IOwin 5250 Emulation Software

for Windows™

User's Guide

Version 1.10

IOwin 5250 Emulation Software Version 1.10
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PREFACE

This IOwin User's Guide includes instructions for installing the IOwin software on an I-O 8251EH/ME emulation card. Also included are instructions to install the I-O emulation card.

The I-O 8251 Emulator Card and IOwin Emulation Software allows an IBM or compatible personal computers (PCs) to be connected to an IBM System/36, /38, or AS/400. During an active session with the host, the IOwin software and I-O 8251 hardware allows a PC to act as a display station, and the attached PC printer acts as a system printer. It's like having several display stations and printers all on one desk top.

This manual will guide you through a step-by-step installation procedure. Once installed, the IOwin software and I-O 8251 hardware works without further operator intervention. This manual is divided into the following sections:

1. **INTRODUCTION** - Provides an overview of the IOwin software.

2. **HARDWARE INSTALLATION** - Explains the simple installation process of the hardware for the I-O 8251 Emulator Cards.

3. **SOFTWARE INSTALLATION** - Explains the IOwin software installation and the required setup options.

4. **CONFIGURATION** - Explains how to configure the IOwin software.

5. **DISPLAY** - Provides a detailed overview of the display session and advanced features of the IOwin screen.

6. **PRINTING** - Provides a detailed overview of laser and dot matrix printers and how they emulate the IBM 3812, 5219 and 4214 printers.

7. **UTILITIES** - Provides a detailed overview of the utility including, screen attributes, keyboard customization, and installation settings.

Caution! The I-O 8251 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 an exposed twinax connector on a cable attached to the host) before handling the card. Do not touch components on the card. Handle the card by the edges only.

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IOwin 5250 Emulation Software

for
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Quick Setup Guide

Version 1.10

The IOwin software has been designed for simple installation and ease of use. The installation requires very few steps, however, if this Quick Setup Guide does not contain enough information, please refer to the User's Guide for detailed installation and configuration instructions.

Note: Complete the section only if the I-O 8251 has not been installed.

Installing the I-O 8251 Emulator Card

The following is an outline of the installation steps for all local I-O 8251 Emulator Cards. Complete only those steps that are applicable:

1. For Micro Channel users: Boot from the IBM Reference Diskette and select the option to merge an option diskette. Use the I-O diskette as the option disk.

2. All users: Power off the PC and all attached peripherals.

3. All users: Remove the PC cover, and find an empty expansion slot.

4. Full size card users only: Set the DIP switches (refer to Appendix G in the User's Guide).

5. All users: Carefully insert the I-O 8251 Emulator Card into the expansion slot.

6. Micro Channel users: Boot with the IBM Reference Diskette and answer "Yes" to Auto Configuration.

7. All users: Replace the PC cover.

8. All users: Connect the twinax cable to the I-O 8251 Emulator Card.

9. All users: Connect the power cord to the PC and monitor, then turn on the PC.

10. All users: Verify the cable addresses.

11. All users: Install the I-O 8251 software.

12. All users: Configure the I-O 8251 Emulator Card software.

13. All users: Start emulation.

Installing the IOwin Software

An installation diskette has been included with the hardware.

Note: If the hard drive is not C: and/or the floppy drive is not A: replace the correct values for C: and/or A:.

The I-O 8251 Emulator Card must be installed in the PC before continuing.

1. Start Windows

2. For Windows 3.1x, insert the IOwin software diskette number 1 into Drive A: Select File, Run, then type in **A:\SETUP.EXE**, and click on OK.

   For Windows 95/98, insert the IOwin software diskette number 1 into Drive A: Select Start, Run, then type in **A:\SETUP.EXE**, and click on OK.

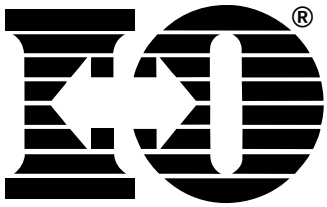
3. After all files are copied, remove the diskette and store in a safe place.

Starting Emulation

To begin emulation, double click on the display or printer Icon.

Ending Emulation

From the sign on screen, select exit.



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1 INTRODUCTION

The IOwin allows an IBM or compatible personal computer (PC) with an I-O 8251 Emulator Card to be connected to an IBM System/36, /38, or AS/400.

The IOwin software can be configured with the following features:

Sessions supported	**7**
Display emulation supported	3180 3196 3197C 3197D 5251-11 5291 5292/31/79
Printer emulation supported	3812 4214 5219 5224 5225 5256
132-column capability	Yes
Macros	Yes
Hot spots	Yes
Tool Bar	Yes
Printer Control screen	Yes
Windows print manager	Yes
Command Pass-Thru	Yes
Computer Output Reduction (COR)	Yes
Auto print orientation (APO)	Yes

INTRODUCTION

PC Requirements

The following systems are required to use the IOwin Software:

- IBM PC, PC/XT, PC/AT, or compatible, IBM PS/2 model 25, 30, or 80386, or a 386 or 486 personal computer with an I-O 8251 emulator card (I-O 8251EH only)
- IBM PS/2 Model 50 or higher (Micro Channel bus) with an I-O 8251 Emulator Card (I-O 8251ME only)
- I-O 8251EH or I-O 8251ME Emulator Card.
- Floppy drive
- DOS version 3.3 or higher
- Microsoft® Windows 3.1x, Windows 95/98
- 3 Meg of disk space
- Ram 4 Meg

Unpacking

When the product is received, check the package for water or shipping damage. If any damage is evident, contact the carrier immediately. The shipping package should contain the following:

- IOwin software diskette(s)
- IOwin Quick Setup and User's Guide
- I-O Utah series mouse pad

If hardware was purchased, the package will also contain:

- I-O 8251 Emulator Card
- Auto-terminate V-connector or RJ4509 twisted pair connector
- Screwdriver

Note: IOwin has been sent with a 3 1/2" high density diskette. If your system requires another type of diskette, please contact I-O Customer Service at (801) 972-1446.

Keep the original packaging in case the product must be reshipped.

2 HARDWARE INSTALLATION

Note: Only complete this section if the I-O 8251 Emulator Card was purchased with this package or needs to be installed.

Caution! The I-O 8251 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 an exposed twinax connector on a cable attached to the host) before handling the card. Do not touch components on the card. Handle the card by the edges only.

Installing the I-O 8251 Emulator Cards

Follow these instructions to install the I-O 8251 Emulator Card into a PC. Complete only those steps that are applicable:

1. ***Micro Channel PC (PS/2 50 and higher) users only:***

   Note: Always use the same copy of the IBM Reference Diskette. If another diskette is used, drivers for other cards may be lost.

   a. Power off the PC and insert the backup copy of the IBM Reference Diskette. Power on the PC.

   b. When the IBM Main Menu appears, select "Merge an Option Diskette."

   c. Follow the instructions on the screen using the I-O 8251 diskette (not the IOwin diskette 1) as the option diskette.

   d. Exit the program and power off the PC.

   e. Continue the installation using Step 2 on the following page.

2. **All users:** Power off the PC and other devices attached to the PC.

3. **All users:** Lift the monitor off the PC and set it aside.

4. **All users:** Follow the PC user's guide for removing the PC cover. Set the cover aside, and save the screws for reassembly.

5. **All users:** Locate an empty expansion slot in the PC. Remove the expansion slot cover. Save the screw to hold the card in place.

6. **All users:** 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. The power cord must be connected to the PC; otherwise, the PC chasis will not be grounded.

7. ***Full size card users only:*** Set the DIP switches (refer to Appendix G).

8. **All users:** Hold the card by its edges (do not touch the components or circuitry), and insert the card into the expansion slot.

9. **All users:** Press the card into the PC motherboard socket connector. See Figure 2-1.

10. **All users:** 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 properly aligned. If the slot is not properly aligned, the card will not seat correctly in the bus of the PC and the card will not function properly.

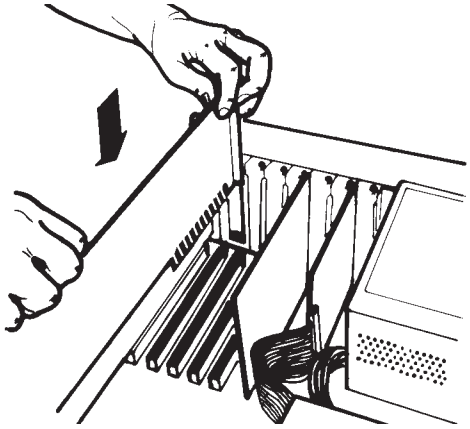

Figure 2-1

11. **All users:** Insert and tighten the screw. Replace and fasten the PC cover. Replace the monitor.

12. **Micro Channel users:** Boot the PC from the IBM Reference Diskette. If a 165 error appears, repeat Step 1. If asked to auto configure, answer Yes. Exit the program and reboot.

13. **All users:** Replace the cover and monitor.

14. **All users:** Reattach the cables.

Connecting the I-O 8251 Cards to the Host

Take the following steps to connect the I-O 8251 to the host system.

1. Attach the host twinax cable to either one of the twinax connectors. The V-connector automatically terminates when attaching one cable and automatically cables through when attaching two cables.

2. Locate the 9-pin connector on the I-O 8251 at the back panel of the PC.

3. Attach the V-connector and tighten the two mounting screws to secure the connection.

4. up the PC and other devices.

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3 SOFTWARE INSTALLATION

This chapter will give instructions for installing the IOwin software, and configuring the IOwin software to be used with Windows 3.1x, and Windows 95/98.

The following key indicates the type of transactions which will be used to install the IOwin software:

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

Creating Backup Diskettes

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

Note: If the hard drive is not C: and/or the floppy drive is not A: replace the correct values for C: and/or A:.

1. From DOS, type **Diskcopy A: A:** and follow the prompt.

2. Store the original disks in a safe place.

Installing the IOwin Software

Note: If the hard drive is not C: and/or the floppy drive is not A: replace the correct values for C: and/or A:.

Follow these simple steps to install the IOwin software into Windows:

1. Start Windows by typing **WIN.EXE**

2. For Windows 3.1x, insert the IOwin software diskette number 1 into Drive A: Select File, Run, then type in **A:\SETUP.EXE**, and click on OK.

For Windows 95/98, insert the IOwin software diskette number 1 into Drive A: Select Start, Run, then type in **A:\SETUP.EXE**, and click on OK.

3. Execute **A:SETUP.EXE**

4. Click on OK.

This will start the IOwin software installation procedure. While in Installation, press "Next" to continue to the next screen, "Back" will back up one screen, and "Cancel" will exit the installation utility.

Banner -- No input is required on this screen, it is an information screen. When OK is clicked or the Enter key is pressed, the installation will continue. If you do not want to install this software press CANCEL. When the BACK button is available, you will be returned to the previous screen.

Licensee -- Enter the name of the company or person legally responsible for the software license. Most software is licensed by companies. The name will be used if a call is placed to I-O customer support.

Serial Number -- There is a nine digit serial number printed on the first installation diskette or the outside of the boxsleeve. Enter the number in this field. If there is no serial number, call customer support. The serial number will be used for any warranty issues that may arise.

Diskette drive -- The software must be installed from a floppy diskette. Select the drive containing the Installation diskette. Use the space key to toggle between selections.

Directory -- Enter the drive and directory where the software files are to be copied. Support will be easier if the default is used. Use the format of DRIVE:\Directory. For example: C:\IOWIN

Adapter Address -- This is the memory address location where the I-O 8251 Emulator Card communicates with the PC. This address must not conflict with any other device in the PC. The default is D000 and will work with most installations. If this address conflicts with any other device(s), then set the memory address to a free location. This can also be changed in "Utilities" after the software is installed.

PC Support Yes or No -- If IBM's PC Support/400 or Client Access/400 for DOS has been installed on this PC and you wish to use it with this emulator card select "USE". If you are connecting to any other system than the AS\400, have not installed PC Support/400 or Client Access/400 for DOS, or you are not going to use PC Support/400 or Client Access/400 for DOS, then select 'NOT USED'. Use the space key to toggle between the selections.

Note: If you are going to use the Client Access/400 for Windows, see Client Access/400 for Windows in this section.

PC Support Path -- The installation needs to know what file is executed to start PC Support/400 or Client Access/400 for DOS and where the file is located. The IBM default is shown (C:\PCS\STARTPCS.BAT). Change this only if you are using a different file or have loaded the software into a different directory.

Summary -- Verify the information located in the upper left box is correct. If changes are needed, select BACK to go to the appropriate input screen and make the correction. This information will be permanently saved when OK is pressed.

Copy Screen -- The files will be copied to the drive and directory you selected. Press OK to continue.

Edit Config.Sys Screen -- Memory managers use the same address space as the emulator card. In the CONFIG.SYS file, the memory manager can be told not to use an area. For most memory managers, use an EXCLUDE statement X=YYYY-ZZZZ. If this is not done, the emulator card may not work properly. The line should read:

Device=C:\DIRECTORY\MEMORY MANAGER X=YYYY-ZZZZ

Example: C:\DOS\EMM386.EXE X=D000-D7FF

Note: If you are not using the DOS EMM386 memory manager or QEMM, check the memory manager program's manual for instructions on excluding memory.

SOFTWARE INSTALLATION

Items Defaulted During Installation

Language -- The IOwin supports 18 languages. The installation defaults to the same language that Windows is configured for. If this needs to be changed, use the utilities under "System Settings."

Installing Client Access for Windows Drivers

Note: If the hard drive is not C: and/or the floppy drive is not A: replace the correct values for C: and/or A:.

Follow these simple steps to install the IOwin software into Windows:

1. Start Windows.

2. For Windows 3.1x, insert the IOwin software diskette number 1 into Drive A: Select File, Run, then type in **A:\INSTALL.EXE**, and click on OK.

   For Windows 95/98, insert the IOwin software diskette number 1 into Drive A: Select Start, Run, then type in **A:\INSTALL.EXE**, and click on OK.

3. Follow the instructions on the screen.

4 CONFIGURATION

This chapter will give instructions for configuring the system, display, and printer devices. There are four areas: System, Host, Device Type, and Emulation.

System

The host system must be configured for the device type to match the emulation type in the configuration. If the device is a PC Support/400 or Client Access/400, then the system must be configured as a 5150 model one for ISA Bus and model 2 for a MCA Bus.

Host

Each twinax line has a total of seven physical addresses labeled 0 through 6. No two hardware devices can share the same address. Check with the System Administrator to get the address(es) that are to be used.

Device Type -- The device type is the host device to be emulated for each address.

None -- The emulation card will not use this host address.

Display -- The emulator card will use this address to act as a display station. This session begins with a sign on screen.

Printer -- The emulator card will use this address to act as a printer. This session begins with a printer control screen. The printer attached to your PC then becomes a system printer for the host.

For the address desired, use the pull down box to make the selection.

CONFIGURATION

Emulation

Each display and printer device must emulate a system device. The selection here must match the host's system settings. Ask the System Administrator for the device type.

Emulation -- The IOwin can emulate IBM displays or printers. The devices available for a display are: 5251 Model 11, 5291, 5292/3179, 3180, 3196, 3197C, 3197D. The devices available for printers are: 5256 text, 5224, 5225, 4214, 5219, and 3812. Use the pull down box to select the desired emulation.

When the configuration is complete, select "Save and Exit" from the file menu.

If this is the first installation, the install will create a group called "IOWIN" which contains an icon for each host address configured, a "Configuration" icon to change addresses or device types, and a "Utility" icon.

Display devices

3179-2 -- This is a seven color display station. The colors are red, green, white, blue, yellow, turquoise, and pink. The display is 24 lines with 80 characters each.

3180 -- This is a monochrome display. This device is used as the console for many systems. The display modes are 24 x 80 and 27 x 132.

3196 -- This is a monochrome display and is equivalent to the 5291. The display mode is 24 x 80.

3197-C -- This is a color display station. Functionally, this is equivalent to the 3179-2. If you want a color display station this is the best choice. The display mode is 24 x 80.

3197-D -- This is a monochrome display station. The display modes are 24 x 80 and 27 x 132. If you want a 132-column display, this is the best choice.

5251-11 -- This is an advanced function monochrome display station. The display mode is 24 x 80 and is the most commonly used monochrome 80-column display station.

5291 -- A monochrome display station. The display mode is 24 x 80. This performs the same functions as the 5251-11

5292-1 --This is an advanced seven color display station. The display mode is 24 x 80. This model does not support business graphics.

Printer devices

3812 -- This is a multi-function laser printer. This is the best selection for laser printers, as it has graphic capabilities and full font control. I-O supports the 3812-1 SCS printer data stream.It does not print IPDS data streams.

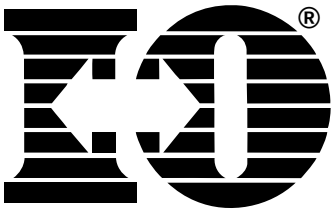
4214 -- This is a multi-function dot matrix printer. This is the best choice if you are using a dot matrix printer. This will print BGU and APF graphics.

5219 -- This is compatible with old I-O 5219 emulation. The only time this should be selected is if you have been using an I-O 5219 printer emulation product and you want to remain compatible. All laser printers should select 3812.

5224 -- This is for dot matrix printers. Only select this if you are replacing a 5224 printer.

5225 -- This is for dot matrix printers. Only select this if you are replacing a 5225 printer.

5256 -- This is a basic dot matrix printer. It does not support any advanced printer functions, and is for high throughput text-only printing.



"Products That Work"

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5 DISPLAY

This chapter will give instructions on starting emulation, Windows hot keying, the emulation screen, menu commands, and ending emulation.

Starting Emulation

To start emulation, double click on the I-O display or printer icon. This will start the session and establish the connection to the host system.

Windows Hot Key Sequences

Use your standard Windows hot keying to move between applications.

These next sequences can be used to jump between applications while in Windows. Press and hold **<Alt>**, then press **<Tab>** to cycle through the active applications. Using **<Alt>** and **<Esc>** allows you to cycle through the active applications, but when an application is minimized, **<Enter>** must be pressed to activate the application.

Mouse Control

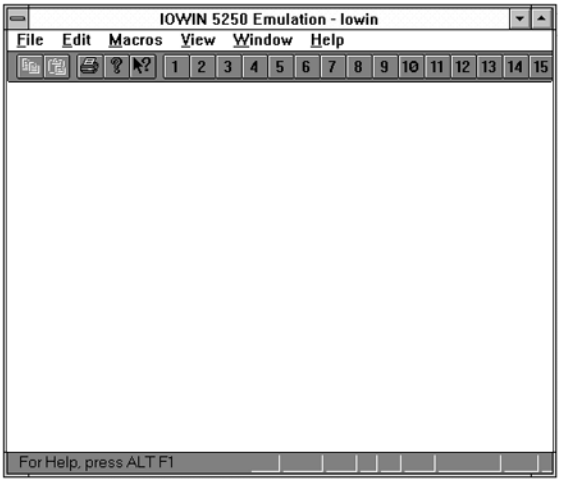
The right button of the mouse will move the cursor to the current mouse position. Double clicking the left mouse button will execute a hot spot function. For example, if you double click on the number of a menu option, it will be executed. Hot spots are defined by F#. or any number followed by a period. When these are clicked on, the option will be executed at the cursor location.

Menu Commands

The following commands can be selected from the Windows menu bar.

Commands that have a shortcut button, show the button with the command. To select the command use the mouse and click on the menu option then make the selection. If a shortcut button is shown simply click

on it. To select the option manually use the Alt key then the arrow keys to make your selection.



File Menu Commands -- The File menu offers the following commands:

Print Screen 	Sends the current screen to the Windows default printer. This will open a print dialog box.
Exit	Ends the current emulation session closes the window, frees memory and resources. This has no effect on other sessions.

Print Dialog Box -- The following options allow you to specify how the screen image should be printed:

Printer	This is the active printer and printer connection. Choose the Setup option to change the printer and printer connection.

Setup	Displays a Print Setup dialog box for selecting a printer and printer connection.
Print Range	This command is automatically selected for you.
All	This command is automatically selected for you.
Selection	This command is automatically selected for you.
Pages	This command is automatically selected for you.
Copies	Specify the number of copies to be printed.
Collate Copies	Prints copies in page number order, instead of separated multiple copies of each page.
Print Quality	Select the print quality. Generally, lower quality printing takes less time to produce.

Print Setup Dialog Box -- The following options allow you to select the destination printer and its connection.

Printer	Choose the Default Printer or choose the Specific Printer option and select one of the printers currently installed, as shown in the box. You must install printers and configure ports using the Windows Control Panel.
Orientation	Choose Portrait or Landscape.
Paper Size	Select the size of paper on which the screen data is to be printed.
Paper Source	Some printers offer multiple trays for different paper sources. Specify the tray here.
Options	Displays a dialog box where you can make additional choices about printing, specific to the type of printer you have selected.
Network	Choose this button to connect to a network printer, assigning it a new drive letter.

Edit Menu Commands

The Edit menu offers the following commands:

Copy 	Use this command to copy selected data onto the clipboard. This command is not available if there is no data currently selected. Copying data to the clipboard replaces the contents previously stored there.
Paste 	Use this command to insert a copy of the clipboard contents at the insertion point. The insertion point is the current cursor position. This command is not available if the clipboard is empty.

Macros Menu Command

The macros menu command offers the following options:

Play	Play back a macro
Start Record	Begin recording keystrokes
End Record	Stop recording keystrokes
User Buttons	Assign a macro to a user button
Recorder	Start Windows Recorder
User # 	Execute the macro assigned to a specific user button

Macros Play Command -- This command allows you to send a recorded keystroke macro to the host. When selected, this command queries for the name of the desired macro.

Open File Dialog -- Use the following options to specify the macro to play back.

File Name	Type the name of the desired macro.
Drives	Select the drive where the macro is located.
Directories	Select the directory where the macro is located.
Network	Choose this button to connect to a network location, assigning it a new drive letter.

Tips Double-click on a filename in the list box to open the file. This will execute the macro immediately.

Macros Start Record Command -- This command begins recording all keystrokes until the Macro End Record command is selected. This command will save up to 512 keystrokes.

Macros End Record Command -- Use this command to stop recording keystrokes. When selected, this command will request a name for the macro and save the keystrokes using that name. (See also - Save As Dialog.)

File Save As Dialog Box -- The following options allow you to specify the name and location of the file you're about to save:

File Name	Type the name of the macro. A filename can contain up to eight characters and an extension of up to three characters. The default and recommended extension is MAC.
Drives	Select the drive in which you want to store the macro.
Directories	Select the directory in which you want to store the macro. You should use the default path.
Network	Choose this button to connect to a network location, assigning it a new drive letter.

Macros User Buttons Command -- Use this command to associate a previously recorded macro with the user definable push buttons on the tool bar. (See also - User Push Button Dialog Box.)

DISPLAY

User Push Button Dialog Box -- Use this dialog to assign or change macros to the 16 user push buttons. The following functions are available.

Add	1. Select the push button you would like to use. 2. Press the ADD button (this will activate the file open dialog). 3. Select the desired macro and press OK.
Delete	1. Select the user button you would like to delete. 2. Press the DELETE button. 3. When all changes are made, press OK to accept the changes and exit the dialog box.
Cancel	Use this button to exit the dialog box and ignore all changes.
OK	Use this button to activate all changes and exit.

Open File Dialog -- Use the following options to specify the macro you want to play back.

File Name	Type the name of the desired macro.
Drives	Select the drive where the macro is located.
Directories	Select the directory where the macro is located.
Network	Choose this button to connect to a network location, assigning it a new drive letter.

Tips Double-click on a filename in the list box to open the file. This will execute the macro immediately.

Macros Recorder Command -- Use this command to start the Windows Recorder utility. This is a global recorder. If you are familiar with the Windows recorder, it will work with this emulation software. Please refer to your Windows documentation for information regarding the Windows Recorder utility.

Macros User Command -- Use this command to execute (play) the macro assigned to the user button.

Macros User Buttons Command -- Use this command to assign a previously recorded macro with the user buttons on the tool bar. (See also - User push button dialog.)

User Push Button Dialog -- Use this dialog to assign or change macros to the 16 user push buttons. The following functions are available.

Add	1. Select the push button you would like to use. 2. Press the ADD button (this will activate the file open dialog). 3. Select the desired macro and press OK.
Delete	1. Select the user button you would like to delete. 2. Press the DELETE button. 3. When all changes are made, press OK to accept the changes and exit the dialog box.
Cancel	Use this button to exit the dialog box and ignore all changes.
OK	Use this button to accept all changes and exit.

Open File Dialog -- Use the following options to specify the macro you want to play back.

File Name	Type the name of the desired macro.
Drives	Select the drive where the macro is located.
Directories	Select the directory where the macro is located.
Network	Choose this button to connect to a network location, assigning it a new drive letter.

Tips Double-click a filename in the list box to open the file.

View Menu Commands

The View menu offers the following commands:

Font	Select the font and font attributes for the display.
Auto Size	Turn the auto size feature on or off.
Toolbar	Displays or hides the toolbar.
Status Bar	Displays or hides the status bar.
Block Cursor	Select a block or bar cursor.

View Font Command -- Use the Font dialog box to select a font and its characteristics to use in the current session.

Font -- Use the Font dialog box to select a font and its characteristics to use in the current session.

The Sample box shows the font in the selected style and size as it will appear in windows on your display. The following options are available:

Font	Select the desired font from the list displayed. The fonts E5250SM and E5250LG were specifically designed for this emulation. We strongly recommend using these fonts.
Font Style	Select the desired font style from the available choices.
Size	Select the desired character point size.

Auto Size -- Use this command to enable or disable the Auto Size feature. The Auto Size function provides the following features.

1. As the session window is resized, the font size is adjusted so the text will fit inside the new window. Vertical resizing has the most effect.

2. As a new font size is selected the window is resized.

3. If the display changes to 132 columns, a smaller font is automatically selected.

Toolbar -- The toolbar is displayed across the top of the application window, below the menu bar. The toolbar provides quick mouse access to many or the most commonly used tools. To hide or display the Toolbar, choose Toolbar from the View menu.

Click To:		
		Copy the screen selection to the clipboard.
		Send the contents of the clipboard to the host.
		Print the current screen.
		Activate the Help screen.
		Context sensitive help.
		Activate user definable push buttons 1-16.

Status Bar -- The status bar is displayed at the bottom of the window. To display or hide the status bar, use the Status Bar command in the View menu.

The left side of the status bar describes actions of menu items as you use the arrow keys to navigate through menus. Similarly, this area shows messages that describe the actions of toolbar buttons as they are depressed. If you do not want to make a command selection, simply release the mouse button while the pointer is off the toolbar button.

The right side of the status bar are similar to status indicators on a 5250 terminal, their meaning is as follows:

DISPLAY

Indicator	Description
SA	System Available. This address is communicating with the host.
MW	Message Waiting. This session has a message waiting.
KS	Key Shift. The shift key is pressed.
II	Input Inhibited. No data can be sent to the host when input is inhibited.
IM	Insert Mode. This session is in insert mode.
KB/RC	Keyboard Buffer/Recorder. Keystrokes are waiting to be sent to the host. / Keystroke record is active.
RR-CC	Row Row - Column Column. Indicates the current row and column position of the cursor.
CAP	Caps Lock. The Caps Lock key is on (up) or off (down).

Block Cursor -- Use this command to select a block or a vertical bar cursor.

Window Command

The Window command allows you to switch directly to any of the active host sessions by simply selecting the desired session.

Help Menu Commands

The Help menu offers the following commands which provide assistance with this application:

Index	Offers a concise index of topics.
Using Help	Provides general instructions on using help.
About	Displays the version number of this application, licensed user's name, serial number, and the date the software was installed.

Index Command -- Use this command to display the opening screen of Help. From the opening screen, you can jump to step-by-step instructions. Once Help is open, click the Contents button whenever you want to return to the opening screen.

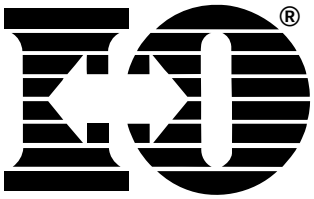
Index Command -- Use this command to display the opening screen of Help. From the opening screen, you can jump to step-by-step instructions for using various types of reference information. Once Help is open, click the Contents button whenever you want to return to the opening screen.

Using Help -- Select this to view the Windows instructions on how to use Help.

About Command -- Use this command to display the version number of this application, licensed user's name, serial number, and the date the software was installed.

Ending Emulation

After completing work in a host session, follow the log off procedure for the active display session. At a sign-on screen, select File then Exit. A dialog box will appear asking you to select "Yes" to close the session and "No" to return to the session.



"Products That Work"

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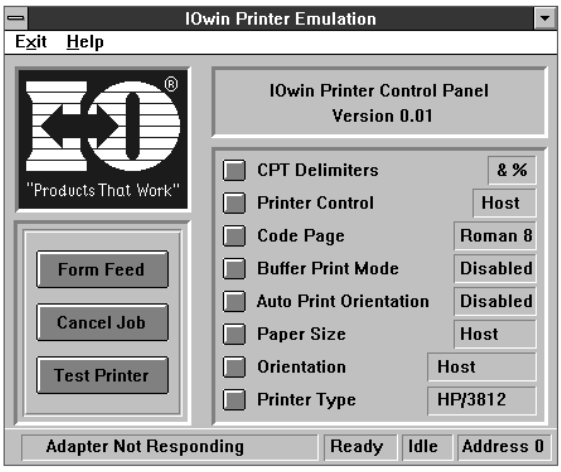
6 PRINTING

This chapter contains the instructions for printing. There are eight areas: 3812/5219 Printer Control Screen, 3812 Printer Emulation, 5219 Printer Emulation, I-O Command Language, I-O Font Change Commands, I-O Escape Commands, I-O Command Pass-Thru™, and Dot-Matrix Printing, and Windows 95/98 Printing.

When printing host jobs, specify the attached printer's host ID. This enables the host to route the print job to the printer. The system operator will assign an ID to the attached printer when the printer is configured onto the host.

3812/5219 Printer Control Screen

The printer control screen gives you control of your printer and lets you



customize the output.

Form Feed: This will send a form feed to the printer.

Cancel Job: This will send a cancel to the host system and stop sending data to the print manager. Data already in the print manager and printer buffer will continue to print.

Test Printer: This will send a test print to the printer this will be used for diagnostics.

CPT Delimiters -- Command Pass-Thru allows printer control not available through host commands. For example, it is possible to select bold printing by simply placing commands in a host document.

The IOwin Software recognizes the commands and "passes the command through" to the printer. A delimiter (which default is &%) signals the card to pass the command through. See page 6-23 for more information on Command Pass-Thru.

Printer Mode -- When in host mode the commands from the host set the printer mode. When in PC mode the printer will be setup by the printer front panel.

Code Page Selection -- The default code page selection is Roman 8. If the printer supports it, change to Code Page 850 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.

Notes: If a change is made to Code Page 840, any changes made to the Code Page Roman 8 character set will be lost.

Code Pages are different character sets used by the printer. Change this if unusual characters are printing.

Buffer Print Mode: Prints all host commands for diagnostic use.

APO -- 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" in this chapter for more information).

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	=	Accepts the paper size loaded in the printer

Orientation -- This option is used to select the default print orientation which are, COR (Computer Output Reduction), Portrait, or Landscape, for the 3812 printer emulation (see "3812 Printer Emulation" in this chapter for more information).

Printer Type -- The host emulation and the attached PC Printer

3812 Printer Emulation

The I-O 8251 allows an attached laser printer that supports HP or PPDS modes to emulate the IBM 3812-1 (SCS) printer.

The 3812 printer provides font changing capability plus text rotation and compression features called COR (Computer Output Reduction) and APO (Automatic Page Orientation). The IOwin Software's 3812 printer emulation provides font changes and a true 3812 COR emulation. It also obeys host commands for duplexing like an IBM 3816 printer when issued from within word processing. Refer to duplex printing in this chapter for information on duplex printing in data processing applications.

When the system operator configures the printer on the host, a default font ID is configured for the printer. The default font ID should be the most commonly used font. The font ID can then be changed as necessary with a font ID in the word processing document see Font Change Commands or a printer override or OCL command in the data processing report.

Font Change Commands

You can place font change commands within the text of a word processing or data processing document to select a font other than the

default font. The commands appear on the screen but do not print. The font change takes effect immediately and continues until the next font change. See the Font (FGID) Reference chart in Appendix D for a list of font IDs.

To change fonts, use the following format to type in a font change command.

> ¬Q2304 where ¬ is a "logical not", Q indicates a font change, and 2304 is the font ID.

To select a resident scalable font with a specific point size, use the following format:

> ¬F5687,14 where ¬ is a "logical not", F indicates a resident scalable font change, 5687 is the font number, and 14 is the desired point size. The resident scalable font numbers are located in Appendix J.

All text following the command will be printed in the new font until you specify another font change command.

Note: The host may send the original font code to the printer at the beginning of each page. If this happens, you may need to put a font change command at the beginning of each page of your document.

If the 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, you may not be able to specify more than one font ID per line.

Data Processing

To change font IDs for a data processing report, you must add the font to the CL or OCL printer statement (for the System/36, you must convert the font number to hexadecimal before adding it to the printer statement). The font IDs listed in the table below can be used in host printer statements.

Font ID	Hex	Pitch (CPI)	Typeface
05	05	10	Presentation
11	0B	10	Courier
13	0D	10	Courier
80	50	12	Prestige Elite
85	55	12	Courier
86	56	12	Prestige Elite
87	57	12	Letter Gothic
91	5B	12	Letter Gothic
158	9E	Prop.	Times Roman
159	9F	Prop.	Time Roman Bold
160	A0	Prop.	Helvetica
162	A2	Prop.	Helvetica Italic
223	DF	15	Letter Gothic
254	FE	17.1	Letter Gothic

Font IO Table

Print Orientation

When operating the printer in IBM 3812-1 emulation mode, the print orientation of the host document or report is determined by a variety of factors. These factors are in order of their impact on the final print orientation:

1. Page Rotation specified in the print file of a data processing document or in the document format menu of a word processing document.

2. Automatic Print Orientation (APO) setting on the printer interface.

3. Print Orientation setting on printer interface.

As you read the following explanation, refer to the diagram on figure 6-8 for an illustration of the print orientation logic.

1. Page Rotation

Degrees of page rotation can be specified through the print file of a data processing document or in the document format menu of a word processing document. See "Changing Page Rotation Settings" below for a description on how to access the print file and the document format menu. The available settings are 0, 90, 180, 270 degrees and AUTO (AS/400 only). The print file also offers DEVD and COR (AS/400 only).

a. With 0, 90, 180, and 270 degrees you can specify the desired rotation directly from the host.

b. The COR setting will always print COR, unless the print quality (AS/400 and S/38) is set to NLQ or STD, or Text (S/36) is set to YES. If the page rotation is set to COR and print quality/text is one of the above mentioned settings, the print job will print in portrait in the requested font.

c. With the DEVD and AUTO settings the host does not influence the print orientation. Rather, the print orientation is determined by the settings on the printer interface.

2. Automatic Print Orientation

If no page rotation was specified on the host, the emulator's Automatic Print Orientation (APO) feature is the first setting to determine the final print orientation. This feature automatically rotates print jobs with dimensions of 8.5 x 14 inches or smaller to portrait or landscape orientation.

a. With the APO feature ON, the emulations first checks the dimensions of the host print job. If the print job is larger than 8.5 x 14 inches the emulator cannot fit the print job on one page. In this case the orientation of the print job is determined by the print orientation setting on the Printer Control Screen.

b. If the dimensions of the print job are 8.5 x 14 inches or smaller, the emulation compares the width to the height and automatically rotates the print job to portrait if the height is larger than the width or landscape if the width is larger than the height.

The dimensions of a word processing document are specified directly through the document format menu. The dimensions of a data processing report are calculated in the following manner:

Width = Page Width (in number of columns) / CPI
Length = Page Length (in number of lines) / LPI

3. Print Orientation Settings

The emulator's print orientation settings determine the orientation of the host document/report AFTER the host's page rotation setting AND the interface's APO setting have been obeyed.

The available print orientation settings are portrait, landscape, and COR. The COR feature rotates documents to landscape orientation and compresses the font as needed to fit the complete document on a standard 8.5" x 14" page. This allows the user to print a report initially designed to fit on 14 7/8" x 11" green bar paper onto a standard letter or legal size page without redesigning the report.

When used together the APO and COR features can be a powerful tool to print host jobs in portrait, landscape, or if required in landscape with reduced font (COR) without user intervention.

The COR option is a true 3812-1 emulation. With certain page rotation settings on the host, the IBM 3812-1 printer allows the user to manipulate the final print orientation through the print quality setting. Note though, that this "override" only applies if the print orientation is set to COR, host override allowed.

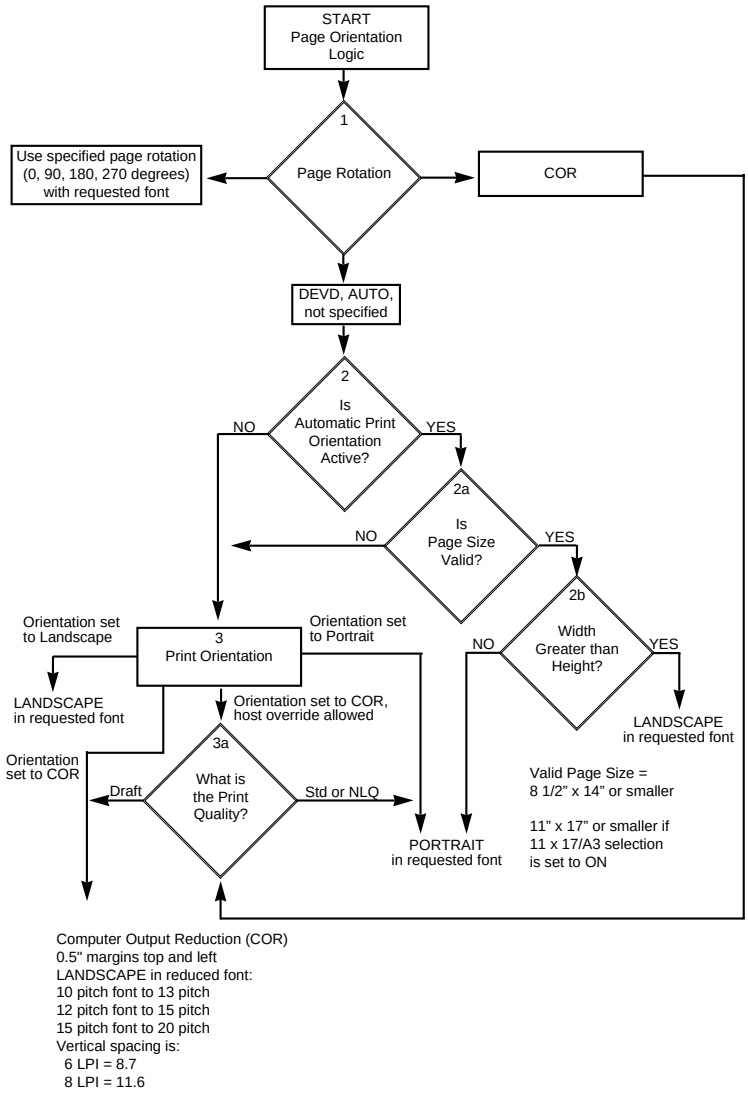

START
Page Orientation
Logic
1
Page Rotation
Use specified page rotation
(0, 90, 180, 270 degrees)
with requested font
COR
DEVD, AUTO,
not specified
2
Is
Automatic Print
Orientation
Active?
NO
YES
2a
Is
Page Size
Valid?
NO
YES
2b
Width
Greater than
Height?
NO
YES
Orientation set
to Landscape
3
Print Orientation
Orientation set
to Portrait
LANDSCAPE
in requested font
Orientation set to COR,
host override allowed
LANDSCAPE
in requested font
Orientation
set to COR
3a
What is
the Print
Quality?
Draft
Std or NLQ
PORTRAIT
in requested font
Valid Page Size =
8 1/2" x 14" or smaller
11" x 17" or smaller if
11 x 17/A3 selection
is set to ON
Computer Output Reduction (COR)
0.5" margins top and left
LANDSCAPE in reduced font:
10 pitch font to 13 pitch
12 pitch font to 15 pitch
15 pitch font to 20 pitch
Vertical spacing is:
6 LPI = 8.7
8 LPI = 11.6

Figure 6-1

The following tables show what page rotation settings can be manipulated through print quality settings and how the combination of page rotation and print quality affects the final print orientation.

Host System	Page Rotation Setting	Print Quality Setting causing portrait orientation
AS/400	*DEVD (print file)	*NLQ, *STD
AS/400	*AUTO (OfficeVision/400)	NLQ, Text
S/36	not specified	Text - Yes
S/38	not specified	*NLQ, *STD

COR is defined as printing in landscape orientation, top left margins set at 0.5", with CPI and LPI reduced according to the following tables:

Host CPI	Reduced to:
10	13.3
12	15
15	20

Host LPI	Reduced to:	Maximum Rows (Lines)/Page
6	8.7	66
8	11.6	88

The table on the following page shows the print orientation results desired and recommends a combination of settings required to obtain that result. Most print orientation results can be achieved with different setting combinations. Refer to the table on page 6-10

		Printer Interface Setting for	
Result	**Host Setting**	**APO**	**Print Orientation**
Data processing: Print reports with a width of 80 columns or less (at 10 CPI) in portrait AND print reports with a width of 132 (at 10 CPI) or 198 (at 15 CPI) columns in landscape with reduced font (COR) **Word processing**: Print documents of up to 8.5 x 14 in portrait, 14 x 8.5 in landscape, and anything larger in landscape with reduced font (COR)	Degree of Page Rotation .... *AUTO Rotate Paper.....=1 (Automatic)	ON	COR
Print all reports/documents in landscape with reduced font (COR)	Degree of Page Rotation .... *AUTO; Rotate Paper .....=1 (Automatic)	OFF	COR
Print all reports/documents in landscape with requested font	Degree of Page Rotation .... *AUTO; Rotate Paper .....=1 (Automatic)	OFF	Landscape
Print all reports/documents in portrait with requested font	Degree of Page Rotation .... *AUTO; Rotate Paper .....=1 (Automatic)	OFF	Portrait

Changing Page Rotation Settings

Before changing page rotation settings, first verify the current settings. In Office Vision/400 and DisplayWrite/36, page rotation settings can be viewed and changed in the following manner:

1. Press **F20** "Format options."

2. Press **1** "Document options" then ENTER.

3. Press **1** "Document format" then ENTER.

4. Press **4** "Page layout/paper options" then ENTER.

5. Press **Page Down** to scroll to the second screen.

6. Locate "Rotate Paper . . . option."

7. Move the cursor to the currently selected rotation setting and type in the desired selection.

To permanently change the page rotation setting for a data processing report the print file must be changed. This should be done by an MIS staff member, since a changed print file most likely affects many printers. The page rotation setting can be changed temporarily by overriding the print file. The print file must be changed or overridden before the host creates the print job. An overridden print file applies only to print jobs created on the host session that was active when the print file was overridden.

To view the current print file settings, type **CHGPRTF** followed by a space and the name of the print file on the command line of the host. Press **F4**. Do not change any settings unless authorized by the IS director.

To change the print file:

1. Type **CHGPRTF** on the command line of the host, and press Enter.

2. Type in the name of the print file to be changed.

3. Press **F10** to display additional parameters.

4. Press **Page Down** to scroll to the fourth screen.

5. Locate "Degree of page rotation . . ." option.

6. Move the cursor to the beginning of the dashed line and enter the desired selection.

7. Press ENTER to activate the selection and exit the print file menu.

To override the print file:

1. Type **OVRPRTF** on the command line of the host, and press Enter.

2. Type the name of the print file to be changed.

3. Press **Page Down** to scroll to the third screen.

4. Locate "Degree of page rotation . . ." option.

5. Move the cursor to the beginning of dashed line and enter the desired selection.

6. Press ENTER to activate the selection and exit the print file menu.

Word Processing

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

The font ID can be changed as necessary with a font ID command in the word processing document. You can use font change commands, or you can select a font ID number within the word processing program. Refer to the word processing program operator's manuals for information on changing font IDs within the program.

The interface allows bolding, underlining, and super/subscripting by recognizing the host commands for these features in the WP (word processing) document. The interface uses a shadow print for bolding fixed pitch fonts, even on small and italic fonts. A bold font is specified to bold proportional and typographic fonts.

Formatting the Page

The printer prints up to 66 lines at 6.25 LPI (the line spacing is compressed slightly to fit). The System/36 only allows 65 lines per page. If you get one or two lines at the top of the next page, it's usually because you have formatted more lines per page than can be printed.

Paper Size

Configure the printer's setup to the paper size you use most. The MPP and font must match the paper size exactly to work correctly. The emulator only recognizes these paper sizes:

Letter Paper	8.5 x 11 in. (215.9 x 279.4 mm)
A4 Paper	8.27 x 11.69 in. (210 x 297 mm)
Legal Paper	8.5 x 14 in. (215.9 x 355.6 mm)
Executive Paper	7.25 x 10.5 in. (184.2 x 266.7 mm)

If you choose any other paper dimensions in the word processing program, the interface ignores it and uses the previous paper size choice.

You can also choose a paper size override through a host download command. The "No Size" selection uses the paper installed in the tray, regardless of size. The "A4 Size" selection uses A4 paper only.

With A4 paper size selected, 10 CPI fonts will print as 10.3 CPI. This allows 80 columns to be printed in portrait on A4 paper.

The following describes how to select legal size paper in DisplayWrite/36 or AS/400 Office.

1. Choose legal size paper on the host and send the print job.

2. The printer's operator panel displays 3 for "Load paper request." Install the legal size paper tray into the printer.

3. Press Start/Stop on the printer operator panel to continue.

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

1. Select a paper size in the program.

2. Install the correct paper size into the printer.

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

4. Release the job for printing at the printer's controlling workstation.

The line format screens in DisplayWrite/36 (Command 20) also permit you to select "Justify," which aligns the right margin. For best results in using justification, change the zone width to 1 (instead of 6). Right justification is only supported for fixed pitch fonts.

Envelope Printing

Use landscape orientation for envelope printing 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 helps in positioning the address. There are three ways to select envelopes:

1. Select "Manual Feed" in the word processing program's paper feed selections. The printer displays 3 on the operator panel. Place envelopes into the manual feed tray and press Start/Stop, then press Paper to select manual.

2. Place envelopes into the paper tray and move the tray stops to the proper position. Specify the bin number in the word processing program and the printer prints envelopes from the paper tray.

3. Select "Envelope Feed" in the word processing program's paper feed selections, a paper width of 7.5" or 9.5" (or 220 mm), and paper length of 11.0". The printer automatically finds the envelope feeder (if installed) and prints from the feeder.

Document/Envelope Printing

You can 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 your letter. Enter your letter file. On the first typing line, press CMD20 for "Change Format."

2. Select 1 for "Entire Document Options," then another 1 for "Document Format." Now select 3 for "Typestyle/Color."

3. Select the font ID number for your letter, such as No. 11, 86, etc., then press <**Enter>**.

4. 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 of 8.5 (width) x 11 (length) inches and a paper source of 1. If the letter is more than one page, select a paper source of 1 for the following pages. Press **<Enter>** to return to the Document Format screen, then CMD12 to return to the Document Options screen.

5. You can now set up the alternate format for the envelope. Select 2 for "Alternate Format," then 3 for "Typestyle/Color." Select the font ID for the envelope, such as 5, and press **<Enter>** to return to the Alternate Format screen.

6. Select 4, "Page Layout/Paper Options." Choose a first typing line of 1, 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.

7. Select option 1 for "Margins and Tabs" and make the left margin 1. Press **<Enter>** and CMD3 until you are back in your document.

8. Type in the text. When you're done, add in a "page end" by pressing **<Alt><P>**.

9. Now load in your alternate format for the envelope. To do this, press the CMD5 key, "Goto," and type in **RF** for "Resetting Format." Press **<Enter>**. Select option 4 on the Alternate Format screen, "Begin Alternate Format." Press **<Enter>**.

10. The document will now be displayed with the alternate format. The cursor will be on the first typing line of 1 with a left margin of 1. 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 you change 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.

Duplex Printing

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

The IOwin Software allows access to the printer's duplexing capability in a variety of ways:

1. If you are running OS/400 V2R3 on the host, simply select duplex printing in the printer file. The menu option is called "Print on both sides . . ." and is found on the second to last menu screen. Available selections are *NO, *YES, and *TUMBLE.

2. Select duplex printing in the word processing program. In the OfficeVision/400 printer options menu, the printer option is called "Type of page printing . . ." and the available selections are: 1 = Single-sided; 2 = Double-sided; and 3 = Double-sided tumble.

3. Insert the I-O duplex printing command on the first line (line 1, position 1) of the document. The I-O duplex printing commands are:

   ¬D0 for simplex printing
   ¬D1 for duplex printing, long-edge
   ¬D2 for duplex printing, short-edge (tumble)

For 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. If you want 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.

5219 Printer Emulation

The IOwin Software's 5219 emulation is for LaserJet printers. The HP LaserJet printer file is automatically used when 5219 emulation is selected.

The IOwin Software 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 IOwin Software 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 address on the host system. The default 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 WP or DP document RPG program.

If a data processing report is sent to the printer, the 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, select a default font ID. 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 user's guide 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 to be chosen. In such cases, use I-O font change commands. (See I-O Command Language on page 6-22, 6-26 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 IOwin software 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.

For A4 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.

Paper Size

Configure the printer setup to the paper size used most. The IOwin software 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 in the word processing program are chosen, the IOwin software 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 paper dimensions different from the above are specified, 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 permit "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 from the tray.

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 from the feeder.

Note: The LaserJet may eject a blank page when printing 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 you are printing in 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 IOwin Software 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 in documents 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 may not 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 available 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 Command Pass-Thru™

The Command Pass-Thru feature allows you to access all of the built-in features of your printer, even if these features aren't normally available through the host software. Command Pass-Thru lets you place printer-specific command sequences into the data sent to the printer. The interface 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 EBCDIC delimiter, as defined by a host download command (refer to Chapter 3, Configuration) in the document at the point you want the feature to take effect. This signals the start of the print feature.

Enter the beginning printer command, then enter the delimiter again. You may enter a space between hexadecimal code pairs to make the command easier to read, but do not put spaces between the delimiter and the hexadecimal characters.

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: The command **ESC &d0D** begins underlining and **ESC &d@** ends underlining. First convert the start command to the hexadecimal **1B 26 64 30 44** and the ending command to **1B 26 64 40**. And, if the delimiter is the default **&%** (hex 50 6C), then enter the commands as follows:

This is an &%1B26643044&%underlined&%1B266440&% word.

To print on the printer as:

This is an underlined word.

Only characters from 00 to FF are recognized (alphabetic characters must be in upper case).

Errors in the Command Pass-Thru sequence will cause the IOwin Software to ignore the command and printing will resume at the point the error occurred.

Although the command is displayed on the screen, it is treated as a command and does not print it. If part of the sequence is printed, you have made an error in entering the codes; check your document and make sure you are using the correct format and EBCDIC hexadecimal characters.

Command Pass-Thru may invalidate horizontal spacing. Avoid sending codes that would move the print position during Command Pass-Thru. Since these commands are not processed, it cannot keep track of the print position changes; this may affect the position of following characters and page layout.

Other Printer Commands

You can also enter commands into your document that allow you to control true LPI and response to host commands. These commands (shown below) are similar to font change commands.

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

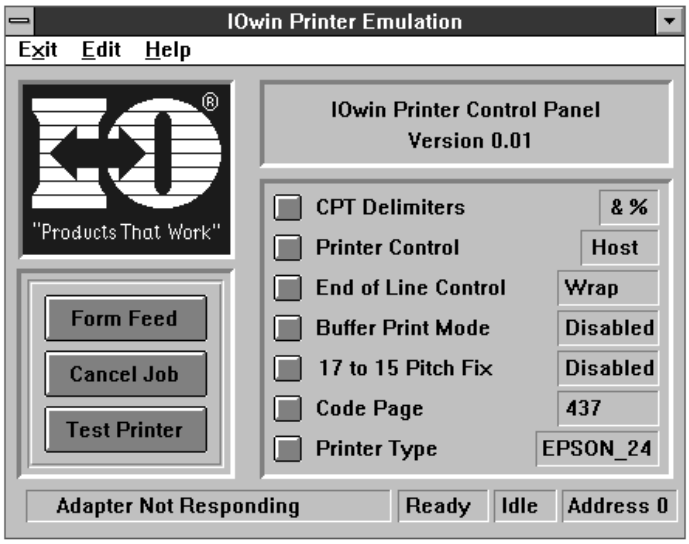
The ¬E command allows you to send an escape command to the printer to control the printing. For example, **¬E(s3B** would begin bold printing (see your printer's manual for a list of the printer or escape commands).

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 interface to remove the host carriage return and line feed commands and send only the data to the printer.

Dot-Matrix Printing

The printer control screen gives you control of your printer and lets you customize the output.



Form Feed: Will send a form feed to the printer.

Cancel Job: This will send a cancel to the host system and stop sending data to the print manager. Data already in the print manager and printer buffer will continue to print.

Test Printer: This will send a test print to the printer. This will be used for diagnostics.

CPT Delimiters -- Command Pass-Thru allows printer control not available through host commands. For example, it is possible to select bold printing by simply placing commands in a host document.

The IOwin Software 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 in the spaces on the screen. See Command Pass-Thru in this chapter for more information.

Printer Control -- When in host mode the commands from the host set the printer. When in PC mode, the printer will be setup by the printer front panel.

End of the Line Control: In truncate mode, narrow carriage printers ignore data beyond 80. In wrap mode, the data prints on the next line.

Buffer Print Mode: Prints all host commands for diagnostic use.

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 the document requires 15 pitch, select this option by moving the cursor to the option and pressing **<Enter>**.

When selected, it may cause printers to print very slowly in 15 pitch.

Code Page Selection -- 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.

Notes: If a change is made to Code Page 437, any changes made to the Code Page 850 character set will be lost.

Code Pages are different character sets used by the printer. Change this if unusual characters are printing.

Printer Type -- If the printer is not listed, it is possible to create a printer definition by selecting **Edit**, typing a new name, and then defining the printer.

To customize a printer, select **edit**.

The Printer Commands Definition function is used to define a new printer or modify the command strings for an existing printer.

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 to modify the command strings for an existing printer. All command strings are in hexadecimal and the first set of characters is the string length. The table on the following page lists the various selections and their uses.

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

Windows 95/98 Printing

In order to print in Windows 95/98, you must do the following:

- Must have the most current Windows printer driver installed in Windows.

- Configure the desired printer on the host. Refer to your system administrator for this.

- Configure the matching printers in the IOwin emulation software.

- Configure Windows 95/98 for printing from IOwin using the following steps:

    1. Click on START, click on SETTINGS, click on PRINTERS.

    2. Use the RIGHT mouse button to single click on your printer Icon, make sure there is an check mark next to "Set as default printer".

3. Click on PROPERTIES, click on DETAILS, click on SPOOL SETTINGS, make sure the Spool data format setting says Raw or the circle marked "Print directly to printer" should be filled in.

4. Save settings and exit this screen. Shutdown Windows 95/98.

5. Power off/on your printer, restart Windows 95/98 and the IOwin printing session.

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7 UTILITIES

This chapter outlines instructions for changing the colors of the display screen, the position of the keys on the keyboard, and the installation settings. When the Utility icon is selected, three options are displayed: Colors, Keys, and System.

Colors

The screen attributes control the appearance of the screen. Each field in the screen is preceded by an attribute telling the computer how the following area is to be displayed. Each of the attributes has a text and background color. The color of the attributes can be changed in this section.

System Attribute Definition -- The attribute system definition is the code used to tell the field how it is to be displayed. These are hex values between 20 and 3F, listed in table 7-A. The definition of each is given in the pull down box.

Custom Attribute Definition -- The text and background buttons bring up the color pallet. Select a color from the pallet then press OK. The selected color will be displayed in the example box. If a color is chosen that does not fill the matrix completely for the background, Windows will modify it slightly.

Default -- Returns the currently displayed system attribute to the default; OK: Saves all modifications and exits; Cancel: Exits and does not save any of the modifications.

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 individual tastes or applications.

To change the colors, do the following:

1. Find the IBM 5250 attribute to change by its description in Table 7-A, (on the following page). Use the mouse to select the attribute, or type in the hex value for that field.

2. Press the Text button to modify text or the Background button to modify the background.

3. Select the desired color from the pallet (solid colors work best). Then press OK.

4. Press OK to save and exit; or press Cancel to return to the previous settings.

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

Table 7-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

Keys

Keyboard Mapping -- The function of most of the keys on the keyboard can be changed in this section. You can select PC style or 5250 style keyboards, and also tell the host if you are using a standard US or a world trade keyboard. Almost every key can be changed to perform a different function. For example the "*" on the number pad can be changed to the "Host print screen."

Changing keys -- Most keys on the keyboard can be changed. The keys that are light are not available for modification. To change a key use the mouse and click on it, or simply press the key when the cursor is in the SELECT A KEY field. This will display the definition for the key in the normal, shifted and control state. Use the pull down box to make changes.

5250 and PC styles -- If you want to change the Enter key to the right control key and make the PC Enter key the Field Exit key, select 5250 style. 5250 style is for people who want to use a keyboard like the 5250 display keyboards. PC style leaves the keyboard close to a PC keyboard. Most people should use PC style because then the keyboard will be consistent throughout their programs.

World trade and US -- If your host system is set for world trade keyboards, select world trade. Otherwise select US.

OK -- Will save the changes.

Cancel -- Will abort all the changes.

System

Installation settings -- Settings that were selected or defaulted during the installation can be modified here. These include Language, PC Support/400 or Client Access/400 for DOS installation, translation tables for both the display and printer, and the adapter address.

Language -- The IOwin software supports 18 languages, select the language that matches the host system settings. This only affects the layout of the keyboard.

The language was automatically set to that used by Windows when the software was installed. If the language was changed or you need the emulator card and Windows to use different languages, change the language to the desired setting. If your host system is set to use multinational codes, check this box.

PC Support/400 or Client Access/400 for DOS -- If IBM's PC Support/400 or Client Access/400 for DOS has been installed on the PC and you wish to use it with this emulator card select this button. If you are connecting to a system other than the AS/400 and have not installed PC Support/400 or Client Access/400 for DOS, or if you are not going to use PC Support/400 or Client Access/400 for DOS, then do nothing with this selection.

PC Support Path -- The installation needs to know what file is executed to start PC Support/400 or Client Access/400 for DOS and where the file is located. IBM's default is shown. Only change this if you are using a different file or have loaded the software into a different directory.

Translation tables -- The translation tables are the actual tables IOwin software uses to communicate with the host system. DO NOT CHANGE THESE UNLESS IT IS ABSOLUTELY NECESSARY! The host and the PC communicate in different languages. These tables allow changes to be made to handle special applications.

The codes around the outside are the EBCDIC codes the host is sending down. The top of the table is the first digit and down the side is the second digit. The inside codes are the ASCII codes for the PC. To modify these, type in or use the mouse to click on the host EBCDIC code you wish to change, then input the PC ASCII code you wish to send to the PC.

Adapter Address -- This is the memory address location where the emulator card communicates with the PC. This address must not conflict with any other device in the PC. The default is D000 and will work with most installations. If there is a conflict, locate the address of other devices then set this to a free location.

8 PROBLEM RESOLUTION

The IOwin software and 8251 Emulator Card are designed for easy installation and reliable operation. If you are having problems, first consult this manual and take the following steps.

1. Verify all the installation steps have been completed.

2. List any error messages displayed or unique system operational problems observed (see Error Messages in this chapter).

3. Review the problem resolution guide that follows.

4. 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 Software diskette)
   - Software revision level
   - Date of purchase
   - Model of the printer (if attached)
   - Type of host system
   - Model of Emulator Card

Most Common Problems

Emulation adapter not found

1. Change the adapter address in the "Utilities/System" selection. Try C800 then E000. Leave at E000 if it does not work.

2. Check for a memory manager in the CONFIG.SYS. Common managers are EMM386.EXE, QEMM, and BLUEMAX.

   For EMM386 and QEMM add the statement X=E000-E7FF
   For BLUEMAX add the statement RAM=E000-E7FF

The addresses that can be used by I-O emulator cards are:

C000-C7FF, C800-CFFF
D000-D7FF, D800-DFFF
E000-E7FF

For example:

DEVICE =C:\DOS\EMM386.EXE X=E000-E7FF

3. Disable RAM SHADOWING and CACHE in the CMOS of the PC.

4. Boot from a DOS diskette to eliminate conflicts in the CONFIG.SYS and AUTOEXEC.BAT.

If you are using a 386 or 486 computer that uses memory cache, disable caching in the memory addresses occupied by the emulator card. (This is typically done through the BIOS setup. Instructions can be found in the computer user's guide.)

If you are using a 286, 386, or 486 computer that uses an old 16-bit bus VGA adapter, it may interfere with the emulator card. To avoid this, do one of the following:

- Set the 8251 address to E000
- Configure the VGA adapter for 8-bit bus operation

System not available at address X

1. Run CABLECHK.EXE A=Address C=Cable Type

Addresses = C000, C800, D000, D800, E000, E800

This has to match the setting in IOwin.

Cable type = 2 is for Twinax, 3 is for Twisted pair

Example: CABLECHK.EXE A=D000 C=2

a. **Host polls:** If this is 0000 on all addresses, then the signal from the host is not reaching the I-O card. If only some addresses are not getting host polls, then they are not configured on the host or are varied off.

b. **Device responses:** Any address there is a response on has a device communicating with the system. If the address has device responses, then there is already a device on that address.

c. **Device parity:** Any address with a parity error means the device is sending a bad signal to the host. Check the device.

d. **Cable errors:** Problems with the cable. Check the termination and try a different "V" connector.

e. **Emulator errors:** Call I-O Customer Support for assistance.

f. **Lapsed time:** Run this program for a minimum of 15 seconds. This tells how long the program has been running.

Any message containing the numbers 6809

1. Run the program from within the directory where the files are located. Execute PC Support functions from the PCS directory, or execute the I-O emulation from the IOwin directory.

2. Reload the I-O software.

Any PC Support message

1. From within the PCS directory, type PSCHELP #### (where #### is the message number).

Cannot change the enter key and field exit key

1. In the utilities under keyboard, select 5250 or PC. If 5250 is selected the left control key is the enter. If PC is selected the enter key is the enter.

PROBLEM RESOLUTION

General Problems

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 8251 card.

Graphics characters or blinking characters appear on the screen

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

Cause: Memory address conflict.
Action: Make sure the I-O 8251 memory address is set to a vacant address on the PC.

Cause: Memory address conflict.
Action: On a 386 or 486 computer, configure any memory management to exclude the memory area occupied by the I-O 8251.

Cause: Memory address conflict.
Action: If the 386 or 486 computer uses memory cache, disable caching in the memory area occupied by the I-O 8251. (This is typically done through the BIOS setup.)

Cause: Memory address conflict.
Action: If the 286, 386 or 486 computer uses a 16-bit bus VGA adapter, do one of the following: 1) have address E000 available, or 2) configure the VGA adapter for 8-bit bus operation.

Cause: Memory 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 memory address used by the card.

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

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

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

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

Cursor appears in the middle of a blank screen

Cause: Memory address conflict
Action: Make sure the I-O 8251 memory address is set to a vacant memory address in the PC.

Cause: Memory address conflict.
Action: On a 386 or 486 computer, configure any memory management to exclude the memory area occupied by the I-O 8251.

Cause: Memory address conflict.
Action: If the 386 or 486 computer uses memory cache, disable caching in the memory area occupied by the I-O 8251. (This is typically done through the BIOS setup.)

Cause: Memory address conflict.
Action: If the 286, 386 or 486 computer uses a 16-bit bus VGA adapter, do one of the following: (1) have address E000 available, or (2) configure the VGA adapter for 8-bit bus operation.

Cause: Memory 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 memory address used by the card.

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

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

Cause: Incorrect termination.
Action: If the I-O 8251/PC is the last device on the cable, make sure it is terminated correctly.

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

Printer does not work

Cause: Printer not configured or configured incorrectly.
Action: Make sure the printer is configured on the host and in the IOwin configuration.

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

Cause: Printer not configured or configured incorrectly.
Action: Check that if "other" is selected in the configuration program, the printer is described in the "Printer" option. If the printer is not described, the printer will not work.

Cause: Invalid cable address.
Action: Check the cable addresses on the host and in the IOwin 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 the printer is communicating with the PC.

Printer prints improper characters

Cause: Printer or emulator is set to the wrong code page.
Action: Change the code page in the IOwin (see page 7-5).

Printer prints improper characters

Cause: Printer or emulator is set to the wrong code page.
Action: Change the code page in the IOConfig (see page ?).

Cause: Page width in word processing program is not set wide enough.
Action: Change to a wider page.

Cause: Page width is too wide.
Action: Select a narrower page.

Cause: Form length not correct in software (maximum length is 66 lines).
Action: Make sure your document length doesn't exceed the maximum number of lines.

Cause: Page orientation was changed.
Action: The printer may eject the blank page when the page orientation (portrait or landscape) is changed.

Cause: Form length incorrect in software.
Action: Change form length.

Cause: Incorrect configuration at the host.
Action: Make sure the host configuration matches the printer's.

PROBLEM RESOLUTION

Cause: Incorrect typestyle number.
Action: Make sure the font ID used is valid. Invalid font IDs are ignored by the printer.

Cause: Wrong font cartridge loaded.
Action: Load the cartridge with the font that corresponds to the font ID.

Cause: Font cartridge damaged or not seated into the printer properly.
Action: If possible try a known good cartridge to determine if cartridge is faulty. Make sure the cartridge is loaded properly.

Cause: Switches host download command or printer front panel set for portrait.
Action: Change printer control or font panel selection to landscape.

Cause: Did not select a rotation in the word processing program.
Action: Select 90 or 270 rotation in the program.

Cause: Did not select a rotation (STO) in the data processing OCl statement.
Action: Add a 90 or 270 orientation instruction to the OCL statement.

Cause: Paper width specified in program is inadequate.
Action: Change paper width to allow the landscape orientation and 198 columns.

Cause: Switches host download command or printer front panel set for landscape.
Action: Change switches command or front panel selection to portrait.

Cause: A mistake may have been made while using Display Write.
Action: Choose "yes" to printer error log on page 3 of the Print Option Screen.

Error Messages

The error messages below are generated by the IOwin software during configuration, while starting emulation, or during active emulation. The IBM Systems/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.

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.

PROBLEM RESOLUTION

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.

I**nvalid Configuration File** - The configuration file you are trying to modify is invalid. Verify the correct file is being specified. 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 Adapter Does Not Respond - The emulation adapter 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 I-O dealer.

Emulation Adapter Diagnostic Error - The emulation adapter detects an error during power up. Power PC off and restart emulation. If the problem continues, contact your I-O 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 IOwin 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 IOwin 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 IOwin 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/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 host communications.

PROBLEM RESOLUTION

Avoiding Software Conflicts

The IOwin is compatible with most PC application programs. The following information may help you prevent any conflicts.

Setting the Memory Address in the PS/2

Each card installed into a PS/2 uses an area or "address" of the PS/2 upper memory. The I-O 8251ME memory address is set using software. Find the backup copy of the IBM Reference diskette, or if you cannot locate the disk, contact IBM for a replacement.

Take the following steps to set the I-O 8251ME memory address.

1. Insert the Reference Disk Backup into diskette drive A.

2. An IBM logo screen appears. Press **<Enter>** to continue.

3. A main menu screen appears. Select "**Set Configuration**" and press **<Enter>**.

4. Select "**View Configuration**" and press **<Enter>**.

   The configuration screen appears and shows the basic hardware and a description of all cards installed into the PC.

5. Move down to the slots. If any slot is unidentified, the driver for that card is not on the copy of the reference diskette being used. Find the driver and return to the main menu.

   a. Select "Copy/Merge an Option Diskette". Using the disk for the unidentified card as the option diskette.

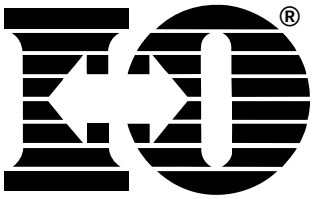
   b Follow the instructions on the screen.

6. Return to "View Configuration" and look at the slots. Each card's assigned memory area is shown. An asterisk (*) marks cards with conflicting memory addresses. (Two cards occupying the same memory address could cause operating difficulties.)

7. If conflicting addresses are shown, press the **F5** or **F6** key to change the memory address for one of the conflicting cards. F5 selects the next lower memory address, and F6 selects the next higher memory address. Press **F10** to save the change.

8. Press **F3** until prompted to reboot.

9. Press **<Enter>** and the system will reboot.



"Products That Work"

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APPENDIX A

Specifications

General

Host Systems:	IBM System/36, /38 and AS/400
Controller Systems:	IBM 5251-12, 5294, 5394, and 5494 I-O 8294/8394 Series
Display Emulations:	IBM 5251-11, 5291, 5292-1, 3179-1, 3196, 3197C, 3197D, 3180
Printer Emulations:	IBM 5224/5225, 5256, 4210, 4214 (APF and BGU), 3812 SCS and 5219
Minimum configuration:	One display
Maximum configuration:	Seven sessions (supports maximum of one printer)
Memory required:	32K upper memory block
	Microprocessor: Motorola 68B09. Application Specific Integrated Circuit © 1987-1993 Sherwood Digital Electronics Corp. Programmed Devices © 1987-1993 Sherwood Digital Electronics Corp.
Interface:	9-pin connector with auto-terminating twinax V-connector for connection to host
Indicator:	Line sync indicator on rear bracket indicates communication with host

APPENDIX A

Physical

Board size:	8251EH: 4" x 6" (10.2 x 15.24 cm)
	8251ME: 3.25" x 12.25" (8.25 x 31.12 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

APPENDIX B

Programs

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

CONNAH.EXE - The adapter handler program used with AS/400 PC Support. The startpcs.bat file is modified to start connah. In the startpcs.bat file, the IBM adapter handler is replaced with connah (IO adapter handler), and is also replaced with the emulator's memory address (such as D000).

SETUP.EXE - An installation program that copies the emulation software and sets up the IOwin software

UTILITY.EXE - Utility Programs that include attributes, keyboard remaping and setup parameters.

IOWIN.EXE - The display module used for Windows. This can be manually executed by typing it and then try address you want to use.

CABLECHK.EXE - A utility program that is helpful in determining which addresses are being used on the twinax cable. To execute at DOS prompt, change to directory where software is located and then type: **cablechk.exe**.

PCSINST.EXE - A program that installs the AS/400 PC Support adapter handler (connah). It must be run after the AS/400 PC Support software has been installed.

APPENDIX B

Executable by the Emulator

Other files include:

*.P14	Printer files using 4214 emulation.
*.DAT	File utilized in configuration to make changes for language.
*.CFG	Configuration files.
*.HEX	Emulation adapter microcode file.
*.BAS	Keyboard Base File.
*.CHG	Keyboard Change File.
*.DEF	Keyboard Definition File.
*.DLC	Dynamic Link Library Files.
*.FON	Font Files.
*.CFB	Configuration Base File.
*.HLP	Help Files.
*.GRP	Group File.
KBWIN.*	Keyboard Files.

APPENDIX C

Code Page/Character Set

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

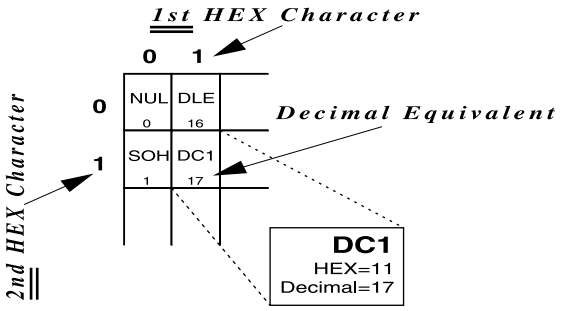
HEX	EBCDIC
DD	ù
DE	ú
DF	ÿ
E0	\
E1	# space
E2	S
E3	T
E4	U
E5	V
E6	W
E7	X
E8	Y
E9	Z
EA	²
EB	Ô
EC	Ö
ED	Ò
EE	Ó
EF	Õ
F0	0
F1	1
F2	2
F3	3
F4	4
F5	5

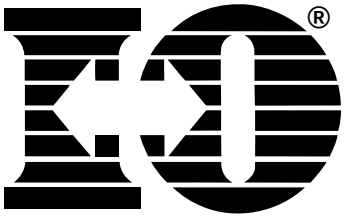
HEX	EBCDIC
F7	7
F8	8
F9	9
FA	³
FB	Û
FC	Ü
FD	Ù
FE	Ù
FF	

Roman-8 Symbol Set

Includes US ASCII (dec. 1-127) and Roman Extension Symbol Sets

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL 0	DLE 16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	þ 240
1	SOH 1	DC1 17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	. 242
3	ETX 3	DC3 19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	ACK 6	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	BEL 7	ETB 23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	BS 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	^ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	~ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	CR 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255





"Products That Work"

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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 IOwin software 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	--

APPENDIX D

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	--

Note: Numbers in parentheses are alternatives that more closely match the IBM CPI spacing of the font.

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/CP850	P/L	13.33	8.5	204
Line Printer	R-8/CP850	P/L	15	8.5	223
Line Printer	R-8/CP850	P/L	17.1	8.5	254
Line Printer	R-8/CP850	P/L	19	8.5	281
Courier	R-8/CP850	P/L	10	12	11
Courier Bold	R-8/CP850	P/L	10	12	46
Courier Italic	R-8/CP850	P/L	10	12	18
Courier	R-8/CP850	P/L	12	10	85
Courier Bold	R-8/CP850	P/L	12	10	88
Courier Italic	R-8/CP850	P/L	12	10	89
Letter Gothic	R-8/CP850	P/L	12	12	87
CG Times	R-8/CP850	P/L	Prop.	6	4605
	R-8/CP850	P/L	Prop.	8	4606
	R-8/CP850	P/L	Prop.	10	4607
	R-8/CP850	P/L	Prop.	12	4608
	R-8/CP850	P/L	Prop.	14	4609
	R-8/CP850	P/L	Prop.	18	4611
	R-8/CP850	P/L	Prop.	24	4614
	R-8/CP850	P/L	Prop.	30	4617
CG Times Bold	R-8/CP850	P/L	Prop.	6	4625
	R-8/CP850	P/L	Prop.	8	4626
	R-8/CP850	P/L	Prop.	10	4627
	R-8/CP850	P/L	Prop.	12	4628
	R-8/CP850	P/L	Prop.	14	4629
	R-8/CP850	P/L	Prop.	18	4631
	R-8/CP850	P/L	Prop.	24	4634
	R-8/CP850	P/L	Prop.	30	4637

Typeface	Symbol	Orient	Pitch	Point	Type-style No.
CG Times Italic	R-8/CP850	P/L	Prop.	6	4645
	R-8/CP850	P/L	Prop.	8	4646
	R-8/CP850	P/L	Prop.	10	4647
	R-8/CP850	P/L	Prop.	12	4648
	R-8/CP850	P/L	Prop.	14	4649
	R-8/CP850	P/L	Prop.	18	4651
	R-8/CP850	P/L	Prop.	24	4654
	R-8/CP850	P/L	Prop.	30	4657
CG Times Bold Italic	R-8/CP850	P/L	Prop.	6	4665
	R-8/CP850	P/L	Prop.	8	4666
	R-8/CP850	P/L	Prop.	10	4667
	R-8/CP850	P/L	Prop.	12	4668
	R-8/CP850	P/L	Prop.	14	4669
	R-8/CP850	P/L	Prop.	18	4671
	R-8/CP850	P/L	Prop.	24	4674
	R-8/CP850	P/L	Prop.	30	4677
Univers Medium	R-8/CP850	P/L	Prop.	6	4805
	R-8/CP850	P/L	Prop.	8	4806
	R-8/CP850	P/L	Prop.	10	4807
	R-8/CP850	P/L	Prop.	12	4808
	R-8/CP850	P/L	Prop.	14	4809
	R-8/CP850	P/L	Prop.	18	4811
	R-8/CP850	P/L	Prop.	24	4814
	R-8/CP850	P/L	Prop.	30	4817
Univers Med Italic	R-8/CP850	P/L	Prop.	6	4825
	R-8/CP850	P/L	Prop.	8	4826

Typeface	Symbol	Orient	Pitch	Point	24Type-style No.
(Continued)	R-8CP/850	P/L	Prop.	10	4827
	R-8/CP850	P/L	Prop.	12	4828
	R-8/CP850	P/L	Prop.	14	4829
	R-8/CP850	P/L	Prop.	18	4831
	R-8/CP850	P/L	Prop.	24	4834
	R-8/CP850	P/L	Prop.	30	4837
Univers Med Condensed	R-8/CP850	P/L	Prop.	6	4845
	R-8/CP850	P/L	Prop.	8	4846
	R-8/CP850	P/L	Prop.	10	4847
	R-8/CP850	P/L	Prop.	12	4848
	R-8/CP850	P/L	Prop.	14	4849
	R-8/CP850	P/L	Prop.	18	4851
	R-8/CP850	P/L	Prop.	24	4854
	R-8/CP850	P/L	Prop.	30	4857
Univers Med Cond. Italic	R-8/CP850	P/L	Prop	6	4865
	R-8/CP850	P/L	Prop.	8	4866
	R-8/CP850	P/L	Prop.	10	4867
	R-8/CP850	P/L	Prop.	12	4868
	R-8/CP850	P/L	Prop.	14	4869
	R-8/CP850	P/L	Prop.	18	4871
	R-8/CP850	P/L	Prop.	24	4874
	R-8/CP850	P/L	Prop.	30	4877
ITC Zapf Dingbat	R-8/CP850	P/L	Prop.	6	4985
	R-8/CP850	P/L	Prop.	8	4986
	R-8/CP850	P/L	Prop.	10	4987
	R-8/CP850	P/L	Prop.	12	4988
	R-8/CP850	P/L	Prop.	14	4989
	R-8/CP850	P/L	Prop.	18	4991

Typeface	Symbol	Orient.	Pitch	Point	Type-style No.
(Continued)	R-8/CP850	P/L	Prop.	24	4994
	R-8/CP850	P/L	Prop.	30	4997

APPENDIX D

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

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

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

APPENDIX D

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

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

APPENDIX D

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

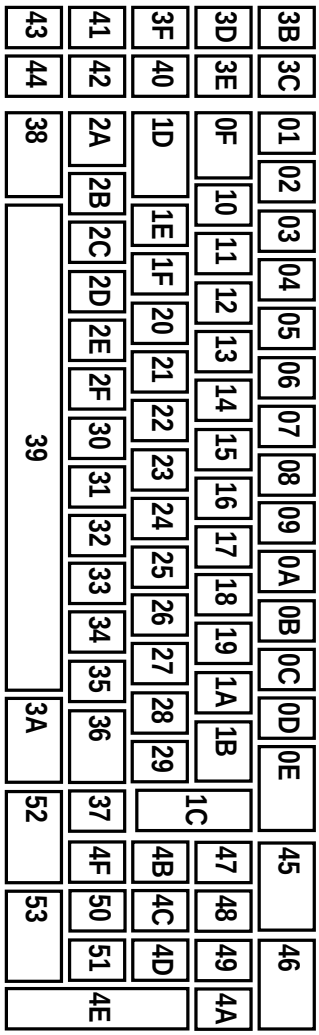
Swiss 721 bold	Prop.	12	34124	34124
Swiss 721 bold	Prop.	14	34125	34125
Letter Gothic	15	9.5	230	230
Supports Z Cartridge 1255844				
Press Roman	Prop.	8	185	185
Press Roman	Prop.	10	186	186
Press Roman bold	Prop.	10	187	187
Press Roman italic	Prop.	10	188	188
Press Roman	Prop.	12	189	189
Press Roman 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

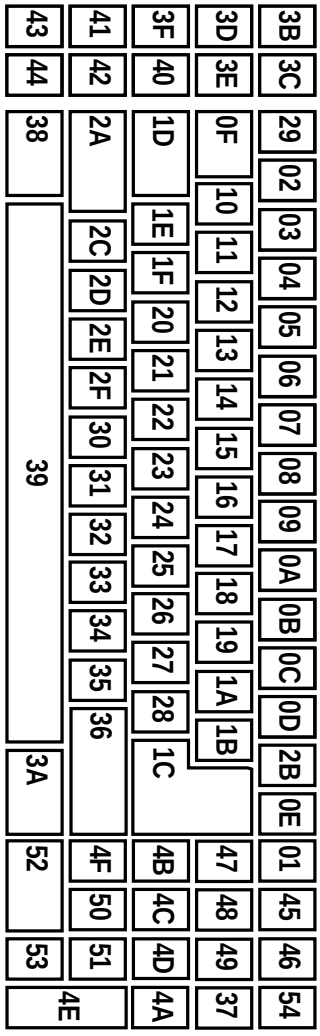
Courier	12	10	85*	85
Supports N Cartridge 1255847				
Letter Gothic	12	12	87*	87
Letter Gothic bold	12	12	110	110
Letter Gothic italic	12	12	109	109
Supports T Cartridge 1255848				
Swiss 721	Prop.	6	34101	34101
Swiss 721	Prop.	8	34102	34102
Swiss 721 bold	Prop.	10	34123	34123
Swiss 721 bold	Prop.	12	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

APPENDIX E

Keyboard Scan Codes

The keyboard scan codes shown on the following pages are the factory defaults.


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


AT Keyboard
3B 3C 29 02 03 04 05 06 07 08 09 0A 0B 0C 0D 2B 0E 01 45 46 54
3D 3E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 47 48 49 37
3F 40 1D 1E 1F 20 21 22 23 24 25 26 27 28 1C 4B 4C 4D 4A
41 42 2A 2C 2D 2E 2F 30 31 32 33 34 35 36 4F 50 51 4E
43 44 38 39 3A 52 53

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		

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						

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APPENDIX F

Keyboard Templates

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.

5250 Style on an AT Keyboard

I-O 8250 Series Emulator Card Template

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

I-O 8250 Series Emulator Card Template

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

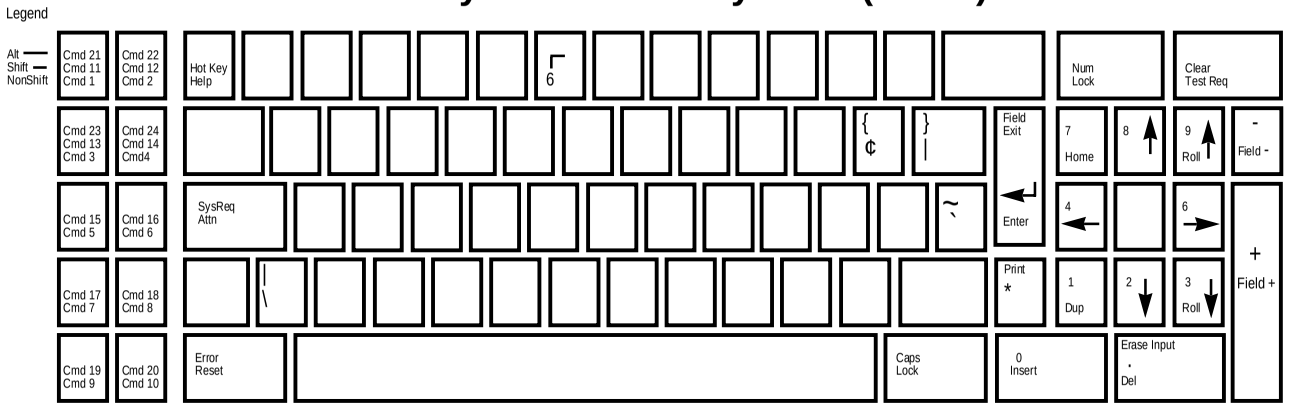
I-O 8250 Series Emulator Card Template

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
Legend
Alt —
Shift =
NonShift
Cmd 21
Cmd 11
Cmd 1
Cmd 22
Cmd 12
Cmd 2
Help Key
Help
Num
Lock
Clear
Test Req
Cmd 23
Cmd 13
Cmd 3
Cmd 24
Cmd 14
Cmd4
Field
Exit
7
Home
8
9
Roll
Field -
Cmd 15
Cmd 5
Cmd 16
Cmd 6
SysReq
Attn
Enter
4
6
Cmd 17
Cmd 7
Cmd 18
Cmd 8
Print
*
1
Dup
2
3
Roll
Field +
Cmd 19
Cmd 9
Cmd 20
Cmd 10
Error
Reset
Caps
Lock
0
Insert
Erase Input
.
Del
I-O 8250 Series Emulator Card Template
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:

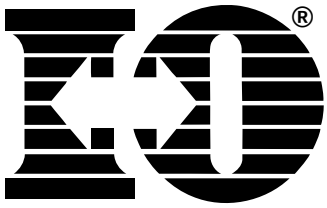
rr-cc	Cursor location (Row-column)
SA	System Available
MW	Message Waiting
KS	Keyboard Shift
IM	Insert Mode
II	Input Inhibited
KB	Keyboard Buffering
Sn	n = active logical unit
An	n = active host address

PC Style on an Enhanced Keyboard

I-O 8250 Series Emulator Card Template

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

DIP Switch Settings

The following are DIP switch settings for the I-O 8251 and I-O 8251E emulator cards. Look for a sticker labeled "PC Plug" and match the sticker to the appropriate chart.

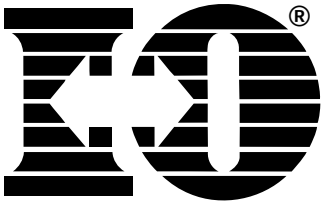
4 Session (PC Plug Q, PC Plug QK)

I-O 8251 Memory Address								
Address	Switch Number							
	1	2	3	4	5	6	7	8
C000-C3FF	OFF	OFF	ON	ON	ON	ON	OFF	OFF
C400-C7FF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
C800-CBFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
***CC00-CFFF**	**OFF**	**OFF**	**ON**	**ON**	**OFF**	**OFF**	**OFF**	**OFF**
D000-D3FF	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
D400-D7FF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
D800-DBFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
DC00-DFFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF

7 Session (PC Plug F, PC Plug FK)

I-O 8251E Memory Address								
Address	Switch Number							
	1	2	3	4	5	6	7	8
C00-C7FF	OFF	ON	ON	ON	ON	OFF	OFF	OFF
C800-CFFF	OFF	ON	ON	ON	OFF	ON	OFF	OFF
***D00-D7FF**	**OFF**	**ON**	**OFF**	**ON**	**ON**	**OFF**	**OFF**	**OFF**
D800-DFFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
E000-E7FF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
E800-EFFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF

* Factory default



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APPENDIX H

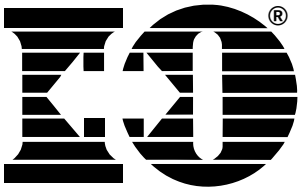
Helpful Hints When Using DOS 6.0 MemMaker

When using MemMaker, a memory manager utility in MS-DOS 6.0, with the I-O 8251EH, follow these procedures:

1. Before running MemMaker, make sure the I-O 8251 card has been enabled by typing at the prompt: **cd\8251**. (The directory where the emulation software was installed.)

   Run the emset command by typing at the prompt: **emset XXXX**. XXXX = address where emulator card is configured (default D000).

2. After MemMaker is complete, the CONFIG SYS file must be modified. Using any text editor, locate the command DEVICE=C:\DOS\EMM386.EXE. At the end of this line, add the option X=xxxx-yyyy to exclude the memory used by the I-O 8251 card. For example, if the card is configured at D000, the command would be **X=D000-D7FF** for the STD memory software. For LOW memory software, the command would be **X=D000-D3FF**.



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APPENDIX I

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

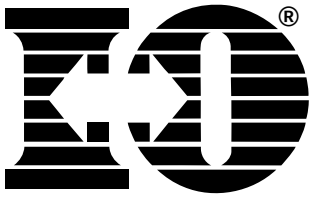
IBM PC Support AS/400 DOS Installation and Administration Guide, SC41-0006

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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APPENDIX J

PC Support/400

The IBM PC Support/400 diskettes are required to install PC Support/400. PC Support/400 cannot be run in conjunction with standard I-O emulation. Use either I-O emulation or PC Support.

To install PC Support/400, take the following steps:

1. Run **INSTALL.EXE** on the IBM PC Support disk.

2. Select ENHANCED 5250 EMULATION for the installation, and follow the installation instructions.

3. Go to the I-O directory. **C:\IO8251**

4. Type **PCSINST.EXE<Enter>**

5. Verify that C:\PCS=STARTPCS.BAT is the correct file.

6. Change the directory to PCS by typing: **cd\PCS**

7. Start PC Support by typing: **STARTPCS.BAT**

   Note: The PCSINSTL.EXE program does not always work. If you have problems, continue with Steps 8 through 15. If the installation is successful, PC Support is loaded.

8. Go to the I-O directory. **C:\IO8251**

9. Copy the I-O files to the PCS directory by typing:
   COPY C:\IO8251\6809*.HEX
   COPY C:\IO8251\CONNAH.EXE

10. Use Edit, EDLIN or another editor to edit the STARTPCS.BAT file.

11. Find the E5250AH or WSEAH command line. The position of this line will vary.

12. Replace E5250AH or WSEAH with **CONNAH.EXE.**

13. Save and exit the editor. This completes the installation.

14. Change the directory to PCS by typing: **CD\PCS**

15. Start PC Support by typing: **STARTPCS.BAT**

Note: While using PC Support/400, use the original <Alt><Esc> hot key sequence. If the hot key sequences have been customized in IOCONFIG.EXE, they will not work while using PC Support AS/400.

File Transfer

The File Transfer function allows transfer files from the host to the PC (download) and from the PC to the host (upload).

If transferring files in an application, make certain the application will accept the file format.

The I-O 8251 software is compatible with many file transfer utilities.

Shared Folders -- This function allows PC data to be stored on the host in the same folder as the user when on the host.

Virtual Disk -- This function allows a portion of the host disk to be assigned to the PC. This disk space can be accessed as another disk drive. It expands PC storage capacity, and allows access to data by other PCs.

Virtual Printer -- Allows data to be printed from the PC to a host system printer. This function must be configured during installation of the IBM PC Support software on the PC.

For more details regarding file transfer, virtual disk, and virtual printer applications, refer to IBM PC Support manuals and related publications.

APPENDIX K

HP MIO Resident Scalable Font Numbers

Font	Font ID No.
Letter Gothic	410
Letter Gothic Bold	420
Letter Gothic Italic	430
Courier	460
Courier Bold	470
Courier Italic	480
Courier Bold Italic	490
Symbol	3400
Wingdings	3500
Dingbats	3600
CG Omega	4919
CG Omega Bold	4939
CG Omega Italic	5067
CG Times	5687
CG Times Bold	5707
CG Times Italic	5815
CG Times Bold Italic	5835
Arial	6199
Arial Bold	6219
Arial Italic	6327
Arial Bold Italic	6347
Garamond Antiqua	8503
Garamond Halbefett	8523
Garamond Kursiv	8631
Garamond Kursiv Halbfett	8651
Coronet	8759

Claredon condensed	8779
Marigold	8887
Albertus medium	12855
Albertus extra bold	12875
Times New	16951
Times New Bold	12875
Times New Italic	17079
Times New Bold Italic	17099
Antique Olive	33335
Antique Olive Bold	33355
Antique Olive Italic	33463
Univers medium condensed	33591
Univers Bold condensed	33601
Univers Medium cond. Italic	33719
Universe Bold condensed Italic	33729
Universe Medium	34103
Universe Bold	34123
Universe Medium Italic	34251
Univers Bold Italic	34251
3812 Font Numbers which use the CG Times Typeface	
Sonoran-Serif	751
Sonoran-Serif	1051
Sonoran-Serif Bold	1053
Sonoran-Serif Italic	1056
Sonoran-Serif	1351
Sonoran-Serif Bold	1653
Sonoran-Serif Bold	2103

APPENDIX L

Using IOwin and Client Access Together in Windows 95/98

You may use both IOwin and IBM's Client Access/400 in Windows 95/98 (but not at the same time). Perform the following steps to configure your system:

1. Load Client Access Win95/98 software or equivalent software.

   NOTE: If you are prompted by Client Access to search for an updated driver or 32 bit driver choose NO.

2. (Optional) In a blank area to the right of the **START** button, right click and choose Properties, choose Start Menu Programs, choose the Remove button, and a listing should appear. Double click Startup and remove the Client Access Service Check. Then Exit.

3. Install the IOWin software.

4. Run emulation and verify the connection with a signon screen.

5. Exit all applications and Windows 95/98

6. Reboot the PC to the DOS Command Prompt only.

7. Edit the AUTOEXEC.BAT file so that the emulation card adapter handler is loaded first, followed by the NStwinax TSR as follows:

   CD\IOWIN
   CONNAH A=D0
   CD\PROGRA~1\IBM\CLIENT~1 (refers to directory where client software is located) **NSTWINAX**
   (Add the command **PAUSE** below **NSTWINAX** if you want the PC to stop booting to verify if these commands executed properly.)

9. Save the **AUTOEXEC.BAT**, and Power Off/On the PC.

10. Watch the system as it loads to see if the adaptor handler & the Nstwinax TSR are loaded.

11. Once the system returns to Windows 95/98, click Start, click Programs, click Client Access, click NSrouter folder, click the NS administrator icon. Right click the **Router** icon and choose Properties. Configure the Router and save it.

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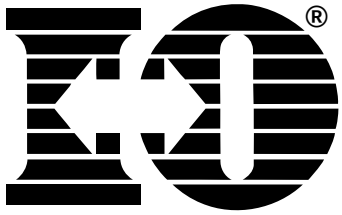
Should you have any questions regarding this agreement, or if you wish to contact I-O Corporation, please write I-O Corporation, 2265 South 3600 West, Salt Lake City, Utah 84119, or call (801) 973-6767.



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SOFTWARE WARRANTY INFORMATION

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Effective July 21, 1995[a]

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- If a product fails call I-O Customer Support for assistance at (801) 972-1446 for locations with the Continental U.S. or International; or 32(0)2 721 20 13 for locations within Europe

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.

I-O Ships Replacement Unit

- I-O will ship a replacement product or part thereof.
- Replacement units carry the same warranty as remaining on the original product.
- I-O's Software Product Warranty Service applies only to warranted product failures. You must pay for non-warranted product repairs or replacement.

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.

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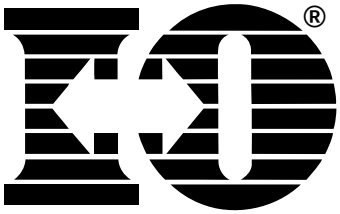
[a] I-O reserves the right to change the terms and conditions of this policy without notice.



"Products That Work"

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HARDWARE WARRANTY INFORMATION

The following policy applies only to hardware (the physical Emulator Card and Twinax Connector). For software see software warranty information.

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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The following policy applies only to hardware (the physical Emulator Card and Twinax Connector). For software see software warranty information.

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.

HARDWARE WARRANTY INFORMATION

The following policy applies only to hardware (the physical Emulator Card and Twinax Connector). For software see software warranty information.

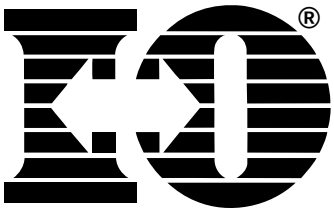
Manufacturer's One Year Limited Warranty (International)

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.



"Products That Work"

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HARDWARE WARRANTY INFORMATION

The following policy applies only to hardware (the physical Emulator Card and Twinax Connector). For software see software warranty information.

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.

HARDWARE WARRANTY INFORMATION

The following policy applies only to hardware (the physical Emulator Card and Twinax Connector). For software see software warranty information.

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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HARDWARE WARRANTY INFORMATION

The following policy applies only to hardware (the physical Emulator Card and Twinax Connector). For software see software warranty information.

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.

GLOSSARY

active session - The host session currently being used, 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 Print 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.

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.

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.

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

GLOSSARY

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 preassigned function of the system.

Command Pass-Thru™ - This 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. Printer-specific command sequences are placed into the data sent to the printer from the host. The emulation software 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.

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.

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

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.

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 midrange 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 - Area between 640K and 1M used as base memory.

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-Thru™

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

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

GLOSSARY

HP mode - A third party printer will receive HP LaserJet commands.

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

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.

keyboard template - A template shows where keys are located on 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) - Manages 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.

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 and dot-matrix 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 function 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.

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.

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.

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

truncate - Breaks or cuts off 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.

GLOSSARY

upper memory block - A block of memory between the 640K unit of conventional memory and 1MB running on MS-DOS or 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.

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