1486A/G/P Display Station

Operator's Manual

P/N 701334-002

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This equipment complies with FCC regulations for EMI.

WARNING!

This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case users, at their own expense, will be required to take whatever measures may be necessary to correct the interference.

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Chapter 1. Introduction

The 1486A/G/P Display Station is an ergonomically designed data entry display station that offers a wide range of functions and applications. The 1486A/G/P can display up to 3564 characters on a monochrome 14-inch monitor that can be ordered in amber (1486A), green (1486G), or page white (1486P).

This manual describes the 1486A/G/P, identifies controls and operating procedures, and presents diagnostic and maintenance procedures that you can perform. The manual also introduces data entry and editing functions associated with the display station.

Data messages are communicated between the display station and the System/3X or AS/400 through a twinax cable up to 1500 meters (4920 feet) long. The 1486A/G/P can be attached to any of the following processors and control units:

- IBM System/36
- IBM System/38
- IBM 5294 Control Unit
- IBM 5394 Control Unit
- IBM 5494 Control Unit
- IBM AS/400

You enter or change information on a keyboard that resembles a typewriter. Entered data is simultaneously displayed as alphanumeric characters and symbols on the screen. Function keys are used to transmit entered data to the System/3X or AS/400 or to recall data from the System/3X or AS/400 to the screen. The 1486A/G/P supports 122-key, 104-key, and 102/103-key keyboards. All display station control adjustments except brightness and contrast are made from the keyboard.

Hardware within the display station processes data during transmit and receive operations. You can generate hard copy by attaching a twinax printer to the System/3X or AS/400 or by attaching a host addressable printer to the 1486A/G/P. The Local Screen Print feature enables you to make a hard copy of displayed text on display stations not configured for host addressable print sessions.

Subsequent manual chapters are:

- **Customer Installation** – Provides physical and environmental information as well as information on setting up the display station.
- **Controls, Setup Menus, and Indicators** – Describes the controls, indicators, and keyboard controls on the 1486A/G/P.
- **Operating Procedures** – Provides information required for entering and editing data at the display station, transmitting data messages, and using the Keystroke Record/Playback feature.
- **Calculator Operations** – Describes the functions and gives operating instructions for the decimal, hexadecimal, and binary calculators.

- **Problem Determination and Maintenance** – Describes available maintenance plans and provides information required for diagnosing and correcting display station related problems.
- **Appendix A. Four-Digit Error Codes** – Lists the possible 4-digit error codes and recovery procedures.
- **Appendix B. System Configuration** – Provides information for configuring a System/3X or AS/400 when adding a 1486A/G/P and host addressable printer.
- **Appendix C. Printer Support and Limitations** – Lists the supported printer types and describes printer limitations.

Standard Features

The 1486A/G/P has the following standard features:

- **Multiple Emulations** – The 1486A/G/P can emulate several different display types. Both monochrome and color displays can be emulated. For display stations attached to a System/36 or System/38, a 132-column color format can be selected.
- **Typeahead** – Enables you to continue to enter keystrokes, even if the system inhibits keyboard input. The display station can save up to 64 keystrokes.
- **Configuration Print** – You can print all the setup menus to keep a record of the setup configuration.
- **Three Host Sessions** – You can configure up to two host display sessions and one printer host session that run concurrently.
- **Full-Screen Setup Menus** – The full-screen setup menus offer simplicity and ease of use for all setup functions. You can choose between English, German, Italian, Spanish, and French.
- **Power Saver Mode** – You can turn the Power Saver mode on or off. When turned on, the Power Saver mode reduces power consumption during periods of inactivity.
- **Keystroke Record/Playback** – Allows you to store keystroke sequences under assigned keys. A maximum of 1500 keystrokes can be stored in nonvolatile memory and can be played back at any time. A Pause key feature allows you to stop the record or playback operation and temporarily resume normal operations. See “Keystroke Record/Playback” on Page 4-12.
- **Record/Playback Security Mode** – With this option you can select one of several levels of Record/Playback security.
- **Auto Dim** – Automatically blanks the screen, leaving only the operator status row displayed, when a specified length of time has passed during which no key is pressed and no data is written to the screen by the System/3X or AS/400. You can specify the amount of time before cutoff as 2, 5, 10, or 20 minutes, or the feature can be disabled for no cutoff. After 30 minutes the entire screen blanks, including the operator status row.

- **Security Keylock** – Blanks the screen and inhibits access from the keyboard. The operator status row remains displayed.
- **Audible Alarm** – Sounds when the host system signals the display station.
- **Tilt/Rotate Stand** – Enables the display/logic element to be tilted over 20 degrees of arc and rotated a full 160 degrees for viewing ease.
- **Row/Column Indicator** – Provides display of the cursor location with respect to the upper left corner of the screen. Numbers indicating the cursor row and column position are displayed on the operator status row.
- **Dual Display Sessions** – Allows the 1486A/G/P to operate with two display station addresses. You can use the Jump key to toggle between sessions. See "Dual Display Mode" on Page 4-2.
- **Split Screen** – Allows for the simultaneous display of two display station sessions on one screen. See "Dual Display Mode" on Page 4-2.
- **Local Screen Print Function** – Allows you to make a hard copy of the screen contents without using system resources. The local screen print feature can be used only on display stations not configured for host addressable print sessions.
- **Print Trim Function** – Allows you to print only a selected portion of the screen when making a local screen print.
- **Rule Cursor** – Enables you to select either a vertical (|), horizontal (-), or horizontal/vertical (+) cursor.
- **MVP (Multivendor printers)** – The 1486A/G/P supports a wide variety of industry standard printers.

Optional Features

- **Lift Arm** – An optional lift arm is available that attaches to the display. With the lift arm, the display's height can be adjusted from the lowest position of 4.85 inches (12.32 cm) to the extended position of 12.10 inches (30.73 cm). The display can be tilted over 20 degrees of arc and can be rotated a full 180 degrees for viewing ease. The lift arm has a base footprint of 12.66 inches (32.16 cm) by 10 inches (25.40 cm) and weighs 10 pounds (4.53 kg). To purchase the lift arm, see your MTX Customer Representative.

Warning

Do not pick up the Display element if the lift arm is attached to it. The lift arm could separate from the Display element and injure you.

- **Magnetic Stripe Reader** – The 1486A/G/P can support a magnetic stripe reader that attaches between the keyboard and the display station. The magnetic stripe reader should supply its own power.

- **Bar Code Reader** – The 1486A/G/P can support a bar code reader that attaches between the keyboard and the display station. The bar code reader translates coded data from the bar code reading device into keystroke data. The bar code reader should supply its own power.

Keyboards

- US English
  - 102/103-Key EBCDIC US English Typewriter
  - 104-Key EBCDIC US English Typewriter
  - 104-Key Data Entry
  - 122-Key EBCDIC US English Typewriter
  - 122-Key Data Entry
- Austrian/German – 103-Key, 104-Key, 122-Key Typewriter
- Belgium – 103-Key, 104-Key, 122-Key Typewriter
- Danish – 103-Key, 104-Key, 122-Key Typewriter
- French Canadian – 103-Key, 104-Key, 122-Key Typewriter
- French AZERTY – 103-Key, 104-Key, 122-Key Typewriter
- Italian – 103-Key, 104-Key, 122-Key Typewriter
- Norwegian – 103-Key, 104-Key, 122-Key Typewriter
- Portuguese – 103-Key, 104-Key, 122-Key Typewriter
- Spanish (Spain) – 103-Key, 104-Key, 122-Key Typewriter
- Spanish-Speaking – 103-Key, 104-Key, 122-Key Typewriter
- Swedish/Finnish – 103-Key, 104-Key, 122-Key Typewriter
- Swiss/German – 103-Key, 104-Key, 122-Key Typewriter
- Swiss/French – 103-Key, 104-Key, 122-Key Typewriter
- United Kingdom English – 103-Key, 104-Key, 122-Key Typewriter
- Netherlands – 103-Key Typewriter

Chapter 2. Customer Installation

This chapter lists the physical statistics and environmental requirements for the 1486A/G/P Display Station. It also describes the procedures for setting up the display station.

The 1486A/G/P is designed to be installed by the user. No special tools are required to set up the display station.

Physical Statistics

Measurement	Without Lift Arm	With Lift Arm
Weight	16.0 lb (7.25 kg)	26.0 lb (9.70 kg)
Height	13.7 in (34.80 cm)	Minimum: 15.50 in (44.45 cm) Maximum: 24.62 in (62.53 cm)
Depth	12.8 in (32.51 cm)	17.1 in (43.43 cm)
Width	12.6 in (32.00 cm)	12.6 in (32.00 cm)

Environmental Requirements

Clearance for Cooling	Six inches on all sides of the unit (Damage may result if air vents are blocked.)
Operating Temperature Range	50° to 105°F (10° to 40.6°C)
Relative Humidity	8% to 80%, no condensation
Maximum Wet Bulb	80°F (26.7°C)
Power	90 to 132 VAC or 180 to 264 VAC at 47 to 64 Hz
Power Consumption	Normal Mode – 35 watts (typical) Power Screen Mode – 9 watts (typical)
Heat Dissipation	Normal Mode – 118 BTU/hr (typical) Power Screen Mode – 30 BTU/hr (typical)

For units operating at 100-120V: The power cable required for domestic units is a UL listed, CSA certified 18/3 AWG, type SVT or SJT cable (15-foot [4.6-meter] maximum). It is terminated on one end by a 125V, 15A grounding type attachment connector. It is terminated at the other end by a 125V, 15A parallel blade, grounding type attachment plug.

For units operating at 200-240V: The power cable required for domestic units is a UL listed, CSA certified, 18/3 AWG, type SVT or SJT cable (15-foot [4.6-meter] maximum). It is terminated on one end by a 250V, 15A grounding type attachment connector. It is terminated at the other end by a 250V, 15A tandem blade, grounding type attachment plug.

The power cable required for international units is an 18/3 AWG, type SJT cable (15-foot [4.6-meter] maximum). It is terminated on one end by a 250V, 15A grounding type attachment plug body. It is terminated at the other end by a 250V, 15A grounding type cord connector. The cord set is marked HAR to signify appropriate safety approvals. The socket outlet must be nearby and easily accessible, per IEC 950 Sec. 1.7.2.

The installation site must provide a properly wired and grounded power outlet. Do not attach the display stations to circuits that are connected to air conditioners or to devices that generate significant transient electrical noise.

Electronic discharge in the vicinity of the unit should be minimized by avoiding high resistance floor material and carpeting that does not have antistatic properties, by avoiding the use of plastic seats and covers, and by avoiding low humidity levels. The unit should be located away from areas that generate electromagnetic interference (for example, transformers, power distribution panels, welding equipment, motors, transmitters). Do not put the unit next to fluorescent lights. The 1486A/G/P should not be installed where the atmosphere contains corrosive elements that can damage the unit.

Do not run the cable in areas that produce electromagnetic interference (for example, near transformers, switching equipment, welding equipment, power distribution panels, and under carpets where vacuum cleaning is done). Also, do not roll heavy equipment over the cable.

Cable

You must supply all cabling for the 1486A/G/P. The cabling can be twinax cable, IBM Cabling System cable, or telephone twisted-pair cable.

Twinax Cable

Order the cabling using the following part numbers, or purchase cabling with equivalent specifications:

Bulk	Alpha 9818 Belden 9207
Adapter (cable-to-cable)	Amphenol 82-5588 AMP 227502-1
Connector (single male)	Amphenol 82-5589 AMP 22724-1

Specify the total length of each cable when ordering, including the distance from the display station to the next attaching device (host system, remote workstation controller, or another display station) plus a sufficient length of cable to reach the cable connection on the units on both ends of the cable (approximately 6 feet or 2 meters).

IBM Cabling System Cable

The IBM Cabling System cable must meet IBM specifications.

Telephone Twisted-Pair Cable

The telephone twisted-pair cable must meet the following specifications:

- #22 or #24 AWG
- Solid copper twisted-pair wires with at least two twists per 12 in (308 mm)
- A maximum of 28.6 ohms DC resistance per 1000 ft (305 m)
- Impedance characteristics:
  - 90 to 120 ohms at 256 kHz
  - 87 to 118 ohms at 512 kHz
  - 85 to 115 ohms at 772 kHz
  - 84 to 113 ohms at 1000 kHz

Maximum attenuation per 1000 ft (305 m)

  - 4.00 dB at 256 kHz
  - 5.66 dB at 256 kHz
  - 6.73 dB at 256 kHz
  - 8.00 dB at 1000 kHz

- In addition, all type 3 Specified Media must meet at least one of the following industry specifications:
  - ANSI/ICEA S-80-576-1983
  - REA PE-1
  - Bell System 48007

- Because telephone twisted-pair cable is unshielded and not well balanced, it is subject to cross talk and interference from intercoms, fluorescent lighting, power cables, welding equipment, HVAC, radio frequency transmissions, radar installations, and electric motors.

  Twisted-pair cable must not be installed near high voltage power lines or florescent lights. The minimum distance between the twisted-pair cable and power lines is as follows:

  – At least 5 in (128 mm) from power lines carrying 2 kV AC or less

  – At least 12 in (308 mm) from power lines carrying 2 kV to 5 kV AC

  – At least 36 in (923 mm) from power lines carrying 5 kV AC or more

  – At least 5 in (128 mm) from fluorescent lights

Inspecting the Packages

Before you unpack the Display/Logic element and Keyboard element, inspect the carton for physical damage.

If the exterior package is damaged, contact the local MTX, Inc. sales office or distributor. Also contact the carrier to request examination of the damage. The carrier is required to complete and sign a damage report form.

Note: To report damage, customers in the Continental US should call MTX, Inc. toll free at 1-888-648-7826 and ask for the Customer Service Department.

If the package is not damaged, remove the package contents as described in "Unpacking Instructions," below.

Unpacking Instructions

1) Move the carton to the work area.

2) Open the carton from the top.

3) Remove the accessories from the carton (power cord and operator's manual) and place these items conveniently aside.

4) Remove the carton containing the Keyboard element. Open the carton; remove the keyboard and place it aside.

5) Remove the carton containing the Display/Logic element. Open the carton and remove the Tilt/Rotate stand and the Display/Logic element. Remove the two side cushions. Place the Display/Logic element on a sturdy, flat surface. See "Installing the Tilt/Rotate Stand" on Page 2-6 for instructions on how to install the Tilt/Rotate stand.

6) Save the cartons in case you need to ship any of the elements for repair.

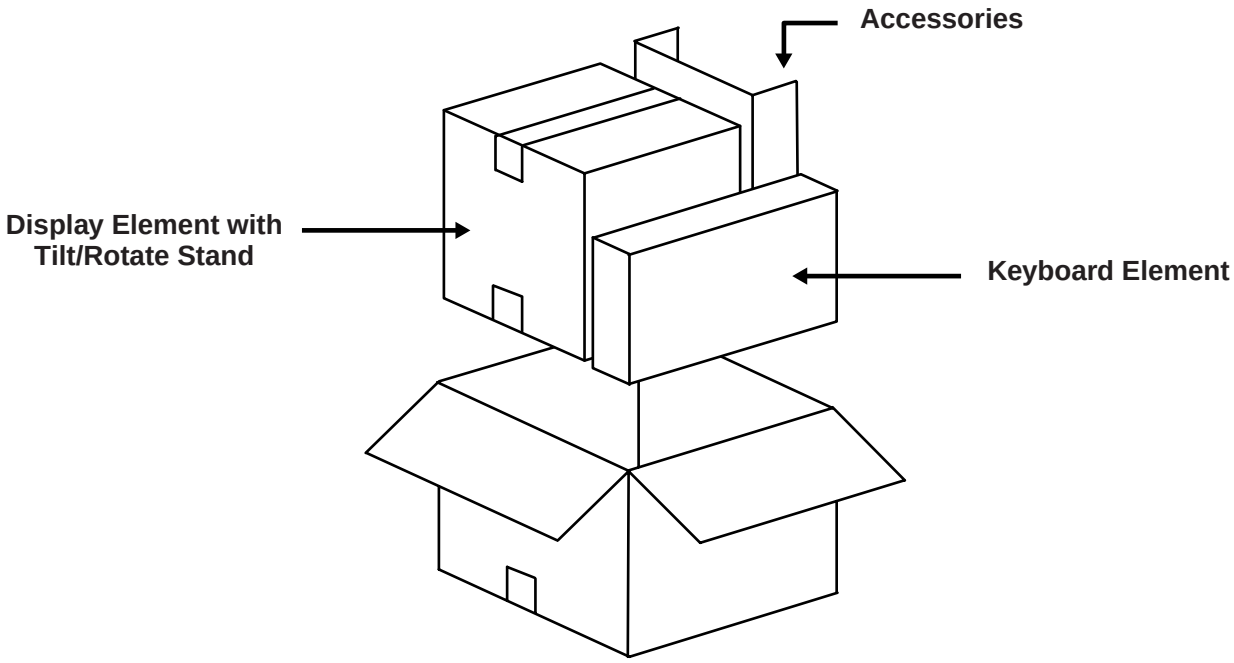


Figure 2-1. Display Station Packaging

Packing Instructions

1) To pack the Display/Logic element for shipment, remove the Tilt/Rotate stand and repack the Display/Logic element in its appropriate box. Use reinforced nylon tape to close the box.

2) To pack the Keyboard element for shipment, repack the element in its appropriate box. Use reinforced nylon tape to close the box.

Installing the Tilt/Rotate Stand

1) Turn the Display/Logic element face down with the bottom facing you.
2) Insert the four tabs on the Tilt/Rotate stand into the slots on the bottom of the Display/ Logic element and slide the Tilt/Rotate stand up until it locks into place in the slots (see Figure 2-2, below).
3) Turn the Display/Logic element with the installed Tilt/Rotate stand upright.

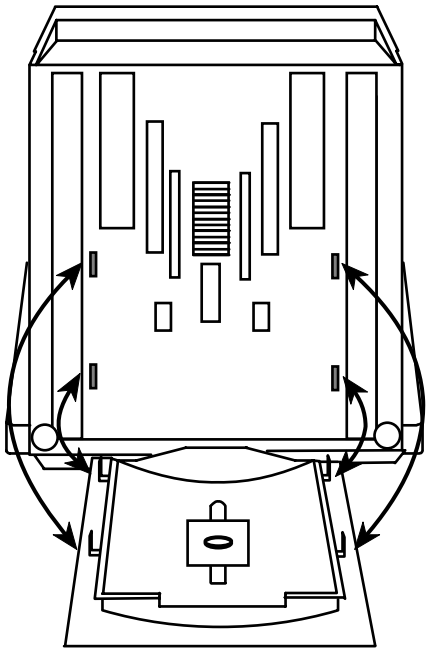


Figure 2-2. Installing the Tilt/Rotate Stand

Setting Up the Display Station

1) If you are installing more than one 1486A/G/P and they will be daisy chained by way of the twinax cable, begin with the 1486A/G/P that will be connected closest to the System/3X, AS/400, or remote control unit.

2) Place the Display/Logic element within connecting distance of an appropriate AC power outlet.

3) Place the keyboard in front of the Display/Logic element. Pull out the feet underneath the keyboard to adjust it to a higher setting, if desired. Insert the keyboard plug into the keyboard connector on the back of the Display/Logic element (Figure 2-3, below).

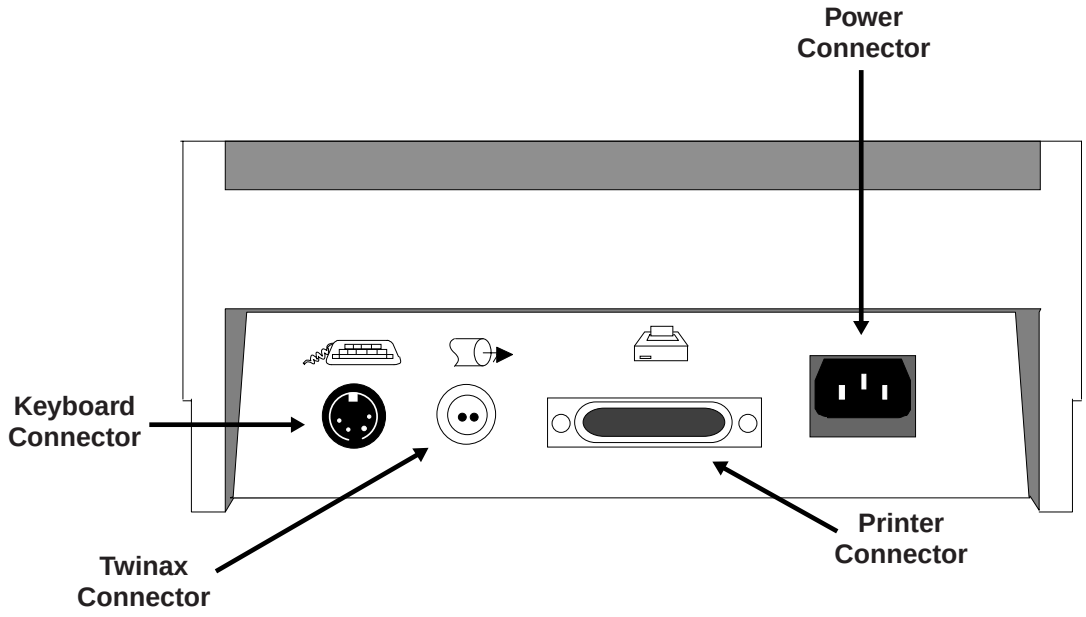


Figure 2-3. 1486A/G/P Receptacle Connectors

4) Ensure that a key is inserted into the security keylock located on the right side of the Display/Logic element (Figure 3-1 on Page 3-1).

5) Attach the printer cable (provided with the printer) to the connector on the back of the Display/Logic element as displayed in Figure 2-3, above.

6) Make sure that the Power-On/Off switch is set to Off (see Figure 3-1 on Page 3-1).

7) Plug the power cord into the power receptacle on the back of the Display/Logic element (see Figure 2-3, above).

Connecting the Display Station to the Host System

Connect the display station to the host system or to a controller by following these steps. Refer to Figure 2-3 on Page 2-7.

1) Locate the twinax cable extending from the host system or from the closest device on the host system side of the line. Attach the connector at the end of this cable to either socket on the 2-socket end of the autoterminating T-connector cable.

2) Push the connector into the socket and turn the retaining ring clockwise until tight.

3) Align the single end of the connector cable with the twinax connector on the back of the Display/Logic element. Connect the cable and secure it in place by turning the retaining ring clockwise until tight.

4) If there are other display stations in the daisy chain, connect the second cable from the next display station to the unused socket of the 2-socket end of the T-connector cable before attaching the connector cable to the back of the Display/Logic element.

5) Make sure the twinax line is terminated properly. The last T-connector should have one input open. If the last device is a MTX device, it must have a T-connector. If the last device is not a MTX device, ensure that it is terminated correctly according to the manufacturer's or the cabling network's specifications.

   If there are no more stations to be connected in the daisy chain, you are ready to begin operating the display station. See "Preparing to Operate" on Page 4-1 for instructions on how to operate the 1486A/G/P.

Note: When one connector of the 2-socket end of twinax cable is unattached, the cable is self-terminating. When the single end of the connector cable is unattached, the cable is in Pass Through mode, and signals continue on to the next connected device. Never attach the twinax cable directly to the Display/Logic element because it could result in incorrect or no operation in this display station or another display station on the line.

Chapter 3. Controls, Setup Menus, and Indicators

This chapter describes the display station controls, keyboard controls, and display indicators on the 1486A/G/P and its attached keyboard.

Display Station Controls

Figure 3-1, below, shows the location on the 1486A/G/P of the Power-On/Off switch, the Brightness control, the Contrast control, the Power-On indicator, and the security keylock. These are the only controls located on the display station itself. All other controls are set from either offline or online menus.

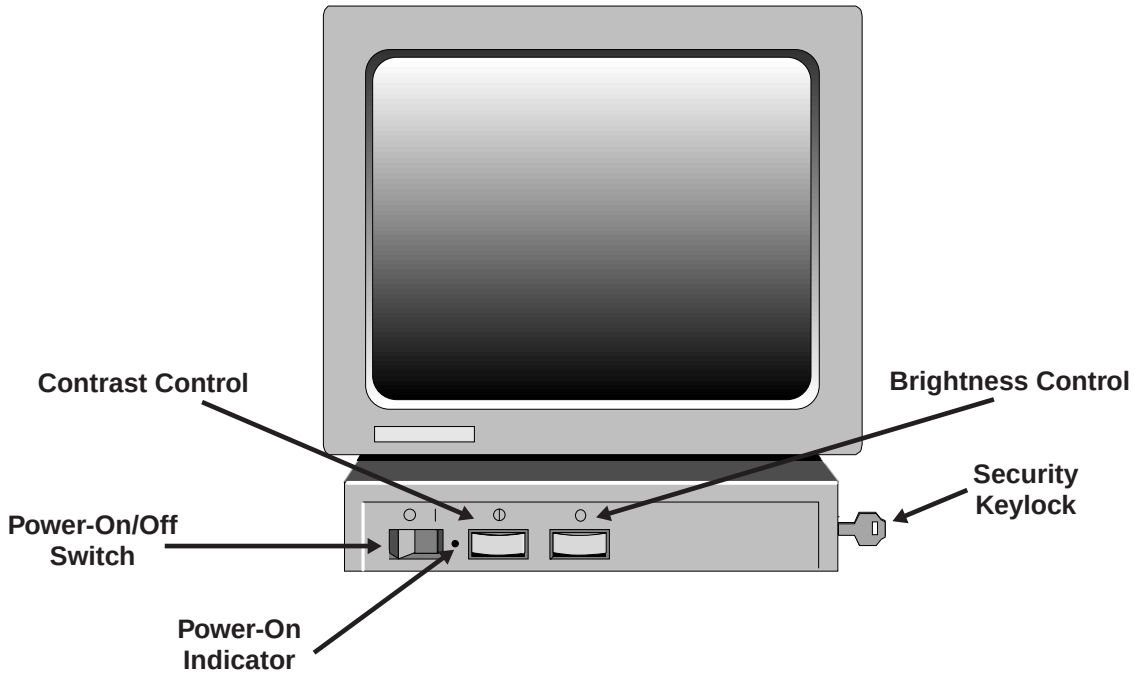


Figure 3-1. 1486A/G/P Front View

Power-On/Off

Set the Power-On/Off switch to **On** (**|**) to turn the power on. Set the Power-On/Off switch to **Off** (**O**) to turn the power off.

Brightness Control

Turn the control to the right to increase brightness or turn it to the left to decrease brightness.

Contrast Control

Turn the control to the left to increase contrast or turn it to the right to decrease contrast.

Security Keylock

The security keylock blanks the screen and inhibits 1486A/G/P access to the System/3X or AS/400. The operator status row remains displayed. Insert the key and rotate it counterclockwise to lock the keyboard. Rotate the key clockwise to unlock the keyboard.

Key Functions

The following keys perform the following functions:

Alt – Simultaneously press the Alt key and any other key to activate functions specified on the front key face. Only keys with labeled front faces have Alt (alternate) functions.

Shift – Simultaneously press the Shift key and any other key with a shifted function on the keytop to activate that shift function.

Reset – Press the Reset key to restore keyboard operations after an error condition, exit Offline Setup mode, end character insertion in Insert mode, or terminate a printer identification sequence before all characters have been entered.

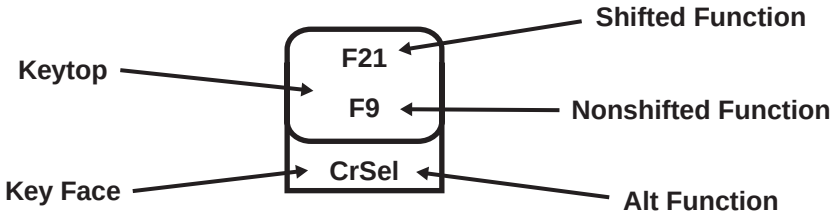


Figure 3-2. The Keytop and Key Face

Note: On some international keyboards, the Alt key function is located on the top right quadrant of the key.

Each keyboard contains autorepeat keys that repeat their functions as long as they are held down. Autorepeat keys include all keys that enter alphabetic, numeric, or symbolic characters, the space bar, and keys that assign or move the cursor's position.

Setup Mode

You can select or change screen, cursor, keyboard, and printer options; set the display station and printer address; enter the display station serial number; and test the display station in Setup mode.

All of the options can be set in Offline Setup mode, and, for your convenience, you can set or review many of the options in Online Setup mode. Refer to the following table for a list of all the setup options. The options that can also be set or changed online are marked in the Online Setup Mode column.

Setup Option	Online Setup Mode	Setup Option	Online Setup Mode
Display Emulation		Printer Emulation	
Terminal Mode		Proportional Spacing	
Language		Double Height Character	
Display Address		Download Character	
Multinational		Type Style	✓
Printer Address		Code Page	✓
Keyboard		Paper Feed	✓
Keyboard ID		Form	✓
Alarm Volume	✓	Source Drawer	✓
Click Enable	✓	Characters per inch	✓
Click Volume	✓	Lines per Inch	✓
Cursor Style	✓	Print Quality	✓
Cursor Blink	✓	Character Height	✓
Row/Column Indicator	✓	Page Orientation	✓
Rule Line Style	✓	Paper Type	✓
Rule Line Intensified	✓	End of Line Wrap	✓
Rule Line Follows Cursor	✓	Envelope Source	✓
Auto Dim Time Delay (Minutes)	✓	Attention	✓
Extended Display	✓	Form Feed after Print	✓
Typeahead	✓	Page Length	✓
Power Down	✓	Print Key	✓
Reverse Video	✓	Trim Border	✓
Intensity Control	✓	Set Power-On Escape Sequences	
Attached Printer Type		Set Soft Translate Table	

Setup Option	Online Setup Mode	Setup Option	Online Setup Mode
Set NLQ/DPQ Commands		Set Record/Playback Security	
Set Serial Number		Test	

Entering Offline Setup Mode

To enter Offline Setup mode, hold down the space bar while you turn on the display station. The Offline Main Display Setup menu is displayed (Figure 3-3, below).

Note: If the menu does not look like the one in Figure 3-3, use the Left Arrow key to highlight **Display Setup** and press the Enter key.

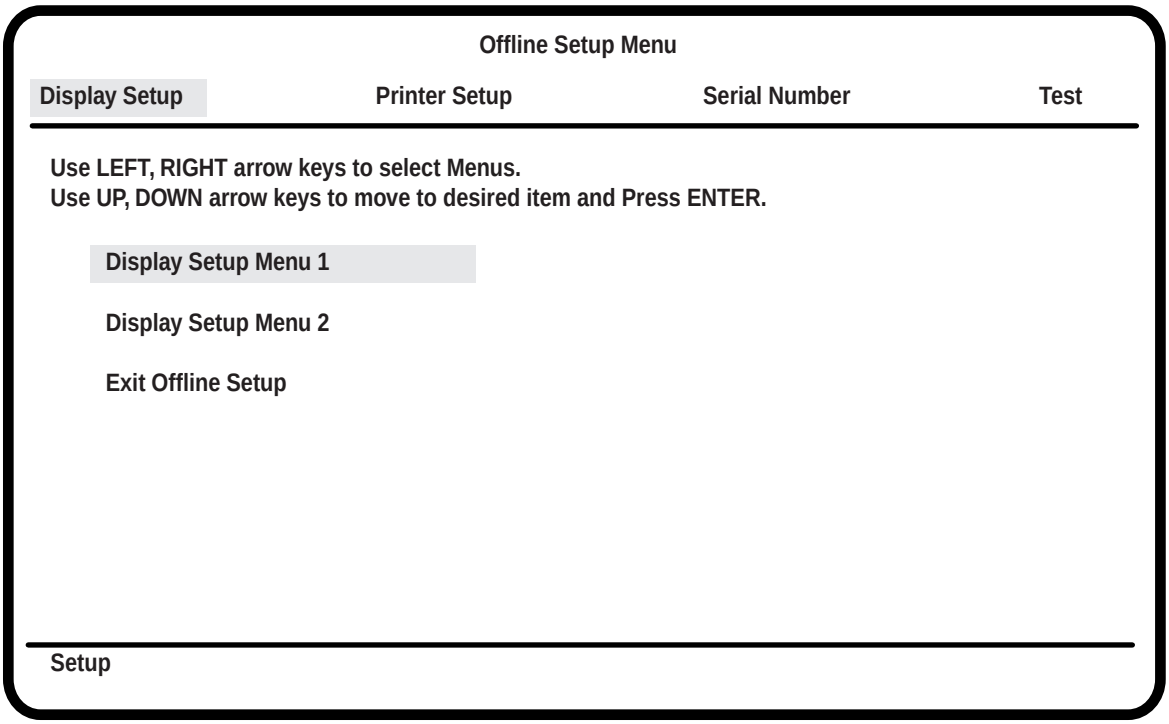
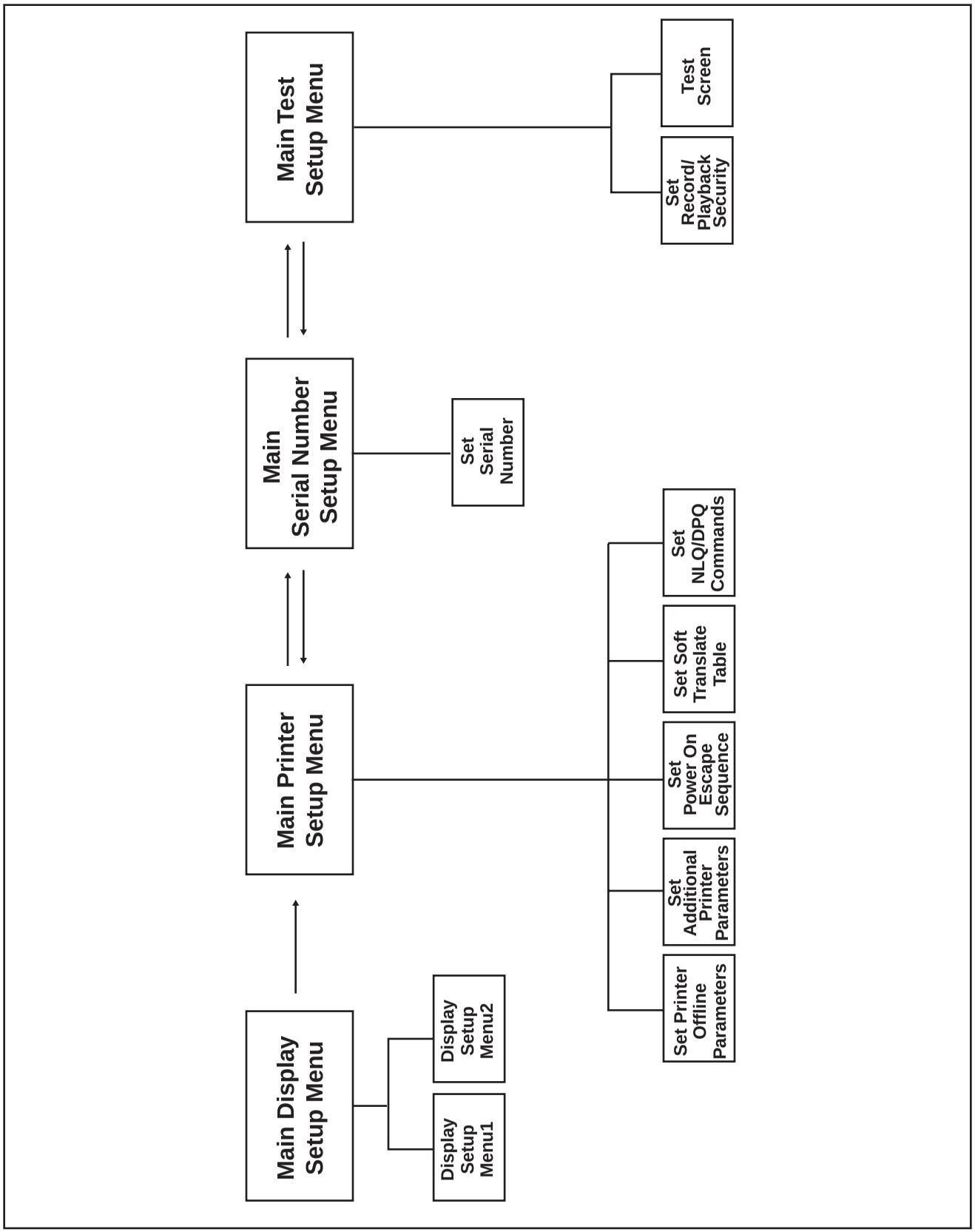


Figure 3-3. Offline Main Display Setup Menu

Offline Setup Menus



Entering Online Setup Mode

To enter Online Setup mode, the display station must be online. To go online when you power on, turn the Power-On/Off switch to On. After you are online, enter Online Setup mode by pressing the Setup key. The Online Main Display Setup menu is displayed (Figure 3-4, below).

Note: If the menu does not look like the one in Figure 3-4, use the Left Arrow key to highlight **Display Setup** and press the Enter key.

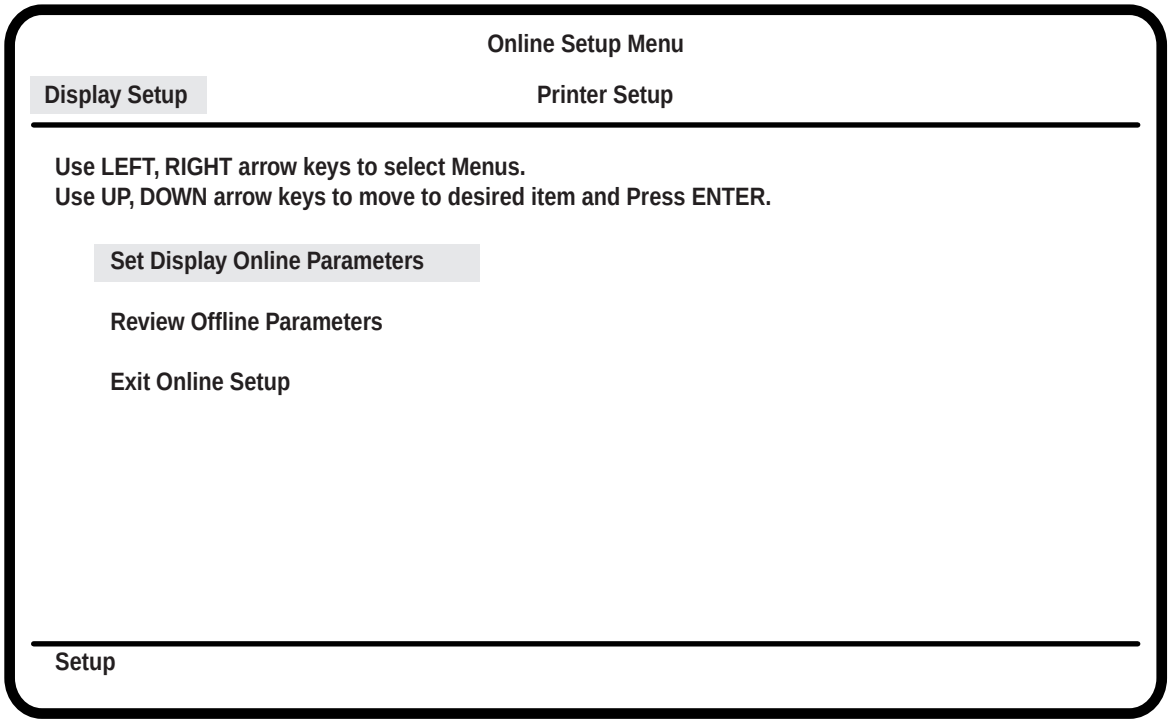
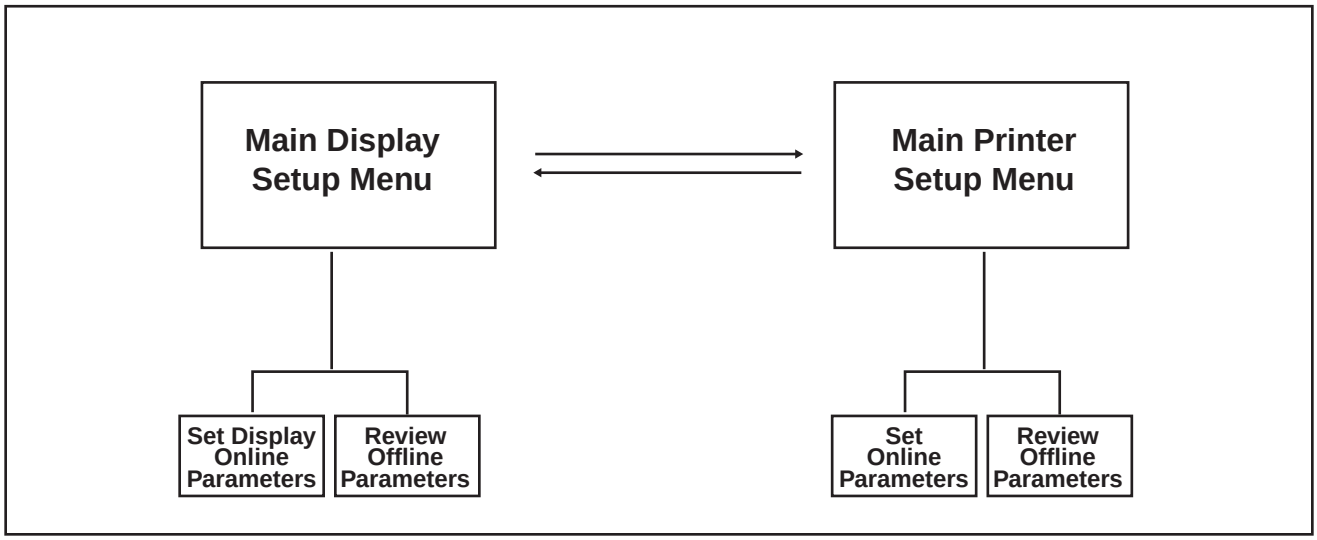


Figure 3-4. Online Main Display Setup Menu

Online Setup Menus



Using the Setup Menus

To select a main setup menu, press the Left or Right Arrow key to highlight the menu name on the top of any of the main setup menus and press the Enter key. Use the main menu to access submenus that contain the setup options. See “Offline Setup Menus” on Page 3-6 and “Online Setup Menus,” above, for illustrations of the submenus that can be accessed from each main setup menu.

To display a setup options menu, press the Up or Down Arrow key to highlight a setup choice and press the Enter key. The setup options menu is displayed.

To set an option, press the Up or Down Arrow key on the setup options menu to highlight the option and press the Enter key to cycle through the option choices. Keep pressing the Enter key until the your choice is displayed.

To save the setup option choices on a menu, press the Reset key. The option choices are saved and you return to the main setup menu.

Printing the Offline Setup Configuration

You can print a hard copy of your offline setup configuration. This is particularly useful if you move from one display station to another and want to duplicate your setup parameters. In addition, system operators can keep a hard copy of the setup configuration for all users.

To print a copy of all the offline setup menus displaying the current setup selections, display the Offline Test menu by pressing the Left or Right Arrow key to highlight **Test**, then press the PF1 key.

Setting Up the Display Station

The options in Figure 3-5, below, are available only in Offline Setup mode. See "Setup Mode" on Page 3-4 for description of Setup mode and instruction on how to enter Setup mode and use the setup menus.

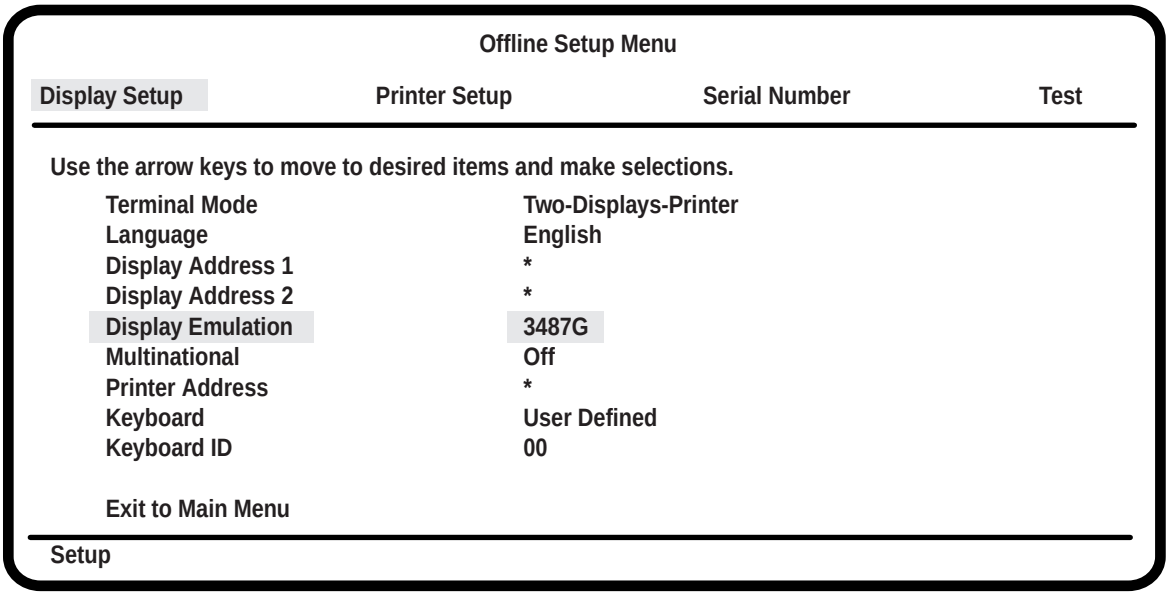


Figure 3-5. First Display Setup Menu

Display Emulation

By selecting one of the 132-column monochrome emulations, you can enable a 1486A/G/P Display Station attached to a System/3X to have 132-column capability, even though the System/3X does not support 132-column color display.

The **Display Emulation** option is also useful when installing and configuring devices where system support services are not readily available (for example, at a remote site). You can select the emulation of the display that is already configured on your system without having to change the host configuration.

Selection	Description
3477 Model D	132-column monochrome display. This emulation supports Extended Character attributes. Select this emulation for display stations attached to an AS/400.
3477 Model G	132-column monochrome display. This is the only display emulation that supports Extended Character attributes. Select this emulation for display stations attached to an AS/400.
3197 Model D 3180 Model 2	132-column monochrome display. Select one of these emulations for 132-column support for display stations attached to a System/3X.
3196	80-column monochrome display.
3179 Model 2	80-column monochrome display. If you select this option, the screen may look different from the way you are used to seeing it.
3487 Model G	132-column monochrome display. This is the default setting.

Terminal Mode

Consult the system operator before changing this option.

The 1486A/G/P can operate in four different terminal modes. By enabling up to three independent host sessions to be configured, each with a different address on the system, multiple host functions can be active simultaneously.

Selection	Description
One-Display	The 1486A/G/P operates as a single display station with one address. This is the default setting. Local screen printing is available.
Two-Displays	The 1486A/G/P operates as two display stations with two display station addresses. See "Dual Display Mode" on Page 4-2 for information about operating with two display addresses. Local screen printing is available. This is the default setting.
One-Display-Printer	Both the display and attached printer are logically connected to the host, each having a different address. In this mode, host addressable printing is enabled. Local screen printing is not available.
Two-Displays-Printer	Two displays and an attached printer are logically connected to the host, each having a different address. See "Dual Display Mode" on Page 4-2 for information about operating with two display addresses. In this mode, host addressable printing is enabled. Local screen printing is not available.

Setup Language

The default setup language is determined by the keyboard switch settings according to the table below. See "Keyboard Switch Settings" on Page 3-36 for information about setting the keyboard switches.

Keyboard Language	Setup Language
Belgian Danish Dutch Norwegian Portuguese Swedish/Finnish UK English US English	English
Spanish (Spain) Spanish-Speaking	Español
Austrian/German Swiss German	Deutsch
Canadian French French (AZERTY) Swiss French	Francais
Italian	Italiano

As soon as you select one of the following languages, the setup menus change to that language:

- **English**
- **Español**
- **Deutsch**
- **Francais**
- **Italiano**

Display Address

The display address is the display station's logical address on the System/3X or AS/400 port. Ask the system supervisor for this address. The 1486A/G/P will not operate online until you enter this address. No default address is set at the factory.

Selection	Description
00 through 06	Select an address from **00** through **06**. If you selected **Two-Displays** or **Two-Displays-Printer** for **Terminal Mode** (see "Terminal Mode" on Page 3-10), a second display address option is displayed. Select an address for each display. Do not assign the same address for two displays or a display and a printer.

Multinational Character Set

Before changing this option, consult with the system operator.

The 1486A/G/P supports country-specific character sets and the Multinational character set. The Multinational character set is a common international character set that can be used in place of the country-specific set.

Selection	Description
On	The 1486A/G/P ignores the language setting that corresponds to the keyboard switch settings and uses the Multinational character set.
Off	The 1486A/G/P selects the country-specific character set that corresponds to the keyboard switch settings. This is the default setting.

Printer Address

The printer address is the printer's logical address on the twinaxial cable originating at the System/3X or AS/400. No default address is set at the factory. Ask the system supervisor for this address. This option is available only if the display station is operating in **One-Display-Printer** mode or **Two-Displays-Printer** mode (see "Terminal Mode" on Page 3-10).

Selection	Description
00 through 06	Select an address from **00** through **06**. Do not assign the same address for a display and a printer.

Keyboard

Selection	Description
Standard	Select this iption for 122-key, 104-key, and 102/103-key keyboards. This is the default setting.
User Defined	Select a value from **00** through **63**. The user defined keyboard type is not currently supported by any host system.

Keyboard ID

This option is not displayed if **Standard** is selected for **Keyboard**. The **User Defined** option for **Keyboard** is not supported, so **Keyboard ID** is not currently used.

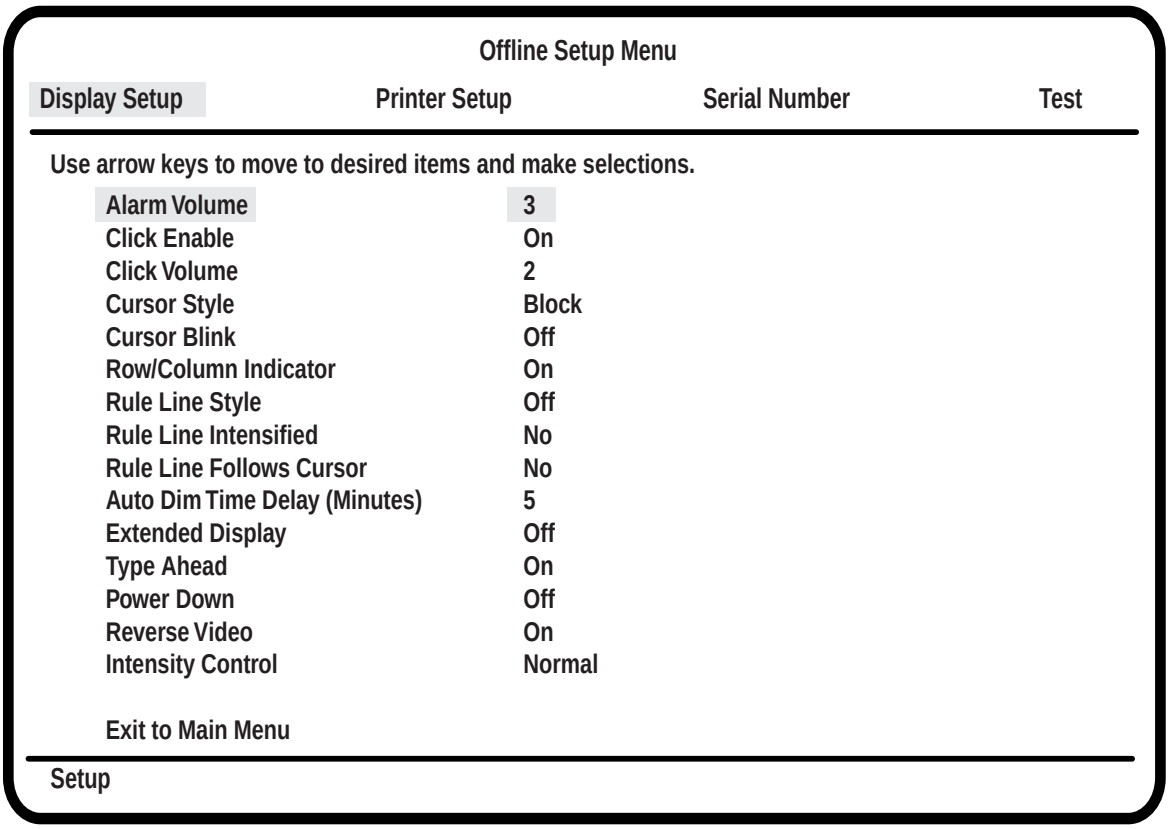


Figure 3-6. Second Display Setup Menu

Alarm Volume

The alarm sounds when the host system signals the display station to sound the alarm or when an error condition is encountered. Refer to a system user's guide for additional information regarding alarm signals from the System/3X or AS/400.

Selection	Description
Off	Turns the alarm off.
1 through 5	Select a setting from **1** (lowest volume) through **5** (highest volume). The default setting is **3**.

Click Enable

Selection	Description
On	Enables the keyboard click. This is the default setting.
Off	Disables the keyboard click.

Click Volume

Before you set the keyboard click volume, you must enable the keyboard click. See “Click Enable” on Page 3-13 for instructions on enabling the keyboard click.

Selection	Description
1 through 5	Select a setting from **1** (lowest volume) through **5** (highest volume). The dafault setting is **3**.

Cursor Style

Selection	Description
Block	Selects a block cursor (▮). This is the default setting.
Underline	Selects an underline cursor (_).

Cursor Blink

Selection	Description
On	Selects a blinking cursor.
Off	Selects a nonblinking cursor. This is the default setting.

Row/Column Indicator

You can choose to display the current row and column position of the cursor. When the Row/Column indicator is turned on, the row number followed by a slash (/) and the column number is displayed on the operator status line (*nn/nn*).

Selection	Description
On	The cursor position is displayed. This is the default setting.
Off	The cursor position is not displayed.

Rule Line Style

Selection	Description
Cross	The rule cursor is a cross (+). This is the default setting.
Vertical	The rule cursor is a vertical line (|).
Horizontal	The rule cursor is a horizontal line (–).

Rule Line Intensified

Selection	Description
No	The rule line is not intensified. This is the default setting.
Yes	The rule line is intensified.

Rule Line Follows Cursor

You can choose to have the rule line remain stationary or follow the cursor. The default setting is **No** (remains stationary).

Selection	Description
No	The rule line remains stationary. This is the default setting.
Yes	The rule line follows the cursor.

Auto Dim Time Delay (Minutes)

When the auto dim timer is set, it causes the screen to be blanked if no information is received from either the host or the keyboard during the length of time selected for this option.

Selection	Description
Off	Turns the auto dim timer off.
2, 5, 10, or 20	The screen is blanked if no information is received for 2, 5, 10, or 20 minutes. The default setting is **5**.

Extended Display

When Extended Display is enabled, certain characters, such as attributes, are displayed in hexadecimal format. This option is useful for programmers when designing formatted screens.

Selection	Description
Off	Attributes are not displayed. This is the default setting.
PS	Attributes in the display area are displayed.
ECB1	Attributes in the Extended Character Buffer #1 are displayed.
ECB2	Attributes in the Extended Character Buffer #2 are displayed.

Typeahead

When the typeahead feature is enabled, you can continue to type, even if the host system inhibits keyboard input. The 1486A/G/P stores up to 64 keystrokes. When the input inhibited condition goes away, the stored keystrokes are sent to the system. Pressing the Reset key clears the typeahead buffer and stops sending stored keystrokes to the system.

Note: If you are in an input inhibited condition while in typeahead mode, press one of the following keys to clear the typeahead buffer. These keys are immediately sent to the system.

- Reset
- Help
- Atten
- Sys Req

Selection	Description
On	The typeahead feature is enabled.
Off	The typeahead feature is disabled. The 1486A/G/P does not hold keystrokes during an Input Inhibited condition. This is the default setting.
System	The 1486A/G/P's typeahead feature is disabled. If the 1486A/G/P is attached to an AS/400 and the AS/400's typeahead feature is enabled, the typeahead function is provided by the system.

Power Down

When turned on, the **Power Down** option cuts power to the monitor and blanks the screen 30 minutes after the screen is blanked by the auto dim timer (see “Auto Dim Time Delay (Minutes)” on Page 3-15). Communication with the host is maintained while the display is powered down. The screen is restored when information is received from either the host or the keyboard.

Note: Restoration of the screen will not be instantaneous.

Selection	Description
On	The power down option is enabled.
Off	The power down option is disabled. This is the default setting.

Reverse Video

This option is available only on the 1486P.

Selection	Description
On	Black characters are displayed on a white screen. This is the default setting.
Off	White characters are displayed on a black screen.

Intensity Control

The **Intensity Control** setting enables you to determine the area to be highlighted. There are three settings for **Intensity Control**: **Normal** (the default), **Data only**, and **Highlight**.

The intensity control option is available only on the 1486P. To use the intensity control option, you must first set **Reverse Video** on Offline Display Setup Menu 2 to **On** (black characters on a white screen).

Figure 3-7, below, illustrates the **Intensity Control** options.

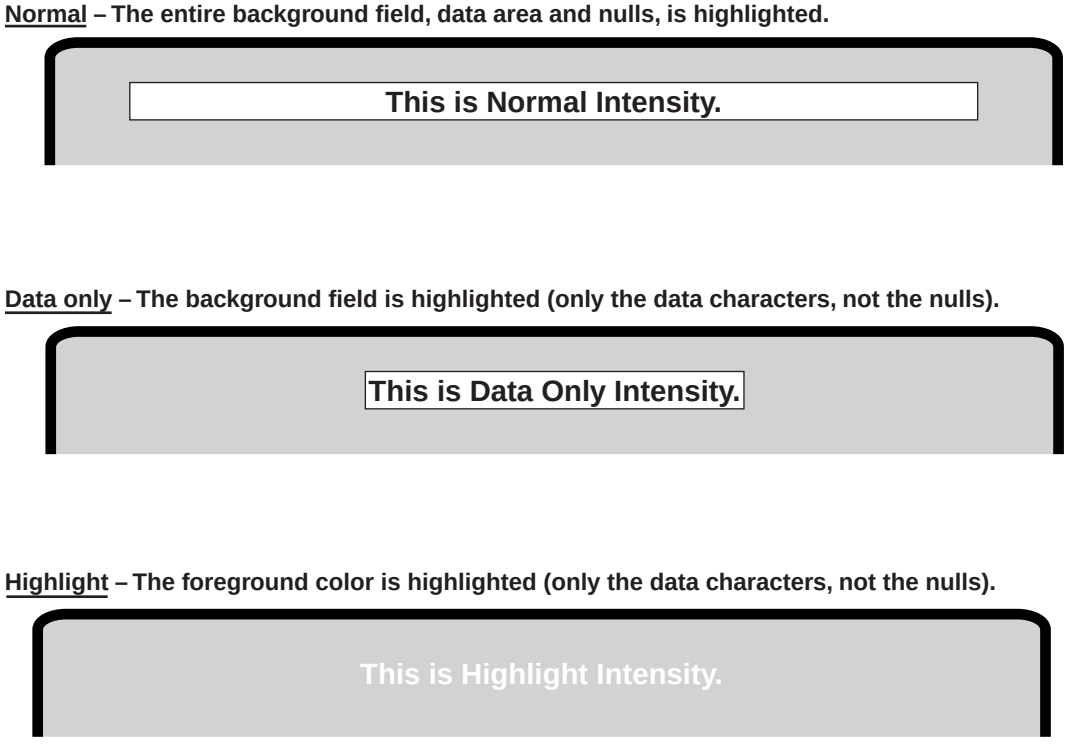


Figure 3-7. Intensity Control Options

Setting Up the Printer

The attached printer can be used as a host addressable printer if you select **One-Display-Printer** or **Two-Displays-Printer** for **Terminal Mode** on the First Display Setup menu (Figure 3-5 on Page 3-9).

The attached printer can be used as a local printer if you select **One-Display** or **Two-Displays** for **Terminal Mode** on the First Display Setup menu.

There are two printer setup menus. The first, which is offline, sets the printer parameters. The second, which is both offline and online, controls the appearances of the printed text.

Setting the Printer Parameters

The options on the menu in Figure 3-8, below, are available only in Offline Setup mode.

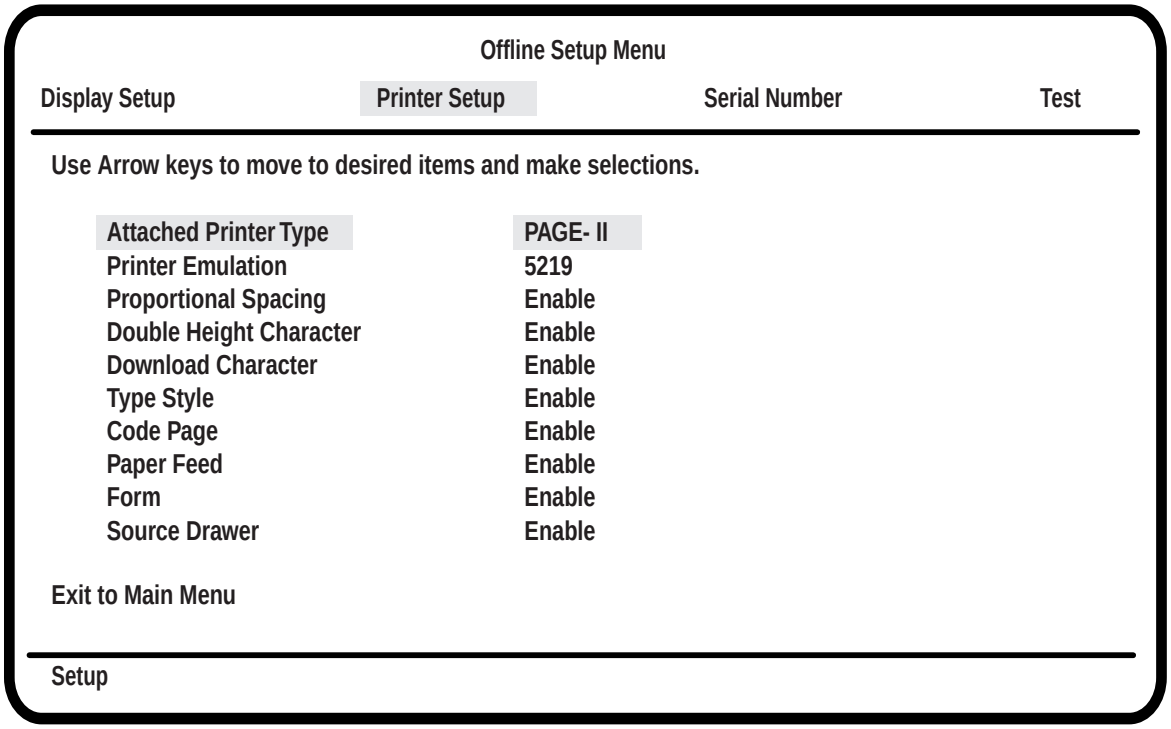


Figure 3-8. First Printer Setup Menu

Attached Printer Type

See Appendix C, "Printer Support and Limitations," for a complete list of supported printers, the emulations each printer supports, and any special configuration requirements.

Menu Option	Printer types	Notes
PRO-I/II	IBM Proprinter, Proprinter II, and compatibles	Download character support is required for international characters. This is the default setting.
PRO-III	IBM Proprinter III and compatibles	Configure printer to automatically load code page 850 into download character RAM.
QW3/QCK	IBM Quickwriter and Quietwriter-III	Requires font cartridge with code page 850.
X24/XL24	IBM Proprinter X-24, Proprinter XL-24, and compatibles	
X24E/XL24E	IBM Proprinter X-24E, Proprinter XL-24E, and compatibles	
PAGE-II	IBM Pageprinter laser printer and compatibles	Font cartridges required for support of nonresident fonts.
HP-LASER	HP LaserJet II, LaserJet III printers and compatibles	Uses Roman-8 symbol set for best font support. Font cartridges required for support of nonresident fonts.
EPSON-LQ	Epson LQ series printers and compatibles	Download character support required for international characters.

Printer Emulation

The table below lists the printer emulations supported for each printer type.

Selection	Printer type	Description
5219	QW3/QCK X24E/XL24E PAGE-II HP-LASER	Use for sophisticated word processing tasks that require font selection, automatic justification, bolding, underlining, and overstriking. Supported only on laser printers and advanced 24-wire dot matrix printers.
4214	PRO-I/II PRO-III QW3/QCK X24E/XL24E PAGE-II HP-LASER EPSON-LQ	Use for general purpose printing. This emulation supports system control of some printing parameters, such as characters per inch, lines per inch, and print quality. This is the default setting.
5256	PRO-I/II PRO-III QW3/QCK X24E/XL24E PAGE-II HP-LASER EPSON-LQ	Provides basic printing for systems that do not support the other printer emulations.

Proportional Spacing

Some printers that claim to be compatible with one of the supported printer types may not accept the command sequence used for the selection of proportionally spaced characters. These printers may treat the command as printable text. Use this selection to disable proportional spacing so the printer does not print these command sequences.

Selection	Description
Enable	Enables proportionally spaced printing by either the user or the system. This is the default setting.
Disable	Prevents the display from sending proportionally spaced printing commands to the printer.

Double Height Character

Some printers that claim to be compatible with one of the supported printer types may not accept the command sequence used for the selection of double height characters. These printers may treat the command as printable text. Use this selection to disable double height printing so the printer does not print these command sequences.

Selection	Description
Enable	Enables operator selection of double or single height characters. This is the default setting.
Disable	Prevents the display from sending character height commands that select single or double height characters to the printer.

Download Character

The download character option is used to support international characters on printers that do not support Code Page 850. The default setting depends on the printer.

Selection	Description
Enable	Enables character downloading. This is the default setting.
Disable	Disables character downloading.

Type Style

The type style is the style of the font (for example, Times Roman or Gothic). Some printers that claim to be compatible with one of the supported printer types may not accept the command sequence used for the selection of type style. These printers may treat the command as printable text. Use this selection to disable the type style option so the printer does not print these command sequences.

Selection	Description
Enable	Enables the selection of type style. This is the default setting. To select a type style, see Page 3-25.
Disable	Prevents the display station from sending select type style commands.

Code Page

The code page is the character set used by the printer to define the character representation. Some printers that claim to be compatible with one of the supported printer types may not accept the command sequence used for the selection of the character code page. These printers may treat the command as printable text. Use this selection to disable the code page option so the printer does not print these command sequences.

Selection	Description
Enable	Enables the code page option. This is the default setting. To select a code page, see Page 3-25.
Disable	Prevents the display station from sending code page commands. Select this setting if your printer does not support code page selection.

Paper Feed

Some printers that claim to be compatible with one of the supported printer types may not accept the command sequence used for the selection of the paper feed technique. These printers may treat the command as printable text. Use this selection to disable the paper feed option so the printer does not print these command sequences.

Selection	Description
Enable	Enables the paper feed option. This is the default setting. To select a paper feed technique, see Page 3-25.
Disable	Prevents the display station from sending paper feed commands.

Form

Some printers that claim to be compatible with one of the supported printer types may not accept the command sequence used for the selection of the form type. These printers may treat the command as printable text. Use this selection to disable the form option so the printer does not print these command sequences.

Selection	Description
Enable	Enables the selection of the forms type. This is the default setting. To select a form type, see Page 3-25.
Disable	Prevents the display station from sending form type commands.

Source Drawer

Some printers that claim to be compatible with one of the supported printer types may not accept the command sequence used for the selection of the source drawer. These printers may treat the command as printable text. Use this selection to disable the source drawer option so the printer does not print these command sequences.

Selection	Description
Enable	Enables the selection of the source drawer. This is the default setting. To select a source drawer, see Page 3-26.
Disable	Prevents the display station from sending source drawer commands.

Controlling the Appearance of Printed Text

All of the options displayed in Figure 3-9, below, may not be available for your printer setup. For some options that are available, some of the selections for that option may not be available. The options and selections available depend on the following setup parameters:

- Whether the printer is configured as a system printer or a local printer
- If the printer is a host addressable printer, the type of printer emulation selected
- The attached printer type

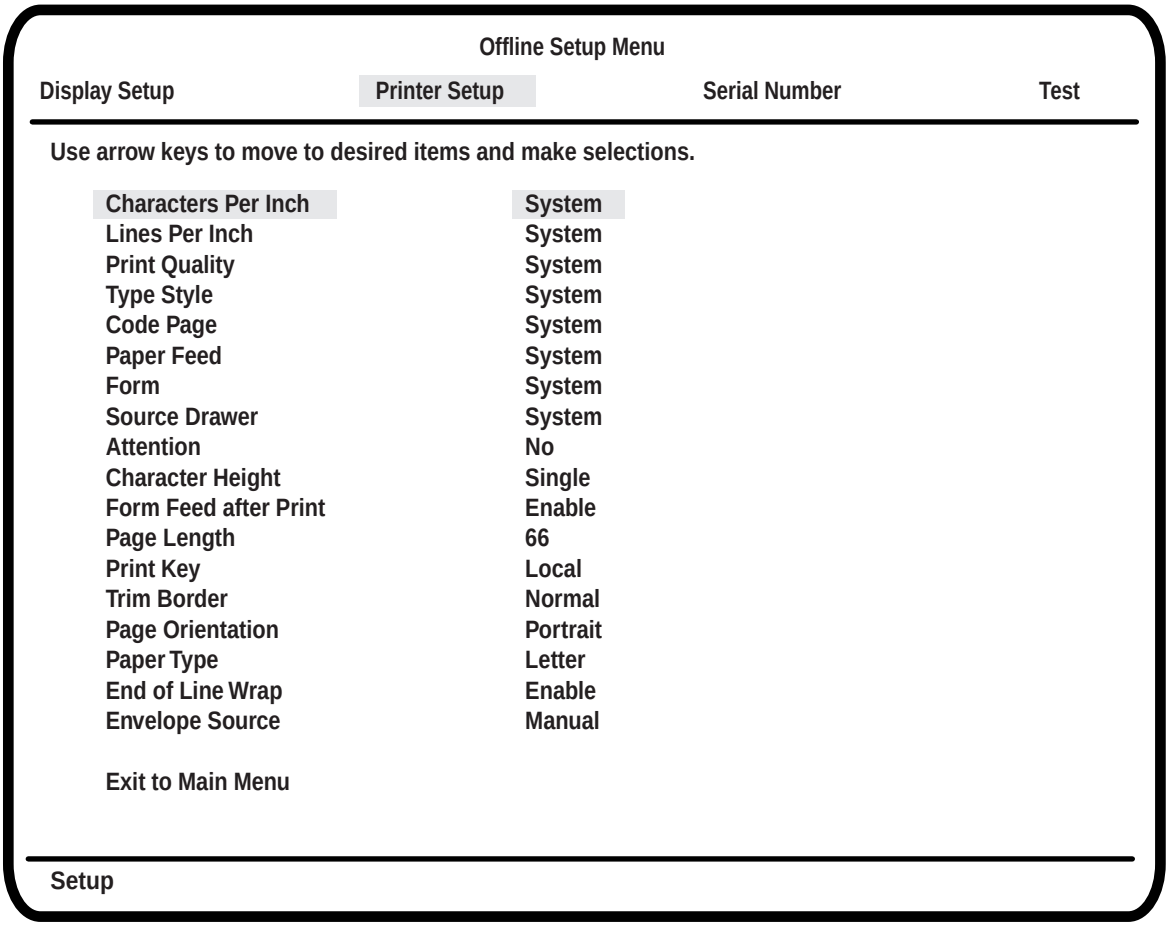


Figure 3-9. Second Printer Setup Menu

Characters per Inch

Selection	Description
System	The system selects the character density for the text sent to the printer. This is the default setting for system printers.
5, 6, 8.5, 10, 12, 17	Select a numerical value, 5, 6, 8.5, 10, 12 or 17 characters per inch, for the character density. 10 is the default setting for local printers.
PS	Forces the text to be printed with proportional spacing.
10.5	Forces the text to be printed at 10.5 characters per inch. This enables 80 characters to be printed on a line of A4 paper.
System with Compression	Enables the system to select the character density, but compresses it slightly to enable the same number of characters to be printed on A4 paper as would be printed on letter size paper.

Lines per Inch

Selection	Description
System	The system selects the line density for the text sent to the printer.
3, 4, 6, 8	Select a numerical value, 3, 4, 6, or 8 lines per inch, for the character density. 6 is the default setting for local printers.
System with Compression	Enables the system to control the line density, but compresses it to allow a .5-inch top and bottom margin. The line density compression depends on the selected paper size.

Print Quality

Selection	Description
System	The system specifies the print quality. This is the default setting.
Draft	The text is printed in draft quality. Draft quality prints the fastest.
NLQ	The text is printed in near letter quality (NLQ). NLQ is the most readable quality for 9-wire dot matrix printers.
Letter	The text is printed in letter quality. This is the most readable quality for 24-wire dot matrix printers.
Enhanced	The text is printed in enhanced print mode. This is the most readable quality for Quickwriter and Quietwriter-III printers.

Type Style

Type Style must be enabled before you can select a type style setting. See Page 3-21 for information about enabling the type style option.

Selection	Description
System	The system selects the type style. This is the default setting.
Local	The printer selects the type style. The system specified type style is ignored. The user selects the type style from the printer's operator panel.

Code Page

Code Page must be enabled before you can select a code page setting. See Page 3-21 for information about enabling the code page option.

Selection	Description
System	The system specifies the code page. This is the default setting.
Local	The code page specified by the system is ignored. The user selects the code page from the printer's operator panel.

Paper Feed

Paper Feed must be enabled before you can select a paper feed setting. See Page 3-21 for information about enabling the paper feed option.

Selection	Description
System	The system selects one of the following paper feed techniques: manual, automatic sheet feed, or continuous forms. **System** is the default setting.
Local	The paper feed technique specified by the system is ignored. The user selects the paper feed technique from the printer's operator panel.

Form

Form must be enabled before you can select a form setting. See Page 3-22 for information about enabling the form option.

Selection	Description
System	The system selects a form type, either paper or envelope. **System** is the default setting.
Paper	Forces the form type to be paper regardless of the system requested form type.
Envelope	Forces the form type to be envelope regardless of the system requested form type.

Source Drawer

Source Drawer must be enabled before you can select a source drawer setting. See Page 3-22 for information about enabling the source drawer option.

Selection	Description
System	The system specifies the drawer to be used as the paper source. This is the default setting.
1 or 2	Select drawer 1 or drawer 2. The selected drawer is used as the paper source.

Attention

When **Attention** is enabled, the display station suspends printing and displays the **ATTN** message on the operator status row to warn the operator a new type style, code page, paper feed, form, or source drawer has been requested by the system. To continue printing, display one of the online printer setup menus and press the F2 key.

Selection	Description
Yes	Enables the attention feature.
No	Disables the attention feature. This is the default setting.

Character Height

Double Height must be enabled before you can select a character height. See Page 3-20 for information about enabling the double height option.

Selection	Description
Single	Text is printed at its normal height. This is the default setting.
Double	Text is printed at twice its normal height.

Form Feed after Print

Selection	Description
Enable	At the end of a print job, the page advances to the top of the next form. This is the default setting.
Disable	At the end of a print job, the page does not advance.

Page Length

Selection	Description
001 through 255	Select the number of lines on a page, from **001** through **255**. The default setting is **066**.

Print Key

The **Print Key** selection determines how a print request is handled when you press the Print key. This option is displayed only if the display station is configured as **One-Display** or **Two-Displays** (see "Terminal Mode" on Page 3-10).

Selection	Description
System	The print request is sent to the host. The host selects the printer to print the screen contents.
Local	The screen contents are printed on an attached printer. This is the default setting.

Trim Border

Selection	Description
Normal	The trim border has normal intensity. This is the default setting.
Intensified	The trim border is intensified.

Page Orientation

Selection	Description
System	The system specifies the orientation of the text on the page.
Portrait	Forces the text to be printed on the page in portrait orientation. This is the default setting.
Landscape	Forces the text to be printed on the page in landscape orientation.

Paper Type

This option defines the paper size so character and/or line density is adjusted for A4 paper when **System with Compression** is selected for **Lines per Inch** (see Page 3-24).

Selection	Description
Letter	Selects a page size of 8.50 in x 11.00 in (215.90 mm x 279.40 mm).
Legal	Selects a page size of 8.50 in x 14.00 in (215.90 mm x 355.60 mm).
A4	Selects a page size of 8.25 in x 11.70 in (210 mm x 297 mm).
Executive	Selects a page size of 7.25 in x 10.50 in (184.15 mm x 266.70 mm).

End of Line Wrap

Use this option to select whether printable text that extends past the right edge of the printable area is wrapped onto the next line or is truncated by the printer.

Selection	Description
Enable	A printed line longer than the printable area continues on the next line. No text is eliminated from the document, but the page formatting may become disrupted.
Disable	A printed line longer than the printable area is truncated. Text may be lost, but page formatting is not disrupted.

Envelope Source

The Envelope Source option determines the source used when **Envelope** is the form type. See Page 3-25 for information about selecting a form type.

Selection	Description
Manual	Selects manual feed input as the envelope source.
1, 2	Selects source drawer 1 or 2 as the envelope source. Use this option for trays designed to handle envelopes.
Auto	Selects an optional automatic envelope feeder as the envelope source.

Setting the Power-On Escape Sequence

The power-on escape sequence is a command that sets parameters for the printer when the printer is powered on. The escape sequence can select a font, set the CPI or LPI size, put the printer in graphics mode, or set any other parameters for which there is an escape sequence. Consult the printer manual for power-on sequence codes. The default power-on sequence is all blanks.

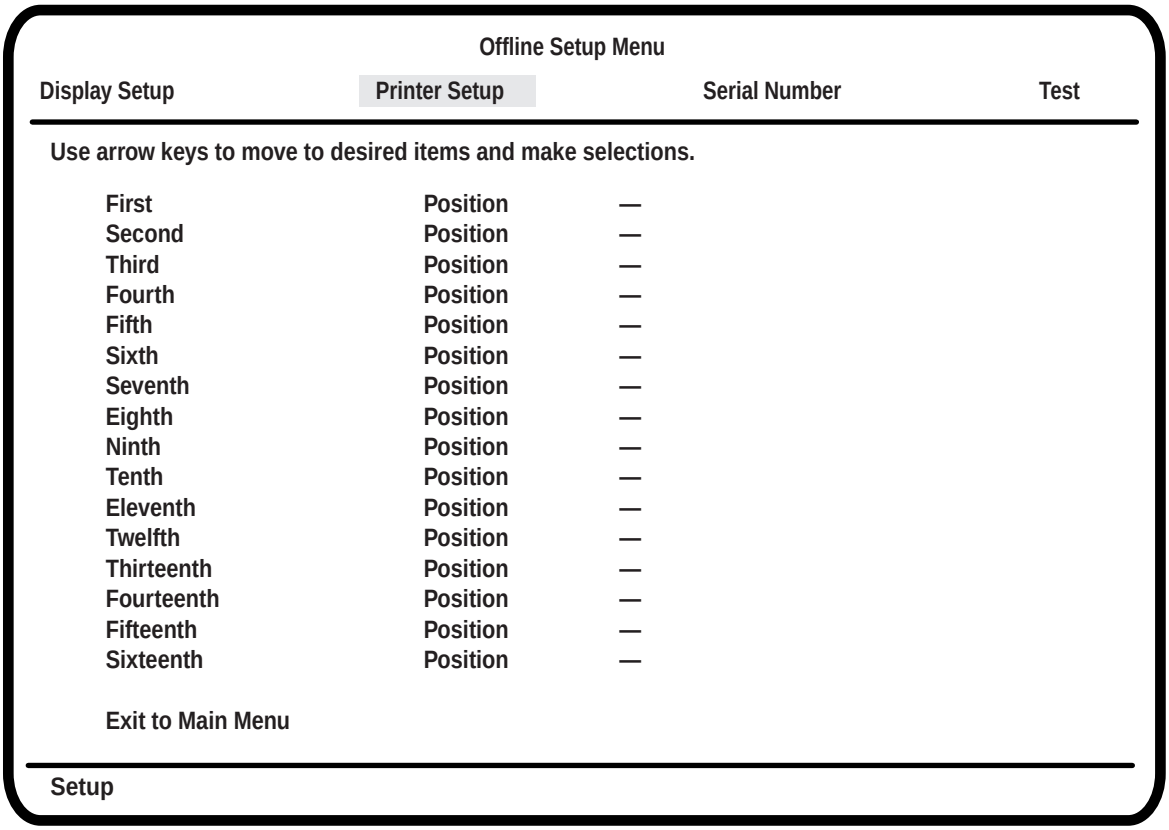


Figure 3-10. Offline Printer Power-On Sequence Setup

First Position through Sixteenth Position

Press the Up or Down Arrow key to select a position. Press the Right Arrow key to increment the hexadecimal value for the highlighted position, or press the Left Arrow key to decrement the hexadecimal value for the position.

Selection	Description
00 hexadecimal through FF hexadecimal	For each position needed, enter a value from **00** hexadecimal through **FF** hexadecimal. Consult your printer's manual for the escape codes. Some escape sequences may be shorter than 16 positions. For these sequences, do not enter a value for the unneeded positions.

Translating EBCDIC Characters to ASCII

You can use the soft translate table to define the translation of characters from EBCDIC to ASCII. You can customize the way characters print (change the character **0** to **Ø**) or define specialized functions. For example, if you have attached a supported color printer, you can use the translate table to create color switching support. Because the color printer uses escape sequences to change colors, you can select a seldom used character, such as **@**, and translate the **@** to the ASCII escape character **1B**. By entering the EBCDIC code for **@** in the EBCDIC column of the table and **1B** in the ASCII column of the table, an **@** character detected in the printer datastream is translated to an ASCII **1B**. This method enables you to imbed an escape sequence in the text that generates a color change.

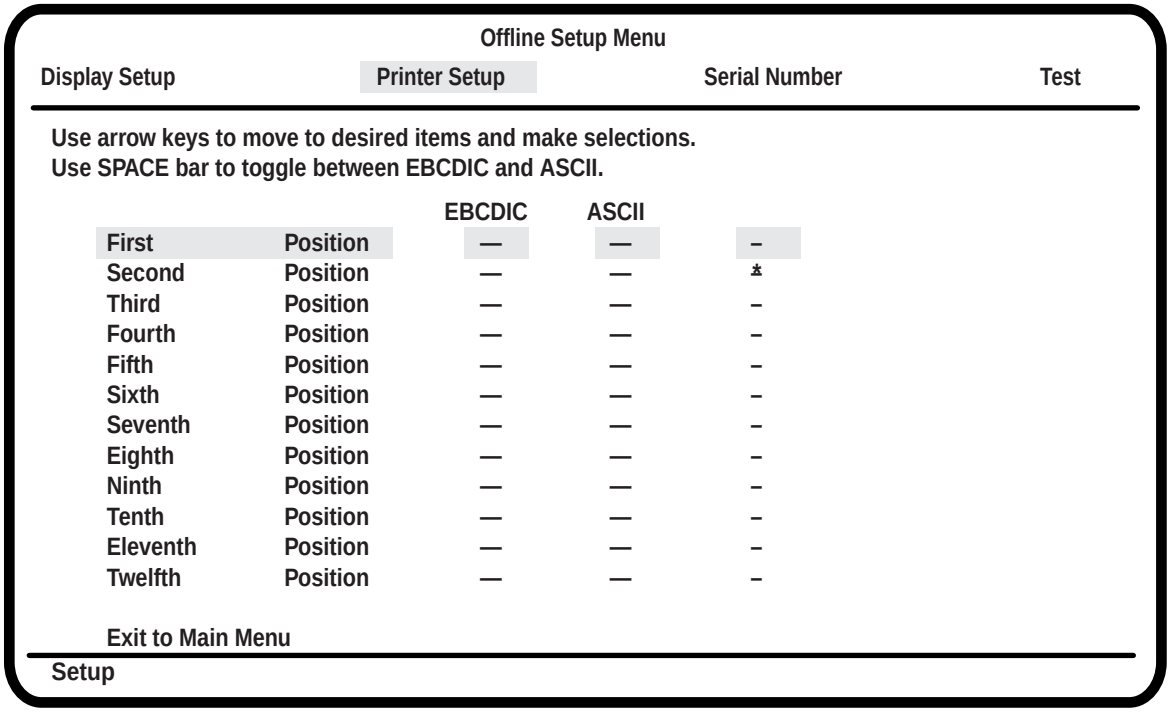


Figure 3-11. Offline Printer Soft Translate Table Setup

First Position through Twelfth Position

Selection	Description
EBCDIC: 40 hexadecimal through FF hexadecimal	For each position needed, enter a value from **40** through **FF** (EBCDIC) or **00** hexadecimal through **FF** hexadecimal (ASCII).
ASCII: 00 hexadecimal through FF hexadecimal	An asterisk (*) in the column to the right of the ASCII field identifies the ASCII code in that position as a downloaded character. Only ASCII characters **21** hexadecimal through **4A** hexadecimal can be downloaded characters. This field is displayed only if the printer supports downloaded characters and **Download Character** is enabled on the First Printer Setup menu (Figure 3-8 on Page 3-18).

Entering Print Quality Escape Sequences

The printer may support different escape sequences for near letter quality (NLQ) and draft printing (DPQ). If the printer is not performing correctly, change the escape sequences. The default setting for the escape sequences is blanks.

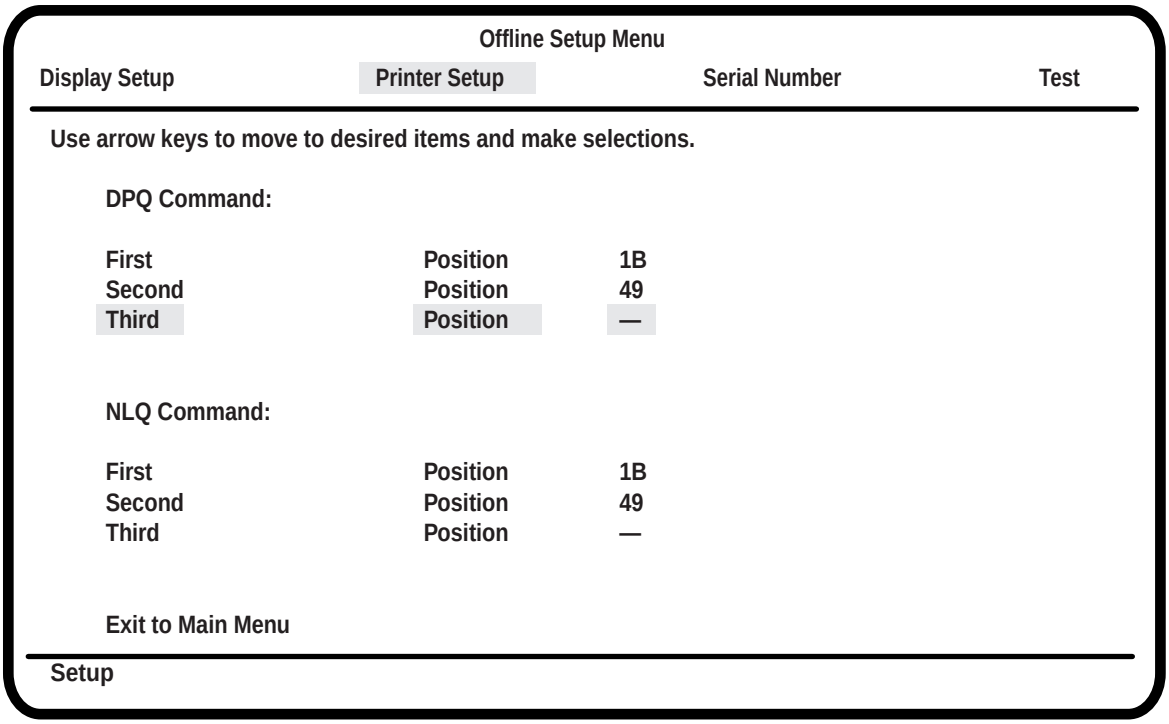


Figure 3-12. Offline Printer NLQ/DPQ Setup Menu

DPQ Commands and NLQ Commands

Selection	Description
Third Position	Enter a hexadecimal value for the **Third Position**. The **First** and **Second Positions** are for information only and cannot be changed. See the table on Page 3-32 for the hexadecimal print quality escape sequences.
Third Position	The **NLQ Command** positions are not displayed if NLQ printing is not available on the printer. Enter a hexadecimal value for the **Third Position**. The **First** and **Second Positions** are for information only and cannot be changed. See the table on Page 3-32 for the hexadecimal print quality escape sequences.

Print Quality Escape Codes

Printer Type	LQ/NLQ	DPQ
Memorex Telex 1201 Memorex Telex 1202 Memorex Telex 1208	1B 49 02	1B 49 00
IBM Proprinter (IBM 4201-001) IBM Proprinter II (IBM 4201-002) IBM Proprinter XL (IBM 4202-001) IBM Proprinter XL (IBM 4202-002)	1B 49 02	1B 49 00
IBM Proprinter III (IBM 4201-003) IBM Proprinter XLIII (IBM 4202-003)	1B 49 06	1B 49 04
IBM Proprinter X24 (IBM 4207-001) IBM Proprinter XL24 (IBM 4208-001) IBM Proprinter X24E (IBM 4207-002) IBM Proprinter XL24E (IBM 4208-002)	1B 49 02	1B 49 00
IBM Graphics Printer (IBM 5152)	1B 78 01	1B 78 00
IBM Quietwriter III (IBM 5202) IBM Quickwriter (IBM 5204)	1B 49 02	1B 49 01
Okidata 393	1B 78 01	1B 78 00
Epson LQ-850 Epson LQ-950 Epson LQ-1050	1B 78 01	1B 78 00

Note: It is not necessary to set escape codes for the IBM Pageprinter-II, IBM Pageprinter-E, Memorex Telex 1808, and Hewlett-Packard LaserJet II, IID, IIP, and III because they operate in LQ mode only.

Changing the Serial Number

Note: The serial number for the display station is already stored in memory. Check with the system operator before you change this value.

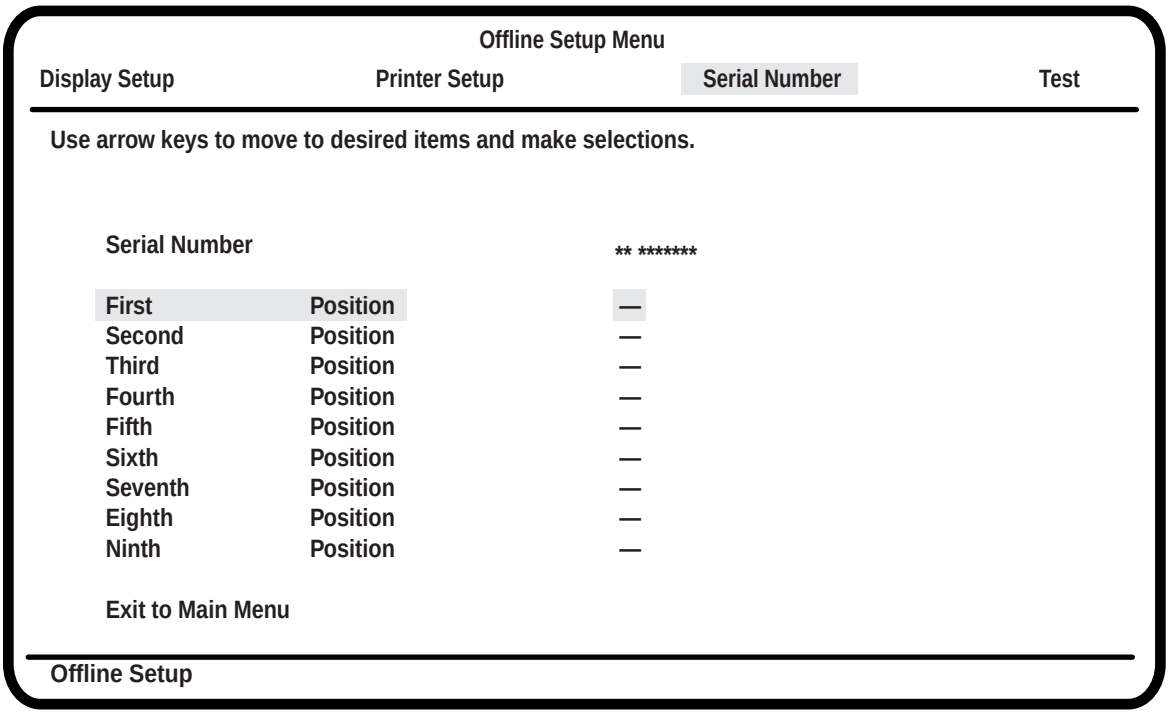


Figure 3-13. Offline Serial Number Setup Menu

Serial Number

Selection	Description
0 through 9 A through Z	For each position, enter a value of **0** through **9** or **A** through **Z**.

Setting the Record/Playback Security Mode

Record/Playback Security mode can be set to one of three levels of security, to enable users full, partial, or no access to the Record/Playback feature. For example, the system operator can prevent users form recording security-sensitive information, such as passwords, by setting the Record/Playback Security mode to **R1**. For additional information about Record/Playback mode, see “Keystroke Record/ Playback” on Page 4-12.

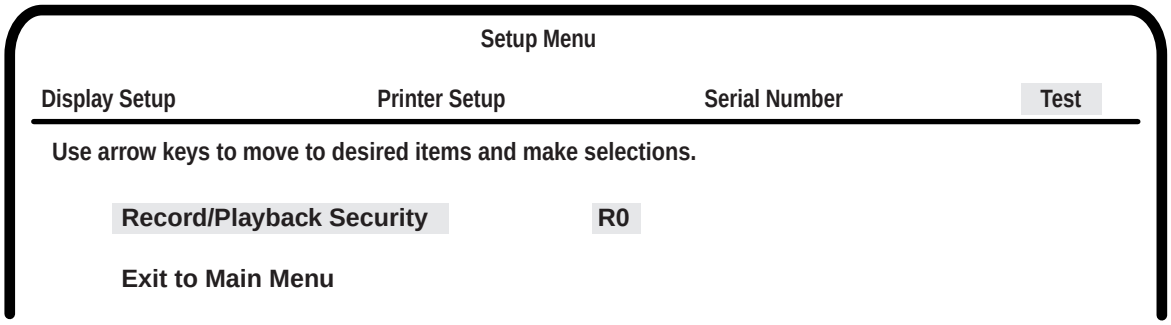


Figure 3-14. Offline Record/Playback Security Setup

Record/Playback Security

Selection	Description
R0	The full Record/Playback function is available. This is the default setting. To choose **R0** when the security setting is **R1** or **R2**, you must contact the field service representative.
R1	Data cannot be recorded in a nondisplay field (for example, you cannot record your password). To choose **R1** when the security setting is **R2**, you must contact the field service representative.
R2	The Record/Play function is disabled. You can change the security setting from **R0** or **R1** to **R2**. To change the setting from **R2** to **R0** or **R1**, contact the field service representative.

Warning

If you change to a more restrictive security level (from **R0** to **R1** or **R2** or from **R1** to **R2**), you can change back to the less restrictive level before you press the Enter key. Once you press the Enter key, the change is written to memory and you must contact a field service representative to change to a less restrictive security mode.

Testing the Display Station

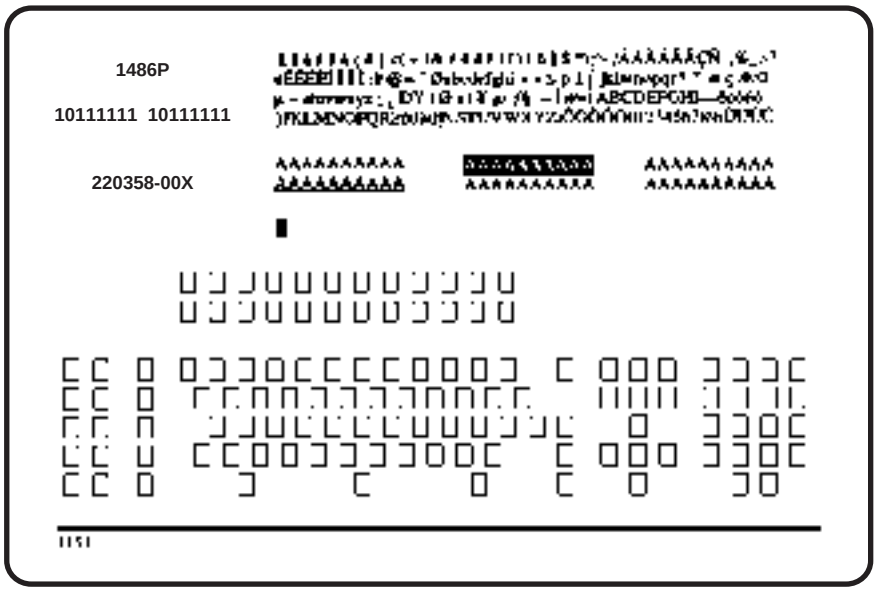


Figure 3-15. Offline Keyboard Test Screen

Each key can be tested by pressing the key. All but three keys toggle from an open box to a solid box when pressed. The Reset key and Enter key, if working properly, take you to the Main Test Setup menu when pressed. The F19 key is the Power Save Test key. If the F19 key is working properly, when it is pressed the monitor turns off. To power the monitor back on, press any other key.

Keyboard Switch Settings

The keyboard switch settings, accessed through an opening on the back of the keyboard, are set at the factory according to the keyboard ordered. You should not need to change them. If, however, the settings are inadvertently changed, reset all switches as indicated in the table below.

1486A/G/P Keyboard Switch Settings													| = OFF and O = ON
Keyboard Type	**Switch Numbers**												
	1	2	3	4	5	6	7	8	9	10	11	12	
United States – TW	|	|	|	|	O	|	|	|	|	|	|	|	
United States – DE	|	|	|	|	O	O	|	|	|	|	|	|	
Austria/Germany	|	|	|	|	O	|	|	|	|	|	|	O	
Belgium	|	|	|	|	O	|	|	|	|	|	O	|	
Canada (French)	|	|	|	|	O	|	|	|	|	O	|	|	
Denmark	|	|	|	|	O	|	|	|	|	O	|	O	
France (Azerty)	|	|	|	|	O	|	|	|	|	O	O	|	
Italy	|	|	|	|	O	|	|	|	O	|	|	O	
Norway	|	|	|	|	O	|	|	|	O	O	|	|	
Portugal	|	|	|	|	O	|	|	|	O	O	|	O	
Spain	|	|	|	|	O	|	|	|	O	O	O	|	
Spanish Speaking	|	|	|	|	O	|	|	|	O	O	O	O	
Sweden/Finland	|	|	|	|	O	|	|	O	|	|	|	|	
Switzerland (German)	|	|	|	|	O	|	|	O	|	|	|	O	
Switzerland (French)	|	|	|	|	O	|	|	O	|	|	O	|	
United Kingdom	|	|	|	|	O	|	|	O	|	|	O	O	
Netherlands*	|	|	|	|	O	|	|	O	|	O	|	|	

***** 103-key keyboard only

Setting the 122-Key Keyboard Switches through Key Sequences

To set the keyboard switches through key sequences, follow these steps:

1) Press the left Alt, Reset, and Caps Lock keys at the same time. You enter ID Set mode with all switches set to Off (indicated by I in the previous table).
2) Function keys 1 through 12 correspond to positions 1 through 12. Referring to the previous table, for each position that you want to set On, press the corresponding function key.

   For example, to set switch 6 On, press F6.
3) When the ID is set, press the left Alt, Reset, and Caps Lock keys at the same time to leave ID Set mode and save the switch settings.

If you press the wrong function key while in ID Set mode, you must leave ID Set mode, enter ID Set mode again (this resets all the switches to Off), and press the correct function key.

Indicators

The 1486A/G/P indicators are the Power-On indicator, the cursor, and the operator status row indicators.

Power-On Indicator

When lit, the Power-On indicator tells you the display station is powered on.

Cursor

After the 1486A/G/P has been powered online and has completed its warm-up period, a cursor is displayed. The position of the cursor is determined by the host. When you use the keyboard to enter characters, the cursor moves to the next available character position on the screen. You can move the cursor by using the cursor positioning keys. If you move the cursor beyond the edge of the screen, it "wraps," so that the cursor appears at the first character position of the next line on the opposite side of the screen. If you move the cursor to the right (beyond the last position in the last data row), it reappears in the first character position on the top row. The cursor also wraps from bottom to top in the same character position.

Operator Status Row Indicators

The operator status row is the area below the last data row and is separated from the rest of the screen by one nonintensified line. The operator status row contains symbols that indicate the current operation conditions.

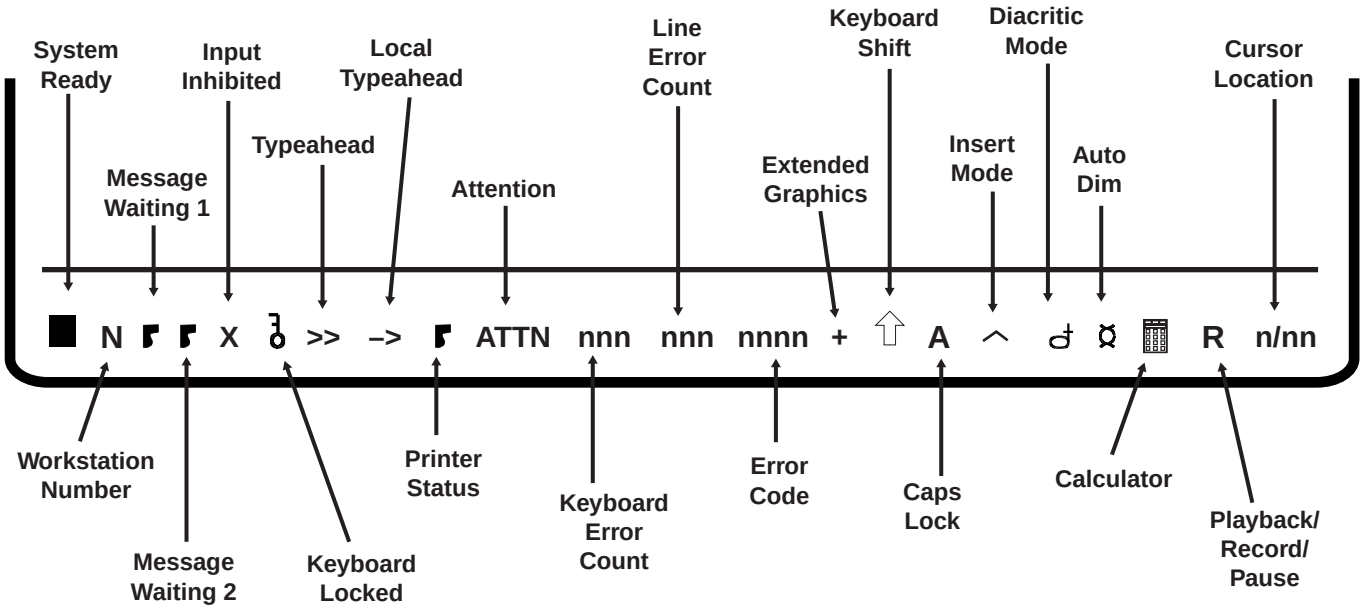


Figure 3-16. Operator Status Row Symbols

Note: The printer status symbol is always displayed if the display station is configured for a host addressable printer (**One-Display-Printer** or **Two- Displays-Printer**). See "Terminal Mode" on Page 3-10 for instructions on how to select the terminal mode.

If the display station is configured for a local printer (**One-Display** or **Two-Displays**), the printer status symbol is displayed only if the printer is attached and powered on. If the printer is not attached, or if it is not powered on, no printer status symbol is displayed on the operator status row.

The table on Page 3-40 describes the symbols that are displayed on the operator status row.

Note: If a one- to three-character error code is displayed on the operator status row, refer to "Hardware Failure Error Codes" on Page 6-3. If a four-digit error code is displayed on the status row, refer to Appendix A, "Four-Digit Error Codes."

Local Screen Print Symbols

When you perform a local screen print, the following symbols are displayed on the operator status row:

Figure 3-17. Operator Status Row - Local Screen Print

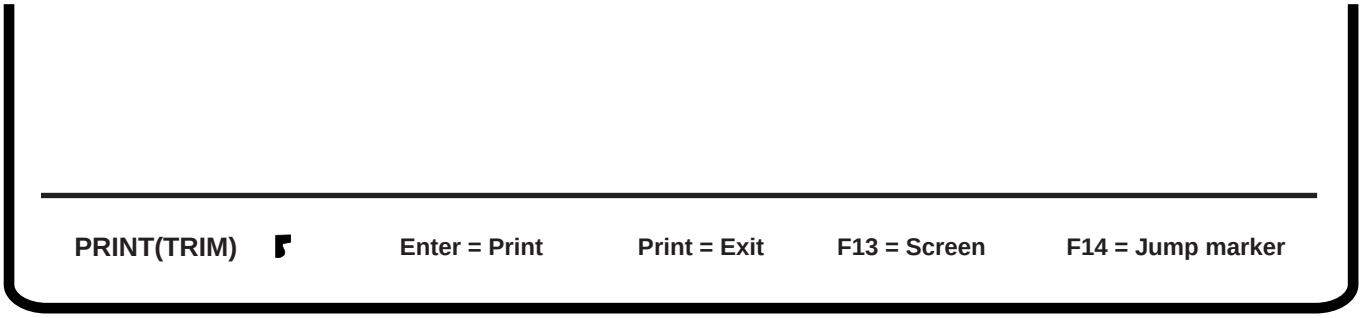


Figure 3-18. Operator Status Row - Local Trim Print

See the table on Page 3-41 for a description of the local screen print and local trim print operator status row symbols.

Operator Status Row Indicator Symbols		
Symbol	**Name**	**Meaning**
■	System Ready	The system is operating and available.
n	Workstation Number	Indicates which logical display station is currently active, 1 or 2.
	Message Waiting	A message is waiting in the active session.
	Message Waiting	A message is waiting in the inactive session.
X	Input Inhibited	The system does not accept the keyboard input. This indicator is turned on when the system is processing the input or when it recognizes an error condition.
	Keylock Locked	The security keylock is locked. Nothing can be displayed until it is unlocked.
	Typeahead	You can continue keying in, even if the keyboard becomes locked. This feature is supported on AS/400 Release 2 or later.
	Local Typeahead	You can continue keying in, even if the host inhibits the keyboard.
	Printer Status – Printer Not Available	The printer is not available. **System Printer**: There is a problem (for example, the printer is not powered or it is not in communication with the host). **Local Printer**: Printer attached.
	Printer Status – Printer Available	The printer is available. **System Printer**: The printer is powered on and in communication with the host. **Local Printer**: Printer printing.
ATTN	Attention	A warning that a new type style, code page, paper feed, form, or source drawer has been requested by the system.
nnn	Keyboard Error Count	The number of keyboard errors that have occurred since the display was powered on.
nnn	Line Error Count	The number of line errors that have occurred since the display was powered on.
nnnn	Error Code	A four-digit number. Refer to Appendix A, “Four-Digit Error Codes.”
+	Extended Graphics	The extended keyboard layout has been selected. Extended graphics is supported on the AS/400 Release 2 or later.
	Keyboard Shift	The keyboard is in Insert mode.
A	Caps Lock	The keyboard is in Caps Lock mode. All alphabetic characters are entered in uppercase.
^	Insert Mode	The keyboard is in Shift mode.
	Diacritic Mode	The display station is in Diacritic mode. Diacritic mode is a function of the host.

Operator Status Row Indicator Symbols		
Symbol	**Name**	**Meaning**
¤	Auto Dim	The Automatic Screen Dim function is on. No key has been pressed and the host has not sent a write message for the number of minutes specified. Press any key to restore the screen.
R	Record/Playback/Pause	**R** indicates Record mode, **P** indicates Playback mode, and **P^** indicates Pause mode. The number after **R** is the number of keystrokes you can store. For more information about Keystroke Record/Playback mode, see “Keystroke Record/Playback” on Page 4-12.
nn/nn	Cursor Location	The row and column of the current cursor location.

Local Screen Print Operator Status Row Symbols		
Symbol	**Name**	**Meaning**
PRINT(SCREEN)	Local Screen Print Status Indicator	The display station is in Local Screen Print mode.
PRINT(TRIM)	Local Trim Print Status Indicator	The display station is in Local Trimmed Area Print mode.
	Printer Status – Printer Not Available	The printer is not available. There is an error at the printer (for example, the printer is disabled or it is out of paper). or The printer is currently printing another job.
	Printer Status – Printer Available	The printer is available. There are no errors at the printer.

Chapter 4. Operating Procedures

To follow the operating procedures in this manual, the 1486A/G/P Display Station must be attached to a powered, operational System/3X or AS/400.

Refer to Chapter 2, “Customer Installation,” for more information about connecting the 1486A/G/P. Refer to Appendix B, “System Configuration,” for configuration information.

Preparing to Operate

After the display station has been properly installed and connected to the System/3X or AS/400, it is ready to operate online. To ensure that the display station is prepared to operate, perform the following steps. If you encounter operating difficulty or if the display station malfunctions, refer to Chapter 6, “Problem Determination and Maintenance,” for additional information.

1) Turn the security keylock clockwise to unlock the keyboard.

2) Set the Power-On/Off switch to **On** (|) to turn on the power.

3) The Power indicator lights, a cursor is displayed in the host specified position on the screen, and the operator status row displays the System Available indicator.

   Note: Refer to Chapter 3, “Controls, Setup Menus, and Indicators,” for explanations of all operator status row symbols.

4) If the cursor fails to appear or a display like the one described above is not produced, refer to Chapter 6, “Problem Determination and Maintenance.”

5) Adjust the Contrast control and Brightness control.

Terminal Modes

The 1486A/G/P can interact with the host system in four different modes: Single Display mode, Dual Display mode, Display-Printer mode, and Display-Display- Printer mode. The following section describes the operating procedures in each mode. Refer to "Setting Up the Display Station" on Page 3-9 for information on how to configure the display station for each mode.

Single Display Mode

The display station operates as one display station with one display station address.

Dual Display Mode

The display station operates as two display stations with two display station addresses. You can toggle between the two sessions by pressing and holding the Alt key while you press the Jump key, or you can view data from the two logical display stations simultaneously in Split Screen mode. To enable and disable Split Screen mode, press and hold the Alt key while you press the Zoom key (a ⟷ a).

In Split Screen mode, the active session is always 24 lines by 80 columns and contains the cursor. The inactive session is always 18 rows by 80 characters and does not contain the cursor. If you change the inactive session to the active session, the cursor moves to the new active session, the new active session expands to 24 rows, and the formerly active session shrinks to 18 rows. See Figure 4-1, below.

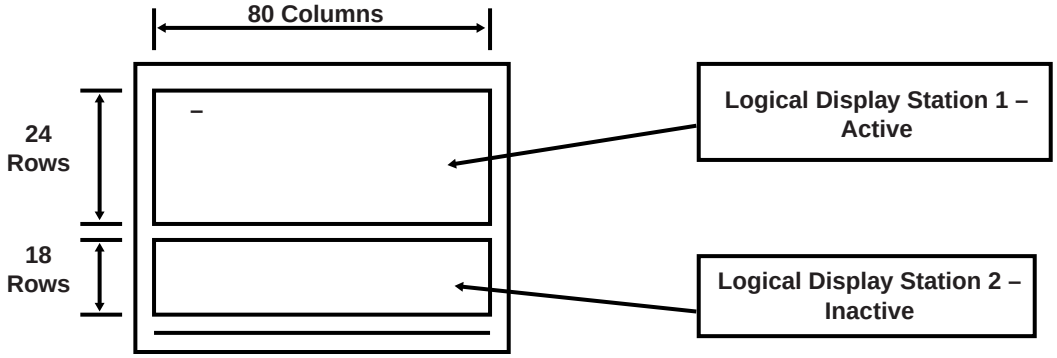


Figure 4-1. Dual Display Mode Split Screen

The following table shows the keystrokes required to perform Dual Display mode functions:

To perform this function	Press these keys simultaneously
Enable or disable Split Screen.	Alt + **a** ⟷ **a** (Zoom)
Scroll forward through the inactive session (logical display station 2). Scrolling goes to the 24th line of data. When it reaches the 24th line, it stops.	Alt + Fwd
Scroll backward through the inactive session (logical display station 2). Scrolling goes to the 1st line of data. When it reaches the 1st line, it stops.	Alt + Back
Change active screens as determined by the display station address.	Alt + Jump

Display-Printer Mode

The display station operates with one display station address and one printer address. In this mode, you can use the host addressable print function. See “Setting Up the Printer” on Page 3-18 for instructions on how to set the print parameters.

Two-Displays-Printer Mode

The display station operates as two display stations and a printer station with addresses for each. Press the Jump key to change displays. The host addressable print function is also available and has its own address (see “Setting Up the Printer” on Page 3-18).

Entering Data

Data entry consists of writing data messages in an acceptable form for computer processing. As messages are entered through the keyboard, they are displayed on the screen either as unformatted information or according to a program determined format. Attributes of the formatted screen fields control the amount and type of entered data (alphanumeric or numeric).

Moving the Cursor

The cursor always indicates the next available character position on the screen. For applications using an unformatted screen, you select where the next character is to be entered by moving the cursor to the desired screen position. The table below shows the keys used for positioning the cursor:

Keytop Labels		Key Name	Key Function
122/104-Key Keyboard	102/103-Key Keyboard		
↑	↑	Cursor Up	Moves the cursor up.
↓	↓	Cursor Down	Moves the cursor down.
←	←	Cursor Left	Moves the cursor left. When the cursor moves beyond the edge of the screen, it “wraps” to the last character position of the previous line.
N/A	Alt + ←	Cursor Fast Left	Moves the cursor left at double speed.
→	→	Cursor Right	Moves the cursor right. When the cursor moves beyond the edge of the screen, it “wraps” to the first character position of the next line.
N/A	Alt + →	Cursor Fast Right	Moves the cursor right at double speed.
↵	⇧ + ↵	New Line	Moves the cursor to the first entry position on the next line. If the cursor is at the last entry position on the bottom line, pressing this key moves the cursor to the first entry position at the top of the screen.
←	←	Backspace	Moves the cursor backward.
⇤	⇧ + ⇤	Field Backspace or BackTab	Moves the cursor back to the first position of the current input field, or, if the cursor is already in the first position, moves it to the first position of the previous field.
⇥	⇥	Field Advance	Moves the cursor forward to the next position at which data can be entered. On formatted screens, pressing the Field Advance key moves the cursor to the first position of the next input field.

Keytop Labels		Key Name	Key Function
122/104-Key Keyboard	102/103-Key Keyboard		
Field Exit	Field Exit	Field Exit	Inserts blanks from the present location to the end of the field. In a right justified field, the data to the left of the cursor is shifted to the right. The vacated positions are filled with blanks or zeros, as specified by the format, and the cursor advances to the next input field. In a signed numeric field, pressing this key inserts a blank in the last position of the field.
Field +*	Field +	Field +	When you use the numeric keypad, this key performs the function of the Field Exit key.
Field –*	Field –	Field –	When you use the numeric keypad, this key places a minus sign (–), or an alphabetic character that the application program designates as a minus sign, in the last position of a signed numeric-only field.
Alt + Home	Home	Home	Moves the cursor to the first input position of the first line on an unformatted screen or to the first input position of the first input field on a formatted screen.

***** 122-key keyboards only

Entering Data Characters and Selecting Modes

Enter alphabetic, numeric, and special characters by pressing the corresponding keys.

After you fill the last data line of the display field, the cursor automatically returns to the first available character position. If you enter additional data, you may write over any previously entered characters. To prevent loss of previous entries, transmit the data message to the System/3X or AS/400 whenever the screen has been completely filled with data. Refer to "Transmitting Messages" on Page 4-8 for additional information on how to transmit messages.

Keytop Labels		Key Name	Key Function
122/104-Key Keyboard	102/103-Key Keyboard		
⇧	⇧	Shift	Selects upper characters on dual character keys, or uppercase characters for alphabetic keys. Shift key must be pressed while entering data. Shift mode is indicated on the operator status row by the Shift (⇧) symbol.
🔒	Caps Lock	Shift Lock or Caps Lock	Locks the keyboard into Shift Lock or Caps Lock mode. Alphabetic characters are entered as uppercase characters and characters on the upper half of nonalphabetic keys are entered. On the 102-key keyboard, the Caps Lock key works only for keys with alphabetic characters. For nonalphabetic keys, you must hold down the Shift key to select the character on the upper half of the key.

Editing Data

After a data message has been composed, you can change the information before you send it to the System/3X or AS/400, or you can call up previously entered data messages for editing.

All the keys described in "Entering Data Characters and Selecting Modes" on Page 4-6 can also be used to edit data and messages.

Keytop Labels		Key Name	Key Function
122/104-Key Keyboard	102/103-Key Keyboard		
Ins	Insert	Insert	Adds characters at the cursor's current position. Press the Reset key to exit Insert mode. The symbol ^ is displayed on the operator status row when the display station is in Insert mode.
Delete	Delete	Delete	Removes a character at the cursor's current position. The remainder of the line shifts one character position to the left.
⇧ + ErInp	Alt + ErInp	Erase Input	Erases all field entry positions and returns the cursor to the home position.
Dup	⇧ + Dup	Dup	Repeats entered data and moves the cursor to the first entry position of the next entry field. An overscored asterisk ($\bar{*}$) is displayed in the cursor position and in any additional positions in that field that follow the cursor.
Alt + Hex	Alt + Hex	Hex	Enters the hexadecimal equivalent of a character.
⇧ + Roll ↑	PgUp	Scroll Up or Page Up	Scrolls up through the lines on the display.
⇧ + ↓	PgDn	Scroll Down or Page Down	Scrolls down through the lines on the display.
Rule	Alt + Rule	Rule	Enables or disables one of three selectable ruler styles (vertical [|], horizontal [–], or vertical and horizontal [+]). See "Rule Line Style" on Page 3-14 for instructions on how to select a ruler style.

Transmitting Messages

After you have filled all character positions on the screen, send the displayed information to the System/3X or AS/400 before continuing data entry. If you continue to enter data, the cursor "wraps" and reappears in the first available character position of the screen. Subsequently entered characters replace displayed characters, resulting in loss of previous entries.

After filling all required character positions on the screen, press the Enter key to request a communications line for sending displayed data to the System/3X or AS/400.

Keytop Labels		Key Name	Key Function
122/104-Key Keyboard	102/103-Key Keyboard		
Enter	Enter	Enter	Requests a communications line for sending displayed data to the System/3X or AS/400.
Alt + Clear	Clear	Clear	Erases all displayed data on the screen, returns the cursor to the first available character position, and/or signals the System/3X or AS/400 that a clear operation has occurred.
F1 through F24	F1 through F12 or ⇧ + F13 through F24	Program Function	Initiates a program determined function. Contact your supervisor or refer to a system user's guide for more information about Program Function keys.
⇧ + SysRq, then enter	Alt + SysRq, then Enter	System Request	Performs one of the following tasks: Alerts the system that the operator is ready to select a new program or job. Starts a new program or activity. Unlocks the keyboard after normal recovery action fails.
Reset, then Enter	Reset, then Enter	Cancel System Request	Cancels a System Request function.
Attn	Attn	Attention	Temporarily stops the current activity and allows you to select a new activity.
Help	Help	Help	Use when an error code is displayed. Gives information about the error condition.
Atl + Test	Alt + Test	Test	Initiates an online test that is defined by the controller.

Printing

You can configure the display station so that the printer can perform system prints or you can configure the display station so that the printer can perform local screen prints.

Local Screen Printing

To be able to perform a local screen print, you must configure the display station as **One-Display** or **Two-Displays** with the **Terminal Mode** option of the Offline Display Setup menu. If you configure the display station as **One-Display-Printer** or **Two-Displays-Printer**, you will *not* be able to perform a local screen print. See "Setting Up the Display Station" on Page 3-9 for instructions on how to configure the display station as **One-Display**.

With local screen print, you can print the entire contents of the screen, or you can print any part of the screen you select. To print the entire screen, see "Full Screen Printing," below. To print a selected part of the screen, see "Trim Screen Printing" on Page 4-10.

Full Screen Printing

If the display station is configured correctly for a local screen print, press the Print key to enter Print mode. The following screen is displayed:

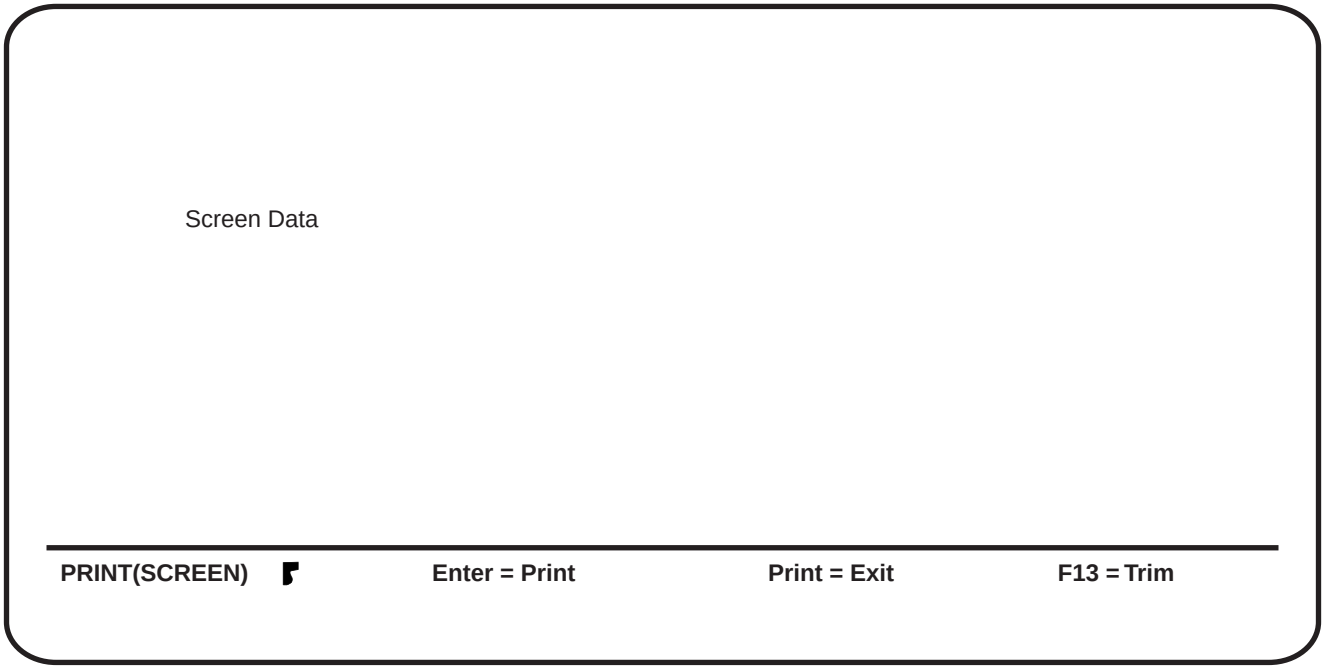


Figure 4-2. Local Print Screen

Press the Enter key. The contents of the screen are sent to the attached printer and printing starts. While the data is printing, the ▛ on the operator status row is replaced with ▛. When the data has completed printing, ▛ is replaced with ▛.

See "Local Screen Print Symbols" on Page 3-39 for an explanation of the local screen print operator status row symbols.

Trim Screen Printing

Note: If you configure the display as **Two-Displays** and use a split screen, you cannot perform a partial screen print. If you attempt a partial screen print, error code **9033** is displayed on the operator status row. See Appendix A, "Four-Digit Error Codes."

1) If the display station is configured correctly for a local screen print, press the Print key to enter Print mode. The Local Print screen (Figure 4-2 on Page 4-9) is displayed.

2) Press the F13 key. The Local Trim Print screen is displayed (Figure 4-3, below).

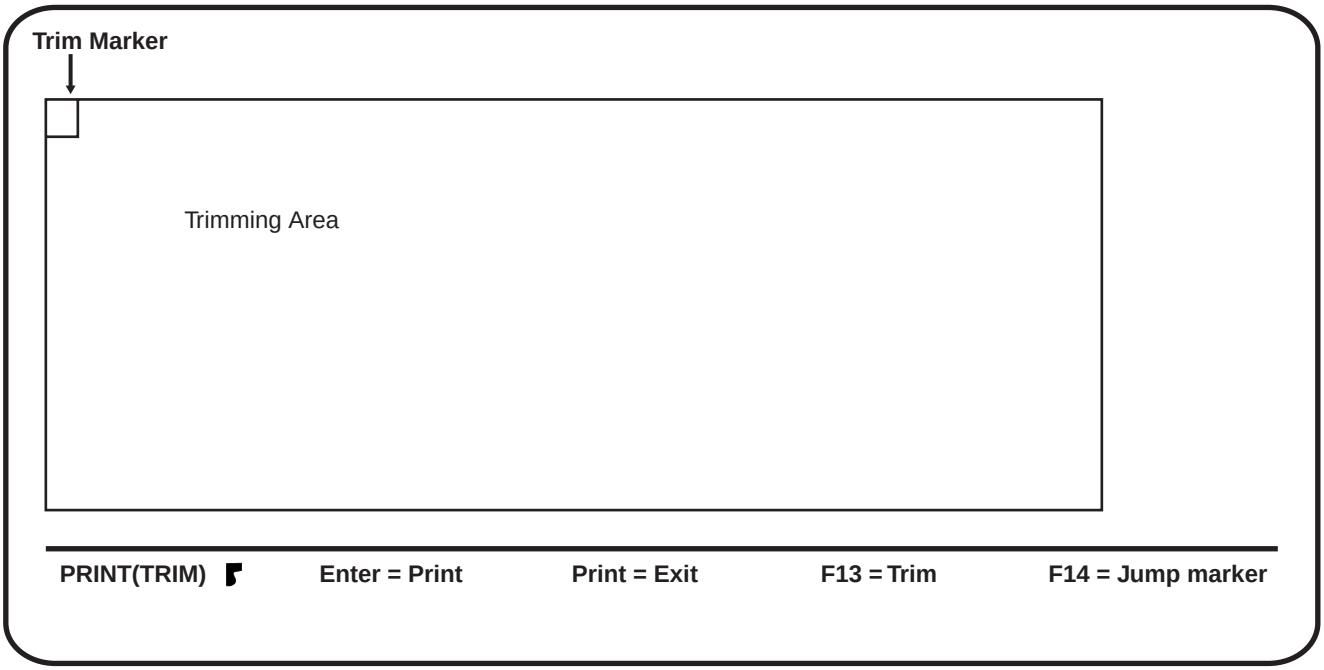


Figure 4-3. Local Trim Print Screen

3) The data within the trimming area is the data to be printed. To change the trimming area, move the Trim Marker (box cursor at upper left corner) using the cursor arrow keys. Move the cursor to the right to make the width smaller or to the left to make the width larger. Move the cursor down to make the height lower or up to make the height higher.

   Press the F14 key to move the Trim Marker from the upper left corner to the lower right corner of the trimming area.

4) When the data you want to print is within the trimming area, press the Enter key. The contents of the trimming area are sent to the attached printer and printing starts. While the data is printing, the ▛ on the operator status row is replaced with ▛. When the data has completed printing, ▛ is replaced with ▛.

System Printing

To be able to perform a system print, you must select **System** for the **Print Key** option on the Second Printer Setup menu (Figure 3-9 on Page 3-23).

System Print Keys

The following table describes the Print key.

Keytop Labels		Key Name	Key Function
122/104-Key Keyboard	102/103-Key Keyboard		
Print	Print	Print	Sends a print request to the host. If supported, the host selects the printer that prints the displayed data. To send a print job to an attached local screen printer, the attached local screen printer must be designated as the default printer for the display station.

Stopping a System Print Operation

To stop a print operation, follow these steps:

1) Press the Setup key to display the Online Main Display Setup menu.
2) Use the space bar to highlight **Printer Setup**.
3) Press and hold the Alt key while pressing the Quit key.
4) Press the Reset key. You leave Setup mode and the display station goes online.

Warning

Data being printed will be lost.

Keystroke Record/Playback

The Keystroke Record/Playback function allows you to reduce the number of keystrokes required for a frequently repeated entry. Keystroke sequences can be stored under each of the 24 Function keys. You can store up to 1500 keystrokes. The Shift and Alt key combination and the Shift Lock key (alone) each count as two keystrokes.

The entered keystroke sequences are stored in nonvolatile memory, which means that the data is saved even when the power is turned off.

Storing and Correcting Keystroke Sequences

Follow these steps to store keystrokes:

1) To begin the Record sequence, press one of the following keys or key combinations, depending on the keyboard type:

Record Keys	
122/104-Key Keyboard	**102/103-Key Keyboard**
Recrd	Alt + Recrd

The operator status row looks like this:

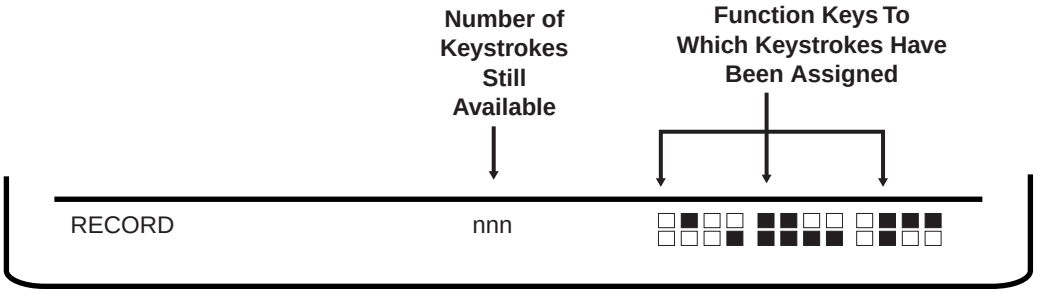


Figure 4-4. Operator Status Row After Recrd Key

2) Make a Function key selection as follows:

Function Keys	
122/104-Key Keyboard	**102/103-Key Keyboard**
Press one of the 24 Function keys.	Press one of the 24 Function keys.

The operator status row looks like this:

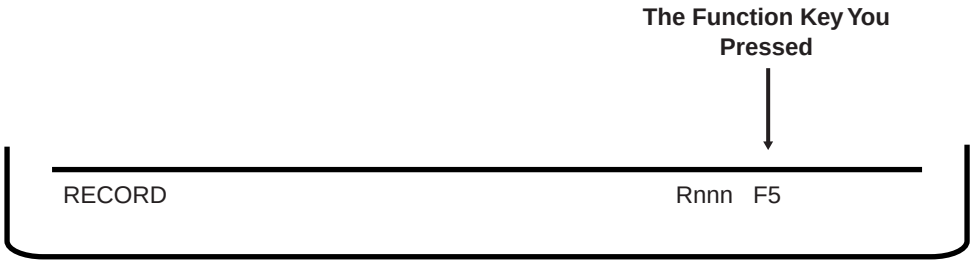


Figure 4-5. Operator Status Row After Function Key

If the alarm sounds and the number increases when you press the Function key, it means recorded keystrokes have already been assigned to that key. If you want to save the recorded key sequence, press the Record key defined for the keyboard and exit from Record mode.

To delete a keystroke sequence, press the appropriate Function key and follow it by the Delete key specified below:

Delete Keys	
122/104-Key Keyboard	**102/103-Key Keyboard**
Delete	Delete

3) Enter the keystroke sequence you want to save. As you type, the number that follows **R** on the operator status row decreases.

   If you want to temporarily stop recording, press the Pause key or keys as indicated in the table on Page 4-15.

   Resume normal operations and press the Pause key or keys again before recording the rest of the keystroke sequence.

4) Press the keyboard's Record key to store the sequence and exit Record mode.

Store and Exit Keys	
122/104-Key Keyboard	102/103-Key Keyboard
Recrd	Alt + Recrd

The keystroke sequence is saved even if the display station power switch is turned off, but do not turn the power off before you exit Record mode or the recorded sequence may be lost.

Record Mode Reminders

Keep the following points in mind when you record a keystroke sequence for playback:

- Using the Shift, Alt, or Pause key with any other key counts as two keystrokes.
- If you try to record keystroke sequences that cause an input inhibited condition, the keystroke sequences are recorded, but when the keystrokes are played back, the input inhibited condition occurs.

  If the typeahead feature is disabled (see "Typeahead" on Page 3-16) on display stations attached to a System/3X, any keystrokes played back after the input inhibited condition are ignored by the system. On display stations attached to an AS/400, if typeahead is enabled at the system, keystrokes are not ignored.

  If the typeahead feature is enabled, the display station saves the keystrokes until the input inhibited condition is cleared by the system. Press one of the following keys to clear any saved keystrokes and send the pressed key to the system:

  – Reset
  – Help
  – Atten
  – Sys Req
- The following keystrokes cannot be assigned to a Function key:
  – Play
  – Setup
  – Recrd
  – Printer Setup Mode keys

- The following keys are useful during Record mode:
  - **Pause key** – Press the Pause key during Record mode where you want to insert some words or sentences during a playback operation. **P ⁑ ^** is displayed on the operator status row. The pause action is recorded the same way other keystroke sequences are recorded. To continue the record operation, press the Pause key again. See the following table for the appropriate Pause key or keys for the keyboard:

Pause Keys	
122/104-Key Keyboard	**102/103-Key Keyboard**
Alt + Pause	Alt + Pause

  - **Quit key** – To exit Record mode without saving keystrokes that you have just entered, press the appropriate key or keys as indicated in the table below:

Quit Keys	
122/104-Key Keyboard	**102/103-Key Keyboard**
Alt + Quit	Alt + Quit

  - **Erase Input key** – To erase all key sequences that you have just assigned to Function keys, press the appropriate key or keys for the keyboard as indicated in the following table:

Erase Input Keys	
122/104-Key Keyboard	**102/103-Key Keyboard**
ErInp	ErInp

Note: If a 4-digit error code appears on the operator status row during Record mode, refer to Appendix A, “Four-Digit Error Codes.”

Playing Keystroke Sequences

A stored sequence is automatically keyed in Playback mode by doing the following:

1) Set the cursor to the insertion location.
2) Press the Play key as defined in the following table.

Playback Keys	
122/104-Key Keyboard	**102/103-Key Keyboard**
Play	Alt + Play

The operator status row looks like this:

Figure 4-6. Operator Status Row After Play Key

3) Press the Function key under which the sequence is stored. The **P** is no longer displayed when playback is completed. Once initiated, playback cannot be stopped, and additional keystrokes are not accepted until playback is completed.

Playback Mode Reminders

The following keys are useful during Playback mode:

- **Play key** – When playback stops at a recorded pause sequence, you can key in any words or sentences, then press the Play key to continue the playback action. See Page 4-15 for a description of the appropriate Play key for the keyboard.
- **Quit key** – Press the Quit key during the playback operation to cancel the playback sequence. See Page 4-15 for a description of the appropriate Quit key for the keyboard.

Note: If a 4-digit error code is displayed on the operator status row during Playback mode, refer to Appendix A, "Four-Digit Error Codes."

Record/Playback Security Mode

When you enable this option, you cannot use the alphanumeric keys on the keyboard to record data, If you try, the 1486A/G/P automatically exits from Record/Playback mode. It also prevents you from playing back data recorded in the Command or Function keys. If you press a Function key, the display station exits from Record/ Playback mode.

See "Setting the Record/Playback Security Mode" on Page 3-34 for instructions on enabling Record/Playback Security mode.

Chapter 5. Calculator Operation

The 1486 Display Station has a built-in calculator that enables you to add, subtract, multiply, and divide positive and negative numbers in decimal, binary, or hexadecimal; import numbers from the active session to the calculator; export results from the calculator to the active session; and calculate percentages in decimal. Computations up to 13 digits long in decimal and binary modes and 8 digits long in hexadecimal mode are supported.

The Decimal calculator can be selected in Calculator mode by pressing F10.

The Binary calculator can be selected in Calculator mode by pressing F2.

The Hexadecimal calculator can be selected in Calculator mode by pressing F16.

Once a specific calculator is selected, it will be the calculator displayed whenever Calculator mode is entered until changed by selection of another calculator.

Calculator Mode

To enter or exit Calculator mode, depending on the attached keyboard, press and hold the Alt and F12 keys (122-key and 104-key keyboards) or press and hold the Alt and F12/F24 keys (102/103-key keyboards). The calculator symbol is displayed on the operator status line.

Note: The calculator symbol must be displayed on the operator status line in order for you to use the calculator.

A calculator simulation is displayed on the screen as in Figures 5-1 on Page 5-4, 5-3 on Page 5-6, and 5-5 on Page 5-8. Use the simulation with the numeric keypad on the 122-key and 102/103-key keyboards and the six keys immediately above the Cursor Direction keys on all supported keyboards. The calculator function keys for the 104-key keyboards are shown in Figures 5-2 on Page 5-4, 5-4 on Page 5-6, and 5-6 on Page 5-8.

Moving the Calculator on the Screen

The following keys reposition the Decimal, Binary, and Hex calculators on the screen:

Key	Direction
<	Left
>	Right
U	Up
V	Down

The Cursor Direction keys can be used to reposition decimal or binary calculators.

Limits to Calculator Movement

Downward movement of the calculator is limited to keep its top three lines within the active session's full screen display. If the session is in a small window in Dual Screen mode, the calculator can be moved completely out of view.

Whenever the calculator is activated in Dual Screen mode, it is automatically repositioned if necessary to make at least its top three lines (the result area) visible in the window.

Jumping Between Calculator Mode and Normal Operation

If you want to return keyboard functionality to the twinax screen without losing the calculator display, press the F12/F24 key. Make the changes to the twinax screen, then press the Alt and F12/F24 keys to return to Calculator mode.

Even though the 104-key keyboard does not have a numeric keypad, you can still use the calculator. All operations have alternative methods of entry from the main keypad as described in the following pages.

Partial Simulation Mode

In Partial Simulation mode, the calculator occupies only three lines of the display, leaving more of the active session visible.

Decimal Calculator

Use the decimal and numeric keys on the numeric keypad or the main keypad to enter numbers for calculation.

After entering a number, enter the mathematical symbol designating the operation to be performed. On the 104-key keyboard, you must use the main keypad.

+ for addition

- for subtraction

* for multiplication

/ for division

If you want to enter a negative number, enter the number and then press the +/- key indicated on the calculator simulation.

Press the = key on the calculator simulation (or on the main keypad) to display the result of your computation in the calculator's Results field.

Setting the Decimal Place

You can set from 0 through 9 decimal places on the calculator or you can choose to not specify the number of decimal places.

If you select 0 through 9 decimal places, only the number of decimal places you select is displayed in the Results field of the calculator. You can enter numbers for calculation with more decimal places than can be displayed in the Results field. If the result of the calculation has more decimal places than can be displayed in the Results field, the system rounds off the answer before it is displayed.

You can also choose to not specify the number of decimal places. If you do not specify the number of decimal places, the calculator displays as many decimal places as necessary for the answer.

Note: The calculator can display a maximum of 13 digits in the Results field. If a calculation causes a result larger than the Results field maximum of 13 digits, the overflow symbol **?** is displayed. Press C/E (Clear Entry [Clear on the 104-key keyboards]) to continue with calculations.

To set the decimal place, with the 1486 in Decimal Calculator mode, press the PF3 key, then:

To set from 0 through 9 decimal places – press the PF3 key, then press the 0 through 9 key (**D0** through **D9** is displayed at the top of the Results field).

or

To not specify the number of decimal places – press the N key.

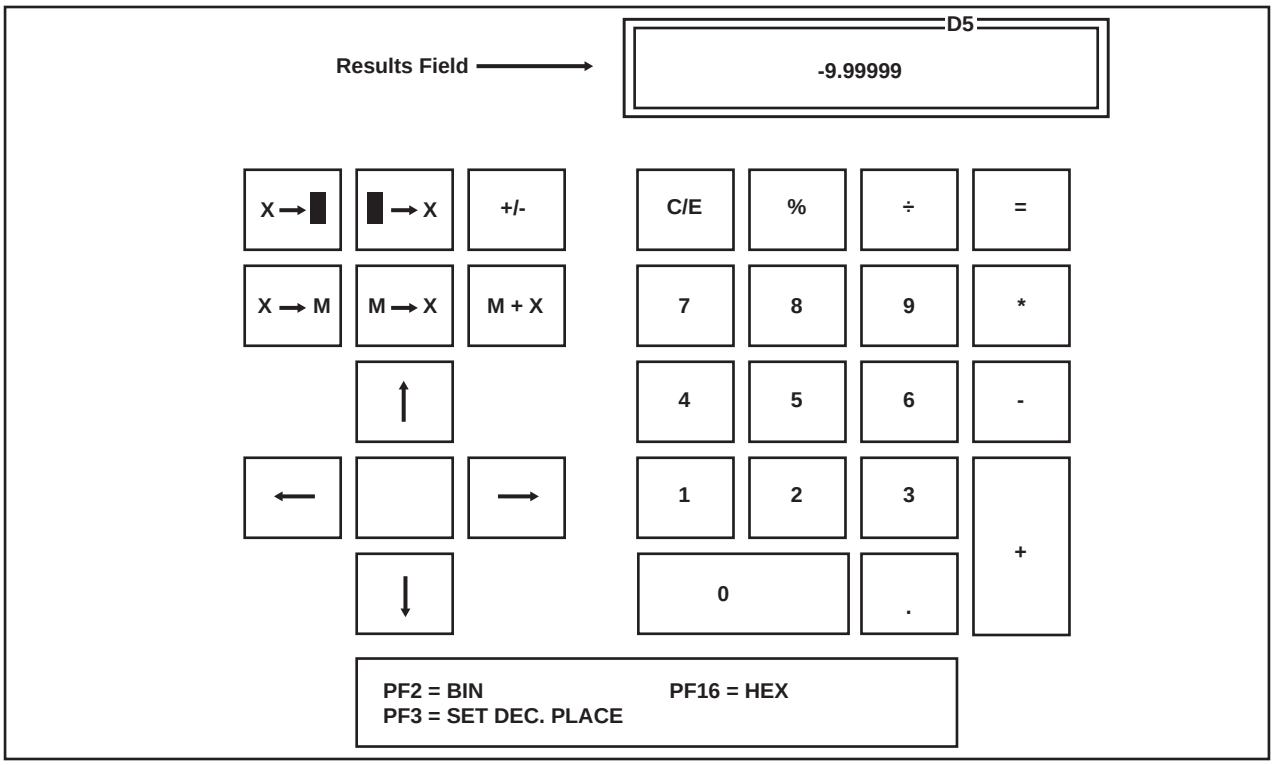


Figure 5-1. Simulated Decimal Calculator

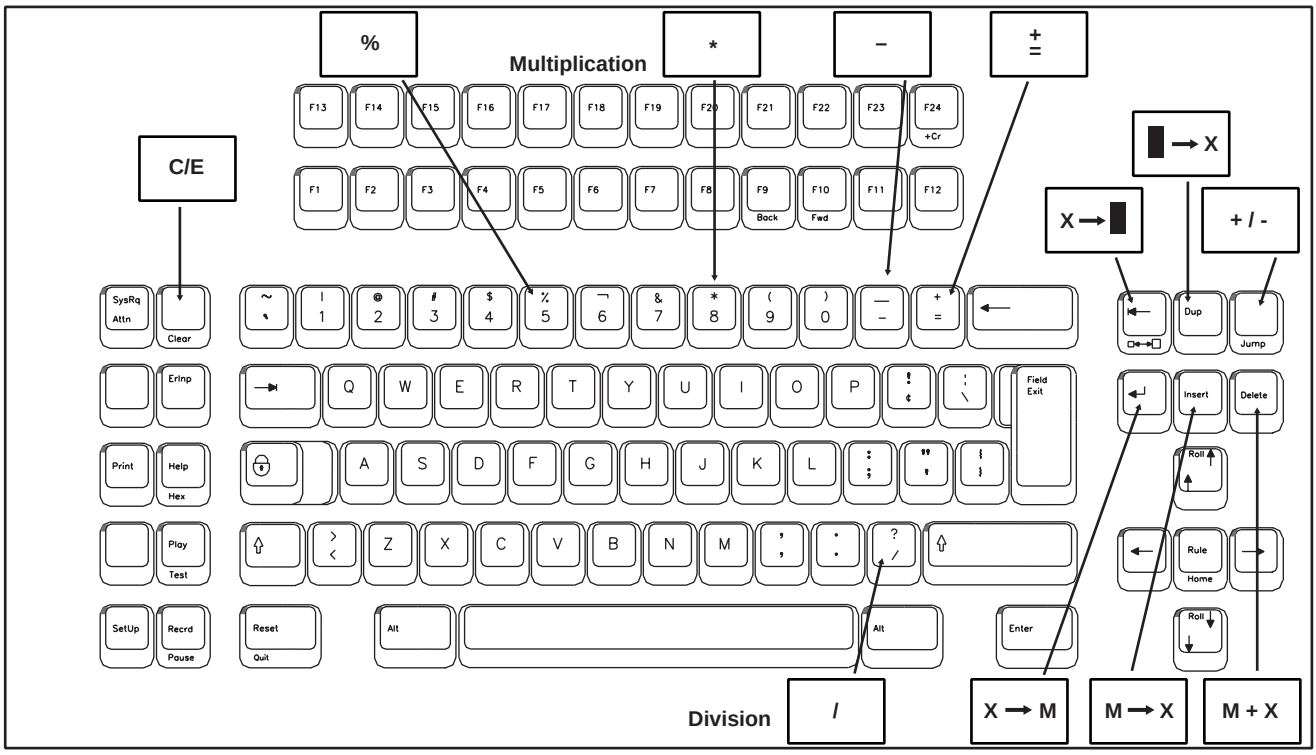


Figure 5-2. 104-Key Keyboard Decimal Calculator Keys

Calculating Percentages

To calculate a percentage of a number with the Decimal calculator:

1) Enter the number.
2) Press the % key indicated on the calculator simulation of the numeric keypad or the % key on the main keypad.
3) Enter the percentage.
4) Press the = key indicated on the calculator simulation or the = key on the main keypad.

The calculated percentage is displayed in the Results field of the calculator simulation.

Other Calculator Functions

Press the C/E key once to clear the current entry. Press the C/E key a second time to clear the current total. You can also use the Clear key on the main keyboard.

Press the **M + X** key to add the currently displayed value to memory. **M** is displayed at the bottom of the Results field to indicate that there is a number in memory.

Press the **M → X** key to recall and display the memory contents. The memory contents are recalled in the current Calculator mode equivalent value regardless of the mode in which the value was saved. For example, if 128 is saved with the Decimal calculator and recalled with the Binary calculator, 10000000_2 is displayed in the Results field.

Press the **X → M** key to store the currently displayed value in memory. Press this key with zero in the Results field to clear the memory.

Press the **▮ → X** key to import the value from the current cursor position on the twinax screen to the Results field on the calculator. The import field holds a maximum of 13 digits.

Note: The calculator interprets a comma in the import field as a European decimal point. Any numbers to the right of the comma are treated as decimal point values and not whole numbers (for example, 10,500 is treated as if it were 10.5).

Press the **X → ▮** key to export the value in the Results field to the current cursor position on the twinax screen.

Press the PF1 key to toggle the calculator simulation between full simulation display and display of the Results field only.

Binary Calculator

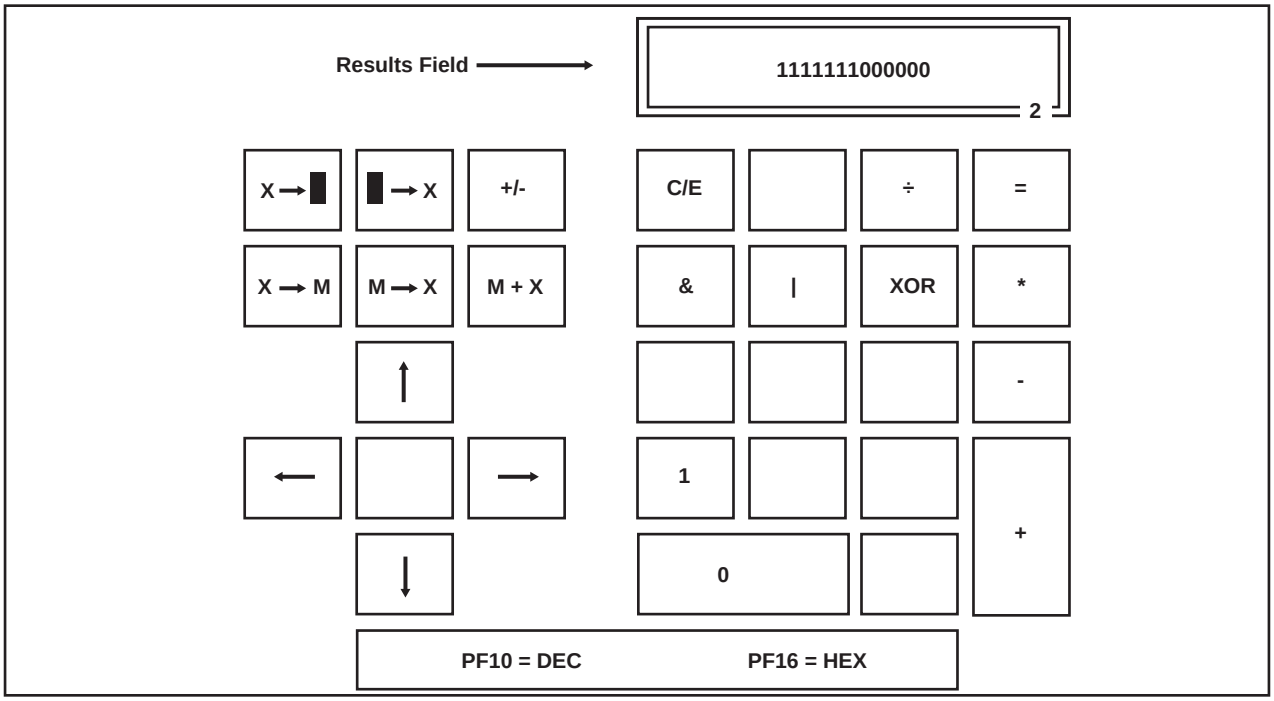


Figure 5-3. Simulated Binary Calculator

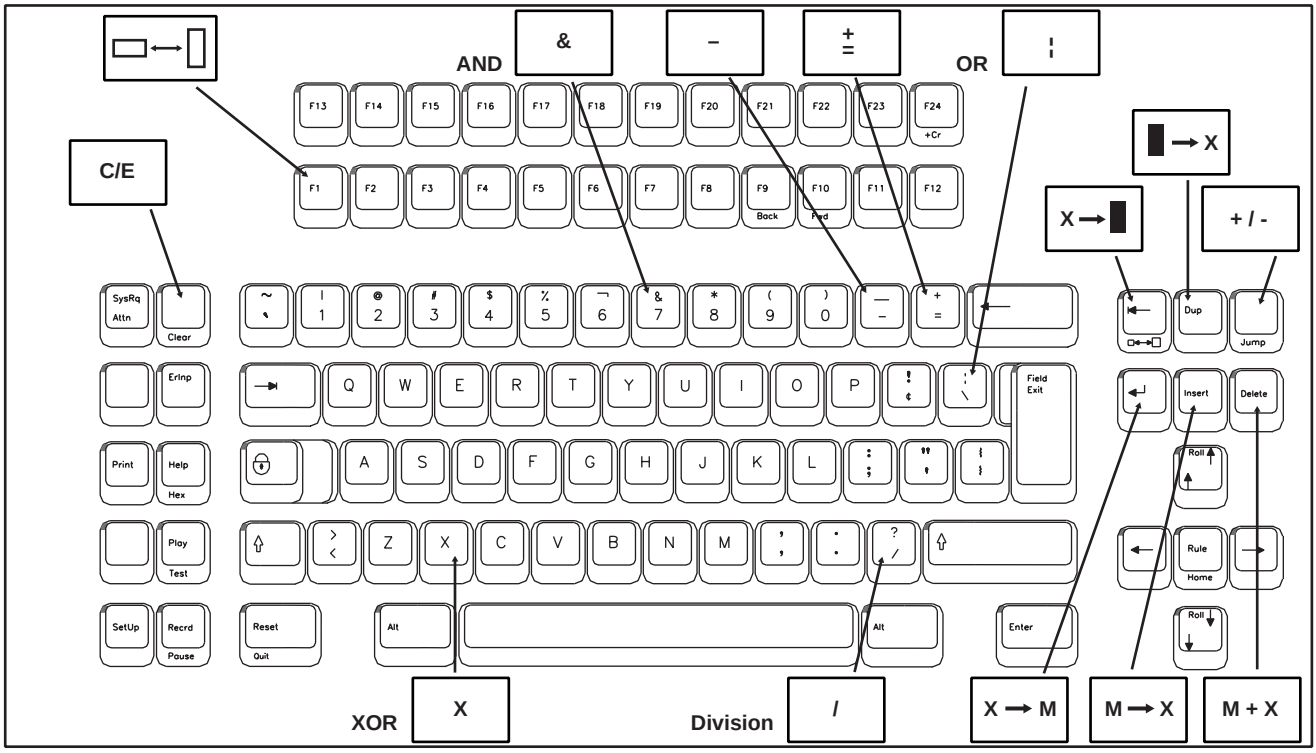


Figure 5-4. 104-Key Keyboard Binary Calculator Keys

Binary Mathematical Operations

Use the numeric keys on the numeric keypad or the main keypad (1 or 0) to enter numbers for calculation.

After entering a number, enter the mathematical symbol designating the operation to be performed. For the 104-key keyboard, you must use the main keypad.

+ for addition

- for subtraction

* for multiplication

/ for division

X or XOR for logical XOR

for logical OR

& for logical AND

If you want to enter a negative number, enter the number and then press the +/- key indicated on the calculator simulation.

Press the = key on the calculator simulation (or on the main keypad) to display the result of your computation in the calculator's Results field.

If a calculation causes a result larger than the Results field maximum of 13 digits, the overflow symbol **?** is displayed. Press C/E (Clear Entry [Clear on the 104-key keyboards]) to continue with calculations.

Other Calculator Functions

Press the C/E key once to clear the current entry. Press the C/E key again to clear the current total. You can also use the Clear key on the main keyboard.

Press the **M + X** key to add the currently displayed value to memory. **M** is displayed at the bottom of the Results field to indicate that there is a number in memory.

Press the **M → X** key to recall and display the memory contents. The memory contents are recalled in the current Calculator mode equivalent value regardless of the mode in which the value was saved. For example, if 128 is saved with the Decimal calculator and recalled with the Binary calculator, 10000000_2 is displayed in the Results field.

Press the **X → M** key to store the currently displayed value in memory. Press this key with zero in the Results field to clear the memory.

Press the **▮ → X** key to import the value from the current cursor position on the twinax screen to the Results field on the calculator. The import field holds a maximum of 13 digits.

Press the **X → ▮** key to export the value in the Results field to the current cursor position on the twinax screen.

Press the PF1 key to toggle the calculator simulation between full simulation display and display of the Results field only.

Hex Calculator

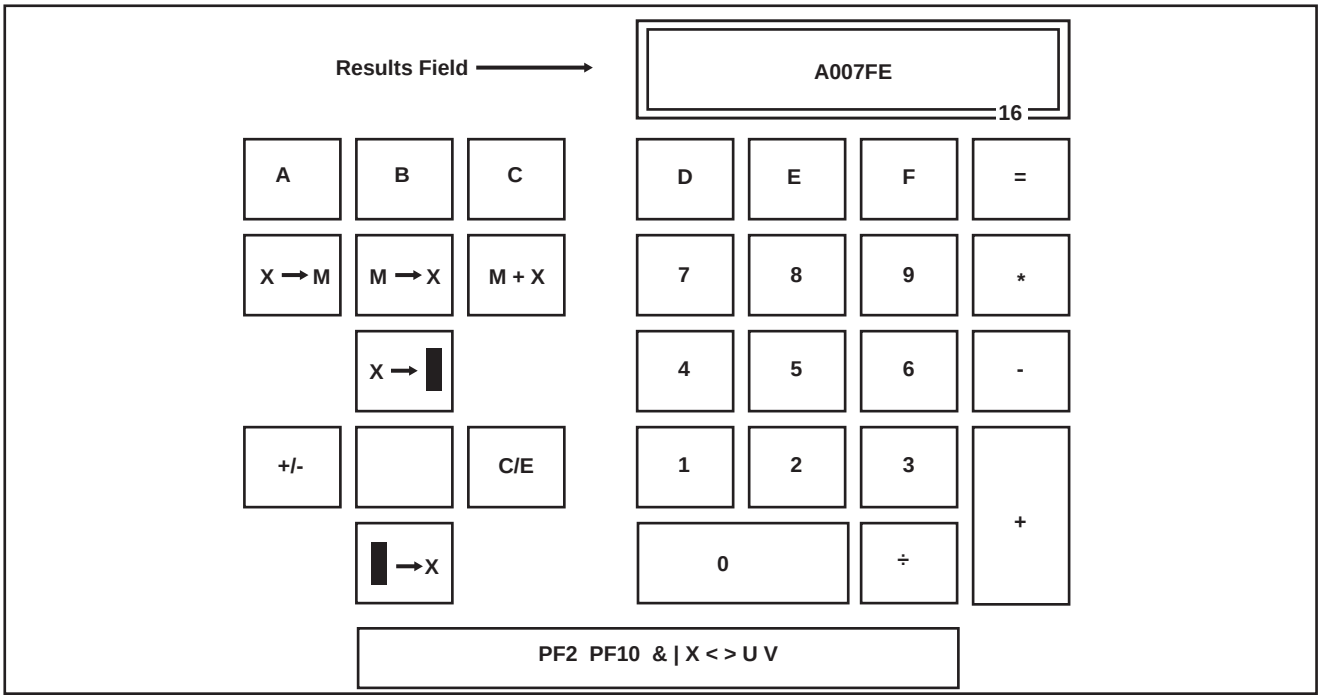


Figure 5-5. Simulated Hex Calculator

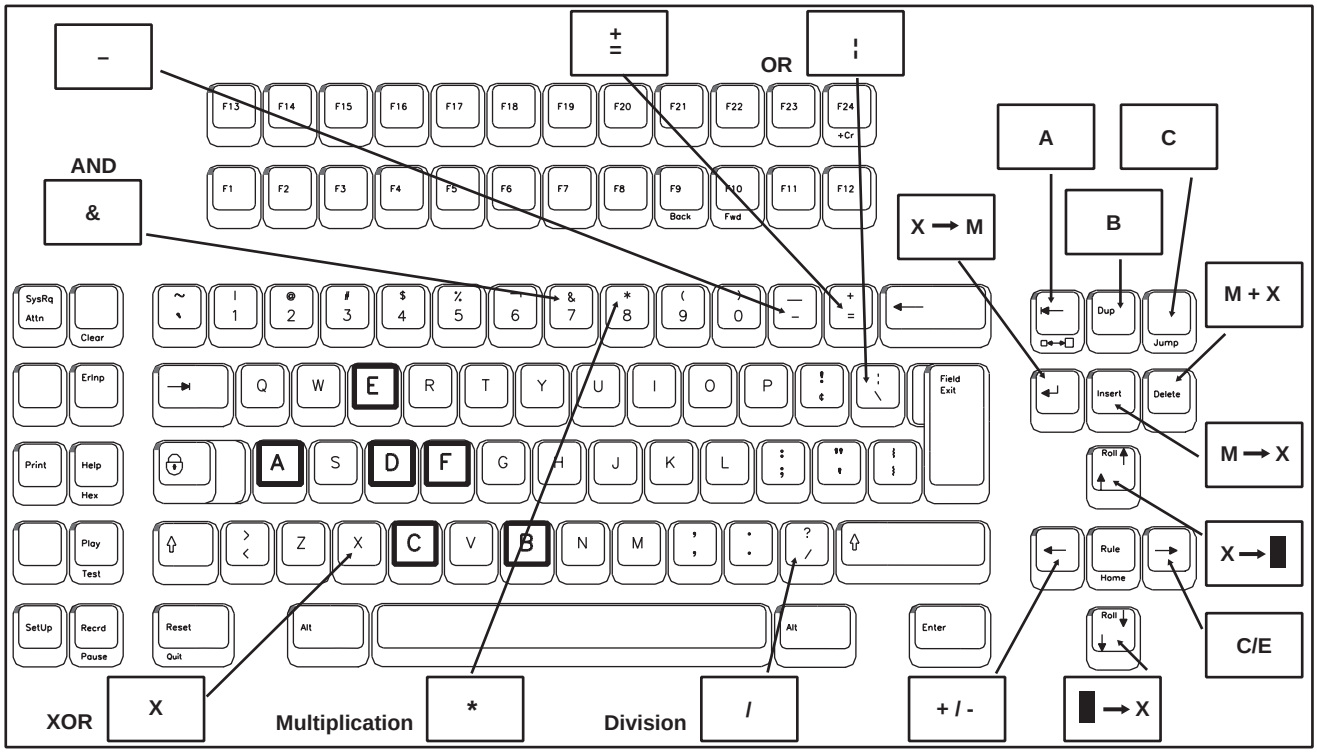


Figure 5-6. 104-Key Keyboard Hex Calculator Keys

Hex Mathematical Operations

Use the numeric keys on the numeric keypad (0 through 9) and the keys A through F to enter numbers to be operated on. You can also use the main keypad to enter numbers (0 through 9) and the keys A through F.

After entering a number, enter the mathematical symbol designating the operation to be performed. For the 104-key keyboard, the main keypad must be used.

+ for addition

- for subtraction

* for multiplication

/ for division

X (main keyboard) for logical XOR

¦ (main keyboard) for logical OR

& (main keyboard) for logical AND

If you want to enter a negative number, enter the number and then press the +/- key indicated on the calculator simulation.

Press the = key on the calculator simulation (or on the main keypad) to display the result of your computation in the calculator's Results field.

If a calculation causes a result larger than the Results field maximum of 13 digits, the overflow symbol **?** is displayed. Press C/E (Clear Entry [Clear on the 88-key and 104-key keyboards]) to continue with calculations.

Other Calculator Functions

Press the C/E key once to clear the current entry. Press the C/E key again to clear the current total. You can also use the Clear key on the main keyboard.

Press the **M +** **X** key to add the currently displayed value to memory. **M** is displayed at the bottom of the Results field to indicate that there is a number in memory.

Press the **M → X** key to recall and display the memory contents. The memory contents are recalled in the current Calculator mode equivalent value regardless of the mode in which the value was saved. For example, if 128 is saved with the Decimal calculator and recalled with the Hex calculator, 80_{16} is displayed in the Results field.

Press the **X → M** key to store the currently displayed value in memory. Press this key with zero in the Results field to clear the memory.

Press the **▮ → X** key to import the value from the current cursor position on the twinax screen to the Results field on the calculator. The import field holds a maximum of 13 digits.

Press the **X → ▮** key to export the value in the Results field to the current cursor position on the twinax screen.

Press the PF1 key to toggle the calculator simulation between full simulation display and display of the Results field only.

Chapter 6. Problem Determination and Maintenance

Diagnostic Testing

The 1486A/G/P performs three types of diagnostic tests:

- Basic Assurance tests (BATs) that are performed automatically each time the display station is powered on.
- Offline tests that check the operation of the display station independent of the attached System/3X or AS/400.
- Online tests that check the display station as it interacts with the attached System/ 3X or AS/400. For information about online tests, refer to the System/3X or AS/400 user's guide.

Basic Assurance Tests

The 1486A/G/P goes through a series of self-tests called BATs each time it is powered on. If the display station encounters an error, it sounds an alarm and attempts to display a response on the screen. If a 2-digit alphanumeric code is displayed on the operator status row, refer to "Hardware Failure Error Codes" on Page 6-2 and attempt the indicated recovery procedures. If more than one error code is displayed, attempt the recovery procedure for the leftmost error code.

If the display screen remains blank, an indication of the error may be given by the audible alarm. A series of one, two, or three long beeps indicates a failure on the Main Logic board of the 1486A/G/P, and the Display/Logic element should be replaced. One short beep after the display station is powered on indicates that the display station has successfully completed its Basic Assurance tests.

Hardware Failure Error Codes

The following error codes may appear on the status row of the display if an error is encountered during the BATs.

Error Code	Meaning
AD1, AD2, or ADP	The display station address or printer address has not been entered. Reset the address as described in "Setting Up the Display Station" on Page 3-9.
L	The Logic element is failing. Replace the Display/Logic element.
LK	The Display/Logic element or the Keyboard element is failing. Set the Power switch to **O**. Unplug the keyboard and set the Power switch to **|**. If the error code still appears, the Display/Logic element is failing. If the error code is no longer present, the Keyboard element is failing. Replace the failing element.
K	The Keyboard element is failing. Set the Power switch to **O**. Ensure that the keyboard cable is firmly attached to the Display/Logic element, then set the Power switch to **|**. If the error code still appears, replace the Keyboard element.
NV1	Nonvolatile RAM has a checksum error. To recover, press the Reset key. You must enter the display control values and Record/Playback keystroke sequences again. If this error occurs frequently, replace the Display/Logic element.
NV2	Keystroke Record/Playback data is incorrect. Press the Reset key to continue. You may have to reenter the Record/Playback sequences. If this error occurs frequently, replace the Display/Logic element.

Offline Tests

To test the 1486A/G/P, follow the instructions in "Testing the Display Station" on Page 3-35.

Symptom/Action Chart

Symptom	Recommended Action
The Audible Alarm continuously sounds (it will not shut off).	Switch off the display station power, then switch the power back on. If the symptom persists, the Display/Logic element probably has failed. Replace the Display/Logic element.
The Keyboard Lock indicator (X) is displayed on the operator status row and the screen is blank.	Insert the security keylock and turn it fully counterclockwise. The symbol should be blanked from the display screen. If the symptom persists, the Display/Logic element probably has failed. Replace the Display/Logic element.
The System Available indicator (■) is not displayed on the operator status row.	Ensure that the twinax cable is securely connected to both an operational control unit and display station. Ensure that the display station address is set correctly. If you are in doubt, check with the system operator. Refer to “Terminal Mode” on Page 3-10 for information on how to change the display address. If the symptom persists, refer to “Customer Maintenance Action Plans (CMAPs)” on Page 6-4.

Preventive Maintenance

Preventive maintenance for the 1486A/G/P is limited to keeping the display station clean and dust-free. Use a nonabrasive solution such as alcohol or window cleaner and a soft, lint-free cloth to clean the screen. Do not spray cleaner directly on the display station. Spray on a cloth and use the cloth to clean the display station. All ventilation ports must be kept free of dirt and dust.

Customer Maintenance Action Plans (CMAPs)

Before you follow these procedures, ensure that the 1486A/G/P is powered on, that it is attached to an operational System/3X or AS/400, that it has an attached 122-key or 102/103-key, and that the security keylock is off. Also, make sure that the display address and the keyboard ID are set correctly. Refer to "Setting Up the Display Station" on Page 3-9 and the system operator for instructions. Perform each of the following test functions in the order given.

STEP 1. When the display station is powered online, does the sign-on screen appear? (Refer to the sample screen in Figure 6-1, below.)

NO ↓

YES ⟶ The display station has passed the internal Basic Assurance tests and is ready for use.

Go to Step 2.

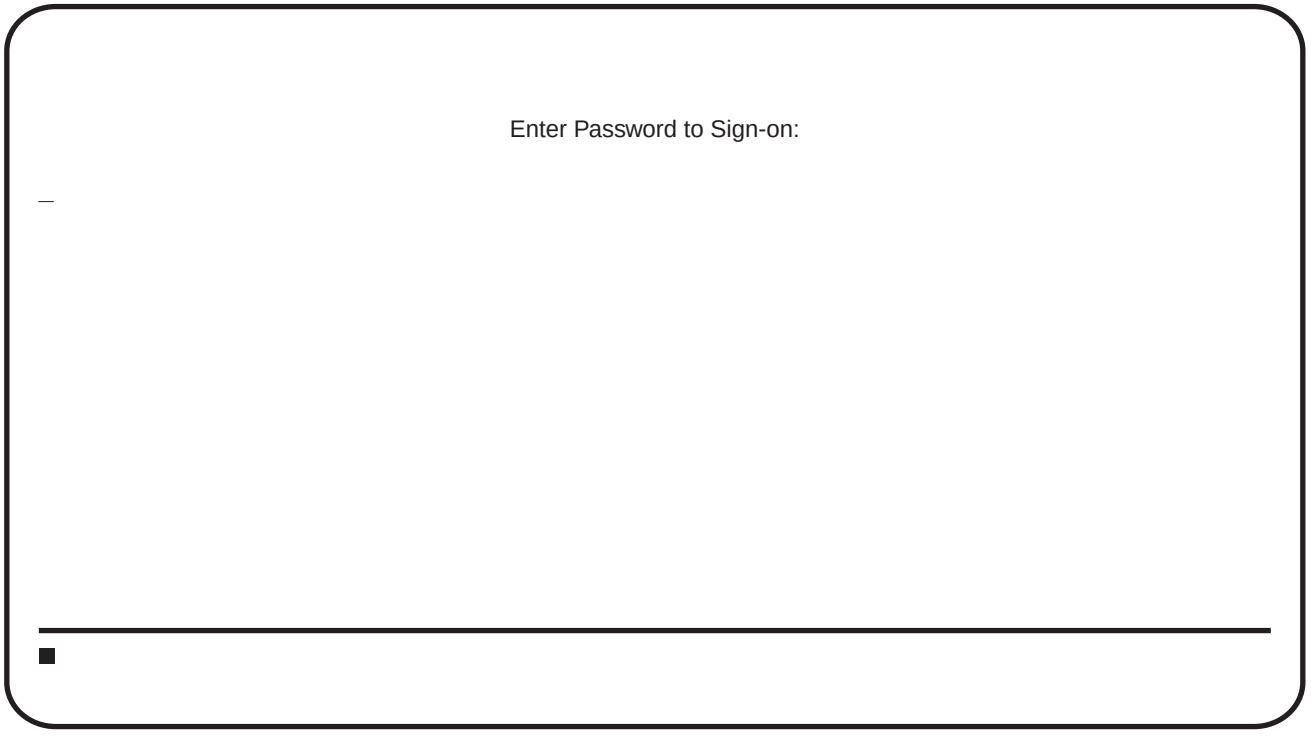


Figure 6-1. A Sample Sign-On Display

STEP 2. If the sign-on display failed to appear, does the test pattern remain on the screen? (See Figure 3-15 on Page 3-35 for an example of a keyboard test screen.)

NO

YES → The display station has attempted to go online and cannot because of a hardware failure. Check with the system operator and make sure the System/3X or AS/400 configuration is set up to recognize the display station at its twinax port address. If the system is configured correctly, skip to Step 7 to verify there are no stuck keys. If all keys are functional as described in Steps 7-8, continue to Step 3.

STEP 3. Does the display station exhibit one of the following problems?

- The System Available indicator is incorrect.
- The System Available indicator is blinking.
- The sign-on display does not appear.

NO

YES →

1) Make sure the communications cables attached to the twinax cable are securely fastened and not damaged. Also, ensure that the twinax cable is securely fastened to the display station.

2) Make sure the display address is set correctly. (Refer to "Setting Up the Display Station" on Page 3-9.)

3) Contact the system operator and make sure that the display station is configured properly. Also ensure that the system cable is working properly and is securely fastened (by way of the twinax cable) to the first display station in the twinax daisy chain.

4) If you have performed all the above steps and the System Available indicator is still incorrect or blinking, ensure that the display station is the only failing display station on the system cable. If so, go to Step 5.

Go to Step 4.

STEP 4. Is the display screen completely dark?

NO ↓

YES → Reset the Contrast control and, if present, the Brightness control. If the problem still exists or the display needs frequent brightness adjustments, replace the Display/Logic element.

STEP 5. Is there an alpha or alphanumeric 2-digit error code displayed on the operator status row of the display?

NO ↓

YES → Refer to "Hardware Failure Error Codes" on Page 6-2 and perform the indicated recovery procedures.

STEP 6. Does the display exhibit a recognizable problem like those listed below?

- Display area drifts horizontally or vertically.
- Characters are fuzzy, out of focus.
- Display area is noticeably reduced or expanded.
- Display area is tilted.

NO ↓

YES → Replace the Display/Logic element.

STEP 7. Enter Test mode as described in "Testing the Display Station" on Page 3-35. Does the display match the screen in Figure 3-15 on Page 3-35?

YES ↓

NO → If there is a display problem, go back to Step 6. If not, continue on to Step 8.

Go to Step 8.

STEP 8. Press any key except the Setup and Reset keys. (These keys are still active.) The set of small blocks on the lower section of the test display corresponds to the keys of the keyboard. When a key is pressed, the corresponding block should fill solid. A second depression of the key removes the fill from the block. Press each key and verify that each key depression changes the corresponding block. Are all keys functional?

YES ↓

NO → Replace the Keyboard element.

STEP 9. Does the display exhibit one of the following symptoms?

- Abnormal sound or smell (turn the unit off and unplug from the AC power supply *immediately*).
- Nothing displayed (including operator status row).

NO ↓

YES → The problem could be with either the Logic element or the Display element. Replace both the Logic element and the Display element.

The display station should be operational. If the problem persists, it is probably external to the 1486A/G/P. Report the problem to your supervisor.

Appendix A. Four-Digit Error Codes

Operator Status Row Error Codes

The following 4-digit error codes are displayed on the operator status row or in the upper left corner of the screen.

Note: If a 4-digit error code is displayed on the message row (at the bottom center of the screen), see “Message Row Error Codes” on Page A-3.

Error Code	Meaning
9001	The Record area is full. To recover, press the Recrd key to exit Record mode. The keystroke sequence is saved up to the point where the 9001 error occurred. Previously stored sequences need to be removed in order to create more room for new keystroke sequences.
9002	A hardware failure occurred. An error was detected in the keystroke sequence stored under a Cmd key or F key. The contents of the stored sequence were erased. To recover, press the Reset key and reenter the keystroke sequence. If the error continues, press the Reset key and reenter the keystroke sequence.
9003	While performing the Record or Play function, you pressed an unacceptable key before pressing the F key. After entering Record mode, the only keys that can be pressed before the F key are the Alt, Recrd, Reset, Erase Input, and Shift keys. To recover, press the Reset key or a valid F key.
9004	While performing the Record or Play function, you pressed the Cmd key while holding the Alt key down. To recover, press the Cmd key without holding down the Alt key.
9007	You pressed the Play key or the Setup key while in Record mode. To recover, press a valid key.
9010	A Cmd key was pressed in Playback mode that does not have a stored keystroke sequence associated with it. To recover, press the Reset key or a Cmd key that has a stored keystroke sequence associated with it.
9011	The Setup key was pressed with the Shift key held down. To recover, press the Reset key or a Cmd key that has a stored keystroke sequence associated with it.
9012	To recover, press the Reset key.
9013	Invalid key pressed during Test mode function. To recover, press a Cmd key that has a function in Test mode.
9015	You pressed the Reset key while holding the Alt key pressed. To recover, press the Reset key only.

Error Code	Meaning
9016	Overrun error. Several keys were pressed at one time. To recover, press keys one at a time. If the error continues, exchange the Keyboard element.
9018	The host has specified a blinking cursor. You tried to change the cursor to nonblinking. To recover, press the Reset key.
9019	While in Record mode, you attempted to enter a keystroke after an “input inhibited” was generated. The sequence cannot be played back past the keystroke that caused the input inhibited condition. To recover, press the Recrd key or the Alt and DvCnl keys. OR While in Playback mode, a previously recorded key sequence caused the host to generate an “Input Inhibited” before all keystrokes were played. To recover, press the Reset key, then change the key sequence so that the key causing the input inhibited condition is the last key in the sequence.
9020	When the Record/Playback function was inhibited, you pressed either the Record key or the Play key. To recover, press the Reset key.
9021	You attempted to record or play back in a nondisplay field. To recover, press the Reset key.
9030	The Jump key was pressed when not in Dual Display mode. To recover, press the Reset key.
9031	You pressed the Back key or the Fwd key while local scrolling was not available. To recover, press the Reset key.
9032	You pressed the Zoom key while not in Dual Display mode. To recover, press the Reset key.
9033	You attempted a trimmed area local screen print while in Split Screen mode. To recover, press the Reset key.
9052	End of paper or the printer is not ready. To recover, check the attached printer and make it ready. You may have lost printer data.

Note: If an alphabetic or an alphanumeric error code is displayed on the operator status row, refer to Chapter 6, “Problem Determination and Maintenance.”

Message Row Error Codes

The message row is the last data row on the screen. Messages from the system as well as error codes that indicate keying errors are displayed on this line. When a keying error occurs, the cursor blinks to mark the location of the error, and the keyboard locks, inhibiting any additional data entry. When this occurs, find the 4-digit error code listed below and attempt the recovery procedure.

The Help key is provided to aid in error recovery. When an error code is displayed, press the Help key to display a message describing the error condition. After responding to the message, press the Reset key and continue entering data.

Note: Error codes 0040 through 0054 are communication errors and must be corrected at the IBM 5294 Control Unit.

Error Code	Meaning
0000	The Help key was pressed. Either no error code was displayed or the error was issued by a program that does not support the Help key. To recover, press the Reset key, then continue to enter information or refer to the meaning for the previous error code displayed and perform the recovery procedure listed.
0001	The System/3X or AS/400 is not keeping up with the rate at which you are entering information and the last character was not recognized. To recover, press the Reset key and resume entering information.
0002	The System/3X or AS/400 received an invalid key code and does not know which key you pressed. To recover, press Reset and try to resume entering data. If the error recurs, contact the system operator and report the problem.
0003	An invalid key was pressed while the Alt key was pressed. To recover, press the Reset key.
0004	You attempted to enter data into a field that does not permit keyboard input. To recover, press the Reset key.
0005	You attempted to enter data into a restricted field. To recover, press the Reset key.
0006	You pressed an invalid key after you pressed the Attn key. To recover, press the Reset key and enter a valid key sequence.
0007	There is at least one mandatory entry field into which you must enter data before the display can be changed. To recover, press the Reset key and enter the required data.

Error Code	Meaning
0008	The field into which you are trying to enter data allows only alphabetic data and you have pressed a nonalphabetic key. To recover, press the Reset key and enter one of the valid characters, A through Z, blank, comma, period, plus, or minus.
0009	The field into which you are trying to enter data allows only numeric characters and you have pressed a nonnumeric key. To recover, press the Reset key and enter one of the valid characters, 0 through 9, blank, comma, period, plus, or minus.
0010	The field into which you are trying to enter data allows only signed numeric data and you have pressed an invalid key. To recover, press the Reset key and enter one of the valid characters, 0 through 9.
0011	You are trying to enter data into the last position of a signed numeric field. To recover, press the Reset key, make sure the data is correct, and exit the field by pressing the Field -, Field +, or Field Exit key.
0012	There is no room to insert data in this field or the cursor is in the last position of the field. Do not use the insert key to enter or transfer any data into this field. To recover, press the Reset key and correct the field, if necessary.
0013	You attempted to exit a field after pressing the Insert key. To recover, press the Reset key.
0014	A function key was pressed to move the cursor out of the field and the requirements of the mandatory fill field have not been met. A mandatory fill field must be completely filled or left blank. To recover, press the Reset key, then fill the field or move the cursor to the start of the field and use the Field -, Field +, or Field Exit key to blank the entire field.
0015	Data was entered into a self-check field and the number and the check digit entered do not correspond. To recover, press the Reset key and check that you have correctly entered the number and check digit. If the numbers you are using are valid and this error recurs, report the problem to the system operator.
0016	The Field - key was pressed but the field you are in is not a signed numeric field or (for some systems) is a numeric-only field. To recover, press the Reset key and continue to enter data or press the Field Exit key to blank all of the field.
0017	The Field -, Field +, or Field Exit key was pressed but the requirements of this mandatory fill field have not been met. A mandatory fill field must be completely filled unless you exit from the first position of the field. To recover, press the Reset key. Continue to enter data to the end of the field or move the cursor to the start of the field and use the Field -, Field +, or Field Exit key to blank all of the field.

Error Code	Meaning
0018	A nondata key such as a Field Exit key or a cursor direction key must be used to exit this field. To recover, press the Reset key, then use a nondata key to leave the field.
0019	The Dup key was pressed but is not permitted in this field. To recover, press the Reset key.
0020	An invalid key was pressed in a right adjust or a signed numeric field. You must exit the field before pressing the following keys: Function, Character Backspace, Enter, Print, Help, Roll, and Home (when the cursor is in the Home position). To recover, press the Reset key. The cursor returns to the position from which you pressed the invalid key. Continue by pressing the Field -, Field +, or Field Exit key.
0021	The Field -, Field +, or Field Exit key was pressed while the cursor was in a mandatory enter field. A mandatory enter field must have data entered into it before you can exit the field. To recover, press the Reset key and enter the required data.
0022	A system error occurred and the status of the present field is unknown. This error can occur during an Insert or Delete operation. To recover, press the Reset key. Make sure the Insert or Delete function was performed properly. If not, correct the field.
0023	The Hex key was pressed but the first key pressed was not a valid key (A through F or 4 through 9) or the second key pressed was not a valid key (A through F or 0 through 9). This error also occurs when a hexadecimal code is used in a numeric-only, signed numeric, alpha-only, or feature I/O field. To recover, press the Reset key. Continue by using valid keys.
0026	The Field - key was pressed to exit a numeric-only field but the last position of the field was not a character 0 through 9. To recover, press the Reset key. Correct the last position of the field or exit the field by using the Field + or Field Exit key.
0027	You pressed a key that is not used by this display station. To recover, press the Reset key and continue using valid keys.
0028	You pressed a key that is not used by this display station. To recover, press the Reset key and continue using valid keys.
0029	The second key pressed during a Diacritic Key function was not a valid combination (applicable to International keyboards only). To recover, press the Reset key and enter a valid combination.
0040	The “data set ready” line is inactive. It should be active. Recovery must be made at the 5294 Control Unit.
0042	The receive clock signal failed during a receive operation. Recovery must be made at the 5294 Control Unit.

Error Code	Meaning
0043	The “data set ready” line is active. It should be inactive. Recovery must be made at the 5294 Control Unit.
0044	The 30-second communications timeout expired with no valid data being received. Recovery must be made at the 5294 Control Unit.
0050	Either the “clear to send” line was active while the “request to send” line was inactive or the “clear to send” line was inactive while the “request to send” line was active. Recovery must be made at the 5294 Control Unit.
0051	The transmit clock signal failed during a transmit operation. Recovery must be made at the 5294 Control Unit.
0052	An internal error was detected by the 5294 Control Unit. Recovery must be made at the 5294 Control Unit.
0054	During communications the 5294 Control Unit received an invalid command from the system. Recovery must be made at the 5294 Control Unit.
0097	The host does not have the programming to support online verification tests. To recover, press the Reset key.
0099	Determine when the error occurred (before, during, or after sign-on) and refer to the following meaning and recovery procedure: **Error occurred before sign-on**: The function key pressed is not valid at this time. To recover, press the Reset key and use the correct procedure to sign on. If the error persists, contact the system operator. **Error occurred during sign-on**: The system is not operational or the remote display station controller is not communicating with the system. To recover, press the Reset key and use the correct procedure to sign on. If the error persists, contact the system operator. **Error occurred after sign-on**: The program or utility does not recognize the key you pressed. To recover, press the Reset key and try to perform a different type of job or procedure. If the error does not occur again, there is a system programming problem or keying error. If the error recurs, contact the system operator.

Appendix B. System Configuration

This appendix describes System/36 or System/38 configuration required when adding a 1486A/G/P Display Station. Before beginning configuration, ensure that the proper Terminal mode (**One-Display**, **Two-Displays**, **One-Display-Printer**, or **Two-Displays-Printer**) has been selected and that all necessary Setup operations have been performed.

This configuration information is for 3487C emulations. Setup for different emulations may vary. Refer to the documentation that came with your host for instructions on how to configure for emulations other than 3487C.

The first section tells how to configure the 1486A/G/P for an AS/400. The second section gives information for configuring the 1486A/G/P and printer for a System/36. The third section gives information for configuring the 1486A/G/P and printer for a System/38.

Configuring the 1486A/G/P and Printer on an AS/400

In order to configure the 1486A/G/P and printer on the AS/400, you need to obtain information from the system operator including:

- The terminal mode of operation.
- The keyboard type (either 122-key or 102-key).
- The printer device type (either 4214 or 5256).

First you must configure the 1486A/G/P on the AS/400, then you must configure the attached printer.

Configuring a Locally Attached Display

Depending on the release of the AS/400 system, the AS/400 may automatically configure the 1486A/G/P or you may be able to choose between automatically configuring the 1486A/G/P or using the **CRTDEVDSP** command.

Configuring the Display Station Automatically

If you have Release 1.0 or 1.2 of the AS/400 system, the system automatically configures the 1486A/G/P as a 3197 Display Station Model D. The attached printer is automatically configured as a 4214 Printer Model 2, a 5219 Printer Model D2, or a 5256 Printer Model 2.

If you have Version 2 Release 2.0 or later of the AS/400 system, and if autoconfiguration is active, the AS/400 configures the 1486A/G/P as a 3487 HG. The attached printer is automatically configured as a 4214 Printer Model 2, a 5219 Printer Model D2, or a 5256 Printer Model 2.

Configuring the Display Station Manually

If you have Release 1.2 or 2.0 of the AS/400 system, you can configure the 1486A/G/P manually by using the **CRTDEVDSP** command with the following parameters:

CRTDEVDSP
DEVD(*display-station-name*)
DEVCLS(*LCL)
TYPE(3487)
MODEL(HG)
PORT(*port-number*)
SWTSET(*device-address*)
CTL(*work-station-controller*)

Configuring a Remotely Attached Display

You must configure a remotely attached display station manually.

Configuring the Display Station to a 5394 Remote Controller

Configure the 1486A/G/P manually by using the **CRTDEVDSP** command with the following parameters:

CRTDEVDSP
DEVD(*display-station-name*)
DEVCLS(*RMT)
TYPE(3197)
MODEL(D2)
LOCADR(*local-address*)
CTL(*attached-controller*)

Configuring the Display Station to a 5294 Remote Controller

Configure the 1486A/G/P manually by using the **CRTDEVDSP** command with the following parameters:

CRTDEVDSP
DEVD(*display-station-name*)
DEVCLS(*RMT)
TYPE(3180)
MODEL(2)
LOCADR(*local-address*)
CTL(*attached-controller*)

Configuring a Locally Attached Printer

To manually configure a local printer attached to a 1486A/G/P, use the **CRTDEVPRT** command with the following parameters:

CRTDEVDSP
DEVD(*display-station-name*)
DEVCLS(*LCL)
TYPE(*xy*)[1]
MODEL(Fz)[2]
LOCADR(*local-address*)
CTL(*work-station-controller*)

[1]For a 4214 printer, set the **MODEL** to **2**.
For a 5219 printer, set the **MODEL** to **D2**.
For a 5256 printer, set the **MODEL** to **2**.

[2]z = 4214, 5219, or 5256.

Configuring a Remotely Attached Printer

You must configure a remotely attached printer manually.

To configure a printer attached to a 1486A/G/P that is remotely attached to either a 5394 or a 5294 Remote Controller, use the **CRTDEVPRT** command with the following parameters:

CRTDEVDSP
DEVD(display-station-name)
DEVCLS(*RMT)
TYPE(xy)[1]
MODEL(Fz)[2]
LOCADR(local-address)
CTL(work-station-controller)

[1]For a 4214 printer, set the **MODEL** to **2**.
For a 5219 printer, set the **MODEL** to **D2**.
For a 5256 printer, set the **MODEL** to **2**.

[2]z = 4214, 5219, or 5256.

Configuring the 1486A/G/P and Printer on a System/36

You can configure the System/36 for the attachment of the 1486A/G/P through autoconfiguration or by using the CNFIGSSP command.

To use autoconfiguration, refer to the System/36 user's manual. Before performing autoconfiguration, be sure to obtain the following information from the system operator:

- Terminal mode of operation.
- Keyboard type (either 122-key or 102-key).
- Printer device type (either 4214, 5256, or 5219).

Configuring a Locally Attached Display

Follow the instructions for the operating system.

Note: On the System/36, 132-column support is not available for the 1486A/G/P.

System/36 Operating System 5.1 or Higher

1486A/G/P with a 122-key keyboard – Configure as a 3197 Model D (Device Display Code 26 in menu 12.0 of **CNFIGSSP**) with 5250 style keyboard.

1486A/G/P with a 102-key keyboard – Configure as a 3197 Model D with enhanced keyboard.

System/36 Operating System 5.0 or Lower

1486A/G/P with a 122-key keyboard – Configure as a 3180 Display Station Model 2 with 5250 style keyboard (Device Display Code 25 in menu 12.0 of **CNFIGSSP**).

1486A/G/P with a 102-key keyboard – Configure as a 3180 Display Station Model 2 with enhanced keyboard.

Configuring a Remotely Attached Display

To attach the 1486A/G/P to a 5294 Remote Controller, configure the 1486A/G/P as a 3180 Model 2. To attach the 1486A/G/P to a 5394 control unit, configure the 1486A/G/P as a 3197 Model D.

Configuring the Printer

If you are attaching a host addressable printer, configure the printer as either a 4214 Printer Model 2 (Device Code EA), a 5256 Printer Model 2 (Device Code AB), or a 5219 Printer Model D2 (Device Code DB), depending on the type of printer you would like to emulate. Again, you may use the autoconfiguration procedure or the **CNFIGSSP** command.

Configuring the 1486A/G/P and Printer on a System/38

To configure the 1486A/G/P and printer on the System/38, you need to obtain information from the system operator including:

- The terminal mode of operation and emulation.
- The keyboard type (either 122-key or 102-key).
- The printer device type (either 4214, 5256, or 5219).

First you must configure the 1486A/G/P on the System/38, then you must configure the attached printer.

Configuring a Locally Attached Display

To configure each 1486A/G/P display session to a workstation controller (WSC) or to a workstation controller extended (WSCE), enter the **CRTDEVD** command with the following parameters:

CRTDEVD
DEVD (display-terminal-name)
DEVADR (000000)
DEVTYPE (3180)
MODEL (0002)
WSCADR (xxyyzz)
CTLU (work-station-controller)*
PRINTER (work-station-printer-name)
WSCKBD (yzzz)**
TEXT ('sample work station')

*A 1486C with a 102-key keyboard is supported only on a WSCE.

****y = P** If you have a 122-key keyboard attached.
y = G If you have an enhanced keyboard.
zzz = Use the appropriate keyboard identifier. Refer to the *IBM System/38 CL Reference Manual*.

Note: The 1486A/G/P has 132-column support and a separate message line only when used with a WSCE.

Configuring a Remotely Attached Display

To configure a 1486A/G/P for a 5294 Remote Control Unit or a 5394 Remote Control Unit, use the **CRTDEVD** command as described above, without the **WSCADR** and **WSCKBD** parameters.

Additional information about the parameters for the **CRTDEVD** command can be found in the system user's documentation.

Configuring a Locally Attached Printer

To configure a **p**rinter attached to a 1486A/G/P which, in turn, is attached to a workstation controller (WSC) or to a workstation controller-extended (WSCE), enter the **CRTDEVD** command with the following parameters:

CRTDEVD
DEVD (work-station-printer-name)
DEVADR (000000)
DEVTYPE (xxxx)*
MODEL (nnnn)**
CTLU (work-station-controller)
WSCADR (xxyyzz)
TEXT ('sample work station printer')

To send operational messages to a display station from the printer, add **MSGQ** (work-station-name).

***xxxx** = **4214, 5256, or 5219.**

****nnnn** = **0002** for 4214 or 5256.
nnnn = **00D2** for 5219.

Configuring a Remotely Attached Printer

If you have a printer attached to a 1486A/G/P that is attached to a 5294 Model 1 Remote Control Unit or a 5394 Remote Control Unit, enter the **CRTDEVD** command as described above, but without the **WSCADR** parameter.

Appendix C. Printer Support and Limitations

This appendix lists the supported printer types and describes printer limitations.

Supported Printer Types

Supported Printers	Menu Option	Supported Emulations	Configuration Settings on Printer
Memorex Telex 1201 Memorex Telex 1202 Memorex Telex 1208	**PRO-I/II**	5256, 4214	None
Memorex Telex 1808	**HP-LASER**	5256, 4214, 5219	None
IBM Proprinter (IBM 4201-001)* IBM Proprinter II (IBM 4201-002) IBM Proprinter XL (IBM 4202-001) IBM Proprinter XL (IBM 4202-002) IBM Graphics Printer (IBM 5152)**	**PRO-I/II**	5256, 4214	None
IBM Proprinter III (IBM 4201-003) IBM Proprinter XL III (IBM 4202-003)	**PRO-III**	5256, 4214	Set Switch 7 to On.
IBM Proprinter X24 (IBM 4207-001) IBM Proprinter XL24 (IBM 4208-001)	**X24/XL24**	5256, 4214	None
IBM Proprinter X24E (IBM 4207-002) IBM Proprinter XL24E (IBM 4208-002)	**X24E/XL24E**	5256, 4214, 5219	None
IBM Pageprinter-II (IBM 4216-020)	**PAGE-II**	5256, 4214, 5219	None
IBM Quietwriter III (IBM 5202) IBM Quickwriter (IBM 5204)	**QW3/QCK**	5256, 4214, 5219	Have installed an IBM Electron Font III cartridge Part Number 1318050.
IBM Pageprinter-E (IBM 4019-E01)	**HP-LASER or PAGE-II**	5256, 4214, 5219	Select correct emulation.
Hewlett-Packard LaserJet II, IID, IIP, III	**HP-LASER**	5256, 4214, 5219	None
Okidata 393	**EPSON-LQ**	5256, 4214	Set Emulation mode to Epson LQ. Set Character Set to Epson.
Epson LQ-850 Epson LQ-950 Epson LQ-1050	**EPSON-LQ**	5256, 4214	None

* This printer does not support proportional space printing. You must set **Proportional Spacing** to **Disable** (see the instructions for disabling proportional space printing in the Chapter 3 setup instructions for your printer emulation).

** This printer does not support character downloading. You must set **Download Character** to **Disable** (see the instructions for disabling character down-loading in the Chapter 3 setup instructions for your printer emulation).

HP LaserJet Limitations and Considerations

The 1486A/G/P does not support some characters on the HP LaserJet. In addition, some IBM Global Font Identifications (GFIDs) are present on the LaserJet but have different names.

LaserJet Printer Limitations

The 1486A/G/P does not support the following characters on the HP LaserJet because they are not included in the HP LaserJet Roman-8 symbol set:

ı – Dotless i

¦ – Broken vertical bar

© – Copyright symbol

® – Registered trademark symbol

‗ – Double underscore

¬ – Logical not

ç – Cedilla

¹ – Superscript 1

² – Superscript 2

³ – Superscript 3

x – Multiplication symbol

÷ – Division symbol

LaserJet Equivalents for IBM GFIDs

The following IBM Global Font Identifications (GFIDs) have the following font pitches:

IBM GFID	Font Pitch
0 – 65	10 CPI
66 – 153	12 CPI
154 – 200	Proportional
201 – 210	13.3 CPI
211 – 239	15 CPI
240 – 249	5 CPI
250 – 257	17.1 CPI
258 – 259	18 CPI
260 – 279	8.55 CPI
280 – 289	20 CPI
290 – 299	27 CPI
300 – 65535	Typographic

10 CPI Fixed Fonts (0 - 65)

GFIDs between 0 and 65 that are not listed in the following table are defined for the LaserJet as Courier, 10 pitch, 12 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
01 – Advocate	Courier	10	12	Upright	Medium
03 – OCR-B	Courier	10	12	Upright	Medium
05 – Orator	Presentation	10	12	Upright	Medium
11 – Courier 10	Courier	10	12	Upright	Medium
12 – Prestige 10	Prestige	10	12	Upright	Medium
13 – Artisan 10	Courier	10	12	Upright	Medium
18 – Courier Italic 10	Courier	10	12	Italic	Medium
19 – OCR-A	Courier	10	12	Upright	Medium
20 – Pica	Prestige	10	12	Upright	Medium
30 – Math Symbol 10	Courier	10	12	Upright	Medium
38 – Orator Bold 10	Presentation	10	12	Upright	Bold

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
39 – Gothic Bold 10	Letter Gothic	10	12	Upright	Medium
40 – Gothic 10	Letter Gothic	10	12	Upright	Medium
41 – Roman 10	Courier	10	12	Upright	Medium
42 – Serif 10	Courier	10	12	Upright	Medium
43 – Serif Italic 10	Courier	10	12	Italic	Medium
44 – Courier Bold 10	Courier	10	12	Upright	Bold

12 CPI Fixed Fonts (66 - 153)

GFIDs between 66 and 153 that are not listed in the following table are defined for the LaserJet as Courier, 10 pitch, 12 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
66 – Gothic 12	Letter Gothic	12	12	Upright	Medium
68 – Gothic Italic 12	Letter Gothic	12	12	Italic	Medium
69 – Gothic Bold 12	Letter Gothic	12	12	Upright	Bold
70 – Serif 12	Courier	12	10	Upright	Medium
71 – Serif Italic 12	Courier	12	10	Italic	Medium
72 – Serif Bold 12	Courier	12	10	Upright	Bold
80 – Math Symbol 12	Courier	12	10	Upright	Medium
84 – Script	Courier	12	10	Upright	Medium
85 – Courier 12	Courier	12	10	Upright	Medium
86 – Prestige 12	Prestige	12	10	Upright	Medium
87 – Gothic 12	Letter Gothic	12	12	Upright	Medium
91 – Light Italic 12	Letter Gothic	12	12	Italic	Medium
110 – Gothic Bold 12	Letter Gothic	12	12	Upright	Bold
111 – Prestige Bold 12	Prestige	12	10	Upright	Bold
112 – Prestige Italic	Prestige	12	10	Italic	Medium

Proportionally Spaced Fonts (154 - 200)

GFIDs between 154 and 200 that are not listed in the following table are defined for the LaserJet as GC Times, proportionally pitched, 10 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
155 – Boldface Italic	GC Times		10	Italic	Bold
158 – Modern	GC Times		10	Upright	Medium
159 – Boldface	GC Times		10	Upright	Bold
160 – Essay	Univers		10	Upright	Medium
162 – Essay Italic	Univers		10	Italic	Medium
163 – Essay Bold	Univers		10	Upright	Bold
173 – Essay Light	Univers		10	Upright	Light
175 – Document	GC Times		10	Upright	Medium

13 CPI Fixed Fonts (201 - 210)

GFIDs between 201 and 210 that are not listed in the following table are defined for the LaserJet as Courier, 13 pitch, 10 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
204 – Gothic 13	Letter Gothic	13	10	Upright	Medium

15 CPI Fixed Fonts (211 - 239)

GFIDs between 211 and 239 that are not listed in the following table are defined for the LaserJet as Courier, 15 pitch, 10 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
221 – Prestige 15	Prestige	15	7.0	Upright	Medium
223 – Courier 15	Courier	15	8.5	Upright	Medium
225 – Math Symbol 15	Courier	15	8.5	Upright	Medium
229 – Serif 15	Courier	15	8.5	Upright	Medium
230 – Gothic 15	Letter Gothic	15	9.5	Upright	Medium

5 CPI Fixed Fonts (240 - 249)

GFIDs between 240 and 249 that are not listed in the following table are defined for the LaserJet as Courier, 5 pitch, 10 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
245 – Courier Bold 5	Courier	5	10	Upright	Bold

17.1 CPI Fixed Fonts (250 - 257)

GFIDs between 250 and 257 that are not listed in the following table are defined for the LaserJet as GC Times, 17 pitch, 8.5 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
252 – Courier 17	GC Times	17	8.5	Upright	Medium
253 – Courier Bold 17	GC Times	17	8.5	Upright	Bold
254 – Courier 17 (S/S)	GC Times	17	8.5	Upright	Medium

18 CPI Fixed Fonts (258 - 259)

There are currently no assigned fonts in this range. The default is Courier, 20 pitch, 10 point, upright, medium fonts.

8.55 CPI Fixed Fonts (260 - 279)

There are currently no assigned fonts in this range. The default is Courier, 28 pitch, 10 point, upright, medium fonts.

20 CPI Fixed Fonts (280 - 289)

GFIDs between 280 and 289 that are not listed in the following table are defined for the LaserJet as Courier, 20 pitch, 10 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
281 – Gothic 20	Letter Gothic	20	6	Upright	Medium

27 CPI Fixed Fonts (290 - 299)

GFIDs between 290 and 299 that are not listed in the following table are defined for the LaserJet as Courier, 27 pitch, 10 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
290 – Gothic 27	Letter Gothic	27	3.6	Upright	Medium

Typographic Fonts (300 - 65535)

GFIDs between 300 and 65535 that are not listed in the following table are defined for the LaserJet as GC Times, proportionally pitched, 10 point, upright, medium fonts.

IBM GFID/ Font Name	LaserJet Font	Pitch	Size	Style	Weight
751 – 8 PT Roman Medium	GC Times		8	Upright	Medium
1051 – 10 PT Roman Med	GC Times		10	Upright	Medium
1053 – 10 PT Roman Bold	GC Times		10	Upright	Bold
1056 – 10 PT Roman Ital	GC Times		10	Italic	Medium
1351 – 12 PT Roman Med	GC Times		12	Upright	Medium
1653 – 16 PT Roman Bold	GC Times		16	Upright	Bold
2103 – 24 PT Roman Bold	GC Times		24	Upright	Light

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