I-O 8251R Remote Emulator Card

Quick Setup Guide

Version 1.11

Thank you for buying the I-O 8251R Remote Emulator Card. This Quick Setup Guide is designed to help you get up and running in a short amount of time. This guide outlines the hardware installation, software installation, and configuration setup in very few steps.

Caution! The I-O 8251R is a static-sensitive device. Keep the card in the protective bag until you are ready to install it.

Unpacking

When the card is received, check the package for water or shipping damage, and contact the carrier if any damage is evident. The shipping package should contain the following:

- I-O 8251R Remote Emulator Card
- I-O 8251R 3.5" software diskettes
- I-O 8251R Quick Setup Guide and User's Guide
- Screwdriver
- One of the following applicable communications cables: CCX21, CCV24, CCV35

Keep the original packaging in case the card must be reshipped. If your system requires 5 1/4" diskettes, please contact Customer Support at (801) 972-1446.

QUICK SETUP

Installing the Hardware

1. Power off the PC and other attached peripherals, and remove the power cord from the PC.

Danger! Make sure the power to the PC is off, remove the power cord, and unplug the cord from the electrical supply before connecting any cables. Do not turn power on until all cables are connected.

Warnung! Vergewisseren Sie sich, dass die PC ausgeschaltet und die Netzzuleitung entfernt ist bevor irgendwelche Kabel angeschlossen werden. Schalten Sie Gerät nicht wieder ein bevor alle Kabel angeschlossen sind. Zur vollständigen Trennung vom Netz ist der Netzstecker zu ziehen.

2. Remove the PC monitor and cover. Locate an empty expansion slot and remove the slot cover. Touch the PC chassis to remove any static charge, then carefully remove the I-O 8251R card from the anti-static bag.

3. Hold the I-O 8251R card by the edges, using the screwdriver provided, set the DIP switches for an unused I/O address (see I/O address table on the following page).

4. Insert the card into the expansion slot by pressing the card firmly in place. Replace the expansion slot screw.

I/O 8251R Base Address DIP Switch Positions				
Address	Switch Number			
	1	2	3	4
300-30F*	**On**	**On**	**On**	**On**
310-31F	On	On	On	Off
320-32F	On	On	Off	On
340-34F	On	Off	On	On
350-35F	On	Off	On	Off
360-36F	On	Off	Off	On
380-38F	Off	On	On	On
3A0-3AF	Off	On	Off	On

* Factory Default

5. Run Diagnostics Program before reattaching the PC cover. Plug in the monitor, keyboard and power without replacing the PC cover. To execute the I-O 8251R Emulator Diagnostic Program, start in the directory where the I-O 8251R emulation software resides. If the software is on a floppy disk, type **A:IODIAG** (assuming the floppy drive is A:). At the DOS prompt, type **IODIAG** and press **<Enter>** (See "I-O 8251R Diagnostic Program" below).

6. Connect the modem to the I-O 8251R Emulator Card with the cable provided. Follow the manufacturer's instructions for installing the modem for synchronous communications.

7. Replace the cover on the PC, then connect the power cord to the PC. Power up the PC and other attached devices.

I-O 8251R Diagnostic Program

To execute the I-O 8251R Diagnostic Program you must be in the directory where the remote emulation software resides. At the DOS prompt, type **IODIAG** and press **<Enter>**.

A copyright screen will appear that will prompt you to press **<Enter>** to continue. A diagnostic screen appears with the addresses. Using the cursor, highlight the address you want to run and press <Enter>. If the test is successful, a prompt for modem loopback test will appear. Select "**N**". Refer to "I-O 8251R Diagnostic Program" in the I-O 8251R User's Guide for more information.

Installing the Software

A configuration diskette has been included with the I-O 8251R card. If you are using Microsoft Windows, refer to "Using Microsoft Windows" in the I-O 8251R User's Guide for more information.

1. If the software is to reside on a diskette, first make a backup copy of the diskette, store the original diskette, and then go to Step 7, using the backup diskette.

   For the hard drive installation, at the DOS prompt type the following (assuming your hard drive is drive C:) **C:**

2. Create a directory at the DOS prompt by typing: **MD 8251R**

3. Insert the I-O 8251R software diskette into drive A: (assuming the floppy drive is A:).

4. Copy the software to the new directory on the hard drive by typing: **COPY A:*.* C:\8251R**.

5. Remove the diskette and place in storage.

6. Change to the emulation directory by typing: **CD \8251R**

7. Begin the configuration program by typing: **RCONFIG**

8. The I-O 8251R software is pre-configured for a standard setup. Select "**Modify**" and the Operating Environment setup screen appears. You will be prompted to move the cursor to the option on the menu and make a selection. Make sure the choice matches the host configuration. Refer to "Configuring the I-O 8251R" in the I-O 8251R User's Guide for more information.

9. After selecting the configuration option(s), press **<Esc>** until you return to the main menu. The following prompt will appear: Do you want to save this configuration? (Y/N). Type "**Y**". If you selected PC Support Only or Terminal Emulation and PC Support, the prompt to enter the correct path for PC Support will appear. Enter in the correct path. You can then select **Exit** to end the program, and press **<Enter>** to return to the DOS prompt.

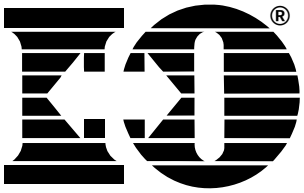
Starting Emulation

To begin emulation, perform the following steps:

1. Type **CD\8251R** and press **<Enter>**.
2. Type **IO8251R** and press **<Enter>**.

Note: If you are using a non-default configuration file, type **IO8251R <File Name>** (where file name is the name of customized installation).

The sign-on screen will appear. If you chose the DOS startup in the Emulator Startup option, the DOS screen will appear, and you will need to hot key to the host session. Refer to "Hot Key Sequence" in the I-O 8251R User's Guide for more information.



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I-O 8251R Remote Emulator Card

for

PC to IBM System/34, /36, /38 and AS/400 Communications

User's Guide

Version 1.11

I-O 8251R Remote Emulator Card	Version 1.11
8251RX-OMAN01-111	Revision Date: Septemer, 1998

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Attachment 1 of BMPT Vfg 243/1991
Certificate of Compliance
by Manufacturer or Importer

We hereby certify that the Equipment

Nomenclature: Remote Emulator Model No. I-O 8251R

is in compliance with the requirements of BMPT Vfg 243/1991 RFI suppressed. The normal operation of some equipment (e.g., signal generators) may be subject to specific regulations. Please observe the notices in the user's manual.

The marketing and sale of the equipment was reported to the Federal Office for Telecommunications Permits (BZT). The right to retest this equipment to verify compliance with the regulation was given to the BZT.

Name of Manufacturer or

Importer: I-O Corporation

Address: 2256 South 3600 West, Salt Lake City, Utah 84119

Anhang zur Anlage 1 zur AmtsblVfg 243/1991

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

DFÜ Emulator
(Gerät, Typ, Bezeichnung)

(DIN-VDE-Norm bzw. EN-Norm Bzw.BMPT-AmtsblVfg 243/1991 funk-entstört ist.

Dem Bundesamt für Zulassungen in der Telekommunikation wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf die Einhaltung der Bestimmungen eingeräumt.

I-O Corporation
2256 South 3600 West, Salt Lake City, Utah 84119
(Name und Anschrift des Herstellers/Importeurs)

PREFACE

The I-O 8251R Emulator Card allows connection of remote IBM or compatible personal computers (PCs) to an IBM System/34, /36, /38, or AS/400. The I-O 8251R can connect to the host locally through the host's communications port or provide remote SDLC communications via modems. The I-O 8251R allows the PC and PC printer to emulate (act like) a controller, display station, and system printer on the host.

This manual will guide you through a step-by-step installation procedure. Once installed, the I-O 8251R works without further operator intervention.

This manual is divided into the following sections:

1. **INTRODUCTION** - Explains the application and interfaces supported by the I-O 8251R Emulator Card.

2. **HARDWARE INSTALLATION** - Explains the hardware installation and connection of the modem.

3. **SOFTWARE INSTALLATION** - Explains the installation of the software to work with DOS, Windows, PC Support, and OS/2.

4. **CONFIGURATION** - Explains the configuration of the software.

5. **OPERATION** - Provides information regarding operation of the I-O 8251R, such as starting and ending emulation, auto print sharing, file transfer, etc.

6. **ADVANCED FEATURES** - Explains the operation of features such as record/playback, macros, 3812/5219 printer emulation, I-O escape commands, and I-O Command Pass-Thru™.

7. **PROBLEM RESOLUTION** - Provides detailed information for troubleshooting.

PREFACE

This manual was prepared by I-O Corporation for use by its customers, dealers, and affiliates. All attempts are made to ensure that the information presented in this manual is correct. However, no liability, expressed or implied, will be assumed by I-O Corporation or its dealers or affiliates for any damage resulting from the use of this information.

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1 INTRODUCTION

The I-O 8251R Emulator Card allows connection of remote IBM or compatible personal computers (PCs) to an IBM System/34, /36, /38, or AS/400. The I-O 8251R can connect to the host locally through the host's communications port or provide remote SDLC communications through synchronous modems. The I-O 8251R allows the PC and PC printer to emulate (act like) a controller, display station, and a host printer.

The I-O 8251R Emulator Card supports the following three interfaces:

- EIA 232D (V.24)
- V.35
- X.21

EIA 232D (known internationally as V.24), is a standard set for interfaces of Data Terminal Equipment (DTE) with Data Communications Equipment (DCE) over short distances.

X.21 is a general purpose interface between DTE and Data Circuit-Terminating Equipment (DCT) for operating on synchronous, Public Data Networks (PDN) that provide circuit-switched and leased-circuit services for data communications. X.21 supports high transmission speeds (up to 64,000 bps) for a distance of 3,334 feet (1,000 meters).

V.35 is a high speed interface that supports high transmission speeds (up to 64,000 bps) for a maximum distance of 2,000 to 4,000 feet (600 to 1,200 meters).

PC Requirements

The following are required to use the I-O 8251R Emulator Card:

- IBM PC, PC/XT, PC/AT, 386, 486, or compatible non-Micro Channel personal computer
- Floppy drive
- DOS version 3.3 or higher
- 225K + 11K per display session + 29K per printer session

INTRODUCTION

System Requirements

You must have the following to use the I-O 8251R Emulator Card in conjunction with the host:

- IBM System/34, /36, /38, or AS/400
- Synchronous communications port that supports the SDLC protocol

Unpacking

When the card is received, check the package for water or shipping damage, and contact the carrier if any damage is evident. The shipping package should contain the following:

- I-O 8251R Remote Emulator Card
- I-O 8251R 3.5" software diskettes
- I-O 8251R Quick Setup Guide and User's Guide
- Screwdriver
- One of the following applicable communications cables: CCX21, CCV24, CCV35

Keep the original packaging in case the card must be reshipped. If your system requires 5 1/4" diskettes, please contact Customer Support at (801) 972-1446.

Note: Optional cables available for local attachment. Please order CCX21M, CCV24M, or CCV35M from your I-O dealer.

2 HARDWARE INSTALLATION

Caution! The I-O 8251R Emulator Card is static sensitive.

Take precautions as you would with any static-sensitive device. Some of these precautions include:

Be aware that some work surroundings, such as carpet, floor mats, dry air from winter heating, etc., can cause static buildup. To prevent a static discharge, touch a grounded surface (such as the PC chassis) before handling the card. Do not touch components on the card. Handle the card by the edges only.

Installing the I-O 8251R Card

Follow these instructions to install the I-O 8251R in your PC.

1. Power off the PC and other devices attached to the PC, and unplug all power cords from the outlet.

Danger! Make sure the power to the PC is off, remove the power cord, and unplug the cord from the electrical supply before connecting any cables. Do not turn power on until all cables are connected.

Warnung! Vergewisseren Sie sich, dass die PC ausgeschaltet und die Netzzuleitung entfernt ist bevor irgendwelche Kabel angeschlossen werden. Schalten Sie Gerät nicht wieder ein bevor alle Kabel angeschlossen sind. Zur vollständigen Trennung vom Netz ist der Netzstecker zu ziehen.

2. Lift the monitor off the PC and set it aside.

3. Follow the PC operator's manual instructions for removing the PC cover. Set the cover aside and save the screws for reassembly.

4. When the I-O 8251R is installed into the PC, it uses an I/O address. The factory setting of the I-O 8251R is at the base I/O address of 300. Two conflicting addresses may result in operating difficulties. If the address of the card needs to be changed, please take the following steps, otherwise continue to Step 5.

   Locate the DIP switches in the upper left hand corner of the board (See Figure 2-1).

Figure 2-1

   Using the screwdriver provided, or another pointed instrument, position the DIP switches to select an unused I/O address (see the I/O address table on the following page). Write down the selection on page 4-10 for the base I/O address for the software configuration.

I/O 8251R Base Address DIP Switch Positions				
Address	Switch Number			
	1	2	3	4
300-30F*	**On**	**On**	**On**	**On**
310-31F	On	On	On	Off
320-32F	On	On	Off	On
340-34F	On	Off	On	On
350-35F	On	Off	On	Off
360-36F	On	Off	Off	On
380-38F	Off	On	On	On
3A0-3AF	Off	On	Off	On

5. Locate an empty expansion slot in the PC.

6. Using a screwdriver (or socket wrench, if necessary), remove the expansion slot cover. Save the screw for later use.

7. Discharge static electricity from your body by touching a grounded surface, such as the PC chassis, then remove the card from the anti-static bag.

8. Hold the card by its edges (do not touch the components or circuitry), and insert the card into the expansion slot. Firmly press the card into the PC motherboard socket connector. See Figure 2-2.

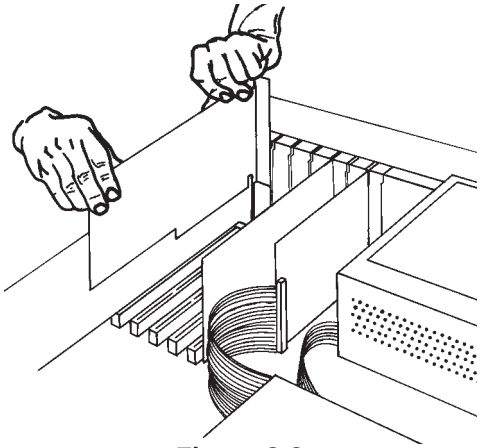


Figure 2-2

9. Align the slot on the bracket with the expansion slot cover hole. To align, gently lift or press down on the end opposite the bracket and connector until it is properly aligned. If the slot is not properly aligned, the card will not seat correctly in the PC and the card will not function properly. Insert and tighten the screw.

10. Run the I-O 8251R Diagnostic Program. Plug in the monitor, keyboard and power without replacing the PC cover. To execute the I-O 8251R Emulator Diagnostic Program, start in the directory where the I-O 8251R emulation software resides. If the software is on a floppy disk, type **A:IODIAG** (assuming the floppy drive is A:). At the DOS prompt, type **IODIAG** and press **<Enter>**.

    A copyright screen appears with a prompt to press **<Enter>** to continue. A diagnostic menu appears, as shown on the following page.

```
                I-O 8251R Diagnostics Program

Select address range that corresponds to the I-O 8251R
Switch Setting

                                300-30F
                                310-31F
                                320-32F
                                330-33F
                                340-34F
                                350-35F
                                360-36F
                                380-38F
                                3A0-3AF
```

```
Menu Command Options:

    Change Option    Select Options    <ESC> Previous Screen
```

Using the cursor, highlight the addresses the DIP switches are set for and press **<Enter>**. The I/O Address Test will run.

I/O Address Test -- The I/O Address Test will check to see if the card will respond to the address specified with the DIP switches. If the I/O address does not respond to any address, check to see if the card has been properly installed. If successful, a prompt to run the Modem Loopback Test will appear.

Modem Loopback Test -- This test determines if the modem is communicating with the host. The modem must be in the loopback mode. Refer to the modem's operation manual for instructions. The baud rate of the modem must also be configured at the same speed as the baud rate of SDLC parameters in the configuration program.

A message will appear stating if the test was successful or failed. If the test failed, the modem may not be communicating due to incorrect configuration on the modem, or the modem is not powered on.

11. Replace and fasten the PC cover. Replace the monitor and reattach the cables.

Connecting a Modem to the I-O 8251R Emulator Card

Connect the modem to the I-O 8251R Emulator Card with the interface cable provided. Follow the manufacturer's instructions for installing the modem for synchronous communications with your type of telephone line.

3 SOFTWARE INSTALLATION

This chapter will give instructions for installing the I-O 8251R software, setting the I-O 8251R to be used with DOS, Windows, PC Support, and OS/2. Complete only the steps needed.

The following key indicates the type of transactions which will be used to install these applications:

Bold	Indicates a command to type in.
Outline	Indicates a button or icon selection.
Underline	Indicates an option selection.

Installing the I-O 8251R Software

Before beginning the software installation, make a backup copy of the I-O 8251R software, using the following steps.

Note: If the disk is in the B: drive, change A: to B:

1. Type **Diskcopy A: A:** and follow the prompt.

2. Store the original disk in a safe place.

Copy the I-O 8251R software to the hard drive, following the instructions below.

1. At the DOS prompt, create a directory from the root directory named 8251R. Type **C: <Enter> CD\ <Enter> MD\8251R <Enter>**.

2. Insert the I-O 8251R software diskette into drive A.

3. Copy the software to the new directory on the hard drive type **COPY A:*.* C:\8251R <Enter>**.

4. When the copying is finished, remove the software diskette and store it in a safe place.

5. This completes the DOS installation.

SOFTWARE INSTALLATION

Using Microsoft Windows 95/98

To create a shortcut in Windows 95/98 to access the I-O 8251R emulation software, follow these simple steps after installing the software:

1. Insert the I-O 8251R diskette.
2. Right click on desktop and select New, then select Shortcut.
3. Browse the A:\ drive for IO8251R.BAT file.
4. Click Open, Next, and then Finish.
5. Right click the shortcut that was just created and select Properties.
6. Click on the Program tab, and select Change Icon.
7. Select Browse, go to A:\ drive, select IO8251R.ICO .
8. Click Open, and then OK twice.

Using Microsoft Windows 3.1x

To install the I-O 8251R into Windows, follow these simple steps after installing the I-O software:

1. Start Windows by typing **WIN.EXE**
2. Go to the folder where the I-O icon is to be located.
3. From the File menu, select New.
4. Select Program Item.
5. For the icon name, type in **IO8251R**
6. For program, type **C:\8251R\IO8251R.PIF**
7. Select Change Icon.

8. For the icon name, type **C:\8251R\IO8251R.ICO**

9. To save and exit, click on OK twice.

10. From the File menu, select New.

11. Select Program Item.

12. For the icon name, type in **RCONFIG**

13. For program, type **C:\8251R\RCONFIG.PIF**

14. Select Change Icon.

15. Type **C:\8251R\RCONFIG.ICO** for the icon name.

16. To save and exit, click on OK twice.

17. Double click on the RConfig icon to start the configuration.

18. Configure the software using the instructions in Chapter 4, Configuration. Change the Hot Key code under "Keyboard."

19. Double click on the IO8251R icon to start emulation.

Hints for Windows 3.X

If you want to exit emulation, follow these steps:

1. Sign off all sessions.

2. Use the hot key **<Alt><Shift>** to go into DOS.

3. To end emulation, press **<Ctrl><C>**.

To restart emulation, follow these steps:

1. Double click on the IO8251R icon.

2. When the message appears, select **<C>** (continue).

3. If emulation does not start, double click on the IO8251R icon for a second time. This will start emulation.

If you want to copy from emulation to a document, follow these steps:

1. Put the screen in a window **<Alt><Enter>**.
2. Bring up the System Menu by clicking on the system menu button "-" located in the upper left hand corner of the screen.
3. Select Edit.
4. Select Mark.
5. Using the mouse, mark the text to be copied.
6. Open the clipboard in Windows.
7. Open Display and select OEM text.
8. Go to the document where the paste will take place.
9. Select Paste.

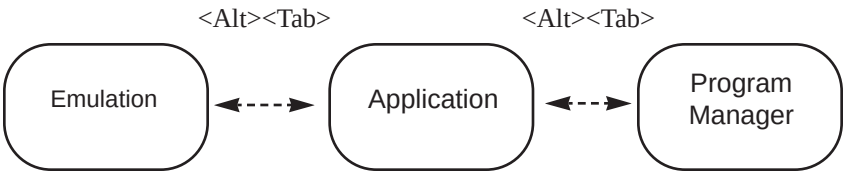
To copy from a document to emulation, follow these steps:

1. Cut the data using the normal sequence for the program.
2. Put the screen in a window **<Alt><Enter>**.
3. Put the cursor where the paste will take place.
4. Bring up the System Menu by clicking on the system menu button "-" located in the upper left hand corner of the screen.
5. Select Edit.
6. Select Paste.

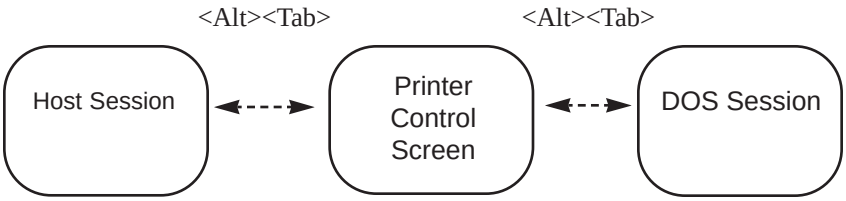
Windows Hot Key Sequences

The following sequences can be used to jump between applications while in Windows.

Starting at the current active emulation, press **<Alt>** then **<Tab>** to roll through the active applications. This sequence advances to each of the current active applications.



Using **<Alt>** and **<Shift>** allows the user to roll through active applications, **<Enter>** must be pressed to activate the application. To change sessions while in emulation window; press **<Alt><Shift>** (or the customized hot key) or **<Alt> <1>** for session 1, **<Alt> <2>** for session 2, etc.



PC Support/38

Follow the installation instructions in the IBM PC Support/38 technical reference manual (IBM enhanced emulation). When starting emulation, do not specify a virtual source drive. For all references to the virtual source drive, use the virtual disk specified in the I-O configuration program.

SOFTWARE INSTALLATION

To install PC Support/38, take the following steps:

1. Configure the I-O 8251R Remote Emulator Card (see Chapter 4). Set the virtual disk drive to A: and set emulator start up to DOS.

2. Create a directory called "PCS38" by typing **MKDIR PCS38**

3. Start emulation by typing **IO8251** from the 8251R directory.

4. Hot key to the S/38 sign on screen and sign on.

5. Execute option **<5>** (execute command).

6. On the command line, type: **ADDLIBLE QIWS**

7. Execute option **<3>** (execute command).

8. Call **QIWDOWNL**

9. Go to the copy screen, then hot key to DOS.

10. Change the drive to A: and type: **COPYLINK C:\PCS38**. The program will begin to copy.

11. When complete, hot key to emulation.

12. Execute **<CMD1>** (end) twice.

13. Sign off the PC.

14. Reboot the PC.

15. Start emulation.

16. From the PC38 directory, execute Link 38.

PC Support/36

During the installation of the IBM PC Support/36 software on the PC, when asked for the type of emulation program, specify "Other" and enter the I-O 8251R emulation program name: **IO8251R.EXE**

OS/2

The I-O 8251R is compatible with OS/2 Version 2.0 and later. To install the I-O 8251R, follow the steps below.

1. Insert the I-O diskette. Double click on Diskette Drive Object for the drive you are using. If the diskette drive object is not on the desktop, do the following:

   - Step 1 - Double click on OS/2 System
   - Step 2 - Double click on Drives
   - Step 3 - Double click on your Diskette Drive Object

2. Double click on the INSTALL.EXE program. Configure the I-O 8251R by following the instructions in Chapter 4.

3. In the configuration, go to the Hot Key selection and select **Change Hot Ke**y.

4. Change the hot key to the left hand shift by pressing the left hand **<Shift>** key followed by **<Enter>**.

5. Double click on the IO8251R icon.

Hints for OS/2

To exit emulation, sign off all sessions. Use the hot key **<Alt><Shift>** to go to DOS. This ends OS/2 and closes the window.

To restart emulation, double click on the IO8251R icon. When the message appears, select **<C>** (continue). If this does not start OS/2, double click on the IO8251R icon a second time. This should restart emulation.

4 CONFIGURATION

Before the I-O 8251R can communicate with the host system, both the host system and the I-O 8251R software must be configured.

Configuring the I-O 8251R

The I-O 8251R configuration information is contained in a disk file. A standard default file is included with the software. The standard default file can be changed, or you can create as many configurations as needed.

The following keys are used throughout the configuration:

Key	Function
<Enter>	Selects and saves your choice
<Esc> (Escape)	Returns to the previous screen
← ↑ → ↓	Moves from one option to another
Space Bar	Erases the choice shown at the cursor location. In some cases, it also toggles through the selections for that option.

Start the configuration process by following the steps below.

1. Make sure you are at the drive and directory where the I-O 8251R software is stored.

   a. Type **CD \8251R <Enter>**.
   b. Type **RCONFIG** at the DOS prompt and press **<Enter>**.

2. After a few moments, the Main Menu appears as shown in Figure 4-1.

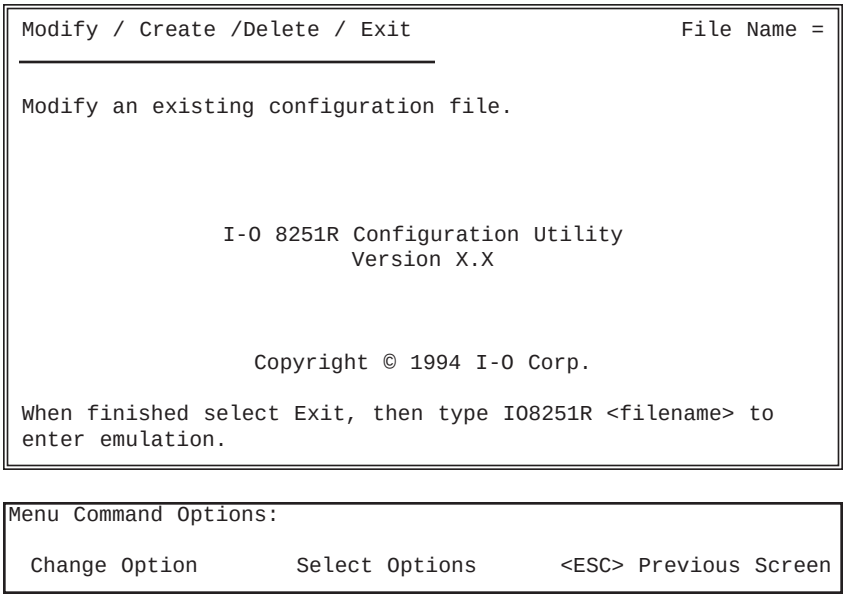


Figure 4-1

3. Use the cursor arrow keys to move the highlighted block on the top of the Main Menu to the choice of Modify, Create, Delete or Exit. Press **<Enter>** .

   "Modify" changes the current configuration. Unless there is a need for more than one configuration, choose this option. Select "Create" if a new configuration is needed.

Delete a Configuration

To delete a configuration file, select **Delete**. A list of the files (up to eight) is displayed. Move the cursor to the file to be deleted and press **<Enter>**. The following prompt appears: "Are you sure you want to delete this file (y/n)?" Type "**Y**" and press **<Enter>**, to delete the file. Type "**N**" and press **<Enter>**, to return to the original screen.

Exit the Configuration Program

After selecting all the configuration options, press **<Esc>** until the following prompt appears: "Do you want to save this configuration? (y/n)." Type "**Y**" to save the new configuration, or type "**N**" to ignore the changes and press **<Enter>**. The prompt to enter the correct path will appear. Select **Exit** to end the program, and press **<Enter>** to return to the DOS prompt.

Modify or Create a Configuration

To change an existing configuration, select "**Modify**." The default configuration file is named **IO8251R**. You may want to modify the default configuration file, rather than create a new one, to reduce the amount of disk storage.

To create a new configuration file, select "**Create**." This creates and stores a new file. Type the new file name, then press **<Enter>**.

When Modify or Create is selected, the "Operating Environment" setup screen appears. There will be a prompt to select one of the following options:

1) Terminal Emulation Only
2) PC Support/400 Only
3) Terminal Emulation and PC Support/400

If Option 1, terminal emulation only or Option 3, terminal emulation and PC Support/400 are selected, continue to the next step. If Option 2, PC Support/400 only was selected, skip to the SDLC parameters on page 4-9 and complete that section.

If Terminal Emulation Only or Terminal Emulation and PC Support/400 are chosen, the configuration menu will appear.

CONFIGURATION

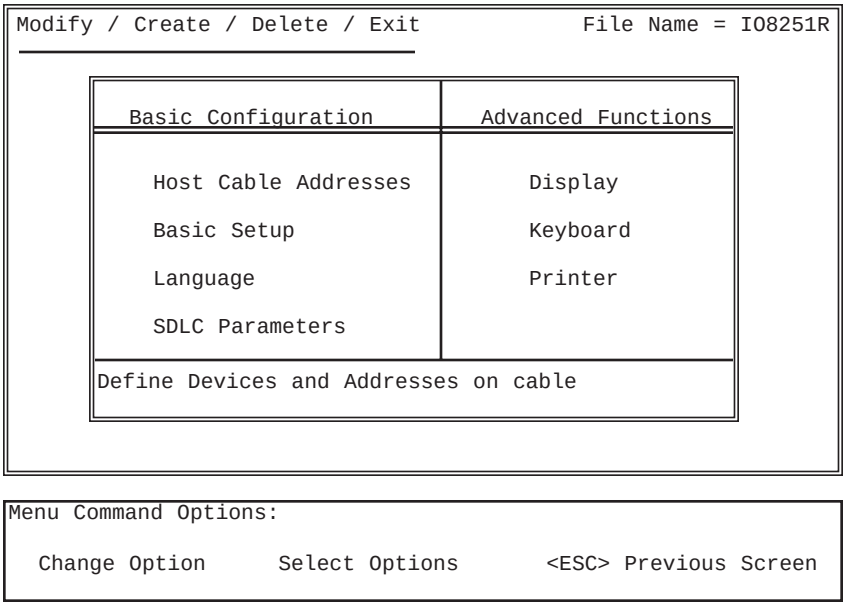


Figure 4-2

- Basic Configuration: The items in the left column are necessary for the basic configuration of the PC.

- Advanced Functions: The items in the right column are for more advanced configuration of the PC with the host. For standard operation, the advanced functions do not need to be changed.

Move the cursor to an option on the Configuration Menu and press **<Enter>**. This displays a second screen of options. Make selections from the items on the Configuration Menu. The selections are described on the following pages.

When finished making selections from the Configuration Menu, press **<Esc>** to return to the Main Menu. A prompt to save the configuration will appear. Choose **Yes**, to save the configuration. Choose **No**, to exit without saving.

Basic Configuration

The Basic Configuration options are used to set the following:

- Host cable addresses
- Basic setup options for the PC
- Language type
- SDLC parameters

Host Cable Addresses

Move the cursor to Cable Addresses and press **<Enter>**. The following screen appears (see Figure 4-3).

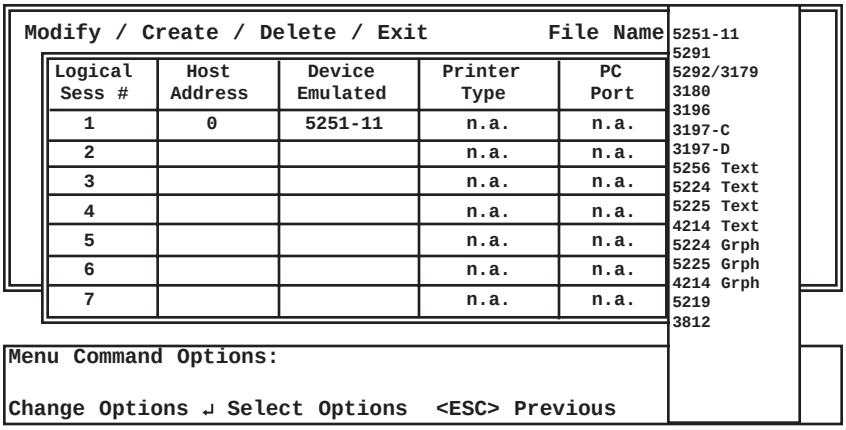


Figure 4-3

Logical Session # -- Each device is referred to as a Logical Unit (LU) or "session." Up to seven devices can be assigned.

Host Address -- The host address is the local station address as configured on the host. Use the space bar to erase an address selection. The address can be used only once, an address conflict message will appear if an address is used more than once.

Device Emulated -- The I-O 8251R can emulate IBM displays or printers. Move the cursor to the Device Emulated column, and a window appears on the screen with the display and printer choices. The choices for displays include: 5251 Model 11, 5291, 5292/3179, 3180, 3196, 3197C, and 3197D. The choices for printers include: 5256, 5224, 5225, 4214, 5219, and 3812. Select a text printer for basic operation and graphics if advanced printer functions are to be used.

Use the cursor up and cursor down keys to highlight the emulation choice and press **<Enter>** to select. Make sure the emulation choice for each cable address matches the device configured on the host by the system operator.

Printer Type -- If the printer configured to the PC is not listed, a printer definition can be created by selecting **Other**, typing a new name, and then defining the printer as discussed in "Advanced, Printer Functions." Select printer commands definition under "Printer" and follow the instructions on page 4-19.

PC Port -- Select the PC port to which the printer is physically attached. Choose an "LPT" port for parallel printers or a "COM" port for serial printers. Move the cursor to the PC Port column, and a window appears with the following choices: LPT 1, LPT 2, LPT 3, COM 1, or COM 2. If "COM" port for serial printers is chosen, a second window will appear on the screen to define communications protocol for baud rate, data bits, stop bits, and parity.

Basic Setup

Basic Setup options configure the PC. Move the cursor to Basic Setup and press **<Enter>**. The screen in Figure 4-4 appears.

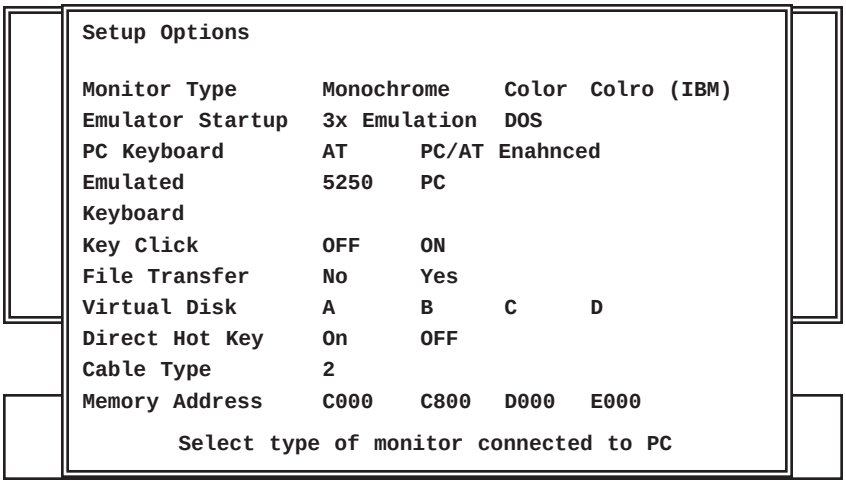


Figure 4-4

Monitor Type -- Select the monitor type connected to the PC. The options include Monochrome, Color, or Color (IBM). To make a selection, move the highlighted block to the choice. Only select color IBM if a CGA monitor is being used and snow appears on the screen.

Emulator Startup -- After starting emulation either a DOS screen or a host screen will appear. To start emulation with a DOS screen, select **DOS**. To enter emulation "hot key" to the host session. To start emulation with a host screen, select **3X Emulation**. To enter DOS, "hot key" to DOS.

PC Keyboard -- Identify which keyboard style is attached to the PC: AT (84 keys with a unique layout); PC/XT (83 keys); or Enhanced (101/102 keys). Move the cursor with the arrow keys and select the keyboard type you have attached to your personal computer. If you do not know which keyboard you have, look at the keyboard templates in Appendix F.

Emulated Keyboard -- Select the keyboard type to emulate. Keyboards used with a PC XT/AT have the same number of keys as the IBM 5250 keyboard for the host; however, they have different key layouts and scan codes.

For experienced host system users, the 5250 layout may be more comfortable. This selection uses the same general layout as a keyboard used on the host. For PC users, the PC layout may be the best. (See Appendix F for the keyboard templates.) The normal PC keyboard layout is restored when DOS is active.

Key Click -- The key click can be turned **On** or **Off**. If it is On, each time a key is struck, a clicking sound will be heard.

File Transfer -- Select **Yes** to enable the API. This is used for all file transfer utilities. Selecting **No** disables API.

Virtual Disk -- This option defines which disk drive is used by PC Support/38 as the virtual disk drive.

Direct Hot Key -- The direct hot key jumps from one session directly to another session rather than jumping sequentially through the sessions. The hot key can be turned **On** or **Off**. Disable this only if there is a conflict with another PC program by pressing **<Alt><#>**.

Language

Select the language that matches the AS/400 or System/3X settings. When the language option is selected, the following screen appears.

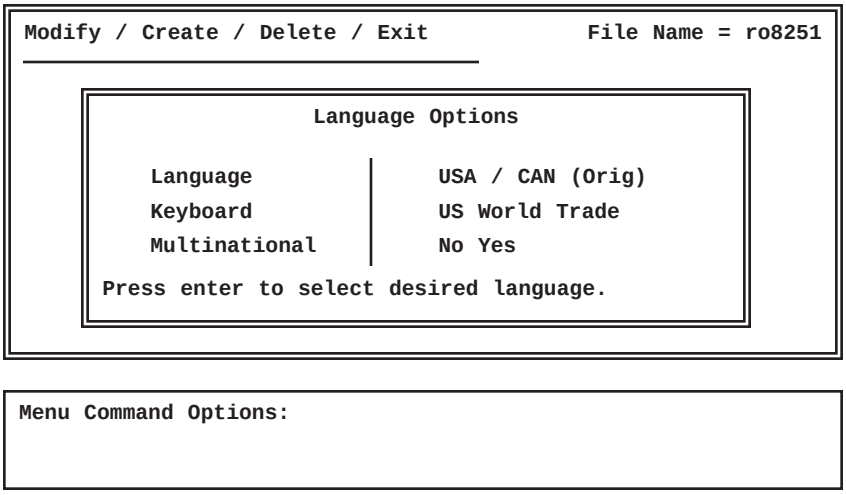


Figure 4-5

Language -- The I-O 8251R supports 18 languages. Select the language that matches the host system settings. The USA/CAN (ORIG) keyboard language configuration utilizes the original I-O keyboard layouts, whereas the USA/CAN (TERM) utilizes the layout resembling the terminal keyboard.

Keyboard -- Select the type of keyboard (U.S. or World Trade) configured on the host system.

Multinational -- If the host is configured for Multinational, select Yes.

SDLC Parameters

The SDLC parameters are used to match the settings configured on the host for line and controller. The system administrator should match these settings to the host configuration. When the SDLC parameter options are selected, the following screen appears.

```
Modify / Create / Delete / Exit                File Name = IO8251R

     SDLC Parameters                              Values

    Controller Type                              5394
    Station Address                              0F
    NRZ/NRZI Encoding                            NRZI
    DMA Channel 1                                Enable
    DMA Channel 3                                Enable
    IRQ Interrupts                               IRQ10
    Base I/O Address                             340-34F
    Baud Rate                                    9600

Select type 5251-12, 5294, or 5394

Menu Command Options:

    Use ↑ ↓ to select parameters ← → to modify values
     Change Option   ↵   Select Options <ESC> Previous Screen
```

Figure 4-6

CONFIGURATION

Controller Type -- The type of remote controller to be emulated. The selection must match the host configuration. The choices are 5394, 5294, and 5251-12.

Note: The System/34 only supports the 5251-12 controller type. System/36 and/38 do not support the 5394 remote controller.

Controller Station Address -- An address used to identify the emulator to the host system. The selection must match the host configuration. Enter the address given to the host controller.

NRZ/NRZI -- NRZ (Non-Return to Zero) and NRZI (Non-Return to Zero Inverted) are SDLC transmission coding options used to keep synchronization loss between modems to a minimum. The recommended initial setting is NRZI. This selection must match the host.

Base I/O Address -- This is the I/O memory address set by the DIP switches on the card. The selection must match the base address set on the adaptor board. Refer to page 2-3 for the options.

Note: PC adaptor boards require a unique I/O address. Make sure the I/O address of the I-O 8251R does not conflict with the I/O address of another board.

Interrupt Request Level -- An IRQ (Interrupt Request) is a control signal sent by the emulator card to demand the PC's attention. The options are 3, 4, 10, 11 and 15. If an 8-bit slot is used, use options 3 or 4. If Windows is used, use IRQ 10, 11 or 15.

Note: PC adaptor boards require a unique IRQ level. Make sure the I-O 8251R does not conflict with the IRQ setting of another board.

DMA Channel 1 or DMA Channel 3 -- These options enable the I-O 8251R to transmit data to the host at a higher baud rate than 9600. If "Disable" is selected, the I-O 8251R will not operate above 9600 baud.

Note: Both channels should be enabled. Problems may occur if this is disabled.

Baud Rate -- Selecting "modem" automatically sets the I-O 8251R to match the baud rate of the modem. When using a null modem cable, manually select the baud rate for the communications line.

Note: If PC Support/400 was selected, press **<Esc>** and go to page 4-23 for the PC Support Installation Menu.

Advanced Functions

Change the advanced functions only for unique applications. Consult your system operator before making any selections. The Advanced Functions options include the following:

- Display
- Keyboard
- Printer

Display

The Display options are used to set up the attributes of the screen display, as shown in Figure 4-7.

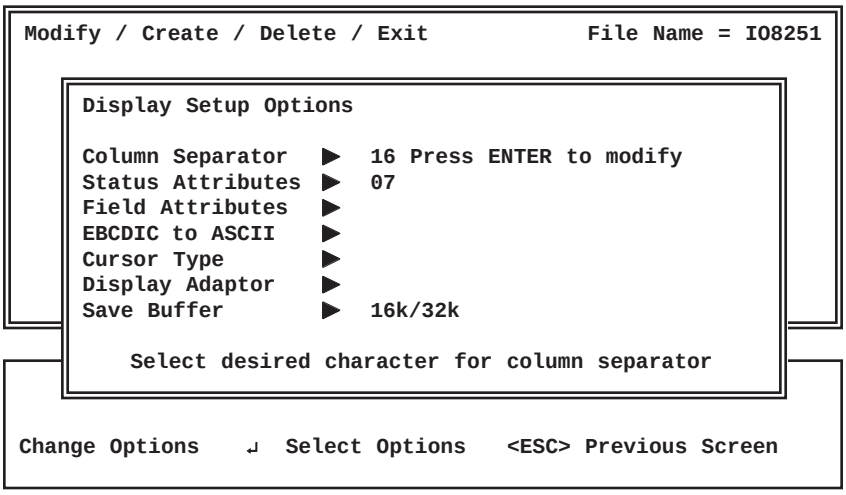


Figure 4-7

Column Separator -- This option will change the column separator. Move the cursor to Column Separator and press **<Enter>**. A window containing an ASCII table appears. Move the cursor around the table to highlight the character selected for the column separator.

Press the **<Enter>** key to select the new character. The default character is hexadecimal 16, which is a straight horizontal line.

Status Attributes -- This option defines how the status line for the host system is displayed on the PC screen. Find the hexadecimal value in Table 4-B (monochrome monitor, page 4-15) or Table 4-C (color monitor, 4-15) to select the status line display attributes.

Note: The value entered is for the first display session. If a color monitor is used, the software automatically assigns each of the following sessions the prior character attribute. For example, if a red character on a black background (04) is selected for the first display session, the second session will have a cyan character (03), the third session a green character (02).

Field Attributes -- Host systems use field attributes to identify different field types on the display screen. For example, a warning or message field on the screen might be flashing red, while the normal screen fields might be green. These field colors can be customized to suit your tastes or applications. When the *Field Attributes* option is selected, a window appears on the screen showing the current field attributes. See Figure 4-8.

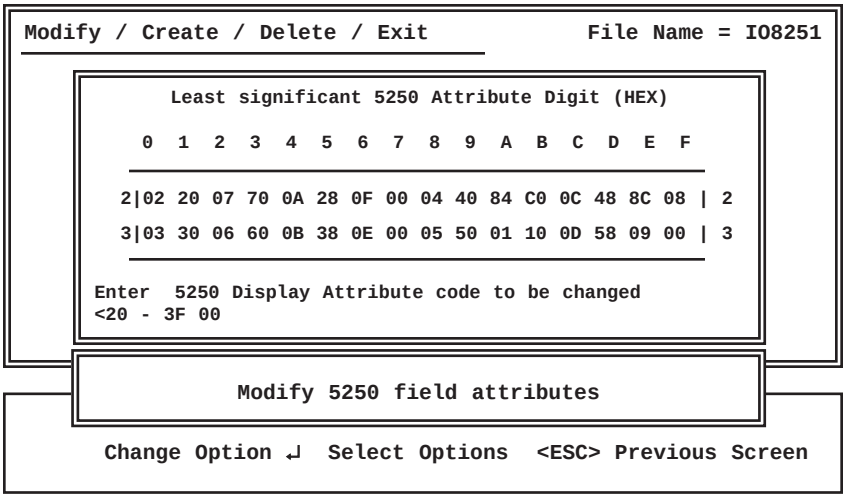


Figure 4-8

To change the field attributes, do the following:

1. Find the IBM 5250 attribute to change by its description in Table 4-A (see page 4-14). Type in the hex value for that field.

2. Press **<Enter>**. A "beep" will sound if an invalid choice is made.

3. Find the attribute you wish to give this field in Table 4-B or 4-C (see page 4-15), depending on the type of monitor.

4. Enter this value and press **<Enter>**. Notice that the field changes to the attributes selected.

5. Continue to change attributes or follow the directions on the screen to exit.

Table 4-A

IBM 5250 Field Attributes	
Hex Value	**Display**
20	Normal display
21	Reverse image
22	High intensity
23	Reverse image, high intensity
24	Underscore
25	Underscore, reverse image
26	Underscore, high intensity
27	No display
28	Blink
29	Blink, reverse image
2A	Blink, high intensity
2B	Blink, high intensity, reverse image
2C	Blink, underscore
2D	Blink, underscore, reverse image
2E	Blink, underscore, high intensity
2F	No display
30	Normal display, column separators
31	Reverse image, column separators
32	High intensity, column separators
33	Reverse image, high intensity, column separators
34	Underscore, column separators

IBM 5250 Field Attributes	
Hex Value	**Display**
Table 7-A (continued)	
35	Underscore, reverse image, column separators
36	Underscore, reverse image, column separators
37	No display
38	Blink, column separators
39	Blink, reverse image, column separators
3A	Blink, high intensity, column separators
3B	Blink, high intensity reverse image, column separators
3C	Blink, underscore, column separators
3D	Blink, underscore, reverse image, column separators
3E	Blink, underscore, high intensity, column separators
3F	No display

Table 4-B

Monochrome Field Attributes	
Hex Value	**Description**
01	Normal, underscored
07	Normal
09	High intensity, underscored
0F	High intensity
70	Reverse image
81	Blink, underscore
87	Normal, blink
89	High intensity, blink underscore
8F	High intensity, blink
F0	Reverse image, blink

Table 4-C

Color Field Attributes			
1st digit	**Background**	**2nd Digit**	**Foreground**
0	Black	0	Black
1	Blue	1	Blue
2	Green	2	Green
3	Cyan	3	Cyan
4	Red	4	Red
5	Magenta	5	Magenta
6	Brown	6	Brown
7	White	7	White
8	Black Blinking	8	Grey
9	Blue Blinking	9	Light Blue
A	Green Blinking	A	Light Green
B	Cyan Blinking	B	Light Cyan
C	Red Blinking	C	Light Red
D	Magenta Blinking	D	Light Magenta
E	Brown Blinking	E	Yellow
F	White Blinking	F	High Intensity White

EBCDIC to ASCII -- (This option is for advanced users only.) The character codes used by the host are different from those used by the PC. The host uses EBCDIC and the PC uses ASCII. To allow both systems to communicate, an EBCDIC to ASCII translation table is used in the I-O 8251R software.

This option allows customization of the table. For example, to change the "$" character to display as a "#" character, move the cursor to the EBCDIC to ASCII option and press **<Enter>**. To change the table, first select the EBCDIC code to be changed then, enter the EBCDIC code for a "$" character, which is 5B (see Appendix C for an EBCDIC table). Second, enter the ASCII code to be displayed (see Appendix C for an ASCII table), in this case, the ASCII code for the "#" character is 23.

Note: A new code page may need to be loaded in the PC for the desired character.

Cursor Type -- Choose the cursor type to be displayed. The choices include: 1 (blinking block), 2 (blinking overline), 3 (no cursor) or 4 (blinking underline).

Display Adaptor -- Some monitors must change modes to display 132 columns, while other monitors may not support 132-column screens at all.

If the monitor supports 132 columns, to enable 132-column display, the AL option must be entered. The AL value is listed in the video card manual as the MODE setting. For most cards, leave the BL value at 00. Press **<Enter>**.

Save Buffer -- If 132-column screens are used in DOS graphics applications, more memory is required to save these screens when hot keying between sessions. Select 32K for 132-column screens used in DOS graphics applications or 16K for all other screens.

Keyboard

The keyboard setup allows the keyboard to be customized. The hot key can be modified, the type ahead can be enabled or disabled, and scan codes can be modified. These options are shown in Figure 4-9.

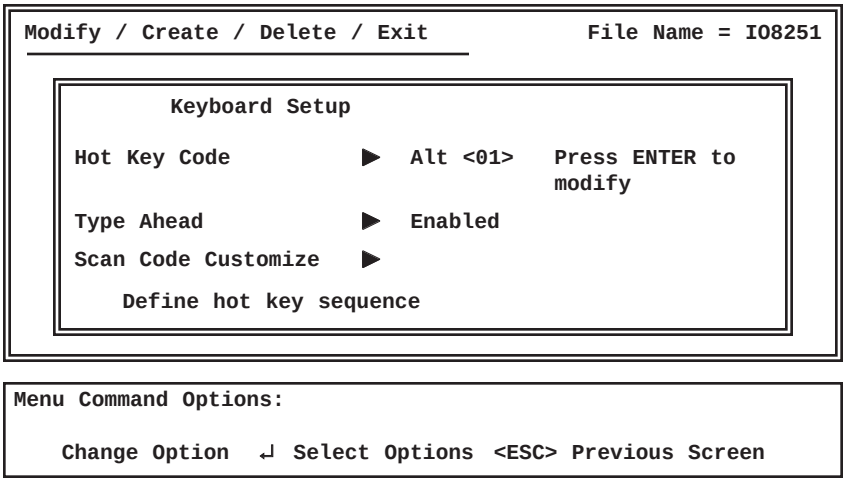


Figure 4-9

Hot Key Code -- The Hot Key Code is the series of keystrokes used to jump from a DOS session to a host session. The default is **<Alt><Esc>**.

Note: When customizing hot keys, the emulator cannot use any keys that are scan code (58) or higher.

Note: For Windows and OS/2, the Hot Key sequence should be **<Alt><Left Shift>** and should display as ALT <2A>.

The hot key code can be customized by pressing **<Enter>** at the Hot Key Code option. A new screen will appear displaying the keyboard type. Press the key to use with the **<Alt>** key, then press **<Enter>**.

Type Ahead -- When Type Ahead is enabled, the PC will hold characters in its buffer. If the host is not ready to accept the characters, the PC will send the characters to the host when it is ready for input.

Scan Code Customize -- The Scan Code Customize option defines keys on the keyboard. Each keyboard uses different scan codes to transmit data from the keyboard to the PC. The keyboard type selected is used on all host sessions during emulation. Factory default scan codes are shown in Appendix E.

To change the keyboard scan codes, move the cursor to Scan Code Customize option, and press **<Enter>**. The screen then displays the keyboard layout. Follow the steps below to customize the keyboard:

1. Look at the keyboard layout, and determine the code of the key to be changed. At the prompt, below the keyboard layout, type in this code.

2. Press **<Enter>** to display the key function. In place of the prompt, the function of the key is displayed in the Normal mode, the Shifted mode, and the Alt mode. The key's normal function is highlighted.

3. Use the up or down cursor arrow keys to highlight the mode to change. Press **<Enter>**. A list of all the keys appears in a window at the right of the screen.

4. Use the cursor arrow keys to highlight the function in this window to assign to this key. (Use the Page Up and Page Down keys for more options.) Press **<Enter>**. The window at the right of the screen disappears, and the keyboard layout screen appears. The new description assigned appears next to the key's mode.

5. Press **<Esc>** twice and a prompt to save this file appears. Answer "**Y**" to save this change, or "**N**" to ignore the changes. Press **<Enter>** and then **<Esc>** to return to the main menu.

Printer

The options in the specialized printer attributes section are used to create a special or unique printer configuration. See Figure 4-10.

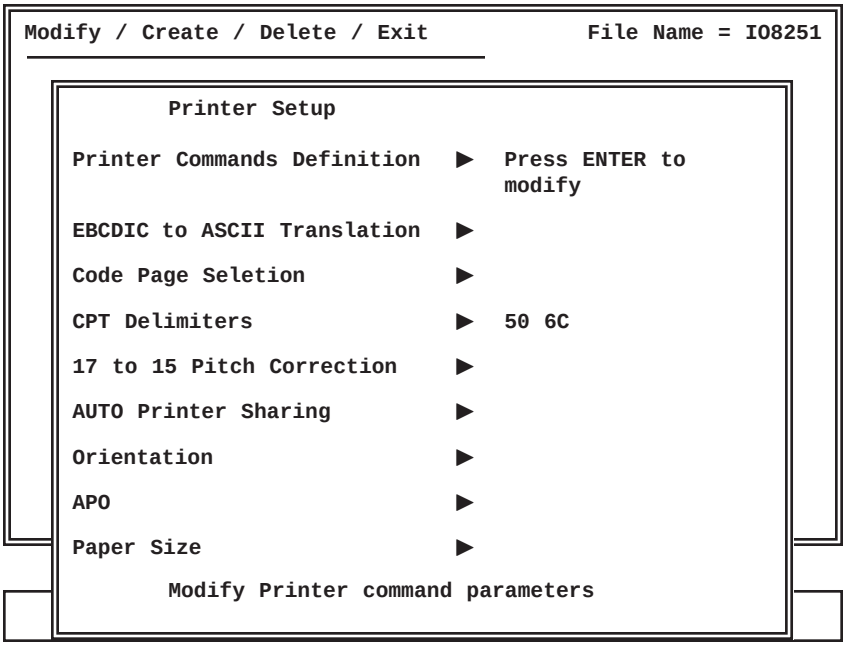


Figure 4-10

Printer Commands Definition -- The Printer Commands Definition function is used to define a new printer or modify the command strings for an existing printer. This is not valid for 5219 and 3812 printing.

All command strings are in hexadecimal. Press **<Enter>** and type in the session number of the printer to be modified. A prompt for the printer session number will appear. Enter the session number.

If a text printer was chosen, only half a screen of command strings will be shown, ending with the command for Near Letter Quality (NLQ).

The printer commands definition function allows a user to define a new printer or modify the command strings for an existing printer. All command strings are in HEX and the first character is the string length.

Initialization String	String Used to Initialize Printer
5 cpi	5 characters per inch
10 cpi	10 characters per inch
12 cpi	12 characters per inch
15 cpi	15 characters per inch
8 lpi	8 lines per inch
6 lpi	6 lines per inch
Begin draft string	Begin draft quality print
Begin NLQ string	Begin New Letter Quality (NLQ) print
Vertical motion string	Used for vertical increments of the page
Increment (72, 60 48)	The fraction of an inch used by the vertical motion string
Offset to variable data	Number of values before the variable data for the vertical motion string
Variable multiplier	Number multiplied to the variable to get the correct value for vertical motion string
Page length string	Used to setup the page length
Offset to variable data	Number of values before the variable data used for the page length string
Length of variable data	Number of values for the page length
Base to add to variable	Amount added to the variable data to get the correct value for page length
Graphics command string	Sets the printer to accept graphics characters

An example of setting up an escape sequence for an HP LaserJet III would be as follows:

1. Find the 6 LPI codes in the HP LaserJet manual, and write down the HEX, if possible.

2. Translate the decimal codes to HEX using Appendix C.

3. The HP LaserJet codes are:

   027 038 108 054 068 Decimal
   1B 26 6C 36 44 Hexadecimal

4. There are five codes. Input these codes with the first one as 05 and the remainder following.

5. The codes for 6 LPI should be entered as follows:

   05 1B 26 6C 36 44

EBCDIC to ASCII Translation -- (This option is for advanced users only.) The character codes used by the host are different from those used by the printer. The host uses EBCDIC and the printer uses ASCII. To allow both systems to communicate, an EBCDIC to ASCII translation table is used in the I-O 8251R software. This option allows advanced users to customize this table. For example, to change the "$" character to print as a "#" character, move the cursor to the EBCDIC to ASCII option and press **<Enter>**. A new screen appears showing the translation table. To change the table, select the EBCDIC code to be changed. Enter the EBCDIC code for a "$" character, which is 5B (see Appendix C for an EBCDIC table), and then enter the ASCII code to be printed (see Appendix C for an ASCII table); in this case, the ASCII code for the "#" character is 23.

Code Page Selection -- (**4214 only**). The default code page selection is Code Page 850. If the printer supports it, change to Code Page 437 by pressing **<Enter>** at this field and selecting it. Refer to the printer user's guide for information regarding the code page used by the printer.

Note: When changing to Code Page 437, any changes made to the Code Page 850 character set will be lost.

CPT Delimiters -- Command Pass-Thru allows printer control command to be passed through to the printer. The I-O 8251R card recognizes the commands and "passes the command through" to the printer. A delimiter (which default is &%) signals the card to pass the command through.

Select the new delimiter by placing the hex codes listed in Appendix C in the spaces on the screen. See page 6-16 for more information on Command Pass-Thru.

17 to 15 Pitch Correction -- Most PC printers do not support 15-pitch printing, but host systems use 15 pitch in many applications. If the printer supports 17 pitch and you would like to print 15 pitch, select this option by moving the cursor to the option and pressing **<Enter>**. A prompt to define the printer session number to modify appears.

When selected, it may cause printers to print very slowly in 15 pitch. This option may also be turned on and off from the Printer Control screen (see Chapter 5).

Auto Printer Sharing -- When Auto Printer Sharing is enabled, printout from either the host or the PC is accepted. This option may also be turned on and off from the Printer Control screen (see Chapter 5).

Note: DOS print jobs will only print while in the DOS session. If hot keying to a host session while printing a DOS job, printing will be suspended until returned to the DOS session.

Orientation (**3812 only**) -- This option is used to select the default print orientation which are: Computer Output Reduction (COR), Portrait, or Landscape.

Note: A prompt will appear to define the printer session number configured.

APO (**3812 only**) -- This option is used to enable or disable Automatic Page Orientation. When enabled (if the COR orientation is enabled) landscape orientation will be automatically selected if the paper width is greater than its height. Portrait will be selected if the paper width is less than its height. (See "3812 Printer Emulation" on page 6-3 for more information.)

Note: A prompt will appear to define the printer session number configured.

Paper Size -- Use this option to select the size of paper used in the printer as follows:

Normal:	Letter size: 8.5 x 11 in. (215.9 x 279.4 mm) or Legal size: 8.5 x 14 in. (215.9 x 355.6 mm)
A4:	A4 size: 8.27 x 11.69 in. (210 x 297 mm)
No Size:	Whatever size is loaded in the printer

Note: A prompt will appear to define the printer session number configured.

When the configuration is complete, press **<Esc>** from the configuration menu. A prompt to save the configuration will appear. Answer "Y" to save the configuration or "N" to abort.

PC Support AS/400

If PC Support/400 was selected for installation, the adaptor handler screen will appear and will prompt you to enter the correct path for PC Support (this is required for PC Support/400 only).

```
Modify / Create / Delete / Exit          File Nambe = Io8251R
_____________________

Configure PC Support/400 to use with IO8251R


C:\PCS\StartPCS.Bat


If PCS startup file is not at the default, please enter
correct path name.  Press Enter to continue, or press ESC to
abort PCS configuration.
```

```
Menu Command Options:

     Change Option    ←  Select Options <ESC> Previous Screen
```

Figure 4-11

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5 OPERATION

With the I-O 8251R installed and configured, host operations can begin.

Starting Emulation

To activate emulation between the PC and the host system, complete the following steps:

1. Vary on the line, controller, and devices on the host.

2. Change to the 8251R directory by typing **CD\8251R <Enter>**.

3. Type **IO8251R <Enter>**.

   Note: If a new configuration file was created, add a space and the configuration file name after IO8251R.

4. A new screen appears, and the I-O 8251R begins communicating with the host. Messages on the screen indicate the status of each session.

After the I-O 8251R has been successfully installed into the PC, the startup of the emulation will depend on the startup option configured. An emulation screen (3X Emulation) or a DOS prompt (DOS) will appear. The hot key sequence between the DOS and emulation applications is now available.

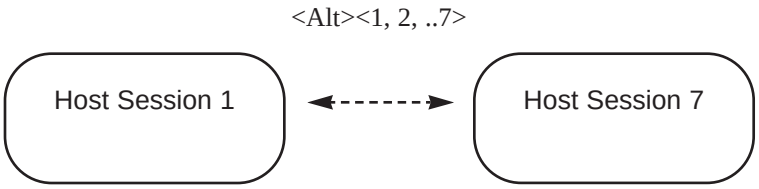
Note: For Windows and OS/2 startup, simply double click on the IO8251R icon after varying on the line, controller, and devices.

Hot Key Sequence

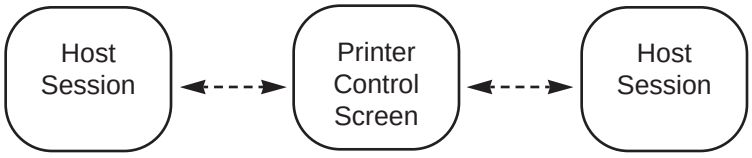
The hot key sequence toggles from one session to another. Press and hold the **<Alt>** key and press the **<Esc>** key (or press the custom hot key sequence chosen in the configuration) to move from a DOS session to a host session.

There are two ways to use the hot key sequence: Direct Access and Round Robin.

Direct Access -- This key sequence moves directly to a host session. It must be enabled on the configuration screen prior to using. For example, to move to host session 1, press and hold **<Alt>** and press **<1>**, session 2, press and hold **<Alt>** and press **<2>**, etc. To return to DOS, press and hold **<Alt>** and press **<0>** or **<8>**. If an unconfigured session is pressed, the next available session will become active.



Round-Robin -- This key sequence moves sequentially through the available sessions as illustrated below. Starting at the current session, this sequence advances to the highest session and then to DOS. From DOS, go back to the lowest session. The printer control screen is the printer session. To use this method, press and hold **<Alt>** and press **<Esc>** (or the customized sequence).



Status Line

The bottom line of the screen is the session status line. It displays information sent from the host, identifies which host address and session is currently accessed, and highlights other information regarding the active sessions. See Table 5-A for a list of the status line characters and their meaning. A status character is active when highlighted.

Table 5-A

Status Line Characters	
Character	**Meaning (When Highlighted)**
rr-cc	CURSOR LOCATION (row-column) -- Identifies the cursor location by row and column.
SA	SYSTEM AVAILABLE -- The host system is communicating with the active session.
MW#	MESSAGE WAITING -- A message from the host system is waiting for the active session. The # is the session the message is waiting for.
KS	KEYBOARD SHIFT -- Keyboard shift is active
IM	INSERT MODE -- The LU session is in insert mode.
II	INPUT INHIBITED -- Keyboard is locked, either because the host system has not completed a previous command, or there is a pending error condition.
KB	KEYBOARD BUFFERING -- Highlighted when there are keystrokes waiting to be sent to the host.
Sn	LOGICAL UNIT -- Where “n” is the logical session or unit that is active.
An	HOST ADDRESS -- Where “n” is the host address.

Printing

Printing from either DOS or host applications on the attached printer is a standard feature. To print from DOS, use either the DOS print command or print through a software program. When printing host jobs, specify the attached printer's host ID. This enables the host to route the print job to the proper printer. The system operator will assign an ID to the attached printer when configuring the printer on the host.

Printer Control Screen

The printer control screen controls host printing sent to the attached printer. The PC is unaware that printing is taking place, even in a DOS session, host printing can continue without interruption. However, DOS printing does not continue in a host session.

Certain printer functions are controlled from the Printer Control Screen. While in emulation, hot key to the session assigned to the printer. The Printer Control Screen will appear. See Table 5-B. The Printer Control Screen is divided into three (3) sections as follows:

Table 5-B

1	Options	F1	Start/Stop Printer
		F2	Truncate/Wrap-around
		F3	Line Feed
		F4	Form Feed
		F5	Cancel Print Job
		F6	User Override of Pitch, Quality, etc.
		F7	Host Control of Pitch, Quality, etc.
		F8	Re-Initialize Printer
		F9	Buffer Print
		F10	Assign Printer to DOS/Host/Auto
		Shift F1	17 to 15 Pitch Correction
2	Printer is attached to:	Host DOS Auto	
	Host Status	**Format Controls**	**PC Printer**
	Ready	User Override Active	Selected
	System Available	Host Control Active	Paper Out
		Buffer Print Mode	Busy
		Truncate	Fault
		17 to 15 Pitch Fix	Check Printer
3		Session: 5XX6XXX	

1. To select any of the functions in section 1, press the indicated function key. See Table 5-C for a description of these functions.

Table 5-C

Printer Commands	
Command	**Printer Function**
F1	START/STOP - Press F1 to start the printer, temporarily suspend printing for printer adjustments, or after receiving a printer error.
F2	TRUNCATE/WRAP-AROUND - In truncate mode, narrow carriage printers ignore data beyond 8". In wrap mode, the data prints on the next line.
F3	LINE FEED - Each time the F3 key is pressed, the paper in the printer advances one line.
F4	FORM FEED - The paper advances to the top of the next page and resets the line and column counts to one.
F5	CANCEL PRINTER JOB - Sends a cancel request to the SYstem/3X or AS/400 host console. This will not cancel data already in the printer buffer.
F6	USER CONTROL OF PITCH, PRINT QUALITY AND LINE SPACING - Defines the pitch, printer quality and line spacing for the attached PC printer. Host commands which alter these values are ignored.
F7	HOST CONTROL OF PITCH, PRINT QUALITY AND LINE SPACING - With this enabled, host commands control pitch, print quality, and line spacing.
F8	RE-INITIALIZE PRINTER - Returns to the original printer configuration.
F9	BUFFER PRINT - Prints all host commands for diagnostic use.
F10	ASSIGN PRINTER TO DOS/HOST/AUTO - Prints only DOS jobs when DOS is highlighted, only host jobs when Host is highlighted, or automatically selects from host or DOS when Auto is highlighted.
Shift F1	Shifts from 17 to 15 pitch printing (5219 emulation does not support this function).

2. Section 2 of the Printer Control Screen shows host and PC printer status. These indicators highlight important information regarding the printer's status when it is assigned to either the host or the PC. See Table 5-D for information on these messages.

Printer attached to -- Indicates which system the printer is attached to: the host, DOS, or auto. If attached to the host, print jobs can be sent from the host to the PC printer. If attached to DOS, the printer will not accept print jobs from the host, but a PC print job can print. Auto allows the I-O 8251R to automatically switch from host to PC printing and vice versa without going back to the printer control screen (DOS print jobs will only print if in the DOS session). The screen will show which is active in reverse image.

Table 5-D

Printer Status Indicators	
Status Message	**Status Indicators**
HOST PRINTER	
READY	The printer is ready to receive data.
SYSTEM AVAILABLE	The host system is operational.
CHECK PRINTER	An error condition, such as a paper jam or paper out, has been detected by the printer.
USER OVERRIDE ACTIVE	After selecting F6, this indicator remains highlighted. Host commands for pitch, print quality and line spacing are ignored.
HOST CONTROL ACTIVE	The host commands for pitch, print quality and line spacing are active (F7).
BUFFER PRINT MODE	The printer is in buffer print mode (F9).
TRUNCATE	When highlighted, truncate mode is active. Press F2 to release.
17 to 15 PITCH FIX	When highlighted, the 17 to 15 pitch correction is active. Press SHIFT F1 to release. (Only affects dot matrix printers).
PC PRINTER	
Parallel Printer	
SELECT	Printer powered on and ready to receive data.
PAPER OUT	Printer is out of paper.
BUSY	Printer is processing data.

3. Section three of the Printer Control Screen shows the Active Display Session, displayed in reverse video, and the status of all the sessions on the host. The numbers show the address of the session. "X" is used for sessions that are not active.

Printer Override Screen

Press **<F6>** (User Override of CPI, LPI, and Quality), and the Printer Override screen is displayed (see Table 5-E). This screen allows "override" or changed settings for the printer when printing host print jobs. Once activated, host commands are ignored and the choices shown on this screen control the printing.

Note: A PC print job cannot be controlled from this screen.

Select any of the printer controls by pressing the function key shown to the left of the control description. The printer must be in a ready state before selections take effect. If the printer is not ready, a message is displayed and the selection does not take effect.

Table 5-E

Printer Emulation Control Screen

Options	F1	Set Printer to 10 CPI
	F2	Set Printer to 12 CPI
	F3	Set Printer to 15 CPI
	F4	Set Printer to 6 LPI
	F5	Set Printer to 8 LPI
	F6	Set Printer to DRAFT
	F7	Set Printer to NLQ
	F8	
	F9	Return to Main Menu
	F10	
	Shift	
	<Alt><Esc>	Hot Key to Next Session

Printer is attached to:	Host DOS Auto	
Host Status	Format Controls	PC Printers Status
Ready	User Override Active	Selected
	Host Control Active	Paper Out
System Available	Buffer Print Mode	Busay
	Truncate	Fault
	17 to 15 Pitfh Fix	Check Printer
		Sessions: 5 X X 6 X X X

Ending Emulation

After finishing the work in the host sessions, log off each active display session. At a sign-on screen, press **<Ctrl><Alt><Del>** to end emulation and return to DOS.

Ending Windows

After finishing the work in the host sessions, log off each active display session. Hot key to the DOS portion of the window. Press **<Ctrl><C>** to end the Windows session.

Ending OS/2

After finishing the work in the host sessions, simply hot key to the DOS side of the current window. This will automatically end emulation.

6 ADVANCED FEATURES

The I-O 8251R offers some unique features for users needing extra productivity tools. These added features include Record/Playback, 3812 printer emulations, 5219 printer emulations, I-O Command Language, and I-O Command Pass-Thru.

Record/Playback

The Record/Playback feature allows a sequence of keystrokes to be recorded for later playback at the press of three keys, which eliminates repeated keystrokes.

To control the Record/Playback feature, use the following keys:

Keystroke	Function
<Alt><F10>	Record a key (functions as the <Record> key on a 5250 keyboard)
<Alt><F8>	Playback a key (functions as the <Play> key on a 5250 keyboard)
<Alt><F7>	Delete a Record/Playback key
<Alt><F9>	Clear all Record/Playback keys

Recording a Sequence

To record a keystroke sequence, follow these steps:

1. Press and hold the **<Alt>** key, then press **<F10>**. The number in the lower left of the screen to the right of a blinking "R" is the number of keystrokes available for recording (maximum of 1,000).

2. Press the key (F1-F10, 0-9) to assign the recorded sequence.

3. Type the keystroke sequence to be recorded.

4. When the keystroke sequence is completed, press **<Alt><F10>** to save the sequence and exit the Record mode.

5. To permanently save a recorded sequence to the disk of the PC, hot key to DOS, then change to the drive and directory where the - I-O 8251R software is stored. Type **SAVEKEYS** and press **<Enter>**. A message will appear indicating the recorded keys are saved.

Each time emulation is started, the SAVEKEYS.DAT will be loaded so the saved keystroke sequences can be used.

Playing a Recorded Sequence

Follow these steps to play back a recorded sequence:

1. Press **<Alt><F8>** to enter Play mode. A blinking "P" appears in the lower left of the screen.

2. Press the key (F1-F10, 0-9) containing the recorded sequence to be played.

3. The playback begins at the cursor location. When finished, the playback exits Play mode.

Deleting a Sequence

To delete a recorded sequence, press **<Alt><F7>**. A blinking "D" appears in the lower left of the screen. Press the key (F1-F10, 0-9) that contains the recorded sequence to be deleted, and the sequence will be deleted.

Clearing All Sequences

To clear all recorded keystroke sequences assigned to all the function keys, press **<Alt><F9>**. A prompt in the lower left of the screen asks, "Clear All (Y/N)?" To clear all the recorded sequences, press "**Y**".

3812 Printer Emulation

The I-O 8251R allows an attached laser printer that supports HP or PPDS modes to emulate the IBM 3812 (non-IPDS) printer.

The 3812 printer provides font changing capability, text rotation, compression features called Computer Output Reduction (COR), and Automatic Page Orientation (APO).

The I-O 8251R Remote Emulator Card's 3812 printer emulation provides font changes and a true 3812 COR emulation. It also obeys host commands for duplexing like the IBM 3816 printer.

The system operator will specify a default font ID when configuring the 3812 address on the host system. The default font ID should be the most commonly used typestyle. The system operator should select one of the typestyle numbers from the Typestyle Reference Chart in Appendix D with an asterisk (*) indicating the default font ID, then change it in the document, as necessary.

Data Processing

To change font IDs for a data processing report, add the font number to the CL or OCL printer statement (for the System/36, convert the font number to hexadecimal before adding it to the printer statement). Only the font IDs marked with an asterisk (*) in the Typestyle Reference Chart in Appendix D can be used in host printer statements.

The 3812's COR feature rotates data processing reports to landscape orientation and compresses the text to fit 198 columns x 66 lines on the page. The steps below describe printing using the COR feature. Refer to Figure 6-1.

1. If a Set Text Orientation (STO) command is specified, the report prints using the STO command to control orientation in the specified font. If an STO command is not specified, the report continues to block 2.

2. If APO is enabled (see Configuration), the report continues to block 3. With APO disabled, the report continues to block 4.

3. At block 3, the page size is calculated. If the page size is valid (8 1/2" x 14" or smaller) the report continues to block 6. The report prints at block 6 depending upon the page layout.

   An invalid page size (larger than 8 1/2" x 14") causes the report to continue to block 4.

4. At block 4, the orientation selected in the configuration program determines the output. If landscape is selected, the report prints in landscape using the specified font.

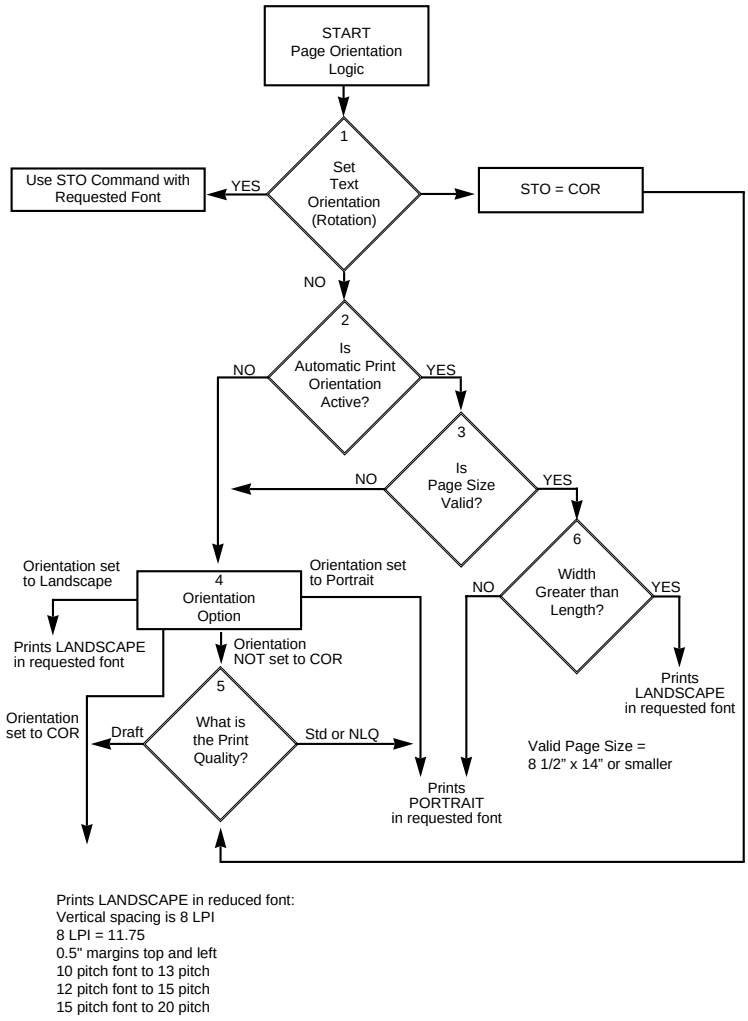
   If portrait is selected, the report prints in portrait using the specified font.

5. A COR override from the host determines the report orientation. Host COR overrides include:

   System/36 OCL: Text-Yes or Rotate-0
   System/38 CL: PRT QLTY (*STD) or (*NLQ), or PGRTT(0)
   AS/400: PRT QLTY (*STD) or (*NLQ) and PAGRTT (*COR)

   A host COR override causes the report to print in portrait with the selected font. If the host does not override the COR, the report prints in landscape orientation with the CPI and LPI reduced as shown in the diagram.

   The printer prints a maximum of 182 columns x 64 lines (IBM PPDS mode) or 198 columns x 66 lines (HP mode) when using COR to control the output.



Prints LANDSCAPE in reduced font:
Vertical spacing is 8 LPI
8 LPI = 11.75
0.5" margins top and left
10 pitch font to 13 pitch
12 pitch font to 15 pitch
15 pitch font to 20 pitch

Figure 6-1

ADVANCED FEATURES

Word Processing

When the system operator configures the printer on the host, a default font ID is configured for the printer, which should be the most commonly used font. The WP program may also have a default font ID. Since the default font ID can vary depending on the system setup, ask your system operator if you have questions about the default font ID.

To change the font, use I-O font change commands, or select a font ID number within the word processing program. Refer to the WP program operator's manual for information on changing font IDs within the program. See I-O Command Language on page 6-14 for information on font change commands for word processing documents.

The I-O 8251R allows bolding, underlining, and super/subscripting by recognizing the host commands for these features in both WP and DP applications. The I-O 8251R uses a shadow print for bolding, even on small and italic fonts.

Page Length

The printer prints up to 66 lines at 6 LPI in HP mode (the line spacing may be compressed slightly to fit) or 64 lines at 6 LPI in IBM PPDS mode for 8.5 x 11 letter size paper. The System/36 only allows 65 lines per page with 8.5 x 11 in letter size paper.

The printer prints up to 72 lines at 6 LPI in HP mode (the line spacing may be slightly compressed to fit), or 70 lines at 6 LPI in IBM PPDS mode for 8.27 x 11.69 A4 size paper.

Paper Size

Configure the I-O 8251R printer setup to the paper size used most. The I-O 8251R only recognizes these paper sizes:

Letter Paper:	8.5 x 11 in. (215.9 x 279.4 mm)
Legal Paper:	8.5 x 14 in. (215.9 x 355.6 mm)
A4 Paper:	8.27 x 11.69 in. (210 x 297 mm)

If any other paper dimensions are chosen in the word processing program, the I-O 8251R ignores them and uses the previous paper size choice. The "No Paper Size" selection uses the paper installed in the tray, regardless of size.

Bin Selection

The I-O 8251R selects paper from bin 2 only if the optional paper tray is installed in the printer. If bin 2 or 3 is chosen in a host document, the printer will print from bin 1 if the optional paper tray is not installed.

Duplex Printing

The AS/400 will only recognize duplexing in word processing. To access duplexing in data processing, enter one of the I-O font change commands on the first line of the document.

¬D0 for simplex printing
¬D1 for landscape duplex printing
¬D2 for portrait duplex printing

Refer to page 6-13 for more information.

Document/Envelope Printing

Print a letter and an envelope from DisplayWrite/36 or AS/400 Office in the same document by following this procedure:

1. Set the format for the letter, and enter the letter file. On the first typing line, press **CMD20** for "Change Format."

2. Select **1** for "Entire Document Options."

3. Select **1** for "Document Format."

4. Select **3** for "Typestyle/Color" and the font ID Number for the letter, such as No. 11, 86, etc., then press **<Enter>**.

5. From the Document Format screen, select option **4** for "Page Layout/Paper Options." Scroll to the second screen of these options and select a paper size and a paper source. If the letter is more than one

page, select the same paper source for the following pages. Press **<Enter>** to return to the Document Format screen.

6. Press **CMD12** to return to the Document Options screen.

7. The alternate format for the envelope can now be setup. Select **2** for "Alternate Format."

8. Select **3** for "Typestyle/Color." Select the **font ID** for the envelope, such as 5, and press **<Enter>** to return to the Alternate Format screen.

9. Select **4**, "Page Layout/Paper Options." Choose a first typing line of 11, then scroll down to the second screen of the options and choose a paper width of 7.5 (monarch size) or 9.5 (commercial, or #10 size) and a paper length of 4 inches.

   For a paper source, select 5 for "Envelope Feed." Press **<Enter>** to return to the Alternate Format screen.

10. Select option **1** for "Margins and Tabs" and make the left margin **40**. Press **<Enter>**.

11. Select **CMD3** to return to the document.

12. Type in the text. When finished, add in a "page end" by pressing **<Alt><P>**.

13. Now load in the alternate format for the envelope. To do this, press the **CMD5** key, "Goto," and type "**rf**" (Resetting Format). Press **Enter**.

14. Select option **4** on the Alternate Format screen, "Begin Alternate Format." Press **<Enter>**.

15. The document will now be displayed with the alternate format. The cursor will be on the first typing line with a left margin of 40.

16. Type in the envelope address, and send the file to print. The letter will print out first followed by the envelope.

Note: The printer may eject a blank page when changing printing orientation. If the Buffer light and Ready light remain steady, press the Print/Check button on the printer's operator panel to eject the last page.

The System/38 only sends margins and other format specifications to a printer when they are different from the previous documents or when the printer has been turned off. To choose a different size paper:

1. Select a paper size in the program.

2. Insert the correct paper size into the printer.

3. Power the printer off for about five seconds, then power it back on again.

4. Release the job for printing from the host.

5219 Printer Emulation

The I-O 8251R's 5219 emulation is for LaserJet printers. The HP LaserJet printer file is automatically used when 5219 emulation is selected.

The I-O 8251R allows bolding, underlining, and super/subscript by recognizing the host commands for these features for DP or WP applications.

The different character styles and pitch are controlled through the IBM typestyle number or font ID. The I-O 8251R uses the IBM typestyle number to select an HP font from a cartridge. The cartridges shown in the Typestyle Reference Chart in Appendix D are the only fonts supported.

The system operator will specify a default font ID when configuring the 5219 on the host system, which should be the font ID most commonly used. Select one of the font ID numbers from the Typestyle Reference Chart in Appendix D with an asterisk (*) indicating the default font ID, then change it as necessary in the DP or WP document.

If data processing reports are sent to the printer, typestyles in the printer's CL or OCL statement must be changed.

Data Processing

Condensed print and 8 LPI commands do not work in data processing documents, because 5219 printers only understand font ID commands.

For DP documents, such as RPG-generated prints, the system default typestyle is used unless fonts are changed by specifying the typestyle in the OCL or CL printer statement. Since only certain fonts are accepted by the host in OCL and CL statements, only the font ID's from the Typestyle Reference Chart in Appendix D with an asterisk (*) can be used.

To change typestyles in DisplayWrite/36, use one of the following commands:

CMD 20, selection No. 1, "Document Option"
CMD 20, selection No. 4, "Display Current Format"
CMD 9, selection No. 7, "Change Font"

See the DisplayWrite user's guide for more information on changing typestyles.

Word Processing

When configuring a 5219 address on the host, a default font ID must be selected. The normal value is 11 (or 0B in hex), which is a 10-pitch font.

There are two ways to change fonts for word processing documents: select a typestyle within the word processing program, or use an I-O font change command in the document. The word processing program operator's manual describes how to change the typestyles within the program.

Some word processing programs, such as TextManagement/38, do not allow more than one typestyle number per line of text. In such cases, use I-O font change commands. (See I-O Command Language on page 6-14 for information on font change commands for word processing documents).

Page Length

The 5219 emulation allows 65 lines at 6 LPI per page for word processing documents and 66 lines at 6 LPI per page for data processing documents. The HP LaserJet printer allows a maximum of 63 lines at 6 LPI. To print 65 lines, the I-O 8251R increases line spacing from 6 lines per inch to about 6.25 lines per inch. This small change is normally not noticeable. A similar small change is made to 8 LPI printing on the 8.5 x 11 letter size paper.

The printer prints up to 72 lines at 6 LPI in HP mode (the line spacing may be slightly compressed to fit), or 70 lines at 6 LPI in IBM mode for the 8.27 x 11.69 A4 size paper.

Paper Size

Configure the printer setup to the paper size used most. The I-O 8251R only recognizes these paper sizes:

Letter Paper:	8.5 x 11 in. (215.9 x 279.4 mm)
Legal Paper:	8.5 x 14 in. (215.9 x 355.6 mm)
A4 Paper	8.27 x 11.69 in. (210 x 297 mm)

If any other paper dimensions are selected in the word processing program, the I-O 8251R ignores them and uses the previous paper size choice. The "No Paper Size" selection uses the paper installed in the tray, regardless of size.

Selecting legal or A4 size paper dimensions on the DisplayWrite/36 "Change Page Format" screen causes the LaserJet display window to flash "Legal Paper." If the paper dimensions specified are different from the above, the paper size is unchanged.

For TextManagement/38, the System/38 does not send paper dimensions to the printer. Instead, it sends a forms message for legal paper to the controlling workstation assigned to the printer. To change the paper tray, do the following:

1. Insert the proper size paper tray, and press the **RESET** button on the printer.

2. Power the printer off and back on.

3. Release the print job at the host.

The System/38 uses a "Printer Support Facility" that only sends the margins and other document form specifications to a printer when different from the previous document or when the printer has been turned off. Either way, the LaserJet must be reset when a different paper tray is installed.

The line format screens in DisplayWrite/36 (Command 20) also permits "Justify," which aligns the right margin. "One-Half Justify" causes only one-half as much alignment of the right margin. For best results in using justification, change the zone width to 1 (instead of 6).

Envelope Printing

To print envelopes, specify typestyle number 5, landscape orientation, with the first line of the address on line 30 and a left margin of 55. A trial run with a blank sheet of paper will often help identify an error in positioning the address.

Manual Feed: Select the "Envelope Feed" option in the word processing program's paper feed selections and a paper size of 11" x 11". The printer will flash "Manual Feed" on the front panel display window. Manually feed the envelope into the printer.

Envelope Tray: Select "Envelope Feed" and a paper size of 7.5" or 9.5" (or 22.0 cm). The printer automatically finds the envelope tray (if installed) and prints the envelope.

Envelope Feeder: Select "Envelope Feed" and a paper width of 7.5" or 9.5" (or 22.0 cm). The printer automatically finds the envelope feeder (if installed) and prints the envelope.

Note: The LaserJet may eject a blank page when print orientation is changed.

Duplex Printing

Some LaserJet models can print both simplex (single sided) and duplex (double sided). They can print both long edge (landscape) and short edge (portrait) duplex printing.

However, changing the printer's mode through the front panel can be time consuming. Instead, place printing commands on the first line of the document to control simplex, landscape duplex, and portrait duplex printing.

These commands are similar to I-O font change commands as follows:

¬D0 for simplex printing
¬D1 for landscape duplex printing
¬D2 for portrait duplex printing

If they are not on the first line, the commands will not become active until the following page. When the printer receives the printing command, it will do all printing in that mode until another printing command is received. In other words, if the printer is most often in simplex mode and is printing in the duplex mode, be sure to put a simplex command at the end of the document to return the printer to simplex mode. Envelope printing between documents won't change the printer's mode.

On some duplex printing, if the last page is blank on the back side, the information for the last page may remain in the printer until the next printing job is received. To print the last page, take the printer off-line by pressing the ONLINE button, then press the FORM FEED button to print the last page. Put the printer back on-line by pressing the ONLINE button again.

Note: Duplexing is supported in word processing applications on the AS/400, but the AS/400 does not support duplex printing for data processing.

I-O Command Language

The I-O Command Language consists of special codes placed in the document. The I-O 8251R recognizes these codes and passes the proper commands to the printer to control the output. These commands may be used in either data processing or word processing documents.

There are three types of I-O Command Language commands:

I-O Font Change Commands
I-O Escape Commands
I-O Command Pass-Thru

I-O Font Change Commands

To change fonts using I-O font change commands, type the I-O font change command into the document at the place where the font change is to take effect. The command is immediately active in the document and prints the specified font until the next font change command is encountered.

For example, to print the word "saves" into the following sentence in a different font with the ProCollection font cartridge loaded in the printer, here is how the sentence might look on the screen:

Quality ¬Q45 saves ¬Q85 you time and money.

The sentence will then print as follows:

Quality **saves** you time and money.

Note: The host may send the original font code to the printer at the beginning of each page. If this happens, put an I-O font change command at the beginning of each page of the document.

If the I-O font change command changes the pitch, the host may continue to format each line according to the original font ID pitch. For Text Management/38 and other word processing programs, more than one font ID per line cannot be specified.

Font ID's and I-O font change commands for the fonts and font cartridges used by the 3812 and 5219 printer emulations can be found in Appendix D, Typestyle (FGID) Reference Chart.

I-O font change commands are formatted as follows:

3812 Printer Emulation - Font change commands for the 3812 emulation are entered using the following format:
¬Q225 ¬ is a "logical not" (Shift 6), Q indicates a font change, and 225 is the typestyle number (font ID).

5219 Printer Emulation - There are two forms of font change commands that can be used with the 5219 emulation: one selects HP font cartridges and one selects IBM typestyles as shown below.

¬QHB ¬ is a "logical not" (Shift 6), Q indicates a font change, H indicates the HP font cartridge, and B indicates which font in the cartridge.

¬QI225 ¬ is a"logical not" (Shift 6), Q indicates a font change, I indicates an IBM typestyle number, and 225 is the typestyle number (font ID).

I-O Escape Commands

Commands can be entered into the document that allow true 6 LPI, ignore host format commands and send an ASCII ESC command to the printer. These commands, shown in the following table, are similar to I-O font change commands.

Command	Function
¬E	Sends an ASCII ESC command to the printer
¬TY	Enables true 6 LPI printing
¬TN	Disables true 6 LPI printing
¬I	Ignores all host formatting commands
¬S	Stops ignoring host formatting commands

The ¬E command allows an "Esc" command to be sent to the printer (HP mode only) to control the printing. For example, ¬E(s3B would begin bold printing (see an HP operator's manual for a list of the (sXX commands).

When in HP mode, the printer may compress line spacing to fit 66 lines onto the page. This may be undesirable, such as when using pre-printed forms that must align correctly. In these cases, the ¬TY command prevents the printer from compressing the line spacing.
Use the ¬I and ¬S commands to remove unwanted host commands from a print file. For example, when printing with forms-generating software, the files are recognized by the host as text files and formatted with unwanted carriage returns and line feeds. Placing the ¬I at the end of a line and ¬S at the front of the next line causes the I-O 8251R to remove the host carriage return and line feed commands and send only the data to the printer.

I-O Command Pass-Thru™

The I-O Command Pass-Thru (hex transparency) feature allows access to all of the built-in features of a printer, even if these features are not normally available through the host software. Command Pass-Thru provides a method of placing printer-specific command sequences into the data sent to the printer.

The I-O 8251R recognizes these special sequences and "passes the command through" to the printer. The steps below describe how to use Command Pass-Thru.

1. Find the command for the print feature in the printer's manual.

2. Convert the printer command to hexadecimal.

3. Place the delimiter &% (or the custom delimiter as described on page 4-21) into the document at the point where the feature is to take effect, signalling the start of the print feature. Enter the beginning printer command, then enter the delimiter again. No spaces are allowed.

4. Move the cursor to the point in the text that you want to end the print feature. Enter the delimiter, followed by the ending printer command, and then the delimiter again, into the document.

For example:

If ESC E begins bold printing and ESC F ends bold printing on the printer, first convert ESC E to the hexadecimal 1B45 (ESC = 1B and E= 45) and ESC F to 1B46.

Then enter the commands as follows:

This is a &%1B45&%bold&%1B46&% word.

to print on the printer as:

This is a **bold** word.

Notes:

- Spaces are not allowed between the delimiter and the hex code.
- Only numbers or the letters A-F are allowed.
- Errors in the Command Pass-Thru sequence will cause the I-O 8251R to ignore the command and resume printing at the point the error occurred.
- Command Pass-Thru may invalidate horizontal spacing.

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7 PROBLEM RESOLUTION

The I-O 8251R is designed for easy installation and reliable operation.

Host configuration, modem settings, and the emulator configuration are common problems. The devices emulated by the I-O 8251R must be recognized by the host, make certain the configuration at the emulation software matches the host configuration. Make sure the modem settings match the type of network the emulator is operating with. If you are having problems, first consult this manual and take the following steps:

1. Verify all the installation steps have been completed.

2. Run the diagnostic program.

3. List any error messages displayed or unique system operational problems observed.

4. Review the problem resolution guide that follows.

5. After trying these methods, if you are still unable to resolve the problem, call your I-O Dealer. Have the following information available:

   - Serial number (label on the card under the connector)
   - Software revision level (label on the diskette)
   - Date of purchase
   - Model of the printer (if attached)
   - Type of host system to which the I-O 8251R is attached

PC does not power on

Cause: Power cord not plugged in.
Action: Make sure the power cord is plugged into the power outlet and back of the PC.

Cause: Faulty cord or power outlet.
Action: Try another cord or outlet.

Cause: No power connections inside PC.
Action: Check power connections inside the PC that may have been disconnected during installation of the I-O 8251R card.

Graphics characters or blinking characters appear on the screen

Cause: I-O 8251R not seated properly.
Action: Open the PC and check the installation of the I- 8251R.

Cause: I/O address conflict.
Action: If there are other cards installed in the PC which may be causing a conflict, refer to the user's manual to determine the I/O address used by the card.

Cause: Cable address conflict.
Action: Check the host cable address and the I-O 8251R software cable address.

Improper keystrokes or no keystrokes appear on the screen

Cause: Host inhibited.
Action: Host may be inhibited, check the indicator on the status line.

Cause: Wrong keyboard emulation.
Action: Check the keyboard emulation (PC or 5250) in the I-O 8251R configuration.

Cursor appears at the top left corner of the screen when starting emulation

Cause: Invalid station address.
Action: Check the station addresses on the host configuration in the I-O 8251R configuration.

Cause: Unanswered messages at the host.
Action: Check the host console for unanswered messages.

Cursor appears att he top right corner of the screen when emulation starting

Cause: Invalid station address.
Action: Check the station addresses on the host configuration and in the I-O 8251R configuration.

Cause: Damaged cabling or connections.
Action: Check cables and connections. Substitute another cable.

"Snow" appears on the screen

Cause: Wrong monitor type.
Action: Select "Color (IBM)" monitor type in the configuration program.

Printer does not work

Cause: Printer not configured or configured incorrectly.
Action: Make sure the printer is configured on the host and in the I-O 8251R configuration.

Cause: Printer not configured or configured incorrectly.
Action: Check that the printer emulation matches the emulation on the host.

Cause: Invalid cable address.
Action: Check the cable addresses on the host and in the I-O 8251R configuration.

Cause: Printer is off line.
Action: Make sure printer is on line and has paper. Send a print screen from DOS to see if printer is communicating with PC.

No host communication - emulator will not come on-line or cannot be varied on.

Cause: Host communication line not operating properly.
Action: Contact system operator; may need to IPL the host. Make sure host/modem cable is attached to the emulator. Have line checked by telephone company.

Cause: NRZI or NONRZI not set properly.
Action: NRZI and NONRZI setting must be the same at both the host and emulator. If unsure, change this setting at the emulator and try to bring it on-line again.

Cause: Local configuration does not match the host's configuration.
Action: Verify the local configuration matches the host configuration.

Cause: Modems not the proper type or not strapped properly.
Action: Verify proper modem type for the network. Make sure modem can communicate at the line speed chosen. Check that the modem is "strapped" for the network type (half or full duplex, etc.). Perform loop back or end-to-end tests to make sure host site and emulator site modems communicate.

Cause: Host not configured for the emulator.
Action: Make sure the host is configured for the emulator.

Cause: Host configuration not correct.
Action: Make sure the emulator address is correct at the host.

Cause: Host not varied on or subsystem not started.
Action: Vary on the host as described in Chapter 5. Some hosts require line, device and subsystem to be varied on before the host can communicate. Make sure subsystem is started.

Emulator drops off line and will not come back up or stays at a "Vary on pending" status

Cause: Telephone line has interference.
Action: Have the phone company check the telephone line.

Cause: Message on console.
Action: Answer then delete message.

Cause: Modem or emulator "locked up".
Action: Power on, then power off both modems or the emulator.

Cause: Subsystem terminated.
Action: Restart subsystem.

Cause: "Drop line upon sign off" selected as "yes" on the AS/400 display description.
Action: Select "no" to drop the line upon sign off.

Slow response time for attached devices

Cause: Interference on communications line.
Action: Check communications line to host for interference.

Cause: Selected baud rate is too slow for the number of attached devices or the application.
Action: Increase baud rate in emulator configuration and on modem settings.

Cause: Host has nonexistent controller varied on to a multi-point line.
Action: Check the host status of the line for this controller. If the line shows any non-existent controllers that have status other than "varied off", vary them off.

Error Messages

The error messages below are generated by the I-O 8251R during configuration, while starting emulation, or during active emulation. The IBM Systems/34, /36, /38, and AS/400 have various error messages to help identify communication problems between the host and the PC or PC printer. The IBM host also has a "help" facility designed for error message recovery. Refer to the IBM Technical Manual for further details.

Address Conflict - The same cable address has been assigned to more than one logical unit session.

Bad File Name - The file name cannot be read. A file extension may have been added when specifying a configuration file name.

PROBLEM RESOLUTION

Error Creating File - DOS is unable to create a file in the current disk and directory. This is usually caused because the current disk is not available, or the disk is write protected.

Error Deleting File - DOS detects an error while attempting to delete a configuration file. This is usually caused because the current disk is not available, or the disk is write protected.

Error Reading File - The disk file is the wrong size or the data is invalid. If this error occurs while reading a user-created file, the file must be recreated; otherwise, the configuration software should be reinstalled.

Error Writing File - DOS detects an error while trying to write data to the current disk. The current disk may be unavailable, may be write protected, or may be full. If the problem can be corrected, enter "Y" and the writing will be retried; otherwise, enter "N" and writing will be aborted.

File Already Exists - The file name indicated already exists.

File Could Not Be Found - The file name indicated cannot be found. Verify that the current disk and directory are correct. If so, recreate a new configuration file.

File Open Error - DOS detects an error while trying to open the requested file. Verify that the current disk and directory are correct; if so, then the configuration software should be reinstalled.

Invalid Configuration File - The configuration file you are trying to modify is invalid. Verify that you are specifying the correct file. If so, the file should be deleted and recreated.

Session is Not a Display Session - The logical session specified for the file transfer has not been configured or is configured as a printer.

Loading Emulation Software Error Messages

Configuration File is Invalid - The configuration file specified contains incorrect data. Verify that the correct file is being used. If so, the configuration file must be recreated.

Configuration File Not Found - The configuration file specified cannot be located. Verify that the current disk and directory are correct and the correct configuration file is specified.

Device ID in Configuration File is Invalid - An incorrect device was found while processing the configuration file. Verify the device in the configuration file and, if necessary, recreate it.

Emulation Adaptor Does Not Respond - The emulation adaptor card has detected a problem. Power off the PC and restart emulation. If the problem persists, verify the hardware configuration. If it is correct, contact your dealer.

Emulation Adaptor Diagnostic Error - The emulation adaptor detects an error during power up. Power PC off and restart emulation. If the problem continues, contact your dealer.

Error Reading Keyboard Definition File - The emulation software cannot read the keyboard definition file. Verify that the current disk and directory are correct. If so, verify the three files, KEYBOARD BAS; KEYBOARD CHG; KEYBOARD DEF, exist on the I-O 8251R software diskette.

Error Reading Printer Definition File - The emulator software cannot read the printer definition file. Verify that the current disk and directory are correct; if so, check the configuration to ensure that the printer is correctly configured. If the problem persists, reinstall the software.

Keyboard Definition File is Invalid - The data in the keyboard definition file is incorrect. Copy the three files, KEYBOARD.BAS; KEYBOARD.CHG; KEYBOARD.DEF, from the I-O 8251R software.

Keyboard Definition File Not Found - The emulation software is unable to locate the keyboard definition file. If the current disk and directory are correct, copy the three files, KEYBOARD.BAS; KEYBOARD.CHG; KEYBOARD.DEF, from the I-O 8251R software.

Printer Definition File Not Found - The emulation software is unable to locate the printer definition file. Verify the printer configuration and, if correct, reinstall the emulation software.

AS/400 PC Support Error Messages

Handler is already resident - If PC Support is not active, reboot the system.

Host Error Messages

The host system also has a set of error messages to report problems with communication between the host and display station. These four digit error messages consist of codes 0040 through 0054. See the IBM System/34, /36, /38, or AS/400 Technical Reference Manual for further information on host error messages.

Use the **<Error Reset>** key to clear the error condition and proceed with the host communications.

The I-O 8251R is compatible with most PC application programs. The following information may help prevent any conflicts.

Microsoft Windows

The I-O 8251R software is Windows-compatible if used under a Windows DOS partition. Included on the I-O 8251R software are two *.PIF (Program Information File) for starting emulation from Windows. The *.PIF file must be entered on the command line of the NEW PROGRAM OBJECT window when creating an icon.

DOS Shell

Make sure all programs, including the I-O 8251R emulation program, are loaded before loading DOS Shell. If the emulation program is loaded from DOS Shell, the next application program may not load properly since the PC's memory is not fully free.

43- or 50-Line Mode

The ANSI.SYS screen driver must be installed when using programs with 43- or 50-line mode, such as Quattro Pro. Otherwise, the number of lines may revert to another size when hot keying to a host session and then back to the DOS session.

The screen colors may change during the hot keying for some programs (such as MS Works), but the data will remain unaffected and the screen colors will be restored after the next startup.

HandsOn

When using HandsOn or Novell Menu for file transfer, the PC clock may lose the proper time, but data is unaffected.

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APPENDIX A

Specifications

General

Host Systems:	IBM System/34, /36, /38 and AS/400
Controller Emulations:	IBM 5394, 5294 and 5251-12
Display Emulations:	IBM 5251-11, 5291, 3179-1, 3180, 3196, 3197C, 3197D
Printer Emulations:	IBM 5224/5225, 5256, 4214 (APF and BGU), 3812 (non-IPDS) and 5219 for standard memory usage
Number of sessions:	Seven
Minimum configuration:	One display
Maximum configuration:	Seven sessions (session #1 must be a display, otherwise any combination of displays and printers), DOS supports maximum of five printers
Memory required:	225K + 11K per display + 29K per printer session
Interface:	44 pin D Sub. This needs to be connected to an I cable.
Cables:	EIA 232D (V.24) V.35 X.21
Indicators:	TXD DSR RXD CTS RTS DCD

APPENDIX A

Physical

Board size:	4.0" x 6.0" (10.2 cm x 15.24 cm)

Environmental

Operating temperature:	0 C to 45 C (32 F to 110 F)
Storage temperature:	-30 to 70 C (-20 F to 160 F)
Relative humidity:	0 to 95% non-condensing
Heat generation:	4.5 W maximum

Additional Features

Features that are available on the I-O 8251 Remote Emulator Card include:

- Text Assist Entry
- 132 column screens
- Supports IBM File Support Utility (FSU),File Transfer Facility (FTF), PC Support/36, /38, AS/400 PC Support, SSI and Andrew ETU, IBM API
- Both parallel and serial printers host-addressable
- Record/Playback macros for repeated keystrokes

Optional Cables

Available for local attachment (null modem):

CCX21M, CCV35M, CCV24M

Limitations

Features not available on the I-O 8251 Remote Emulator Card include:

- Graphics (5292-2)
- X.21 protocol support
- Light pens
- Magnetic stripe reader

APPENDIX B

The following are filenames for executable programs. An executable program is a set of step-by-step instructions given to the computer to complete a task. Some of these files are executed by the user and some are executed by the emulator (called by the emulation program).

Executable by the User

IO8251R.EXE - The main emulation program. To execute at a DOS prompt, change to the directory where emulation is located and then type: **IO8251R**

IODIAG.EXE - A utility program that checks for communication between the PC and the Remote Emulator Card. If this is successful, it checks for communication with the modem.

IOKBCHK.EXE - A utility program that helps to determine which type of keyboard is being used. To execute at a DOS prompt, change to the directory where emulation is located and then type: **IOKBCHK**

IOMEMCHK.EXE - A program that is used to check the upper memory segments not used by the personal computer (PC). To execute at a DOS prompt, change to the directory where emulation is located and then type: **IOMEMCHK**

RCONFIG.EXE - The configuration program. To execute at a DOS prompt, change to the directory where emulation is located and then type: **RCONFIG**

SAVEKEYS.EXE - A program used to save keystrokes recorded during the record/playback feature. You will need to hot key out of emulation. At the DOS prompt, change the directory to where the emulation software is located and type: **SAVEKEYS**

WININST.EXE - A program that adds the emset command to the winstart.bat file. If the winstart.bat does not exist, wininst will create the file. At the DOS prompt, type: **WININST**

Executable by the Emulator

HP.EXE - A program that allows 3812 emulation on a laser printer in HP mode.

HP4029.EXE - A program that allows 3812 emulation on an IBM 4029 laser printer in HP mode.

HP5219.EXE - A program that allows 5219 emulation on a laser printer in the HP mode.

PPDS4029.EXE - A program that allows 3812 emulation of an IBM 4029 laser printer in PPDS mode.

PREM.EXE - A program that allows 4214 emulation in a dot matrix printer.

IO8251C.EXE - A program that executes the controller and starts communication with the host.

IO8251CA.EXE - A program that executes the controller if the IBM PC Support AS/400 is executed.

IO8251E.EXE - A program that executes the emulation software.

IO8251EA.EXE - A program that executes the emulation for IBM PC Support AS/400.

IO8251RA.BAT - A program that executes the setup of the remote card to work with IBM PC Support AS/400.

Other files include:

*.P12	Printer files using 3812 emulation.
*.P14	Printer files using 4214 emulation.
*.P19	Printer files using 5219 emulation.
*.P56	Printer files using Text Mode.
*.DAT	File utilized in configuration to make changes for language.
*.CFG	Configuration files.
*.HEX	Emulation adaptor microcode file.
*.PIF	Program Information File used in conjunction with Windows.
*.BAS	Keyboard Base File.
*.CHG	Keyboard Change File.
*.DEF	Keyboard Definition File.
*.ICO	Icon Files.

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APPENDIX C

Code Conversion Tables

EBCDIC Table (U.S. National)

For 8D, AD, BC and DA, either of the two characters may print, depending on the printer type or emulation.

For other languages, refer to the IBM 5250 Function Reference Manual, SA21-9247-6.

APPENDIX C

HEX	EBCDIC
40	space
41	req. space
42	â
43	ä
44	à
45	á
46	ã
47	å
48	ç
49	ñ
4A	¢
4B	.
4C	<
4D	(
4E	+
4F	|
50	&
73	Ë
74	È
75	Í
76	Î
77	Ï

HEX	EBCDIC
51	é
52	ê
53	ë
54	è
55	í
56	î
57	ï
58	ì
59	ß
5A	!
5B	$
5C	*
5D	)
5E	;
5F	¬
60	-
61	/
8E	Þ
8F	±
90	o
91	j
92	k

HEX	EBCDIC
62	Â
63	Ä
64	Á
65	Á
66	Ã
67	Å
68	Ç
69	Ñ
6A	|
6B	,
6C	%
6D	-
6E	>
6F	?
70	ø
71	É
72	Ê
A8	y
A9	z
AA	¡
AB	¿
AC	D

HEX	EBCDIC
78	Ì
79	`
7A	:
7B	#
7C	@
7D	’
7E	=
7F	"
80	Ø
81	a
82	b
83	c
84	d
85	e
85	f
86	g
87	h
88	i
8A	«
8B	»
8C	δ
C2	B

HEX	EBCDIC
93	l
94	m
95	n
96	o
97	p
98	q
99	r
9A	ª
9B	º
9C	æ
9D	ξ
9E	Æ
9F	¤
A0	µ
A1	~
A2	s
A3	t
A4	u
A5	v
A6	w
A7	x
DC	ü

HEX	EBCDIC
AD	Ý or
AE	Þ
AF	®
B0	^
B1	£
B2	¥
B3	·
B4	*f*
B5	§
B6	¶
B7	¼
B8	½
B9	¾
BA	[
BB	]
BC	- or
BD	¨
BE	´
BF	–
C0	{
C1	A
F7	7

APPENDIX C

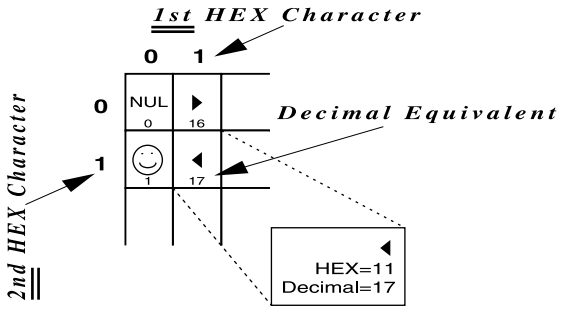
HEX	EBCDIC
C3	C
C4	D
C5	E
C6	F
C7	G
C8	H
C9	I
CA	—
CB	ô
CC	ö
CD	ò
CE	ó
CF	õ
D0	}
D1	J
D2	K
D3	L
D4	M
D5	N
D6	0
D7	P
D8	Q
D9	R
DA	1 or
DB	û

HEX	EBCDIC
DD	ù
DE	ú
DF	ÿ
E0	\
E1	# space
E2	S
E3	T
E4	U
E5	V
E6	W
E7	X
E8	Y
E9	Z
EA	²
EB	Ô
EC	Ö
ED	Ò
EE	Ó
EF	Õ
F0	0
F1	1
F2	2
F3	3
F4	4
F5	5

HEX	EBCDIC
F7	7
F8	8
F9	9
FA	³
FB	Û
FC	Ü
FD	Ù
FE	Ù
FF	

Code Page 850 Symbol Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL 0	▶ 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	▒ 176	└ 192	ð 208	Ó 224	- 240
1	☺ 1	◀ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▓ 177	┴ 193	Ð 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	‗ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	‖ 186	╩ 202	┌ 218	Û 234	. 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	▓ 219	Ù 235	¹ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▬ 220	ý 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▬ 223	´ 239	255



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APPENDIX D

Typestyle (FGID) Reference Chart

The tables on the following pages list the IBM typestyle numbers (font IDs) that the I-O 8251R uses to select fonts internal to the printer and from HP font cartridges. I-O font change commands for each font are also listed.

Typestyle numbers with an asterisk (*) next to them are acceptable IBM font IDs for device configuration and OCL or CL printer commands (in hexadecimal).

I-O font change commands begin with a logical not (¬), which is upper shift 6 on U.S. keyboards. The caret (^) symbol may be substituted in non-U.S. applications.

Proportional fonts cannot be right justified through use of the IBM justify command.

5219 Emulation

The table below lists IBM typestyle numbers and I-O font change commands for HP LaserJet resident fonts (internal to the printer) and HP font cartridges with the 5219 printer emulation.

Note: Typestyle number 86 prints the resident 10 CPI courier font at 12 CPI spacing in portrait (¬ QXM). Typestyle number 85 prints the resident 16 CPI Line Printer font at 12 CPI spacing in landscape (¬ QXN).

APPENDIX D

Hewlett Packard LaserJet Internal Resident Fonts						
Printer Model	**Font**	**Orient**	**Pitch**	**Point Size**	**Type-style No.**	**Font Change Command**
All Models	Courier	P	10	12	*11	¬ QXG
		L	10	12	*5	¬ QXH
Plus & Series II	Line Printer	P	16.66	8.5	*221	¬ QXJ
		L	16.66	8.5	*222	¬QXR
Series II	Line Printer (8LPI)	P	16.66	8.5	*223	¬ QXL
Series II	Line Printer (8LPI)	L	19.0	8.5	*225	¬ QXP
			13.3	8.5	*91	¬ QXK

HP Cartridge Fonts							
				Typestyle No		**Font Change Command**	
Font	**Orient**	**Pitch**	**Point Size**	**Standard**	**Legal**	**Standard**	**Legal**
A Cartridge *Courier 1 (Roman 8 Symbol Set)*							
Courier bold	P	10	12	8	--	¬ QLA	--
	L	10	12	9	--	¬ QLC	--
Courier light	P	10	12	6	--	¬ QLB	--
	L	10	12	7	--	¬ QLC	--
Line Printer light	P	16.66	8.5	*221	--	¬ QLE	--
B Cartridge *TMS Proportional 1 (US ASCII Symbol Set)*							
Helvetica bold	P	Prop.	14.4	175	--	¬ QBA	--
Tms Rmn med	P	Prop.	10	*158	--	¬ QBB	--
Tms Rmn bold	P	Prop.	10	*159	--	¬ QBC	--
Tms Rmn med itl	P	Prop.	10	*162	--	¬ QBD	--
Tms Rmn light	P	Prop.	8	154	--	¬ QBE	--
Line Printer light	L	16.66	8.5	255	--	¬ QBF	--
		19.0	8.5	*225	--	¬ QBG	--

Font	Orient	Pitch	Point Size	Typestyle No.		Font Charge Command	
				Standard	Legal	Standard	Legal
E Cartridge *Letter Gothic (Roman 8, US ASCII Symbol Set)*							
Letter Gothic med	P	12	12	*84	--	¬ QNA	--
	L	12	10	88	--	¬ QND	--
Letter Gothic bold	P	12	10	97	--	¬ QNB	--
	L	12	10	98	--	¬ QNE	--
Letter Gothic med italic	P	12	10	107	--	¬ QNC	--
	L	12	10	108	--	¬ QNF	--
G Cartridge *Legal Elite (US ASCII Symbol Set)*							
Prestige Elite medium	P	12	10	*80	90	¬QGUA	¬QGLA
Prestige Elite bold	P	12	10	82	92	¬QGUC	¬QGLC
Prestige Elite med italic	P	12	10	81	93	¬QGUB	¬QGLB
Prestige Elite medium	P	16.66	7	*222 (252)	227 (253)	¬QGUD	¬QGLD
	L	16.66	7	261 (250)	228 (254)	¬QGUE	¬QGLE
		19.0	7	214	--	¬QGUF	--
Line Draw Set	P	12	12	110	110	¬QGUB ¬QGF	--

APPENDIX D

Font	Orient	Pitch	Point Size	Typestyle No.		Font Charge Command	
				Standard	Legal	Standard	Legal
H Cartridge *Legal Courier (US ASCII Symbol Set)*							
Courier medium	P	10	12	*20	30	¬ QHUA	¬QHLA
Courier bold	P	10	12	22	32	¬ QHUC	¬QHLC
Courier med italic	P	10	12	21	31	¬ QHUB	¬QHLB
Prestige Elite medium	P	16.66	7	*222 (252)	227 (253)	¬ QHUD	¬QHLD
	L	16.66	7	216 (250)	228 (254)	¬ QHUE	¬QHLE
		19.0	7	214	--	¬ QHUF	--
Line Draw Set	P	10	12	40	--	¬ QHF	--
L Cartridge *Courier P&L (Roman 8 Symbol Set)*							
Courier bold	P	10	12	8	--	¬ QLA	--
	L	10	12	9	--	¬ QLC	--
Courier medium italic	P	10	12	6	--	¬ QLB	--
	L	10	12	7	--	¬ QLD	--

Font	Orient	Pitch	Point Size	Typestyle No		Font Change Command	
				Standard	Legal	Standard	Legal
Line Printer medium	P	16.66	8.5	*221	--	¬ QLE	--
	L	16.66	8.5	255	--	¬ QLF	--
		19.0	8.5	*225	--	¬ QLG	--
M Cartridge *Prestige Elite (Roman 8 Symbol Set)*							
Prestige Elite medium	P	12	10	*87	--	¬QMA	--
	L	12	10	88	--	¬QMD	--
Prestige Elite bold	P	12	10	97	--	¬QMB	--
	L	12	10	98	--	¬QME	--
Prestige Elite med italic	P	12	10	107	--	¬QMC	--
	L	12	10	108	--	¬QMF	--
N Cartridge *Letter Gothic P&L (Roman 8 Symbol Set)*							
Letter Gothic medium	P	12	12	*84	--	¬ QNA	--
	L	12	12	*85	--	¬ QND	--
Letter Gothic bold	P	12	12	94	--	¬ QNB	--
	L	12	12	95	--	¬ QNE	--
Letter Gothic medium italic	P	12	12	104	--	¬ QNC	--
	L	12	12	105	--	¬ QNF	--
Q Cartridge *Memo 1 (Roman 8 Symbol Set)*							
Courier bold	P	10	12	8	--	¬ QQA	--
	L	10	12	9	--	¬ QQE	--
Courier medium italic	P	10	12	6	--	¬ QQB	--
	L	10	12	7	--	¬ QQF	--

Font	Orient	Pitch	Point Size	Typestyle No.		Font Change Command	
				Standard	Legal	Standard	Legal
Letter Gothic med	P	12	12	*84	--	¬ QQC	--
Letter Gothic bold	P	12	12	94	--	¬ QQD	--
R Cartridge *Presentations 1*							
Presentation bold	P	6.5	18	18 (240)	28	(242)	¬ QRUA
	L	6.5	18	19 (241)	29 (243)	¬ QRUD	¬ QRLD
Presentation bold	P	8.1	16	16 (260)	26	(262)	¬ QRUB
	L	8.1	14	17 (261)	27 (263)	¬ QRUE	¬ QRLE
Presentation bold	P	10	14	14	24	¬ QRUC	¬ QRLC
	L	10	14	15	25	¬ QRUF	¬ QRLF
Letter Gothic medium	P	10	14	*12	34	¬ QRUG	¬ QRLG
	L	10	14	*13	35	¬ QRUH	¬
PCLine bold	P	10	14	36	--	¬ QRJ	--
	L	10	14	37	--	¬ QRK	--
Line Draw	P	10	14	38	--	¬ QRM	--
	L	10	14	39	--	¬ QRN	--

APPENDIX D

3812 Emulation

The following chart lists the IBM typestyle numbers (font IDs) and I-O font change commands used to change fonts within a document with the 3812 printer emulation. For information on changing fonts, refer to Chapter 4.

APPENDIX D

Typeface	Symbol	Orient	Pitch	Point	Type-style No.
Line Printer	R-8/850	P/L	13.33	8.5	204
Line Printer	R-8/850	P/L	15	8.5	223
Line Printer	R-8/850	P/L	17.1	8.5	254
Line Printer	R-8/850	P/L	19	8.5	281
Courier	R-8/850	P/L	10	12	11
Courier Bold	R-8/850	P/L	10	12	46
Courier Italic	R-8/850	P/L	10	12	18
Courier	R-8/850	P/L	12	10	85
Courier Bold	R-8/850	P/L	12	10	88
Courier Italic	R-8/850	P/L	12	10	89
Letter Gothic	R-8/850	P/L	12	12	87
CG Times	R-8/850	P/L	Prop.	6	4605
	R-8/850	P/L	Prop.	8	4606
	R-8/850	P/L	Prop.	10	4607
	R-8/850	P/L	Prop.	12	4608
	R-8/850	P/L	Prop.	14	4609
	R-8/850	P/L	Prop.	18	4611
	R-8/850	P/L	Prop.	24	4614
	R-8/850	P/L	Prop.	30	4617
CG Times Bold	R-8/850	P/L	Prop.	6	4625
	R-8/850	P/L	Prop.	8	4626
	R-8/850	P/L	Prop.	10	4627
	R-8/850	P/L	Prop.	12	4628
	R-8/850	P/L	Prop.	14	4629
	R-8/850	P/L	Prop.	18	4631
	R-8/850	P/L	Prop.	24	4634
	R-8/850	P/L	Prop.	30	4637

Typeface	Symbol	Orient	Pitch	Point	Type-style No.
CG Times Italic	R-8/850	P/L	Prop.	6	4645
	R-8/850	P/L	Prop.	8	4646
	R-8/850	P/L	Prop.	10	4647
	R-8/850	P/L	Prop.	12	4648
	R-8/850	P/L	Prop.	14	4649
	R-8/850	P/L	Prop.	18	4651
	R-8/850	P/L	Prop.	24	4654
	R-8/850	P/L	Prop.	30	4657
CG Times Bold Italic	R-8/850	P/L	Prop.	6	4665
	R-8/850	P/L	Prop.	8	4666
	R-8/850	P/L	Prop.	10	4667
	R-8/850	P/L	Prop.	12	4668
	R-8/850	P/L	Prop.	14	4669
	R-8/850	P/L	Prop.	18	4671
	R-8/850	P/L	Prop.	24	4674
	R-8/850	P/L	Prop.	30	4677
Univers Medium	R-8/850	P/L	Prop.	6	4805
	R-8/850	P/L	Prop.	8	4806
	R-8/850	P/L	Prop.	10	4807
	R-8/850	P/L	Prop.	12	4808
	R-8/850	P/L	Prop.	14	4809
	R-8/850	P/L	Prop.	18	4811
	R-8/850	P/L	Prop.	24	4814
	R-8/850	P/L	Prop.	30	4817
Univers Med Italic	R-8/850	P/L	Prop.	6	4825
	R-8/850	P/L	Prop.	8	4826

Typeface	Symbol	Orient	Pitch	Point	24Type-style No.
(Continued)	R-8/850	P/L	Prop.	10	4827
	R-8/850	P/L	Prop.	12	4828
	R-8/850	P/L	Prop.	14	4829
	R-8/850	P/L	Prop.	18	4831
	R-8/850	P/L	Prop.	24	4834
	R-8/850	P/L	Prop.	30	4837
Univers Med Cond.	R-8/850	P/L	Prop.	6	4845
	R-8/850	P/L	Prop.	8	4846
	R-8/850	P/L	Prop.	10	4847
	R-8/850	P/L	Prop.	12	4848
	R-8/850	P/L	Prop.	14	4849
	R-8/850	P/L	Prop.	18	4851
	R-8/850	P/L	Prop.	24	4854
	R-8/850	P/L	Prop.	30	4857
Univers Med Cond. Italic	R-8/850	P/L	Prop	6	4865
	R-8/850	P/L	Prop.	8	4866
	R-8/850	P/L	Prop.	10	4867
	R-8/850	P/L	Prop.	12	4868
	R-8/850	P/L	Prop.	14	4869
	R-8/850	P/L	Prop.	18	4871
	R-8/850	P/L	Prop.	24	4876
	R-8/850	P/L	Prop.	30	4877
Univers Bold	R-8/850	P/L	Prop.	6	4905
	R-8/850	P/L	Prop.	8	4906
	R-8/850	P/L	Prop.	10	4907
	R-8/850	P/L	Prop.	12	4908
	R-8/850	P/L	Prop.	14	4909
	R-8/850	P/L	Prop.	18	4911

Typeface	Symbol	Orient	Pitch	Point	24Type-style No.
(Continued)	R-8/850	P/L	Prop.	24	4014
	R-8/850	P/L	Prop.	30	4917
Univers Bold Italic	R-8/850	P/L	Prop.	6	4925
	R-8/850	P/L	Prop.	8	4926
	R-8/850	P/L	Prop.	10	4927
	R-8/850	P/L	Prop.	12	4928
	R-8/850	P/L	Prop.	14	4929
	R-8/850	P/L	Prop.	18	4931
	R-8/850	P/L	Prop.	24	4934
	R-8/850	P/L	Prop.	30	4937
Univers Bold Cond.	R-8/850	P/L	Prop.	6	4945
	R-8/850	P/L	Prop.	8	4946
	R-8/850	P/L	Prop.	10	4948
	R-8/850	P/L	Prop.	12	4949
	R-8/850	P/L	Prop	18	4951
	R-8/850	P/L	Prop.	24	4954
	R-8/850	P/L	Prop.	30	4957
Univers Bold Cond. Italic	R-8/850	P/L	Prop.	6	4965
	R-8/850	P/L	Prop.	8	4966
	R-8/850	P/L	Prop.	10	4967
	R-8/850	P/L	Prop.	12	4968
	R-8/850	P/L	Prop.	14	4969
	R-8/850	P/L	Prop.	18	4971
	R-8/850	P/L	Prop.	24	4974
	R-8/850	P/L	Prop.	30	4977
ITC Zapf Dingbats	10L	P/L	Prop.	6	4985
	10L	P/L	Prop.	8	4986
	10L	P/L	Prop.	10	4987

Typeface	Symbol	Orient	Pitch	Point	24Type-style No.
(Continued)	R-8/850	P/L	Prop.	12	4988
	R-8/850	P/L	Prop.	14	4989
	R-8/850	P/L	Prop.	18	4991
	R-8/850	P/L	Prop.	24	4994
	R-8/850	P/L	Prop.	30	4997

Optional Fonts as originally found in ProCollection Cartridge					
Line Printer	ASCII	P/L	17.1	8.5	253
Courier Bold	ASCII	P/L	10	12	45
Courier Italic	ASCII	P/L	10	12	17
Courier	ASCII	P/L	12	10	84
Courier Bold	ASCII	P/L	12	10	108
Courier Italic	ASCII	P/L	12	10	92
Courier	Legal	P	10	12	51
Courier Bold	Legal	P	10	12	52
Courier Italic	Legal	P	10	10	53
Courier	Legal	P	12	10	93
Courier Bold	Legal	P	12	10	94
Courier Italic	Legal	P	12	10	95
Prestige Elite	ASCII	P/L	15	7	220
Prestige Elite	ASCII	P/L	12	10	83
Prestige Elite Bold	ASCII	P/L	12	10	113
Prestige Elite Italic	ASCII	P/L	12	10	114
Prestige Elite	Legal	P	15	7	219
Prestige Elite	Legal	P	12	10	97
Prestige Elite Bold	Legal	P	12	10	98
Prestige Elite Italic	Legal	P	12	10	99
Letter Gothic	ASCII	P/L	27	3.6	291
Letter Gothic	ASCII	P/L	19	6	281
Letter Gothic	ASCII	P/L	17.1	9.5	257
Letter Gothic	ASCII	P/L	12	12	66
Letter Gothic Bold	ASCII	P/L	12	12	69
Letter Gothic Italic	ASCII	P/L	12	12	68
Times Roman	ASCII	P	Prop.	8	163

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Typeface	Symbol	Orient	Pitch	Point	Type-style No.
Times Roman	ASCII	P	Prop.	10	164
Times Roman Bold	ASCII	P	Prop.	10	165
Times Roman Italic	ASCII	P	Prop.	10	166
Times Roman	ASCII	P	Prop.	12	167
Times Roman Bold	ASCII	P	Prop.	12	168
Times Roman Italic	ASCII	P	Prop.	12	169
Times Roman	Legal	P	Prop.	8	173
Times Roman	Legal	P	Prop.	10	174
Times Roman Bold	Legal	P	Prop.	10	175
Times Roman Italic	Legal	P	Prop.	10	176
Times Roman	Legal	P	Prop.	12	177
Times Roman Bold	Legal	P	Prop.	12	178
Times Roman Italic	Legal	P	Prop.	12	179
Helvetica	ASCII	P	Prop.	8	183
Helvetica	ASCII	P	Prop.	10	184
Helvetica Bold	ASCII	P	Prop.	10	185
Helvetica Italic	ASCII	P	Prop.	10	186
Helvetica	ASCII	P	Prop.	12	187
Helvetic Bold	ASCII	P	Prop.	12	188
Helvetica Italic	ASCII	P	Prop.	12	189
Helvetica Bold	ASCII	P	Prop.	14	190
Helvetica Bold	Legal	P	Prop.	14	191
Optional Fonts as originally found in WordPerfect Cartridge					
CG Times	DskTop	P	Prop.	6	4685
CG Times	DskTop	P	Prop.	8	4686

Typeface	Symbol	Orient	Pitch	Point	Type-style No.
CG Times Bold	DskTop	P	Prop.	8	4706
CG Times Italic	DskTop	P	Prop.	8	4814
CG Times	DskTop	P	Prop.	10	4687
CG Times Bold	DskTop	P	Prop	10	4707
CG Times Italic	DskTop	P	Prop.	10	4815
CG Times	DskTop	P	Prop.	12	4688
CG Times Bold	DskTop	P	Prop.	12	4708
CG Times Italic	DskTop	P	Prop.	12	4816
CG Times	DskTop	P	Prop.	14	4689
CG Times Bold	DskTop	P	Prop.	14	4709
CG Times Italic	DskTop	P	Prop.	14	4817
CG Times Bold	DskTop	P	Prop.	18	4711
CG Times Bold	DskTop	P	Prop.	24	4714
Univers	DskTop	P	Prop.	14	4789
Univers	DskTop	P	Prop.	18	4791
Univers	DskTop	P	Prop.	24	4794
Optional Fonts as originally found in Microsoft Cartridge					
Helvetica	R-8	P	Prop.	8	34102
Helvetica	R-8	P	Prop.	10	34103
Helvetica Bold	R-8	P	Prop.	10	34123
Helvetica Italic	R-8	P	Prop.	10	34231
Helvetica	R-8	P	Prop.	12	34104
Helvetic Bold	R-8	P	Prop.	12	34124
Helvetica Italic	R-8	P	Prop.	12	34232
Helvetica Bold	R-8	P	Prop.	14	34125

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Typeface	Symbol	Orient	Pitch	Point	Type-syle No.
TmsRmn	R-8	P	Prop.	8	5686
TmsRmn	R-8	P	Prop.	10	5687
TmsRmn Bold	R-8	P	Prop.	10	5707
TmsRmn Italic	R-8	P	Prop.	10	5815
Times Roman	R-8	P	Prop.	12	5688
Times Roman Bold	R-8	P	Prop.	12	5708
Times Roman Italic	R-8	P	Prop.	12	5816
Times Roman Bold	R-8	P	Prop.	14	5709
Line Printer	R-8	P	Prop.	835	223
Optional Fonts as originally found inPolished Worksheet Cartridge					
Prestige Elite	R-8/850	P/L	15	7	221
Prestige Elite	R-8/850	P/L	12	10	86
Prestige Elite Bold	R-8/850	P/L	12	10	111
Prestige Elite Italic	R-8/850	P/L	12	10	112
Prestige Elite	Legal	P/L	15	7	219
Prestige Elite	Legal	P/L	12	10	97
Prestige Elite Bold	Legal	P/L	12	10	98
Prestige Elite Italic	Legal	P/L	12	10	99
Letter Gothic	R-8/850	P/L	27	3.6	290
Letter Gothic	R-8/850	P/L	12	12	87
Letter Gothic Bold	R-8/850	P/L	12	12	110
Letter Gothic Italic	Legal	P/L	12	12	109
Letter Gothic	Legal	P/L	27	3.6	292
Letter Gothic	Legal	P/L	12	12	90
Letter Gothic Bold	Legal	P/L	12	12	107
Letter Gothic Italic	Legal	P/L	12	12	106

Typeface	Symbol	Orient	Pitch	Point	Type-style No.
Presentation Bold	ASCII	P/L	8.1	16	434
Presentation Bold	Legal	P/L	8.1	16	431
Optional Fonts as originally found in Persuasive Presentations Cartridge					
Letter Gothic	ASCII	P/L	10	14	39
Letter Gothic	Legal	P/L	10	14	38
Presentation Bold	ASCII	P/L	10	14	6
Presentation Bold	Legal	P/L	10	14	7
Presentation bold	ASCII	P/L	8.1	16	434
Presentation bold	Legal	P/L	8.1	16	431
Presentation bold	ASCII	P/L	6.5	18	435
Presentation bold	Legal	P/L	6.5	18	432
Presentation bold	ASCII	P/L	5.7	24	436
Presentation bold	Legal	P/L	5.7	24	433
Helv Outline	ASCII	P/L	Prop.	24	34115
Helv Outline	Legal	P/L	Prop.	24	34116
Serifa	ASCII	P/L	Prop.	24	34215
Serifa	Legal	P/L	Prop.	24	34216
Line Draw	LinDrw	P/L	10	14	31
PC Line bold	PCLin	P/L	10	14	32
Optional Fonts as originally found in Forms, Etc. Cartridge					
Univers	R-8/850	P/L	Prop.	6	33101
Univers	R-8/850	P/L	Prop.	8	33102
Univers bold	R-8/850	P/L	Prop.	8	33122
Univers bold	R-8/850	P/L	Prop.	10	33123
Univers bold	R-8/850	P/L	Prop.	12	33124
Univers bold	R-8/850	P/L	Prop.	14	33125
Helv Cond. Black bold	TXNum	P/L	Prop.	24	34128
OCR-A	OCR-A	P	10	12	19

Typeface	Symbol	Orient	Pitch	Point	Type-style No.
Tax Line Draw	Taxlin Drw	P/L	10	12	30
Optional Fonts as originally found in Bar Codes & More Cartridge					
Letter Gothic	R-8	P/L	15	9.5	230
Letter Gothic	R-8	P/L	112	12	87
Letter Gothic	R-8	P/L	10	14	40
OCR-A	OCR-A	P	10	12	19
OCR-B	OCR-B	P	10	12	3
Code 3 of 9	3 of 9	P	8.1	12	60
Code 3 of 9	3 of 9	P	4.6	12	240
EAN/UPC 10 Mil	UPC	P	Prop.	12	170
EAN/UPC 13 Mil bold	UPC	P	Prop.	12	171
USPS Zip	ZIP	P/L	Prop.	12	172
Line Draw	LinDrw	P/L	10	12	33
Optional Fonts as originally found in Text Equations Cartridge					
Prestige Elite	R-8	P	15	7	221
Prestige Elite	R-8	P	17.1	7	256
Prestige Elite	R-8	P	12	10	86
Prestige Elite bold	R-8	P	12	10	111
Prestige Elite italic	R-8	P	12	10	112
CG Times	R-8	P	Prop.	8	157
CG Times	R-8	P	Prop.	10	158
CG Times bold	R-8	P	Prop.	10	159
CG Times italic	R-8	P	Prop.	10	155
Optional Fonts as originally found in Global Text Cartridge					
CG Century Schoolbook	R-8/850	P/L	Prop.	8	16950
CG Century Schoolbook	R-8/850	P/L	Prop.	10	16951
CG Century Schlbk Bold	R-8	P/L	Prop.	10	16971
CG Century Schlbk Italic	R-8	P/L	Prop.	10	17079

Typeface	Symbol	Orient.	Pitch	Point	Type-style No.
CG Triumvirate	R-8	P/L	Prop.	10	33335
CG Triumvirate Bold	R-8	P/L	Prop.	14	33357
Optional Fonts as originally found in Pretty Faces Cartridge					
Microstyle	ASCII	P	Prop.	18	5910
Microstyle Bold	ASCII	P	Prop.	36	5920
Hobo Medium	ASCII	P	Prop.	30	5930
Hobo Medium	ASCII	P	Prop.	14	5940
Thunderbird	ASCII	P	Prop.	54	5950
Signet Roundhand	ASCII	P	Prop.	18	5960
Signet Roundhand	ASCII	P	Prop.	14	5970
ITC Dingbats	ITC	P	Prop.	36	5980
ITC Dingbats	ITC	P	Prop.	18	5990

PPDS 4029 Mode Fonts				
Font	**Pitch**	**Point Size**	**Typestyle No.**	**Font Change Command**
Courier outline	Prop.	6	416	416
	Prop.	8	426	426
	Prop.	10	436	436
	Prop.	12	446	446
	Prop.	14	456	456
	Prop.	18	466	466
	Prop.	24	476	476
	Prop.	30	486	486
Courier bold outline	Prop.	6	420	420
	Prop.	8	430	430
	Prop.	10	440	440
	Prop.	12	450	450
	Prop.	14	460	460
	Prop.	18	470	470
	Prop.	24	480	480
	Prop.	30	490	490
Courier italic outline	Prop.	6	424	424
	Prop.	8	434	434
	Prop.	10	444	444
	Prop.	12	454	454
	Prop.	14	464	464
	Prop.	18	474	474
	Prop.	24	484	484
	Prop.	30	494	494
Courier bold italic outline	Prop.	6	428	428
	Prop.	8	438	438
	Prop.	10	448	448
	Prop.	12	458	458
	Prop.	14	468	468
	Prop.	18	478	478
	Prop.	24	488	488
	Prop.	30	498	498
Helvetica outline	Prop.	6	2304	2304
	Prop.	8	2314	2314
	Prop.	10	2324	2324
	Prop.	12	2334	2334
	Prop.	14	2344	2344
	Prop.	18	2354	2354
	Prop.	24	2364	2364
	Prop.	30	2374	2374

Helvetica bold outline	Prop.	6	2305	2305
	Prop.	8	2315	2315
	Prop.	10	2325	2325
	Prop.	12	2335	2335
	Prop.	14	2345	2345
	Prop.	18	2355	2355
	Prop.	24	2365	2365
	Prop.	30	2375	2375
Helvetica italic outline	Prop.	6	2306	2306
	Prop.	8	2316	2316
	Prop.	10	2326	2326
	Prop.	12	2336	2336
	Prop.	14	2346	2346
	Prop.	18	2356	2356
	Prop.	24	2366	2366
	Prop.	30	2376	2376
Helvetica bold italic outline	Prop.	2307	2307	2307
	Prop.	8	2317	2317
	Prop.	10	2327	2327
	Prop.	12	2337	2337
	Prop.	14	2347	2347
	Prop.	18	2357	2357
	Prop.	24	2367	2367
	Prop.	30	2377	2377
Times New Roman outline	Prop.	6	2308	2308
	Prop.	8	2318	2318
	Prop.	10	2328	2328
	Prop.	12	2338	2338
	Prop.	14	2348	2348
	Prop.	18	2358	2358
	Prop.	24	2368	2368
	Prop.	30	2378	2378
Times New Roman bold outline	Prop.	6	2309	2309
	Prop.	8	2319	2319
	Prop.	10	2329	2329
	Prop.	12	2339	2339
	Prop.	14	2349	2349
	Prop.	18	2359	2359
	Prop.	24	2369	2369
	Prop.	30	2379	2379

Times New Rmn italic outline	Prop.	6	2310	2310
	Prop.	8	2320	2320
	Prop.	10	2330	2330
	Prop.	12	2340	2340
	Prop.	14	2350	2350
	Prop.	18	2360	2360
	Prop.	24	2370	2370
	Prop.	30	380	2380
Times New Roman bold italic outline	Prop.	6	2311	2311
	Prop.	8	2321	2321
	Prop.	10	2331	2331
	Prop.	12	2341	2341
	Prop.	14	2351	2351
	Prop.	18	2361	2361
	Prop.	24	2371	2371
	Prop.	30	2381	2381
Prestige Elite symbol	12	10	89	89
Letter Gothic Cartridge 1255083				
Letter Gothic	10	14	36	36
Letter Gothic	12	12	87*	87
Letter Gothic bold	12	12	110	110
Letter Gothic italic	12	12	109	109
Letter Gothic symbol	12	12	88	88
Delegate Cartridge 1255804				
Delegate	10	12	2	2
Adjutant	12	10	95	95
Modern	Prop.	12	158*	158
Essay	Prop.	12	160*	160
Essay italic	Prop.	12	162*	162
Script/OCR Cartridge				
Script	12	10	84*	84
Olde World	12	10	96	96
Title	Prop.	12	157	157
APL	12	10	76	76
OCR A	10	12	19	19
OCR B	10	12	3	3
APT/TN	12	10	77	77
Orator Cartridge 1255806				
Orator bold	8.1	16	434	434
Orator bold	6.5	18	435	435

Orator	10	14	5*	5
Compressed Cartridge 1255807				
Prestige	15	9	221	221
Letter Gothic	15	9	222*	222
Letter Gothic	17.1	8.5	255	255
Letter Gothic	20	7.5	281	281
Letter Gothic	25	6	85	285
Light italic	12	10	91*	91
Press Roman Cartridge 1255808				
Press Roman	Prop.	10	186	186
Press Roman bold	Prop.	10	187	187
Press Roman italic	Prop.	10	188	188
Press Roman bold italic	Prop.	10	189	189
Press Roman symbol	12	10	185	185
Foundry Cartridge 1255809				
Foundry	Prop.	10	190	190
Foundry bold	Prop.	10	191	191
Foundry italic	Prop.	10	194	194
Foundry italic bold	Prop.	10	195	195
Foundry symbol	Prop.	10	192	192
Testimonial Cartridge 1255820				
Testimonial	Prop.	12	5943	5943
Testimonial	Prop.	14	5944	5944
Testimonial	Prop.	18	5945	5945
Engravers' Old English Cartridge 1255821				
Engravers' Old English	Prop.	12	37431	37431
Engravers' Old English	Prop.	14	37432	37432
Engravers' Old English	Prop.	18	37433	37433
Times Roman Cartridge 1255822				
Times Roman	Prop.	12	5688	5688
Times Roman bold	Prop.	14	5709	5709
Times Roman bold	Prop.	18	5710	5710
Times Roman Cartridge 1255823				
Times Roman	Prop.	6	5685	5685
Times Roman	Prop.	8	5686	5686
Times Roman bold italic	Prop.	10	5835	5835
Times Roman	Prop.	10	5687	5687
Times Roman bold	Prop.	10	5707	5707
Times Roman italic	Prop.	10	5815	5815
Combo (Data Stream 1) Cartridge 1255824				
Prestige Elite	12	10	86*	86

Helvetica	Prop.	14	34105	34105
Orator	10	14	5*	5
OCR A	10	12	19	19
OCR B	10	12	3	3
Helvetica Cartridge 1255825				
Helvetica	Prop.	12	34104	34104
Helvetica bold	Prop.	14	34125	34125
Helvetica bold	Prop.	18	34126	34126
Helvetica Cartridge 1255826				
Helvetica	Prop.	6	34101	34101
Helvetica	Prop.	8	34102	34102
Helvetica bold italic	Prop.	10	34251	34251
Helvetica	Prop.	10	34103	34103
Helvetica bold	Prop.	10	34123	34123
Helvetica italic	Prop.	10	34231	34231
Cursive Cartridge 1255827				
Cursive	Prop.	12	41783	41783
Cursive	Prop.	14	41803	41803
Cursive	Prop.	18	41804	41804
Palatino Cartridge 1255828				
Palatino	Prop.	12	6200	6200
Palatino	Prop.	4	6219	6219
Palatino	Prop.	18	6220	6220
Palatino Cartridge 1255829				
Palatino	Prop.	6	6197	6197
Palatino	Prop.	8	6198	6198
Palatino	Prop.	10	6199	6199
Palatino bold	Prop.	10	6218	6218
Palatino italic	Prop.	10	6327	6327
Optima Cartridge 1255830				
Optima	Prop.	12	33336	33336
Optima bold	Prop.	14	33356	33356
Optima bold	Prop.	18	33357	33357
Optima Cartridge 1255831				
Optima	Prop.	6	33333	33333
Optima	Prop.	8	33334	33334
Optima	Prop.	10	33335	33335
Optima bold	Prop.	10	33355	33355
Optima italic	Prop.	10	33463	33463
Optima bold italic	Prop.	10	33483	33483
Century Schoolbook Cartridge 1255832				
Century Schoolbook	Prop.	12	16952	16952
Century Schoolbook bold	Prop.	14	16972	16972
Century Schoolbook bold	Prop.	18	16973	16973

Century Schoolbook Cartridge 1255833				
Century Schoolbook	Prop.	6	16949	16949
Century Schoolbook	Prop.	8	16950	16950
Century Schoolbook	Prop.	10	16951	16951
Century Schoolbook bold	Prop.	10	16971	16971
Century Schoolbook italic	Prop.	10	17079	17079
Century Schlbook bold italic	Prop.	6	17099	17099
Goudy Old Style Cartridge 1255834				
Goudy Old Style	Prop.	12	4920	4920
Goudy Old Style bold	Prop.	14	4940	4940
Goudy Old Style bold	Prop.	18	4941	4941
Goudy Old Style Cartridge 1255835				
Goudy Old Style	Prop.	6	4917	4917
Goudy Old Style	Prop.	8	4918	4918
Goudy Old Style	Prop.	10	4919	4919
Goudy Old Style bold	Prop.	10	4939	4939
Goudy Old Style italic	Prop.	10	5047	5047
Goudy Old Style bold italic	Prop.	10	5067	5067
Baskerville Cartridge 1255836				
Baskerville	Prop.	12	8504	8504
Baskerville bold	Prop.	14	8524	8524
Baskerville bold	Prop.	18	8525	8525
Baskerville Cartridge 12558237				
Baskerville	Prop.	6	8501	8501
Baskerville	Prop.	8	8502	8502
Baskerville	Prop.	10	8503	8503
Baskerville bold	Prop.	10	8523	8523
Baskerville italic	Prop.	10	8631	8631
Baskerville bold italic	Prop.	10	8651	8651
Futura Cartridge 1255838				
Futura Book	Prop.	12	33592	33592
Futura Heavy	Prop.	14	33602	33602
Futura Heavy	Prop.	18	33603	33603
Futura Cartridge 1255839				
Futura Book	Prop.	6	33589	33589
Futura Book	Prop.	8	33590	33590
Futura Book	Prop.	10	33591	33591
Futura Heavy	Prop.	10	33601	33601
Futura Book italic	Prop.	10	33719	33719
Futura Heavy italic	Prop.	10	33729	33729

APPENDIX D

Bar None Cartridge				
Code 3 of 9		4.6	21	21
		8.1	22	22
EAN/UPC		13 mil	23	23
		10 mil	24	4
USPS Zip			26	26
Line Draw			312	312

HP4029 Mode Fonts				
Font	**Pitch**	**Point Size**	**Typestyle No.**	**Font Change Command**
Resident Fonts				
Courier	10	12	11*	11
Courier bold	10	12	46	46
Courier	15	8.5	223*	223
Courier	17.1	8.5	254	254
HP Font Cartridge Fonts				
Combo Cartridge 1255824				
OCR-A	10	12	19	19
OCR-B	10	12	3	3
Prestige Elite	12	10	86*	86
Orator	10	14	5*	5
Courier	12	10	85*	85
Helvetica	Prop.	14	34105	34105
Supports M Cartridge 1255841				
Prestige Elite	12	10	86*	86
Prestige Elite bold	12	10	111	111
Prestige Elite italic	12	10	112	112
Supports R Cartridge 1255842				
Orator bold	6.5	18	435	435
Orator bold	8.1	16	434	434
Orator bold	10	14	38	38
Letter Gothic	10	14	40	40
Lines I	10	14	31	31
Lines II	10	14	32	32
Supports U/V Cartridge 1255843				
Swiss 721	Prop.	6	34101	34101
Swiss 721	Prop.	8	34102	34102
Swiss 721 bold	Prop.	10	34123	34123

Swiss 721 bold	Prop.	12	34124	34124
Swiss 721 bold	Prop.	14	34125	34125
Letter Gothic	15	9.5	230	230
Supports Z Cartridge 1255844				
Press Roman	Prop.	8	185	185
Press Roman	Prop.	10	186	186
Press Roman bold	Prop.	10	187	187
Press Roman italic	Prop.	10	188	188
Press Roman	Prop.	12	189	189
Press Roman bold	Prop.	12	190	190
Press Roman italic	Prop.	12	191	191
Press Roman bold	Prop.	14	192	192
Letter Gothic	17.1	8.5	255	255
Supports Z Cartridge 1255845				
Swiss 721	Prop.	10	34103	34103
Swiss 721 italic	Prop.	10	34231	34231
Swiss 721	Prop.	12	34104	34104
Swiss 721 italic	Prop.	12	34232	34232
Swiss 721	Prop.	8	34102	34102
Swiss 721 bold	Prop.	10	34123	34123
Swiss 721 bold	Prop.	12	34124	34124
Swiss 721 bold	Prop.	14	34125	34125
Letter Gothic	17.1	8.5	255	255
Supports Resident Cartridge 1255846				
Courier	10	12	11*	11
Courier bold	10	12	46	46
Courier italic	10	12	18	18
Courier bold	12	10	108	108
Courier italic	12	10	92	92
Courier	16.7	8.5	252	252

Courier	12	10	85*	85
Supports N Cartridge 1255847				
Letter Gothic	12	12	87*	87
Letter Gothic bold	12	12	110	110
Letter Gothic italic	12	12	109	109
Supports T Cartridge 1255848				
Swiss 721	Prop.	6	34101	34101
Swiss 721	Prop.	8	34102	34102
Swiss 721 bold	Prop.	10	34123	34123
Swiss 721 bold	Prop.	12	34124	34124
Swiss 721 bold	Prop.	14	34125	34125
Swiss 721 bold	Prop.	8	34122	34122
Tax Line Draw	10	12	30	30
OCR-A	10	12	19	19
Bar None Cartridge				
Code 3 of 9		4.6	21	21
		8.1	22	22
EAN/UPC		13 mil	23	23
		10 mil	24	24
USPS Zip			26	26
Letter Gothic (Roman 8)		10	36	36
		12	88	88
		15	225	225
Presentation (Roman 8)		18	50	50
Presentation (Legal)		18	51	51
Line Draw			312	312

Note: Numbers with an asterisk (*) can be converted to hex for CL or OCL printer strings.

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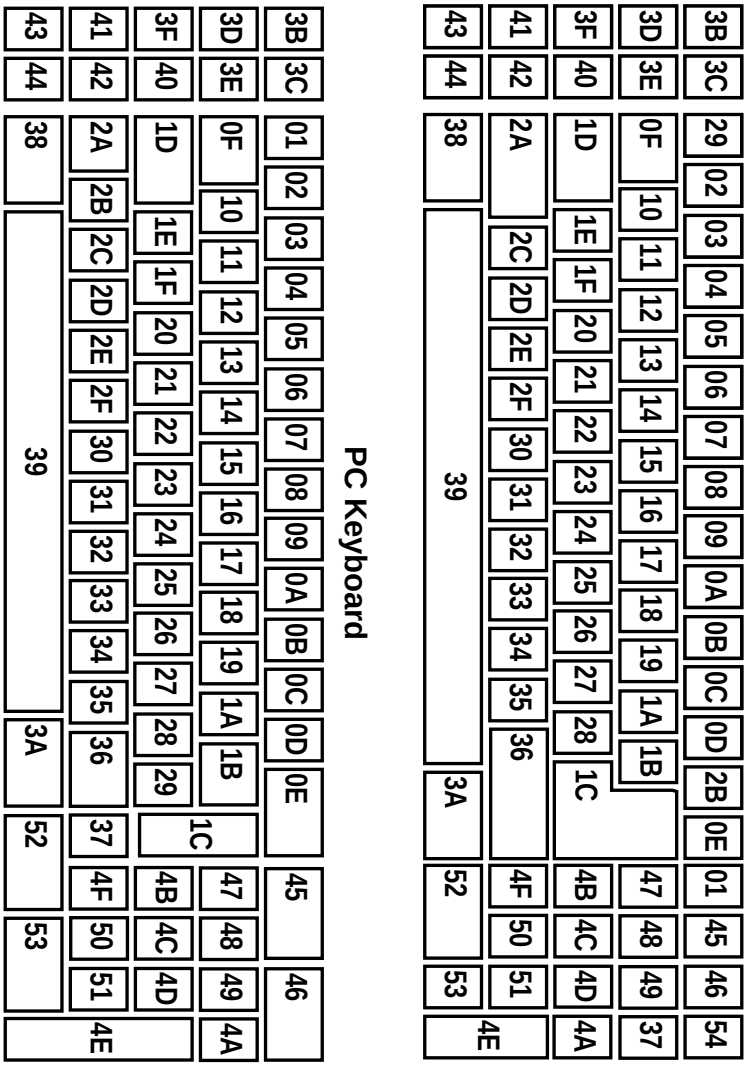
APPENDIX E

Scan Codes

The keyboard scan codes shown on the following pages are the factory defaults. These codes can be changed using the Advanced Functions, Keyboard, "Scan Code Customize" option in the configuration software as described in Chapter 3.

APPENDIX E



5250 Keyboard

7C	6F	3E	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D		48		4C				
6C	6D	20		21	22	23	24	25	26	27	28	29	2A	2B	2C		2D		47	48	49	4E	
6E	7D	54		11	12	13	14	15	16	17	18	19	1A	1B	1C				44	45	46		
71	70	57		0E	01	02	03	04	05	06	07	08	09	0A	56		0C		41	42	43	4D	
72	73	7E							0F						68		40		4A				

Enhanced PC Keyboard

01		3B	3C	3D	3E		3F	40	41	42		43	44	57	58		66	46	67				
29	02	03	04	05	06	07	08	09	0A	0B	0C	0D		0E			5B	5E	62		45	65	37	4A
0F	10	11	12	13	14	15	16	17	18	19	1A	1B	2B				5C	5F	63		47	48	49	4E
3A	1E	1F	20	21	22	23	24	25	26	27	28	1C									4B	4C	4D	
2A		2C	2D	2E	2F	30	31	32	33	34	35	36						60			4F	50	51	
1D		38					39					68			59		5D	61	64		52		53	5A

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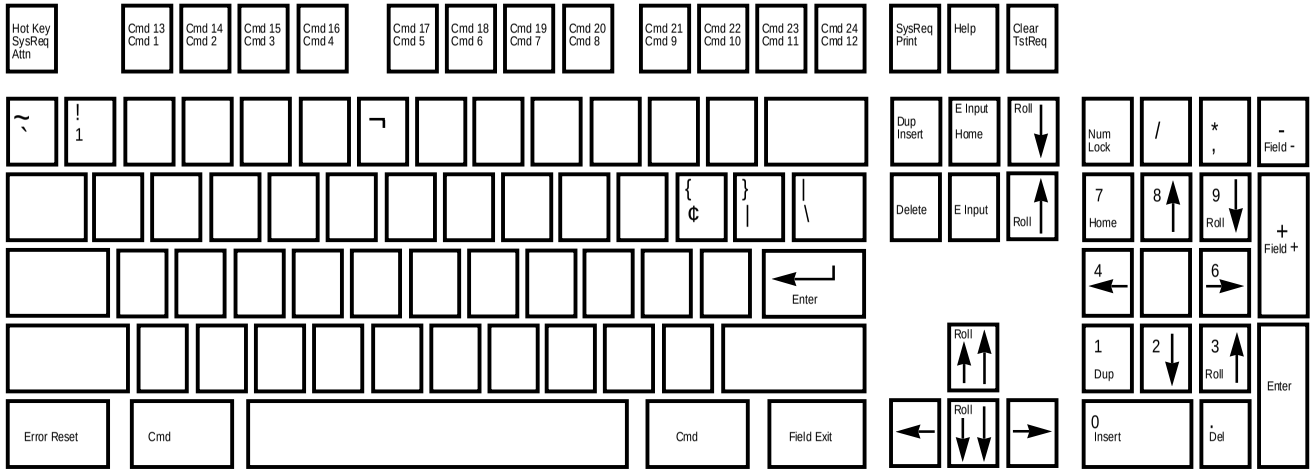
APPENDIX F

The following table gives a general definition for each 5250 (host) key. Keyboard templates have been included.

5250 Keys	Functions of the Keys
Cmd	This key disregards the normal function of the repeating key and performs the function assigned in the host's program.
Del	Deletes the character where the cursor is located.
Dup	Requests that the host program duplicate the data from the same field in the previous record.
Erase Input	Erases data entered in all input fields. The cursor will move to the top left corner of the screen.
Error Reset	Unlocks keyboard after it is locked because of error condition. The key will also reset the help, insert, command, and system request modes.
Field +	Can be used as a field exit key in all fields.
Field -	Operates much like the Field + key, but in signed numeric and numeric fields only.
Field Exit	Used to exit fields that are specified in a program as field-exit required, or as right justified.
Help	Describes the current error condition. The error reset key will reset the help message and error condition to restore the screen and unlock the keyboard.

PC Style on an Enhanced Keyboard (ORIG)



I-O 8250 Series Emulator Card Template

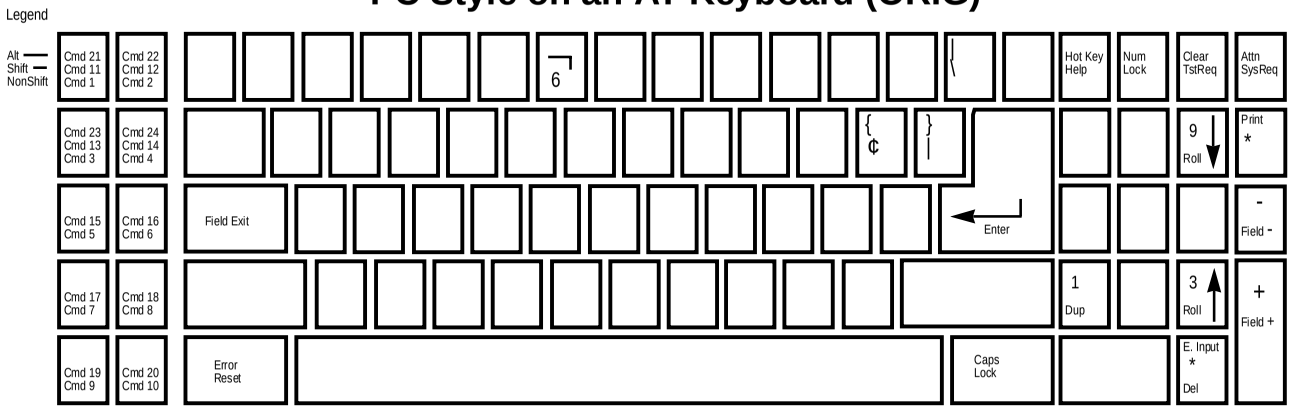
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

PC Style on an AT Keyboard (ORIG)



I-O 8250 Series Emulator Card Template

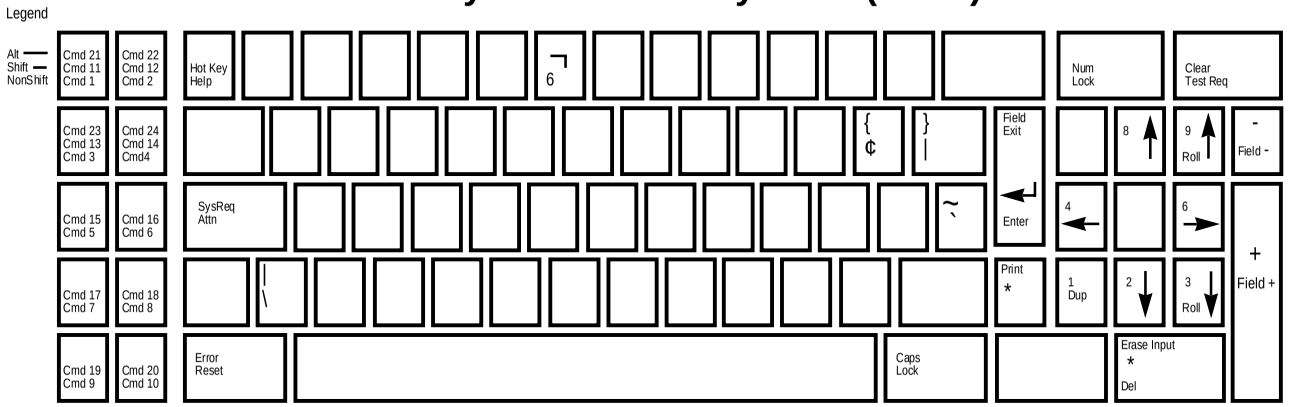
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

PC Style on an PC Keyboard (ORIG)



I-O 8250 Series Emulator Card Template

Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

5250 Style on an Enhanced Keyboard (ORIG)

I-O 8250 Series Emulator Card Template

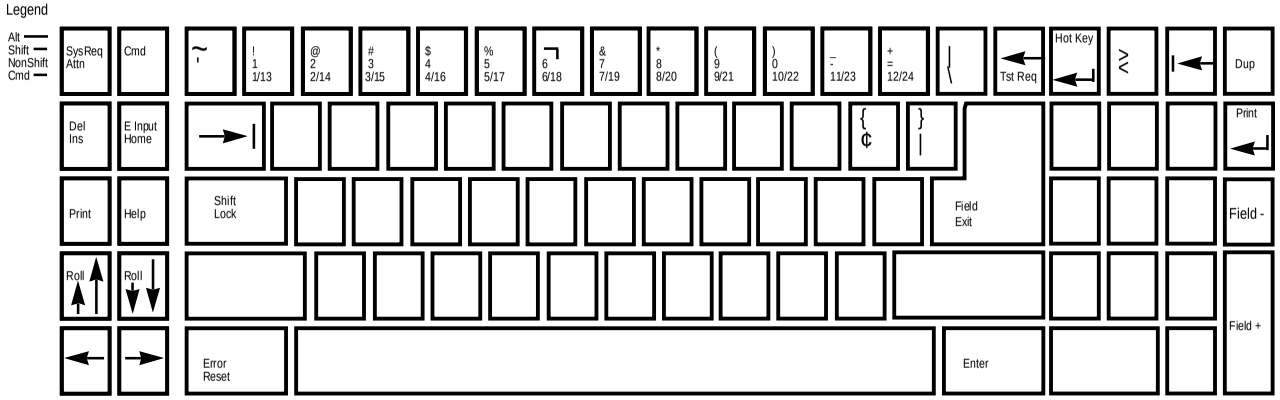
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

5250 Style on an AT Keyboard (ORIG)



I-O 8250 Series Emulator Card Template

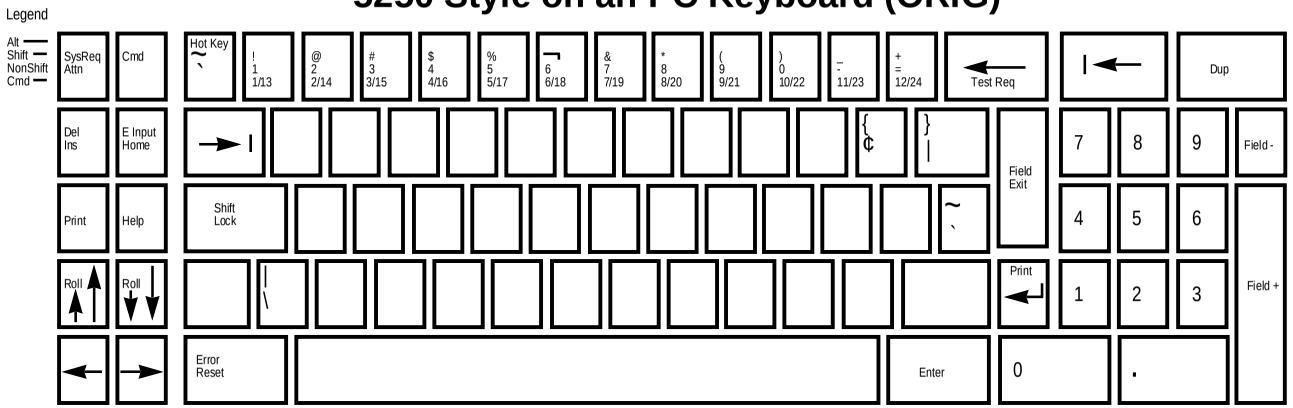
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

5250 Style on an PC Keyboard (ORIG)



I-O 8250 Series Emulator Card Template

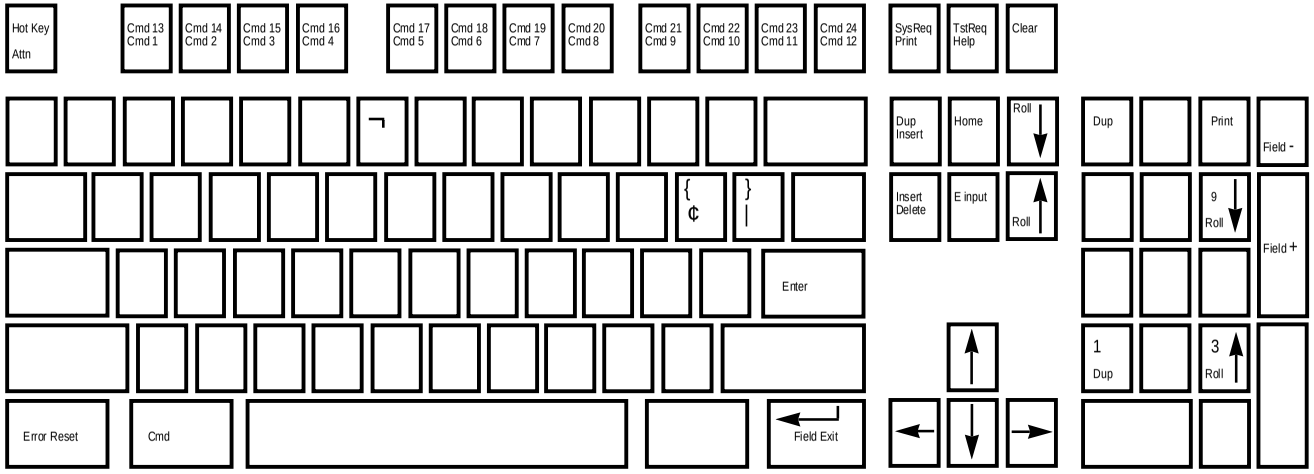
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

PC Style on an Enhanced Keyboard (TERM)



I-O 8250 Series Emulator Card Template

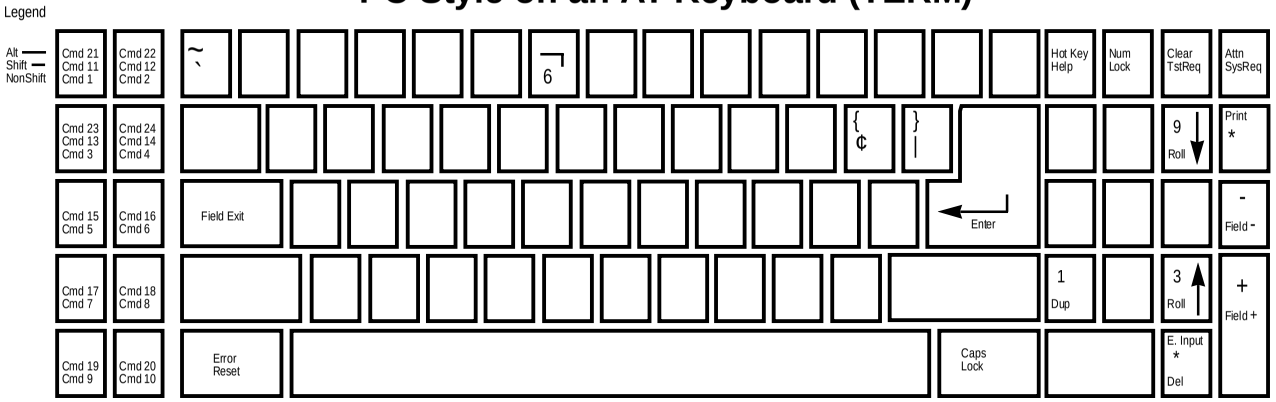
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

PC Style on an AT Keyboard (TERM)



I-O 8250 Series Emulator Card Template

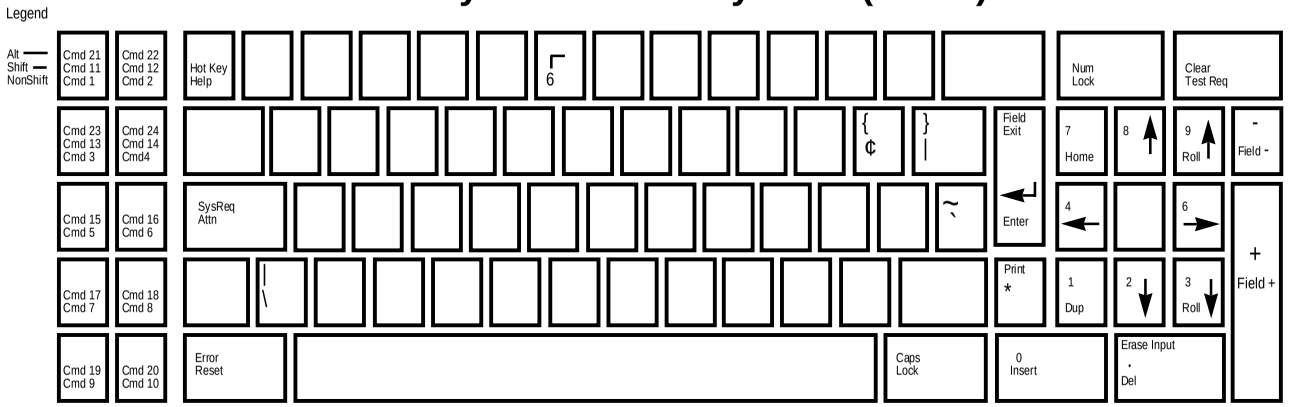
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

PC Style on an PC Keyboard (TERM)



I-O 8250 Series Emulator Card Template

Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

5250 Style on an Enhanced Keyboard (TERM)

I-O 8250 Series Emulator Card Template

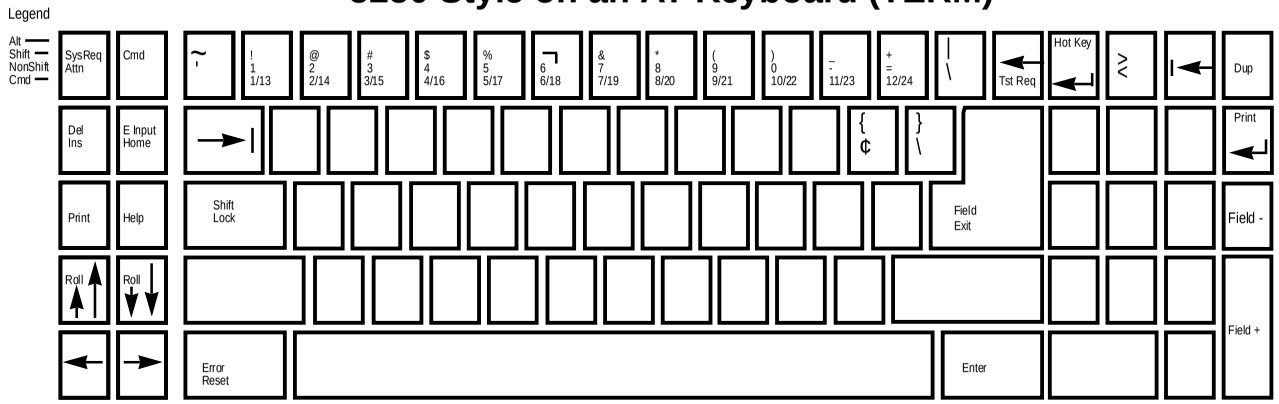
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

5250 Style on an AT Keyboard (TERM)



I-O 8250 Series Emulator Card Template

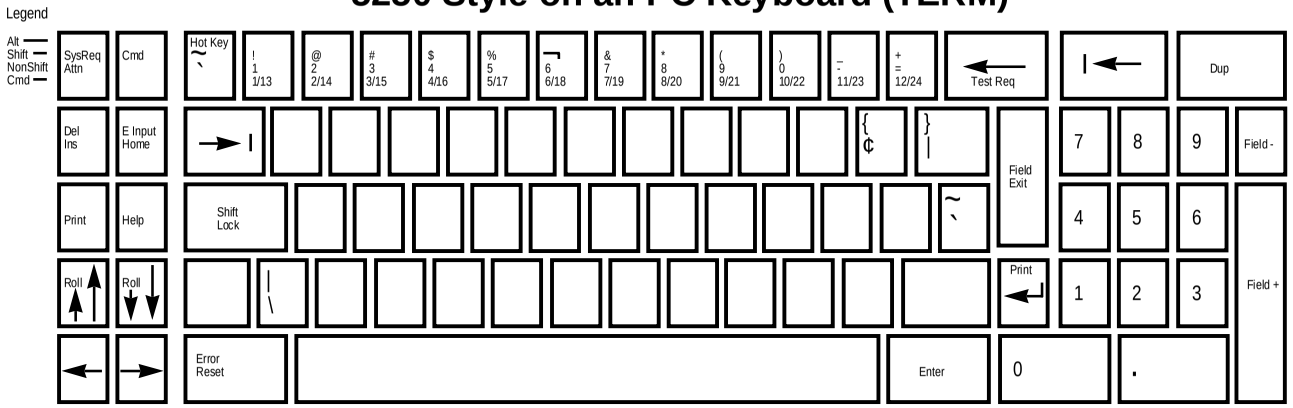
Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

5250 Style on an PC Keyboard (TERM)



I-O 8250 Series Emulator Card Template

Command Summary:

Configuration Program:	IOCONFIG
Start Emulation:	IO8251
End Emulation:	
at 3X Main Menu	OFF <ENTER>
at 3X Sign-On Screen	<ALT><CTRL><DEL>
Hot Key to DOS or Printer Control Screen:	<ALT><ESC>

Status Line:

rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

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APPENDIX G

Related Documentation

The following manuals may be helpful in the installation and operation of PC Support:

IBM PC Support/36 Messages Guide, SC 21-9525

IBM PC Support/36 Organizer, SC21-9563

IBM PC Support/36 User's Guide, SC21-9088

IBM PC Support/38 Messages Guide, SC21-9360

IBM PC Support/38 Technical Reference, SC21-9090

IBM PC Support/38 User's Guide, SC21-9089

IBM PC Support AS/400 DOS Installation and Administration Guide, SC41-0006

IBM PC Support AS/400 DOS and OS/2 Technical Reference, SC41-8091

IBM PC Support AS/400 OS/2 User's Guide, SC41-8200

IBM PC Support AS/400 OS/2 Installation Guide, SC41-0007

IBM PC Support AS/400 User's Guide for DOS, SC41-8199

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Manufacturer's One Year Limited Warranty (United States)

The following warranty applies only to products purchased and operated within the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain a replacement product by meeting the terms of the I-O Customer On-Site Exchange Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

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Customer On-Site Exchange Repair Policy

Terms, Conditions, and Limitations
Effective May 1, 1994[a]

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (United States), I-O's Customer On-Site Exchange (COE) Repair Policy provides customers with a replacement unit for a defective product, subject to the following terms and conditions:

Call Customer Support

- If a product fails call I-O Customer Support for assistance at (801) 972-1446.

Verify Product Failure

- I-O will verify the product serial number, warranty coverage and product failure.

* You are responsible for assisting in verifying the product failure.

- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number for the failed product.

Replacement Units

- Replacement units are shipped from I-O's stock of refurbished units, subject to availability.

- Replacement units carry the same warranty as remaining on the original product.

- I-O's COE Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs or replacement.

Customer On-Site Exchange Repair Policy
(Continued)

Return Your Failed Unit

- When you return the failed product it must be shipped freight prepaid. Always note the RMA number on the outside of the package.

Install the Replacement Unit

- You are responsible for installing the replacement unit.
- After receiving the replacement unit please call I-O Customer Support if any assistance is required.

[a] I-O reserves the right to change the terms and conditions of this policy without notice.

Manufacturer's One Year Limited Warranty (International)

The following warranty applies only to products purchased or operated outside the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain warranty service by meeting the terms of the I-O Return-to-Depot Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

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Return-to-Depot Repair Policy

Terms, Conditions, and Limitations
Effective May 1, 1994[a]

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (International), I-O's Return-to-Depot (RTD) Repair Policy provides customers with warranty service for a defective product, subject to the following terms and conditions:

Call Customer Support

- If a product fails call I-O Customer Support for assistance at:

  (801) 972-1446 for all locations outside the United States.

Verify Product Failure

- I-O will verify the product serial number, warranty coverage and product failure.
- You are responsible for assisting in verifying the product failure
- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number to authorize return of the failed product.

Select Your Preferred Repair Location

- I-O's Customer Support Representative will assist you in identifying the nearest I-O authorized repair depot.
- I-O's Customer Support Representative will provide you with an RMA transmittal form referencing the assigned RMA number and the authorized repair depot address.

Return-to-Depot Repair Policy

(Continued)

Return Your Failed Unit

- Return the failed product to the I-O authorized repair depot previously identified, enclosing the RMA transmittal form. When you return the failed product it must be shipped freight prepaid.

- I-O's RTD Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs.

Install Your Repaired Unit

- I-O's authorized repair depot will service the faulty unit and return it to you, freight prepaid.

- You are responsible for installing the returned unit.

- After receiving the repaired unit please call I-O Customer Support if any assistance is required.

[a] I-O reserves the right to change the terms and conditions of this policy without notice.

Manufacturer's One Year Limited Warranty (European Area)

The following warranty applies only to products purchased and operated within the European Area.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original end-user, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to original end-user the actual amount paid by original end-user or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Original end-user may obtain a replacement product by meeting the terms of the I-O Customer On-Site Exchange Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

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Customer On-Site Exchange Repair Policy

Terms, Conditions, and Limitations
Effective June 1, 1997[a]

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (European Area), I-O's Customer On-Site Exchange (COE) Repair Policy provides original end-users with a replacement unit for a defective product, subject to the following terms and conditions:

Call Customer Support

- If a product fails call I-O Customer Support for assistance at 44(0) 1908 567722.

Verify Product Failure

- I-O will verify the product serial number, warranty coverage and product failure.
- You are responsible for assisting in verifying the product failure.
- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number for the failed product.

I-O Ships Replacement Unit

- Replacement units are shipped from I-O's stock of refurbished units, subject to availability.
- I-O will invoice you for full retail value of the replacement unit upon shipment from I-O.
- Replacement units carry the same warranty as remaining on the original product.
- I-O's COE Repair Policy applies only to warranted product failures. You must pay for non-warranted product repairs or replacement.

Customer On-Site Exchange Repair Policy
(Continued)

Return Your Failed Unit

- When you return the failed product it must be shipped freight prepaid. To insure proper tracking always note the RMA number on the outside of the package.
- I-O will issue you a credit (reversing the replacement unit invoice amount) when the failed product is received by I-O.
- If you do not return the failed product (or pay the replacement unit invoice) within 14 calendar days of the date the replacement unit is shipped from I-O, your warranty coverage and service will be suspended on all I-O products you own.

Install the Replacement Unit

- You are responsible for installing the replacement unit.
- After receiving the replacement unit please call I-O Customer Support if any assistance is required.

[a] I-O reserves the right to change the terms and conditions of this policy without notice.

active session - The host session that you are currently using, as opposed to an inactive session.

adapter - A card that provides communications between part of a device and the processor.

address - In a computer, the location where the data is stored.

API (Application Program Interface) - System software that provides resources to create user interface features and to route programs or data.

APO (Auto Page Orientation) - Software decides by the size of the page if the data is to be printed in landscape or portrait orientation.

application - Software program used on a personal computer (PC).

ASCII (American Standard Code for Information Interchange) - The coding used in personal computer systems. Systems that link personal computers to IBM mainframes must include a translating device to connect the two codes.

attribute - A characteristic, such as bold and italic.

auto configure - Configures a program automatically during the initialization process.

automatic printer sharing - Automatically switches from PC printing to host printing and vice versa.

backup - To save information or data onto a diskette for a second copy.

balun - The device used to convert twisted pair wiring to the twinax connectors used on the T-connector.

baud rate - The transmission speed of the serial port, which is measured in bits per second (bps).

BGU - Business Graphics Utility

BIOS (Basic Input/Output System) - A set of programs encoded in read-only memory (ROM) of IBM PC-compatible computers that facilitate the transfer of data and control instructions between the computer and peripherals.

blank character - A character that is not displayed but occupies a position on the display screen.

buffer - An area in the memory that holds data temporarily.

GLOSSARY

cache memory - RAM (random access memory) set aside to store the most frequently accessed information stored in RAM.

character - A letter of the alphabet, a number, punctuation mark, or any other symbol that represents information.

c**haracter set** - A set of alphabetic, numeric, and special characters that may be displayed or printed by a system unit or device.

code page - Set of coded characters often displayed as an array or code table.

column separator - A vertical line used to separate one field from another.

command - An instruction that directs the system to perform a particular operation.

command keys - The keys on the top row(s) of the keyboard that are used to request a pre-assigned function of the system.

Command Pass-Thru™ - This feature allows you to access all of the built-in features of a printer, even if these features are not normally available through the host software. Printer-specific command sequences are placed into the data sent to the printer from the host. The display station recognizes these sequences and "passes the command through" to the printer.

configuration - Software setup of a computer program or system.

connector - A plug connected to a cable that fastens to a port of the back of a device.

controller - A device used to coordinate and control the operation of one or more devices with a remote host system.

COR (Computer Output Reduction) - Rotates data processing reports to landscape orientation and then compresses the text to fit 198 column by 66 lines on a page.

cpi - Characters per inch.

CTS (Clear to Send) - The attached DTE may begin transmitting.

cursor - A character which indicates the position that data entry will occur.

DCD (Data Carrier Detect) - The local modem is receiving data from the remote modem.

default - The value assumed when no other value is specified.

default setting - The standard setting for a feature which automatically appears unless the user selects a different setting.

delimiter - A character that marks the beginning and/or ending of a unit of data.

DIP switch - Used to provide user-accessible configuration settings.

direct access - A hot key sequence used to take the user directly to the next host session configured.

display screen - A cathode ray tube that is used to display alphanumeric characters.

display station - An input/output device containing a display screen and an attached keyboard. Also called a terminal.

DOS (Disk Operating System) - A single user operating system developed by Microsoft. DOS can be referred to as PC-DOS for the PC, PS/1, and PS/2 series, or referred to as MS-DOS for non-IBM PCs.

DOS EMM386 - A memory management software.

dot matrix - A text printer that prints a series of dots to create characters.

driver - A program routine that contains instructions necessary to control the operation of a peripheral.

DRS (Data Set Ready) - This indicates that the modem is connected to the telephone circuit.

DTE (Data Terminal Equipment) - The unit sending the signal, modem, PC.

duplex - Prints on both sides of the paper.

EBCDIC (Extended Binary Coded Decimal Interchange Code) - A standard computer character set used to represent 256 standard characters. IBM mainframes use EBCDIC coding.

emulation - The duplication or imitation of one device by another device.

emulator card - A card that is installed into a PC, which enables the PC and PC printer to emulate host devices while allowing access to PC applications.

expanded memory - When storage of the RAM on the board makes the size of the computer larger than it actually is.

GLOSSARY

extended memory - Memory that has been added to allow programs greater than 640K of RAM to run on a computer.

FGID (Font Global Identifier) - Font identifier used by IBM to standardize typestyle numbers used globally.

field attributes - Control characters stored in the character buffer in the first character position of a field.

field - An undefined area that contains a certain type of data.

file extension - A three letter suffix used to describe a file's contents (in addition to a DOS file name).

file transfer - A process used to transfer a file from one storage location to another.

font - (1) A collection of characters of a given typeface and size. (2) Used generically to mean the collection of coded fonts, font character sets, and code pages. (3) A font file that contains characters that must be used in conjunction with a code page file.

form feed - The advancing of a form in the printer to the top of the next page by a code sent to the printer from the computer.

hex (hexadecimal) - A number system with a base of sixteen, numbers used are digits 0-9 and alpha A-F.

hex transparency - See Command Pass-ThruTM

host - The central controlling processing unit in a twinax environment.

hot key - A selected key or key combination that accesses a menu command.

HP mode - Third party printer, if compatible, will receive HP LaserJet commands.

IBM mode - Same as HP, but will receive IBM LaserJet commands.

interface - The hardware and software that permits the exchange of information between computers or devices.

intensity - The brightness level used to display the characters on the screen.

I/O (Input/Output) - Transferring of data between the central processing unit and a peripheral device. Each transfer is an output from one device and an input into another device.

IRQ Level (Interrupt Request Level) - A hardware flag to the PC software that a hardware products needs immediate interaction with the software.

keyboard template - Pattern of a keyboard.

key click - Keys will make clicking sounds when depressed unless disabled.

landscape - A printing orientation in which the text prints across the length of a page.

LED (light emitting diode) - A light located on the back of the emulator card that lights up when communicating with the host.

line feed - A character code that advances the cursor on screen in the printer to the next line.

logical unit (Abbreviated as LU) - Manage the exchange of data between the user and host application.

lpi (lines per inch) - The number of lines per vertical inch of paper.

macros - Keystrokes that have been saved and which can be played back.

memory address - A code number that specifies a specific area in a computer's random access memory (RAM).

message line - See status message.

microcode - One or more micro instructions.

Microsoft Windows™ - Windowing environment and application user interface (API) for DOS that brings some of the graphical user interface features to IBM format.

motherboard - The main board in the PC which other boards are installed.

nonshifted - Allows keys to be entered as characters or functions similar to when a shift key is not held down on a PC or typewriter.

NRZ (Non-return to Zero) - A binary encoding technique in which a change in state represents a binary one, and no change in state represents a binary zero.

NRZI (Non-return to Zero Inverted) - A binary encoding technique in which a change in state represents a binary zero and no change in state represents a binary one.

GLOSSARY

parity - Error detection system with a serial device. A method of error detection where a redundant bit is added to each character in order to make the sum of the bits in the character either even or odd.

PC Support - An IBM host/PC communications program that provides the emulator card with access to virtual disk, virtual printer, and shared folder functions.

pitch - The number of characters per horizontal inch, or the positioning intervals of characters in a line of text.

pixel - The smallest displayable unit on a video screen, out of which the displayed image is constructed.

portrait - A printing orientation in which the text prints across the width of a page.

PPDS (Personal Printer Data Stream) - A printer programming language for some IBM laser printers.

prompt - A display symbol, word, or phrase that requests the user to enter data from the keyboard.

RAM (Random Access Memory) - A storage device in which data is entered and retrieved in a non-sequential manner.

record/playback - Keyboard macro used to save keystrokes and then play them back.

resident - Program is in the memory.

root directory - Directory that contains a list of files stored on that disk.

Round Robin - A hot key sequence used to take the user sequentially through the highest host session, then to the Printer Control Screen, and then to DOS.

router - PC Support /36, /38 and AS/400 programs that run on the personal computer (PC) and the host system. Routers manage communications between the PC Support facilities on the system and PC.

RTS (Request to Send) - This indicates that the DTE has data to send.

RXD (Receive Data) - Data is being received by the I-O 8251R Remote Emulator Card from the host.

scan code - Code used to transmit data from the keyboard to the PC.

session - An active connection between the terminal emulation and a host system. A session is opened when the user signs on.

set text orientation - Text is printed in a specified orientation regardless of paper size when using this command.

SDLC (Synchronous Data Link Control) - An IBM communications protocol commonly used in SNA environments.

simplex - Prints on only one side of the paper.

status attributes - An option used to define how the status line is displayed.

status line - An information line displayed on screen that displays information to the operator concerning the processing of the text.

status message - Information on the last line of the display screen that tells the operator about display station conditions.

stop bits - The number of bits sent to terminate each character sent to a serial printer.

third-party - Software and/or hardware made from a company other than by the original manufacturer.

truncate - Breaks of a part of a number or character string.

twisted pair - A pair of small insulated wires commonly used in telephone cables that are twisted around each other to minimize interference from other wires in the cable.

TXD (Transmit Data) - Data is being transmitted by the I-O 8251R Remote Emulator Card to the host.

upper memory block - A block of memory between the 640K unit of conventional memory 1MB running on MS-DOS on an IBM-compatible computer.

virtual disk - Allows the user to assign a portion of the host disk to the PC.

virtual printer - Allows users to print data from the PC to a host system printer.

workstation - A display station or printer.

GLOSSARY

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INDEX

DECLARATION OF CONFORMITY

EUROPEAN COMMUNITY COMPLIANCE STATEMENT:

This product is in conformity with the protection requirements of EC Council Directives 72/23/EEC, and 89/336/EEC on the approximation of the laws of the Member States relating to: Standard EN60950 (Safety of Information Technology Equipment); Standard EN50082-1 (Generic Immunity Standard for Residential, Commercial, and Light Industrial Products); and Standard EN55022 (Limits and Methods of Measurement of Radio Interference from Information Technology Equipment).

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

DECLARATION OF CONFORMITY

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