-intervention test and check transmit and receive circuits using TEST/NORMAL and TEST switches (section 3 states how and table later in this section lists error fixes). 3. Notify network personnel of problem.

TABLE 6-3. HOST LOADING PROBLEMS (CONTD)

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED*
FAILURE LOADING MODE shows on screen when internal modem is to auto dial host	1. Have your supervisor verify that terminal and mode installation parameters relating to internal modem are correct (refer to Installation Parameter Modification in appendix B). If that is not the problem, basic terminal unit needs maintenance attention.**

*Actions assume that instructions under Starting Up Terminal in section 3 have been followed and that no fault was detected by power-on test.

**If items requiring maintenance attention are to be turned in to a CDC repair service center, refer to the latter portion of this section for instructions.

TABLE 6-4. MEMORY-MODULE LOADING PROBLEMS

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED*
Attempting to load from a memory module and FAILURE LOADING MODE shows on screen and alarm sounds	1. Verify that memory module is installed in terminal. Section 3 contains installation instructions. 2. Verify that loading from memory module is correct procedure for mode to be run. 3. Replace memory module.**

*Actions assume that instructions under Starting Up Terminal in section 3 have been followed and that no fault was detected by power-on test.

**A new memory module may be purchased from your CDC sales representative. Order the part number marked on the old memory module.

TABLE 6-5. OPERATOR-INTERVENTION TEST PROBLEMS

SYMPTOM	PROBLEM/CORRECTIVE ACTION*
Power-on test ran OK but operator-intervention test cannot be initiated Vertical lines displayed by graphics feature appear incorrectly or pressing a key does not clear lines from screen Not all specified symbols appear in display Symbols are randomly displayed on screen Words BLINK, DIM, UNDERSCORE, and INVERSE are not displayed with corresponding highlighting or the word BLANK appears	>Basic terminal unit needs maintenance attention.**
Alignment border is not in line with notches in bezel	Have your supervisor realign crt per appendix A.
Wrong code appears for a key or code does not change when key is released	Pull out TEST switch at rear of terminal. If KBD FAIL or KBD CLOCK FAIL is displayed, basic terminal unit needs maintenance attention; otherwise, keyboard needs maintenance attention.**
One or more indicators on front of terminal do not light during test Touching touchpanel when TOUCHPANEL ENABLED is displayed does not move cursor to touched position TEST switch pulled out and KBD CLOCK FAIL is displayed	>Basic terminal unit needs maintenance attention.**
TEST switch pulled out and either COMM FAIL or KEYBOARD FAIL is displayed	Basic terminal unit needs maintenance attention.**

TABLE 6-5. OPERATOR-INTERVENTION TEST PROBLEMS (CONTD)

SYMPTOM	PROBLEM/CORRECTIVE ACTION*
TEST switch pulled out and either PORT A FAIL or PORT B FAIL is displayed	Verify that TEST/NORMAL switch on dual asynchronous-interface board in rear slot I/F 1 through I/F 3 is in TEST position. If not, place that switch in TEST position and rerun test by pushing TEST switch in and then pulling it back out. If TEST/NORMAL switch was in TEST position, dual asynchronous-interface board needs maintenance attention.**
Test halted when TEST switch was pulled out	Basic terminal unit plus any boards in I/F-1 through I/F-3 slots need maintenance attention.**
TEST switch pulled out, PARALLEL PORT FAIL is displayed, and a parallel-interface graphics printer is connected to PARALLEL connector of terminal	Do the following actions until problem is corrected or resolved. Recheck test results after each action by momentarily pushing TEST switch in and then pulling it back out. This reruns test and if problem is corrected, PARALLEL PORT OK displays. If a Flexible Disk Drive is on the parallel channel, it must be powered on. 1. Check that PRINT indicator/switch on printer is lit. If not, press PRINT switch to light indicator. 2. Check that FT116-A terminator is secure in rear connector of printer. Also check that cable(s) connecting devices are secure. 3. Press PRINT indicator/switch on printer to extinguish indicator and use printer TEST switch to do a test print (refer to printer operator's guide/reference manual, preface lists publication number). If print-out cannot be done, graphics printer needs maintenance attention.

TABLE 6-5. OPERATOR-INTERVENTION TEST PROBLEMS (CONTD)

SYMPTOM	PROBLEM/CORRECTIVE ACTION*
	4. If equipment is covered by an on-call maintenance agreement, call for maintenance service; otherwise, proceed to next step. 5. If another parallel-interface graphics printer is available as a substitute, do the following: a. Power off current printer and terminal. b. Connect substitute printer and cable (if available) in place of original printer and cable. c. If substitute printer does not have a terminator, install terminator from original unit. d. Press in TEST switch on terminal, then power on printer and terminal. e. Press PRINT indicator/switch on printer to light indicator. f. Refer to section 3 and reenter operator-intervention test. g. Pull out TEST switch. If PARALLEL PORT OK appears, original printer and cable need maintenance attention. If PARALLEL PORT FAIL still appears, parallel-interface board (board with PARALLEL connector) needs maintenance attention.**

TABLE 6-5. OPERATOR-INTERVENTION TEST PROBLEMS (CONTD)

SYMPTOM	PROBLEM/CORRECTIVE ACTION*
	6. Call hotline number for assistance.

*Actions assume that instructions under Operator-Intervention Test in section 3 have been followed.

**If items requiring maintenance attention are to be turned in to a CDC repair service center, refer to the latter portion of this section for instructions.

TABLE 6-6. DISPLAY PROBLEMS

SYMPTOM	PROBLEM/CORRECTIVE ACTION
Display went completely black	Check that terminal has power (for power problems, refer to table 6-1). If terminal has power, verify that BRIGHTNESS or CONTRAST control did not accidentally get turned too far counterclockwise. If that is not the problem, basic terminal unit or board in rear slot I/F 1 through I/F 3 needs maintenance attention. If terminal is covered by a carry-in maintenance agreement, determine which is faulty as follows: ● If no board is installed in slots I/F 1 through I/F 3, basic terminal unit needs maintenance attention.* ● If one or more boards are installed in I/F 1 through I/F 3, do the following: a. Turn off power to terminal and all devices connected to terminal.

TABLE 6-6. DISPLAY PROBLEMS (CONTD)

SYMPTOM	PROBLEM/CORRECTIVE ACTION
	b. Remove two screws securing cover plates of boards in I/F-1 through I/F-3 slots and pull boards from slots (reference figure 6-1 later in this section). c. Power on terminal to see whether display now operates correctly. Note if a dual asynchronous-interface board was removed, a PORT A FAIL and PORT B FAIL message will appear if display is operating properly. This is because the board is removed. d. If display still does not operate correctly, the basic terminal unit needs maintenance attention; otherwise, the board(s) removed in step b needs maintenance attention.*
Wrong language character set is displayed	Have your supervisor verify that correct language is selected in terminal installation parameters. If that is not the problem, basic terminal unit needs maintenance attention.*
No display of keyboard entries or data displayed is meaningless.	Press RESET switch. If problem is still present, basic terminal unit or board in rear slot I/F 1 through I/F 3 needs maintenance attention. If terminal is covered by a carry-in maintenance agreement, determine which is faulty as follows: • If no board is installed in slots I/F 1 through I/F 3, basic terminal unit needs maintenance attention.*

TABLE 6-6. DISPLAY PROBLEMS (CONTD)

SYMPTOM	PROBLEM/CORRECTIVE ACTION
	• If one or more boards are installed in I/F 1 through I/F 3, do the following: a. Turn off power to terminal and all devices connected to terminal. b. Remove two screws securing cover plates of boards in I/F-1 through I/F-3 slots and pull boards from slots (reference figure 6-1 later in this section). c. Power on terminal to see whether display now operates correctly. Note if a dual asynchronous-interface board was removed, a PORT A FAIL and PORT B FAIL message will appear if display is operating properly. This is because the board is removed. d. If display still does not operate correctly, the basic terminal unit needs maintenance attention; otherwise, the board(s) removed in step b needs maintenance attention.*
Display not stable BRIGHTNESS or CONTRAST control have little affect	>Basic terminal unit needs maintenance attention.*
Display too bright	Check that BRIGHTNESS and CONTRAST controls are not turned too far clockwise. If that is not the problem, basic terminal unit needs maintenance attention.*

TABLE 6-6. DISPLAY PROBLEMS (CONTD)

SYMPTOM	PROBLEM/CORRECTIVE ACTION
Background of display is opposite than expected	Enter CYBER mode (refer to Starting Up Terminal in section 3) and display second set of operator parameters by pressing SETUP key, then F10 key (parameters displayed are described in section 4 under Operator Parameters). Press F2 key several times to verify that display background alternately goes light to dark. If no change occurs, basic terminal unit needs maintenance attention.*
Display resolution poor	Check that BRIGHTNESS control is not too far clockwise. If that is not the problem, basic terminal unit needs maintenance attention.*
Data in left margin seems too close or too far from side of screen Data in first line seems too close or too far from top of screen	Enter operator-intervention test (section 3 contains instructions). Check whether alignment border in test is in line with notches in bezel. If border is not in line, have your supervisor realign crt per appendix A. If that does not correct problem, basic terminal unit needs maintenance attention.*
Unit does not hold tilted position	Basic terminal unit needs maintenance attention.*

*If items requiring maintenance attention are to be turned in to a CDC repair service center, refer to the latter portion of this section for instructions.

TABLE 6-7. KEYBOARD AND TOUCHPANEL PROBLEMS

SYMPTOM	PROBLEM/CORRECTIVE ACTION*
No response when any key is pressed	Make sure that: • Keyboard cable is connected to terminal • TEST switch at rear of terminal is pushed in • Communications with host have not been cut off • If a board with a TEST/NORMAL switch is in I/F 1 through I/F 3 at rear of terminal, that switch is set to NORMAL If none of these are cause of problem, do as follows: 1. Pull out TEST switch at rear of terminal. 2. Press RESET switch to rerun power-on test. 3. If KBD CLOCK FAIL or EXT KBD LOOPBACK FAIL appears on screen, basic terminal unit needs maintenance attention; otherwise, keyboard needs maintenance attention.**
Not the expected response when a particular key is pressed	Enter operator-intervention test and check whether correct code appears when key is pressed (section 3 contains instructions). If correct code appears, problem is likely not with keyboard or terminal but with operating program or host. If incorrect code appears, keyboard needs maintenance attention.**
Lock key indicator does not light when that key is in use	Check whether indicator lights while in CYBER mode (instructions for entering CYBER mode are in section 3 under Starting Up Terminal). If indicator lights in CYBER mode, operating-mode program

TABLE 6-7. KEYBOARD AND TOUCHPANEL PROBLEMS (CONTD)

SYMPTOM	PROBLEM/CORRECTIVE ACTION*
	being used is not instructing indicator to light. If indicator does not light in CYBER mode, do as follows: 1. Refer to instructions in section 3 and enter operator-intervention test. 2. If a board with a TEST/NORMAL switch is in I/F 1 through I/F 3 at rear of terminal, place switch in TEST position. 3. Pull out TEST switch at rear of terminal. If KBD FAIL is displayed, basic terminal unit needs maintenance attention; otherwise, keyboard needs maintenance attention.**
Keyboard unexpectedly locked (LOCK indicator lit on front panel)	If operating online with host, check that connected modem is operational and that DATA SET READY indicator is lit on terminal. If that is not the problem, unlock keyboard by pressing RESET switch. If condition reoccurs, call hotline number for assistance.
No response to attempted touchpanel input	Enter operator-intervention test and check whether touchpanel operates correctly in test (section 3 contains instructions). If it does, touchpanel input was probably not enabled when attempted or there is a problem with operating program or host. If touchpanel does not operate correctly in test, basic terminal unit needs maintenance attention.**

*Actions assume that instructions under Starting Up Terminal in section 3 have been followed and that no fault was detected by power-on test.

**If items requiring maintenance attention are to be turned in to a CDC repair service center, refer to the latter portion of this section for instructions.

TABLE 6-8. PRINTING PROBLEMS

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED
No printing occurs in CYBER mode when PRINT key is pressed	1. Check that: • Printer is ready and online with terminal (if necessary, refer to printer operator's guide for instructions on placing printer online) • Cable connections at terminal and printer are secure • TEST switch at rear of terminal is pressed in, and if a TEST/NORMAL switch is present at rear in I/F-1 through I/F-3, that switch is in NORMAL position 2. Check whether printer can do a test print or self test successfully (refer to printer operator's guide for applicable procedure). If it cannot, printer needs maintenance attention. 3. If printer has been reconnected and is a serial-interface character or graphics printer, verify it is connected to the correct connector at terminal. Connector J1 is for port-A operations and connector J2 is for port-B operations. Which port is correct depends on the parameters established during installation. 4. Enter operator-intervention test and check that PRINT key displays correct code and use TEST/NORMAL and TEST switches to check sending and receiving circuits (section 3 contains instructions and a table earlier in this section lists corrective actions if an error occurs in test). 5. Call hotline number for assistance.

TABLE 6-8. PRINTING PROBLEMS (CONTD)

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED
Serial-interface character or graphics printer prints meaningless data when terminal is turned on	1. Power off terminal and run printer test print or self test (refer to printer operator's guide for procedure). If printer test print or self test does not run successfully, printer needs maintenance attention; otherwise, basic terminal unit and dual asynchronous-interface board need maintenance attention.*
Meaningless or missing data in printout	1. If this problem is occurring with a serial-interface character or graphics printer in its initial use, check that printer and terminal port are using same data rate, parity, and number of stop bits. These characteristics on terminal port are determined by installation parameters. Correlation between port and terminal connector is that connector J1 is for port-A operations and connector J2 is for port-B operations. 2. If this problem is occurring with a parallel-interface graphics printer, check that FT116-A terminator is secure in rear connector of printer. 3. Check whether printer can do a test print or self test successfully (refer to printer operator's guide for applicable procedure). If it cannot, printer needs maintenance attention. 4. Enter operator-intervention test and use TEST/NORMAL and TEST switches to check sending and receiving circuits (section 3 contains instructions and a table earlier in this section lists corrective actions if an error occurs in test).

TABLE 6-8. PRINTING PROBLEMS (CONTD)

SYMPTOM	ACTIONS TO BE DONE UNTIL PROBLEM IS CORRECTED OR RESOLVED
	5. Call hotline number for assistance.

*If items requiring maintenance attention are to be turned in to a CDC repair service center, refer to the latter portion of this section for instructions.

TURNING IN COMPONENTS TO A REPAIR SERVICE CENTER

The information in this portion of the section is for supervisory personnel. This information covers the procedure for turning in terminal components to a CDC repair service center when maintenance attention is required. Such maintenance service is available to users having a carry-in maintenance agreement with CDC. To acquire this type of agreement, contact your nearest CDC sales representative. The representative will inform you of the nearest available repair service center. Always check with the representative before shipping an item because the location of repair service centers occasionally change and a newly opened center may be closer.

All items turned in (either by person or by shipment) must be packed in CDC approved materials. If original packing materials were not saved, approved materials may be obtained through your CDC representative. Indicate that the packing material required is CDC part number 90538400. You will be charged for packing material.

The following terminal components are assigned as turn-in items:

- Basic terminal unit - includes all but the keyboard, equipment-interconnecting cables, optional printed-circuit boards in rear slots I/F 1 through I/F 3, and any memory module that may be installed
- Keyboard with attached cable
- Optional printed-circuit boards in rear slots I/F 1 through I/F 3. These include the parallel-interface board and the dual asynchronous-interface board.

The next paragraphs describe how to prepare the above mentioned items for turn in. After that is a listing of information that must accompany turned-in items.

PREPARING BASIC TERMINAL UNIT FOR TURN IN

Parts removed from the basic terminal unit in the following steps are to be saved for later installation and not turned in with the unit. To prepare the unit, do as follows:

1. In case the memory containing installation parameters inadvertently gets cleared during maintenance, make sure current installation parameters are recorded on the Configuration Sheet near front of manual. Instructions in appendix A tell how to display the current parameters.

2. Turn off power to terminal and to all devices connected to terminal.

3. Disconnect the following:

   - Terminal power cord at both ends
   - Keyboard cable from terminal
   - All device-interconnecting cables from terminal (it maybe desirable to tag these cables to facilitate reconnection later)

4. If any printed-circuit boards are in the I/F-1 through I/F-3 slots at rear of terminal (figure 6-1), they may be removed before turning in terminal. If that is desired, remove two screws securing cover plates of boards to rear of terminal and pull boards from slots. Then use same screws and cover empty slots with original cover plates.

5. If a memory module is installed, remove screw securing memory-module cover, remove cover, and carefully pull memory module out.

6. Coil up terminal power cord and place in a polyethylene bag.

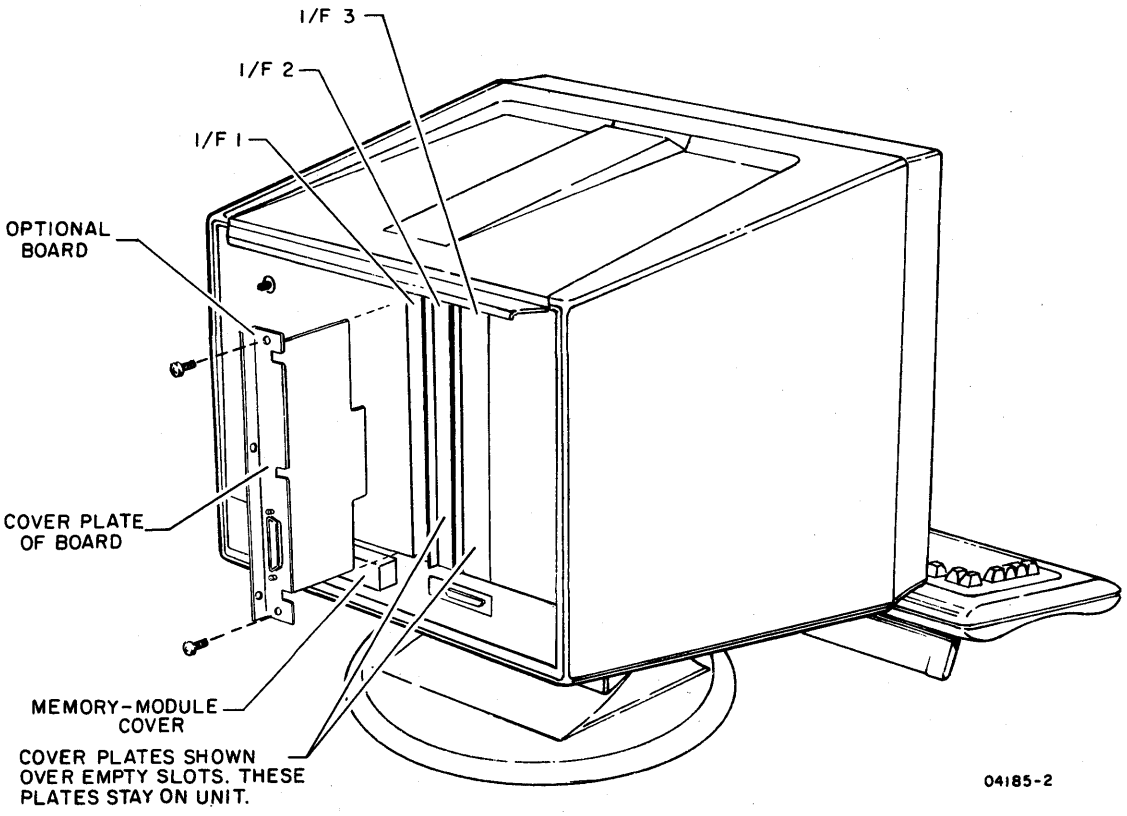


Figure 6-1. Removing Optional I/F 1 through I/F 3 Printed-Circuit Boards

7. Refer to figure 6-2 and pack basic terminal unit using original packing materials or approved, replaced materials.

8. Place bag with coiled power cord on top of terminal unit and tape to inside of carton.

9. Seal basic terminal carton with 3-inch box-sealing tape.

10. Proceed to instructions on Accompanying Information.

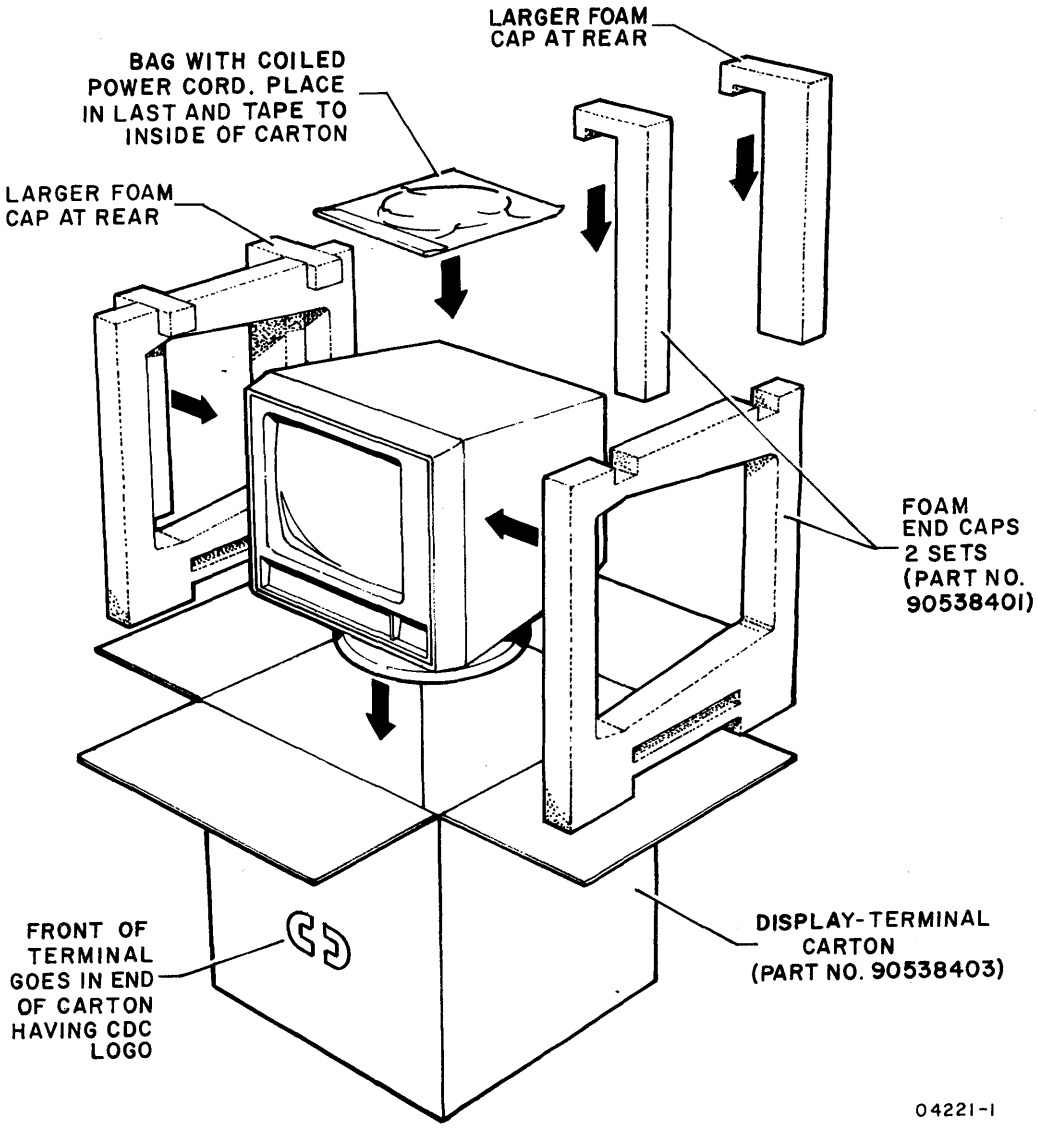


Figure 6-2. Packing Basic Terminal Unit

PREPARING KEYBOARD FOR TURN IN

To prepare the keyboard for turn in, do as follows:

1. Turn off power to terminal.
2. Disconnect keyboard cable from terminal.
3. Refer to figure 6-3 and pack keyboard using original packing materials or approved, replaced materials. Seal keyboard carton with 3-inch box-sealing tape.
4. Proceed to instructions on Accompanying Information.

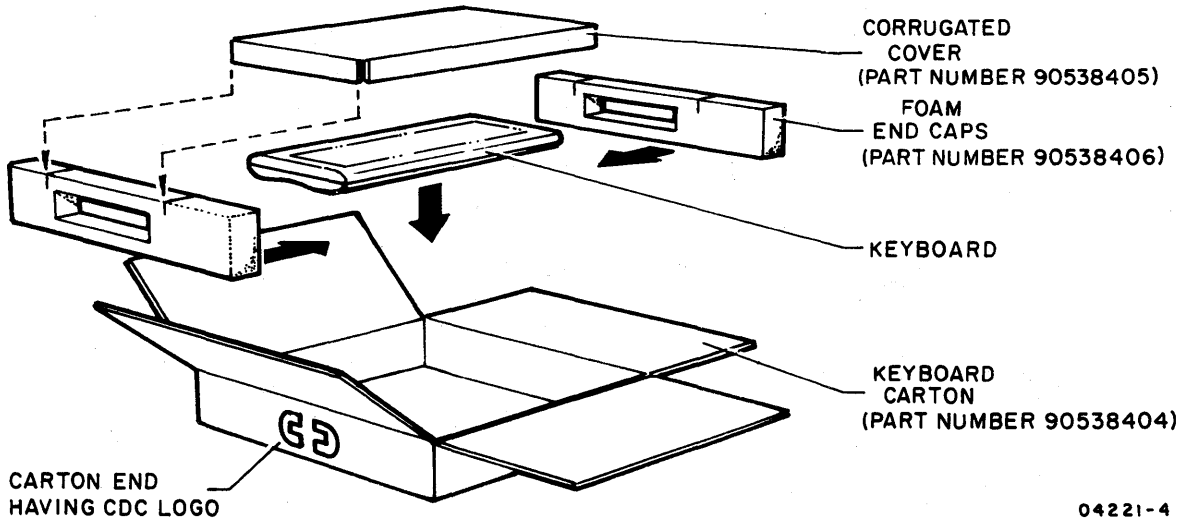


Figure 6-3. Packing Keyboard

PREPARING OPTIONAL BOARD IN I/F 1 THROUGH I/F 3 FOR TURN IN

To prepare an optional board in one of the rear slots I/F 1 through I/F 3 for turn in, do as follows:

1. Turn off power to terminal and to all devices that are connected to bad board.
2. Disconnect device cable(s) from connector(s) on cover plate of bad board.

3. Remove two screws securing cover plate of bad board to rear of terminal and pull board from slot (figure 6-1). Keep screws for later installation of board.

4. Pack bad board in original packing container or a replacement container and fill space between board and container with cushioning material.

5. Proceed to instructions on Accompanying Information.

ACCOMPANYING INFORMATION

The following information must accompany the turned-in item:

- The company name and address of the user
- The name and telephone number of the person to be contacted if any questions arise
- The failure that occurred
- The contract number or account number of the maintenance agreement
- The eight-digit part number on the item being returned

The information in this appendix is for personnel who have a technical background and an understanding of the system to which the terminal is to be connected. This information includes:

- Installation considerations
- Required tools and supplies
- Terminal preparation
- Board installation in I/F 1 through I/F 3
- Cable installation*
- Initial power on
- Parameter entries*
- Checkout*
- CRT realignment

INSTALLATION CONSIDERATIONS

For proper installation, the following items must be taken into consideration.

- Check that enough cable slack is provided to allow moving the terminal approximately 1 m (3 ft) to permit servicing.
- Avoid direct sunlight on display screen.
- Allow a 102-mm (4-in) minimum space at top and sides of terminal for adequate cooling.
- Avoid installing the terminal in areas of high electromagnetic interference. Such areas usually exist near radio-transmitting antennas, radar, induction heaters, arc welders, insulation testers, time clocks, certain electrical heating systems, and high-energy power lines.
- Avoid installing the terminal where particulate, liquid, and gaseous atmospheric contaminates 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.

*Appendix B has additional installation, operation, and checkout information for terminals using the internal 1200/1200 baud modem.

- Separate I/O cables from electrical-power wiring by a minimum of 51 mm (2 in). Unshielded, high-energy power wiring (above 220/240 V ac) requires a larger separation.

- Support I/O cables, both horizontally and vertically, every 3 m (10 ft).

- Ensure that the electrical power circuit for the terminal has adequate overload protection to limit maximum current flow to 20 amperes. Also, the installation location must allow easy access to the power outlet.

REQUIRED TOOLS AND SUPPLIES

The tools and supplies required for installation include the following:

- Medium sized Phillips screwdriver

- Medium sized slot-head screwdriver

- Cable for host communications using DATA SET connector at rear of terminal The recommended cable is CDC 799-10 (equipment number YA255-A), which is 3 meters (10 feet) long and meets RS-232-C requirements.* See Appendix B if using internal modem.

TERMINAL PREPARATION

These instructions assume that the terminal, the keyboard, and optional items have been unpacked per the instruction sheet that was included with shipping papers. With that done, do as follows:

1. Place terminal where it is to be used. This must be a flat surface and a 102 mm (4 in) clearance must exist at top and sides of terminal for ventilation.

2. Place keyboard in front of terminal and connect keyboard cable to terminal (figure A-1). Be sure clip on cable connector is to the front and that clip locks when making connection.

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*RS-232-C is the Electronic Industries Association standard for signal interchange between data terminal equipment and data communication equipment.

3. If keyboard is to be in a tilted position, flip down leg on bottom of keyboard.

4. If terminal is to load from a memory module during operations, refer to instructions in section 3 and install memory module.

5. If a keycap kit, power conversion kit, XA360-A internal modem, or XA368-A graphics board is to be installed, install per the instructions that came with the item.

6. If a YR101-A dual asynchronous-interface board or YR102-A parallel-interface board is to be installed, proceed to instructions for Board Installation in I/F 1 through I/F 3; otherwise, proceed to instructions for Cable Installation.

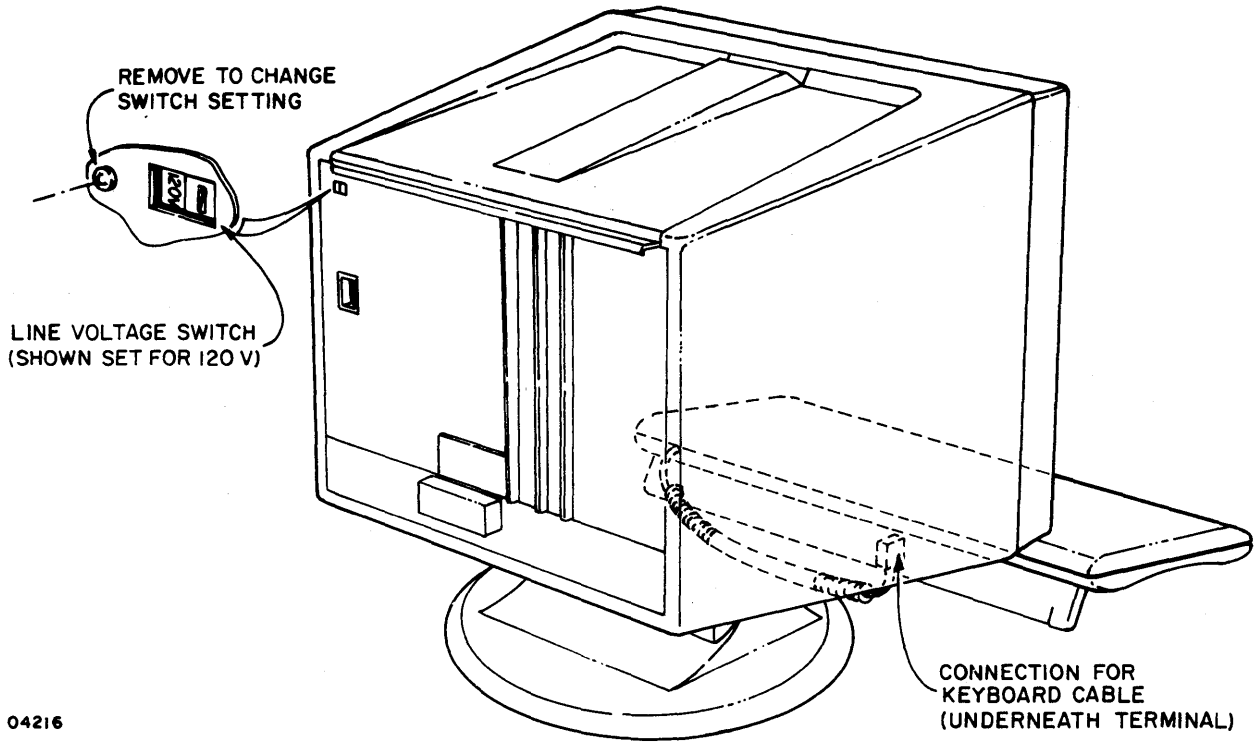


Figure A-1. Connecting Keyboard Cable

BOARD INSTALLATION IN I/F 1 THROUGH I/F 3

These instructions cover the installation of the YR101-A asynchronous-interface board or the YR102-A parallel-interface board. To install one of these boards, refer to figure A-2 and do as follows:

1. Remove two screws securing cover plate on rear of terminal at I/F-1.
2. Remove cover plate. This exposes the I/F-1 board slot. Save cover plate for remounting if basic terminal is shipped to a service center.

CAUTION

Be sure board is aligned with slot connector before pushing on board during next step.

3. Insert optional board in I/F-1 slot as shown in figure A-2.
4. Use the two screws removed in step 1 and secure cover plate of board to rear of terminal.
5. If a TEST/NORMAL switch is on cover plate of board, check that switch is in NORMAL position.
6. If more than one board is being installed, repeat previous steps and install in I/F-2 or I/F-3 slot.
7. Proceed to Cable Installation instructions.

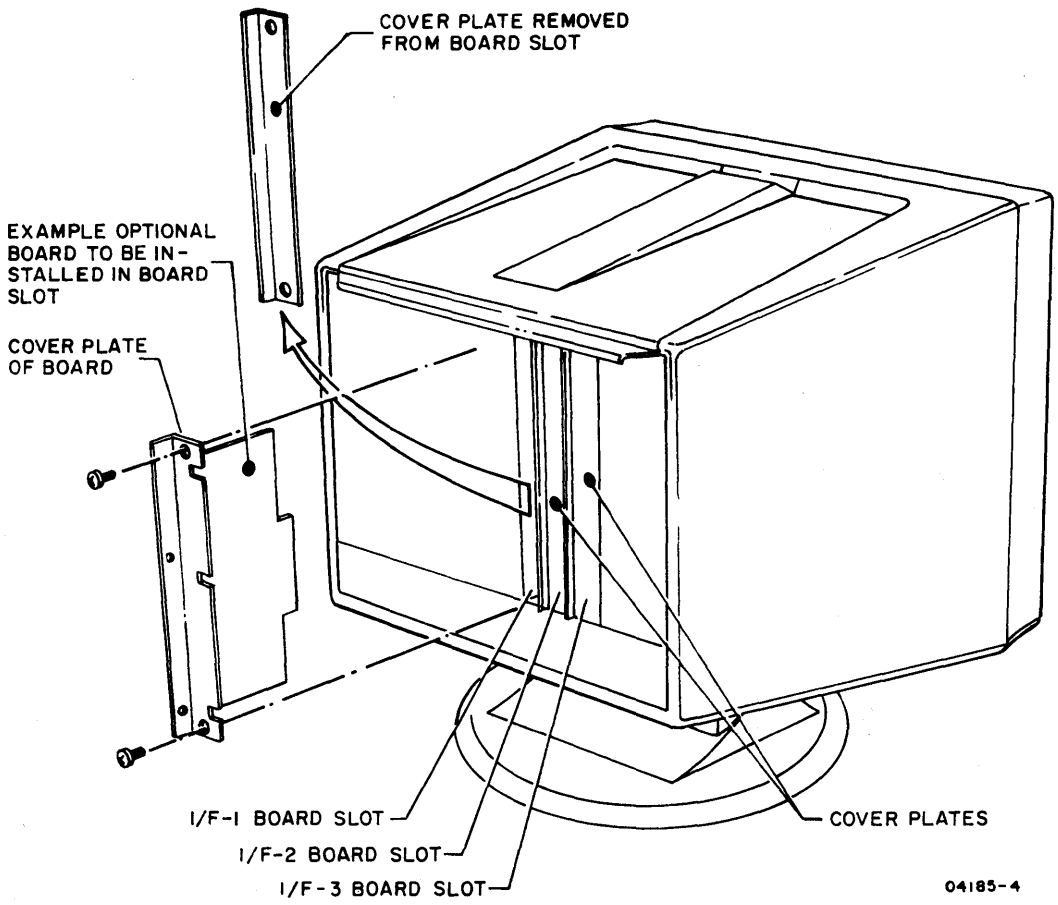


Figure A-2. Installation of Boards in I/F 1 through I/F 3

CABLE INSTALLATION

This portion of the section shows the cable connections for the equipment arrangements listed below (refer to Appendix B for installing a terminal using an internal modem). Refer to the appropriate figure(s) and be sure to tighten screws when connecting cables with connector retainers.

Equipment Arrangement	Figure No.
Host communications via external modem	A-3
Host communications via direct cable	A-4
Associated asynchronous-communication peripheral	A-5
Associated parallel-interface graphics printer	A-6

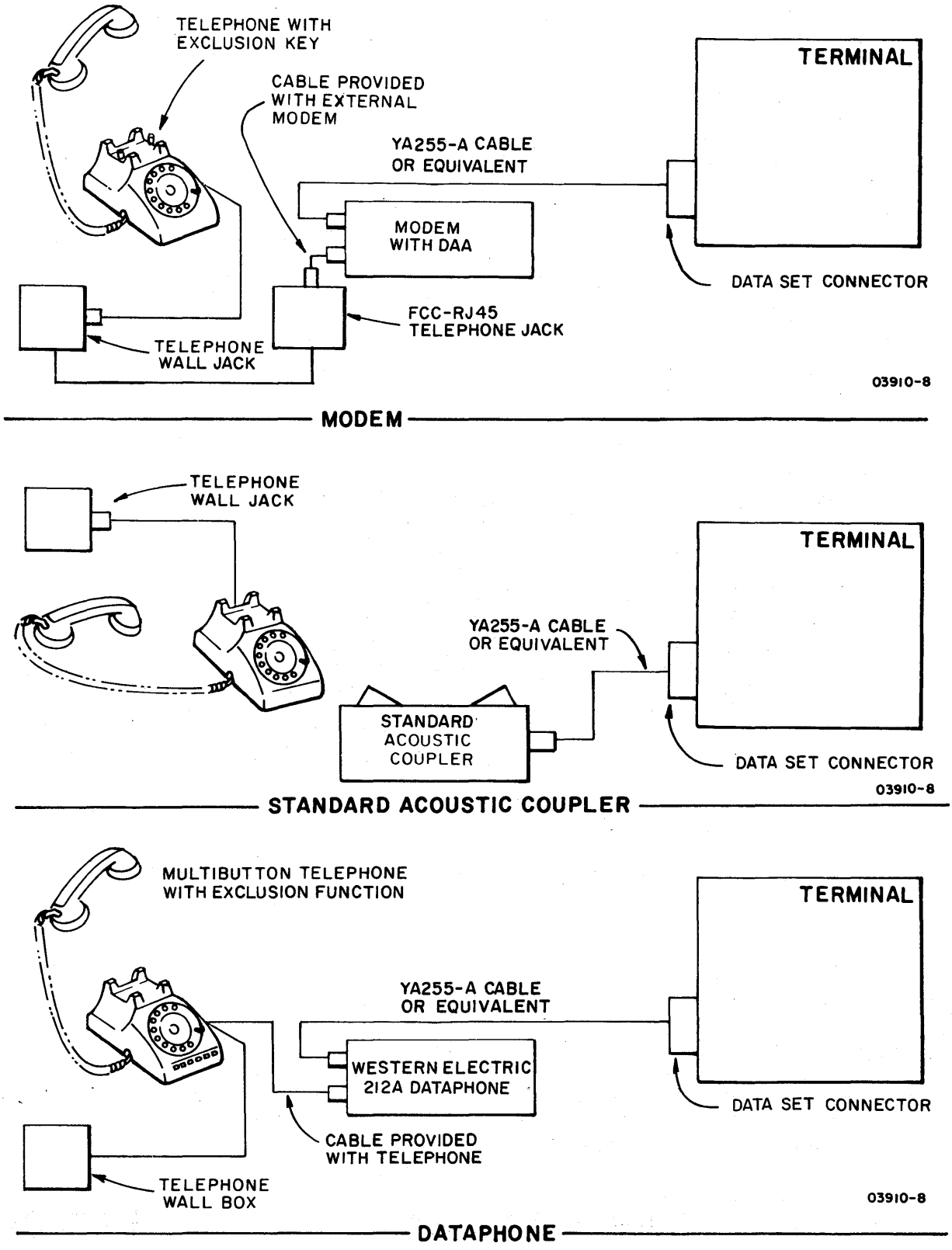


Figure A-3. Host Communications Via External Modem

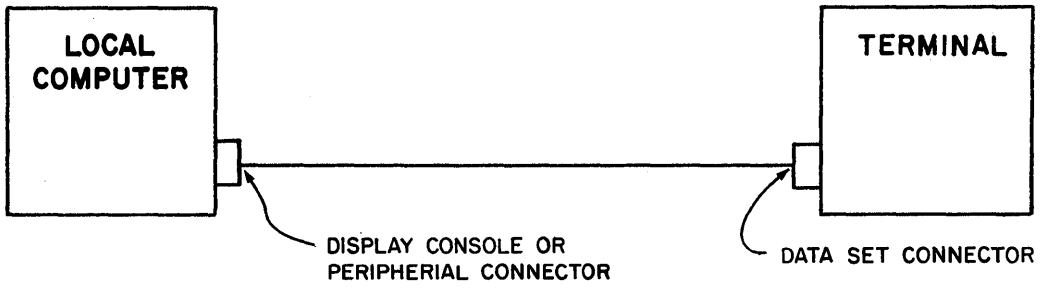


Figure A-4. Host Communications Via Direct Cable

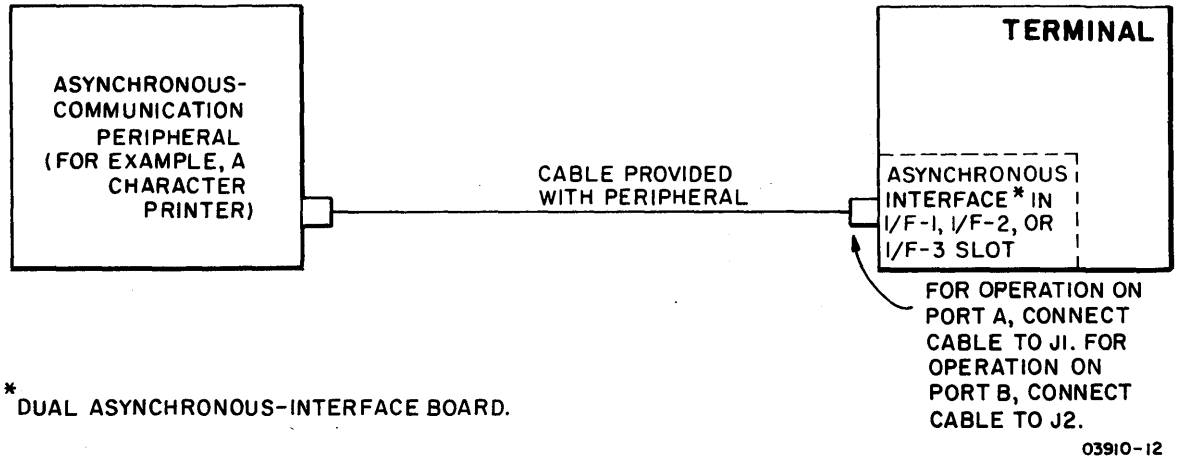


Figure A-5. Associated Asynchronous-Communication Peripheral

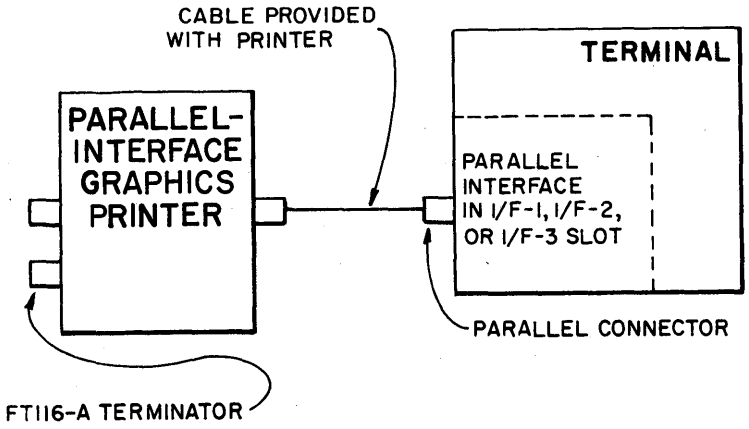


Figure A-6. Associated Parallel-Interface Graphics Printer

INITIAL POWER ON

With the preceding installation instructions completed, power on the terminal as follows:

1. Check that side of POWER switch marked with a 0 is pressed in.
2. Connect power cord to receptacle at rear of terminal (figure A-7) and to site power outlet. If the latch is in the way of the receptacle, push the latch down.

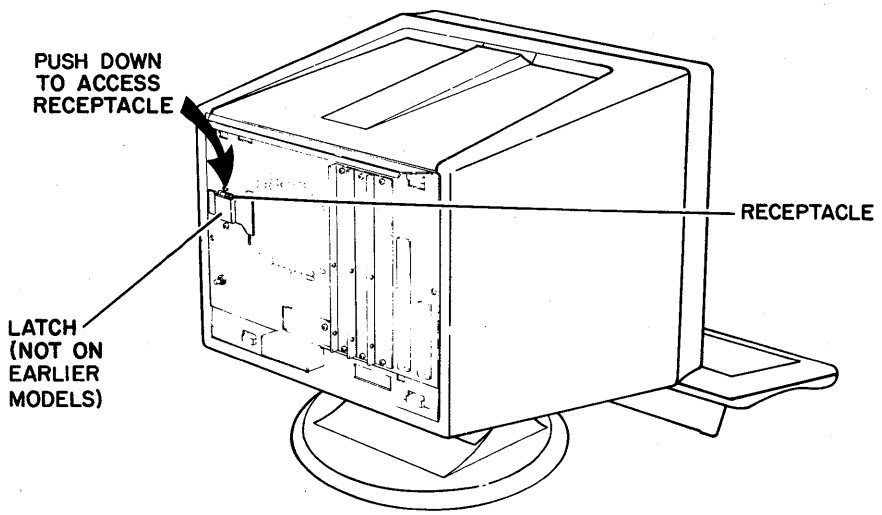


Figure A-7. Accessing Power-Cord Receptacle

CAUTION

The next step assumes that the terminal is conditioned for existing power voltage. The terminal comes from the factory conditioned for 120-V ac, 60-Hz operation. For 50-Hz operation at 220/240 V ac, the YA275-A power conversion kit must be installed or damage to the terminal may result.

3. Apply power to terminal by pressing side of POWER switch marked with the 1. With power applied, the terminal automatically does a power-on self test. Test execution takes a few seconds and the audible alarm sounds when the test ends. A copywrite message and mode menu then appears. The mode menu consists of a row of blocks displayed in inverse video (dark characters on light background). If the mode menu is not visible, the BRIGHTNESS or CONTRAST control is probably turned too far counterclockwise.

4. Proceed to Parameter Entries.

PARAMETER ENTRIES

The following instructions cover the process of entering installation parameters into nonvolatile memory using the keyboard. A full complement of installation parameters includes a set of terminal installation parameters and up to six sets of mode installation parameters, one set for each mode that the terminal is to operate in. The terminal installation parameters and five sets of mode installation parameters are factory set for a typically configured terminal and for the most commonly used operating modes. Changes may be required for installed options or for certain applications; such changes will be noted in the option or application documentation. The instructions here cover all parameters in detail so that future changes may be made easily. Refer to appendix B for parameters specifically related to the internal 1200/1200 baud modem option.

The values of the factory-set parameters are listed below. A factory-installed battery in the back of the terminal has kept these values stored in nonvolatile memory (Replacing Battery instructions are in section 3). If the battery is replaced incorrectly (terminal power off when battery is replaced), the parameter values in nonvolatile memory will be lost and the factory-set values will be displayed for rewriting into nonvolatile memory. This rewriting is done with the COPY key as described in the following instructions.

Preset Terminal Installation Parameters

Block	CC634-A Terminals	CC638-A Terminals
F2	000000	010000
F3	000000	001000
F4	000000	000000
F5	000000	000000
F6	0 0 0	0 0 0
F7	0 0000	0 0000
F8	0 6	0 6
F9	A 6	A 6

Preset Mode Names and Installation Parameters

	MODES				
Block	CYBER	PLATO	CP/M	Disk	C120
F2	100000	100100	100110	100110	100000
F3	000110	000110	000100	000110	000000
F4	000000	000001	000000	000001	000000
F5	010000	000000	000000	000000	000000
F6	4C04	6C24	6C25	6C24	4421
F7	000000	000000	000000	000000	000000
F8	000000	000000	000000	000000	000000
F9	00 6 6	08 6 6	00 6 6	00 6 6	00 9 9
F10	0000	0000	0000	0000	0000

To make the initial entries, do as follows:

1. If terminal has just been installed, fill out front of Configuration Sheet (foldout) near front of manual. That portion of sheet is to be referred to for parameters that deal with the configuration of the terminal.

NOTE

The next step assumes that the mode menu is on the screen after Initial Power-On instructions have been done. If existing parameters are being accessed, mode menu is displayed by doing as follows:

- If operating in CYBER mode, press SETUP key, then F10 key twice.
- If not in CYBER mode and terminal is conditioned for manual selection of operating mode, press RESET switch (menu appears after power-on test).
- If not in CYBER mode and terminal is conditioned for automatic selection of operating mode, pull out TEST switch at rear of terminal, then press RESET switch. This shows a TEST SWITCH ENABLED message with menu. Disregard message and push TEST switch back in.

2. With mode menu on screen, press CTRL (Control) and SETUP keys. This displays menu of terminal installation parameters (figure A-8).

NOTE

Only certain keys are enabled while entering parameters. These keys are referred to where applicable in the procedure. Pressing a disabled key sounds the alarm.

3. Square cursor in F2 block of menu indicates where first entry is. Each succeeding block through F9 contains further entries. Refer to figure A-8 and follow instructions on figure.

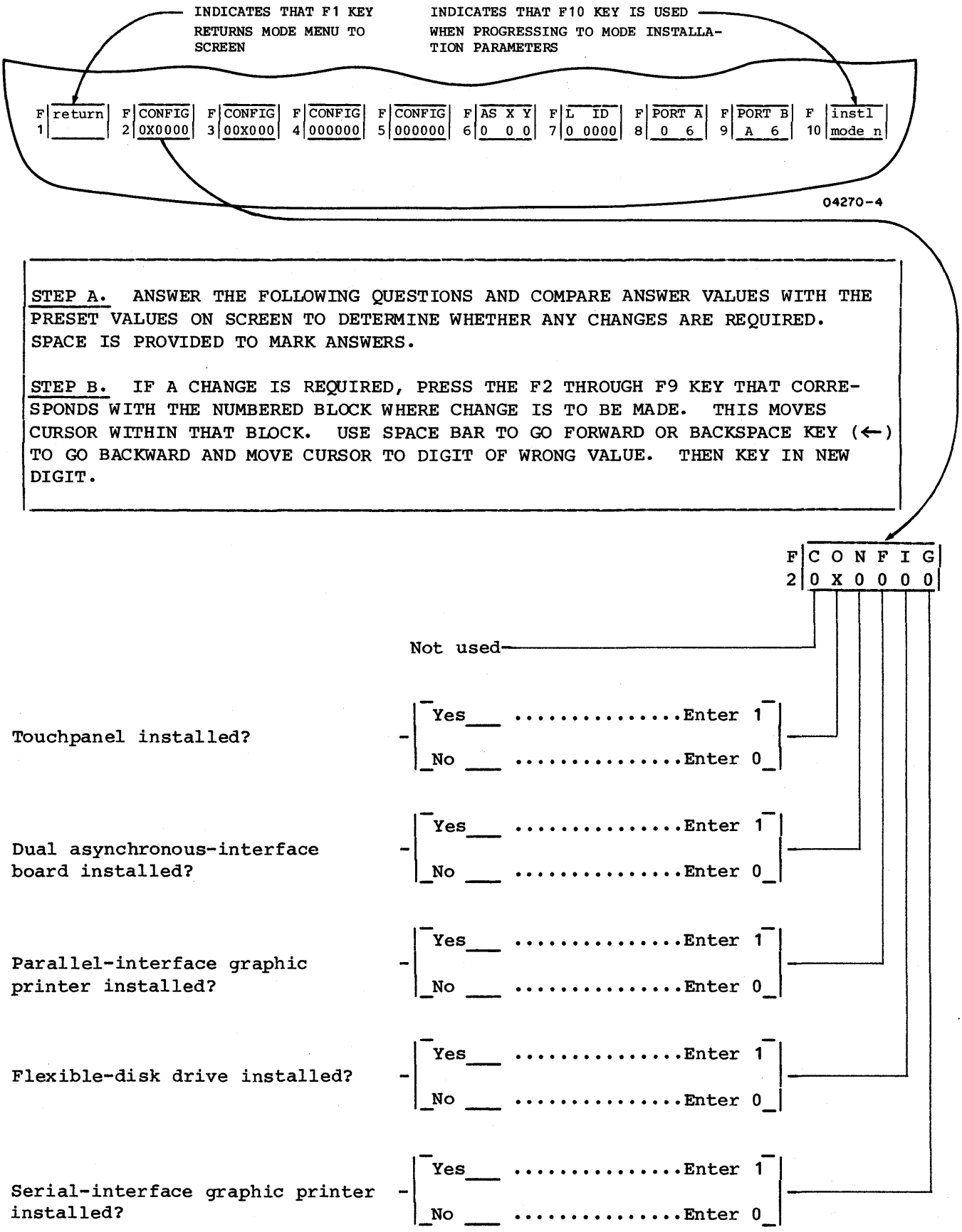


Figure A-8. Terminal Installation Parameters (Sheet 1)

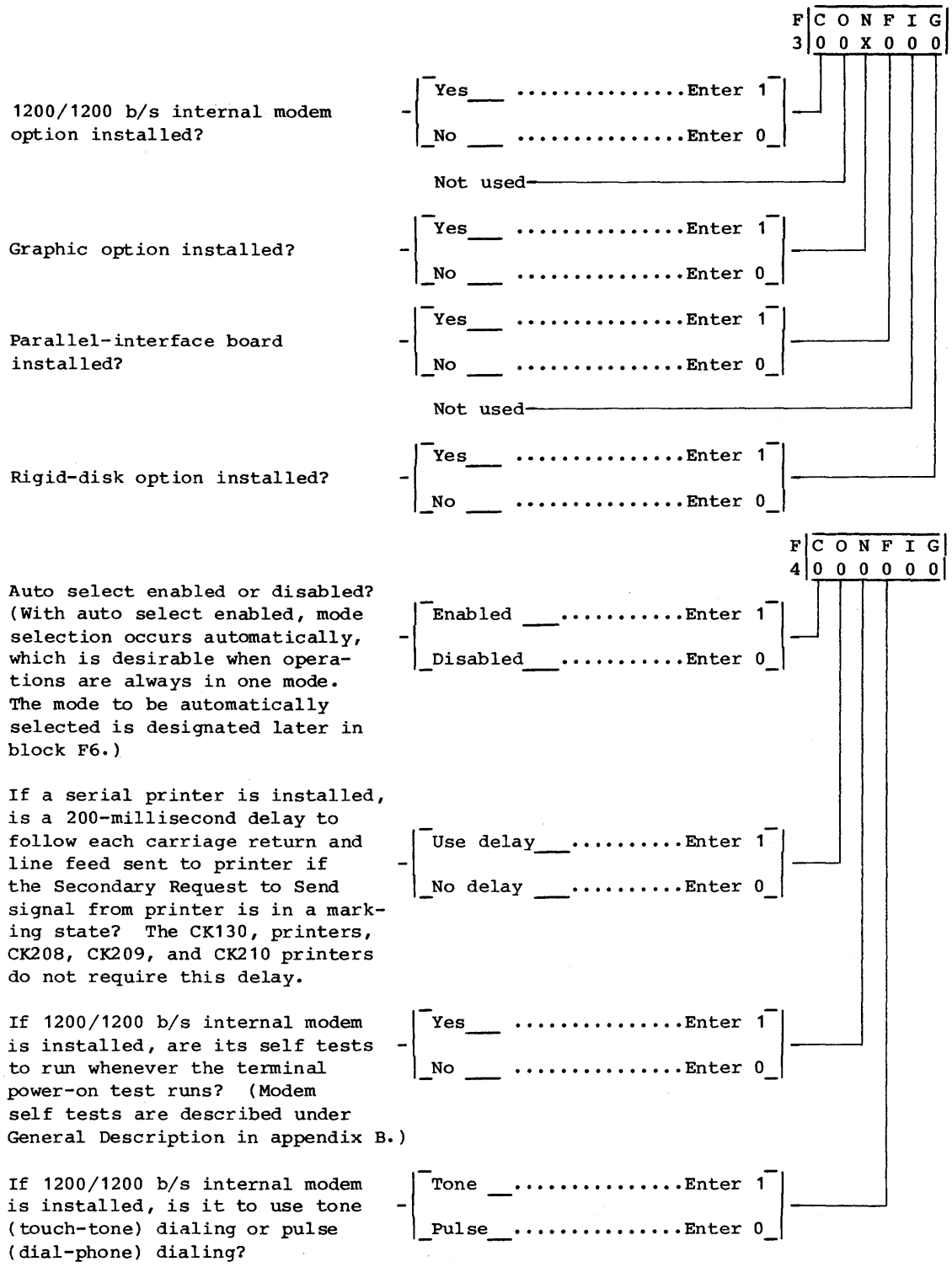
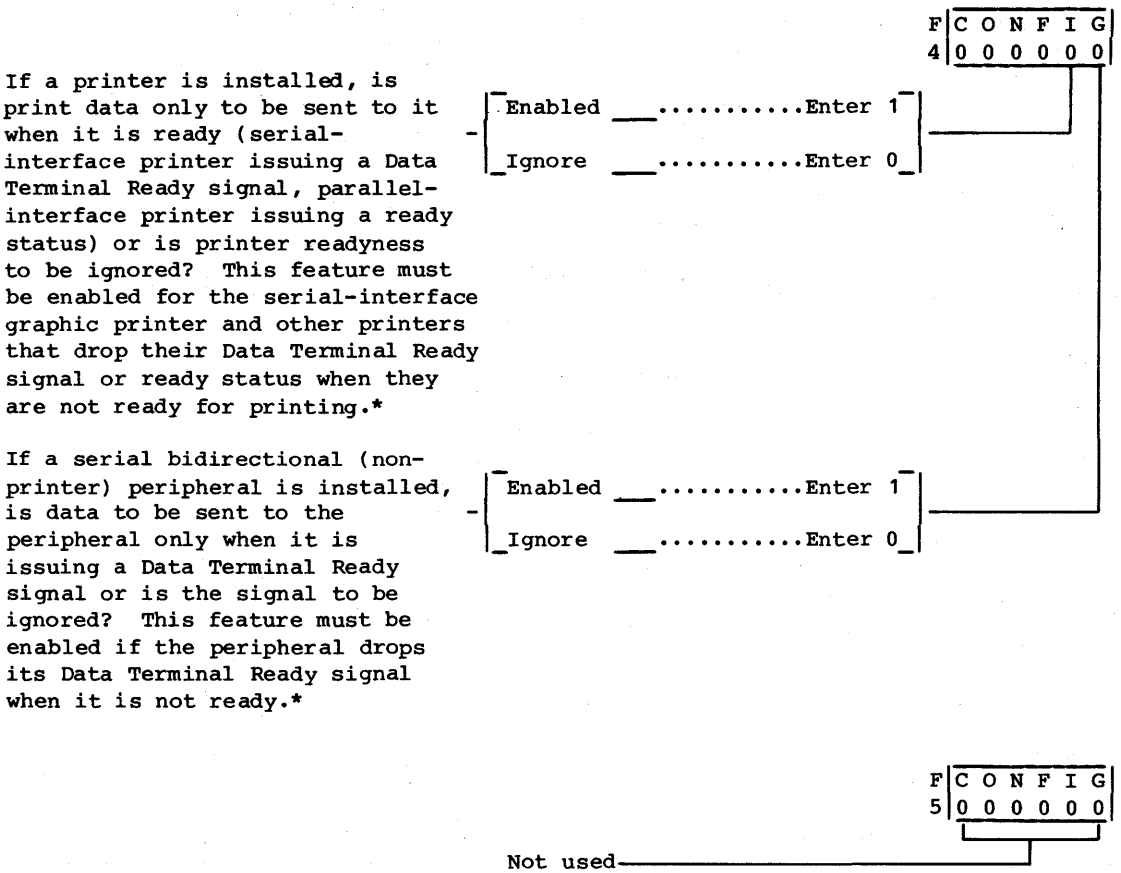
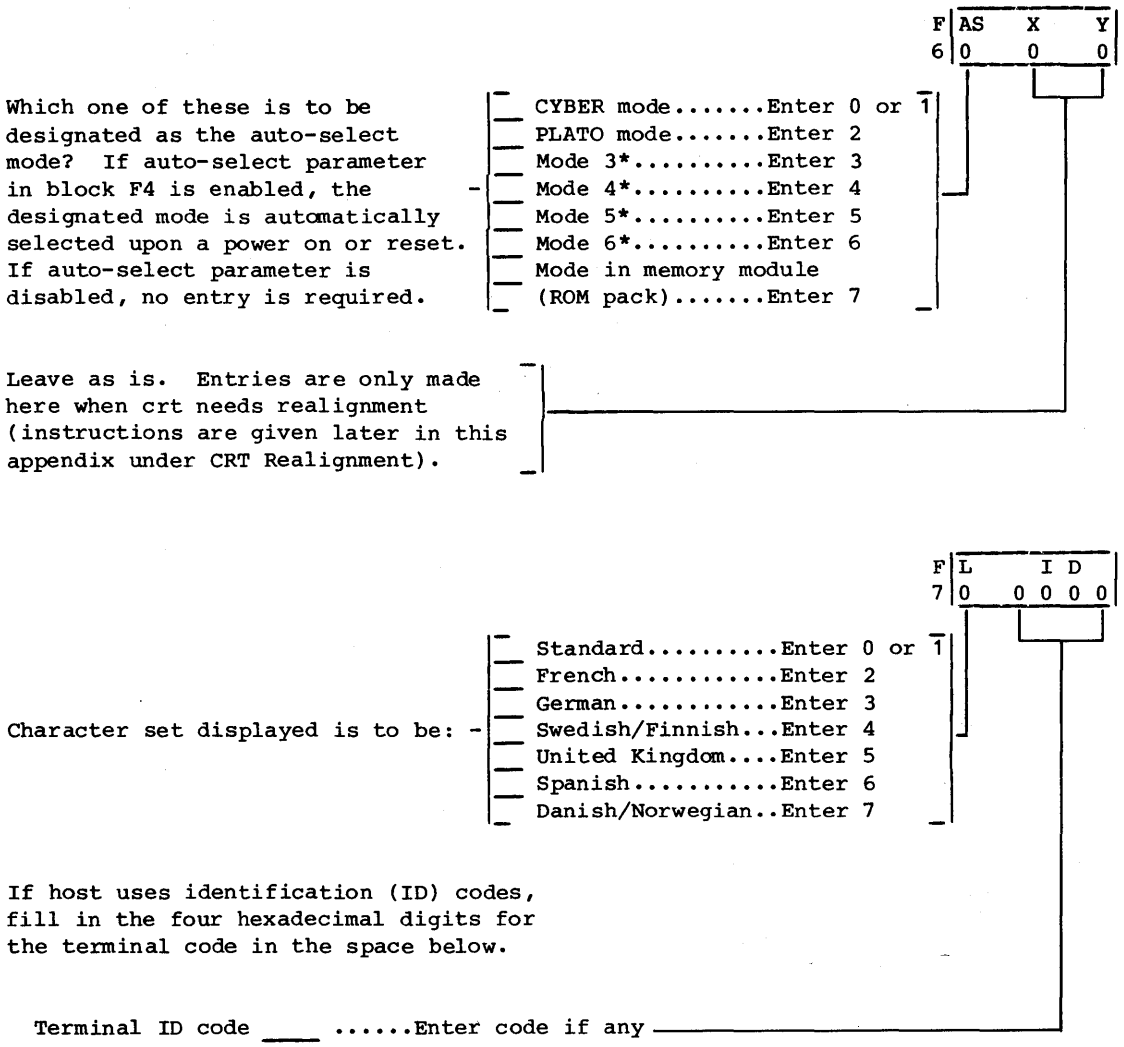


Figure A-8. Terminal Installation Parameters (Sheet 2)



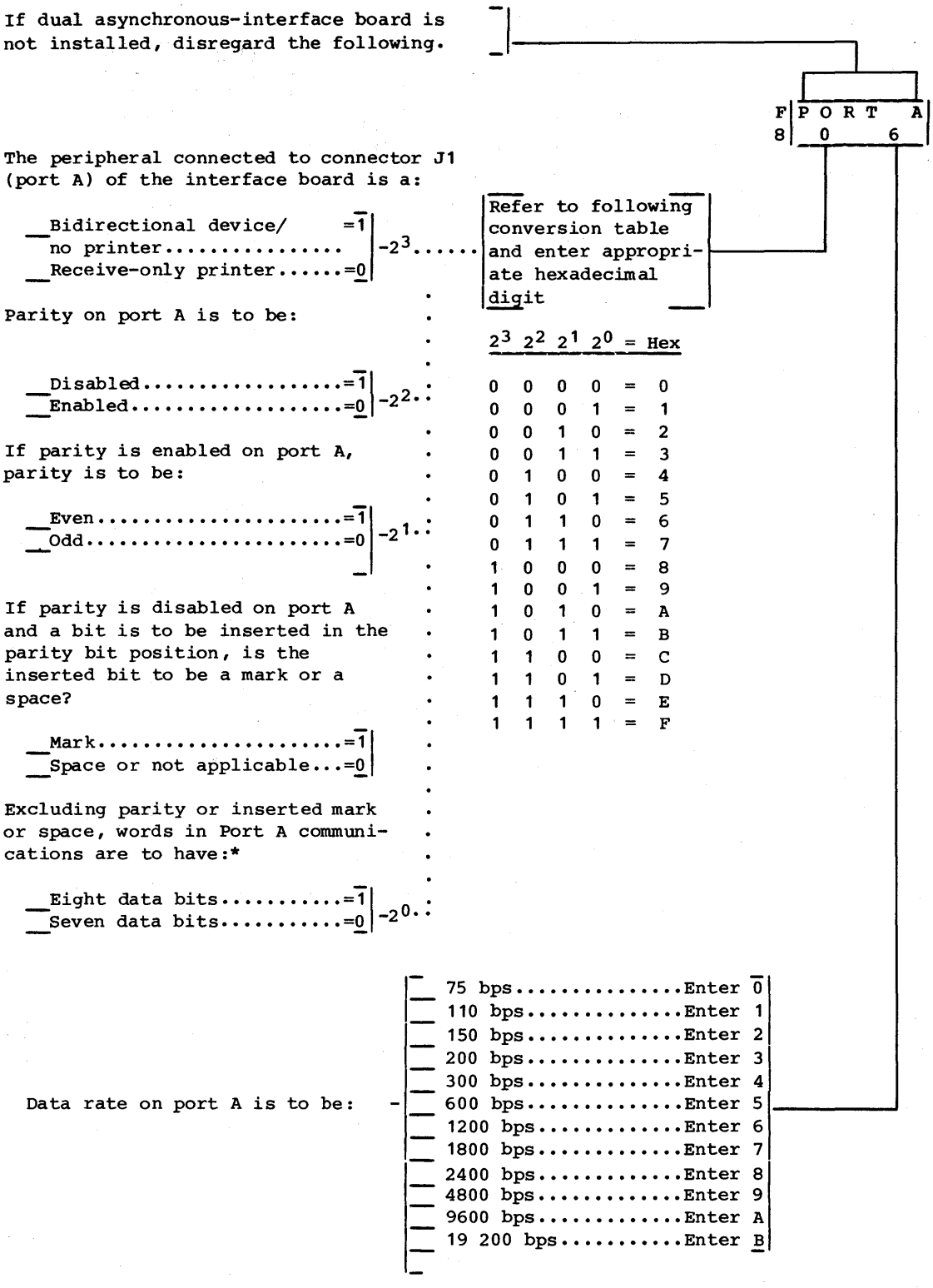
*With either of these features enabled, the printer/bidirectional peripheral must be powered on and ready during online operations. If this is not done, communications with host may be tied up waiting for the printer/bidirectional peripheral to become ready.

Figure A-8. Terminal Installation Parameters (Sheet 3)



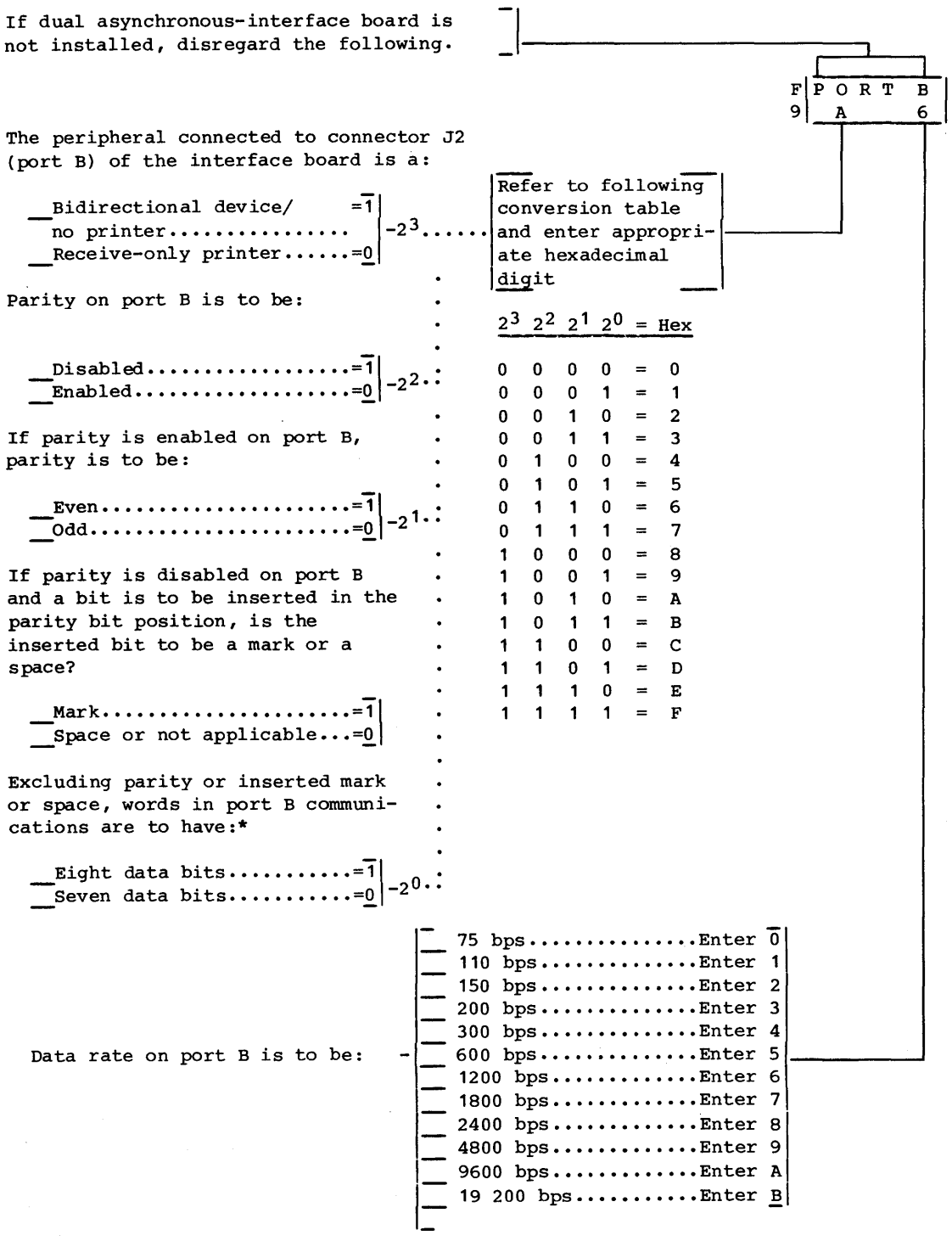
*Modes 3, 4, and 5 are preassigned as CP/M, disk, and C120 modes respectively. Mode 6 is for a user assigned mode. If desired, modes 3 through 5 may be changed for additional user assigned modes. Modes are assigned later when mode parameters are entered.

Figure A-8. Terminal Installation Parameters (Sheet 4)



*Eight data bits apply if a serial-interface graphics printer is connected to port A (connector J1).

Figure A-8. Terminal Installation Parameters (Sheet 5)



*Eight data bits apply if a serial-interface graphics printer is connected to port B (connector J2).

Figure A-8. Terminal Installation Parameters (Sheet 6)

4. If any entries were made, check that they are correct. Then press COPY key. This writes entries into nonvolatile memory (also applies if factory-set values have been cleared and are being rewritten).

5. If changes were made to the factory-set terminal installation parameters, record the entries on screen on back of Configuration Sheet. This will facilitate reentry if it becomes necessary in the future.

6. Press F10 key. This displays:

ENTER MODE n |_|

7. The terminal uses 1 through 7 as identifying numbers for operating modes. Mode 1 is the resident CYBER mode; mode 2 is for PLATO mode; modes 3 through 5 are preassigned as CP/M, DISK, and C120 modes respectively, but may be changed through mode parameters for user assigned modes; mode 6 is for a user assigned mode; and mode 7 is reserved for functions stored in a memory module. Except for mode 7, each mode to be used requires a separate set of mode parameters. Parameters for modes 1 through 5 have been preset.

   Enter number for mode that terminal is to operate in. If operations are to occur in more than one mode, enter number of lowest number mode. If number entered is 3, 4, 5, or 6, ENTER MODE NAME appears on screen; if number entered is 1 or 2, menu of mode installation parameters appears (figure A-9). With modes 3 through 5, the name of the preassigned mode appears adjacent to ENTER MODE NAME.

8. If ENTER MODE NAME is displayed and a mode name already exists that is not to be changed, press either of the NEXT keys. Otherwise, with ENTER MODE NAME displayed, enter four alphanumeric characters to serve as an identifying code name for mode whose number was entered. After parameters are established, terminal will show this name along with the mode number when displaying mode menu.

   Upon pressing a NEXT key or entering the four characters, menu of mode installation parameters appears (figure A-9).

9. The menu of mode installation parameters on screen is for the mode whose number was entered in step 7. Refer to figure A-9 and make entries as required.

10. If any entries were made, check that they are correct and press COPY key to write entries into nonvolatile memory (also applies if factory-set values have been cleared and are being rewritten).

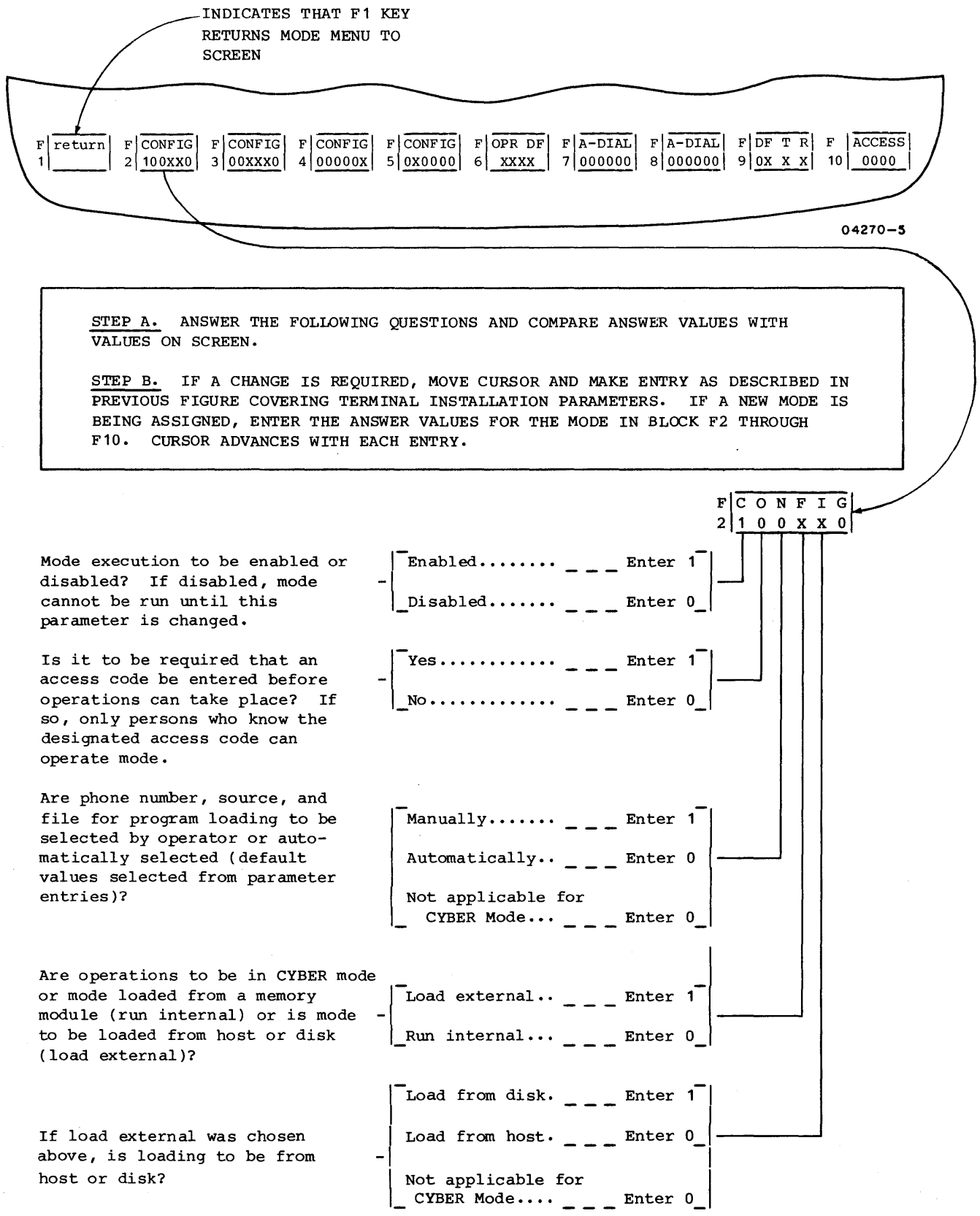
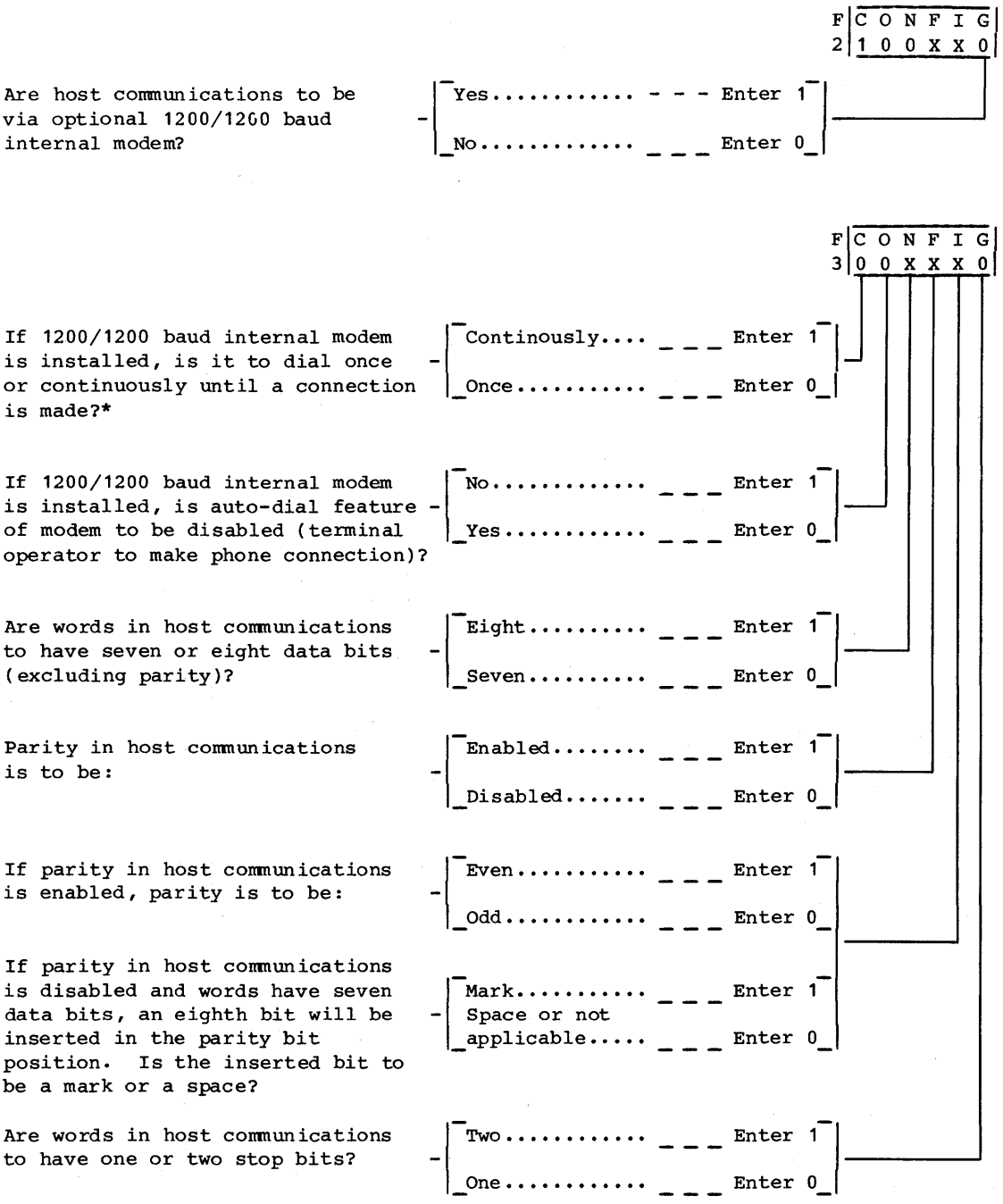


Figure A-9. Mode Installation Parameters (Sheet 1)



*With continuous dialing, the internal modem calls the first specified number, and if no connection is made, it calls the second specified number. If no connection is made with the second number, the modem retrys the first number. This cycle continues until a connection is made or the terminal is reset or the M REL/BREAK key is pressed.

Figure A-9. Mode Installation Parameters (Sheet 2)

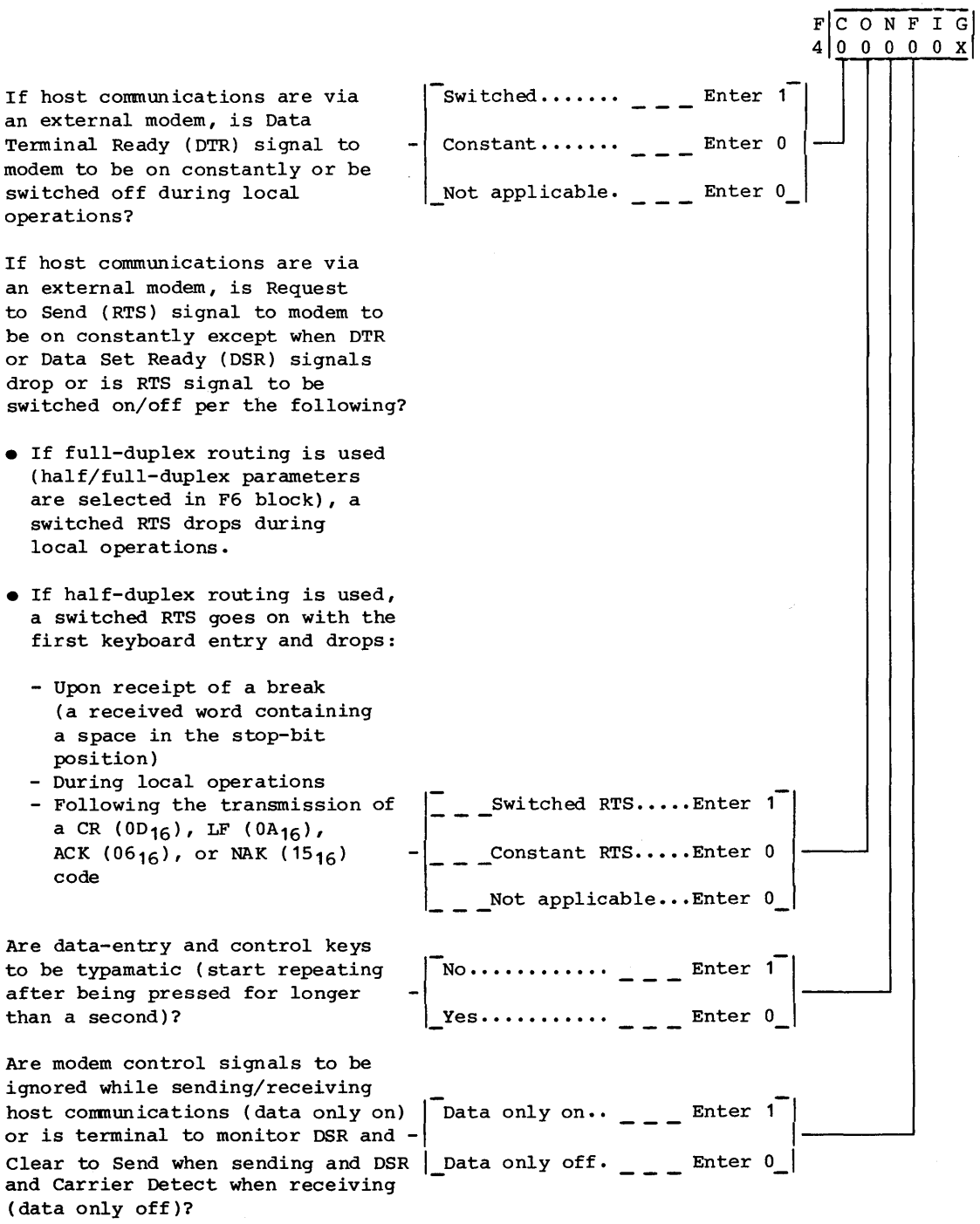
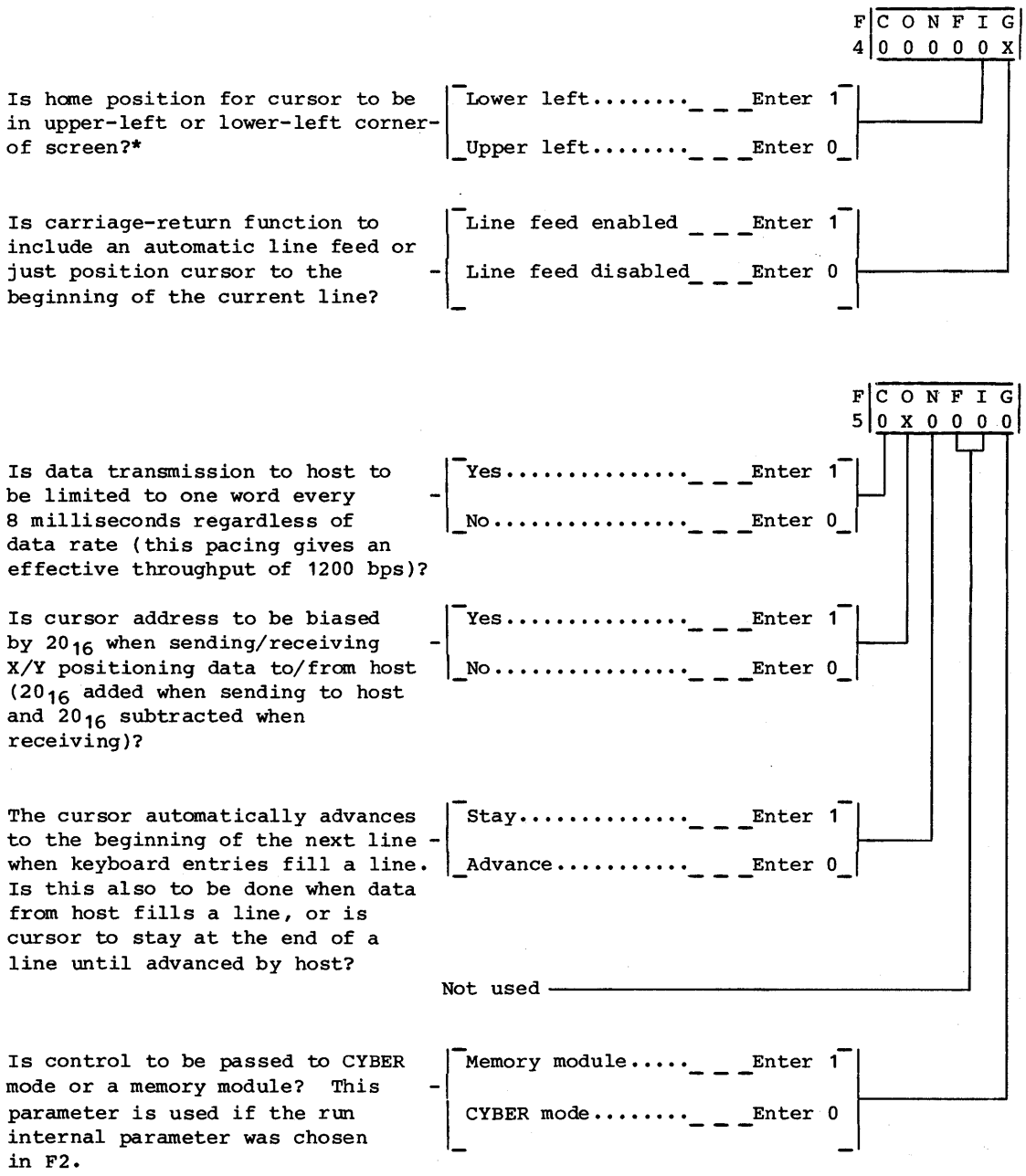


Figure A-9. Mode Installation Parameters (Sheet 3)



*Upper-left selection is applicable in CYBER mode if compatibility with CDC 722-10 (CC628-A) TTY Display Terminal is desired.

Figure A-9. Mode Installation Parameters (Sheet 4)

NOTE

THE PARAMETERS OF BLOCK F6 REPRESENT DEFAULT PARAMETERS THAT ARE EFFECTIVE DURING A MODE EXCEPT WHEN TEMPORARILY CHANGED BY OPERATOR OR HOST (SUCH CHANGES ARE MADE THROUGH THE OPERATOR PARAMETERS COVERED IN SECTION 4). THESE DEFAULT PARAMETERS APPLY SPECIFICALLY TO THE RESIDENT CYBER MODE. FOR A MODE OTHER THAN CYBER, USE OF THE DEFAULT PARAMETERS IS PROGRAM DEPENDENT AND SOME PARAMETERS MAY BE IGNORED.

F	O P R D F
6	X X X X

Is audible alarm to be loud or soft?

_ _ _ Loud .....=1
_ _ _ Soft .....=0 | -2^3

Is audible alarm to signal operator when keyboard entries advance cursor to either eighth position from end of line or to last line?

_ _ _ Yes.....=1
_ _ _ No.....=0 | -2^2

If a printer is connected, is printing of received and transmitted data to be initially enabled when mode is entered?

_ _ _ Yes.....=1
_ _ _ No or not applicable..=0 | -2^1

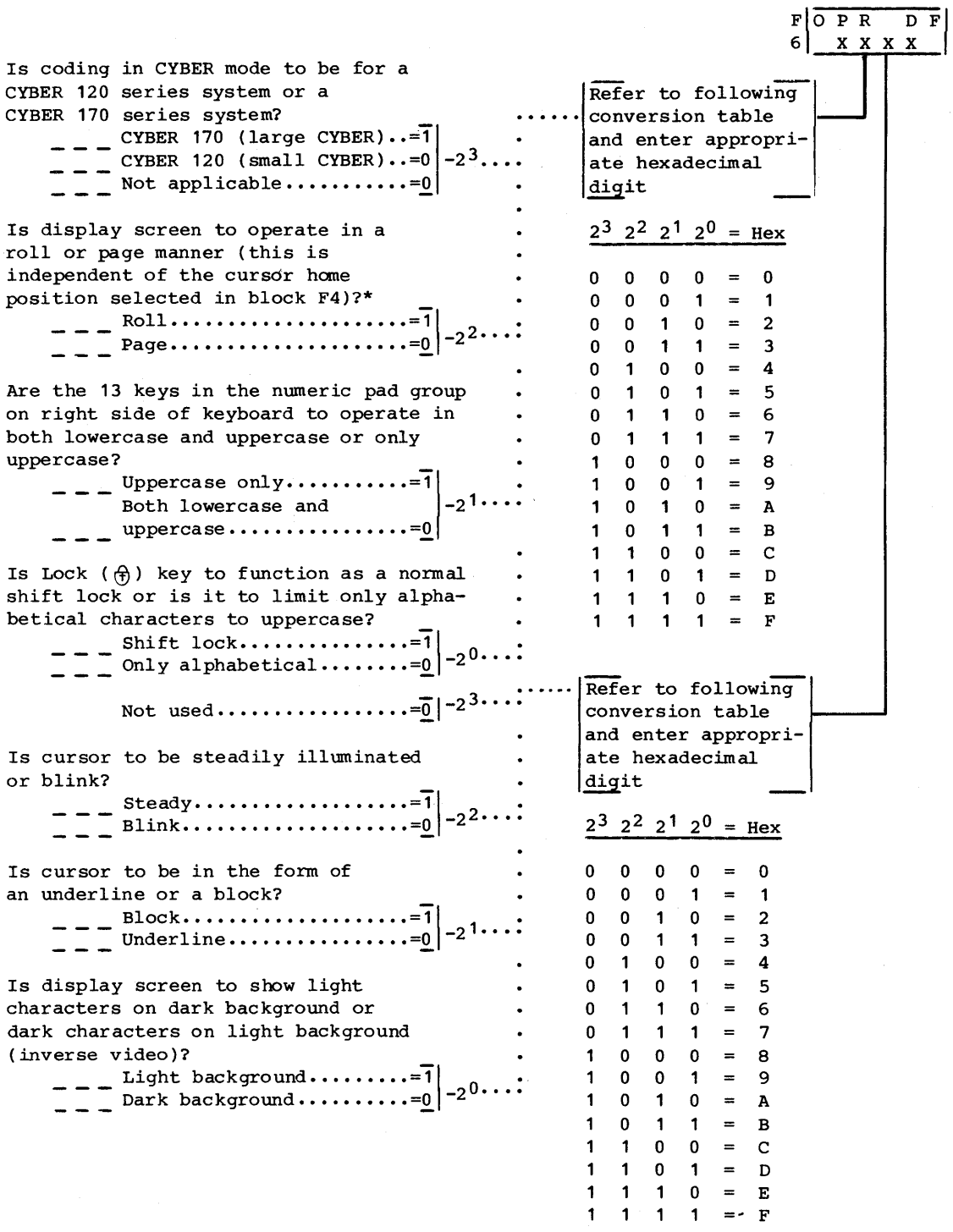
Is terminal to assume a local or online state after mode is entered (local state disables transmission to host)?

_ _ _ Local.....=1
_ _ _ Online.....=0 | -2^0

Refer to following conversion table and enter appropriate hexadecimal digit

2^3	2^2	2^1	2^0	=	Hex
0	0	0	0	=	0
0	0	0	1	=	1
0	0	1	0	=	2
0	0	1	1	=	3
0	1	0	0	=	4
0	1	0	1	=	5
0	1	1	0	=	6
0	1	1	1	=	7
1	0	0	0	=	8
1	0	0	1	=	9
1	0	1	0	=	A
1	0	1	1	=	B
1	1	0	0	=	C
1	1	0	1	=	D
1	1	1	0	=	E
1	1	1	1	=	F

Figure A-9. Mode Installation Parameters (Sheet 5)



*Roll selection is applicable in CYBER mode if compatibility with CDC 722-10 (CC628-A) TTY Display Terminal is desired.

Figure A-9. Mode Installation Parameters (Sheet 6)

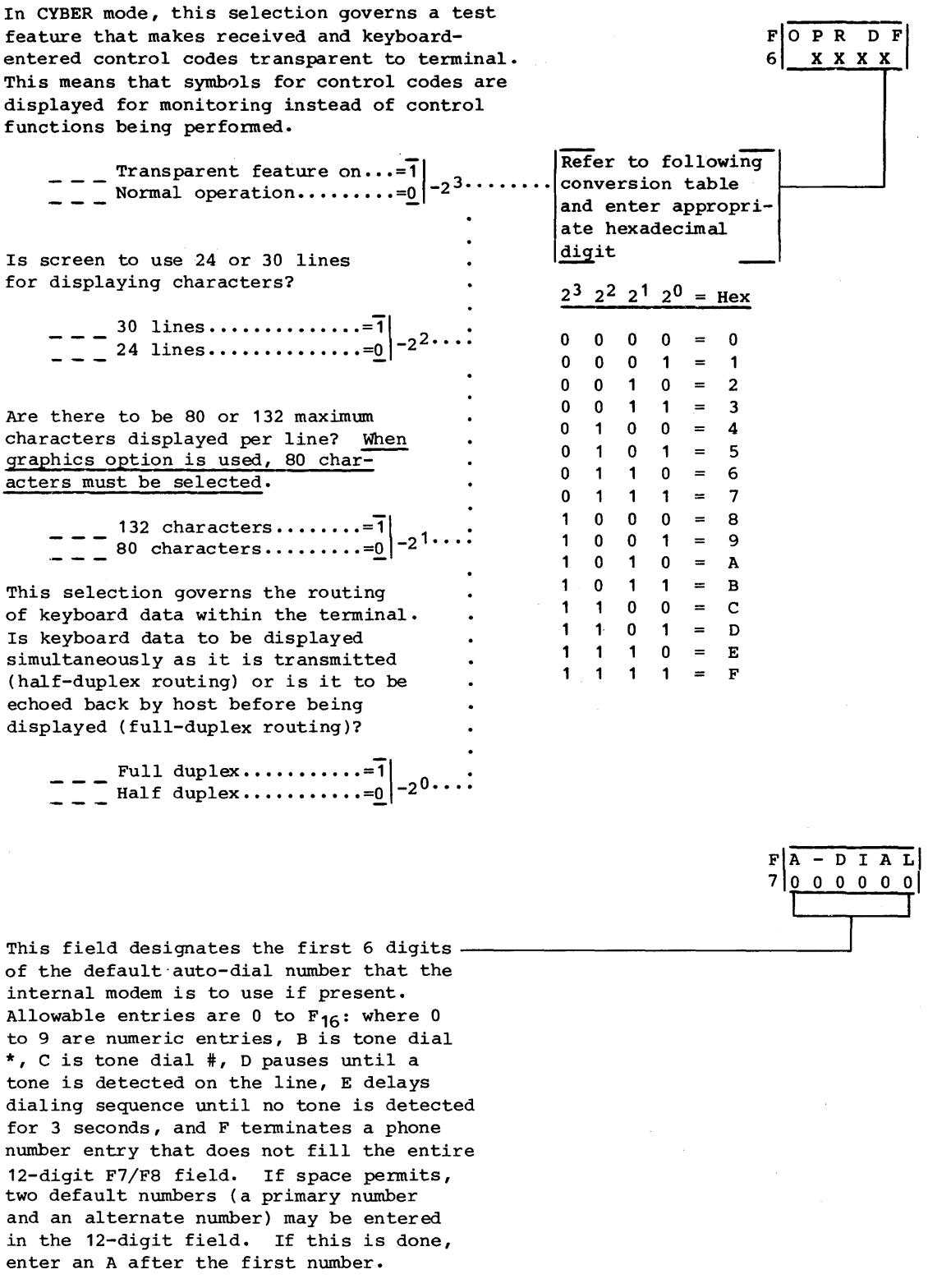


Figure A-9. Mode Installation Parameters (Sheet 7)

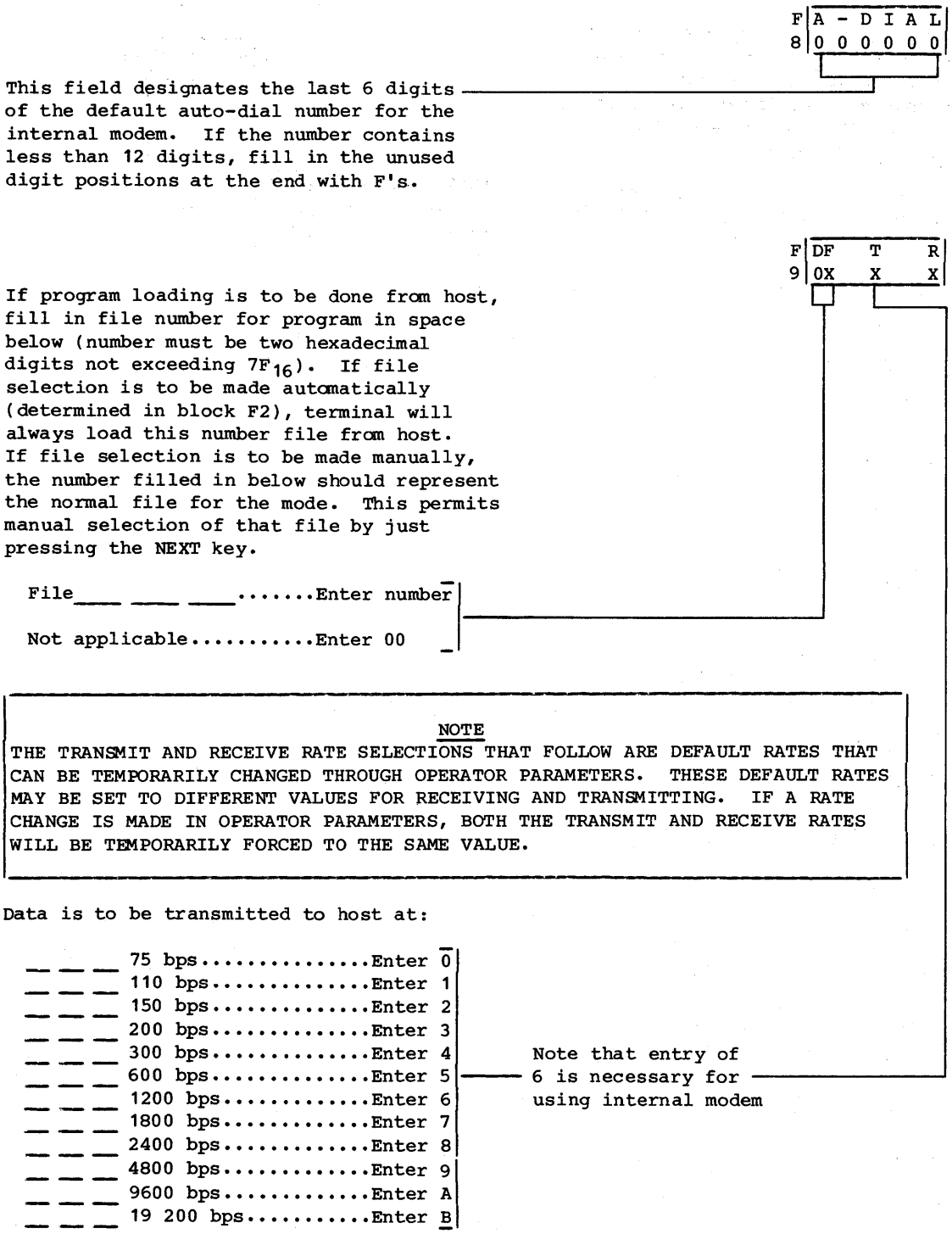


Figure A-9. Mode Installation Parameters (Sheet 8)

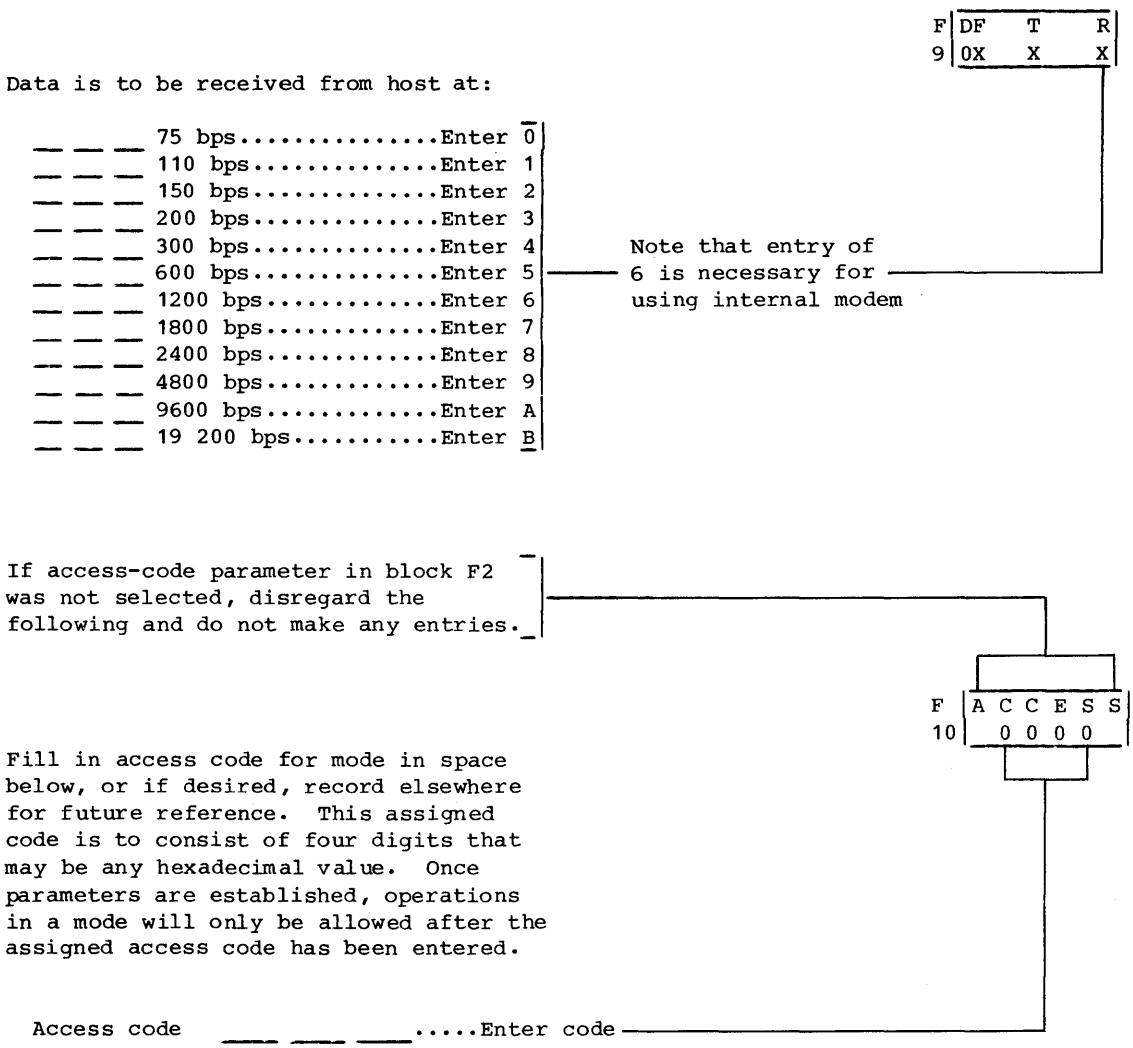


Figure A-9. Mode Installation Parameters (Sheet 9)

11. If changes were made to factory-set mode parameters or a new mode established, record the entries on screen on back of Configuration Sheet.

12. If operations are to occur in more than one mode, press F1 key, then CTRL and SETUP keys. This returns operations back to where step 6 is the next action to be taken. Repeat steps 6 through 11 for each mode that terminal is to operate in.

13. Proceed to Checkout instructions.

CHECKOUT

Do the following to check out the terminal. If a problem is encountered, refer to table A-1 and verify that the problem is not due to an improper installation parameter. If an improper parameter has been selected, update the Configuration Sheet after making correct entry. Parameters may be observed and changed by repeating the Parameter Entry instructions. If an improper parameter is not the cause of the problem, refer to Error Recovery/Fault Isolation information in section 6.

1. Attach the yellow and black Repair Service tag you received in the keyboard carton where it is handy for reference. The numbers on this tag are Control Data hotline numbers which you may call if you have equipment problems that you cannot solve. In the blank box on the tag, enter the phone number of the repair center in your area. You can find the number in the pamphlet that came with the tag.

2. Power on peripheral and communications equipment connected to terminal.

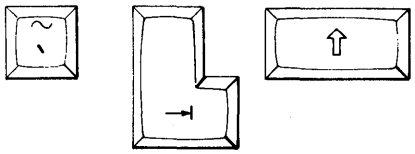
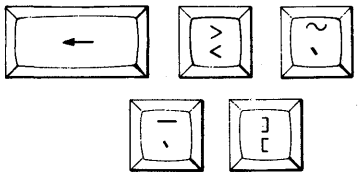
3. Press RESET switch on terminal to rerun power-on test. With TEST switch at rear of terminal pulled out, a message appears with mode menu and ERROR indicator lights. If no fault is detected, message only states TEST SWITCH ENABLED along with the words RES REV, which are to be disregarded.

4. Push in TEST switch.

5. Refer to instructions in section 3 and run operator-intervention test. Check each key for correct code and if present, check that touchpanel operates correctly.

6. Refer to Startup instructions in section 3 and check operation of terminal and connected peripheral equipment online with host.

TABLE A-1. PROBLEMS POSSIBLY CAUSED BY IMPROPER PARAMETERS*

SYMPTOM	POSSIBLE CAUSE
Power-on test shows message of GRAPHICS FAIL 8000 XX 55 (Note: XX are random hex digits)	Optional graphics feature not present but recorded in terminal installation parameters as being installed.
Power-on test shows message of PORT A FAIL and PORT B FAIL	Dual asynchronous-interface board not present but recorded in terminal installation parameters as being installed.
Terminal has standard keycaps and incorrect codes appear for one of the following keys in operator-intervention test: 	Optional keycaps inadvertently recorded in terminal installation parameters.
Optional keycap kit installed and incorrect codes appear for one of the following keys in operator-intervention test: 	Optional keycaps not recorded in terminal installation parameters.
No reaction when touch-panel is touched in operator-intervention test	Presence of touchpanel not recorded in terminal installation parameters.
TEST switch pulled out in operator-intervention test and PARALLEL PORT FAIL appears	Optional parallel-interface board not present but recorded in terminal installation parameters as being installed.

*Appendix B covers parameter-entry problems for internal modem.

TABLE A-1. PROBLEMS POSSIBLY CAUSED BY IMPROPER PARAMETERS (CONTD)

SYMPTOM	POSSIBLE CAUSE
TEST switch pulled out in operator-intervention test and no PORT A or PORT B RUNNING displays and dual asynchronous-interface board is installed.	Optional dual asynchronous-interface board is not recorded in terminal installation parameters as being installed.
Trying to load from host and NO REPLY shows on screen and ERROR indicator lights	Receive/transmit rate for host communications entered in mode installation parameters is incorrect.
Trying to load from host, screen shows block 0 loading, then NO REPLY shows and ERROR indicator lights	Invalid file number recorded in mode installation parameters.
Automatic mode selection in effect and FAILURE LOADING MODE shows on screen instead of mode being entered or loading occurring	Any of the following: • Number of auto-select mode entered in terminal installation parameters does not match the number of the mode for which mode installation parameters have been established (invalid mode being selected). • Specified auto-select mode is inadvertently disabled in mode installation parameters. • No memory module installed but is assigned as load source for auto-select mode in mode installation parameters.
Online but cannot establish communications with host	Any of the following: • Invalid word format or wrong parity specified in mode installation parameters for host communications. • Receive/transmit rate for host communications entered in mode installation parameters is incorrect.

TABLE A-1. PROBLEMS POSSIBLY CAUSED BY IMPROPER PARAMETERS (CONTD)

SYMPTOM	POSSIBLE CAUSE
Communications with host have parity errors (■ shown on screen or alarm sounds randomly)	Any of the following: • Invalid word format or wrong parity specified in mode installation parameters for host communications. • Receive/transmit rate for host communications entered in mode installation parameters is incorrect.
No keyed-in characters display when online	Host does not echo data back and full-duplex internal routing is designated in mode installation parameters.
Two characters display for each keyboard entry when online	Host does echo data back and half-duplex internal routing is designated in mode installation parameters.
Cursor positioning done by host is erratic	Selection regarding biasing of cursor address is incorrect in mode installation parameters.
Displayed data from host seems restricted to a single line	If in CYBER mode, coding selected in mode installation parameters is for CYBER 120 (small) series systems instead of for CYBER 170 (large) series systems. If not in CYBER mode, automatic line feed is disabled in mode installation parameters, but should not be.
Alternate lines of displayed data from host are blank	If in CYBER mode, coding selected in mode installation parameters is for CYBER 170 (large) series systems instead of for CYBER 120 (small) series systems. If not in CYBER mode, automatic line feed is enabled in mode installation parameters, but should not be.

TABLE A-1. PROBLEMS POSSIBLY CAUSED BY IMPROPER PARAMETERS (CONTD)

SYMPTOM	POSSIBLE CAUSE
Character printer connected to dual asynchronous-interface board does not respond when PRINT key is pressed in CYBER mode	Port having printer connected (port A/connector J1 or port B/ connector J2) is conditioned in mode installation parameters for a bidirectional device instead of a receive-only printer.

CRT REALIGNMENT WITHOUT TOUCHPANEL INSTALLED

The following instructions apply if the displayable area of the screen has drifted off center. This is a normal condition that may gradually occur as the crt ages. If realignment does not correct this condition, the basic terminal unit needs maintenance attention.*

To realign the crt, do as follows:

1. If the display for the operator-intervention test is currently on the screen (figure A-10), disregard this step and step 2; otherwise, make the mode menu appear by doing the applicable actions that follow:

   - If operating in CYBER mode, press SETUP key, then F10 key twice.
   - If not in CYBER mode and terminal is conditioned for manual selection of operating mode, press RESET switch (menu appears after power-on test).
   - If not in CYBER mode and terminal is conditioned for automatic selection of operating mode, pull out TEST switch at rear of terminal, then press RESET switch. This shows a DIAGNOSTIC FAILURE message with menu. Disregard FAILURE message.

*Instructions for turning in the basic terminal unit into a CDC service center are provided in section 6.

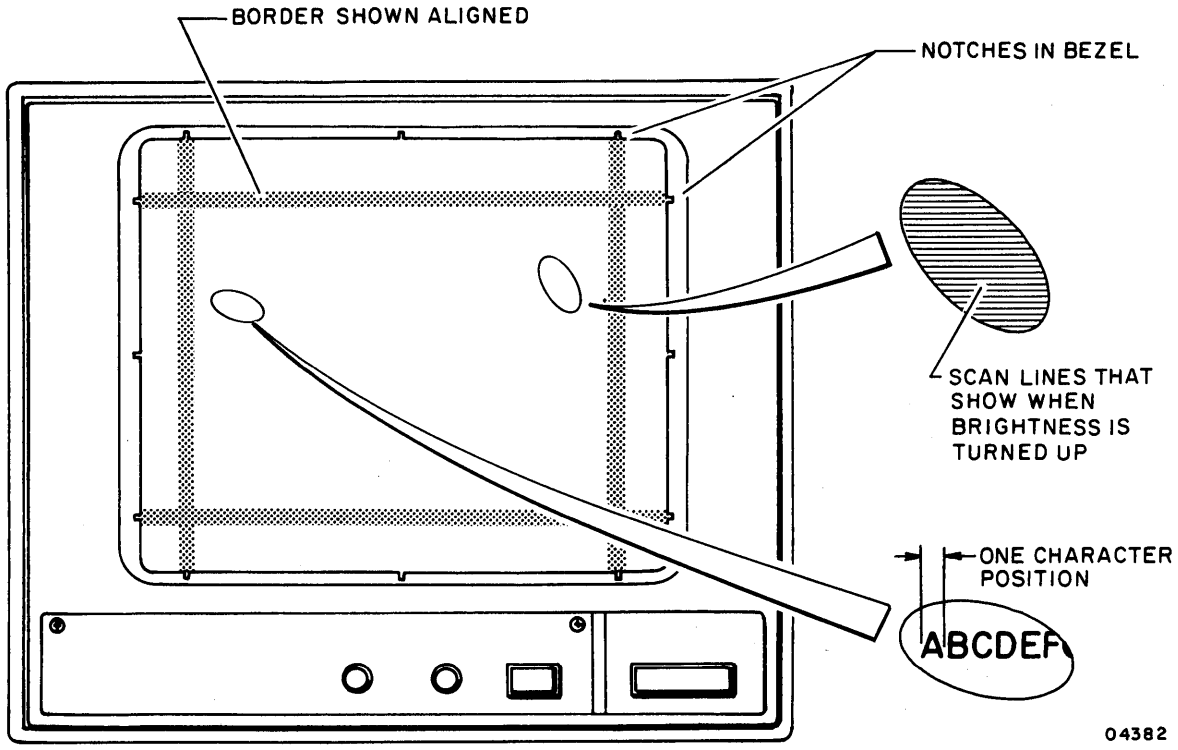


Figure A-10. Estimating Required Realignment

2. Press F8 key to select TERMINAL TEST mode from menu. This shows the display for the operator-intervention test on the screen (figure A-10).

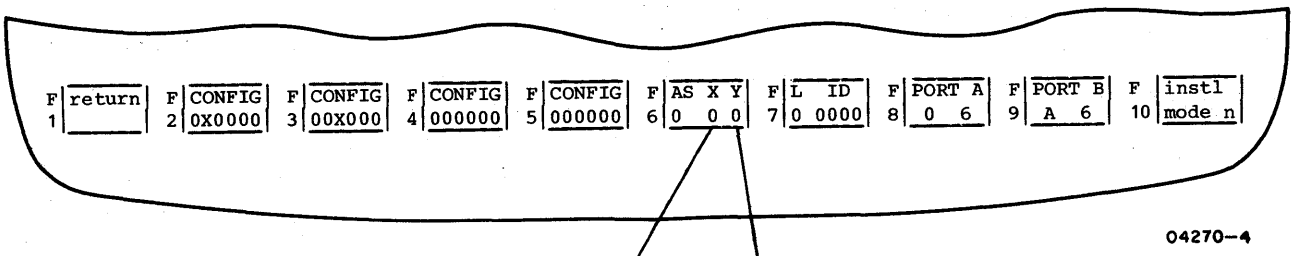
3. The notches in the corners of the screen bezel indicate where the middle of border lines should be displayed on the screen (figure A-10). Use those as a guide and estimate the distance to be corrected as follows:

   - If border is off center horizontally, estimate how many character positions right or left that the border must move.

   - If border is off center vertically, estimate how many scan lines up or down that the border must move. To see the scan lines on the screen, momentarily turn the BRIGHTNESS control nearly all the way clockwise.

4. Make mode menu appear per step 1.

5. With mode menu on screen, press CTRL (Control) and SETUP keys. This displays menu of terminal installation parameters (figure A-11).



FOLLOWING LISTED ENTRIES REALIGN CRT HORIZONTALLY:

ENTRY	DIRECTION	NUMBER OF CHARACTER POSITIONS
0	-	NONE
1	RIGHT	1
2	RIGHT	2
3	RIGHT	3
4	-	NONE
5	LEFT	1
6	LEFT	2
7	LEFT	3

FOLLOWING LISTED ENTRIES REALIGN CRT VERTICALLY:

ENTRY	DIRECTION	NUMBER OF SCAN LINES
0	-	NONE
1	UP	1
2	UP	2
3	UP	3
4	UP	4
5	UP	5
6	UP	6
7	UP	7
8	-	NONE
9	DOWN	1
A	DOWN	2
B	DOWN	3
C	DOWN	4
D	DOWN	5
E	DOWN	6
F	DOWN	7

Figure A-11. Realignment Entries

6. Press F6 key to advance cursor into block F6. Then use Space bar to advance cursor under X if horizontal realignment is required, or under Y if vertical realignment is required. If cursor is advanced too far, backspace cursor with Backspace (←) key.

7. Refer to figure A-11 and make applicable keyboard entry. If a mistake is made, overwrite the erroneous entry with the correct entry. If horizontal plus vertical realignment is necessary, make each entry.

8. Press COPY key. This writes entry into nonvolatile memory and changes alignment.

9. Press F1 key to return to mode menu, then press F8 key to return to operator-intervention test. If optional graphics feature is installed, follow this by pressing any key.

10. Check alignment of border with notches in bezel. If further correction is needed, repeat the process starting with step 3.

CRT REALIGNMENT WITH TOUCHPANEL INSTALLED

This procedure is also used to realign the display area of the crt if it has drifted off center. This procedure, however, is for use with terminals that have the touchpanel and graphics option installed. To realign the crt in this instance, do the following:

1. Use one of the following methods to get the mode selection menu appearing on the terminal display screen.

   - If operating in CYBER mode, press SETUP key, then F10 key twice.

   - If not in CYBER mode and terminal is conditioned for manual selection of operating mode, press RESET switch (menu appears after power-on test)

   - If not in CYBER mode and terminal is conditioned for automatic selection of operating mode, pull out TEST switch at rear of terminal, then press RESET switch. This shows a DIAGNOSTIC FAILURE message along with the mode selection menu. Disregard the failure message and press the TEST switch at rear of terminal back in.

2. Press F1 key to select CYBER mode.

3. Press SETUP key to obtain operator parameters selection display near bottom of screen.

4. Select the following conditions on the operator parameters selection display. Refer to section 4 of this manual for directions in making operator-parameter entries.

   - LINE OFF - use F2 of first operator entry display to toggle terminal online and offline.

   - BACKGD LIGHT - use F2 of second operator entry display to toggle between light (inverse) and dark (normal) video display.

- CH/LN 80 - use F7 of second operator entry display to toggle between 80 and 132 characters per display line.

- LINES 30 - use F8 of second operator entry display to toggle between 24 and 30 horizontal lines per display screen.

5. Press the F1 key to return to CYBER mode.

6. Key in the data pattern shown in figure A-12. Refer to sections 2 and 4 in main body of this manual for operating instructions if required.

7. For horizontal alignment, verify that the left side of the touchpanel grid is between the 8 and the 9 numeric entries (as indicated in figure A-12). If positioning is not correct, refer to figure A-11 to determine correction necessary for X entry of F6 of terminal installation parameters display. Record required correction value for later entry in terminal installation parameters.

8. For vertical alignment, verify the relative position of your 1 and 30 entries on the display screen match those indicated in figure A-12 (1 in lower part of upper left grid and 30 in upper part of lower left grid). If positioning is not correct, refer to figure A-11 to determine correction necessary for Y entry of F6 of terminal installation parameters display. Record required correction value for later entry in terminal installation parameters.

9. Once correction values are obtained from the two preceding steps, refer to earlier part of this appendix for making terminal installation parameter entries and enter correction values in appropriate X and Y positions of F6 field.

10. Be sure to press COPY key to enter correction values into nonvolatile memory after making correction entries described above in steps 8 and 9.

16 X 16 TOUCH PANEL GRID, VISIBLE WHEN IN INVERSE VIDEO

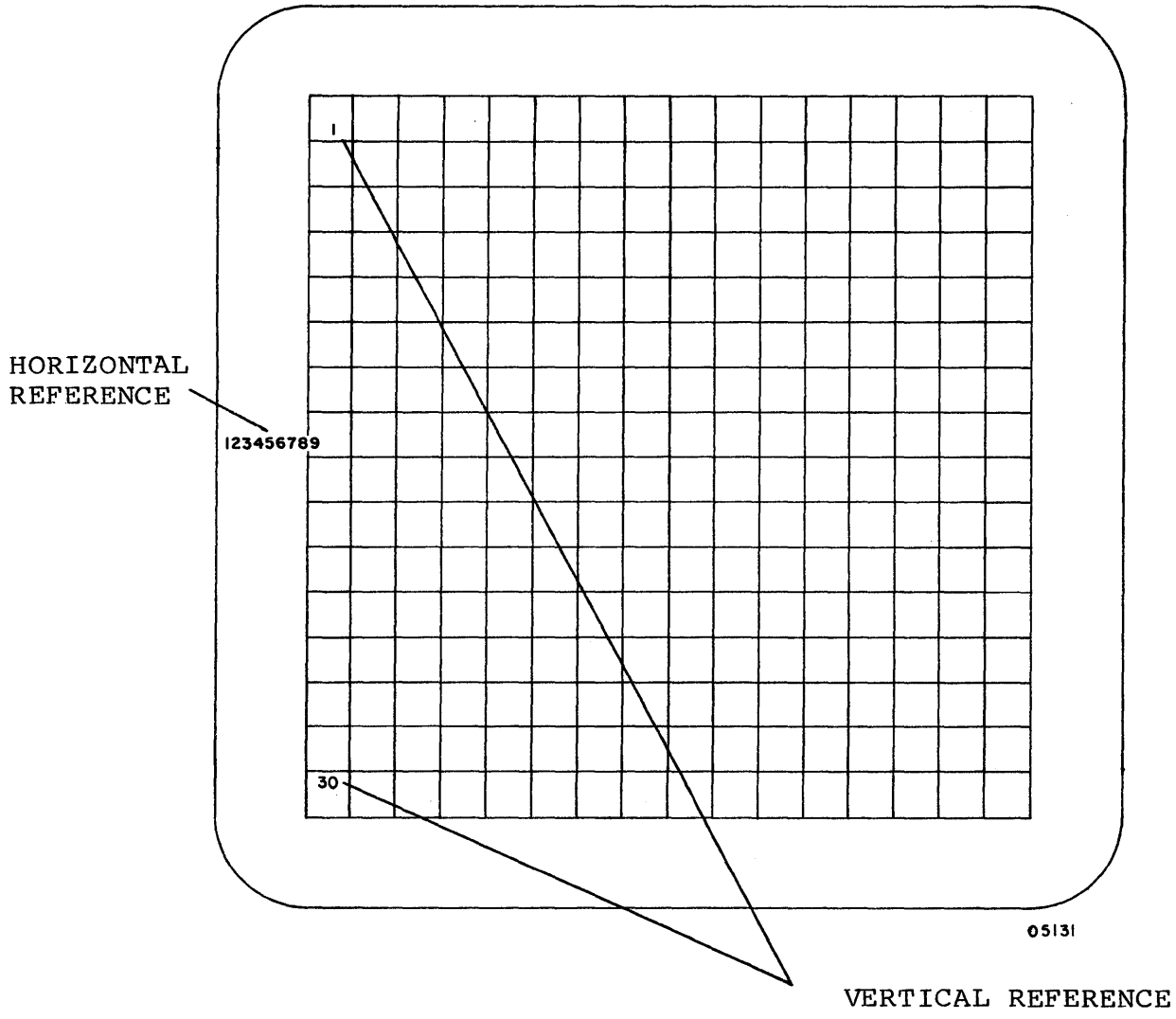


Figure A-12. Display-Alignment Pattern for Use with Touchpanel

This appendix provides information about the internal 1200/1200 baud modem that may be installed as an option in the terminal. Included in the appendix are a general description of the modem and its operating characteristics. Also included is information regarding the operation and installation of a terminal containing an internal modem.

GENERAL DESCRIPTION

The equipment number of the modem is XA360-A, and it is installed in large option-board location I/F-4 (refer to figure B-1). The presence of this modem in the terminal is most easily established by checking the I/F-4 location at the rear of the terminal. The rear of the modem with its Canadian Department of Communications and FCC certification label is prominently visible through a slot in the rear of the terminal at the I/F-4 location. The modem is a user-installed option for CC634-B and CC638-B model terminals and a service-center installed option for CC634-A and CC638-A model terminals.

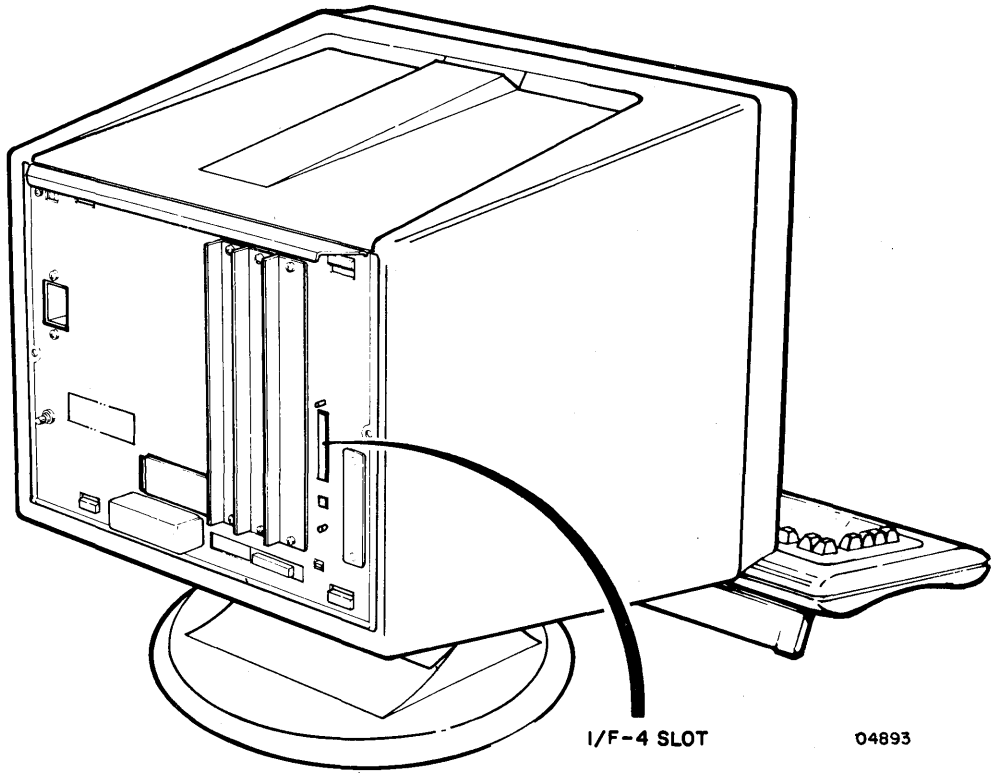


Figure B-1. View of Terminal Showing I/F-4 Slot

The 1200/1200 baud modem provides the terminal with a telephone line interface capable of data reception and transmission at a rate of 1200 bits per second (approximately 120 characters per second). The modem is compatible with Bell 212A data communication equipment requirements and is capable of either full- or half-duplex data transfers on standard telephone transmission lines. The modem has been designed and manufactured for conformance to most of the commonly recognized industry, national, and international standards.* Some of the more notable features and capabilities of the modem are listed below:

- Bell 212A compatibility for 1200 bits per second (b/s) data exchange rates
- Capable of full-duplex transmissions on 2-wire, switched-network local or long-distance telephone lines without special conditioning
- Automatic dual-tone multi-frequency dialing (touch-tone**)
- Automatic pulse dialing (standard dial-phone dialing)
- Operation in auto-answer mode
- Operation in either call originate or call answer mode
- Operation in both digital and analog loopback test mode
- A firmware-resident self-test feature
- Standard telephone line interface: 1) a RJ11C modular phone-jack connector accessible at rear of terminal, and 2) a 4.3-metre (14-foot) cable with a RJ11 plug at one end and a RJ11 duplex (T) connector at the other end for connecting both the terminal and a telephone to the same line
- A 4k read-only memory
- Vadic 3400 compatible

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*Specific standards with which the modem is in conformance include: industry standards UL STD 478, FCC Part 15 (Subpart J), and FCC Part 68; national standards ANSI X3.4, ANSI X3.15, and ANSI X3.16; and international standards CITT V.24k-1968, CSA STD C22.2-143, VDE 0871, VDE 0730, VDE 875, IEC 380, and TAPS.

**Touch tone is a registered trademark of American Telephone and Telegraph Corporation.

The principal use of the internal modem is to permit its host terminal to communicate over the telephone lines with a host computer system or with other terminals using a compatible interface to the same telecommunications network. The automatic features of the modem permit its use either for automatically downloading an operating mode from the host computer of the system, or for use in communicating with the host computer or other network terminals during typical system operations.

The self tests of the modem are integrated with the terminal power-on test that is described under Starting Up Terminal in section 3. This integration makes the modem self tests run each time the terminal power-on test runs. The modem self tests include a loopback test that checks components of the modem board and tests that check the read-only memory (ROM) and universial asynchronous receiver/transmitter (UART) on an associated modem interface board. The modem loopback test is controlled by the third entry position of the F4 field in the terminal installation parameters. This entry position should be a 1 if you desire that the loopback test be run with the other modem self tests (the loopback test takes approximately 10 seconds to complete) or be a 0 if you do not desire it to run with the other self tests.

Following is a listing of the fault messages associated with the modem self tests. If any one of these messages appear on the terminal screen following a power on or reset, the terminal requires maintenance attention.

- INTERNAL MODEM CHECKSUM FAIL
- INTERNAL MODEM UART FAIL
- INTERNAL MODEM LOOPBACK FAIL

OPERATION

This portion of the appendix describes operations and operator actions related to a terminal with an internal modem installed. It does not discuss the temporary modification of operator parameters associated with the 1200/1200 b/s modem; such information is discussed under Operator Parameters in section 4. The following text includes operations associated with the 1200/1200 b/s modem to which the terminal operator responds or reacts. These operations include entering a telephone number on the terminal keyboard, monitoring phone-call status and starting a load, calling a telephone number without loading, manually dialing a telephone call, and using auto-answer mode.

ENTERING A TELEPHONE NUMBER ON THE TERMINAL KEYBOARD

The following description assumes that the terminal has had its mode installation parameters previously set up to select the auto-dial function of the internal modem but not to use the default-value parameter entries for automatic selection of the phone number, load source, and load files. It also assumes that the terminal has been powered on, the power-on test ran successfully, and the mode-selection menu has appeared on the lower portion of the terminal screen (refer to section 3 if required). At this point, the operator does the following:

1. Presses function key associated with the desired operating mode of the terminal. (In accordance with the previous assumptions, the mode selected must be one that uses the internal modem.) As a result of this action, the following message appears on the terminal display screen:

   ENTER PHONE NUMBER

2. Keys in the desired phone number on the terminal keyboard. The following characters are permissible for making phone number entries on the terminal keyboard; the terminal does not accept key entries other than those listed below.

   0 to 9 these digits are used to make standard telephone number entries.

   A this alpha character entry is acceptable. However, it is not currently used in making phone-number entries.

   B this alpha character entry is used as a substitute for the * character on tone-dial telephones. It should not be used on pulse-dial lines.

   C this alpha character entry is used as a substitute for the # character on tone-dial telephones. It should not be used on pulse-dial lines.

   D this alpha character entry causes an auto-dialing sequence to pause until a tone is detected. For example, it delays the dialing sequence to wait for a dial tone after dialing for an outside line)

E this alpha character entry causes an auto-dialing sequence to pause until no tone is detected on the line for 3 seconds. It is used, for example, to insert a 3 second delay between a direct-dial access number and an area-code number sequence, or between the area-code number sequence and the actual telephone number.

F this alpha character entry is acceptable. However, it is not currently used in making phone-number entries.

3. Presses the NEXT key on the terminal keyboard once the operator has made the proper entries and the desired telephone number is appearing on the screen.

At this point, the auto-dial function of the internal modem takes over and all that the operator can do now is monitor the progress of the call on the display screen and start the load.

MONITORING A TELEPHONE CALL AND STARTING A LOAD

Figure B-2 depicts the sequence of display messages possible during an auto-dial operation of the terminal modem in which the operator makes the phone number entry. The sequence that automatically enters a phone number and selects the load source and file is very similar except that the boxed-in display messages do not appear (operator only monitors call status and is not required to make entries). The following text describes the steps depicted in figure B-2 in more detail.

- ENTER PHONE NUMBER - this is the initial message that appears on the display screen during an auto-dial sequence in which the terminal operator enters the desired telephone number on the terminal keyboard. The operator's response to this message has been previously described under the heading Entering a Telephone Number on the Terminal Keyboard.

  - NO DIAL TONE/DIALING PHONE NUMBER - either one of these two messages can occur as the first response after the operator has keyed in the telephone number and pressed the NEXT key on the terminal keyboard. Regardless of which message occurs, it only appears on the display screen for a short time. The no-dial-tone message provides an no-connection pathway to the SELECT LOAD SOURCE, etc. message. The connection-possible path, of course, is via the dialing-phone-number message, and this path can lead to either of the two following messages.

Operator-action/Comments

Possible Display Messages

Operator selects an operating mode that uses internal modem, but does not use default source/file/phone-number values stored in mode parameter entries; F2, for example.

Operator keys in phone number and presses NEXT key. See text for allowable entries.

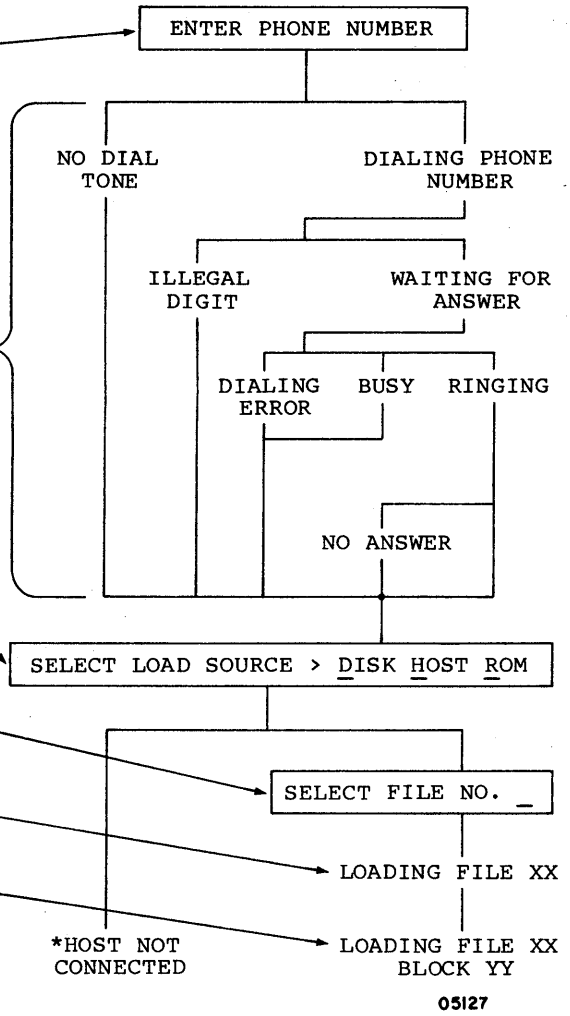
The next messages appear one at time in sequence. Where more than one message possibility is available, only the message that reflects the actual condition of the phone line appears.

Operator keys in desired load source (H), or default value can be used.

Operator keys in desired file number (00 to $3F_{16}$ range), or default value can be used.

This message reflects loading of file specified by operator (or default value).

The YY_{16} portion of this message increments as each block of the selected file loads.



*The last message (HOST HOT CONNECTED) only appears if the source-select message is entered via the no-dial-tone, illegal-digit, dialing-error, busy, or no-answer route. About 40 seconds after this last message appears, a loading failure message appears along with the redisplay of the mode-selection menu. The 40-second delay allows the operator time to manually dial (if T-connector is used) the desired number to verify the cause of the connection failure. If connection is made, the modem should respond to answer tone, and therefore, the operator can simply hang up the phone and let the operation continue normally at this point.

Figure B-2. Auto-Dialing Display Messages

- ILLEGAL DIGIT/WAITING FOR ANSWER - the first message only appears if, as the modem is dialing the phone number, it detects a character that is not usable as a phone number character on the type of line being used. For example, this message would appear if a B character (tone-dial equivalent of *) had been entered for use on a pulse-dial telephone line. Note that pulse dialing can be used on a tone-dial network, but that the reverse is not true. That is, tone-dialing cannot be used on a pulse-dial network. As is the case with the first possible no-connection response, this one also leads to the SELECT LOAD SOURCE, etc. message. The connection-possible message (waiting-for-answer) appears on the display screen during the brief interval that the modem is awaiting a response after having completed the dialing sequence. This connection-possible pathway then leads to one of the following three messages.

- DIALING ERROR/BUSY/RINGING - the first two of these messages are fairly self explanatory and indicate that the phone call cannot properly be completed. They therefore follow the no-connection path to the SELECT LOAD SOURCE, etc. message. The last of the three possible messages (ringing) indicates that the number dialed has been reached and that the dialed device is ringing. This message can still lead to one last possible no-connection message, or it can take a connection-completed path.

- NO ANSWER - this is the last of the no-connection messages. It indicates that the dialed phone has rung a specified number of times and has not answered the call. This is the last of the no-connection pathways to the SELECT LOAD SOURCE, etc. message.

- SELECT LOAD SOURCE > DISK HOST ROM - Notice that this display screen message may be arrived at by way of either a no-connection or a connection-completed pathway. If this message appears on the display screen due to a no-connection condition, the operator may either try again later to make connection, or he may use a telephone handset to manually dial the desired phone number and verify cause of the no-connection condition. If the SELECT LOAD SOURCE, etc. message results from a connection-completed condition, the operator's response should be to key an H on the terminal keyboard and press the NEXT key. This latter action causes the following message to appear.

- SELECT FILE NO. _ - In response to this message, the terminal operator is to key in the file number that corresponds to the desired load file and press the NEXT key. Permissible numeric entries for selecting the load file include hexadecimal numbers between 00_{16} and $3F_{16}$. This last entry operator entry results in the following two display messages:

  - LOADING FILE XX - this message displays to verify that the file selected by the operator is the one being loaded.

  - LOADING FILE XX BLOCK YY - this message is similar to the preceding one but provides additional information. The YY portion of the message is a hexadecimal number that indicates which block of the selected file is currently loading and increments as each successive block of the file loads. When loading is complete, a Terminal Ready message appears on the display screen to inform the operator that applications operations of the terminal may now begin.

Three other display messages may appear on the terminal display screen as the result of an attempt to download information over the telephone lines using the internal modem. These messages occur only if the terminal has not made a proper telephone-line connection with the host computer. In such an instance, a HOST NOT CONNECTED message appears a short time after the terminal operator presses the H and NEXT keys of the terminal to initiate the download operation. If the terminal has not established a communications line connection within 40 seconds after the HOST NOT CONNECTED message appears, the download operation aborts and both HOST LOAD FAILURE and FAILURE LOADING MODE messages appear on the terminal display screen. Along with these last two messages, a redisplay of the mode selection menu occurs.

CALLING A TELEPHONE NUMBER WITHOUT LOADING

If a telephone connection is to be made without any loading done, a special telephone call sequence can be started through the CYBER mode operator parameters described in section 4. This special sequence is similar to the sequence described in the preceding paragraphs, but when the telephone connection is made, the loading process does not occur. Instead, operations return to where they were before the operator parameters were changed and the call was made. This special sequence may be used to avoid doing a reload from a host after a telephone connection is lost.

MANUALLY DIALING A TELEPHONE CALL

The following method of manually making a telephone line connection between the terminal and a host computer using the internal modem assumes that both the modem and a telephone handset are connected to the same telephone line via a telephone jack T adapter. It also assumes that the mode installation parameters of the terminal have been set up not to use the auto-dial feature of the modem. In such a case, the operator begins a manual-dial call with the mode selection menu appearing on the terminal display screen. Completing the operation requires that the operator take the following steps:

1. Select the desired operating mode by pressing the appropriate function key. The following message appears on the terminal display screen (refer to lower half of figure B-4):

   SELECT LOAD SOURCE > DISK HOST ROM

2. Press the H key on the terminal keyboard to select a load-from-host operation. After about 3 seconds, the message HOST NOT CONNECTED appears on the terminal display screen. This message remains on the screen for approximately 40 seconds before it is replaced by other messages that indicate a loading failure has occurred. The 40 second interval allows the terminal operator time to complete the following step.

3. Dial the desired telephone number on a hand set, wait for the phone to be answered and to hear the answer tone, and hang up the telephone hand piece.

4. At this point, the internal modem detects the carrier signal from the host and establishes the connection. As soon as this occurs, the SELECT FILE NO. _ message appears on the display screen, and the system awaits the entry of the file number that is to be loaded.

USING AUTO-ANSWER MODE

Auto-answer mode places the terminal in a inactive state where it waits for telephone line activity. The use of the mode depends on the application. For example, auto-answer mode may be used in an application where the host sends a nightly report at a time when no terminal operator is present. Under these circumstances, the terminal operator selects auto-answer mode before going home (auto-answer mode is selected using the operator parameters described in section 4). When time comes to transfer the report, the call from the host on the telephone line places the terminal

online and the terminal stores the report on the screen or printer for later access.

The characteristics of the terminal when in auto-answer mode are as follows:

- The keyboard locks except for the M REL/BREAK key. Pressing the M REL/BREAK key returns the terminal to the operating mode that was previously in effect.
- The message WAITING TO ANSWER appears on the last line of the display screen.
- The internal modem monitors the telephone line for two successive rings. When this occurs, the terminal makes the connection and goes online.

INSTALLATION

This portion of the appendix describes how a terminal with a 1200/1200 b/s modem installed is connected to the telephone line. It also describes how to modify certain installation parameters that are associated with the internal modem. For information on how to install the modem into the terminal (user installation of the modem only applies to CC634-B or CC638-B terminals), refer to the Hardware Installation Instructions that came with the modem (preface lists the publication number).

CONNECTING MODEM-EQUIPPED TERMINAL TO TELEPHONE LINE

To connect a terminal to the telephone line in the manner described below, the following items are necessary:

- A CC634 or CC638 terminal with an internal 1200/1200 b/s (XA360-A) modem installed in it
- A 4.3-metre (14-foot) telephone-line extension cord (CDC part number 61409590), having a single, modular RJ11 plug on one end and a duplex-jack RJ11 plug on the other end (refer to figure B-3)
- Additionally, a RJ11 modular jack that is connected to the building telecommunications lines must be available within 4.3 metres (14 feet) of the terminal installation site

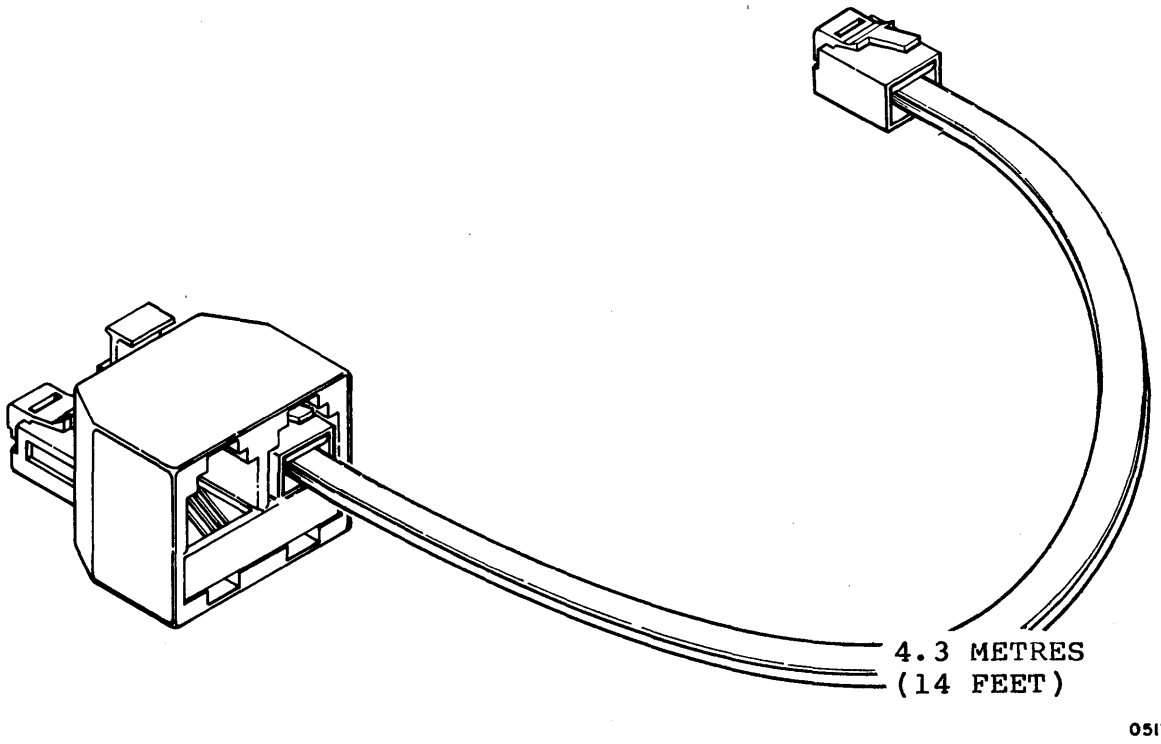


Figure B-3. Telephone-Line Extension Cord with Duplex-Jack Plug

To connect the terminal to the telecommunications lines, refer to figure B-4 and perform the following operations.

NOTE

Canadian Department of Communications guidelines require that a tool is necessary to disconnect communications cords or cables from their associated communications devices. To conform to Canadian requirements, the terminal-device ends of all extension cords furnished with internal-modem-equipped terminals have had the retaining clips of their RJ11 plugs shortened slightly so that a tool is necessary to remove them from their mating jacks.

1. Remove the telephone cord from the wall jack to which the terminal is to be connected by squeezing the retaining clip of the RJ11 plug and withdrawing the plug from the jack (refer to figure B-4a).

2. Insert the plug on the duplex-jack end of the furnished extension cord (CDC part number 61409590) into the wall jack from which the telephone cord was just removed (refer to figure B-4b).

3. Insert the free end (single plug end) of the furnished extension cord (CDC part number 61409590) into the RJ11C connector at the rear of the terminal (refer to figure B-4c).

4. Insert free end of the telephone cord removed in step 1 into the second jack (only open one) of the duplex-jack connector plugged into the wall jack (refer to figure B-4d).

5. Check that completed installation appears as shown in figure B-5.

NOTE

The installation must appear as shown in the figure B-5. The installation will not function properly with the duplex-jack plug of the furnished extension cord connected to the rear of the terminal, or to the body or hand piece of the telephone.

INSTALLATION PARAMETER MODIFICATION

This portion of the appendix is for use by service or supervisory personnel in modifying default installation parameters of the terminal that are related to the internal 1200/1200 b/s modem. The following text repeats much of the modem-related parameter-setup information included in appendix A but differs from that in that this relates only to modem parameters. For internal-modem-related parameter entries that are modifiable by operator personnel, refer to Operator Parameters in section 4.

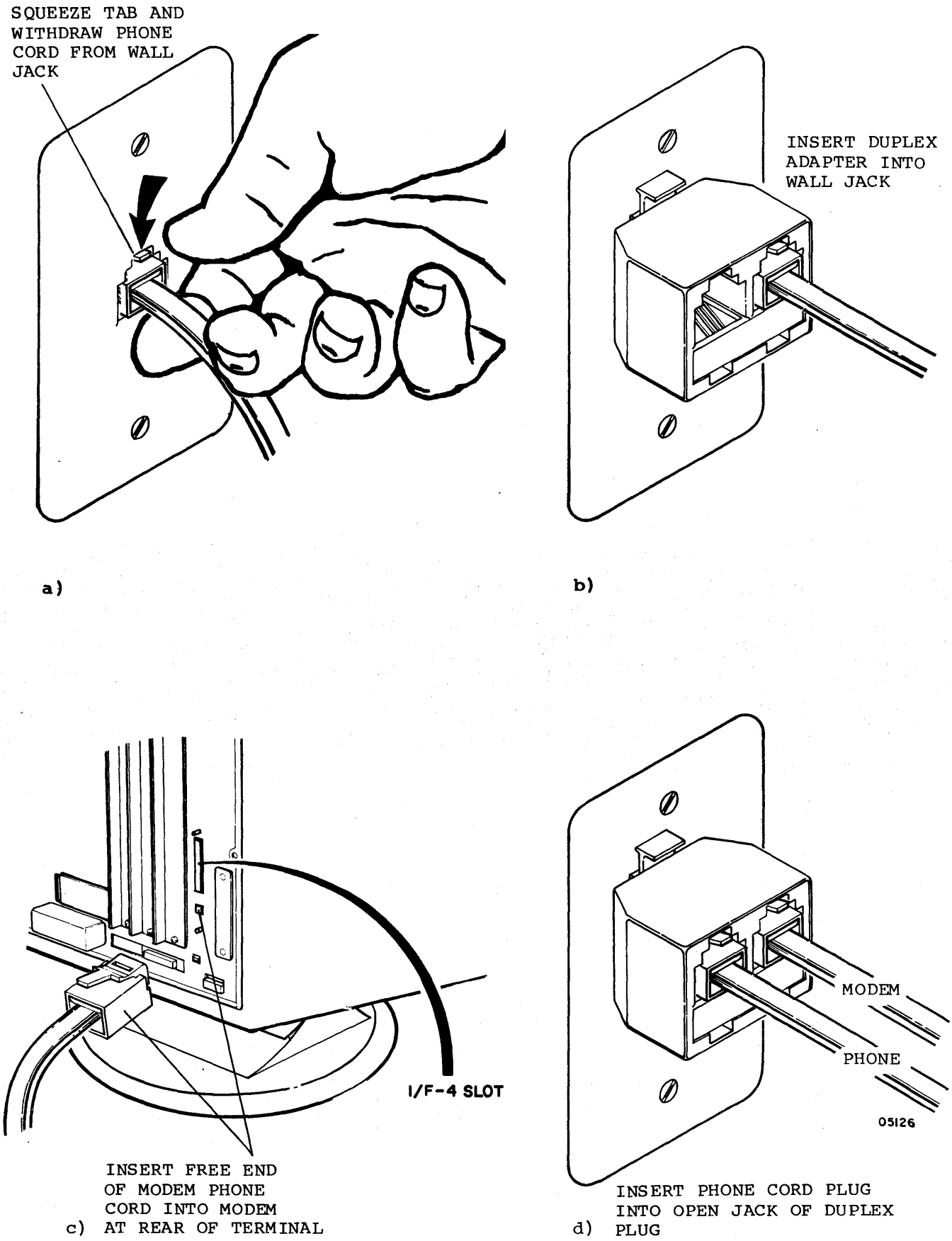


Figure B-4. Installing a Modem-Equipped Terminal

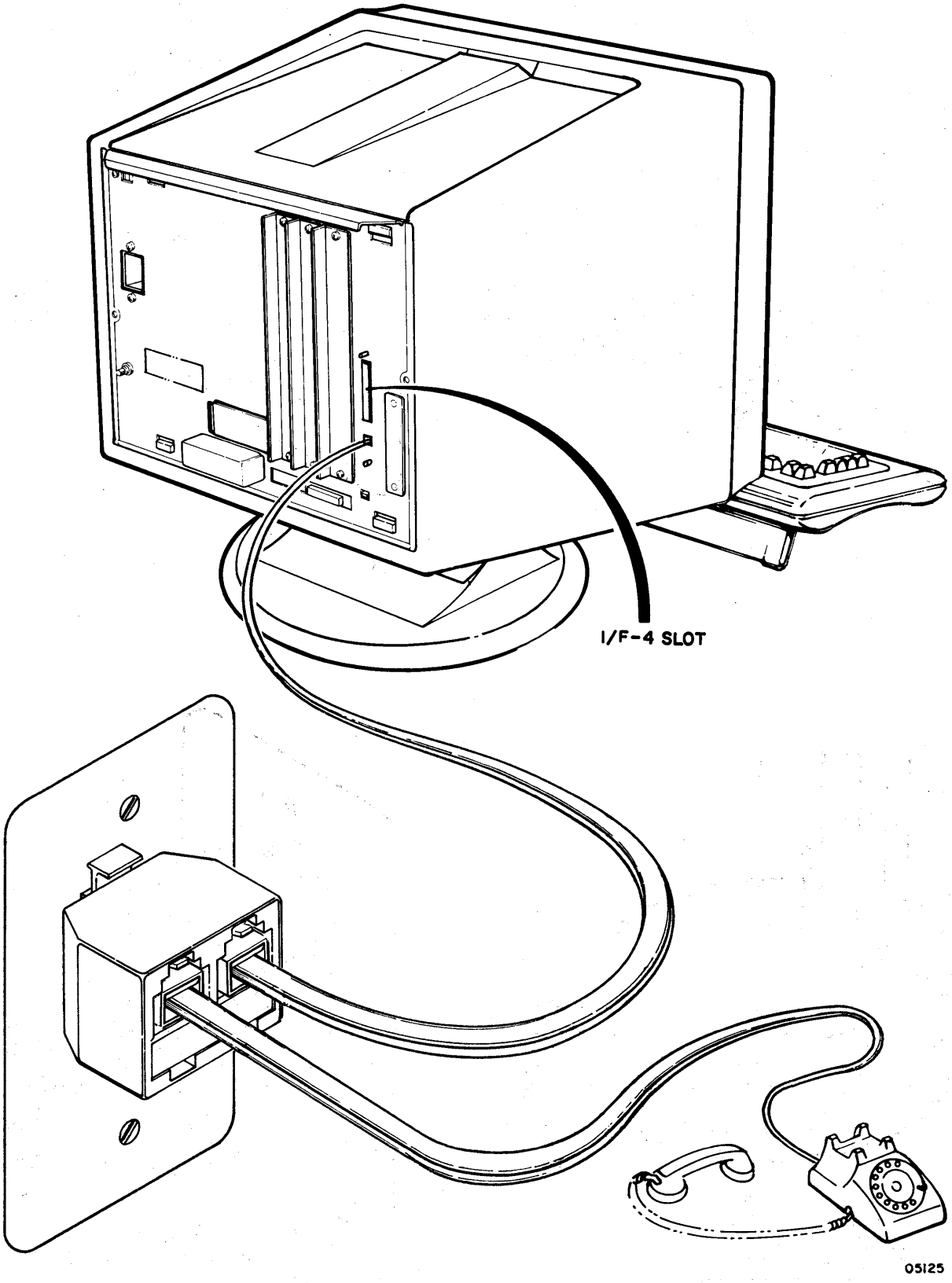


Figure B-5. Completed Installation of Modem-Equipped Terminal

To set the terminal installation and mode installation parameters relating to an internal 1200/1200 b/s modem, do the following:

1. Obtain a mode menu (display) by pressing the 1 side of the POWER switch. One of two things occurs at this point.

   a. Mode menu appears at bottom of display screen as illustrated below. If this occurs, skip to step 2; if not, continue with step 1b.

F	MODE 1	F	MODE 2	F	MODE 3	F	MODE 4	F	MODE 5	F	MODE 6	F	MODE 7	F	TERMNL	F		F	
1	CYBER	2	PLATO	3	CP/M	4	DISK	5	C120	6		7	PACK	8	TEST	9		10	

Mode Menu

   b. The terminal automatically enters one of its available operating modes because certain parameters have been preset to cause this action to occur. If this latter action occurs, forcing an error condition causes both an error message and the mode selection menu to display. An error condition may be forced by:

      1) Pulling out the TEST switch at rear of terminal (refer to figure B-6).

      2) Pressing the RESET switch at front of terminal.

      3) Pushing the TEST switch at rear of terminal back in as soon as the mode menu appears near the bottom of the display screen.

2. Press the CNTL key and hold it down while pressing the SETUP key; then release both keys. The terminal-installation parameters menu replaces the mode menu at the bottom of the display screen. The terminal-installation parameters menu looks like this:

F	return	F	CONFIG	F	CONFIG	F	CONFIG	F	CONFIG	F	AS X Y	F	L ID	F	PORT A	F	PORT B	F	instl
1		2	0X0000	3	00X000	4	000000	5	000000	6	0 0 0	7	0 0000	8	0 6	9	A 6	10	mode n

Terminal-Installation Parameters Menu

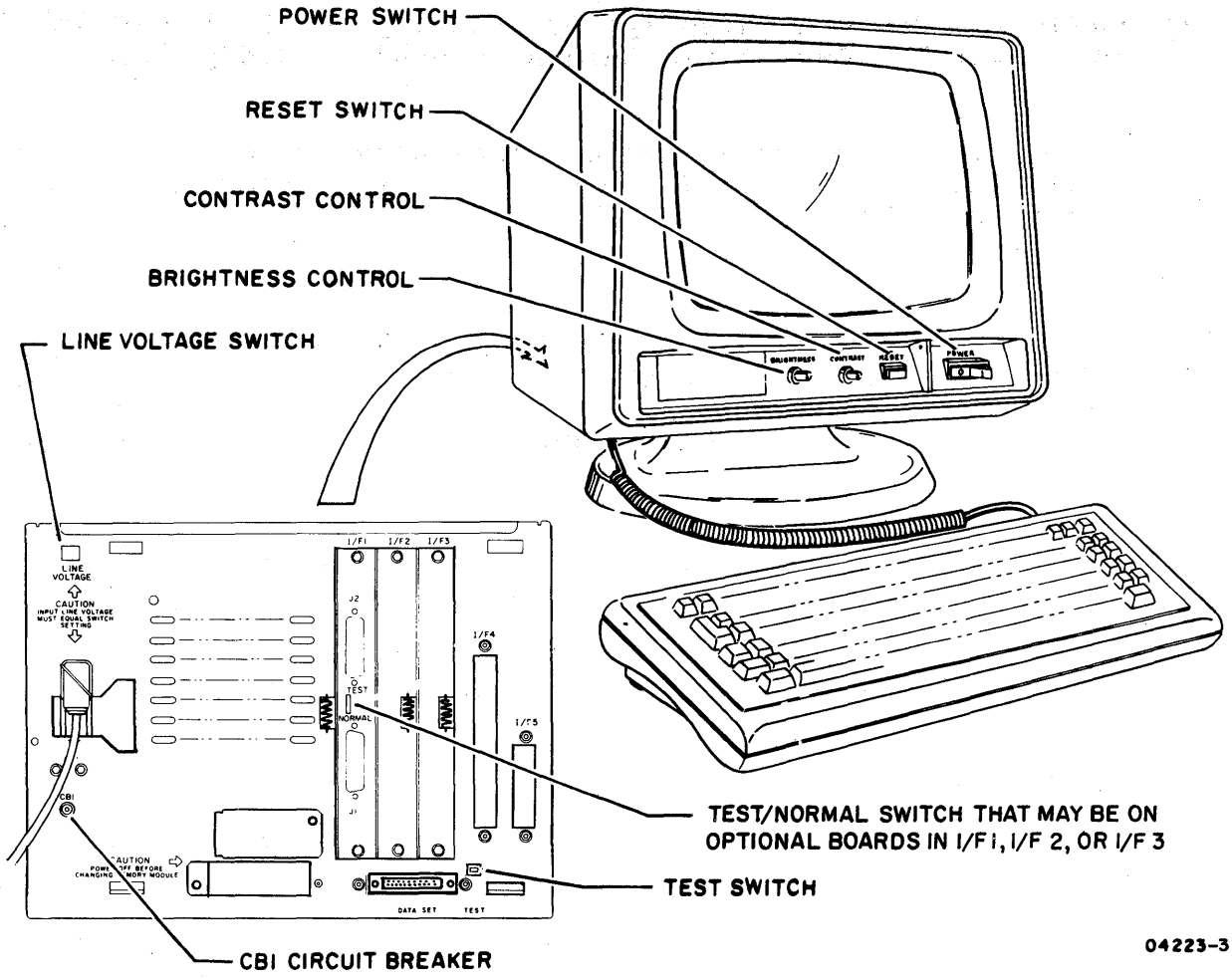


Figure B-6. Operator Controls on Front and Rear of Terminal

3. Parameter entry positions 1 of the F3 field and 3 and 4 of the F4 field relate to the internal modem. Press the F3 key to move the cursor to position 1 of the F3 field.

4. Position 1 of the F3 field must be a 1 if the 1200/1200 b/s internal modem is installed or be a 0 if it is not installed. Make the necessary entry by pressing the appropriate numbered key.

5. Press the F4 key to move the cursor into the F4 field. The cursor can be moved forward using the Space bar and backward using the Backspace (←) key. Move the cursor forward in the field to position 3.

6. Position 3 of the F4 field must be a 1 if the modem loopback self test is to run with the other modem self tests or be a 0 if it is not (the modem loopback test takes approximately 10 seconds to run). Make the appropriate entry. This advances the cursor to position 4.

7. Position 4 of the F4 field must be a 1 if the internal modem is to use tone (touch-tone) dialing or a 0 if it is to use pulse (dial-phone) dialing. Make the appropriate entry.

8. Make any other necessary changes to the terminal-installation parameter entries.

9. Press the COPY key to complete the entry of the terminal installation parameters.

10. Press the F10 key. This either causes an ENTER MODE NAME prompt to appear on the screen, or causes the mode-installation parameters menu to appear as shown below. If the ENTER MODE NAME prompt appears, either entering a four-character mode name or pressing the NEXT key causes the mode-installation parameters menu to appear below the prompt.

F 1	return	F 2	CONFIG 100XX0	F 3	CONFIG 00XXX0	F 4	CONFIG 00000X	F 5	CONFIG 0X0000	F 6	OPR DF XXXX	F 7	A-DIAL 000000	F 8	A-DIAL 000000	F 9	DF T R 0X X X	F 10	ACCESS 0000

Mode-Installation Parameters Menu

Parameter entry positions 3 and 6 of the F2 field and positions 1 and 2 of the F3 field are related to the 1200/1200 b/s modem. The F7, F8, and F9 fields also contain entries relating to the 1200/1200 b/s modem.

11. Use the keyboard Space bar to move the cursor to position 3 of the F2 field and make the desired entry. A 1 in this position permits the terminal operator to enter a telephone number via the keyboard; a 0 in this position causes the terminal to use the phone number stored in the F7 and F8 mode-installation parameter fields later in this procedure.

12. Use the keyboard Space bar to move the cursor to position 6 of the F2 field and make the desired entry. A 1 in this position causes the terminal to use the 1200/1200 b/s modem to load its operating program; a 0 in this position causes the terminal to use the DATA-SET connector interface to load its operating program.

13. Position 1 of the F3 field determines whether the 1200/1200 b/s modem auto dials the specified number once or continuously until a connection is made or the terminal is reset or the M REL/BREAK key is pressed. Enter a 1 if continuous dialing is desired or a 0 for single dial.

14. Make the desired entry in position 2 of the F3 field. A 1 in this position enables the auto-dial feature of the 1200/1200 b/s modem; a 0 in this position disables the auto-dial feature.

15. Press the F7 key to move the cursor to the first entry position of the F7 field of the mode-installation parameters menu.

    The F7 and F8 fields allow the entry of up to 12 characters of information related to the default telephone number (refer to position 3 entry of F2 field). Allowable character entries for the F7 and F8 fields are the hexadecimal digits 0 through F. The 0 through 9 digits are used to enter the digits of the telephone number. The A character is used at the end of a telephone number if another telephone number (an alternate telephone number) follows in the combined F7 and F8 fields. The B and the C alpha characters represent the tone-dial symbols * and #, respectively. The D and the E alpha characters are both used for inserting pauses in the number dialing sequence. The D character inserts a pause in the dialing sequence until a tone is received, and the E character inserts a 3 second pause in a dialing sequence and then recommences dialing provided no tone is received.

    The F character is used to indicate the end of a telephone-number dialing sequence that does not fill the 12 available spaces of the combined F7 and F8 fields. An example of a telephone call made from an inhouse switching network might be as follows:

    9D855E1155F

16. Make the desired default telephone number entry in the F7 and F8 fields.

17. Press the F9 key to move the cursor to the beginning of the F9 field.

18. Use the Space bar to move the cursor directly under the T area of the F9 field, and then enter a 6 on the keyboard to correspond to a 1200 b/s transmit rate for the terminal. This advances the cursor under the R area of the F9 field. Key in another 6 to correspond to a 1200 b/s receive rate for the terminal.

19. Make any other required mode-installation parameter entries. Use the Backspace key, the Space bar, and the appropriate function keys (F2 through F10) to move the cursor to the proper locations for making the required entries.

20. Press the COPY key to complete the entry of the mode installation parameters.

21. Press the F1 key to return to the mode menu.

COMMENT SHEET

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Operator's Guide/Installation Instructions

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COMPANY: _____

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