

AS/400

SA41-3130-00

ASCII Work Station Reference

Version 3



AS/400

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(RSFTD201)

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Wyse	Wyse Corp.
WY30	Wyse Corp.
WY50	Wyse Corp.
WY60	Wyse Corp.

About ASCII Work Station Reference (SA41-3130)

This book provides information on how to adjust the settings of ASCII work stations and modems attached to the AS/400 system through the ASCII Work Station Controller and how to use ASCII work stations in the AS/400 system environment. For programmers who need to control ASCII data streams, this book also provides information about data stream interface commands for display stations and printers.

To help users of this book create a run book for their work station operators, this book contains keyboard mappings and character code mappings.

You may need to refer to other IBM books for more specific information about a particular topic. The *Publications Reference*, SC41-3003, provides information on all the books in the AS/400 library.

For a list of related publications, see the "Bibliography" on page K-1.

Part 1 – Reference

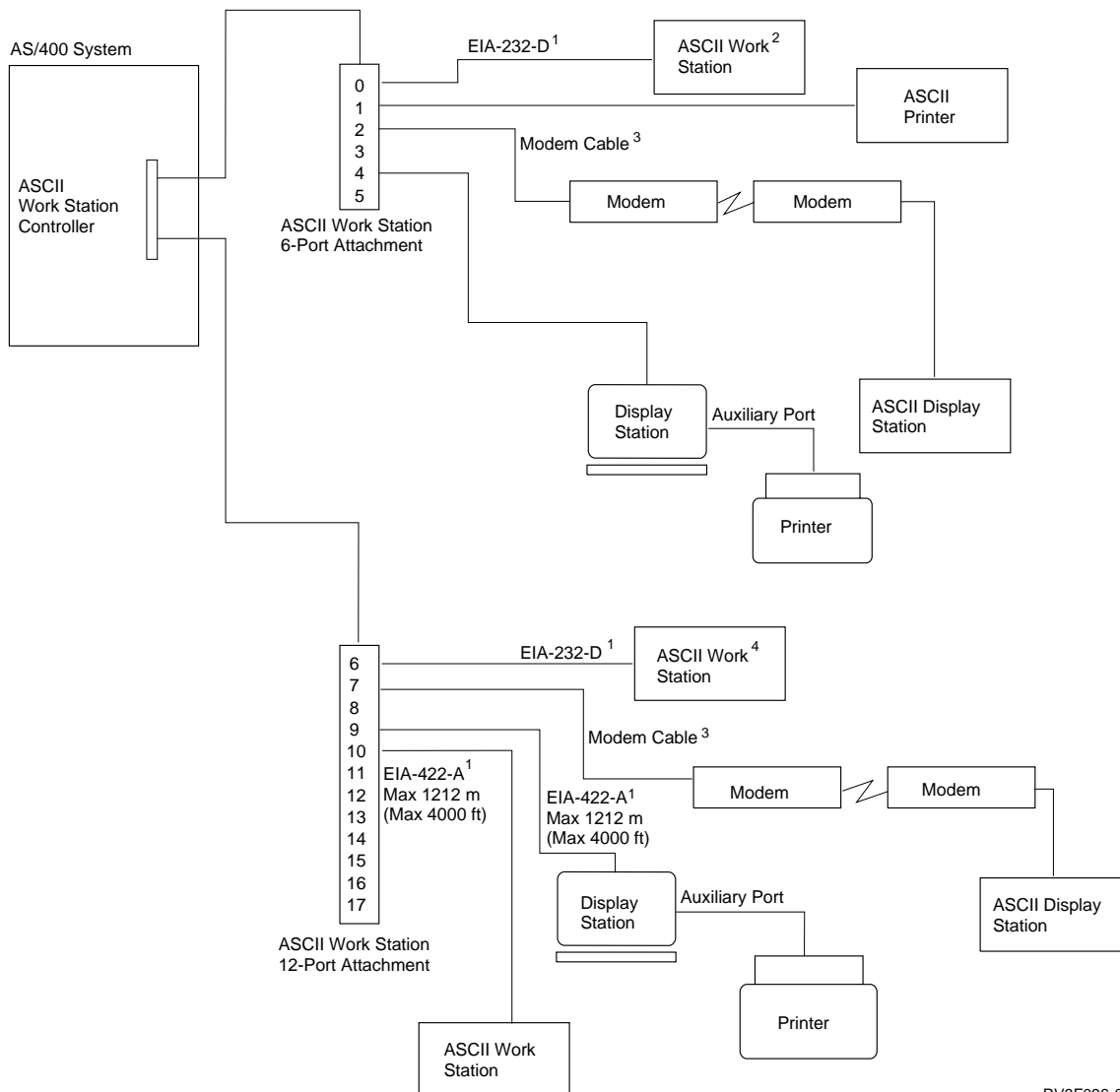
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This chapter provides an overview of the AS/400* system ASCII work station support function. It covers the following topics:

- Brief description of the AS/400 ASCII support function
- Port arrangement
- Work station controller emulation
- ASCII work station parameters
- ASCII consoles supported
- ASCII display stations supported
- Personal computers supported
- ASCII printers supported
- ASCII modems supported
- Attachment methods supported
- National languages supported
- Performance considerations

Figure 1-1 shows the supported functions of the ASCII Work Station Controller for AS/400 System Units.



RV3F096-0

Figure 1-1. An Overview of the AS/400 System Unit ASCII Support

Notes:

1. In this book, the term EIA-232-D refers to the EIA standard RS-232, and EIA-422-A refers to both the EIA standard RS-422 and CCITT standard V.11. See Appendix B, "Suggested Settings for ASCII Printers," for information regarding the two versions of serial interface cards.

For information concerning distance limitations for EIA-232-D cabling, refer to the *Physical Planning Reference*.

2. If an ASCII work station is used as the console, it must be attached to port 0 of the 6-port attachment of the first ASCII Work Station Controller.

3. For specific modem cable requirements, refer to the *Physical Planning Reference*.

4. Personal computers are work stations that can be attached to the system, emulating a supported ASCII display station or running the Client Access/400 licensed program.

Figure 1-2 shows the supported functions of the ASCII Work Station Controller.

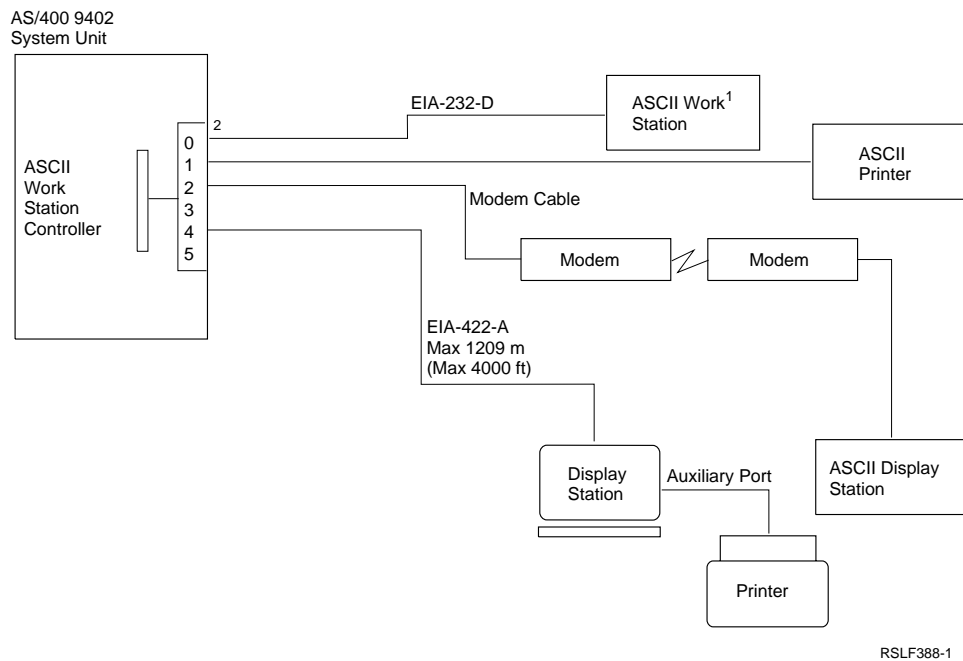


Figure 1-2. An Overview of AS/400 ASCII Support

Notes:

1. On the AS/400 9402 Models Cxx-Fxx system unit, the 2637 ASCII Work Station Controller is the primary ASCII controller in the system. The 2637 controller supports either six built-in ports numbered 0 to 5 (as illustrated in Figure 1-2), or an adapter to which two 6-port attachments are connected. The ports on the two 6-port attachments are numbered 0 to 5 and 6 to 11, respectively. The 2637 ASCII Work Station Controller on the AS/400 9402 Model 20x supports the 6-port and 12-port attachments.

2. The AS/400 9402 System Unit supports the attachment of additional ASCII devices through one or more 6141 ASCII Work Station Controllers installed in the available card slots. A 6141 controller accommodates one 6-port and one 12-port work station attachment.

3. If an ASCII work station is used as the console, it must be attached to port 0 of the 2637 ASCII Work Station Controller.

Certain devices have special cabling requirements. Refer to the *Physical Planning Reference* and individual device user's guides for specific requirements.

Brief Description of the AS/400 ASCII Support Function

The ASCII work station support is provided by the ASCII Work Station Controller, a card installed in the AS/400 system as shown in Figure 1-1 on page 1-2.

The ASCII Work Station Controller translates 5250 data streams to ASCII data streams and vice versa, providing a cost-effective means of connecting ASCII work stations to the AS/400 system. The ASCII Work Station Controller emulates twinaxial work stations for the ASCII work stations it supports, to allow them to take advantage of the AS/400 programs and the AS/400 interactive operations.

This book uses the term **ASCII work stations** to include the following:

- ASCII printers and display stations directly attached to the AS/400 system
- ASCII printers attached to the auxiliary ports of display stations
- ASCII display stations attached to the AS/400 system through modems
- Personal computers and PS/2* work stations running Client Access/400 asynchronous communications

Note: Bar codes and graphics are not supported by the ASCII Work Station Controller.

Port Arrangement

As shown in Figure 1-1 on page 1-2, *one* ASCII Work Station Controller can support 18 ports, through an ASCII Work Station 6-Port attachment and an ASCII Work Station 12-Port attachment. Some ASCII display stations can support an auxiliary ASCII printer. Thus, a maximum of 36 work stations can be physically connected to and configured on each ASCII Work Station Controller. However, only 18 work stations (including auxiliary printers) can be active at the same time.

The 2637 ASCII Work Station Controller supports 12 active work stations using the six ports on the back of the AS/400 9402 System Unit, or 18 active work stations if it is equipped with the feature that accommodates two 6-port attachments or a 6-port and a 12-port attachment. Since each port allows the connection of a display station with an attached auxiliary printer, two devices can be configured and physically connected to the work station controller for each port. However, the maximum number of active devices that the 2637 ASCII Work Station Controller can accommodate is 18.

ASCII Work Station Parameters on the AS/400 System

Figure 1-3 on page 1-5 lists all the ASCII parameters supported on the AS/400 system. Appendix A, "Suggested Settings for ASCII Display Stations," Appendix B, "Suggested Settings for ASCII Printers," and Appendix C, "Suggested Settings for Modems," contain details on suggested settings for the supported ASCII display stations, printers, and modems. For more information on settings for

personal computers running Client Access/400 asynchronous communications, see the *Client Access/400 for DOS Ext Memory User Guide*.

Figure 1-3. ASCII Work Station Parameters

Parameter	Values Supported
Interface	EIA-232-D, EIA-422-A
Line speed	150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 19200, 38400 ¹ bps
Word length	7 bits, 8 bits
Parity	Even, Odd, Mark, Space, None
Stop bits	1, 2

Note:

¹ To allow the PC running Client Access/400 to operate at 38400, the port must be configured for ASCII port sharing using automatic detection of line speed, parity, and word length.

ASCII Consoles Supported

The AS/400 system supports an ASCII display station as the console or as an alternative console. These consoles are used to operate the system and diagnose problems. The display station used as the console or an alternative console must either be an IBM* 3151 or IBM 316X, or support all the same commands and responses that those display stations do. For more information about console setup and requirements, refer to "ASCII Display Station Setup Considerations" on page 2-4.

ASCII Display Stations Supported

The AS/400 system supports ASCII display stations as one of the following: the IBM 3196 Model A2 monochrome twinaxial display station, the IBM 3197 Model C2 color twinaxial display station, or the IBM 3197 Model D2 monochrome twinaxial display station. As shown in Figure 1-1 on page 1-2, ASCII display stations can be attached to the AS/400 system directly or through asynchronous modems.

Figure 1-4 lists the ASCII display stations supported on the AS/400 system and the twinaxial display stations they emulate.

Figure 1-4. AS/400-Supported ASCII Display Stations and Emulations

ASCII Display Stations Supported	Emulated Twinaxial Displays
IBM 3101 (Model 23)	3196-A2
IBM 3151 (Models 11, 31, 41, 805) ¹	3196-A2 or 3197-D2 ²
IBM 3161	3196-A2
IBM 3162	3196-A2 or 3197-D2
IBM 3163	3196-A2
IBM 3164	3197-C2
IBM Personal Computers emulating a supported display	3196-A2 or 3197-C2
Dasher** D220	3197-C2
DEC** VT 100 (101 level), VT 220	3196-A2
TeleVideo** 910, 925, 955	3196-A2
Wyse**, WY30**, WY50**, WY60**	3196-A2
ALIS** AVT 220 (Arabic)	3196-A2
Visual 600, Model V603, VT 220 (Hebrew)	3196-A2

¹ Model 805 is available as Request for Price Quotation (RPQ) number RJ0140.

² The 3197-D2 emulation enables 132 column capability. The 3151 must have the Cartridge for Expansion (part number 81X5575) inserted before it can emulate the 3197-D2.

Note: For IBM 3151 display stations, the Cartridge for Expansion may only be used with Model 31 or 41. For more information, see “132 Column Support” on page 3-13.

Other ASCII display stations can be attached to the AS/400 system, if they can emulate one of the supported display stations and have the following characteristics:

- Operate in character mode.
- Use either the EIA-232-D or EIA-422-A interface.
- Use standard 128-character ASCII (7- or 8-bit data with or without parity).
- Use asynchronous full-duplex communications with or without modem control.
- Operate within the parameters shown in Figure 1-3 on page 1-5.
- Support the command set of a display station listed in Figure 1-4 on page 1-5.
- Can prevent screen scrolling.

Through the use of the work station customizing functions available on the AS/400 system, ASCII display stations other than those types listed in Figure 1-4 on page 1-5 can be attached to the ASCII work station controller. The customizing functions allow the user to specify all the parameters needed to support an ASCII display on the ASCII Work Station Controller.

An ASCII display station attached to an ASCII Work Station Controller using the customizing functions must conform to all of the device characteristics listed, except the need to support the command set of one of the displays listed in Figure 1-4 on page 1-5. You can use the customizing functions to specify these commands,

which enables devices with command sets differing from those listed in Figure 1-4 on page 1-5 to be attached to the AS/400 system. Refer to “Customizing Work Stations Attached to an ASCII Work Station Controller” on page 3-15 for additional information on the work station customizing functions.

You are responsible for verifying the satisfactory operation of any display station not listed in Figure 1-4 on page 1-5. This applies to display stations emulating one of the listed displays or display stations attached through the customizing functions.

Personal Computers Supported

The ASCII Work Station Controller supports personal computers in the following ways:

- Personal computers running an emulation program for one of the supported ASCII displays
- Personal computers running Client Access/400 asynchronous communications

ASCII Printers Supported

The ASCII Work Station Controller only supports serial ASCII printers attached to the AS/400 system directly or through the auxiliary ports of display stations. See “Special Considerations for Auxiliary Printers” on page 2-11 for more information. Printers attached to the system through modems are not supported.

The work station controller allows the supported ASCII printer to emulate an IBM 5256, IBM 5224, IBM 5219, or IBM 3812 twinaxial printer. ASCII printers with functional capabilities beyond those available on the emulated twinaxial printers may be supported, but their additional capabilities are not available.

Figure 1-5 lists the ASCII printers supported on the AS/400 system and the twinaxial printers they emulate.

Figure 1-5 (Page 1 of 2). AS/400-Supported ASCII Printers and Emulations

Printers Supported	Emulation
IBM 2380 (Personal Printer Series II)	5224-1, 5256-3
IBM 2381 (Personal Printer Series II)	5224-1, 5256-3
IBM 2390 (Personal Printer Series II)	5219-D2, 5224-1, 5256-3
IBM 2391 (Personal Printer Series II)	5219-D2, 5224-1, 5256-3
IBM 4019-001 (LaserPrinter)	3812-1, 5219-D2, 5224-1, 5256-3
IBM 4019-E01 (LaserPrinter)	3812-1, 5219-D2, 5224-1, 5256-3
IBM 4029 (Models 10, 20, 30, 40)	3812-1, 5219-D2, 5224-1, 5256-3
IBM 4037 (Model 5E)	3812-1, 5219-D2, 5224-1, 5256-3
IBM 4072 (ExecJet*)	3812-1, 5219-D2, 5224-1, 5256-3
IBM 4076 (ExecJet II*)	5219-D2, 5224-1, 5256-3
IBM 4201-2 (Proprinter* II)	5224-1, 5256-3
IBM 4201-3 (Proprinter III)	5224-1, 5256-3
IBM 4202-1 (Proprinter XL)	5224-1, 5256-3

Figure 1-5 (Page 2 of 2). AS/400-Supported ASCII Printers and Emulations

Printers Supported	Emulation
IBM 4202-2 (Proprinter II XL)	5224-1, 5256-3
IBM 4202-3 (Proprinter III XL)	5224-1, 5256-3
IBM 4207-1 (Proprinter X24)	5219-D2, 5224-1, 5256-3
IBM 4207-2 (Proprinter X24E)	5219-D2, 5224-1, 5256-3
IBM 4208-1 (Proprinter XL24)	5219-D2, 5224-1, 5256-3
IBM 4208-2 (Proprinter XL24E)	5219-D2, 5224-1, 5256-3
IBM 4216-10 (Personal Pageprinter)	3812-1, 5219-D2, 5224-1, 5256-3
IBM 4224 (Model 301, 302, and 3E3)	5219-D2, 5224-1, 5256-3
IBM 4226 (Model 302)	5224-1, 5256-3
IBM 4232 (Model 302)	5224-1, 5256-3
IBM 4234-13 (Dot Band Printer)	5224-1, 5256-3
IBM 5204 (Quickwriter*)	3812-1, 5219-D2, 5224-1, 5256-3
IBM 6252-AS8 (Impactwriter*)	5224-1, 5256-3
IBM 6408 (Models A00, CTA)	5224-1, 5256-3
IBM 6412 (Models A00, CTA)	5224-1, 5256-3

Only those IBM 420X printers with serial interface cards installed are supported by the ASCII Work Station Controller. The serial interface card can be ordered by the part number 6493187 or part number 23F4395, depending on the printer model.

The following parts are used in conjunction with the cables listed in "Learning about the Cables to Use" on page 10-4.

- A serial interface module is required to attach the IBM Personal Printer Series II printers. The serial interface module part number is 79F4758; the feature number is 5216.
- A serial interface feature is required to attach the IBM 4072 ExecJet printer. The serial interface feature part number is 1232334; the feature number is 0334.
- A system interface feature is required to attach the IBM 4037 or 4076 printer. The serial interface adapter part number is 1363110; the feature number is 3110.
- A system serial cable connector is required to attach the IBM 4019, 4029, 4226 or 5204 Printer to the ASCII Work Station Controller. The cable connector is ordered by the part number 1319143.

Other printers can be attached to the AS/400 system:

- Printers that can emulate one of the supported printers can be attached to the AS/400 system.
- Printers that are configured to use the host print transform function can be attached to the AS/400 system. For example, many ASCII printers sold by the following companies can be attached if they are configured to use the host print transform function:

Epson** America Incorporated

Hewlett-Packard** Company
IBM Corporation
NEC** Corporation
Okidata** Corporation
Panasonic** Corporation

See the *Printer Device Programming* book for information on configuring ASCII printers to use the host print transform function.

All ASCII printers you attach must have the following characteristics:

- Use asynchronous full-duplex communications
- Use either the EIA-232-D or EIA-422-A interface, or the appropriate interface for an auxiliary port on a display station
- Use standard 128-character ASCII (7- or 8-bit data with or without parity)
- Have minimum carriage width of 20 cm (8 inches)
- Do not create a line feed when receiving a carrier return
- Use DTR or XON/XOFF for flow control
- Operate within the parameters shown in Figure 1-3 on page 1-5

The work station customizing functions available on the AS/400 system enable you to specify all the parameters needed to support an ASCII printer on the ASCII Work Station Controller, including ASCII printers not listed in Figure 1-5.

If you attach an ASCII printer using the customizing functions, the printer must conform to the device characteristics listed. Refer to “Customizing Work Stations Attached to an ASCII Work Station Controller” on page 3-15 for additional information on the work station customizing functions. The work station customizing functions are described in detail in the *Workstation Customization Programming* book.

You are responsible for verifying the satisfactory operation of any printer not listed in Figure 1-5 on page 1-7. This applies to printers emulating one of the listed printers, or to printers attached by means of the customizing functions.

Modems Supported

The ASCII Work Station Controller supports modems compatible with BELL 212A, EIA-232-D, or V.24/V.28 interface.

The following modems have been tested with the ASCII Work Station Controller:

- IBM 5811-20, IBM 5812-10, IBM 5841, IBM 5842, IBM 5853, and IBM 7855
- Concord 224** Auto Dial
- Hayes** Smartmodem** 1200**, Smartmodem 2400**, Smartmodem 9600, and ULTRA Smartmodem 9600
- Racal-Vadic** 2400PA
- Cermetek Spectrum 9600FR**
- Telebit T2000
- MicroCom AX/2400/C, AX/9624/C, and QX/4232/HS

See Appendix C, “Suggested Settings for Modems” for suggested settings for these modems.

Other modems that have the characteristics listed below can be attached to the ASCII Work Station Controller, but the user must verify that the operation of a particular modem is satisfactory. The required characteristics are as follows:

- Operates in character mode
- Uses the EIA-232-D interface
- Uses standard 128-character ASCII (7-or 8-bit data with or without parity)
- Uses asynchronous full-duplex communications
- Operates within the parameters shown in Figure 1-3 on page 1-5

Attachment Methods Supported

The ASCII Work Station Controller supports the EIA-232-D and EIA-422-A interface.

The *Physical Planning Reference* contains more detailed information about cabling.

The modems can be on switched lines or nonswitched lines provided by common or private communications carriers. For more information about modem requirements, refer to "Modem Requirements" on page 2-14 of this book.

The attachment settings are defined in Figure 1-6.

Figure 1-6. AS/400-Supported Attachment Settings

Attachment (Chosen at Config- uration)	Interface Signal Levels	Outbound Flow Control	Connect Control	Required Interface Cable	Interface Type
Direct	EIA-232	XON/XOFF	DTR	Direct	Serial
Modem	EIA-232	XON/XOFF and RTS/CTS	DCD	Crossover	Serial
PTT	EIA-232	XON/XOFF and RTS/CTS	DSR	Crossover	Serial
3-Wire	EIA-232	XON/XOFF	PERM	Direct	Serial
4-Wire	EIA-232	DTR	PERM	Direct	Serial
EIA-422	EIA-422	XON/XOFF	PERM	Direct	Serial

National Languages Supported on Display Stations

The ASCII Work Station Controller supports national languages other than United States English. Support for these languages is provided at two levels:

- A base level of support is provided if the display station is configured without specifying a customizing object (created using the customizing functions available on the AS/400 system) in the device description for the display. For the base level of support, there are restrictions on the keyboard language types that can be configured and on the display types for which languages other than US English may be configured. For those language and device types supported at the base level, the ASCII Work Station Controller uses a set of default character mapping tables to handle all the necessary translations between EBCDIC and ASCII character sets.

- An expanded level of national language support is provided if the display station is configured with a customizing object specified. Additional language types are available to be configured for an ASCII display, and these language types can be selected for any of the ASCII display types supported by the ASCII Work Station Controller.

The following sections further describe these two levels of national language support.

Base National Language Support on Display Stations

The base national language support for ASCII display stations supports a particular set of national languages on specific types of ASCII display stations. With the exception of the Arabic and Hebrew languages, the base national languages are supported only on ASCII display stations and printers that are manufactured by the IBM Corporation. Figure 1-4 on page 1-5 lists ASCII display stations that will support the Arabic and Hebrew national languages.

Notes:

1. Arabic National Language Support is provided on the ASCII Work Station Controller for the ALIS AVT 220 ASCII display. When configuring this display, V220 must be selected as the device type.
2. Hebrew National Language Support is provided on the ASCII Work Station Controller for the Visual V603 VT 220 ASCII display. When configuring this display, V220 must be selected as the device type.

The keyboard and language type is selected by the user during device configuration. The keyboard and language type selected for a particular device determines how the ASCII Work Station Controller translates EBCDIC character codes into ASCII character codes and vice versa.

If US/Canada or US/Canada Multinational Character Set is selected as the keyboard and language type, the ASCII Work Station Controller will translate EBCDIC characters into the United States ASCII character set. If any other keyboard and language type is selected, the ASCII Work Station Controller assumes that a national language ASCII character set is installed in the device, and EBCDIC-to-ASCII character translations are done based on the device type and the keyboard and language type selected.

For IBM display stations, the national languages are provided through plug-in cartridges and language-specific keyboards, which are shipped (when ordered) with the display stations. Refer to the user's manual for the display station for instructions on how to install the national language feature.

There are three types of ASCII character sets defined for national languages on IBM display stations:

- National Code Page (NCP) character set, defined for French, Canadian French, UK English, German, Italian, and Spanish
- Multinational Languages Code Page (MLP) character set, which conforms to the code page defined by ISO-8859, for all the languages listed in Figure 1-7 on page 1-12

- 3101 character set, which is defined for French, German, Italian, UK English, and Canadian French (Bilingual French) and supported by the ASCII Work Station Controller only on IBM 3101 display stations

Figure 1-7 summarizes the ASCII character sets that must be used for IBM display stations attached to the ASCII Work Station Controller.

Figure 1-7. National Languages Supported on IBM Display Stations

Languages Supported	3151, 3161, 3162	3163, 3164	3101
Spanish ¹	MLP	NCP	
UK English	MLP	NCP	3101
Italian	MLP	NCP	3101
French	MLP	NCP	3101
German	MLP	NCP	3101
Canadian French	MLP	NCP	3101
Belgium (Dutch)	MLP	MLP	
Finnish, Swedish	MLP	MLP	
Danish	MLP	MLP	
Norwegian	MLP	MLP	
Portuguese	MLP	MLP	
Swiss French	MLP	MLP	
Swiss German	MLP	MLP	

¹ Spanish language includes Latin American Spanish.

Expanded National Language Support on Display Stations

The customizing functions on the AS/400 system support an expanded level of national language support on ASCII display stations. You create a customizing object using the work station customizing functions, and specify the customizing object in the device description for an ASCII display.

This level of support provides you with an expanded list of keyboard language types from which to choose when configuring a work station. In addition, it eliminates the restrictions on which language types can be configured for a given type of ASCII display. The base support restricts the use of some languages to particular types of ASCII displays.

The ASCII Work Station Controller provides default mapping tables that map between the Multinational EBCDIC and United States ASCII code pages for keyboard language/display type combinations that are not supported at the base level. If you specify a customizing object in a device description and the language/display type combination configured is not one that is supported at the base level, you must provide EBCDIC-to-ASCII and ASCII-to-EBCDIC translation information within the customizing object. This entails replacing the default mapping tables with mapping information specific to the EBCDIC and ASCII code pages to be used for the device you are configuring.

Figure 1-8 on page 1-13 lists the language types that can be configured with this level of support, and specifies the following information for each:

- The value to be entered for the KBDTYPE parameter in the device description.
- The EBCDIC code page associated with that keyboard language type.
- An indicator of the extent to which this keyboard language type is supported in the base level (if blank, it is not supported at all in the base level).

Figure 1-8 (Page 1 of 2). Language Types Configured with Expanded National Language Support

Language Type/ Country	KBDTYPE	EBCDIC Code Page	Base Language Support
Arabic	CLB	420	4
Austria/Germany	AGB	273	2
Brazilian Portuguese	BRB	037	
Bulgaria	BGB	1025	
Canadian French	CAB	260	2
Cyrillic	CYB	880	
Czech Republic	CSB	870	
Denmark	DMB	277	3
Finland/Sweden	FNB	278	3
France (Azerty)	FAB	297	2
Greek (Code page 875)	GNB	875	
Greek (Code page 423)	GKB	423	
Hebrew	NCB	424	4
Hungary	HNB	870	
Iceland	ICB	871	
Italy	ITB	280	2
Latin 2	ROB	870	
Macedonia	MKB	1025	
Netherlands	NEB	037	
Norway	NWB	277	3
Poland	PLB	870	
Portugal	PRB	037	3
Romania	RMB	870	
Russia	RUB	1025	
Serbia (Cyrillic)	SQB	1025	
Slovakia	SKB	870	
Spain	SPB	284	3
Spanish Speaking	SSB	284	3
Thailand	THB	838	
Turkey	TKB	1026	

Figure 1-8 (Page 2 of 2). Language Types Configured with Expanded National Language Support

Language Type/ Country	KBDTYPE	EBCDIC Code Page	Base Language Support
United Kingdom	UKB	285	2
United States/Canada	USB	037	1
Languages of the former Yugoslavia	YGI	870	
Multinational	AGI CAI FAI ITI UKI	500	2
	BLI DMI FNI NWI PRI		2
	SPI SSI SFI SGI		2
	USI		1
	ALI ICI NEI		

Note: The four types of base level language support for ASCII displays are defined as follows:

1. The language can be selected for any ASCII display type configured.
2. The language can be selected if the display type configured is an IBM ASCII display (IBM 3101, IBM 3151, IBM 316X displays).
3. The language can be selected if the display type configured is an IBM 3151 or IBM 316X display.
4. This language can be selected if the display type configured is a VT220.

National Languages Supported on Printers

The national language support feature is built in for printers. The national language is selected at configuration time. The *Physical Planning Reference* contains more detailed information.

The following types of ASCII character sets are defined for IBM ASCII printers supported by the ASCII Work Station Controller:

Character Set 437 (Personal Computer Character Set 2) is used to map the national languages supported on IBM 4201-2, 4202-1, 4202-2, 4207-1, and 4208-1 printers.

Character Set 256 (International Number 1 Character Set) is used to map the national languages supported by the IBM 4224 printers.

Character Set 850 (Personal Computer Multinational Character Set) is used to map the national languages supported by the IBM 4019-E01, 4019-001, 4201-3, 4202-3, 4207-2, 4208-2, 4216-10, 4234-13, 6252-AS8, and 5204 printers.

Figure 1-9 lists languages supported on printers by the ASCII Work Station Controller. These languages do not include all the languages supported by the AS/400 system.

Figure 1-9. National Languages Supported on IBM Printers

Languages Supported	4201-2, 4202-1, 4202-2, 4207-1, 4208-1	4224	4201-3, 4202-3, 4207-2, 4208-2, 4216-10, 6252-AS8, 4234-13, 5204, 4019
Spanish ¹	437	256	850
UK English	437	256	850
Italian	437	256	850
French	437	256	850
German	437	256	850
Canadian French	437	256	850
Belgium (Dutch)	437	256	850
Finnish, Swedish	437	256	850
Danish	437	256	850
Norwegian	437	256	850
Portuguese	437	256	850
Swiss French	437	256	850
Swiss German	437	256	850
Hebrew	862	-----	862
Arabic	864	-----	864

¹ Spanish language includes Latin American Spanish.

You can use the work station customizing functions available on the AS/400 system to modify the EBCDIC-to-ASCII character translations for ASCII printers. In addition, if you specify a customizing object in the device description for a printer, you can expand the list of language types that can be selected when configuring the printer (see Figure 1-8 on page 1-13). Refer to “Customizing Work Stations Attached to an ASCII Work Station Controller” on page 3-15 for further information on the work station customizing functions.

Performance Considerations

The performance of ASCII work stations can be affected by the environment in which they are used, as follows:

- Because the ASCII Work Station Controller transmits its data serially to the attached devices using EIA-232-D or EIA-422-A interfaces, the system response is a function of how the ASCII work stations are configured on the AS/400 system. The lower the line speed selected, the slower the response time of the displays.
- Printers attached to auxiliary ports will affect the performance of the display stations because the data is transferred serially to both the display station and the printer on the same port.
- If modems are used, the line speed of work stations is restricted by the speed of the modems.
- When using modems, set the work stations to the highest line speed that the modems can handle. For information on the highest line speed a modem can handle, see the reference manual for the modem.

For example, when using Hayes Ultrasmart 9600 modems, set the line speeds of the work station and the AS/400 system to 19200 bits per second. This allows the modems to use their advanced features, and may enhance the overall throughput. For information on suggested line speed settings for modems, see Appendix C, "Suggested Settings for Modems."

Chapter 2. Work Station and Modem Setup Considerations

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An Outline of the Setup Process

The term **setup** in this book refers to the process of attaching ASCII work stations to the ASCII Work Station Controller and making necessary adjustments to the work stations so that the ASCII work stations and the AS/400 system can communicate with each other. The setup process consists of the following basic phases:

- Planning cable requirements and ordering cables. Detailed information can be found in the following books:
 - *Physical Planning Reference*
 - *9402 Models 1xx and Axx-Fxx Cable Attachment* book
 - *9404 Models Bxx-Fxx Cable Attachment* book
 - *9406 Models Bxx-Fxx Cable Attachment* book
 - *940x Models 2xx/3xx Cable Attachment* book
- Attaching ASCII work station and communications cables. Refer to the following books for more information:
 - *9402 Models 1xx and Axx-Fxx Cable Attachment* book
 - *9404 Models Bxx-Fxx Cable Attachment* book
 - *9406 Models Bxx-Fxx Cable Attachment* book
 - *940x Models 2xx/3xx Cable Attachment* book
- Adjusting ASCII work station and modem settings (explained in this chapter).
- Adjusting personal computer settings (refer to the *Client Access/400 for DOS Ext Memory Setup* book).
- Configuring the devices on the AS/400 system.

From a technical standpoint, these phases are independent of one another and can be performed separately. However, all phases must be completed before the system and the ASCII work stations can communicate with each other.

This chapter focuses on the adjustment of ASCII work station settings. It includes the following sections:

- Guidelines for ASCII work station setup
- Display station setup considerations for consoles, alternative consoles, and personal computers
- Printer setup considerations for auxiliary printers, which include information on ASCII work station, display station, and printer settings
- Modem setup considerations, which include information on adjusting ASCII modems

Guidelines for ASCII Work Station Setup

Although the phases of setting up the ASCII work stations for interaction with the AS/400 system can be performed separately, the following guidelines are recommended:

Note: The guidelines focus on ASCII work stations without modems. Refer to “Modem Setup Considerations” on page 2-13 for modem attachment considerations.

1. Attach the ASCII Work Station Attachments to the ASCII Work Station Controllers.

It is assumed that the cable type has been selected and that the physical connection is already complete. If not, refer to the following books for more information:

- *Physical Planning Reference*
- *9402 Models 1xx and Axx-Fxx Cable Attachment* book
- *9404 Models Bxx-Fxx Cable Attachment* book
- *9406 Models Bxx-Fxx Cable Attachment* book
- *940x Models 2xx/3xx Cable Attachment* book

For a new AS/400 system, this task is performed by IBM or IBM-authorized personnel.

2. If an ASCII display station is to be used as the console, it must be attached to:
 - Port 0 on the back of an AS/400 9402 System Unit with a 2637 ASCII Work Station Controller
 - Port 0 of the first 6-Port Attachment connected to the adapter on the 2637 ASCII Work Station Controller
 - Port 0 of the 6-Port Attachment connected to the first 6141 ASCII Work Station Controller in a 9404 System Unit or 9406 System Unit.

Refer to “Console” on page 2-4 for details regarding console requirements.

3. Adjust the console according to the required console settings.

For a new AS/400 system, this task is performed by IBM or IBM-authorized personnel.

Note that the ASCII console settings should *not* be changed after they are adjusted by IBM or IBM-authorized personnel. Further, the AS/400 system has a predefined configuration for the ASCII console. This configuration must *not* be changed or deleted. Refer to “Console” on page 2-4 for details regarding console requirements.

4. Attach the other display stations to the ASCII Work Station Controller Attachments and the printers to the ASCII Work Station Controller Attachments or the display station auxiliary printer ports, including the console auxiliary printer port if applicable.

For details on attaching work station cables to the 6-Port or 12-Port Attachments, refer to:

- *9404 Models Bxx-Fxx Cable Attachment* book
- *9402 Models 1xx and Axx-Fxx Cable Attachment* book
- *9406 Models Bxx-Fxx Cable Attachment* book
- *940x Models 2xx/3xx Cable Attachment* book

Refer to “Special Considerations for Auxiliary Printers” on page 2-11 in this book for details regarding printers attached to display station auxiliary ports.

For details regarding printers attached to a personal computer printer port, see the *Client Access/400 for DOS Ext Memory Setup* book.

5. On each ASCII work station, adjust the settings according to the suggested settings in Appendix A, “Suggested Settings for ASCII Display Stations” and Appendix B, “Suggested Settings for ASCII Printers.” The suggested settings are based on performance considerations.
6. On the AS/400 system, configure each ASCII work station. Make sure that the console is already active and that the initial program load (IPL) of the AS/400 system has already completed. Then vary on the ASCII work stations by typing in the AS/400 VRYCFG command or the WRKCFGSTS command. From then on, the AS/400 will vary on the configured devices automatically when the system initial program load is completed, if the Online at IPL (ONLINE (*YES)) parameter is specified when creating the AS/400 device descriptions.

This task prepares the system to communicate with each type of ASCII work station that is attached to each port on the ASCII Work Station Controller.

Configuration tells the system what type of ASCII work station is on each port, and varying on tells the system which ASCII work station should be activated.

Notice that the configuration parameter defaults need not be changed as long as the ASCII work stations are adjusted according to the suggested settings.

ASCII Display Station Setup Considerations

Display station setup considerations include the following:

- Console
- Alternative console
- Personal computers
- Types of display station setting adjustments

Console

The console is a display station designated to control and operate the AS/400 system.

An ASCII display station that is used as a console must meet the following requirements:

- It must be an IBM 3151 display station, an IBM 316X display station, or a display station that emulates one of these.
- It must be attached through an EIA-232-D direct cable to port 0 of the first ASCII Work Station Controller on bus 0 (the first card enclosure on the AS/400 system or plate on the back of the AS/400 9402 Cxx-Fxx system).
- It must be physically located within 6.09 meters (20 feet) of the AS/400 system.

The console settings are adjusted (IBM display stations) or verified (non-IBM display stations) by IBM or IBM-authorized personnel when the system is installed. *These settings should not be changed by the users.* However, if the settings are accidentally changed, refer to Appendix A, “Suggested Settings for ASCII Display Stations” to obtain the correct settings for your console.

A customizing object cannot be specified in the device description of the console display station.

Alternative Console

An ASCII alternative console is supported only when the AS/400 system has more than one work station controller and the second controller is an ASCII Work Station Controller. The alternative console is a display station designated to control and operate the AS/400 system when the console is not available.

The requirements for an ASCII alternative console are as follows:

- It must be an IBM 3151 display station, an IBM 316X display station, or a display station that emulates one of these.
- It must be attached directly to port 0 of the *second* work station controller on the AS/400 system.
- It must be adjusted with exactly the same settings as those listed in Appendix A, "Suggested Settings for ASCII Display Stations" for the display station you are using as a console.

Personal Computers

A personal computer must first be equipped with an asynchronous adapter card (EIA-232-D or EIA-422-A interface card) and the related software program to emulate one of the supported ASCII display stations or Client Access/400 before it can be attached to the ASCII Work Station Controller Attachment and communicate with the AS/400 system.

For details on methods to adjust personal computer settings, see the personal computer ASCII emulation books. For information on setting up your personal computer to run Client Access/400, see the *Client Access/400 for DOS Ext Memory Setup* book.

The AS/400 device configuration procedures for personal computers attached to the ASCII Work Station Controller are the same as those for other supported ASCII display stations.

Types of Display Station Setting Adjustments

Settings on some ASCII display stations are adjusted through an online utility. For instance, the IBM 3161 and IBM 3163 display stations are adjusted through a Setup Menu available on the display stations as shown in Figure 2-1 on page 2-6.

```

          Setup Menu
-----
Press Space to select alternatives.

Machine Mode   IBM 3161
Operating Mode BLOCK

          Main Port      Auxiliary Port
-----
Interface      RS-232C
Line Control    PRTS
Line Speed (bps) 9600      9600
Parity          ODD        ODD
Turnaround Character ETX
Stop Bit        1          1
Word Length (bits) 7          7
Response Delay (ms) 100
Break Signal (ms) 500

Terminal ID: _____ Up to 20 alphanumeric
                        characters are allowed.

-----
When all finished, press Send Press Setup to quit.

```

Figure 2-1. Sample Setup Menu for IBM 3161 Display Station

Settings on some other ASCII display stations are adjusted using hardware switches.

Each ASCII display station may be adjusted differently. Follow the work station user's manual shipped with each work station for specific procedures to adjust the settings.

Specifying a Terminal Identifier

The terminal ID of 3151 and 316x devices can be configured on the physical device. Specify the terminal ID in the *Terminal ID* field of the setup menu. You can use from 1 to 20 characters in the *Terminal ID* field to identify the physical device.

The terminal ID is made available to a user application through the QDCRDEVD application program interface (API). You must have automatic detection of device type (as described in "Automatic Detection of Device Type" on page 3-12) specified to use the QDCRDEVD API. See the *System API Reference* for more information on the QDCRDEVD API.

Example: Adjust Settings on IBM 3151 Display Station

This example gives step-by-step instructions to adjust an IBM 3151 display station that uses an online utility. The following is assumed:

- The display station has been unpacked, assembled, and positioned.
- An EIA-232-D interface is used.
- The display station has an auxiliary printer attached.
- The suggested settings in Appendix A, "Suggested Settings for ASCII Display Stations," are used to adjust the display station.
- The display station does not have the Cartridge for Expansion inserted.

Display Station Key Sequences

To accomplish the setup task, you need to use the following keys and key sequences as shown in Figure 2-2 on page 2-7.

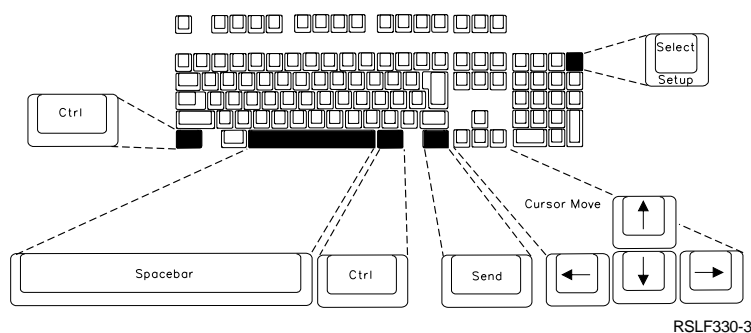


Figure 2-2. IBM 3151 Keyboard

Cursor movement keys

Use these keys to move the cursor from one field to another on the screen.

Ctrl + Setup key sequence

Press and hold the Ctrl key, press the Setup key once, then release both keys to enter or exit the Setup Menu.

Spacebar

Press and release the spacebar alternately to select the required values provided by the display station.

Send key Press the Send key to go to the next menu or display.

Adjusting the IBM 3151 display station involves the display station's Setup Menu. This menu has four related displays. The adjustment process consists of four main phases:

1. Adjust the General display
2. Adjust the Communication display
3. Adjust the Keyboard/Printer display
4. Save the adjustments

Preparations

- Step 1. Have with you the book shipped with the display station for reference.
- Step 2. Make a copy of the suggested settings for the IBM 3151 display station in Appendix A, "Suggested Settings for ASCII Display Stations."
- Step 3. Connect the power cord of the display station to the power source.

Phase 1: Adjust the General Display

- Step 1. Set the power switch to On (I).
- Step 2. If the General display of the Setup Menu appears with the reverse image on GENERAL as shown in Figure 2-3, then go to step 3 on page 2-8.

Otherwise, use the Ctrl + Setup key sequence to go to the General display.

Note: If the General display did not appear, it may be that the display station was previously adjusted.

SETUP MENU			
GENERAL	COMMUNICATION	KEYBOARD/PRINTER	FUNCTION
Machine Mode	IBM 3151	Forcing Insert	OFF
Screen	NORMAL	Tab	FIELD
Row and Column	24 x 80		
Scroll	JUMP		
Auto LF	ON		
CRT Saver	OFF	Term.ID _____	
Line Wrap	ON		

- Step 3. Verify that the value for the *Machine Mode* prompt is IBM 3151. If it is correct, go to the next step. If it is not, alternately press and release the spacebar until IBM 3151 appears. Then, go to the next step.
- Note:** Setup value defaults on the display are replaced with the ones for the new machine mode.
- Step 4. Move the cursor to the next prompt, using the Down Arrow key.
- Step 5. Verify that the value for the next prompt matches the suggested setting. If it does not, alternately press and release the spacebar until the suggested value appears. Then, go to the next step.
- Step 6. Repeat steps 4 and 5, until all the values on this display match those suggested.
- Step 7. Specify an identifier for the display in the *Term. ID* prompt. For this example, use DISPLAY01 as the terminal identifier.
- Note:** This step is optional. If you specify a terminal identifier, it can be made available to a user application through the QDCRDEVD API. See the *System API Reference* for more information on the QDCRDEVD API.
- Step 8. Verify the values of all the prompts on the General display according to the table of suggested settings. They should appear as shown in Figure 2-4 on page 2-9.

Figure 2-4. Correct Values for IBM 3151 Display Station General Display

SETUP MENU			
GENERAL	COMMUNICATION	KEYBOARD/PRINTER	FUNCTION
Machine Mode	IBM 3151	Forcing Insert	OFF
Screen	NORMAL	Tab	FIELD
Row and Column	24 x 80		
Scroll	JUMP		
Auto LF	OFF		
CRT Saver	OFF	Term.ID DISPLAY01_____	
Line Wrap	OFF		

Phase 2: Adjust the Communication Display

- Step 1. Press the Send key to go to the Communication display as shown in Figure 2-5.

Figure 2-5. Communication Display of IBM 3151 Display Station

SETUP MENU			
GENERAL	COMMUNICATION	KEYBOARD/PRINTER	FUNCTION
Operating Mode	ECHO		
Line Speed (bps)	9600	Line Control	PRTS
Word Length (bits)	7	Break Signal (ms)	500
Parity	ODD	Send Null Suppress	ON
Stop Bit	1	Pacing	OFF
Turnaround Character	ETX		

- Step 2. Verify that the value for the *Operating Mode* prompt matches the suggested setting. If it does, go to the next step. If not, alternately press and release the spacebar until the suggested value appears. Then, go to the next step.
- Step 3. Move the cursor to the value for the next prompt, using the Down Arrow key. Verify that the value for the prompt matches the suggested setting. If it does, go to the next step. If not, alternately press and release the spacebar until the suggested value appears. Then, go to the next step.
- Step 4. Repeat step 3 until all the values on the Communication display match the suggested values.
- Step 5. Verify the values on the Communication display. The new values should appear as shown in Figure 2-6.

Figure 2-6 (Page 1 of 2). Correct Values for IBM 3151 Display Station Communication Display

SETUP MENU			
GENERAL	COMMUNICATION	KEYBOARD/PRINTER	FUNCTION
Operating Mode	ECHO		
Line Speed (bps)	19200	Line Control	IPRTS
Word Length (bits)	8	Break Signal (ms)	500

Figure 2-6 (Page 2 of 2). Correct Values for IBM 3151 Display Station Communication Display

SETUP MENU			
GENERAL	COMMUNICATION	KEYBOARD/PRINTER	FUNCTION
Parity	EVEN	Send Null Suppress	ON
Stop Bit	1	Pacing	ON
Turnaround Character	ETX		

Phase 3: Adjust the Keyboard/Printer Display

- Step 1. Press the Send key to go to the Keyboard/Printer display as shown in Figure 2-7.

Figure 2-7. Keyboard/Printer Display of IBM 3151 Display Station

SETUP MENU			
GENERAL	COMMUNICATION	KEYBOARD/PRINTER	FUNCTION
KEYBOARD		PRINTER	
Enter	RETURN	Line Speed (bps)	9600
Return	Field	Word Length (bits)	7
New Line	CR	Parity	ODD
Send	PAGE	Stop Bit	1
Insert Character	MODE	Characters	NATIONAL

- Step 2. Verify that the value of the *Enter* prompt matches the suggested setting. If it does, go to the next step. If not, alternately press and release the spacebar until the suggested value appears. Then, go to the next step.
- Step 3. Use the Down Arrow key to go to the next prompt. Repeat step 2 until all the values on the Keyboard/Printer display match the suggested values.
- Step 4. Verify the values according to the table of suggested settings. The new values should appear as shown in Figure 2-8.

Figure 2-8. Correct Values for IBM 3151 Display Station Keyboard/Printer Display

SETUP MENU			
GENERAL	COMMUNICATION	KEYBOARD/PRINTER	FUNCTION
KEYBOARD		PRINTER	
Enter	SEND	Line Speed (bps)	19200
Return	New Line	Word Length (bits)	8
New Line	CR	Parity	EVEN
Send	PAGE	Stop Bit	1
Insert	Space	Characters	ALL

Phase 4: Save the Adjustments

- Step 1. Press the Send key to go to the Function display.
- Step 2. Use the Right Arrow key to move the cursor to the word Save as shown in Figure 2-9.

Figure 2-9. Save Function of IBM 3151 Display Station

S E T U P M E N U		
GENERAL	COMMUNICATION	KEYBOARD/PRINTER FUNCTION
Recall	Save	Default
Reset Terminal	Clear Status	Mode Adjust*

Step 3. Press the spacebar.

The word `Completed` appears blinking at the bottom of the Setup Menu.

The new values are stored in the display station even after the display station is turned off.

Step 4. Press the `Ctrl + Setup` key sequence to exit the Setup Menu. The screen becomes blank.

The IBM 3151 display station is completely set up to communicate with the AS/400 system.

ASCII Printer Setup Considerations

Printer setup considerations for auxiliary printers and hardware switches are described in this section.

Special Considerations for Auxiliary Printers

Following is a summary of the special considerations for auxiliary printers:

- Auxiliary printers affect the performance of the display stations, since both devices share the same port.
- The AS/400 system supports ASCII serial printers only on the auxiliary ports of the IBM 3151, IBM 3162, IBM 3163, and IBM 3164 display stations.
- Auxiliary printers attached to personal computers running Dial/3X are supported. The device type in the AS/400 device description of that port must be 3161 or *CALC.

Note: Auxiliary printers can be attached to other devices by using work station customization. See the *Workstation Customization Programming* book for information on using work station customization.

- IBM 3151 and IBM 3162 display stations support all IBM printers listed in Figure 1-5 on page 1-7.
- IBM 3162 display stations must be attached to the AS/400 system using the EIA-232-D interface if an auxiliary printer is used; the EIA-422-A interface cannot be used.
- IBM 3163 and IBM 3164 display stations:
 - Support most IBM printers listed in Figure 1-5 on page 1-7, but *not* the IBM 4224 Printer
 - Cannot use IBM 5204 and IBM 4019 printers as auxiliary printers
 - Support only printers configured for the United States
- An auxiliary printer must be set up with the same line speed, word length, stop bits, and parity as the display station to which it is attached. Therefore, the

display station must have its main port and auxiliary port set to the same line speed, word length, stop bits, and parity. Auxiliary printers configured at different line speeds, word length, stop bits, and parity than the display's main port are not supported.

- An auxiliary printer must be configured at line speeds, word length, stop bits, and parity that match the display's configuration unless the display is configured with the automatic line speed, parity, and word length detection parameter of port sharing.
- The auxiliary printer may be set up before or after the setup of the display station to which it is attached.
- The power to the display station must be turned on before the auxiliary printer can be used.
- An auxiliary printer that is varied on counts as one of the 18 active work stations supported on the ASCII Work Station Controller, although the printer is not directly attached to the AS/400 system.
- Printers attached to personal computers running Client Access/400 asynchronous communications are not supported as auxiliaries, but are supported through Client Access/400 asynchronous communications. For more information about this support, see the *Client Access/400 for DOS Ext Memory Setup* book.
- In general, it is recommended that printers be directly attached to the AS/400 system for both improved usability and performance.

Word Length Considerations

Special considerations concerning word length:

- All printers require 8-bit data for special characters.
- Some printers require 8-bit data for control characters.

Due to these considerations, the use of 7-bit word length is not recommended.

Adjustment Switches

Most ASCII printers are adjusted using hardware switches. For instance, the IBM 4207-1 and the IBM 4208-1 printers have hardware switches located in switch banks as shown in Figure 2-10 on page 2-13.

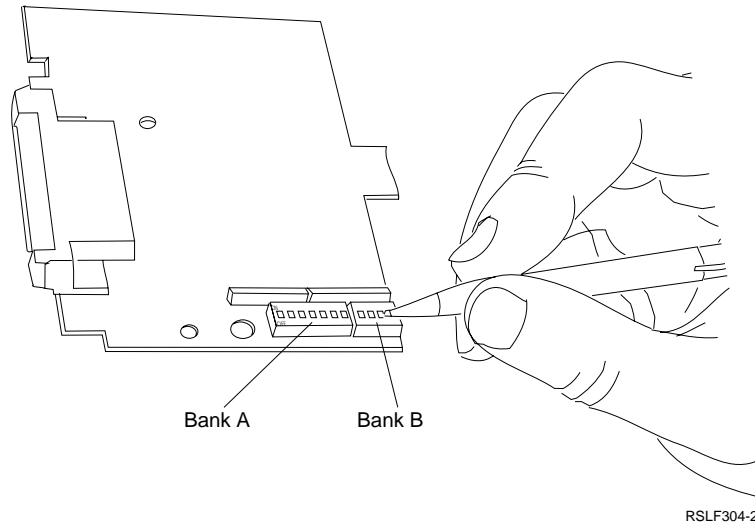


Figure 2-10. Sample Hardware Switches on an IBM 4207-1 Printer

Note: A hard, pointed object should be used to adjust hardware switches.

The adjustment of the hardware switches on an IBM 4207-1 printer is outlined in "The 4207 Auxiliary Printer" on page 9-17. The adjustments are made on the basis of the suggested settings listed in Appendix B, "Suggested Settings for ASCII Printers."

Each ASCII printer may be adjusted differently. To adjust the settings, follow specific procedures in the book shipped with each printer.

Modem Setup Considerations

Modems are used to attach remote ASCII display stations to the AS/400 system. As shown in Figure 2-11, two modems are required for each ASCII display station connected to the ASCII Work Station Controller. This book refers to the two modems as the system modem and the display station modem.

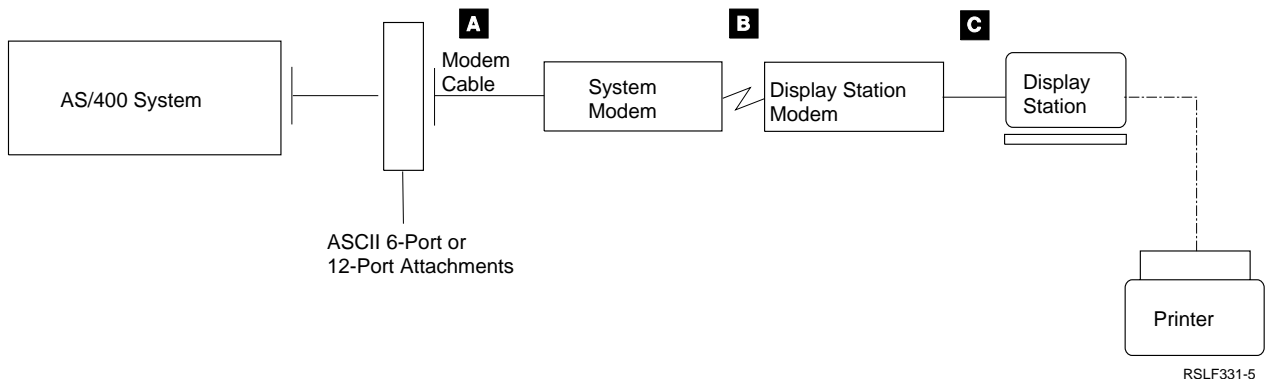


Figure 2-11. ASCII Display Stations Attached via Modems

Notes:

1. Printers that attach to the system through modems are supported only as auxiliary printers. This includes both modem and Post Telephone and Telegraph Administration (PTT) services.
2. Auxiliary printers configured on the AS/400 system at different speeds from their display stations are not supported.

Modem Requirements

ASCII modem requirements are as follows:

- All modems must be capable of full duplex operation.
- Multiplexers are not supported.
- All modems must be capable of running at one of the line speeds supported by the ASCII Work Station Controller. See Figure 1-3 on page 1-5 for information on line speeds.
- All modems must support the EIA-232 or CCITT V.24/V.28 interface.
- All modems must meet the ASCII Work Station Controller requirements for the word length, parity, and stop bits. See Figure 1-3 on page 1-5 for detailed information.
- The system modem should be connected to the 6-Port or 12-Port attachment with an IBM 6.09-meter (20 foot) EIA-232 or CCITT V.24/V.28 cable. This cable is shown as **A** in Figure 2-11 on page 2-13. The part number for this cable is 59X3833; it can be ordered as accessory 69X7017. For Germany, the part number for this cable is 21F2591; it can be ordered as accessory 21F2671. For Japan, the part number for this cable is 93X0185; it can be ordered as accessory 21F2674.

Due to shielding requirements on the AS/400 system, the end of the cable that is closest to the wrap plug should be attached to the modem.

If you supply your own substitute for this cable, the substitute cable must meet the specifications stated in the *Physical Planning Reference*.

- The data link between the two modems may be a switched line (for example, a regular telephone line) or a nonswitched dedicated communications line. This link is indicated by **B** in Figure 2-11 on page 2-13.
- The cable connecting the display station modem and the display station must meet the requirements in the books for the modems and the display station. This cable is indicated by **C** in Figure 2-11 on page 2-13. See "Learning about the Cables to Use" on page 10-4 for more information about the cables you should use to connect the display station modem and the display station.

Modem Setup Guidelines

For adjusting modem settings, some modems have adjustment switches, some require an attached display station, and others require both. Determine the type you have before proceeding. Following are some general guidelines for adjusting modem settings.

Connecting Modems

- Connect the system modem to the communications line (indicated as **B** in Figure 2-11 on page 2-13). Use the planning forms and the modem user's guide to verify correct attachment and connection of the cables.
- Connect the system modem to the ASCII Work Station Controller Port attachment using the modem cable specified in "Modem Requirements" on page 2-14 (indicated as **A** in Figure 2-11 on page 2-13). Use the planning forms and the modem user's guide to verify correct attachment and connection of the cables.
- Connect the display station modem to the display station and the communications line. Use the planning forms and the modem user's guide to verify correct attachment and connection of the cables.

Considerations Before Setting Adjustments

- For safety considerations and for technical requirements of most modems, hardware switch settings should be adjusted with the modem's power turned off and its power cords disconnected.
- The settings required for ASCII work stations attached to an AS/400 system are listed in Appendix A, "Suggested Settings for ASCII Display Stations." However, when you set up a work station that is connected to the system by modem, the work station settings for parity, stop bit, line speed, and word length *must match* the settings for those parameters on the modem. If the settings specified in Appendix A for those four parameters are *not* the same as those required by the modem, adjust the work station to correspond to the modem requirements for those four parameters.
- The system modem and the display station modem on each ASCII port must be adjusted separately.
- When attaching any modem to the work station controller that reports modem or connection status, the reporting option should be disabled in the modem.
See the modem user's guide for instructions to disable the reporting option if applicable.
- Some modems reset some of the adjustment settings to defaults when the power cord is disconnected from the modem or unplugged from the electrical outlet. Consult the modem user's manual for this characteristic.

This type of modem requires adjusting some settings every time a modem's power is disconnected and turned on again. Thus it is recommended that this type of modem be turned on at all times and, where possible, factory default settings be used for those parameters that change at power loss. In cases where modems lose power due to relocation or power failure, remember that the modems may need to be readjusted *each* time the power is restored.

- The AS/400 system does not support half speed initialization. In countries using V.22 BIS modems where circuit 112 (DCE Rate Selector) support is required for 2400 bps operation, the modems must be adjusted for 1200 bps operation only.

Types of Modem Setting Adjustments

Modems Adjusted with Switches: For modems that require adjusting hardware switches, refer to the modem reference manual to locate the hardware switches and the function controlled by each switch. Then use a hard, pointed object to adjust each switch according to the suggested settings for the modem in Appendix C, "Suggested Settings for Modems."

Modems Adjusted by Command Set: For modems with settings that can be adjusted using commands sent from an attached display station, follow the general steps listed below:

1. Connect a display station, or a personal computer with Client Access/400, to the modem being adjusted. Do not use the system modem cable. Use the cable specified on page 10-5 to connect to the modem.
2. For an example using a personal computer running Client Access/400 to set up a modem, see "The 7855 Modem That is Physically Connected to the System" on page 9-27.

See the owner's manual shipped with your modem for modem control commands. See Appendix C, "Suggested Settings for Modems," of this book for suggested modem settings for the AS/400 system.

System Configuration Considerations

The following are general guidelines for configuring the modems for each port of ASCII work stations on the AS/400 system during device configuration:

1. When modems attached to the ASCII Work Station Controller are connected to public switched telephone networks (PSTN) with mandatory modems outside the United States and Canada, the display stations should be configured for PTT. Configured in this way, if the modem drops the Data Set Ready (DSR) signal, the work station controller will cause the modem to disconnect.
2. When modems attached to the work station controller are connected to networks other than PSTN, the display stations should be configured for MODEM. Configured in this way, if the modem drops the Data Carrier Detect (DCD) for 250 milliseconds (1/4 second), the work station controller will cause the modem to disconnect.
3. When an ASCII display station is configured for modem attachment, the work station controller waits at least 500 milliseconds (1/2 second) after DCD is raised by the modem to begin transmitting. For some modems or combinations of modems, initialization of the modems may not be completed even though the modems have raised clear to send (CTS) and received line signal detector (RLSD).

The data transmitted from the work station controller may interrupt the modem initialization and cause the modems to disconnect.

For some private dedicated networks, the use of direct, 3-wire, or 4-wire configuration options should be considered.

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Operating ASCII Work Stations

This chapter discusses general considerations for operating ASCII work stations attached to an AS/400 system, including the following:

- General error detection and recovery considerations
- ASCII display station operations
- ASCII printer operations
- Modem operations
- ASCII port sharing
- 132 column support
- 132 column support and automatic device detection
- Emulation program on personal computers
- Personal computers running Client Access/400 asynchronous communications
- Using the OfficeVision/400* program

General Error Detection and Recovery Considerations

The asynchronous interface makes error detection and recovery more difficult than on a twinaxial interface. For example, if a parity error occurs on a keystroke from an ASCII display station, the work station controller cannot tell the ASCII display to transmit the keystroke again. To notify the system and the display station operator of the error, the work station controller displays an operator error of 0001 on the display. An error code is also sent to the system for logging in the device error log. Similarly, if a frame is received by an ASCII device that has a parity error, it does not report this error to the work station controller. Instead, it just displays or prints an error character. Personal computers running the Client Access/400 licensed program, however, do have error detection and recovery capability.

ASCII Display Station Operations

Display station operations include the following:

- Attachment considerations
- Display attributes
- Display status indicators
- Keyboard operations

These considerations and functions are described in this section.

Attachment Considerations

The 3-wire, 4-wire, and EIA-422-A attachment methods do not allow the ASCII Work Station Controller to determine whether the device is turned on or not. For example, if a display station attached to the work station controller is configured for a 3-wire interface, the work station controller cannot detect when you turn the display station off. Therefore, when you are using devices attached to the work station controller with a 3-wire, 4-wire, or EIA-422-A interface, you should note the following:

- Always sign off a display before turning the display off. Turning the display off does not sign you off the system.
- After turning a display on, enter the Screen Refresh key sequence (see Appendix E, "Supported Keyboard Maps"). The ASCII Work Station Controller

ensures that all the work station initialization commands are sent to the display station, and the current screen image is displayed again.

On some displays and printers, meaningless characters may be printed if the system is turned off or the device description is varied off while the device is still powered on. On printers this can result in an unnecessary waste of paper, which you can avoid by turning the printer off before you turn the system off or before you vary off the device description.

Some devices, such as the IBM 3101 display, require the signal line Data Carrier Detect (DCD) to be active before they can receive or transmit data. Since the work station controller does not drive this signal, a special cable is required to connect DSR from the work station controller to the input for DCD in the attached device.

On those devices with switches to control protocol and communications parameters, it is recommended that you change these switches only when the device is turned off. If you change these switches when the device is on, the change may not take effect until after the device has been turned off and back on.

Display Attributes

Figure 3-1 lists the default attributes available and supported on each ASCII display station supported by the AS/400 system.

Figure 3-1. AS/400 Display Attributes Supported on ASCII Display Stations

Display	Reverse Image	Intensify	Blink	Underline	Column Separator
DEC VT100 ¹	Yes	Yes	Yes	Yes	No
DEC VT220	Yes	Yes	Yes	Yes	No
IBM 3101-23	No	No	No	No	No
IBM 3151	Yes	Yes	Yes	Yes	No
IBM 3161	Yes	Yes	Yes	Yes	No
IBM 3162	Yes	Yes	Yes	Yes	No
IBM 3163	Yes	Yes	Yes	Yes	No
IBM 3164	Yes	Yes	Yes	Yes	No
TeleVideo 910	No	No	No	No	No
TeleVideo 925	Yes	No	Yes	Yes	No
TeleVideo 955	Yes	No	Yes	Yes	No
Wyse WY30	Yes	Yes	Yes	Yes	No
Wyse WY50	Yes	Yes	Yes	Yes	No
Wyse WY60	Yes	Yes	Yes	Yes	No
Dasher D220	Yes	Yes	Yes	Yes	No

¹ Full attribute support is available only on VT100 display stations with advanced video option.

ASCII display stations support attributes, such as blinking, underlining, or reverse image, differently from IBM 3196 and IBM 3197 twinaxial display stations. As a result, data or displays on an ASCII display station may not look exactly the same as they appear on IBM 3196 and IBM 3197 twinaxial display stations.

The following is a summary of the major differences:

- Some display stations support no attributes.
- None of the AS/400-supported ASCII display stations provide column separators, which are available on 3196 and 3197 twinaxial display stations.
- Some ASCII display stations provide the display attribute capability as a feature. For example, extended highlighting is an option on the DEC VT100 display stations but not on others.
- Display stations with limited attributes may have reduced visual effect. For example, display stations that do not have the blink attribute are not as effective as display stations that have the blink attribute if an accounting program uses blinking to indicate overdue accounts.

You can use the work station customizing functions of the AS/400 system to modify the default attribute characteristics listed in Figure 3-1 on page 3-3. You can specify individual ASCII data stream commands to handle mapping of each of the attribute control characters that can be specified in a 5250 data stream. Refer to “Customizing Work Stations Attached to an ASCII Work Station Controller” on page 3-15 for further information on the customizing functions.

Display Status Indicators

ASCII display stations do not support the AS/400 status indicators, such as Input Inhibited and Message Waiting, which are available on twinaxial display stations across the bottom of the display.

The ASCII Work Station Controller emulates these indicators on ASCII displays. Figure 3-2 shows which line is used to display each AS/400 status indicator on ASCII displays.

Figure 3-2. AS/400 Emulated Status Indicators

Indicator	Symbol	Line
Reserved	sp	8
System Available	*	9
Reserved	sp	10
Message Waiting	*	11
Reserved	sp	12
Keyboard Shift	*	13
Katakana Shift	*	14
Insert Mode	*	15
Diacritic Mode	*	16
Input Inhibited	*	17
Reserved	sp	18

The following are methods to use and control the status indicators on ASCII displays attached to the AS/400 system:

- You can choose not to display the status indicators by using the turn indicators on or off key sequence. See Appendix E, “Supported Keyboard Maps,” for the key sequence to use for your display station. When the status indicators are

not displayed, the actual screen character data is displayed in the last column of lines 8 through 18. You can display the status indicators again by pressing the same key sequence.

- Except for the System Available indicator, the indicators are directly controlled by the AS/400 system. You have the option to display the indicators, but you cannot change the status of the indicators.
- The System Available indicator is turned on as long as the ASCII Work Station Controller logically assumes that the display station is active.
- If the indicators are not displayed and the AS/400 system issues a command to turn the Message Waiting indicator on, the AS/400 system automatically displays all indicators to alert the user that action is required.
- Some ASCII display stations, such as WY30, WY50, or TeleVideo 955, do not support individual character display attributes. On these terminals, display attributes, such as underscore or reverse image, are controlled by nondisplayed characters that can be overwritten when the status indicators are displayed, causing undesirable results. (For example, if the status indicator overwrites the character that turns underscoring off, the screen will fill with underscore characters.)

Note: ASCII display indicator labels are available to help identify the function of each status indicator. They can be ordered from your marketing representative using the order number G570-2205-00.

Keyboard Operations

This section provides a summary of the functions and the characteristics of the ASCII display station keyboards used with the AS/400 system and the differences between ASCII and IBM 3196 and 3197 twinaxial keyboards.

Summary of Keyboard Functions Supported

AS/400 Base Functions Supported: Figure 3-3 lists the AS/400 base functions supported on ASCII keyboards. The functions are in alphabetical order, except for the function keys (F1 through F24), which are listed at the end.

Figure 3-3 (Page 1 of 2). The AS/400 Basic Functions Supported on ASCII Keyboards

Attention	Field Mark	F6
Backspace	Help	F7
Clear	Home	F8
Cursor Up	Hex	F9
Cursor Down	Insert	F11
Cursor Left	New Line	F12
Cursor Right	PA1	F13
Cursor Select	PA2	F14
Delete	PA3	F15
Duplicate	Print	F16
Enter	Page Down (Roll Up)	F17
Erase EOF	Page Up (Roll Down)	F18
Erase Input	Sys Req	F19

Figure 3-3 (Page 2 of 2). The AS/400 Basic Functions Supported on ASCII Keyboards

Error Reset	Test Request	F20
Field Advance	F1	F21
Field Backspace	F2	F22
Field Exit	F3	F23
Field +	F4	F24
Field -	F5	

Note: The AS/400 function names are based on the names of the keys on twinaxial keyboards. These are not always the same as the names of the keys on ASCII keyboards. The ASCII Work Station Controller supports the AS/400 basic functions for each supported ASCII display station keyboard. For keyboard mapping information, see Appendix D, "IBM Keyboard Reference Chart," and Appendix E, "Supported Keyboard Maps."

OfficeVision/400 Word Processing Functions Supported: Figure 3-4 lists the OfficeVision/400 word processing functions supported on ASCII keyboards.

Figure 3-4. AS/400 Office Word Processing Functions Supported on ASCII Keyboard

Begin Underline	End
Begin Bold	Required Space
Beginning of Line	Stop Code
End of Line	Next Stop Code
Carrier Return	Tab
Required Carrier Return	Backward Tab
Center	Forward Tab
Display Text Symbols	Required Tab
Half Index Up	Top of Page
Half Index Down	Bottom of Page
Page End	Word Underline

Keyboard Characteristics

A keyboard table is provided for each supported ASCII display station in Appendix E, "Supported Keyboard Maps." The following are some general characteristics of ASCII keyboards:

- In key sequences involving the ESC key, press and release the ESC key before you press the next key.
- For the CTRL key sequences, press and hold the CTRL key while you press the next key.
- Some ASCII keys do not send any characters to the ASCII Work Station Controller; that is, nothing happens when the key is pressed.
- Pressing key sequences that are not defined in the keyboard mapping tables in Appendix E, "Supported Keyboard Maps," may cause problems, such as a loss of communications between the ASCII Work Station Controller and the display

station, or these key sequences may be ignored by the work station controller (nothing happens when the key sequence is pressed).

To avoid keyboard errors, it is important that all keyboard operators understand the keyboard mappings.

- When an error in the ASCII data sent from a work station is detected, the numbers 0001 appear in the lower left corner of the display. For recovery actions, see “Keyboard Error Recovery.”

Keyboard Differences

Basic differences between ASCII and IBM 3196 and 3197 twinaxial keyboards include the following:

- IBM 3196 and 3197 twinaxial display station keyboards have more keys than most ASCII keyboards.
- IBM 3196 and IBM 3197 keyboards support the following, but ASCII keyboards do not:
 - Fast cursor right and fast cursor left
 - Entry of special-character keyboard set data
 - Record and Playback keys
- The ASCII Work Station Controller does not provide a one-for-one IBM 3196 and 3197 keyboard mapping. For example, the twinaxial keyboard supports the SYS REQ function with one key. On the ASCII keyboard, however, this function is supported by pressing the ESC key and the S key.

Keyboard Error Recovery

When information cannot be entered from an ASCII keyboard, look for a 4-digit error number at the lower left corner of the display. If an error number is shown, first press the key sequence defined for the reset function to remove the error number, then correct the problem and continue typing.

Different keyboards use different key sequences for the reset function. For the specific reset function key sequence for your keyboard, see Appendix E, “Supported Keyboard Maps.”

The work station customizing functions of the AS/400 system enable you to modify the ASCII control characters and control character sequences associated with each of the supported keyboard functions. This provides you with the ability to remap the function keys on the keyboard. Refer to “Customizing Work Stations Attached to an ASCII Work Station Controller” on page 3-15 for further information on the customizing functions.

ASCII Printer Operations

The following are general considerations for operating ASCII printers attached to an AS/400 system:

- ASCII printers attached to an AS/400 system using 3-wire EIA-232, 4-wire EIA-232, or EIA-422 cables do not report printer status or printer errors to the system. Therefore, no message is displayed on the console when an error occurs during a print job.

In addition, the ASCII Work Station Controller cannot detect when the power to an attached serial printer is turned off. Therefore, no error status is sent to the

operator and the print file may be lost even though no printing occurred. Turning a serial-attached printer off while it is printing (regardless of attachment type) may cause loss of flow control synchronization between the work station controller and the printers. If this happens, you need to start the printer job again.

- Although some IBM ASCII printers attached to the AS/400 system can emulate the IBM 5219 Printer, they may not have the same range of capabilities as the IBM 5219 Printer. For example, selecting a forms drawer on some of the IBM 420X printers has no meaning, and selecting a different font on an IBM 420X printer does not cause the printer to stop printing.
- The AS/400 system shows a message on the display station that a print job is complete when the final batch of print data is sent to the printer, *not* when the data is actually printed. Some printers can receive several pages of print data at a time. Thus the system message that a print job is complete may appear on the display while the printer is still processing the last few pages.
- The AS/400 system automatically deletes the print file sent to the system from a display station immediately after the message that the print job has completed is displayed.

Under this condition, if a printer error (such as a loss of power or a forms jam) occurs after the message that the print job has completed is displayed, error recovery and restarting the printer where the error occurred is not allowed. The entire print job must be repeated from the beginning.

- To prevent the spooled print files from being removed automatically from the output queue, specify SAVE(*YES) on any of the following commands:
 - Create Printer File (CRTPRTF)
 - Change Printer File (CHGPRTF)
 - Override with Printer File (OVRPRTF)

For the AS/400 System/36 environment, specify HOLD-YES in the printer OCL statement to prevent the spooled print files from being removed automatically from the output queue.

- The IBM 4201 printer, the IBM 4207 printer, and the IBM 4216 printer have 8-inch carriages, but the IBM 5219 printer has a 13.2-inch carriage. Therefore, the system changes some printing parameters (for example, character pitch) when other parameters, such as maximum print position, are changed to try to print files correctly. Also, parameters for some commands are not valid for these printers because of the 8-inch carriage.
- If a printer with an 8-inch carriage is configured as an IBM 5224 and an IBM 5256 and a line being printed is longer than 8 inches, the printer wraps the data to the next line. If the printer has the capability, you may want to change the pitch setting on the printer to accommodate 132 characters on an 8-inch line.

Auxiliary Printer Operations

ASCII printers attached to auxiliary ports of ASCII display stations need special attention in the areas described below:

- Required settings for auxiliary printers may conflict with what is required by the display stations to use them as screen copy printers. A common case of this is when a carrier return is set to cause a line feed.

When there is a conflict, it is important to decide if each auxiliary printer should be supported by the display station or the system, and to set up the auxiliary printers accordingly.

- Performance degradation may occur because the auxiliary printers share the same cables with the display stations to communicate with the system. Display stations will have longer response time when an auxiliary printer is running. How often this occurs depends on the speed, capacity, and print load of each auxiliary printer.

To avoid slowing down the display station response time, it is recommended that large print jobs for auxiliary printers be submitted and processed when keyboard and display response time is of little or no concern.

- The system normally stops transmitting to a printer that has sent XOFF within one character. However, if an auxiliary printer is connected to a display station that is attached to the AS/400 system through modems, the XOFF character may be delayed in reaching the ASCII Work Station Controller. If this happens, the printer buffer may be overrun, causing erroneous output.
- Since ASCII display stations control the communications to auxiliary printers, a printer error or an act to stop the printer may cause a message to appear on the display. In this case, keyboard input on the display station may be inhibited until the error is corrected or the printer is started again.
- Auxiliary printers configured for IBM 3151 or 316X displays remain in varied on pending state until the system detects that it is powered on and attached to the display.
- Printers attached to personal computers running Client Access/400 asynchronous communications are not supported as auxiliaries, but are supported through Client Access/400 asynchronous communications. For more information about this support, see the *Client Access/400 for DOS Ext Memory Setup* book.

PTT Operations

When a device has an attachment type of *PTT, the default inactivity timer is 15 seconds. This timer is a requirement for certain switched PTT services. If 15 seconds elapse without the work station controller receiving a character, the communications line is disconnected. The default can be overridden by specifying a different value for the inactivity timer parameter.

Adaptive Polling

You can use the adaptive polling feature with Personal System/2*s running Client Access/400 that are attached either directly or by modem to the ASCII Work Station Controller.

Adaptive polling reduces the amount of non-productive polling that occurs when attached devices are intermittently used. It improves the performance of heavily used ASCII work station controllers and reduces telephone costs for controllers running over an X.25 network.

Adaptive polling varies the time interval at which the system polls a device to determine its readiness to send or receive data. The normal response mode (NRM) poll

timer is 0.5 seconds. If a device is idle for approximately ten seconds, the poll timer is reset to six seconds. The six-second interval remains in effect until the device transmits data to the ASCII Work Station Controller; then the 0.5 second poll timer is resumed.

To activate the adaptive polling feature for a specific device, set the NRM Poll Timer value to 98 on the Create Device Description display.

Inactivity Timer

The inactivity timer automatically disconnects a user after a specified time period of inactivity. Inactivity is a period of time in which there is no user or job initiated data on the line.

The inactivity timer is not reset by the presence of polling on:

- The Client Access/400 licensed program
- Devices that have auxiliary printers that are varied on, but not attached or powered on

With polling, users are disconnected after the specified time period.

ASCII Port Sharing

ASCII port sharing allows you to have different ASCII displays (either programmable, such as a personal computer or a Personal System/2 running Client Access/400, or nonprogrammable work stations), with different device types and physical parameters, share the same port at different times, without needing to manually create a configuration description for each new display. This is especially useful in an environment that uses work stations that dial in through modems.

ASCII port sharing works by having the system determine the device type, line speed, parity, and word length of the connecting work station. Then the system updates the configuration record for that device automatically.

To use ASCII port sharing, it is necessary to create a special device description for the port. The device description specifies the device type or line speed, parity, and word length parameters to be calculated by the system. To do this, use *CALC as the entry for these parameters when you create the device description.

ASCII port sharing can be used on direct, modem, and PTT connections. It cannot be used on 3-wire EIA-232, 4-wire EIA-232, or EIA-422 connections.

ASCII port sharing consists of the following functions which may be used together or separately:

- Automatic detection of incoming line speed, parity, and word length.
- Automatic detection of device type

The system is able to automatically detect that the device type is a programmable work station with any combination of ASCII port sharing enabled. (Even if only automatic detection of line speed, parity, and word length is enabled, the system can still detect that the attached device is a programmable work station.)

Because you can use the two functions of ASCII port sharing either together or separately, there are really three different combinations of ASCII port sharing. These are:

- Automatic detection of line speed, parity, and word length
- Automatic detection of device type
- Automatic detection of both device type plus line speed, parity, and word length

Automatic Detection of Line Speed, Parity, and Word Length

Automatic detection of line speed, parity, and word length comprises the first function of ASCII port sharing. This allows a specifically configured device type to attach to any of the values of line speed, parity, and word length which are automatically detected (see Figure 3-5 on page 3-11). In addition, a programmable work station can be attached independent of the configured device type. If the device type is configured as a programmable work station, it is the only device type allowed to attach. Both programmable and nonprogrammable work stations may use this detection process.

To enable automatic detection of line speed, word length, and parity:

1. Type *CALC in the Line Speed, Word Length, and Type of Parity fields on the Create Device Description display.
2. When all fields are complete, press the Enter key.
3. Vary on the description.
4. Go to the device you have just configured and type the key sequence 'period period carrier return' (. . CR).
5. If the device is correctly connected to the system, a sign-on screen appears, indicating that the device is ready for use.

Nonprogrammable Work Stations

For nonprogrammable work stations, it is necessary for the user of the display to key in an initialization sequence to allow the system to determine the line parameters. There are two different initialization sequences which may be used.

The first key sequence automatically detects the line parameters listed in Figure 3-5. It is essential that the display be set up exactly as explained in Appendix A with the exception that the line speed, parity, and word length be set up according to some combination of the parameters listed in Figure 3-5.

Figure 3-5. Line Speed, Parity, and Word Length Combinations Detected. These combinations can be detected by 'period period CR'.

Parameter	Detectable values
Line speed (in bits per second)	300, 600, 1200, 2400, 4800, 9600, 19200, and 38400
Word length and parity	8 bit and NO parity 7 bit and EVEN parity 7 bit and ODD parity 7 bit and MARK parity

The first key sequence consists of 'period period carrier return' (. . CR) which generates the hex codes '2E' '2E' '0D'. The key which normally generates the carrier return (hex code '0D') is located on the far right-hand side of the main block

of keys on the keyboard. It is usually marked either RETURN, or CR, or it can be a key with an arrow that points down and to the left. The code for carrier return (hex code 'OD' can also be generated by CNTL M (pressing and holding the CNTL key, pressing and releasing the M key, and then releasing the CNTL key). The sequence is successful when the System Available indicator appears on the display screen. If the System Available indicator does not appear, the sequence may be repeated.

If the System Available indicator does not appear after a minute passes, turn the display off and then back on again and verify the setup of the display. Then reconnect to the system and try the key sequence again.

The second (alternate) key sequence is able to automatically detect the line parameters listed in Figure 3-6. It is essential that the display be set up exactly as explained in Appendix A with the exception that the line speed, parity, and word length be set up according to some combination of the parameters listed in Figure 3-6.

Figure 3-6. Line speed, parity, and word length combinations detected. These combinations can be detected by 'CR'.

Parameter	Detectable values
Line speed (in bits per second)	300, 600, 1200, 2400, 4800, 9600, 19200, and 38400
Word length and parity	8 bit and NO parity 7 bit and EVEN parity

The second key sequence consists of pressing and releasing the carrier return (CR) key several times. This key should be pressed and released a minimum of three times or until the System Available indicator appears on the screen.

If the System Available indicator does not appear after a minute passes, turn the display off and then back on again and verify the setup of the display. Then reconnect to the system and try the key sequence again.

Programmable Work Stations

Automatic detection of line speed, parity, and word length for programmable work stations is entirely automatic; no special action has to be taken by the user of the work station. The system determines the line parameters from the Null XID frames which it receives from the work station. All combinations of line speed, parity, and word length which can be configured on the work station are automatically detected by the host.

Automatic Detection of Device Type

Automatic device type detection is the second component of ASCII port sharing. It is enabled by entering *CALC on the Device Type field when configuring the device. This allows any device type which can be automatically detected to attach to a work station with specifically configured line speed, parity, and word length. This option allows for the automatic detection of the device type for programmable work stations and for certain supported types of nonprogrammable work stations. It enables users to attach different device types to the same port, at different times, without needing to reconfigure the port or having to vary the port off and on.

The types of nonprogrammable work stations which can be detected are the IBM 3151, IBM 3161, IBM 3162, IBM 3163, and IBM 3164. The Read Model command is used in the detection of these displays. Devices which emulate these display stations are recognized only if they respond correctly to Read Model commands. For details on the Read Model commands, see the reference manual for the specific device. Any other currently supported display station is not recognized on a port with automatic device type detection enabled. Programmable work stations are recognized by incoming Null XID frames.

Automatic Detection of Both Device Type Plus Line Speed, Parity, and Word Length

This allows any device type which can be automatically detected (IBM 3151, IBM 3161, IBM 3162, IBM 3163, IBM 3164 and programmable work stations) to attach to a work station with any of the values of line speed, parity, and word length which can be automatically detected (see Figure 3-5 on page 3-11).

Auxiliary Printers and ASCII Port Sharing

Auxiliary printers can be used on displays that use ASCII port sharing.

If the printer is varied on first, then the line speed, parity, and word length being used by the printer is also used by the display. If the display is configured to automatically detect these line parameters, the key sequence for automatic detection is skipped or ignored.

If the display is varied on first, the printer uses the line speed, parity, and word length used by the display, independent of the parameters in the printer's device description.

In general, the line speed, parity, and word length of the display and printer should be configured to match in the device description.

Not all the display stations sharing a port will necessarily have auxiliary printers. However, if auxiliary printers are attached, all of the display stations sharing the port must use the same type of printer.

132 Column Support

Two supported ASCII displays which may be used in 132 column mode are the IBM 3151 (Models 31 & 41) and the IBM 3162. The 132 column mode is accessible through IBM 3197 Model D2 twinaxial display emulation. Only the IBM 3151 and IBM 3162 ASCII displays can be configured with this emulation.

Note: The IBM 3151 **must** have the Cartridge for Expansion (IBM part number 81X5575) inserted in order to use the 132 column mode.

Devices configured with the IBM 3197 Model D2 emulation toggle between 24 x 80 and 27 x 132 screen sizes via the data stream. The IBM 3197 Model D2 also has a separate error line: line 25 for the 24 x 80 format and line 28 for the 27 x 132 format.

For IBM 3151 and IBM 3162 display stations, a choice of emulation is allowed during configuration. If another ASCII device is configured, no emulation can be specified.

IBM 3151 and IBM 3162 display stations may use either IBM 3196 Model A2 or IBM 3197 Model D2 emulations. The IBM 3196 Model A2 is the default emulation, while the IBM 3197 Model D2 emulation allows access to 132 column support.

132 Column Support and Automatic Device Type Detection

While configuring a port for the Automatic Device Type Detection option of Port Sharing (*CALC for Device Type), the user is prompted for the emulation type. When IBM 3151 (with Cartridge for Expansion) or IBM 3162 display stations are detected, the type of emulation configured is selected. When another type of display station is detected, an emulation is automatically assigned (see Figure 1-4 on page 1-5).

Emulation Program on Personal Computers

A personal computer can be attached to the ASCII Work Station Controller if it emulates a display station listed in Figure 1-4 on page 1-5.

For specific information about emulation on personal computers, refer to the emulation package shipped with the personal computer.

Personal Computers Running Client Access/400 Asynchronous Communications

| A personal computer using DOS can be attached to the ASCII Work Station Controller if it is running Client Access/400 asynchronous communications. For planning and installation information about Client Access/400, see the *Client Access/400 for DOS Ext Memory Setup* book, SC41-3500.
|
|
|

Using the OfficeVision/400 Program

The ASCII Work Station Controller allows attached displays to use the OfficeVision/400 program. The following are considerations when using ASCII display stations for OfficeVision/400 operations:

1. On an IBM 3196/3197 twinaxial keyboard, OfficeVision/400 uses several alphabetic and cursor movement keys in conjunction with either the Shift or ALT keys. For example, you can move the cursor to the top of the page by pressing the Shift key in conjunction with the Cursor Up key. For ASCII display stations, substitute the ESC key sequence for any OfficeVision/400 key sequences that use the Shift or ALT keys on an IBM 3196/3197 keyboard.
2. The OfficeVision/400 control characters can be shown on some ASCII displays as special symbols. These symbols can be turned on or off with a key sequence, defined in Appendix E. These symbols are only supported on the IBM 3151 and IBM 316X display stations. Figure 3-7 on page 3-15 provides a summary of these symbols and how they appear on different displays.

Text Control Characters	IBM 3151	IBM 3162	IBM 3161, 3163, and 3164
Page End	▲	▲	▲
Required Space	▼	▼	▼
Tab	┌	➔	➔
Carrier Return	└	←	←
Required Carrier Return	◀	◀	◀
Half Index Up	⌈	↑	↑
Half Index Down	⌋	↓	↓
Word Underline	└	└	└
Stop Code	■	■	■
Required Tab	▶	▶	▶

RSLF335-3

Figure 3-7. Control Character Symbols in OfficeVision/400 Word Processing

Customizing Work Stations Attached to an ASCII Work Station Controller

Mapping tables are used to support communication between a given display station or printer and the AS/400 system. The ASCII Work Station Controller uses mapping tables to support communication between a given display and the AS/400 system. The ASCII Work Station Controller also uses mapping tables to support communication between a given ASCII printer and the AS/400 system, if the printer does not use the host print transform function. The tables that the ASCII Work Station Controller uses reside on the AS/400 system and are downloaded to the Work Station Controller when a device is varied on.

If an ASCII printer is configured to use the host print transform function, the mapping table for the printer resides on the AS/400 system. This mapping table is sent to an ASCII printer through the ASCII Work Station Controller, but is not used by the ASCII Work Station Controller. The mapping table is available when the printer is varied on and the printer writer is started (for spooled print jobs). For nonspooled print jobs, the mapping table is available when the job is printed.

Note: You choose to use the host print transform function when configuring an ASCII printer.

Mapping tables determine the support characteristics associated with a particular ASCII device. For example, the mapping tables determine how character data is mapped back and forth between ASCII and EBCDIC character sets. The mapping tables also determine how function keys on an ASCII keyboard are mapped.

The OS/400* customizing functions and programming languages enable you to create one or more customized ASCII tables that can be used in place of the resident tables that normally support an ASCII device. You can customize the following tables for displays and printers:

- Displays:
 - ASCII to EBCDIC Mapping
 - EBCDIC to ASCII Mapping
 - ASCII to Keyboard Function Mapping
 - Update Screen Table (attribute mapping, screen control commands)
- Printers that are not configured to use host print transform function:
 - Printer Function Table
 - Default EBCDIC to ASCII Mapping
 - Multilanguage EBCDIC to ASCII Mapping
- Printers that are configured to use host print transform function:
 - Transform Table

In addition, you can use the customizing functions to specify all the parameters needed to attach many ASCII displays and printers not currently supported by the ASCII Work Station Controller. Once the customized tables are created, an AS/400 object is compiled from them; you can then specify that object name in the device description for the display or printer.

You can also save the customizing object on a storage medium and restore it on a different AS/400 for use with similar devices. See the *Workstation Customization Programming* book for complete information about the work station customizing functions.

Chapter 4. Programming Considerations

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This chapter is intended for programmers who plan to write programs to control the data streams of ASCII work stations attached to the ASCII Work Station Controller. It provides information on printer data stream interface commands.

ASCII Printer Data Stream Interface Commands

The ASCII Work Station Controller supports the 5250 SNA character string (SCS) and Document Content Architecture final-form text data stream for printers. 5250 Document Content Architecture final-form text consists of two overlapping data streams with compatible formats. Different printers support a different subset of this data stream, and the emulation takes this into account.

Unless specified otherwise, any data stream commands received by the ASCII Work Station Controller that are not supported by the twinaxial printer cause the work station controller to report an invalid SCS command to the AS/400 system.

You can use the work station customizing functions to change the commands sent to an ASCII printer to perform particular print functions. Refer to “Customizing Work Stations Attached to an ASCII Work Station Controller” on page 3-15 for further information on the work station customizing functions.

Printers Emulating 5256

The 5256 Printer accepts some of the 5250 SCS data stream commands. Figure 4-1 lists these commands.

Figure 4-1 (Page 1 of 2). Data Stream Commands Supported by the 5256 Printer

5250 SCS Command	Hex Value	Emulation
Null (NUL)	00	No operation.
Transparent	03	See “Transparency” on page 4-23.
Form Feed (FF)	0C	Sends CR (0D) followed by FF (0C).
Carrier Return (CR)	0D	Sends ASCII CR (0D).
New Line (NL)	15	Sends ASCII CR + LF (0D, 0A).
Record Separator (IRS)	1E	Sends ASCII CR + LF (0D, 0A).
Line Feed (LF)	25	Sends ASCII LF (0A).
Set Horizontal Format (SHF)	2BC1nnhh	Stores maximum characters per line.
Set Vertical Format (SVF)	2BC2nnhh	Stores maximum lines per page. 1B, 43, hh
Set Line Density (SLD)	2BC6nnld	See “Set Line Density (2BC6nnld)” on page 4-9.
Set Graphic Error Action (SGEA)	2BC8nngguu	Stores default graphic and action to be taken when a graphic error occurs.
Set Character Distance (SCD)	2BD2042900cd	See “Set Character Distance (2BD2042900cd)” on page 4-15.
Bell (BEL)	2F	Sends ASCII bell code (07).
Absolute Horizontal Presentation Position (AHPP)	34C0ah	If ah > MPP, then an invalid parameter error is reported. Otherwise, if current column position (CCP) is > ah, ASCII Work Station Controller sends CR followed by ah number of spaces. If CCP is < ah, ASCII Work Station Controller sends CR followed by ah - CCP number of spaces.

Figure 4-1 (Page 2 of 2). Data Stream Commands Supported by the 5256 Printer

5250 SCS Command	Hex Value	Emulation
Absolute Vertical Presentation Position (AVPP)	34C4av	If av > lines per page, then an invalid parameter error is reported. Otherwise, if current line position (CLP) is > av, ASCII Work Station Controller sends a form feed followed by av number of line feeds. If CLP is < av, ASCII Work Station Controller sends out av - CLP number of line feeds.
Relative Horizontal Presentation Position (RHPP)	34C8rh	If rh and current position are less than or equal to MPP, ASCII Work Station Controller sends rh number of spaces; otherwise, an invalid parameter error is reported.
Relative Vertical Presentation Position (RVPP)	344Crv	If rv and current line > lines per page, an invalid parameter error is reported; otherwise, ASCII Work Station Controller sends rv number of line feeds.
Graphic Character	40-FF	Sends ASCII graphic.

Printers Emulating 5224

The 5224 Printer supports the commands listed in Figure 4-2.

Figure 4-2. Data Stream Commands Supported by the 5224 Printer

5250 SCS Command	Hex Value	Emulation
Null (NUL)	00	No operation.
Transparent	03	See "Transparency" on page 4-23.
Form Feed (FF)	0C	Sends CR(0D) followed by FF (0C).
Carrier Return (CR)	0D	Sends ASCII CR (0D).
New Line (NL)	15	Sends ASCII CR + LF (0D, 0A).
Record Separator (IRS)	1E	Sends ASCII CR + LF (0D, 0A).
Line Feed (LF)	25	Sends ASCII LF (0A).
Set Horizontal Format (SHF)	2BC1nnhh	Stores maximum characters per line.
Set Vertical Format (SVF)	2BC2nnhh	Stores maximum lines per page. 1B, 43, hh
Set Line Density (SLD)	2BC6nnld	See "Set Line Density (2BC6nnld)" on page 4-9.
Set Graphic Error Action (SGEA)	2BC8nngguu	Stores default graphic and action to be taken when a graphic error occurs.
Set Coded Graphic Character Set Through Local ID (SCGL)	2BD10381lcid	See "Set Coded Graphic Character Set through ID (2BD10381lcid)" on page 4-21.
Set Character Distance (SCD)	2BD2042900cd	See "Set Character Distance (2BD2042900cd)" on page 4-15.
Load Alternate Characters (LAC)	2BFEnnttdbd	Not supported.
Bell (BEL)	2F	Sends ASCII bell code (07).
Absolute Horizontal Presentation Position (AHPP)	34C0ah	If ah > MPP, then an invalid parameter error is reported. Otherwise, if current column position (CCP) is > ah, ASCII Work Station Controller sends CR followed by ah number of spaces. If CCP is < ah, ASCII Work Station Controller sends ah - CCP number of spaces.
Absolute Vertical Presentation Position (AVPP)	34C4av	If av > lines per page, then an invalid parameter error is reported. Otherwise, if current line position (CLP) is > av, ASCII Work Station Controller sends a form feed followed by av number of line feeds. If CLP is < av, ASCII Work Station Controller sends av - CLP number of line feeds.
Relative Horizontal Presentation Position (RHPP)	34C8rh	If rh and current position are less than or equal to MPP, ASCII Work Station Controller sends rh number of spaces; otherwise, an invalid parameter error is reported.
Relative Vertical Presentation Position (RVPP)	344Crv	If rv and current line > lines per page, an invalid parameter error is reported; otherwise, ASCII Work Station Controller sends rv number of line feeds.
Transparent (TRN)	35nn	Skips nn bytes in data stream.
Graphic Character	40-FF	Sends ASCII graphic.

Printers Emulating 3812 or 5219

The data stream supported by the 3812 printer or the 5219 printer is a combination of the Document Content Architecture final-form text and 5250 SCS data streams. To emulate either the 3812 or the 5219, the ASCII Work Station Controller performs extensive emulation for some commands. The commands that are supported are shown in Figure 4-3.

Note: Printers configured for 3812 or 5219 emulation should also be configured for 8-bit data.

To accommodate the typical 5219 requirement of a 13.2-inch carriage, 5219 emulation on printers with an 8-inch carriage will provide automatic wrap. Therefore, the output may not appear correct. To avoid this occurrence, set the characters per inch (cpi) and maximum presentation position (MPP) according to the following:

- For MPP less than or equal to 80, set any characters per inch.
- For MPP greater than 80, set to 12 or 15 cpi.
- For MPP greater than 97, set to 15 cpi.

Note the following restriction when using an 8-inch carriage:

- Many 5219 commands that use inches as a parameter may cause the output to appear incorrect, particularly justification commands with the right margin expressed in inches. You must ensure that the margin is valid for the selected characters per inch.

The following list defines some of the terms used in Figure 4-3:

Characters Per Inch (cpi)	The number of characters that can be printed in one horizontal inch. This number varies with the character density that is currently selected.
Effective Left Margin	The current left margin or indent level.
Escapement Unit (EU)	A unit of measure of horizontal distance on a printer.
Font Width (FW)	The width of a character in a given pitch.
Lines Per Inch (lpi)	The number of lines of printed text that can be printed in one vertical inch.
Logical Left Margin	The farthest left position a printer can physically print on a page.
Maximum Presentation	The farthest right position a printer can physically
Position (MPP)	print on a page (in columns, not inches).
Pitch	The number of characters that can be printed in one horizontal inch (same as characters per inch).

Figure 4-3 (Page 1 of 4). Data Stream Commands Supported by the 3812 and 5219 Printers

5250 SCS Command	Hex Value	Emulation
Null (NUL)	00	No operation.
Transparent	03	See "Transparency" on page 4-23.
Horizontal Tab (HT)	05	Sends required number of ASCII spaces to reach next tab stop contained in ASCII Work Station Controller's internal Tab Stop table. If no tab stop detected, sends a space.

Figure 4-3 (Page 2 of 4). Data Stream Commands Supported by the 3812 and 5219 Printers

5250 SCS Command	Hex Value	Emulation
Required New Line (RNL)	06	Sends ASCII CR and LF (0D, 0A). Resets indent level to left margin and sends spaces from column 1 to left margin.
Superscript (SPS)	09	Sends an escape character string (1B 53 00). If subscript is active, ESC T is sent (1B 54).
Repeat (RPT)	0A	No operation.
Form Feed (FF)	0C	Sends FF (0C) and correct amount of LFs to get to first print line (top vertical margin).
Carrier Return (CR)	0D	Sends ASCII CR (0D).
New Line (NL)	15	Sends ASCII CR and LF (0D, 0A) and spaces to get to left margin.
Backspace (BS)	16	Sends ASCII backspace (08).
Unit Backspace	1A	See "Unit Backspace (1A)" on page 4-20.
Record Separator (IRS)	1E	Sends ASCII CR and LF (0D, 0A).
Word Underscore (WUS)	23	See "Word Underscore (WUS)" on page 4-8.
Line Feed (LF)	25	Sends ASCII line feed (0A).
Switch (SW)	2A	No operation.
Set Horizontal Format (SHF)	2BC1nnhh	See "Set Horizontal Format (2BC1nnhh)" on page 4-8.
Set Vertical Format (SVF)	2BC2nnhh	ASCII Work Station Controller stores maximum number of lines per page and issues a Set Page Length command. 1B, 43, hh
Set Line Density (SLD)	2BC6nnld	See "Set Line Density (2BC6nnld)" on page 4-9.
Set Graphic Error Action (SGEA)	2BC8nngguu	Stores default graphic and action to be taken when a graphic error occurs.
Set GCGID through GCID (SCG)	2BD10601...	See "Select Global Character Set ID (2BD10601gcccpcp)" on page 4-20.
Set FID through GFID (SFG)	2BD10705...	See "Set FID through GFID (2BD10705gfgffwfwfa)" on page 4-11.
Set Coded Graphic Character Set Through Local ID (SCGL)	2BD10381lclid	See "Set Coded Graphic Character Set through ID (2BD10381lclid)" on page 4-21.
Set Initial Conditions (SIC)	2BD20345si	See "Set Initial Conditions (2BD220345is)" on page 4-14.
Set Horizontal Tab Stops (STAB)	2BD2nn01	Updates internal Tab Stop table.
Justify Text Field (JTF)	2BD2nn03...	See "Justify Text Field (2BD2nn03rerepr)" on page 4-12.
Set Indent Level (SIL)	2BD20307il	Uses il to point into the Tab Stop table and uses the il tab stop as left margin for all text following this command.
Begin Emphasis (BES)	2BD1nn8Aca	See "New Multiple-Byte Controls" on page I-4.
End Emphasis (EES)	2BD1nn8Exx	See "New Multiple-Byte Controls" on page I-4.
Set Line Spacing (SLS)	2BD20309ls	Stores ls and sends out appropriate number of ASCII line feeds (0A) when line indexing characters are received.

Figure 4-3 (Page 3 of 4). Data Stream Commands Supported by the 3812 and 5219 Printers

5250 SCS Command	Hex Value	Emulation
Set Justify Mode (SJM)	2BD2nn0Dstrp	See "Set Justify Mode (2BD2nn0Dstrp)" on page 4-13.
Set Single Line Distance (SSLD)	2BD20415ld	See "Set Single Line Distance (2BD20415ld)" on page 4-10.
Set Character Distance (SCD)	2BD2042900cd	See "Set Character Distance (2BD2042900cd)" on page 4-15.
Set Presentation Page Size (SPPS)	2BD2nn40...	See "Set Presentation Page Size (2BD2nn40wdwdlnln)" on page 4-18.
Page Presentation Media (PPM)	2BD2nn48...	See "Page Presentation Media (2BD2nn48xxxxfcsddoddqdx...)" on page 4-21.
Set Vertical Margins (SVM)	2BD2nn49...	See "Set Vertical Margin (2BD2nn49tmbm)" on page 4-18.
Set Print Setup (SPSU)	2BD2nn4C...	See "Set Print Setup (2BD2nn4Cxxpfxsi)" on page 4-22.
Set Exception Action (SEA)	2BD2nn85ecac	See "Set Exception Action (2BD2nn85ecac)" on page 4-19.
Set Horizontal Margins (SHM)	2BD2nn11...	See "Set Horizontal Margins (2BD2nn11lrm)" on page 4-22.
Set Text Orientation (STO)	2BD3nnF6ccccpppp	See "New Multiple-Byte Controls" on page I-4.
Begin Underscore (BUS)	2BD4nn0A01bp	See "Begin Underscore (2DB4nn0A01bp)" on page 4-19.
End Underscore (EUS)	2BD4020E	See "End Underscore (2BD4020E)" on page 4-19.
Begin Overstrike (BOS)	2BD4nn72...	See "Begin Overstrike (2BD4nn72chgccp)" on page 4-19.
End Overstrike (EOS)	2BD40276	See "End Overstrike (2BD40276)" on page 4-20.
Bell (BEL)	2F	Sends ASCII bell code (07).
Index Return (IRT)	33	Sends ASCII CR and LF (0D, 0A). Resets indent level to left margin.
Absolute Horizontal Presentation Position (AHPP)	34C0ah	If ah > MPP, then invalid parameter error is reported. Otherwise, if current column position (CCP) > ah, ASCII Work Station Controller sends CR followed by ah number of spaces. If CCP < ah, ASCII Work Station Controller sends ah - CCP number of spaces.
Absolute Vertical Presentation Position (AVPP)	34C4av	If av > lines per page, then invalid parameter error is reported. Otherwise, if current line position (CLP) > av, ASCII Work Station Controller sends a form feed followed by av number of line feeds. If CLP < av, ASCII Work Station Controller sends av - CLP number of line feeds.
Relative Horizontal Presentation Position (RHPP)	34C8rh	If rh and current position is less than or equal to MPP, ASCII Work Station Controller sends rh number of spaces; otherwise, an invalid parameter error is reported.
Relative Vertical Presentation Position (RVPP)	344Crv...	If rv and current line > lines per page, an invalid parameter is reported; otherwise, ASCII Work Station Controller sends rv number of line feeds.

Figure 4-3 (Page 4 of 4). Data Stream Commands Supported by the 3812 and 5219 Printers

5250 SCS Command	Hex Value	Emulation
Numeric Backspace (NBS)	36	Sends an ASCII backspace (08).
Subscript (SBS)	38	Sends an ESC character string (1B 53 01). If superscript is active, ESC T will be sent (1B 54).
Indent Tab (IT)	39	See "Indent Tab" on page 4-8.
Required Form Feed (RFF)	3A	Sends a series of LFs to move to top of form; updates internal horizontal left margin.
Substitute (SUB)	3F	Sends ASCII hyphen (2D).

Word Underscore (WUS)

The word to be underscored is the string of characters preceding this control back to the first delimiter that indicates the beginning of a word. The following are these delimiters: BS, NBS, NL, IRS, HT, LF, IT, FF, RNL, IRT, RFF, SP, NSP, UBS, WUS, and CR single-byte controls; the underscore graphic; the JTF final-form text multibyte control; and all the forms of the PP SCS multibyte control.

Indent Tab

The ASCII Work Station Controller reads the internal tab stop table and updates the left margin by putting out the appropriate number of ASCII spaces.

Set Horizontal Format (2BC1nnhh)

The Set Horizontal Format (SHF) command sets the logical maximum number of columns based on the current character width. If the SHF command is received in the data stream at a point that is not at a line boundary, data preceding the SHF position in the data stream is printed using the previous maximum presentation position (MPP). All data in the data stream after the SHF is printed on the same line, provided that the previous MPP does not exceed the new MPP.

If the previous MPP exceeds the new MPP and data exceeds the new MPP, an Invalid Command error will be reported. Any change in character pitch may affect the page width (see "Printers Emulating 3812 or 5219" on page 4-5 for more information). Page width and current position on the page are maintained by the ASCII Work Station Controller.

IBM 4019-E01, 4019-001, 4201-2, 4201-3, 4207-1, 4207-2, and 4216-10

Pitch	Character Column Width	Maximum MPP Value
10	6/60 inch (6 EU)	80
12	5/60 inch (5 EU)	96
17.1	7/120 inch (3.5 EU)	136 (15 pitch not supported)
PS	5/60 inch (5 EU)	96

IBM 4202-1, 4202-2, 4202-3, 4208-1, 4208-2, 4224, 4234-13, 5204, and 6252-AS8

Pitch	Character Column Width	Maximum MPP Value
10	6/60 inch (6 EU)	132
12	5/60 inch (5 EU)	158
17.1	7/120 inch (3.5 EU)	226 (4202 and 4208 only)
PS	5/60 inch (5 EU)	158
15	4/60 inch (4 EU)	198 (4224, 4234-13, 5204, and 6252-AS8 only)

Set Line Density (2BC6nld)

The Set Line Density (SLD) command sets up the vertical distance of one single line space (in units of 1/72 inch). Page depth is calculated when this command is received, if automatic page end is active. The ASCII Work Station Controller maintains the same page length (in inches) and changes the number of lines per page accordingly.

The ASCII Work Station Controller interprets the line density (ld) parameter as a 1-byte binary number that defines (in units of 1/72 inch) the vertical distance of each single line space. The ld value is a range value, not an absolute number. The ranges supported for ASCII printers are summarized in the following two tables. The first table provides the values for IBM 5219 and IBM 5256 emulation. The second table provides the values for IBM 5224 emulation. The supported ASCII printers can use values from either table.

IBM 5219 and 5256

ld Range (Hex)	Action	Hex Value Sent to 4019 and 5204 Printers (n)	Hex Value Sent to Other Printers (n)
0	Set to 6 lpi	18	C
1 to 8	Set to 12 lpi	C	6
9 to 0B	Set to 8 lpi	12	9
0C to 11	Set to 6 lpi	18	C
12	Set to 4 lpi	24	12
13 to FF	Set to 6 lpi	18	C

Notes:

1. Set Variable Line Feeding, 1B 41 n, where n = number of vertical units per inch for one line space.
2. Start Variable Line Feeding 1B 32.

IBM 3812 and 5224

Id Range (Hex)	Action	Hex Value Sent to 4019 and 5204 Printers (n)	Hex Value Sent to Other Printers(n)
0	Set to 6 lpi	18	C
1 to 55	Set 72/lid lpi	ld*2	ld
Greater than or equal to 56	Invalid parameter exception		

Notes:

1. Set Variable Line Feeding, 1B 41 n, where n = number of vertical units per inch for one line space.
2. Start Variable Line Feeding 1B 32.

Set Single Line Distance (2BD20415ld)

The Set Single Line Distance (SSLD) command sets up the vertical distance of a single line space in 1/1440-inch units. The value of ld is a 2-byte number specifying in 1/1440-inch units the depth of one line. The default is 240 (hex F0) for 6 lines per inch.

The 1B 41 n command is used. The following ld values are supported by the IBM 4207, IBM 4208, IBM 4216, and IBM 4224 printers:

Value of ld	5219 lpi	Hex Value (n) Sent to Printer	Printer lpi
30	48	1	72
60	24	3	24
120	12	6	12
150	9.6	7	10.29
180	8	9	8
240	6	C	6
270	5.33	D	5.54
360	4	12	4
570	2.54	1C	2.57

When the IBM 41n command is used, the following ld values are supported by IBM 4019-E01, 4019-001, and 5204 printers:

Value of ld	5219 lpi	Hex Value(n) Sent to Printer	Printer lpi
30	48	3	48
60	24	6	24
120	12	C	12
150	9.6	F	9.6
180	8	12	8

Value of Id	5219 lpi	Hex Value(n) Sent to Printer	Printer lpi
240	6	18	6
270	5.33	1B	5.33
360	4	24	4
570	2.54	39	2.54

Note: IBM 4019-E01, 4019-001, and 5204 printers support vertical units of 144 per inch. All other ASCII printers use 72 vertical units per inch.

All other Id values cause a Systems Network Architecture (SNA) negative response. If continued processing is allowed, the next smaller supported Id value is used. If there is no smaller supported value, the next higher value is used.

Set FID through GFID (2BD10705gfgffwfwfa)

The Set FID through GFID (SFG) command selects the font ID (gfgf), font width (fwfw), and font attributes (fa) to be used in printing subsequent text.

All invalid parameters detected for SFG cause an invalid parameter exception. If continued processing is allowed, SFG is ignored.

Page width is calculated when an SFG command is received. In addition, an fwfw parameter value causing a pitch change may result in a modification of the current MPP value. If the current MPP value exceeds the maximum MPP value for the new pitch, the MPP is set to the maximum allowed for the new pitch (see "Printers Emulating 3812 or 5219" on page 4-5 for more information). If the current MPP does not exceed the maximum MPP for the new pitch, the MPP is not changed.

If there is no change, there is no output.

IBM 4207, 4208, and 4216-10

gfgf ¹	fwfw	fa	Pitch to Select	Command to Printer (Hex)
	144	1	Select 10 pitch	1B4900 (If Q = 1) 1B4902 (If Q = 2)
	120	1	Select 12 pitch	1B4908 (If Q = 1) 1B490A (If Q = 2)
	96	1	Select 17.1 pitch	1B4910 (If Q = 1) 1B4912 (If Q = 2)
		2	Select PSM	1B4900 1B5001 (If Q = 1) 1B4903 (If Q = 2)

¹ The global font ID is ignored.

IBM 4019-E01, 4019-001, and 5204

fwfw	fa	Font/Pitch Selected	Commands to Printer (Hex)
144	1	Select 10 pitch	1B5B49050000gf009001
120	1	Select 12 pitch	1B5B49050000gf007801
96	1	Select 15 pitch	1B5B49050000gf006001
	2	Select PSM	1B5B49050000gf007802

Notes:

1. fa is the limiting factor. If its value is 2, font width is ignored.
2. Commands to printer:
 - Q = 1 stands for draft quality.
 - Q = 2 stands for near letter quality.
 - gf is the font ID in the Set FID through GFID command.

IBM 4224 Printer

fwfw	fa	Font/Pitch Selected	Commands to Printers
144	1	Select 10 pitch	1B49 01 (if Q = 1) 12 1B49 03 (if Q = 2) 12
120	1	Select 12 pitch	1B49 01 (if Q = 1) 1B3A 1B49 03 (if Q = 2) 1B3A
96	1	Select 15 pitch	1B49 01 (if Q = 1) 0F 1B49 03 (if Q = 2) 0F
	2	Select PSM	1B49 04 (if Q = 1) 1B3A 1B49 05 (if Q = 2) 1B3A

Note: fa is the limiting factor. If its value is 2, font width is ignored.

Justify Text Field (2BD2nn03rerepr)

The Justify Text Field (JTF) command specifies the justification of a field of text and the horizontal position to which the text will be justified. The ASCII Work Station Controller rounds down the horizontal position value to the next multiple of 1/120 inch, if the value specified is not a multiple of 1/120 inch.

The ASCII Work Station Controller supports the following percentage rules (pr) of justification:

Value of pr	% of Justification
0	No change to current percentage rule
50	Use 50% justification
100	Use 100% justification

No other values are supported. If continued processing is allowed, the ASCII Work Station Controller uses the nearest supported value other than zero (50% for 1 to 75, 100% for 76 to 255).

Because the printers do not support justification, the ASCII Work Station Controller calculates the number of spaces in the line buffer (between the last printable character and the right margin), divides by 2 (if in 50%), and distributes these spaces uniformly between each word on the line.

Leading white space resulting from RSP, NSP, HT, and IT is not expanded. Trailing white space resulting from SP and NSP is not expanded.

Note: The IBM 4224 Printer can only insert white space by inserting a blank character (5/60 inch); therefore, space between words on a line is not uniform.

Set Justify Mode (2BD2nn0Dstpr)

The Set Justify Mode (SJM) command specifies the justification of all subsequent lines of text. The ASCII Work Station Controller supports the following percentage rules of justification:

Value of pr	% of Justification
0	No change to current percentage rule
50	Use 50% justification
100	Use 100% justification

No other values are supported. If continued processing is allowed, the ASCII Work Station Controller uses the nearest supported value other than zero (50% for 1 to 75, 100% for 76 to 255).

Because the printers do not support justification, ASCII Work Station Controller calculates the number of spaces in the line buffer (after the last printable character), divides by 2 (if in 50%), and distributes these spaces uniformly between each word on the line.

Leading white space resulting from RSP, NSP, HT, and IT is not expanded. Trailing white space resulting from SP and NSP is not expanded.

The emulation for this command is the same as for JTF, except that for SJM, justification at all times applies to the entire line. All text between the left and right margins is justified.

Note: The IBM 4224 Printer can only insert white space by inserting a blank character (5/60 inch); therefore, space between words on a line is not uniform.

Set Initial Conditions (2BD220345is)

The Set Initial Conditions (SIC) command is used to set or reset formatting parameters to their initialization values and to select implicitly either a data processing (DP) or word processing (WP) environment. The *is* byte determines the mode in which the printer will operate. Valid values for the *is* byte are as follows:

- 1 WP mode selected (apply initialization values for WP field)
- 255 DP mode selected (apply initialization values for DP field)

No other values are supported. Any other value causes an SNA negative response. If continued processing is allowed, the ASCII Work Station Controller uses the WP mode values. The SIC command is restricted to page boundaries. Figure 4-4 shows the initialization values for the SIC command.

Figure 4-4. Initialization Values for SIC Command

Parameter/Condition	DP Mode	WP Mode
Exception action (all classes)	End	End
Unprintable character option	No stop, no status	End
Substitute character and default graphic	Hyphen	Hyphen
Automatic new line function	Active	Inactive
Automatic page end function	Active	Inactive
Justification	Inactive	Inactive
Justification percentage	100%	100%
Continuous underscore	Inactive	Inactive
Continuous overstrike	Inactive	Inactive
Release left margin	Not released	Not released
Left margin	0 inches	1.5 inches
First writing line	1	7
Lines per inch	6 lpi	6 lpi
Line spacing	1	1
Page depth	N/A	11 inches
Maximum presentation lines	1	N/A
Tab stop settings	Cleared	Cleared
Font style	11	85
Font attribute	Fixed pitch	Fixed pitch
Forms control type	Paper	Paper
Destination drawer	Not selectable	Not selectable

IBM 4019-E01, 4019-001, 4207, and 4216-10: Figure 4-5 shows the initialization values for IBM 4019-E01, 4019-001, 4207, and 4216-10 printers.

Figure 4-5 (Page 1 of 2). Initialization Values for IBM 4207 and 4216-10 Printers

Parameter/Condition	DP Mode	WP Mode
Right margin	8 inches	7.5 inches

Figure 4-5 (Page 2 of 2). Initialization Values for IBM 4207 and 4216-10 Printers

Parameter/Condition	DP Mode	WP Mode
Pitch	17.1	12
Page width	N/A	8 inches
Maximum presentation position	132	N/A
Character set	Defined by user configuration	Defined by user configuration
Source drawer	1	1
Print quality	Defined by user configuration	Defined by user configuration

IBM 4208, 4224, and 5204: Figure 4-6 shows the initialization values for the IBM 4208, 4224, and 5204 printers.

Figure 4-6. Initialization Values for IBM 4208, 4224, and 5204 Printers

Parameter/Condition	DP Mode	WP Mode
Right margin	13.2 inches	7.5 inches
Pitch	10	12
Page width	N/A	8.5 inches
Maximum presentation position	132	N/A
Character set	Defined by user configuration	Defined by user configuration
Source drawer	1	1
Print quality	Defined by user configuration	Defined by user configuration

Set Character Distance (2BD2042900cd)

The Set Character Distance (SCD) command is used to specify font width (pitch). A 2-byte binary number (cd) specifies the characters per inch (cpi).

Page width is calculated when this command is received. A *cd* parameter that results in a change to current pitch may result in a modification of the current MPP value for the new pitch selected by the SCD control (see "Printers Emulating 3812 or 5219" on page 4-5 for more information). The MPP is set to the maximum allowed for the new pitch.

Valid values for *cd* (in hex) follow. No other values are supported. If continued processing is allowed, the command is ignored.

IBM 4201-2, 4201-3, 4202-1, 4202-2, and 4202-3: Figure 4-7 shows the initialization values for the IBM 4201-2, 4201-3, 4202-1, 4202-2, and 4202-3 printers.

Figure 4-7 (Page 1 of 2). Initialization Values for IBM 4201-2, 4201-3, 4202-2, and 4202-3 Printers

Value of cd	Density	4201-2, 4202-1, and 4202-2 Command Sent to Printer	4201-3 and 4202-3 Command Sent to Printer
0	No change	No action	No action

Figure 4-7 (Page 2 of 2). Initialization Values for IBM 4201-2, 4201-3, 4202-2, and 4202-3 Printers

Value of cd	Density	4201-2, 4202-1, and 4202-2 Command Sent to Printer	4201-3 and 4202-3 Command Sent to Printer
A	Select 10 pitch	1B 49 02 (If Q = 2) 12 1B 49 00 (If Q = 1) 12	1B 49 06 (If Q = 2) 12 1B 49 04 (If Q = 1) 12
C	Select 12 pitch	1B 49 02 (If Q = 2) 12 1B 3A 1B 49 00 (If Q = 1) 12 1B 3A	1B 49 06 (If Q = 2) 12 1B 3A 1B 49 04 (If Q = 1) 12 1B 3A
F	Select 17.1 pitch	1B 49 02 12 (If Q = 2) 12 0F 1B 49 00 12 (If Q = 1) 12 0F (15 cpi not supported)	1B 49 06 (If Q = 2) 12 0F 1B 49 04 (If Q = 1) 12 0F (15 cpi not supported)
FF	Select 10 pitch	1B 49 02 (If Q = 2) 12 1B 49 00 (If Q = 1) 12	1B 49 06 (If Q = 2) 12 1B 49 04 (If Q = 1) 12

Note: A *cd* of F will select 17.1 pitch because 15 characters per inch is not available.

IBM 4207-1, 4207-2, 4208-1, 4208-2, and 4216-10: Figure 4-8 shows the initialization values for the IBM 4207-1, 4207-2, 4208-1, 4208-2, and 4216-10 printers.

Figure 4-8. Initialization Values for IBM 4207-1, 4207-2, 4208-1, 4208-2, and 4216-10 Printers

Value of cd	Density	Command Sent to Printer
0	No change	No action
A	Select 10 pitch	1B 49 02 (If Q = 2) 12 1B 49 00 (If Q = 1) 12
C	Select 12 pitch	1B 49 0A (If Q = 2) 1B 3A 1B 49 08 (If Q = 1) 1B 3A
F	Select 17.1 pitch	1B 49 12 (If Q = 2) 0F 1B 49 10 (If Q = 1) 0F (15 cpi not supported)
B	Select PSM	1B 49 03 1B50 01 (If Q = 2) 1B 49 00 1B50 01 (If Q = 1)
FF	Select 10 pitch	1B 49 02 (If Q = 2) 12 1B 49 00 (If Q = 1) 12

Note: A *cd* of F will select 17.1 pitch because 15 characters per inch is not available.

IBM 4224:

Figure 4-9 shows the initialization values for the IBM 4224 Printer.

Figure 4-9 (Page 1 of 2). Initialization Values for IBM 4224 Printer

Value of cd	Density	Command Sent to Printer
0	No change	No action
A	Select 10 pitch	1B49 01 (If Q = 1) 12 1B49 03 (If Q = 2) 12

Figure 4-9 (Page 2 of 2). Initialization Values for IBM 4224 Printer

Value of cd	Density	Command Sent to Printer
C	Select 12 pitch	1B49 01 (If Q = 1) 1B 1A 1B49 03 (If Q = 2) 1B 3A
F	Select 15 pitch	1B49 01 (If Q = 1) 0F 1B49 03 (If Q = 2) 0F
B	Select PSM	1B49 04 (If Q = 1) 1B3A 1B49 05 (If Q = 2) 1B3A
FF	Select 10 pitch	1B49 01 (If Q = 1) 12 1B49 03 (If Q = 2) 12

IBM 4019-E01, 4019-001, and 5204: Figure 4-10 shows the initialization values for IBM 4019-E01, 4019-001, and 5204 printers.

Figure 4-10. Initialization Values for IBM 5204 Printer

Value of cd	Density	Command Sent to Printer
0	No change	No action
A	Select 10 pitch	1B 5B 49 05 00 00 0B 00 90 01
C	Select 12 pitch	1B 5B 49 05 00 00 55 00 78 01
F	Select 15 pitch	1B 5B 49 05 00 00 DF 00 60 01
B	Select PSM	1B 5B 49 05 00 00 9F 00 78 02
FF	Select 10 pitch	1B 5B 49 05 00 00 0B 00 90 01

IBM 4234 and 6252-AS8: Figure 4-11 shows the initialization values for IBM 4234 and 6252-AS8 printers.

Figure 4-11. Initialization Values for IBM 4234 and 6252-AS8 Printers

Value of cd	Density	Command Sent to Printer
0	No change	No action
A	Select 10 pitch	1B49 01 (If Q = 1) 12 1B49 03 (If Q = 2) 12
C	Select 12 pitch	1B49 01 (If Q = 1) 12 1B 3A 1B49 03 (If Q = 2) 12 1B 3A
F	Select 15 pitch	1B49 01 (If Q = 1) 12 0F 1B49 03 (If Q = 2) 12 0F
FF	Select 10 pitch	1B49 01 (If Q = 1) 12 1B49 03 (If Q = 2) 12

Set Presentation Page Size (2BD2nn40wdwdlnln)

The Set Presentation Page Size (SPPS) command defines the page length and width in units of 1/1440 inch. This command always turns off the automatic new line function. The command also turns off the automatic page end function if ln is specified.

The ASCII Work Station Controller internally maintains page width and does not explicitly send commands to the printers if page width changes. An attempt to print beyond the right margin causes an EC = 1 exception, and all the remaining print lines automatically wraparound. Page depth is also internally maintained by the ASCII Work Station Controller. However, an ASCII ESC C command is issued from the work station controller to the printer to set the page length.

The parameter *wdwd* is a 2-byte number that defines page width (logical left margin is the left reference).

All printers: The *wdwd* value is specified in units of 1/1440 inch.

wdwd value Action

0	No change to current width.
1 to 19008	Set page width to this value rounded down to the nearest 1/1440 inch.

All other values cause an EC = 4 exception. If continued processing is allowed, the ASCII Work Station Controller uses the value of 19008 (13.2 inches).

The value for *lnln* is a 2-byte number defining page length. *lnln* is specified in units of 1/1440 inch, but is rounded down to the nearest 1/72 inch.

lnln value Action

0	No change to the page depth.
1 to 21600	Set page length to this value rounded down to the nearest 1/72 inch.

All other values cause an EC = 4 exception. If continued processing is allowed, the ASCII Work Station Controller uses the value of 21600 (15 inches).

Set Vertical Margin (2BD2nn49tmbm)

The Set Vertical Margin (SVM) command specifies the top and bottom margins. A 2-byte binary value (*tm*) in units of 1/1440 inch specifies the distance from the top of the form to the first printable line. The value of *bm* is a 2-byte binary value that is ignored.

A *tm* value of 0 does not change the current setting. All other *tm* values from 1 to 32767 are converted. Values of *tm* greater than 32767 will cause an EC = 4 exception. If processing is continued, the command is ignored. A *tm* value less than a single line distance of paper motion results in an EC = 1 exception. If processing is continued, a single line distance is used. A *tm* value greater than the page depth causes an EC = 1 exception. If processing is continued, page depth is used.

This number is converted to the closest 1/72 inch so that a single line can be fed, using the sequence detailed in the SSLD command to get the first line. The formula for this conversion is $tm/20$. Example:

tm (1/1440)	Value (1/72)	Distance in Inches
240	12	0.1667 (1 line at 6 lpi)
1680	84	1.1667 inches (7 lines at 6 lpi)

Set Exception Action (2BD2nn85ecac)

The Set Exception Action (SEA) command selects the action to be performed by the ASCII Work Station Controller when it detects errors in the data stream. The actions taken are as follows:

Value

of ac Action Taken

- 0 Accepts the error, reports the error to the system, and continues processing
- 1 Ignores the error, and continues processing
- 2 Reports invalid SCS command or parameter error to the system and stops the processing of the data stream
- 3 Reports the error to the system and stops processing

Begin Underscore (2DB4nn0A01bp)

The Begin Underscore (BUS) command turns on the continuous underscore function. The ASCII Work Station Controller supports the optional bp variable, which identifies the graphic characters not to be underscored. The following values for bp are supported:

Value

of bp Action Taken

- 0 (default) Underscore all graphic characters including the space graphic (hex 40) and the RHPP control (hex 34C8).
- Hex 80 Underscore all characters except those listed above. All other values for bp result in an EC = 4 exception.

When the BUS command is received, the continuous underscore function remains active until ended by an EUS or SIC command. Underscoring starts on the next graphic character in the data stream after the BUS command is received.

White space on any line resulting from an HT, IT, or AHPP command is not underscored. White space resulting from NS and RS is always underscored. When justification is active, any trailing white space is not underscored.

End Underscore (2BD4020E)

The End Underscore (EUS) command ends the continuous underscore function.

Begin Overstrike (2BD4nn72chgccp)

The Begin Overstrike (BOS) command turns on the continuous overstrike function.

When the BOS command is received, all graphic characters are struck over with the ch character until an EOS or SIC command is received. White space resulting from HT, IT, or AHPP commands is not struck over. White space resulting from NS and RS is always struck over. The ASCII Work Station Controller maintains a 1-line overstrike buffer and a variable that contains the current ch value. The overstrike buffer is a copy of the line buffer, but contains the overstrike characters in

place of the printable graphics. If the overstrike variable is not zero, the content of the overstrike buffer is sent to the printer, followed by a CR.

End Overstrike (2BD40276)

The End Overstrike (EOS) command ends the continuous overstrike function. The ASCII Work Station Controller clears the overstrike variable and the overstrike line buffers.

Select Global Character Set ID (2BD10601gcgccpcp)

The GCGID and CPGID are paired parameters specifying the registry ID of the character sets. The following table lists these parameters supported by the ASCII Work Station Controller.

Registry	GCGID	ID	CPGID	Character Set	Country Name
00103		00038		International	(ASCII)
00101		00037		US EBCDIC	
00265		00273		Austria/Germany	
00269		00274		Belgium	
00273		00275		Brazil	
00277		00276		Canadian French	
00281		00277		Denmark/Norway	
00285		00278		Finland/Sweden	
00288		00297		France-1980	
00293		00280		Italy	
00297		00281		Japan/English	
00301		00282		Portugal	
00305		00283		Spain	
00309		00284		Spanish speaking	
00313		00285		United Kingdom	
00103		00256		International	(ASCII)
00101		00256		US EBCDIC	
00029		00256		Austria/Germany	
00043		00256		Netherlands	
00039		00256		Canadian French	
00055		00256		Denmark/Norway	
00053		00256		Finland/Sweden	
00251		00256		France-1980	
00048		00256		Switzerland-French	
00049		00256		Switzerland-German	
00269		00256		Japan-English	
00063		00256		Portugal	
00045		00256		Spain	
00025		00256		Spanish speaking	
00067		00256		United Kingdom	

Unit Backspace (1A)

In fixed pitch, the Unit Backspace (UBS) command is ignored. In proportional space mode (PSM), UBS is processed as a regular backspace, 1/60 inch in width. The IBM 4207, 4208, and 4216-10 printers issue the following sequence:

- A number of backspaces (08) equal to the number of UBSs divided by 5 plus 1; that is, (number of UBSs/5) + 1
- 1B 64
- Two times the quantity of 5 minus the remainder of the number of UBSs divided by 5; that is, $2 \times (5 - [\text{remainder of number of UBSs}/5])$

- 00

For example, if the number of UBSs is 7, the work station controller sends the following sequence of bytes to the 4207 and 4208 printers: 08 08 1B 64 06 00.

The IBM 4224 Printer issues a number of backspaces (08) equal to the number of UBSs divided by 5.

The IBM 5204 Printer issues 1B, 65, the remainder of the number of UBSs multiplied by two, and then divided by 256, followed by the number of UBSs multiplied by two and divided by 256. For example, if the number of UBSs is 7, the work station controller sends the following sequence of bytes to the 5204 printer: 1B 65 0E 00.

Page Presentation Media (2BD2nn48xxxxfcsddoddqgdx...)

- xxxx** A 2-byte number that is not inspected by the printer.
- fc** A 1-byte number specifying the forms selection. Valid values are 0 through 2. A value of 0 causes no change to the forms selection. A value of 1 selects paper as the forms media, and a value of 2 selects envelopes.
- sd** A 1-byte number specifying the source drawer to be used for automatic feeding of paper or envelopes. Valid values are 0 through 3. A value of 0 causes no change to source drawer selection. A value of 1, 2, or 3 selects the respective drawer for form feed media.
- do** Ignored.
- dd** Ignored.
- qq** A 1-byte number specifying the print quality. Valid values are 0 through 3. A value of 0 causes no change. A value of 1 selects draft quality, a value of 2 selects near letter quality, and a value of 3 selects intermediate quality.
- dx** Ignored.

If **fc** and **sd** are both used, when **fc** equals 2, drawer 3 is selected regardless of the value of **sd**. When **fc** does not equal 2, the value of **sd** determines the source drawer selection.

Set Coded Graphic Character Set through ID (2BD10381lcid)

The SCGL control may be used to select the coded graphic character set (CGCS) to be used in processing subsequent text. For only those characters identified in the following table, the SCGL control is an alternative to selecting the character set via SCG.

LCID Value (Hex)	Character Set Registry ID	Selected Country
00	0010300038	International (ASCII)
01	0010100037	US EBCDIC
02	0026500273	Austria/Germany
03	0026900274	Belgium
04	0027300275	Brazil

LCID Value (Hex)	Character Set Registry ID	Selected Country
05	0027700276	Canadian French
06	0028100277	Denmark/Norway
07	0028500278	Finland/Sweden
08	0028800297	France–1980
09	0029300280	Italy
0A	0029700281	Japan
0C	0030100282	Portugal
0D	0030500283	Spain
0E	0030900284	Spanish speaking
0F	0031300285	United Kingdom
All Others	Use character set defined by user configuration.	

Set Print Setup (2BD2nn4Cxxpfxxsi)

The Set Print Setup (SPSU) command specifies the paper feed technique (PFT) and print setup.

Code PFT

- nn** Number of bytes remaining in the command plus 1. Valid values are 04 through 65. An invalid value causes an EC = 3 exception.
- xx** A 1-byte number that is not inspected by the ASCII Work Station Controller.
- pf** A 1-byte number specifying the paper feed device. These values are valid:
- 00 No change to paper feed.
 - 01 Select manual feed.
 - 02 Select tractor feed.
 - 03 Select automatic cut sheet feed.
- All other values cause an invalid parameter exception.
- si** A string of up to 60 characters that is ignored by the ASCII Work Station Controller.

Set Horizontal Margins (2BD2nn11lrm)

The Set Horizontal Margin (SHM) command defines the left and right margins. *lm* is a 2-byte number that specifies in units of 1/1440 inch the farthest left print position. *rm* is a 2-byte number that specifies in units of 1/1440 inch the right margin. These numbers are stored in inches by the ASCII Work Station Controller.

The left margin is immediately converted to columns in the current density to be used for all printed lines. The right margin is converted to columns and used only for justification purposes.

Note: Lines are justified using the right margin. If a line is not justified, the MPP (see “Set Horizontal Format (2BC1nnhh)” on page 4-8) is used for the farthest right print position.

A margin value of 0 causes no change to the margin. A margin value greater than decimal 32767 causes an invalid parameter exception.

Note: The margins and MPP are independent parameters. No check is made between left margin, right margin, or MPP.

Transparency

The transparency function allows data and commands to be passed through the ASCII Work Station Controller to attached devices without modification. This function applies to printers only.

The ASCII Work Station Controller supports a transparent mode of operation in which data conversion to the printer is inhibited. The transparency function is started through use of the ASCII Transparency command (X'03'). This command is followed by a single byte that indicates the number of following bytes to be printed without passing through the EBCDIC-to-ASCII conversion process.

The AS/400 supports a data stream type, DEVTYPE(*USERASCII), that you can select with the Create Print File (CRTPRTF), Change Print File (CHGPRTF), or Override Print File (OVRPRTF) Control Language (CL) commands. You use the *USERASCII data stream option for applications that generate an entirely ASCII data stream. This option automatically invokes the transparency function, so that the data stream generated by the application is sent through the controller without EBCDIC-to-ASCII conversion.

Note: The Replace Unprintable Character (RPLUNPRT) command controls the replacement of unprintable characters (such as hex codes) in the data stream. This command is specified at the CRT/OVR/CHG PRTF level; the default is RPLUNPRT(*YES).

- If you have imbedded transparency commands in the data stream, you must select RPLUNPRT(*NO) so that the command codes are not replaced with blanks, which would disable the transparency function.
- The *USERASCII data stream option automatically controls the replacement of unprintable characters, so that you do *not* need to change the RPLUNPRT default when you select *USERASCII.

The transparency function is used to generate an ASCII data stream and pass it directly to the printer. Therefore, you can use it to support printing bar codes, graphics, forms, or letterhead stationery.

Example of Using Transparency

Following is an example of using the transparency function to access a Helvetica** Italic 18-point font for use in an OfficeVision/400 document. You might want to use a font this large to post a notice on a bulletin board or to use as banner print on a newsletter.

This example assumes you are printing on an IBM 4029 LaserPrinter (emulating an IBM 5219 printer) connected to an IBM 3477 InfoWindow* display station.

Determining the Required Hexadecimal String: Use the printer technical reference manual to determine the hexadecimal string required to send the change font instruction to the printer.

The hexadecimal string required to specify a Helvetica Italic 18-point font for an IBM 4029 LaserPrinter is:

```
03 0A 1B 5B 49 05 00 09 02 01 68 03
```

Where

- 03 is the ASCII transparency command
- 0A is the length of the ASCII bytes to follow
- 1B 5B 49 05 00 09 02 01 68 03 is the Helvetica Italic 18-point font instruction for an IBM 4029 LaserPrinter.

Putting the Change Font Instruction into a File: Following is an example of the steps you can follow to put this change font instruction into a physical file.

1. Type:

```
CRTSRCPF FILE(library/filename)
```

Replace *library* with the name of the library in which you want to store the change font instruction. Replace *filename* with the name of the file in which you want to store the change font instruction.

You see a message confirming that the file was created.

2. Type:

```
STRSEU SRCFILE(library/filename)
```

Replace *library* with the name of the library in which you stored the change font instruction. Replace *filename* with the name of the file in which you stored the change font instruction.

3. On the Work with Members Using SEU display:

- a. Type an object name in the *New member* field (for example, HELIT18 for Helvetica Italic 18-point font).
- b. Type PF (physical file) in the *Type for new member* field.
- c. Type a description of the change font instruction (for example, "Helvetica Italic - 18-Point") in the *Text* field.
- d. Press Enter.

4. On the SEU Edit display, press Prompt (F4).

- a. Type R in the *Name Type* field.
- b. Type RECORD in the *Name* field.
- c. Press Enter.
- d. Type *I* over the first 0 of 0001.00.
- e. Press Enter.
- f. Press Prompt (F4).
- g. Type the new member name (HELIT18, in this example) in the *Name* field.
- h. Type the number of bytes in the hex string (00012, in this example) in the *Length* field.
- i. Type H in the *Data Type* field.
- j. Type the change font instruction hex string in the *Functions* field. In this example, you would type:

```
DFT(X'030A1B5B4905000902016803')
```

- k. Press Exit (F3).

5. On the Exit display, ensure that the *Change/create member* field is set to Y.

6. Press Enter. You return to the Work with Members Using SEU display.

7. Press Exit (F3). You return to the AS/400 Main Menu.

8. Type:

```
WRKMBRPDM FILE(library/filename)
```

Replace *library* with the name of the library in which you stored the change font instruction. Replace *filename* with the name of the file in which you stored the change font instruction.

9. On the Work with Members Using PDM display :
 - a. Press More Options (F23).
 - b. Select option 14 (Compile). The compile is submitted to batch.
 - c. Press Exit (F3) to return to the main menu.
10. When the compile is complete, you receive a notification message in your message queue. A file is created with the name specified for the new member (HELIT18, in this example). To verify that the file exists, type:

```
WRKOBJPDM LIB(library)
```

Replace *library* with the name of the library in which you stored the change font instruction. Then press Exit (F3) to return to the main menu.

11. Initialize the physical file member by typing:

```
INZPFM FILE(library/filename) TOTRCD(1)
```

Replace *library* with the name of the library in which you stored the change font instruction. Replace *filename* with the name of the file in which you stored the change font instruction.

Putting the Change Font Instruction in a Document: You can follow these steps to place the change font instruction into an OfficeVision/400 document.

1. On the AS/400 main menu, select option 2 (Office tasks).
2. On the Office Tasks display, select option 6 (Documents).
3. On the Documents display, select option 1 (Work with documents).
4. On the Work with Documents display, select the document in which you want to use the Helvetica Italic 18-pitch font.
5. On the Revise Document display, position the cursor where you want to place the font change instruction. Then press Instructions (F9).
6. On the Select Text Instruction display, select option 12 (Data field).
7. On the Select Data Field Instruction display, select option 1 (Print the data from a data field). Then press Enter.
8. On the Select Data Field Instruction display:
 - a. Type the file name of the file containing the change font instruction (in this example, HELIT18) in the *Data field* field.
 - b. Type 1 in the *Data field source* field.
 - c. Type 2 in the *Letters or list* field.
 - d. Press Enter.
9. On the Merge Data Options display, select option 3 (merge data source).
10. Press Enter. You see the Edit display. The change font instruction will be merged the OfficeVision/400 document when the document is printed.

Notes:

1. You must set margins and tabs to accommodate the larger point size. (The document does not automatically adjust margins and tabs.)
2. You must set line spacing to accommodate the larger point size, so characters do not overlay one another.

Part 2 – Example

Chapter 5. Introducing the ASCII Work Station

What Is an ASCII Work Station?	5-2
What is Asynchronous Communication?	5-2
What Is the ASCII Work Station Controller?	5-2
Terminology Used in the Example Portion of This Book	5-3

What Is an ASCII Work Station?

An ASCII Work Station is a device (display station, personal computer, or printer) that uses ASCII code for data representation.

What is Asynchronous Communication?

Asynchronous communication is what the ASCII work station normally uses to communicate with the computer. Asynchronous communication means, simply, that the computer and the work station synchronize on each individual character as the character is sent along the cable or line. The work station and computer synchronize the passing of data between them by placing start and stop bits on both sides of the data characters. Because of this, asynchronous communication is also called start/stop.

The ASCII work station controller only supports asynchronous communication. This book will only discuss and show asynchronous communication.

What Is the ASCII Work Station Controller?

The ASCII Work Station Controller is a logic card that resides in the AS/400 system unit. It enables ASCII work stations to communicate with the AS/400 by converting ASCII data to EBCDIC, and EBCDIC data to ASCII. Since all ASCII work stations that are part of an AS/400 system must have access to that data conversion facility, ASCII Work Station Controllers support the connection of multiple ASCII devices to the system through several types of multi-port attachments. The ASCII devices can be nonprogrammable display stations, personal computers, or printers. The ASCII Work Station Controller also supports the attachment of auxiliary printers to personal computers or to display stations that can accommodate them.

The 2637 ASCII Work Station Controller is built in to the AS/400 9402 Models Cxx-Fxx System Units. It is connected to either a 6-port adapter that is installed in the back of the system unit, or a dual-connection adapter that accommodates two 6-port work station attachments. These two adapters enable the 2637 ASCII Work Station Controller to support either 12 or 18 active work stations, respectively. The 2637 ASCII Work Station Controller on a 9402/9404 model 20x supports 6-port and 12-port attachments. The attachments are connected to the back of the system unit.

The 6141 ASCII Work Station Controller is a removable logic card that can be installed in the AS/400 9402 System Unit in addition to a 2637 work station controller, or in the 9404 System Unit or the 9406 System Unit. The 6141 ASCII Work Station Controller can be equipped with one six-port and one 12-port adapter. This allows up to 36 devices to be connected directly to an AS/400 system. Of the 36 connected devices, 18 can be active.

Since the ASCII Work Station Controllers support display stations with auxiliary printers, the number of devices that can be physically connected to the AS/400 is twice the number of ports on each controller. For example, a 6141 ASCII Work Station Controller with one six-port and one 12-port adapter would enable up to 36 devices to be connected to the AS/400. However, the system can communicate with only 18 of these devices at one time.

The remaining chapters in this book explain how to set up and configure ASCII devices that are attached to the AS/400 through an ASCII Work Station Controller.

Terminology Used in the Example Portion of This Book

Terminology can be confusing so we want to define some of the terms we use in this book.

Work station	This can be a printer, a personal computer, or a display station.
Configuring	Defining the work station to the system. This insures that the system has information such as what port the work station is on and how fast information will be sent and received.
ASCII printer	A printer that uses ASCII data. Only serial ASCII printers are supported on the ASCII Work Station Controller.
ASCII display station	A display station that uses ASCII data.
Setting up	Making the work station ready to communicate with the system.
PC	A personal computer, including the Personal System/2* (PS/2) work station.
Console	The display station through which the system provides information to the operator, for instance, when the system is being started. The console is also used for isolating problems on the system. The console must be attached to the first port (port 0) of the first work station controller in the system.
System printer	The printer that the system uses as a default to send all system messages or other printable information.

Chapter 6. Scenario of Our Example and Tasks Included

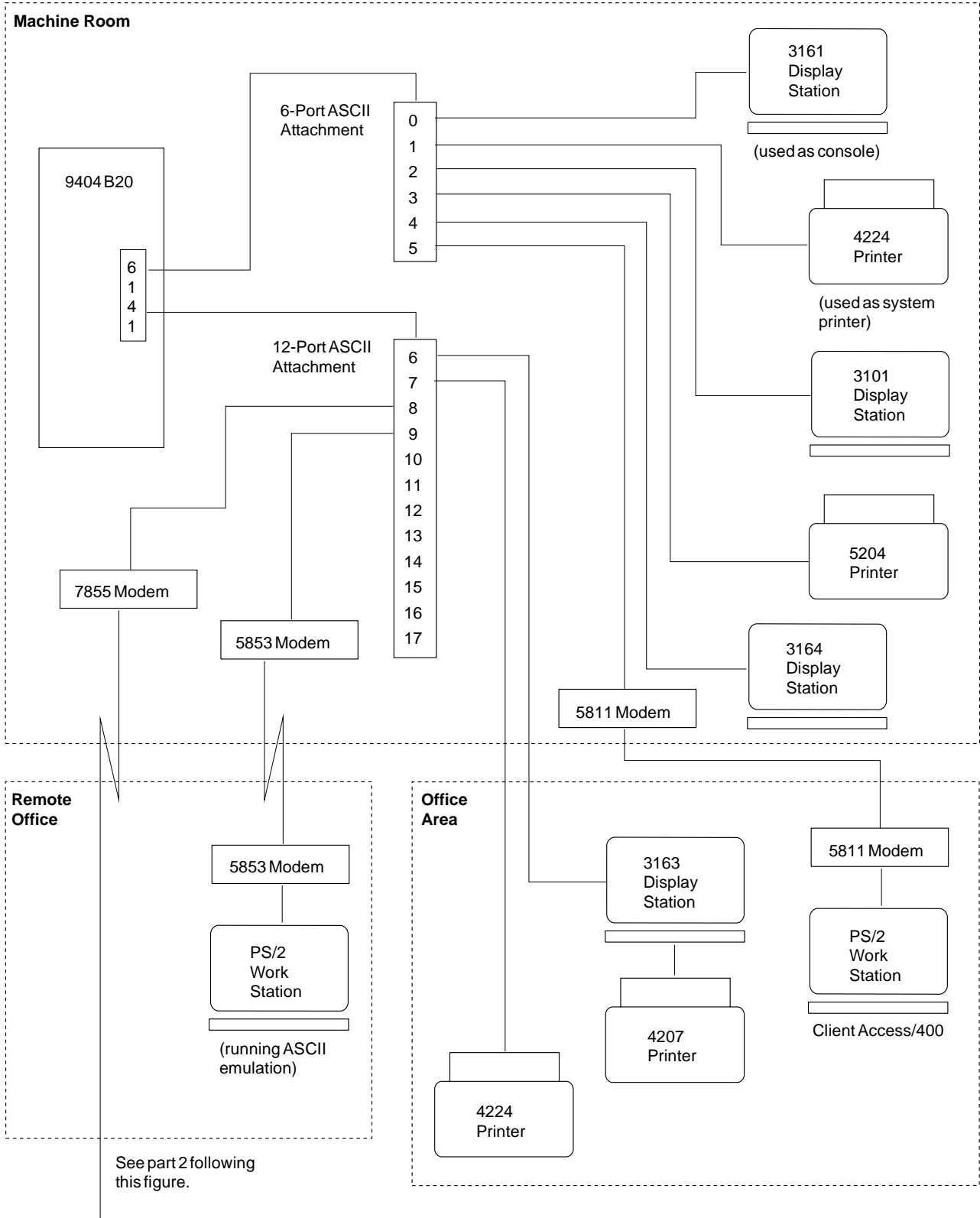
Scenario for a Sample Configuration	6-2
Tasks Explained in the Example	6-5

Scenario for a Sample Configuration

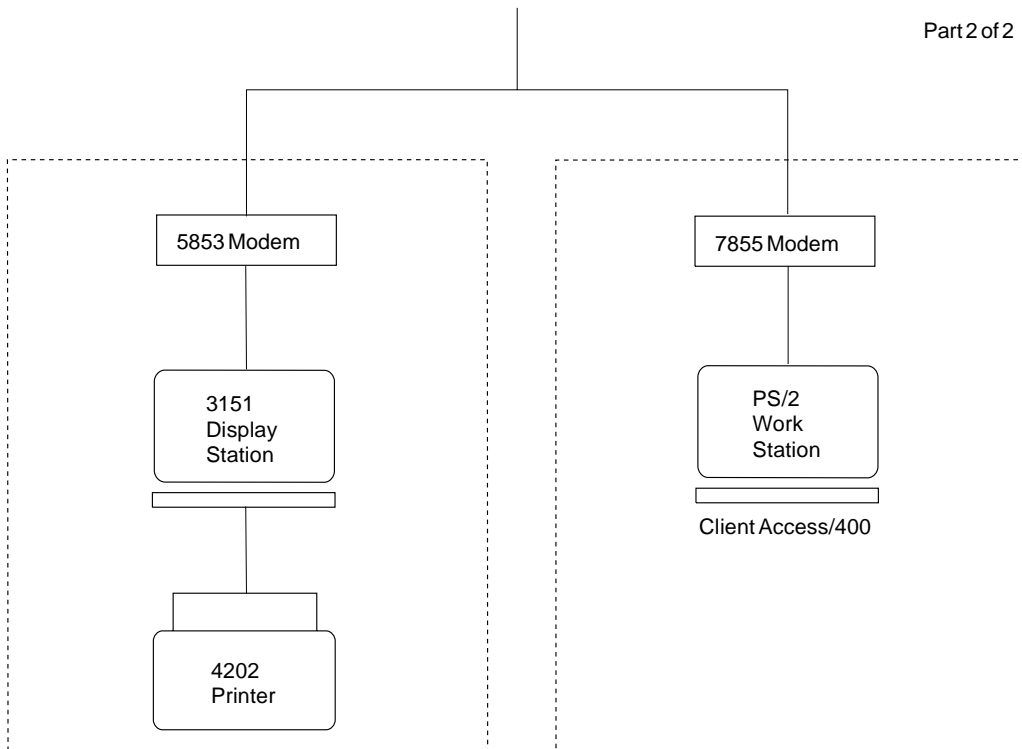
The next several chapters explain the procedures involved in planning for, setting up, and configuring ASCII work stations connected to an AS/400 system. These chapters illustrate how you would perform these procedures with an example describing a typical AS/400 system configuration that serves a small garment company in New York City called Best Dressed. The system consists of an AS/400 9404 System Unit, an ASCII work station controller, 6-port and 12-port attachments, and a variety of ASCII work stations.

As part of a planned expansion program, Best Dressed has opened a sales office on the west coast and purchased the AS/400 system to handle inventory and distribution. Best Dressed chose a configuration using ASCII work stations because it provided a way to meet current computing needs in a cost-effective manner and allow for the expansion of computing facilities in the future.

The system plan that Best Dressed developed appears on the following pages. A description of the components of the system begins on page 6-4.



RV3F099-0



Note: Only one of these display stations can call in to and use the system at any one time. This is possible because this port is designated for ASCII port sharing.

RV3F098-0

Best Dressed decided to install the work stations as follows:

- **In the machine room:**

- One 3161 display station to be used as the console
- One 4224 system printer for the system operator
- One 3101 display station and one 3164 display station for two programmers that Best Dressed has added to the staff
- One 5204 printer for the programmers

Note: All work stations in the machine room are located within the limits of EIA-232-D standard. For this reason, an EIA-232 type direct cable is used to connect the work stations in this room to the ASCII attachment. This cable was chosen because it is simple to set up and because it allows for the full function of the ASCII Work Station Controller. For the full function that the ASCII Work Station Controller provides, it is best to use the direct connection cable. If a 3-wire or 4-wire cable is used, different values need to be recorded on form C7. For more information on EIA-232-D limits and a description of cable types, see the *Physical Planning Reference*.

- **In the office area:**

- An IBM PS/2 work station model 70 running Client Access/400 for their accountant.

This PS/2 work station uses a 5811 modem to connect to the AS/400 system. The PS/2 work station line of personal computers has an asyn-

chronous port built in, therefore an additional expansion card is not necessary to connect to the AS/400 ASCII work station controller or modem.

- An IBM 3163 display station with a locally attached auxiliary 4207 printer for the shipping department. The 4207 printer is configured to use the host print transform function.
- A 4224 printer to be shared by accounting and order entry.

Notes:

1. The office area is physically located two floors above the machine room. This area is *outside* the limits of EIA-232-D standard. The office area is, however, physically located in the same building. Because of this, none of the EIA-232 cables (direct, 3-wire, or 4-wire) can be used. Work stations located within 1219.2 meters (4000 feet) of the system can be connected with EIA-422 cables, PTT connections, or modems.
2. In this example, EIA-422 cables are used when possible. Although the EIA-422 cable does not require a modem, it does not allow full function of the ASCII Work Station Controller.
3. The Personal System/2 is connected with limited-distance modems (5811 modems) because the PS/2 work station requires the full function of the ASCII Work Station Controller. These modems are connected to each other without the use of a telephone line.

- **In the remote sales office:**

This is Best Dressed's west coast office which currently houses one salesperson and a secretary.

- A PS/2 work station model 30 running ASCII emulation for the secretary.

This PS/2 work station uses a 5853 modem to connect to the remote AS/400.

- A 3151 display station and modem with an attached auxiliary 4202 printer for the salesperson.

Note: The remote sales office is located more than 1219.2 meters (4000 feet) from the system. For this reason, modems and telephone lines are used to connect the work stations to the ASCII attachment. EIA-422 cables cannot be used for work stations located more than 1219.2 meters (4000 feet) from the system.

Tasks Explained in the Example

In this example, we explain the tasks needed to plan for, set up, and connect an ASCII work station to a preloaded 9404 System Unit. The example also explains the task of configuring the 9404 System Unit. Other tasks, not specifically addressing ASCII work stations, are covered in detail in other books.

The following tasks are necessary to setup a 9404 preloaded system. Next to the task, it shows whether the information is covered in this book or if the information is covered in other books.

- Planning for the system (only ASCII forms are covered in this book)

In our example, Best Dressed used the *Physical Planning Reference* and planned for their system. As part of this planning, Best Dressed planned for electrical outlets and telephone lines for the modems.

- Positioning the parts of the System (covered in another book)
 In our example, Best Dressed used the *Total System Package Installation* book, to complete this task.
- Unpacking the Parts of the System (covered in another book)
 In our example, Best Dressed used the *Total System Package Installation* book, to complete this task.
- Setting up displays, printers, and modems (covered in this example)
 Information for setting up some ASCII work stations is covered in this example.
- Setting up the System Unit (covered in another book)
 This task is performed by the service representative and is explained in the *Total System Package Installation* book.
- Connecting Cables for Displays and Printers (covered in this example)
 Look at the illustration of the device configuration on page 6-3 and notice the 6- and 12-port attachments. These attachments work somewhat like extension cords. The service representative connected one end of the attachments to the system. In this task you connect the work stations to the other end of the attachments.
- Setting up the work stations (covered in this example)
 In this task, you set some switches and select values on work station displays. This tells the work station how information is to be sent to, and received by, the system.

Notes:

1. The information you select for each work station in this task *must* match the information that you type on the displays when you configure each device on the system.
 2. For example, for each work station, the line speed you specify when you *setup* the work station *must* match the line speed you specify when you *configure* the same work station.
- Setting Up the 5811 Modems (covered in this example)
 Because each setup has specific considerations, refer to the *5811 Modem Description and Planning Guide* for additional information on planning to set up 5811 modems. In addition, refer to the *5811 Modem Manual Setup, Problem Analysis and Resolution* for additional information on setting up 5811 modems.
 - Setting Up the 5853 Modems (covered in this example)
 - Setting Up the 7855 Modems (covered in this example)
 - Starting Up the System Unit (covered in this example)
 - Configuring Devices (covered in this example)
 Configuring devices is done by logging onto the system and typing information on a few screens. This information makes it possible for the system to know where each work station is and how information is be sent to, and received by, each work station.
Note: The information you type in about each work station in this task *must* match the information that was selected when the work station was setup.

For example, if you set up the system printer with a line speed of 19,200 bits per second, and then you configure the system specifying the system printer's line speed as 9,600 bits per second, the system can not communicate with the system printer.

- Completing Electronic Customer Support Communications (covered in another book)

In our example, Best Dressed used the *Total System Package Installation* book, to complete this task.

- Saving the system on Tape (covered in another book)

It is very important for you to perform this task. Some system failures can cause the loss of information that is loaded into the system. The tape you create in this task allows you to load that information back into the system if such a failure occurs.

In our example, Best Dressed used the *Total System Package Installation* book, to complete this task.

- Completing the Setup (covered in another book)

In our example, Best Dressed used the *Total System Package Installation* book, to complete this task.

- Verifying that the Configuration is Working (covered in this book)

Chapter 7. Planning for the Device Configuration

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Planning for Education	7-3
Listing the Equipment You Need	7-3
Ordering Supplies	7-3
Ordering Publications	7-3
Making Arrangements for Equipment Maintenance	7-3

Having a device configuration with ASCII work stations begins with solid planning. As in most things, advance planning can make a big difference in how quickly and easily you get your work stations connected to, and communicating with, the system. Use the *Physical Planning Reference* to plan for this system. Part of this process includes planning for electrical outlets and telephone lines for the modems.

In this chapter, we describe the planning tasks you would perform if your device configuration were the same as our example. If you have finished these planning tasks, you have the information and materials necessary to set up and configure the example work stations.

Good planning starts with the right planning forms to use. Planning forms are designed to help you gather information about the device configuration. Included in this book is a copy of each planning form that you will need to install an ASCII work station.

Chapter 8, "Completing Forms," gives instructions on how to complete the planning forms and worksheets for the ASCII Work Station Controller.

References to other books are given at the end of each task in this example. Though all the necessary information to complete the example is given here, references to other books are also included. These books are helpful when working with ASCII work stations. You might want to refer to these other books for more information, particularly if your setup differs from the example.

Gathering the Planning Forms and Worksheet

All of the forms and worksheets that you need to record ASCII device configuration specifications and create configuration descriptions are included in Appendix H, "Forms." Make photocopies of the forms to record information on and keep the originals to reproduce as needed. You may not need to use all the forms in the appendix, depending on whether or not devices at your site are connected to the system with a modem. Use the forms that fit your particular needs.

The following is a list of all the planning forms required to configure an ASCII work station controller and the ASCII work stations attached to it. Information on how to complete these forms is included in Chapter 8, "Completing Forms."

- ___ Form X1, Recording Resource Names
Complete this form for the ASCII work station controller card that is on the AS/400 system.
- ___ Form C7, ASCII Work Station Diagram (Part 1)
Complete this form for every ASCII work station that *attaches directly* (without a modem) to the ASCII work station controller.
- ___ Form C7, ASCII Work Station Diagram (Part 2)
Complete this form for every ASCII work station that *attaches through a modem* to the ASCII work station controller.
- ___ Form D3, ASCII Work Station Controller Index
Complete this form for every ASCII work station controller configured on your system.

Planning for Education

Prepare an education plan for both your local and remote users if they do not already know how to use the system. Be sure your users know:

- ___ 1. How to use their display station and printer.
- ___ 2. Who they should call when something is not working. (Consider giving them copies of your planning forms to use for reference.)
- ___ 3. How to use the application they are supposed to run.

If you want more information on preparing education plans, refer to the *Physical Planning Reference*.

Listing the Equipment You Need

Prepare a list of all the equipment connected to your system, including:

- The display stations and printers at all locations
- Modems for the AS/400 and remote work stations
- All cables and cable types, including the connections between the following devices:
 - The ASCII Work Station Controller and any work stations or printers that are directly attached
 - The ASCII Work Station Controller and modems
 - The modems and any remote work stations that are attached through a modem
 - The work stations and any auxiliary printers

Ordering Supplies

You need to make sure both local and remote user locations have all the supplies they require. For example, they might need ribbons, paper, and preprinted forms for the printer at their location.

If you need more information on ordering supplies, refer to the *Physical Planning Reference*.

Ordering Publications

Your users need books on the equipment at their location. Many of these books come with the equipment. In addition, you should have copies of any book required to operate the ASCII work stations you have chosen in your office. These books should be obtained from the manufacturer of your work station. Also, if your ASCII work station is a personal computer, you should have a copy of the book on the ASCII work station emulation program that you are using.

If you need more information on ordering publications, refer to the *Physical Planning Reference*.

Making Arrangements for Equipment Maintenance

Make arrangements to have your equipment serviced in case of problems. In this example, IBM service has been selected. Note the telephone number for service calls so you find it quickly when you need it. Consider writing the number down and taping it to the system and to the work stations in the remote office.

If you need more information on equipment maintenance, refer to the *Physical Planning Reference*.

Chapter 8. Completing Forms

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This section explains how to gather the information that you need to create configuration descriptions for your system. You record this information on a set of forms, samples of which are included in Appendix H, "Forms." The completed forms document the configuration specifications for the ASCII work stations and the ASCII Work Station Controller attached to your AS/400 system. Keep the forms in a central location and update them whenever you change a device configuration.

To illustrate the type of information that you will need to record for your system, this chapter includes the forms that document Best Dressed's system configuration, with explanations of how the information on the forms was derived.

Completing Form X-1 - Recording Resource Names

The following instructions explain how to obtain the information to complete form X-1. The information on this form is required to complete form C7. Before you begin, make a copy of form X1 from the original included in Appendix H, "Forms." Use the copy of the form to note the information you find.

You need to determine the resource name (also called controller description name) of the ASCII Work Station Controller that you will be using.

Notes:

1. If you are working with a AS/400 9402 System Unit, you need to be aware of the following card slot specifications:
 - On the AS/400 9402 Models Cxx-Fxx System Unit, the 2637 ASCII Work Station Controller always occupies card slot 4. On the AS/400 9404/9406 model 20x, the 2637 ASCII Work Station Controller occupies slot 5.
 - A 6141 ASCII Work Station Controller can be installed in any slot.

Determining the Resource Name

Perform the following steps to determine the resource name:

1. Determine the card slot for the ASCII Work Station Controller card used by your system.

Which card slot is used depends on your hardware configuration. If you are unsure which card slot it is, ask your IBM representative for guidance.
2. Write the card slot number on form X1 (refer to **1** on the completed form on page 8-4). In this example, the card slot used is 3.
3. Power on the system and perform an initial program load (IPL) of the system, if this has not already been done.
4. Sign on to your system with your security officer user ID.
5. Type WRKHDWRSC *LWS (Work with Hardware Resources, Local Work Station) on any command line and press the Enter key.
6. On the Work with Local Work Station Resources display, press F11 twice.

This display shows a list of the local work station resources installed in your AS/400 system.
7. Look for the card slot that matches the one you recorded on form X-1 (in this example, this is card slot 3 — refer to **1** on the following display):

Work with Local Work Station Resources

System: RCHASLLZ

Type options, press Enter.
 2=Edit 4=Remove 5=Work with configuration description
 7=Add configuration description ...

Opt	Resource	Type	Serial Number	Rack ID	EIA Location	Card Slot
-	WC01		6040	10-8879394		
-	CTL01 2		6141	10-8879394		3 1

Bottom

F3=Exit F5=Refresh F6=Print F11=Display configuration descriptions
 F12=Cancel F23=More options

Notes:

- a. If you do not see the card slot, page through the display by doing the following:
 - Press and release the *Esc* key.
 - Press the *Ctrl* key. While keeping the *Ctrl* key pressed, press the letter "U" key.
 - b. If your AS/400 system has an expansion unit, you need to distinguish the card slot numbers on the system unit from those on the expansion unit. You can distinguish the card slot numbers on the system unit from those on the expansion unit by pressing F11 to display an address field. The first two digits of the address identify the unit in which a card is installed:
 - 00** Identifies the system unit
 - 01** Identifies the expansion unit
8. On the same display, look to the left of the card slot number and find the resource name (refer to **2** on this display). In this example, the resource name is CTL01.
 9. Write the resource name on form X1 (refer to **2** on the completed form on page 8-4).

Note: This Work Station Controller does not have a controller name.
 10. Press F3 to return to the main menu.

X1 Recording Resource Names

Lines

Line Name	Location/Card Slot	Resource Name

Local Controllers

Controller Name	Location/Card Slot	Resource Name
	1 3	2 CTLO1

Tape and Diskette Units

Device Name	Serial Number	Resource Name

Note: You may copy as necessary.

RSLF359-1

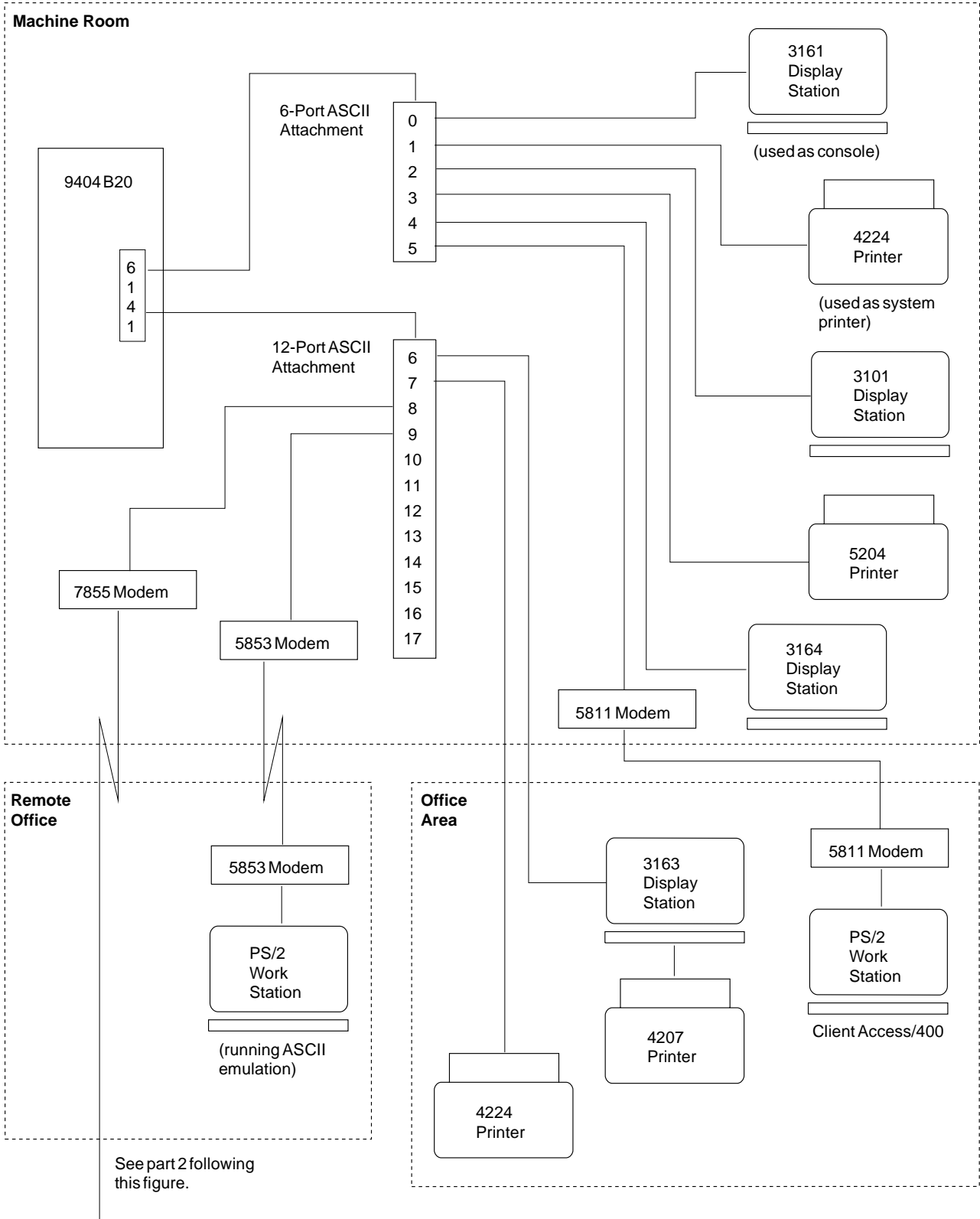
Gathering Information for Form C7 - Diagram for Devices

This section explains how to gather the information you need to create configuration descriptions for the ASCII work stations in your system. You record this information on one or more C7 forms. The C7 forms for Best Dressed's configuration are included as examples, with notes explaining the information entered on the forms.

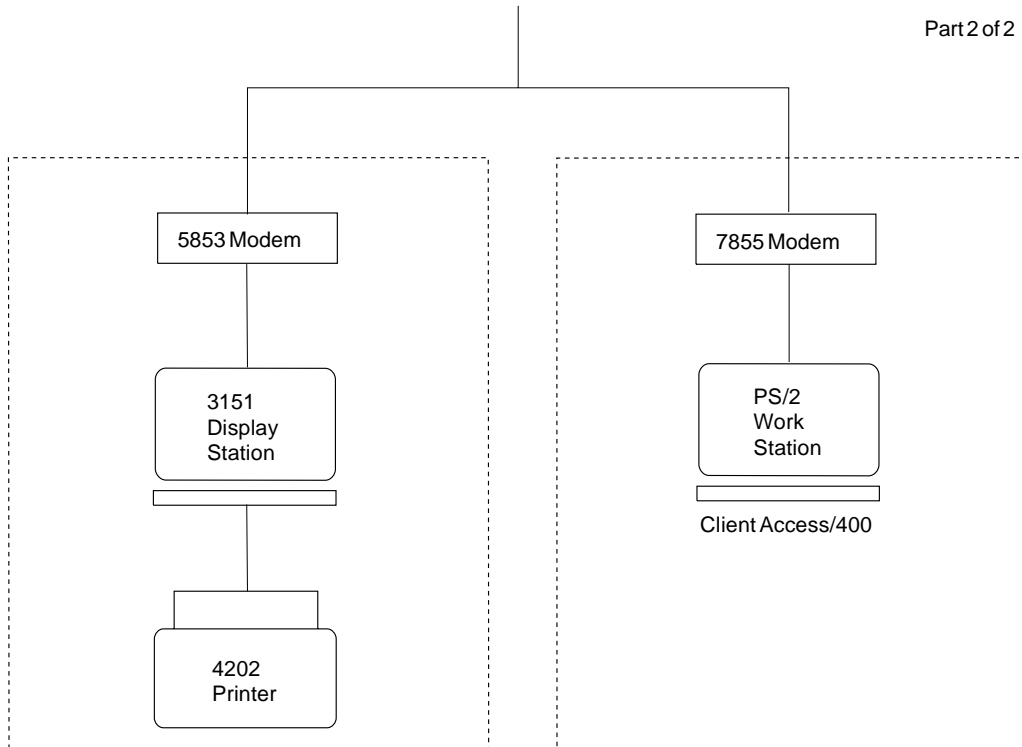
Blank C7 forms are included in Appendix H, "Forms." The full names of these forms are as follows:

- Form C7 - Diagram for Devices Attached without a Modem to the ASCII Work Station Controller (Part 1). You complete this form (Part 1) with information about each work station that *does not use a modem* to attach to the controller.
- Form C7 - Diagram for Devices Attached with a Modem to the ASCII Work Station Controller (Part 2). You complete this form (Part 2) with information about each work station that *uses a modem* to attach to the controller.

The example configuration is separated into rooms that are different distances from the system to provide an illustration of how to set up, connect, and configure work stations that require a variety of attachments and cables. Refer to the following illustration and note the three rooms.



RV3F099-0



Note: Only one of these display stations can call in to and use the system at any one time. This is possible because this port is designated for ASCII port sharing.

RV3F098-0

Notice the ASCII attachments on the preceding illustration. These ASCII attachments work somewhat like extension cords. The service representative connected these attachments to the system. In a later task, you connect work stations to the *ports* of the attachments. These ports are numbered consecutively on the attachments from port 0 on the 6-port attachment to port 17 on the 12-port attachment.

Notes:

1. In this example, the console is an ASCII work station. When the console is an ASCII work station, it is always attached to *port 0* (the first port) of the ASCII attachment. The other work stations are attached to the remaining ports of the ASCII attachment starting with port 1 and continuing consecutively.
2. Some of the values written on the forms are preceded by an asterisk (*), for example, *CALC. The asterisk is **part of the value** and must be included when you create the configuration for the device.

Completing Form C7 (Part 1) - Diagram for Devices

The following devices in this example are attached without a modem to the ASCII Work Station Controller:

- 3161 display station in the machine room (used as a console)
- 4224 printer in the machine room (used as a system printer)
- 3101 display station in the machine room
- 5204 printer in the machine room
- 3164 display station in the machine room
- 3163 display station with a 4207 auxiliary printer in the office area

- 4224 printer in the office area

The work stations in the machine room are all connected with EIA-232 type direct cables. The 3163 display station with the 4207 printer and the 4224 printer in the office area are attached with EIA-422 cables.

You need to complete form C7 (part 1) for each device attached without a modem to the ASCII Work Station Controller. The only exception is the 3161 display station. You do not need to complete form C7 for the 3161 display station because it is used as the console. The console is set up by the service representative and is automatically configured.

Completed forms C7 (part 1) for devices in this example are shown on page 8-11 and 8-12. Following is an explanation of how each section of form C7 (part 1) was completed for the devices in this example.

Completing the Top Portion

The following list explains the headings on the top portion of Form C7 - Diagram for Devices (Part 1).

System: The system type and model. For this example, the system is an AS/400 9404, Model B20.

Controller Description Name: The controller description name. This is also called the resource name and is copied from form X-1, which you completed in a previous task in this chapter. For this example, the controller description name is CTL01.

Page Number: The page number of Form C7 - Diagram for Devices (Part 1). Complete as many pages as it takes, numbering each page consecutively. This example shows pages numbered 1 and 2.

Controller Type: The controller type. In this example, the controller type is 6141 because the ASCII work station is connected to an AS/400 9404 model B20.

Controller Model: The controller model. The controller model is always 1.

Completing the Port Diagram

Form C7 includes a quick-reference Port Diagram that represents one of the following:

- The 6-port or 12-port configurations available with the 2637 ASCII Work Station Controller
- The 6- and 12-port configurations of ASCII Attachments on the 6141 ASCII Work Station Controller

Fill in the circles on the Port Diagram corresponding to each port described on the C7 form. This makes it easier to associate the information on the form with a specific port on your system.

Completing the Middle Portion

The following list explains the headings on the middle portion of Form C7 - Diagram for Devices (Part 1).

Port Number: The number of the port on the ASCII Work Station Controller to which the device is attached. In this example, a 4224 printer is attached to port 1 of the ASCII Work Station Controller Attachment.

Location: The physical location of the device. In this example, the 5204 printer is located in the machine room.

Telephone Number: The telephone number of the person closest to the device or the telephone number of the person who uses the device.

Device Name: The name of the work station. Each work station must have a unique name.

Device Type, Model: The type and model of the device.

For the device type, use either a specific device type or **CALC*. Use **CALC* if you want to use automatic device detection. In this example, specific device types are used.

Note: You cannot use **CALC* as a device type for a printer.

For the model, use either a specific model type or **ASCII*. Use **ASCII* if you want the system to use a default value. In this example, **ASCII* is used for the model.

Emulated Device Type: The twinaxial work station emulated by this ASCII work station. All ASCII work stations must emulate an equivalent twinaxial work station. For display stations, the system provides a default which you may change, if necessary.

Attachment: The type of cable used to connect the device to the ASCII attachment. **Direct* is used in this example when EIA-232 direct cables are used to attach the devices to the ASCII attachment. **EIA422* is used in this example when EIA-422 cables are used to attach the devices to the ASCII attachment.

Line Speed: The speed at which information is sent and received, measured in bits per second (bps). For example, the 4224 printers in this example have a line speed of 19200 bits per second.

Word Length: The length of information pieces (words) sent by a device, usually 7 or 8 bits. For example, the 4224 printers in this example send 8-bit words.

Parity: The type of parity used to check for errors in sending or receiving data. Parity means that when a word (a piece of data) is sent or received, the number of bits should always add up to an even or odd number. If a word is received with the wrong number of bits, the system or work station can tell that there is an error. In this example, the devices use even parity as a way to check for errors when data is sent or received.

Stop Bits: The indication of the end of a word (piece of information).

Completing the Auxiliary Printer Portion

The following list explains the headings on the auxiliary printer portion of Form C7 - Diagram for Devices (Part 1).

Auxiliary Printer: Whether or not the display station has an auxiliary printer attached. An auxiliary printer is a printer that attaches to a display station instead of the ASCII attachment.

Note: You cannot attach a printer to another printer.

Location: The physical location of the auxiliary printer.

Device Name: The device name of the auxiliary printer. The device name of the printer must be a unique name.

Device Type, Model: The device type and model of the auxiliary printer.

For the device type, use a specific device type. You cannot use **CALC* for the device type of a printer.

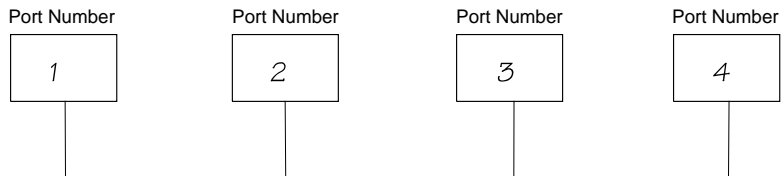
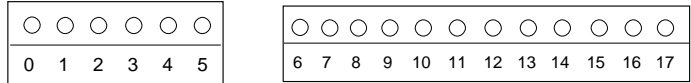
For the model, use either a specific model type or **ASCII*. Use **ASCII* if you want the system to use a default value.

Emulated Device Type: The printer type emulated by the auxiliary printer. Each ASCII printer must emulate an equivalent twinaxial printer.

C7 Diagram for Devices Attached without a Modem to the ASCII Work Station Controller (Part 1)

System 9404B20 Controller Description Name CTL01
 Service for Cabling _____ Controller Type 6141
 Telephone Number _____ Controller Model 1

Port Diagram



Location	Machine Room	Machine Room	Machine Room	Machine Room
Telephone Number	xxx-xxxx	xxx-xxxx	xxx-xxxx	xxx-xxxx
Device Name	ASCPRT1	ASCDSP2	ASCPRT3	ASCDSP4
Device Type, Model	4224, *ASCII	3101, *ASCII	5204, *ASCII	3164, *ASCII
Emulated Device Type	5224	—	5219	—
Attachment ^{1,2,4}	*Direct	*Direct	*Direct	*Direct
Line Speed ^{1,2}	19200	9600	19200	19200
Word Length ^{1,2}	8	7	8	8
Parity ^{1,2}	*Even	*Even	*Even	*Even
Stop Bits ^{1,2}	1	1	1	1
Auxiliary Printer	*No	*No	*No	*No

Auxiliary Printer ³

Location				
Device Name				
Device Type, Model				
Emulated Device Type				

1 This parameter must also match the parameters configured on the system for the device on this port.
 2 Refer to the *ASCII Work Station Reference* for additional settings that are required on the device.
 3 The configuration values on the system for this printer must match that of the display station that it attaches to. The recommended physical settings for this printer are that of the display station it attaches to.
 4 This setting may be referred to as 'interface' on the display station or printer setup parameters.

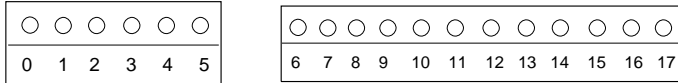
Note: You may copy as necessary.

RV2F912-0

C7 Diagram for Devices Attached without a Modem to the ASCII Work Station Controller (Part 1)

System 9404 B20 Controller Description Name CTLO1
 Service for Cabling _____ Controller Type 6141
 Telephone Number _____ Controller Model 1

Port Diagram



Port Number

6

Port Number

7

Port Number

Port Number

Location	Office Area	Office Area		
Telephone Number	xxx-xxxx	xxx-xxxx		
Device Name	ASCDSP6	ASCPRT7		
Device Type, Model	3163, *ASCII	4224, *ASCII		
Emulated Device Type	—	5224		
Attachment ^{1,2,4}	*EIA422	*EIA422		
Line Speed ^{1,2}	19200	19200		
Word Length ^{1,2}	8	8		
Parity ^{1,2}	*Even	*Even		
Stop Bits ^{1,2}	1	1		
Auxiliary Printer	*Yes	*No		

Auxiliary Printer ³

Location	Office Area			
Device Name	ASCPRT6			
Device Type, Model	4207, *ASCII			
Emulated Device Type	5219			

1 This parameter must also match the parameters configured on the system for the device on this port.
 2 Refer to the *ASCII Work Station Reference* for additional settings that are required on the device.
 3 The configuration values on the system for this printer must match that of the display station that it attaches to. The recommended physical settings for this printer are that of the display station it attaches to.
 4 This setting may be referred to as 'interface' on the display station or printer setup parameters.

Note: You may copy as necessary.

Completing Form C7 (Part 2) - Diagram for Devices

The following devices in this example are attached with a modem to the ASCII Work Station Controller:

- Personal System/2 that runs Client Access/400 in the office area
- 3151 display station with an auxiliary 4204 printer (port sharing) in the remote office
- Personal System/2 work station that runs Client Access/400 (port sharing) in the remote office
- Personal System/2 work station that runs ASCII emulation in the remote office

You need to complete form C7 (part 2) for each device attached with a modem to the ASCII Work Station Controller.

A completed form C7 (part 2) for devices in this example is shown on page 8-17. In this example, one form C7 (part 2) is filled out for the work station in the office area and for the three work stations in the remote office.

Setting up the ASCII Work Station Controller for remote work stations requires the additional step of setting up the modem. You must ensure that you have the correct modems and cables.

The Personal System/2 work station in the office area is connected by modem to the AS/400 system, using one port (port 5) on the 6-port ASCII attachment. The three work stations in the remote office are connected by modem to the AS/400 system, using two ports on the 12-port ASCII attachment.

The Personal System/2 work station running ASCII emulation in the remote office calls in to a 5853 modem connected to the system through port 9.

The 3151 display station in the remote office is connected (by modem) to port 8. Port 8 is designated as a shared port, which allows more than one remote work station to call in to that port. (The display types, line speeds, word lengths, and parity types supported by port-sharing are noted in "ASCII Port Sharing" on page 3-10.) Best Dressed's configuration has only two work stations sharing port 8. The 3151 display station and a Personal System/2 work station at the receiving dock share port 8.

For purposes of illustration, the C7 (Part 2) form includes information for both port-sharing work stations. However, a shared port can be used by many remote work stations, all of which must have the same configuration parameter values. Therefore, you only need to record information on your form C7 (Part 2) for one of the remote work stations that share a particular port.

Completing the Top Portion

The following list describes the headings on the top portion of Form C7 - Diagram for Devices (Part 2).

System: The system type and model. For this example, the system is an AS/400 9404, Model B20.

Controller Description Name: The controller description name. This is also called the resource name and is copied from form X-1, which you completed in a previous task in this chapter. For this example, the controller description name is CTL01.

Page Number: The page number of Form C7 - Diagram for Devices (Part 2). Complete as many pages as it takes, numbering each page consecutively. This example shows a page numbered 1.

Controller Type: The controller type. In this example, the controller type is 6141 because the ASCII work station is connected to an AS/400 9404 model B20.

Controller Model: The controller model. The controller model is always 1.

Completing the Port Diagram

Form C7 includes a quick-reference Port Diagram that represents one of the following:

- The 6-port or 12-port configurations available with the 2637 ASCII Work Station Controller
- The 6- and 12-port configurations of ASCII Attachments on the 6141 ASCII Work Station Controller

Fill in the circles on the Port Diagram corresponding to each port described on form C7. This makes it easier to associate the information on the form with a specific port on your system.

Completing the Modem 1 Portion

The following list describes the headings on the modem 1 portion of Form C7 - Diagram for Devices (Part 2).

Port Number: The number of the port on the ASCII Work Station Controller to which the local modem is attached. (The local modem is the modem which is cabled to the ASCII Work Station Controller attachment.) In this example, the 5811 modem in the machine room is attached to port 5.

Location: The physical location of the local modem. In this example, the local modems are physically located in the machine room.

Telephone Number: The telephone number of the local modem.

Modem type, Model: The type and model of the local modem.

Completing the Modem 2 Portion

The following list describes the headings on the modem 2 portion of Form C7 - Diagram for Devices (Part 2).

Location: The physical location of the remote modem. (The remote modem is the modem which is cabled to the device.) In this example, the remote modems are located in the office area and in the remote office area.

Telephone Number: The telephone number of the remote modem.

Modem type, Model: The type and model of the remote modem.

Completing the Display Station Portion

The following list describes the headings on the display station portion of Form C7 - Diagram for Devices (Part 2).

Location: The physical location of the work station. For example, the Personal System/2 work station running ASCII emulation is physically located in the remote office.

Telephone Number: The telephone number of the person closest to the device or the telephone number of the person who uses the device.

Device Name: The name of the work station. Each work station must have a unique name.

Device Type, Model: The type and model of the device.

For the device type, use either a specific device type or *CALC. Use *CALC if you want to use Automatic device detection.

Note: You cannot use *CALC as a device type for a printer.

For the model, use either a specific model type or *ASCII. Use *ASCII if you want the system to use a default value.

Emulated Device Type: The twinaxial work station emulated by the ASCII work station. All ASCII work stations must emulate an equivalent twinaxial work station. For display stations, the system provides a default which you may change, if necessary.

Attachment: This is the type of cable used to connect the device to the ASCII Work Station Controller attachment.

Line Speed: The speed at which information is sent and received, measured in bits per second (bps).

Word Length: The length of information pieces (words) sent by a device, usually 7 or 8 bits.

Parity: The type of parity used to check for errors in sending or receiving data. Parity means that when a word (a piece of data) is sent or received, the number of bits should always add up to an even or odd number. If a word is received with the wrong number of bits, the system or work station can tell that there is an error.

Stop Bits: The indication of the end of a word (piece of information).

Completing the Auxiliary Printer Portion

The following list describes the headings on the auxiliary printer portion of Form C7 - Diagram for Devices (Part 2).

Auxiliary printer: Whether or not the display station has an auxiliary printer attached. An auxiliary printer is a printer that attaches to a display station instead of the ASCII attachment.

Note: You cannot attach a printer to another printer.

Location: The physical location of the auxiliary printer.

Device name: The device name of the auxiliary printer. The device name of the printer must be a unique name.

Device type, Model: The device type and model of the auxiliary printer.

For the device type, use a specific device type. You cannot use **CALC* for the device type of a printer.

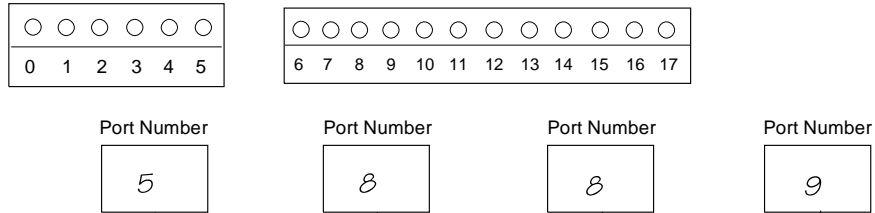
For the model, use either a specific model type or **ASCII*. Use **ASCII* if you want the system to use a default value.

Emulated Device type: The printer type emulated by the auxiliary printer. Each ASCII printer must emulate an equivalent twinaxial printer.

C7 Diagram for Devices Attached with a Modem to the ASCII Work Station Controller (Part 2)

System 9404 B20 Controller Description Name CTL01
 Service for Cabling _____ Controller Type 6141
 Telephone Number _____ Controller Model 1

Port Diagram



Modem 1 (Local)

Location	<i>Machine Room</i>	<i>Machine Room</i>	<i>Machine Room</i>	<i>Machine Room</i>
Telephone Number	xxx-xxxx	xxx-xxxx	xxx-xxxx	xxx-xxxx
Modem Type, Model	<i>5811</i>	<i>7855</i>	<i>7855</i>	<i>5853</i>

Modem 2 (Remote)

Location	<i>Office Area</i>	<i>Remote Office</i>	<i>Receiving Dock</i>	<i>Remote Office</i>
Telephone Number	xxx-xxxx	xxx-xxxx	xxx-xxxx	xxx-xxxx
Modem Type, Model	<i>5811</i>	<i>5853</i>	<i>7855</i>	<i>5853</i>

Display Station ³

Location	<i>Office Area</i>	<i>Remote Office</i>	<i>Receiving Dock</i>	<i>Remote Office</i>
Telephone Number	xxx-xxxx	xxx-xxxx	xxx-xxxx	xxx-xxxx
Device Name	<i>ASCDSP5</i>	<i>ASCDSP8</i>	<i>ASCDSP8</i>	<i>ASCDSP9</i>
Device Type, Model	<i>5150, A1</i>	<i>*CALC, *ASCII</i>	<i>*CALC, *ASCII</i>	<i>3161, *ASCII</i>
Emulated Device Type	_____	<i>*TYPE</i>	<i>*TYPE</i>	_____
Attachment ^{1,2,4}	<i>*Modem</i>	<i>*Modem</i>	<i>*Modem</i>	<i>*Modem</i>
Line Speed ^{1,2}	<i>9600</i>	<i>*CALC</i>	<i>*CALC</i>	<i>2400</i>
Word Length ^{1,2}	<i>8</i>	<i>*CALC</i>	<i>*CALC</i>	<i>7</i>
Parity ^{1,2}	<i>*None</i>	<i>*CALC</i>	<i>*CALC</i>	<i>*Even</i>
Stop Bits ^{1,2}	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>
Auxiliary Printer	<i>*No</i>	<i>*Yes</i>	<i>*No</i>	<i>*No</i>

Auxiliary Printer ³

Location		<i>Remote Office</i>		
Device Name		<i>ASCPRT8</i>		
Device Type, Model		<i>4202, *ASCII</i>		
Emulated Device Type		<i>5256</i>		

1 This parameter must also match the parameters configured on the system for the device on this port.
 2 Refer to the *ASCII Work Station Reference* for additional settings that are required on the device.
 3 The configuration values on the system for this printer must match that of the display station that it attaches to. The recommended physical settings for this printer are that of the display station it attaches to.
 4 This setting may be referred to as 'interface' on the display station or printer setup parameters.

Note: You may copy as necessary.

Completing Form D3 - ASCII Work Station Controller Index

The following list describes the headings on Form D3, the ASCII Work Station Controller Index. Form D3 summarizes the devices attached to the ASCII Work Station Controller and the types of cabling used for each device. Complete one of these forms for each ASCII Work Station Controller attached to your AS/400 system.

System: The type and model numbers of your AS/400 system. In this example, the system is a 9404 model B20.

Card Address: The number of the slot in the AS/400 system unit where the ASCII work station controller is located. In this example, the ASCII Work Station Controller is located in slot 3 of the system unit.

Work Station Controller Name: The work station controller name. In this example, the controller name is CTL01 (assigned by the system during automatic configuration).

Controller Type: The device type of the ASCII Work Station Controller installed in this system. In this example, the ASCII Work Station Controller is a 6141.

Controller Model: The ASCII Work Station Controller model number. In this example, the ASCII Work Station Controller is a model 1.

Location of ASCII 6-Port Work Station Attachment: The physical location of the 6-port attachment. In this example, the 6-port attachment is in the machine room.

Location of ASCII 12-Port Work Station Attachment: The physical location of the 12-Port Attachment. In this example, the 12-port attachment is in the machine room.

Completing the Devices Attached to the 6-Port Attachment Portion

The following list describes the headings on the 6-port attachment portion of Form D3, the ASCII Work Station Controller Index.

Devices attached to the ports on the 6-port attachment: The types of devices attached to each port of the 6-port attachment. In this example, a 3161 console is attached to port 0 of the 6-port attachment.

Type of Cabling/Attachment: The type of cabling used to attach each device to the ASCII Work Station Controller. (The cabling choices are listed on Form D3.) In this example, EIA-232 direct cable is used to attach the 3161 console to the 6-port attachment.

Your Form C7 Page Number: The page numbers of the C7 forms where the configuration specifications for each device are recorded. In this example, because the 3161 display station is the console for Best Dressed's system and is configured automatically, no configuration information is recorded on form C7 for that device.

Completing the Devices Attached to the 12-Port Attachment Portion

The following list describes the headings on the 12-port attachment portion of Form D3, the ASCII Work Station Controller Index.

Devices attached to the ports on the 12-port attachment: The types of devices attached to each port of the 12-port attachment. In this example, a 3163 display station is attached to port 6 of the 12-port attachment.

Type of Cabling/Attachment: The type of cabling used to attach each device to the ASCII Work Station Controller. (The cabling choices are listed on Form D3.) In this example, the 3163 display station is attached to the work station controller by an EIA-422 cable.

Your Form C7 Page Number: The page numbers of the C7 forms where the configuration specifications for each device are recorded. In this example, the 3163 display station is recorded on page 2 of the C7 form (part 1).

D3 ASCII Work Station Controller Index

System 9404 B20 **Card Address** 3 **Work Station Controller Name** CTL01
Service for Cabling _____ **Location of ASCII 6-Port Work Station Attachment** Machine Room **Controller Type** 6141
Telephone Number _____ **Location of ASCII 12-Port Work Station Attachment** Machine Room **Controller Model** 1

Cabling Choices:

Cabling Choices:	Ports	Devices Attached to 6-Port Attachment	Type of Cabling/ Attachment	Your Form C7 Page Number
EIA-422	0	3161, Console	Direct	
EIA-232 3-Wire	1	4224 Printer	Direct	1 (Part 1)
EIA-232 4-Wire	2	3101 Display Station	Special Direct/ *Direct	1 (Part 1)
EIA-232 Modem	3	5204 Printer	Direct	1 (Part 1)
EIA-232 PTT	4	3164 Display Station	Direct	1 (Part 1)
EIA-232 Direct	5	5811 Modem	Modem	1 (Part 2)

Ports	Devices Attached to 12-Port Attachment	Type of Cabling/ Attachment	Your Form C7 Page Number
6	3163 Display Station	EIA-422	2 (Part 1)
7	4224 Printer	EIA-422	2 (Part 1)
8	7855 Modem	Modem	1 (Part 2)
9	5853 Modem	Modem	1 (Part 2)
10			
11			
12			
13			
14			
15			
16			
17			

Note: Only 18 work stations can be active at one time.

Note: You may copy as necessary.

RV2F906-2

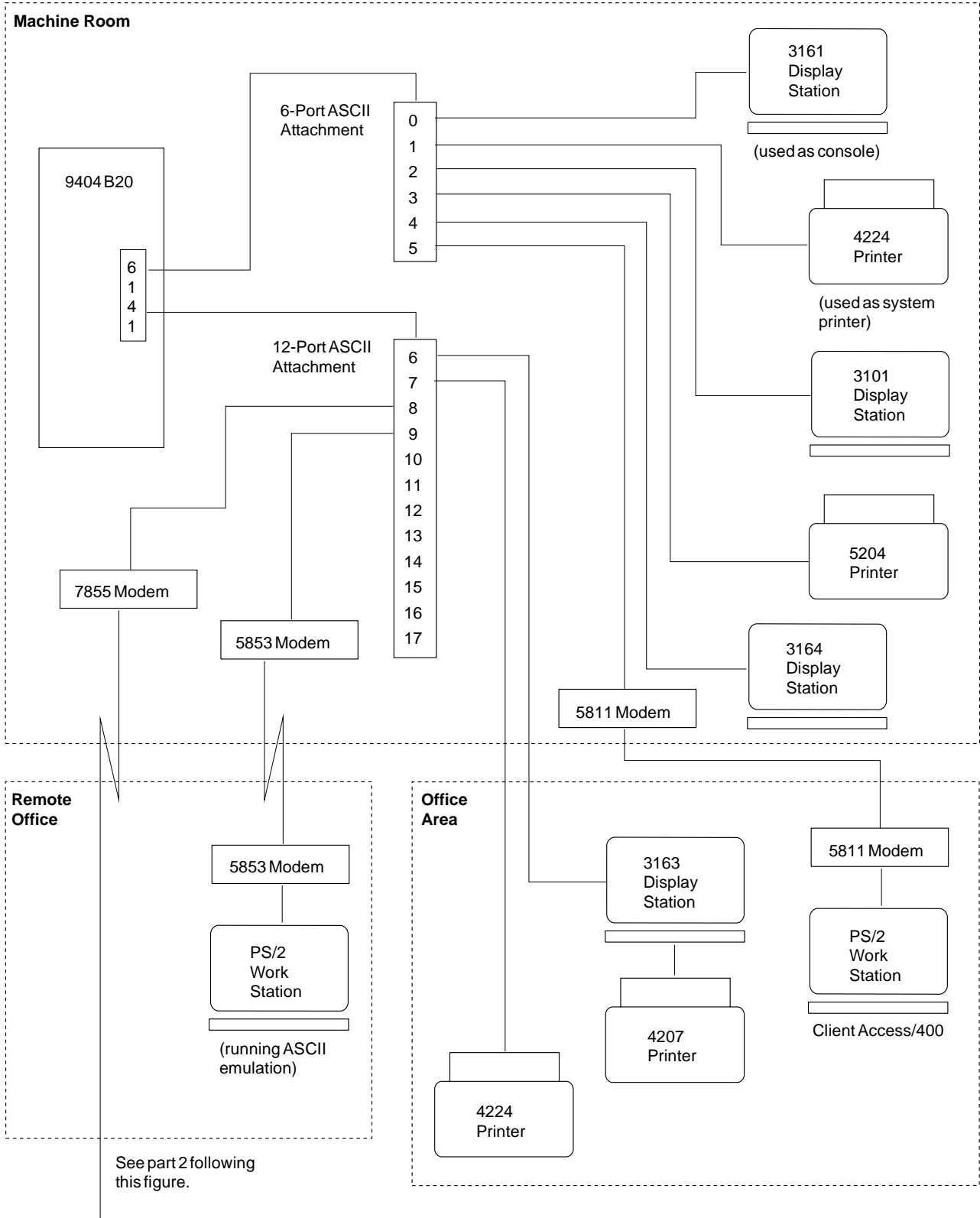
Chapter 9. Setting Up ASCII Work Stations and Modems

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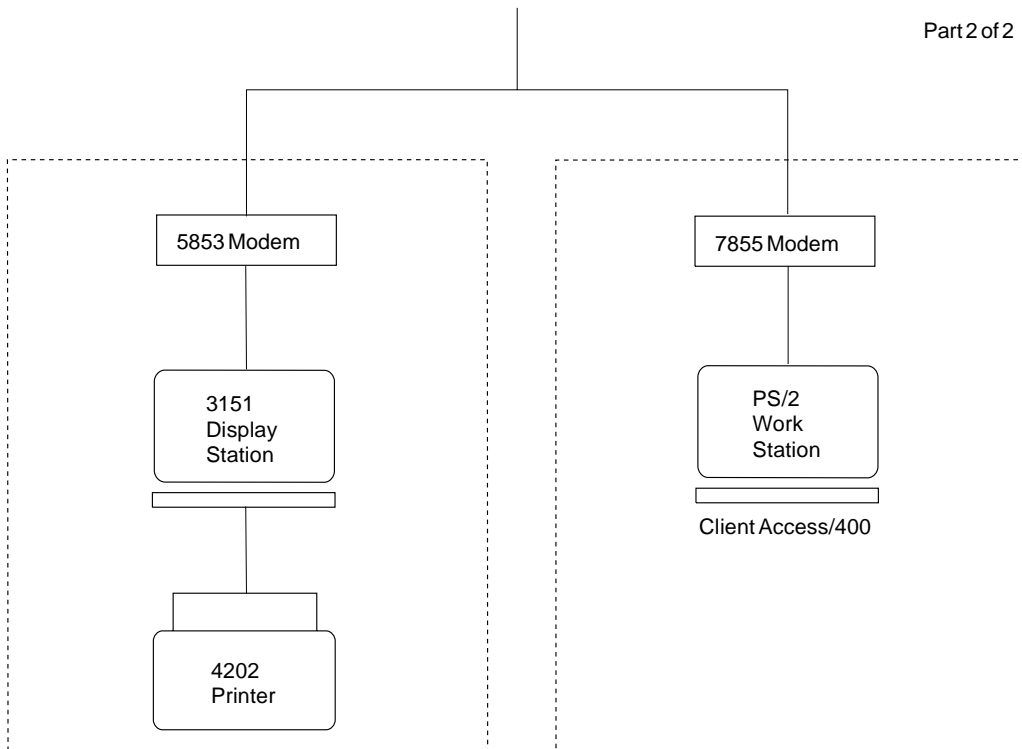
This section provides step-by-step instructions on how to set up the ASCII work stations.

The Best Dressed configuration includes devices that are located at different distances from the system to illustrate how to set up, connect, and configure work stations that require a variety of attachments and cables.

The configuration diagram on the following pages shows work stations located in three areas: the machine room, the office area, and the remote office.



RV3F099-0



Note: Only one of these display stations can call in to and use the system at any one time. This is possible because this port is designated for ASCII port sharing.

RV3F098-0

Work Stations Located in the Machine Room

Use the following instructions to set up the work stations and modems located in the machine room.

The 3161 Display Station as the Console

The user does not have to set up the 3161 display station because it is the system console, which is always set up by the service representative.

Note: The console must be attached to port 0 of the first work station controller in the system.

The 4224 Printer

This section explains how to set up the 4224 printer that is located in the machine room. This printer is attached using EIA-232 direct cable. Unless otherwise noted, the following instructions also apply to setting up the 4224 printer located in the office area, which is attached with EIA-422 cable.

- ___ 1. Plug in the printer to the electrical outlet.
- ___ 2. Turn on the power to the printer.
- ___ 3. Familiarize yourself with the control panel.

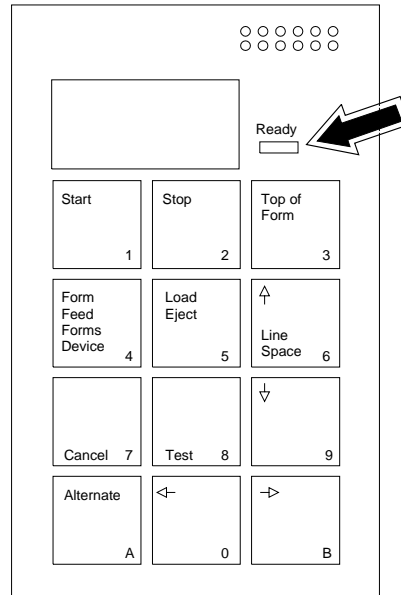
You use the following keys to set up the 4224:

- Alternate
- Test

- Cancel
- Stop
- Number keys

___ 4. Wait for the ready light to come on. (See the following illustration.)

Note: Different numbers appear and some might flash. Do not be concerned.



RSLF356-1

___ 5. Press the *Stop* key.

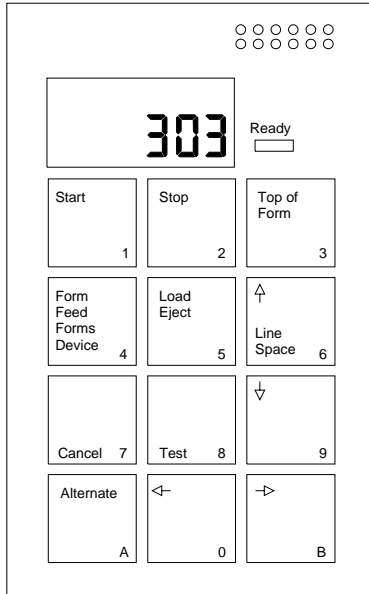
The Ready light goes off, 00 appears on the display.

___ 6. Select the multinational character set by performing the following steps:

- ___ a. Press the *Alternate* key. While keeping the *Alternate* key pressed, press and release the *Test* key until the printer displays 303.

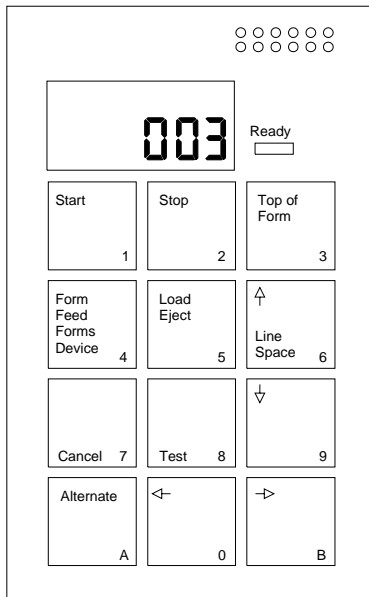
Note: This number might be flashing. This is not a problem.

Release both keys. (See the following illustration.)



RSLF357-0

- ___ b. Press and hold the *Alternate* key, then press and release the 5 key. Do not release the *Alternate* key.
- ___ c. While still holding the *Alternate* key, use the numbers on the keys to enter the value 003. (See the following illustration.)



RSLF358-0

- ___ d. Release the keys.
- ___ 7. Enable the alarm by performing the following steps:
 - ___ a. Press and hold the *Alternate* key, then press and release the *Test* key until the printer displays 304. Release both keys.
 - ___ b. Press and hold the *Alternate* key, then press and release the 9 key until the printer displays the number 001. Release both keys.
- ___ 8. Select the correct BAUD rate (line speed) by performing the following steps:

- a. Press and hold the *Alternate* key, then press and release the *Test* key until the printer displays 305. Release both keys.
- b. Press and hold the *Alternate* key, then press and release the 9 key until the printer displays the number 006. Release both keys.

This selects a BAUD rate (line speed) of 19200 bits per second. This line speed was recorded on the form C7 that you completed in Chapter 8, "Completing Forms."

- 9. Select the correct interface by performing the following steps:
 - a. Press and hold the *Alternate* key, then press and release the *Test* key until the printer displays 315. Release both keys.
 - b. **To select the RS-232 interface:** Press and hold the *Alternate* key, then press and release the 9 key until the printer displays the number 001.

To select the RS-422 interface: Press and hold the *Alternate* key, then press and release the 9 key until the printer displays the number 000. (This instruction applies to the 4224 printer in the office area.)

- 10. Select the correct pacing protocol by performing the following steps:
 - a. Press and hold the *Alternate* key, then press and release the *Test* key until the printer displays 317. Release both keys.
 - b. Press and hold the *Alternate* key, then press and release the 9 key until the printer displays the number 000. Release both keys.

This selects a pacing protocol of XON/XOFF. The pacing protocol *XOFF* is used by the 4224 printer to indicate that it cannot handle any more data. The pacing protocol *XON* is used by the 4224 printer to indicate that it can again handle more data.

- 11. Select the correct parity by performing the following steps:
 - a. Press and hold the *Alternate* key, then press and release the *Test* key until the printer displays 318. Release both keys.
 - b. Press and hold the *Alternate* key, then press and release the 9 key until the printer displays the number 002. Release both keys.

This selects **even** parity. This value was taken from the form C7 that you completed in Chapter 8, "Completing Forms."

- 12. Press and hold the *Alternate* key, then press and release the *Cancel* key. Release both keys.

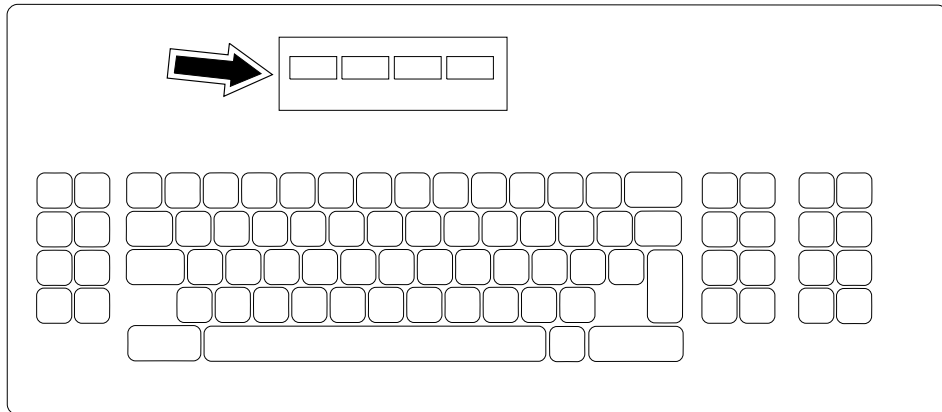
Different numbers might appear. Eventually, the ready light goes on, the number 29 flashes, and the alarm might sound. Ignore this because the printer is just indicating that it is not connected to the system. These error indicators will stop after you have completed the tasks in this book.

- 13. Turn off the power to the printer.

You have completed setting up the 4224 printer as the system printer.

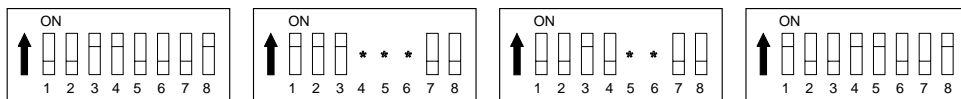
The 3101 Display Station

1. Leave the display station *unplugged*.
2. Leave the power to the display station *turned off*.
3. Find and open the small cover on the keyboard just above the keys. (Refer to the following illustration.)



RSLF363-0

4. There are four banks of switches under the cover. Set the switches to the following positions. These switch settings are explained in Appendix A, "Suggested Settings for ASCII Display Stations."



* Switches 4, 5 and 6 can be in either position.

* Switches 5 and 6 can be in either position.

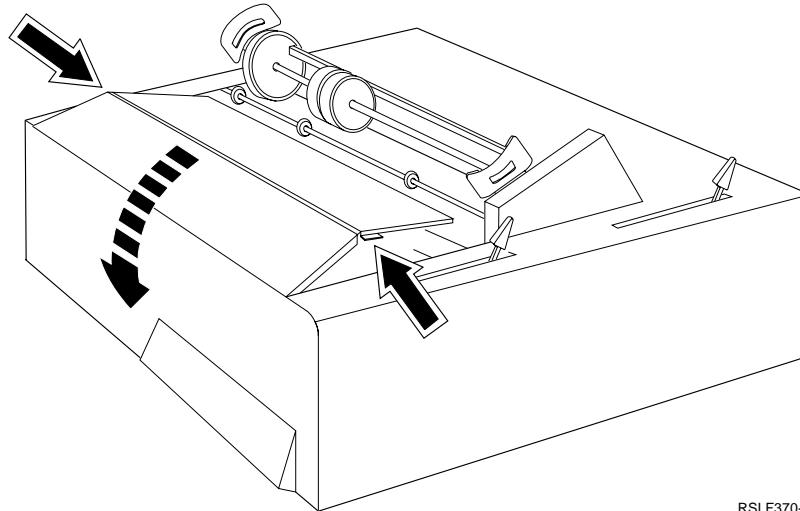
RSLF364-0

5. Close the cover. You have completed setting up the 3101 display station.

The 5204 Printer

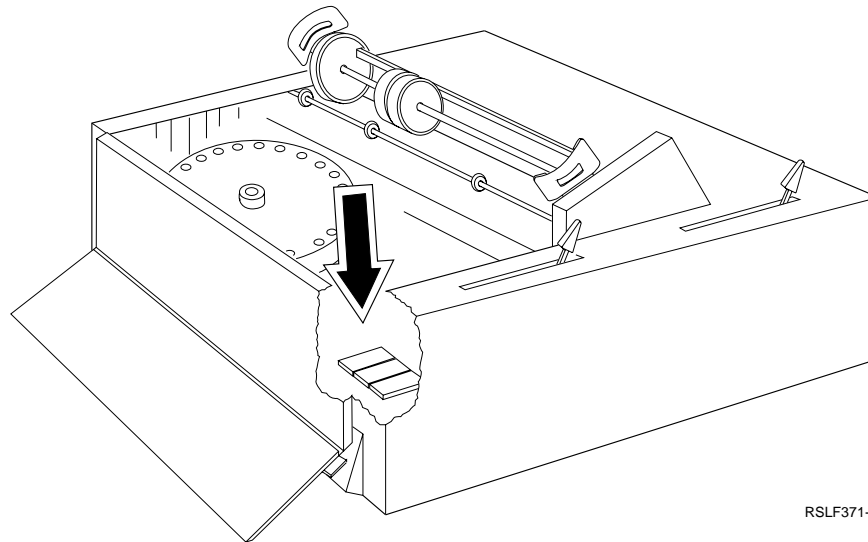
The 5204 printer is set up using switches only.

- ___ 1. Leave the printer unplugged.
- ___ 2. Leave the power to the printer turned off.
- ___ 3. Open the cover. (Refer to the following illustration.)



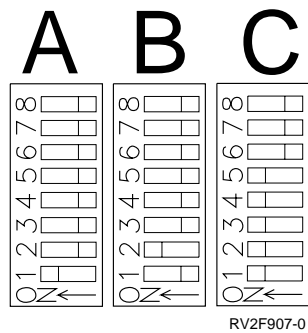
RSLF370-0

___ 4. Locate the three banks of switches. (Refer to the following illustration.)



RSLF371-0

___ 5. Set the switches in banks A, B, and C to the correct positions. Refer to "IBM 5204 Printer" on page B-26 for an explanation of the switch settings.



___ 6. Turn the power to the printer on.
The printer is now set to these values.

- ___ 7. Turn off the power to the printer.

You have completed setting up the 5204 printer.

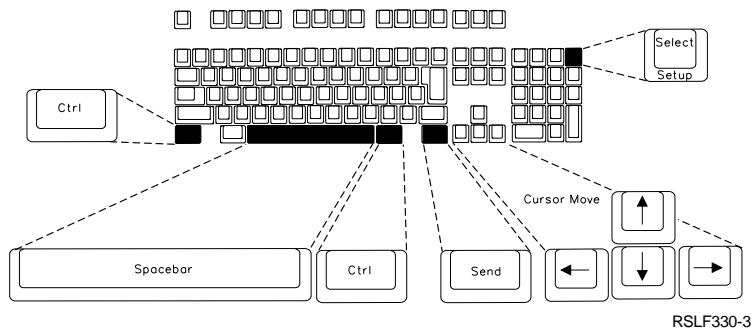
The 3164 Display Station

It is Important to familiarize yourself with the keyboard of the display station. You use these keys for setting up the display station:

- Ctrl (Control)** Press this key along with the *Setup* key to cause the 3164 setup or configuration display to appear.
- Setup** Press the *Setup* key along with the *Ctrl* key to cause the 3164 setup or configuration display to appear.
- Spacebar** On the configuration display, press the spacebar to “roll” through the different options available.
- Arrow keys** On the configuration display, press the arrow keys to move the cursor around to different parameters or values.
- Select** Press the *Select* key during this procedure to cause the next display to appear.
- Send** When you are finished selecting values on a display, press the *Send* key to save the values you have selected.

The following illustration shows one possible keyboard for the display station.

Note: It is possible to have different keyboards with the display station.



- ___ 1. Plug the display station into an electrical outlet.
- ___ 2. Turn on the power to the display station.
- ___ 3. On the keyboard of the 3164 display station, press the *CNTL* and *SETUP* keys.
The Setup display appears.
- ___ 4. Select the following values on the bottom of the display.
Some of these values were copied from form C7 (ASCII Work Station Diagram (Part 1)).

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
Machine Mode	IBM 3164	
Operating Mode	echo	
Interface	RS-232C	This interface was selected because a type <i>direct</i> cable was used to connect the display station. A type <i>direct</i> cable was recorded on form C7.
Line control	IPRTS	
Line speed (bps)	19200	This line speed was recorded on form C7.
Parity	even	This parity was recorded on form C7.
Turnaround character	ETX	
Stop bit	1	This number of stop bits was recorded on form C7.
Word Length (bits)	8	This word length was recorded on form C7.
Response delay (ms)	100	
Break Signal (ms)	500	

After you type the values, the display looks like this:

Setup Menu

Machine Mode	IBM 3164	
Operating Mode	ECHO	
	<u>Main Port</u>	<u>Auxiliary Port</u>
Interface	RS-232C	
Line control	IPRTS	
Line speed (bps)	19200	9600
Parity	Even	ODD
Turnaround character	ETX	
Stop bit	1	1
Word Length (bits)	8	7
Response delay (ms)	100	
Break Signal (ms)	500	
Terminal ID	Up to 20 alphanumeric characters allowed	

When all finished, press SEND. Press Setup to quit.

Local

___ 5. Press the *Send* key to save the values.

___ 6. Press the *Select* key.

A display appears that is blank except for some prompts and values that appear across the bottom.

___ 7. Select the following values on the bottom of the display:

Note: To select a value, press the arrow keys to highlight the correct prompt, then alternately press and release the spacebar to select the correct value for that prompt.

<u>For:</u>	<u>Select:</u>
<i>ENTER</i>	SEND
<i>RETURN</i>	NEW LINE
<i>NEW LINE</i>	CR
<i>TAB</i>	FIELD
<i>WRAP</i>	OFF

When you finish selecting the values, the display looks like this:

ENTER=SEND RETURN=NEW LINE NEW LINE=CR TAB=FIELD LINE WRAP=OFF

- ___ 8. Press the *Send* key to save the values.
Different prompts and values appear at the bottom of the display.
- ___ 9. Select the following values on the bottom of the display:

<u>For:</u>	<u>Select:</u>
<i>AUTO LF</i>	OFF
<i>SEND</i>	PAGE
<i>SEND NULL</i>	OFF
<i>INSERT</i>	SPACE
<i>TRACE</i>	ALL
<i>CRT SAVER</i>	NO

After you select the values, the display looks like this:

AUTO LF=OFF SEND=PAGE SEND NULL=OFF INSERT=SPACE TRACE=ALL CRT SAVER=NO

- ___ 10. Press the *Send* key to save the values.
Different prompts and values appear at the bottom of the display.
- ___ 11. Select the following values on the display:

<u>For:</u>	<u>Select:</u>
<i>SCROLL</i>	OFF
<i>PRINT</i>	VIEWPORT
<i>PRINT NULL</i>	OFF
<i>PRINT EOL</i>	OFF
<i>LINE END</i>	CR-LF

After you select the values, the display looks like this:

```
SCROLL=OFF PRINT=VIEWPORT PRINT NULL=OFF PRINT EOL=OFF LINE END=CR-LF
```

- ___ 12. Press the *Select* key to save all the options you selected for the setup of the display station.
- ___ 13. Turn off the power to the display station.

You have completed setting up the 3164 display station.

Work Stations Located in the Office Area

Use the following instructions to set up the work stations and modems located in the local office area.

The Personal System/2 Work Station Running Client Access/400

In this task, you setup the Personal/System 2 (PS/2) work station that runs Client Access/400.

Note: In this example, Best Dressed Co. has already unpacked, assembled, and positioned the PS/2 work station. They used the information that came with the PS/2 work station to do this.

To setup the PS/2 work station, you must do the following:

- Setup the modem that is on the system side
- Setup the modem that is on the PS/2 work station side

Note: Modems are used for this PS/2 work station because the EIA-422 cable cannot be used to connect a PS/2 work station running Client Access/400.

Setting up the modems: In this example, the PS/2 work station uses 5811 modems to send and receive information.

The 5811 modem sets up using switches only. Perform the following steps:

- ___ 1. Locate the 5811 modem that is:
 - Physically connected to the ASCII attachment
 - Used by the personal computer running Client Access/400

Set the switches on the modem to the following positions:

Switch Settings (SW1)

SWA			SWB		
1	Down	(Asynchronous)	1	Down	(Receive impedance)
2	Up	(Asynchronous)	2	Up	(150 ohms)
3	Up	(Control/primary)	3	Up	(Not used)
4	Down	(Point-to-point)	4	Down	(No LPDA-1)
5	Up	(Asynchronous)	5	Down	(No LPDA-1)
6	Down	(9600 Bps)	6	Up	(Antistreaming disabled)
7	Down	(9600 Bps)	7	Up	(Not used)
8	Down	(9600 Bps)	8	Down	(Transmit impedance B9 and B10)
9	Up	(4-wire data link)	9	Down	(Transmit impedance)

Switch Settings (SW1)					
10	Up	(RTS/RFS short delay)	10	Up	(150 ohms)

Note: The line speed of 9600 was recorded on Form C7.

___ 2. Locate the 5811 modem that is:

- Physically connected to the PS/2 work station
- Running Client Access/400

Work Station

The 5811 modem sets up using switches only.

___ 3. Set the switches on the modem to the following positions:

Switch Settings (SW1)					
SWA			SWB		
1	Down	(Asynchronous)	1	Down	(Receive impedance)
2	Up	(Asynchronous)	2	Up	(150 ohms)
3	Up	(Control/primary)	3	Up	(Not used)
4	Down	(Point-to-point)	4	Down	(No LPDA-1)
5	Up	(Asynchronous)	5	Down	(No LPDA-1)
6	Down	(9600 Bps)	6	Up	(Antistreaming disabled)
7	Down	(9600 Bps)	7	Up	(Not used)
8	Down	(9600 Bps)	8	Down	(Transmit impedance B9 and B10)
9	Up	(4-wire data link)	9	Down	(Transmit impedance)
10	Up	(RTS/RFS short delay)	10	Up	(150 ohms)

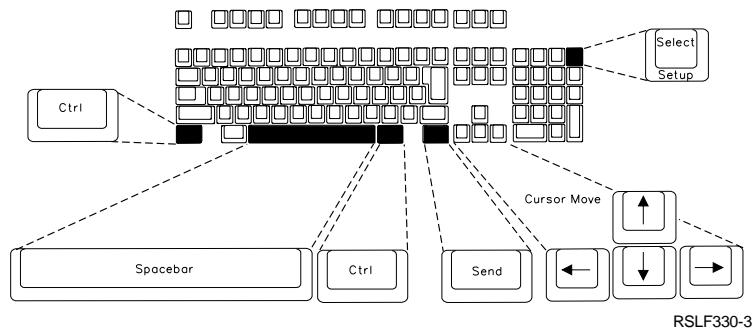
Note: The line speed of 9600 was recorded on Form C7.

You have completed setting up the modems used by the PS/2 work station running Client Access/400. For information on setting up Client Access/400, see the *Client Access/400 for DOS Ext Memory Setup* book.

The 3163 Display Station with an Auxiliary 4207 Printer

It is important to familiarize yourself with the keyboard of the display station. The following illustration shows the keyboard of the display station. You use these keys for setting up the display station:

- Ctrl (Control)** Press this key along with the *Setup* key to cause the 3163 setup or configuration display to appear.
- Setup** Press the *Setup* key along with the *Ctrl* key to cause the 3163 setup or configuration display to appear.
- Spacebar** On the configuration display, press the spacebar to "roll" through the different options available.
- Arrow keys** On the configuration display, press the arrow keys to move the cursor around to different parameters or values.
- Select** Press the *Select* key during this procedure to cause the next display to appear.
- Send** When you are finished selecting values on a display, press the *Send* key to save the values you have selected.



- ___ 1. Plug the display station into an electrical outlet.
- ___ 2. Turn on the power to the display station.
- ___ 3. On the keyboard of the 3163 display station, press the *CTRL* and *SETUP* keys.

The Setup display appears.

- ___ 4. Select the following values on the display.

These values were copied from form C7 (ASCII Work Station Diagram (Part 1)).

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Machine Mode</i>	IBM 3163	
<i>Operating Mode</i>	echo	
<i>Interface</i>	RS-422A	
<i>Line control</i>		
<i>Line speed (bps)</i>	19200	This line speed was recorded on form C7.
<i>Parity</i>	even	This parity was recorded on form C7.
<i>Turnaround character</i>	ETX	
<i>Stop bit</i>	1	This number of stop bits was recorded on form C7.
<i>Word Length (bits)</i>	8	This word length was recorded on form C7.
<i>Response delay (ms)</i>	100	
<i>Break Signal (ms)</i>	500	

After you type the values, the display looks like this:

Setup Menu		
Machine Mode	IBM 3163	
Operating Mode	ECHO	
	<u>Main Port</u>	<u>Auxiliary Port</u>
Interface	RS-422A	
Line control		
Line speed (bps)	19200	19200
Parity	Even	EVEN
Turnaround character	ETX	
Stop bit	1	1
Word Length (bits)	8	8
Response delay (ms)	100	
Break Signal (ms)	500	
Terminal ID	Up to 20 alphanumeric characters allowed	
When all finished, press SEND. Press Setup to quit.		
<hr/>		
Local		

___ 5. Press the *Send* key to save the values.

___ 6. Press the *Select* key.

A display appears that is blank except for some prompts and values that appear across the bottom.

___ 7. Select the following values on the display:

Note: To select a value, press the arrow keys to highlight the correct prompt, then alternately press and release the spacebar to select the correct value for that prompt.

<u>For:</u>	<u>Select:</u>
<i>ENTER</i>	SEND
<i>RETURN</i>	NEW LINE
<i>NEW LINE</i>	CR
<i>TAB</i>	FIELD
<i>WRAP</i>	OFF

When you finish selecting the values, the display looks like this:

ENTER=SEND RETURN=NEW LINE NEW LINE=CR TAB=FIELD LINE WRAP=OFF
--

___ 8. Press the *Send* key to save the values.

Different prompts and values appear at the bottom of the display.

___ 9. Select the following values on the display:

<u>For:</u>	<u>Select:</u>
<i>AUTO LF</i>	OFF
<i>SEND</i>	PAGE
<i>SEND NULL</i>	OFF
<i>INSERT</i>	SPACE
<i>TRACE</i>	ALL
<i>CRT SAVER</i>	NO

After you select the values, the display looks like this:

```
AUTO LF=OFF SEND=PAGE SEND NULL=OFF INSERT=SPACE TRACE=ALL CRT SAVER=NO
```

- ___ 10. Press the *Send* key to save the values.

Different prompts and values appear at the bottom of the display.

- ___ 11. Select the following values on the display:

<u>For:</u>	<u>Select:</u>
<i>SCROLL</i>	OFF
<i>PRINT</i>	VIEWPORT
<i>PRINT NULL</i>	OFF
<i>PRINT EOL</i>	OFF
<i>LINE END</i>	CR-LF

After you select the values, the display looks like this:

```
SCROLL=OFF PRINT=VIEWPORT PRINT NULL=OFF PRINT EOL=OFF LINE END=CR-LF
```

- ___ 12. Press the *Select* key to save all the options you selected for the setup of the display station.

You have completed setting up the 3163 display station.

Continue on with setting up the 4207 printer.

The 4207 Auxiliary Printer

This example uses the IBM 4207 (Model 1) printer, which is also known as the IBM Proprinter X24. In our example, Best Dressed Co. has already unpacked, assembled, and positioned the printer. They used the books that came with the printer to do this.

The IBM 4207-1 printer has two switch cards, which are located in the front of the far left corner of the printer under a removable cover. In this example, the top card is referred to as the serial interface card. The one below the serial interface card is called the base printer card.

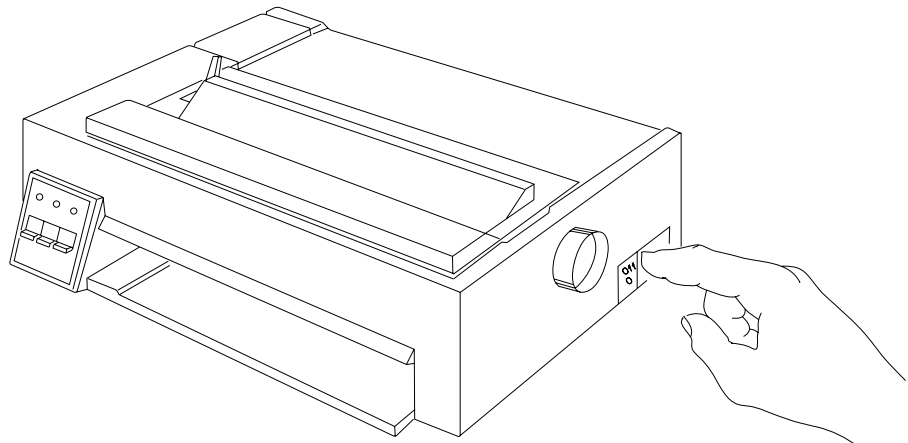
The serial interface card has two switch banks, switch bank A and bank B.

The settings of the base printer card are set at the factory. No adjustment is needed for a new printer, but the settings should be verified for the country where it is used. To set up the 4207 printer, you complete five main phases:

- Phase 1: Access the switch banks.
- Phase 2: Adjust bank A switches on the serial interface card.
- Phase 3: Adjust bank B switches on the serial interface card.
- Phase 4: Adjust base printer card switches (if necessary).
- Phase 5: Make the printer ready.

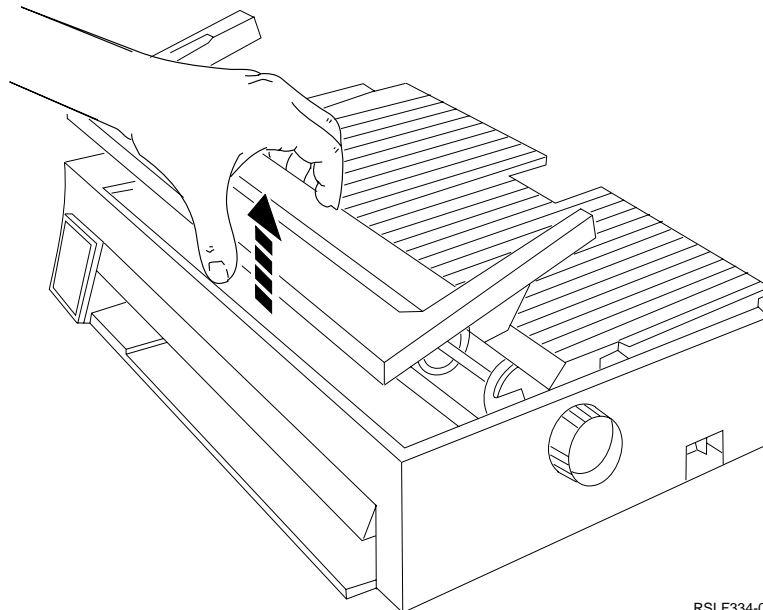
Phase 1: Access Printer Switch Banks:

- ___ 1. If you have any continuous forms in the printer, remove the forms.
- ___ 2. Set the power switch to Off as shown in the following illustration:



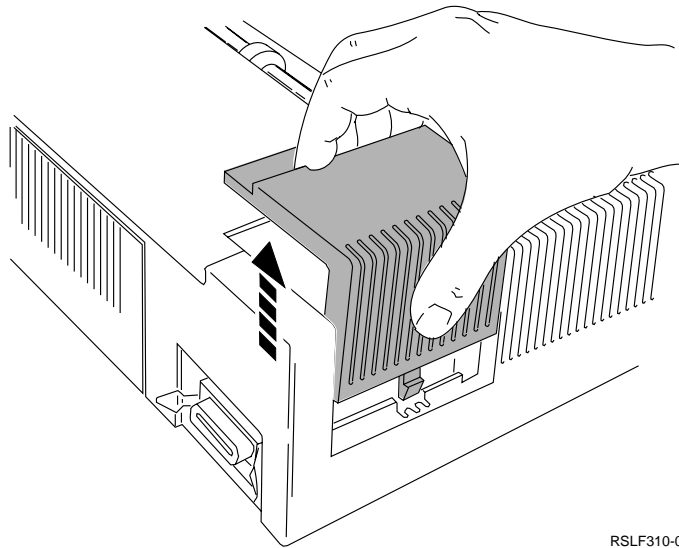
RSLF333-0

- ___ 3. Disconnect the printer power cord from the power outlet.
- ___ 4. Remove the continuous form guide as shown in the following illustration:



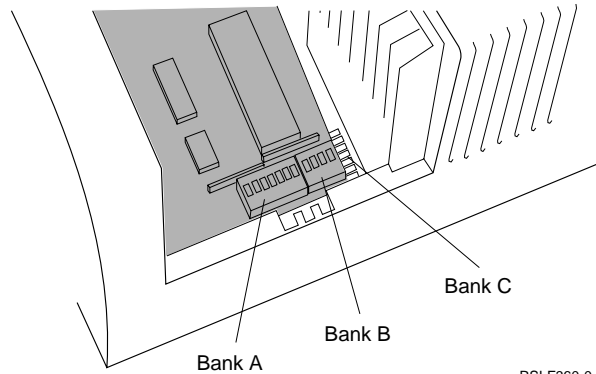
RSLF334-0

- ___ 5. Remove the access cover as shown in the following illustration:



RSLF310-0

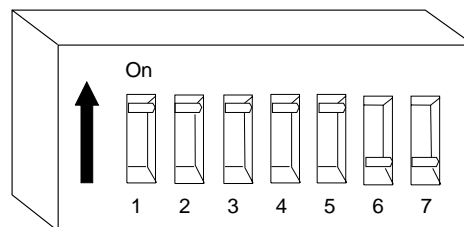
- 6. Locate the two switch banks on the serial interface card, A and B as shown in the following illustration:



RSLF360-0

- 7. Continue with the next phase.

Phase 2: Adjust Bank A Switch Settings on Serial Interface Card



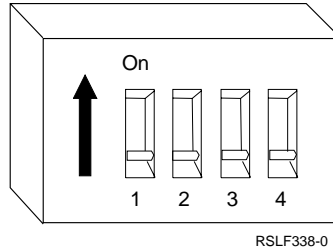
RSLF337-1

<u>Switch #</u>	<u>Position</u>	<u>Function</u>
1	on	Switches 1,2 and 3 select line speed of 19200 bps. This line speed was recorded on form C7.
2	on	19200 bps. This line speed was recorded on form C7.
3	on	19200 bps. This line speed was recorded on form C7.
4	on	Even parity. This parity was recorded on form C7.
5	on	Even parity. This parity was recorded on form C7.
6	off	XON/XOFF Pacing Control
7	off	Always off

Step 1. Continue with the next phase.

Phase 3: Adjust Bank B Switch Settings on Serial Interface Card

- ___ 1. Check to see if the position of the switches in bank B are set as suggested in the table of suggested settings. If the positions are correct, go to the next step. If the positions are not correct, use a hard, pointed object to set the switches to the correct position as shown in the following illustration.



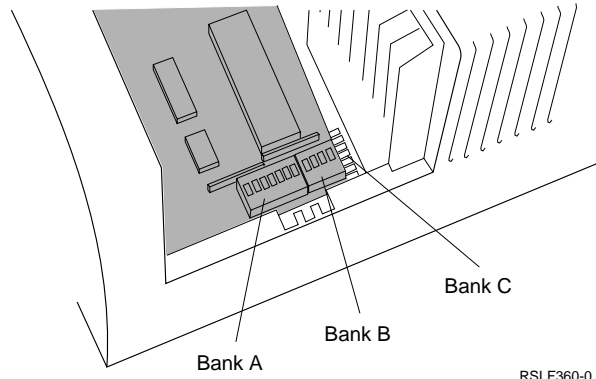
<u>Switch #</u>	<u>Position</u>	<u>Function</u>
1	off	8 data bits. This number of data bits was recorded on form C7.
2	off	1 stop bit. This number of stop bits was recorded on form C7.
3	off	Normal mode
4	off	Always off

- ___ 2. Determine the next step:
1. If the printer has not been previously used or changed, then the base printer card has the factory settings and need not be changed. In this case, skip Phase 4 and go to Phase 5: Make the Printer Ready on page 9-22.
 2. If the printer has been previously used or adjusted, then the base printer card switches must be reset to the factory settings. In this case, continue with the next phase.

Phase 4: Adjust Switches on Base Printer Card

Note: This phase is required only if the printer has been previously used or adjusted.

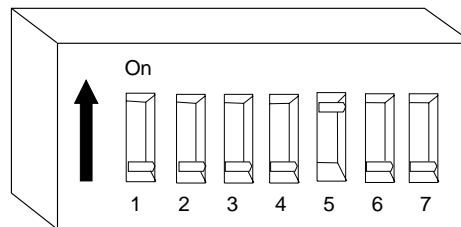
- ___ 1. Locate the base printer card below the serial interface card.
- ___ 2. Locate the Bank C switches on the base printer card, as shown in the following illustration:



RSLF360-0

- ___ 3. Use a hard, pointed object to set the switches on the base printer card to match the suggested settings listed in Appendix B, "Suggested Settings for ASCII Printers" of this book.

For the United States and Canada, the switches should be set as shown in the following illustration:



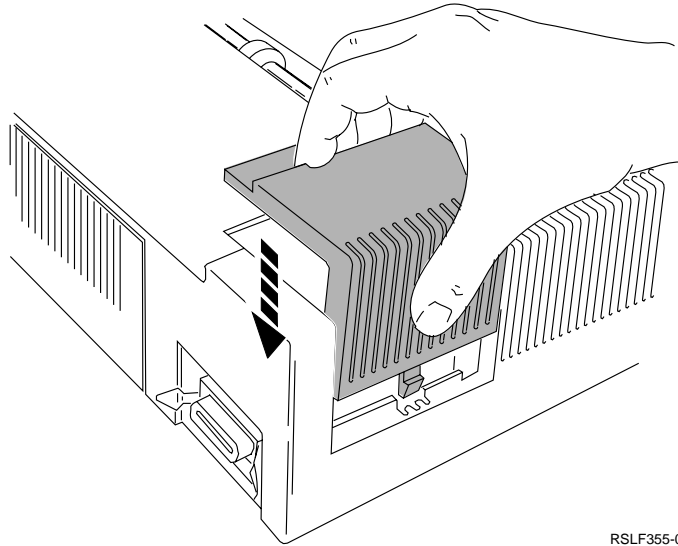
RSLF340-0

<u>Switch #</u>	<u>Position</u>	<u>Function</u>
1	off	Not used
2	off	Disable sheet feeder
3	off	No line feed after carrier return
4	off	11 inch form length
5	on	Character set 2
6	off	Prevent automatic carrier return on line feed
7	off	Alternate graphic support off

- ___ 4. Continue with the next phase.

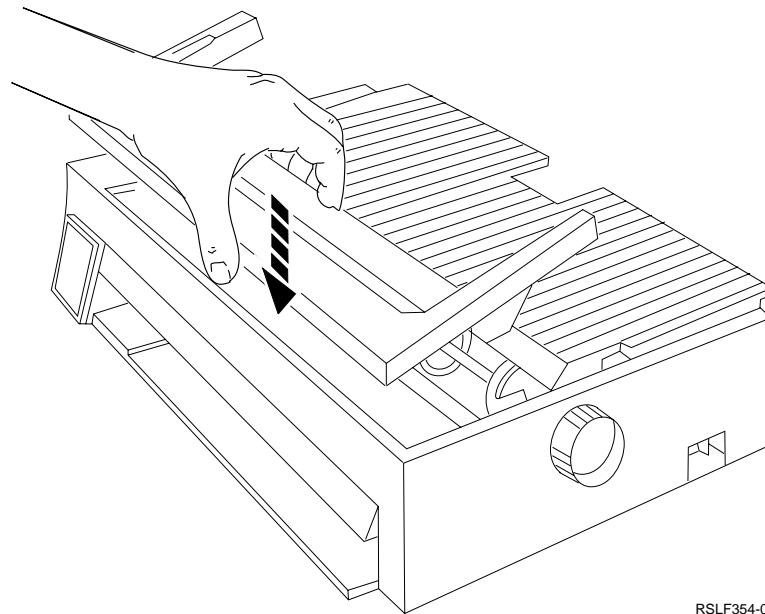
Phase 5: Make the Printer Ready

- ___ 1. Replace the access cover. (Refer to the following illustration.)



RSLF355-0

- ___ 2. Replace the continuous form guide. (Refer to the following illustration.)



RSLF354-0

- ___ 3. Connect the power cord to the power outlet.

You have completed setting up the 4207 printer. These printer settings take effect when the printer power switch is set to On (I).

Work Stations Located in the Remote Office

Use the following instructions to set up the work stations and modems located in the remote office.

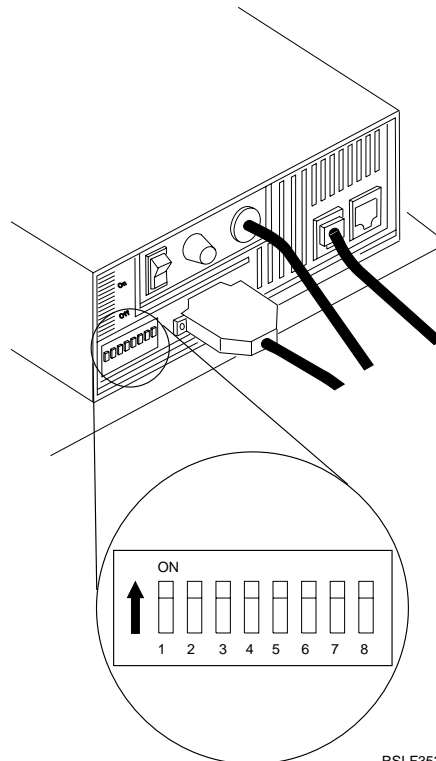
The Personal System/2 Running ASCII Emulation

To set up the Personal System/2 you must do the following:

- Set up the modems that are connected to the display station and the system.
- Install the Dial/3X program on the PS/2 work station.

Setting Up the Modems That Are Connected to the Display Station and the System: Have a hard, pointed object ready to adjust the hardware switches.

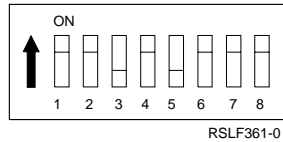
1. Verify that the modem has the power switch set to the Off position and the power cord is disconnected from the outlet.
2. Locate the switches on the back of the modem. The location of the switches is shown in the following illustration:



RSLF353-0

3. Refer to the illustration that follows and set the switches to the following positions:

<u>Switch #</u>	<u>Position</u>	<u>Function</u>
1	On	Change to non-ECL on error conditions
2	On	Save configuration on loss of DTR
3	Off	Modems do not control data flow between themselves
4	On	Modem's DTE speed = modem's telephone line speed
5	Off	Modem uses CTS to control data flow
6	On	CD represents carrier on the line
7	On	CTS = RTS
8	On	DSR represents connection established



- ___ 4. Locate the buttons on the front of the modem.
- ___ 5. Ensure that all of the buttons on the front of the modem are in the out position.

Installing the Dial/3X program on the PS/2 work station: Refer to the *Program Directory* shipped with program 5799-PCE (feature 9076) IBM PC Asynchronous 5250 Terminal Emulation Dial/3X PRPQ for complete instructions on how to install the Dial/3X program on the PS/2 work station.

The 3151 Display Station with a 4202 Printer (Port Sharing)

In this task, you set up the 3151 display station, the modem that is physically connected to the display station, and the auxiliary printer.

To set up the display station you must do the following:

- Set up the modem that is physically connected to the display station.
- Set up the modem that is physically connected to the system. (See “The 7855 Modem That is Physically Connected to the System” on page 9-27.)
- Set up the display station. (See “Example: Adjust Settings on IBM 3151 Display Station” on page 2-6.)
- Set up the printer.

Note: In this example, Best Dressed Co. has already unpacked, assembled, and positioned the display station. They used the information that came with the display station to do this.

Setting Up the 5853 Modem that is Physically Connected to the Display Station: This procedure is explained in “Setting Up the Modems That Are Connected to the Display Station and the System” on page 9-23.

In the next task, you will setup the 4202 printer that is attached to the 3151 display station.

The 4202 Printer

In our example, Best Dressed Co. has already unpacked, assembled, and positioned the printer. They used the books that came with the printer to do this.

The IBM 4202 printer has two switch cards, which are located under a removable cover. In this example, the top card is the serial interface card. The one below the serial interface card is called the base printer card.

The serial interface card has two switch banks, switch bank A and bank B.

The settings of the base printer card are set at the factory. No adjustment is needed for a new printer, but the settings should be verified for the country where it is used. Setting up the 4202 printer consists of five main phases:

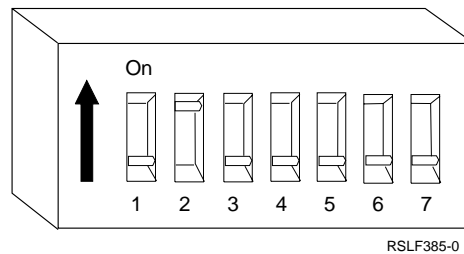
- Phase 1: Access the switch banks.
- Phase 2: Adjust bank A switches on the serial interface card.
- Phase 3: Adjust bank B switches on the serial interface card.

- Phase 4: Adjust base printer card switches (if necessary).
- Phase 5: Make the printer ready.

Phase 1: Access Printer Switch Banks: For illustrations on how to access printer switch banks, see “Phase 1: Access Printer Switch Banks:” on page 9-18.

- ___ 1. If you have any continuous forms in the printer, remove the forms.
- ___ 2. Set the power switch to Off.
- ___ 3. Disconnect the printer power cord from the power outlet.
- ___ 4. Remove the continuous form guide.
- ___ 5. Remove the access cover from the rear corner.
- ___ 6. Locate the two switch banks on the serial interface card, A and B.
- ___ 7. Continue with the next phase.

Phase 2: Adjust Bank A Switch Settings on Serial Interface Card



RSLF385-0

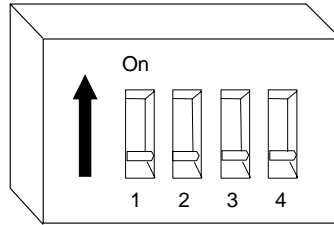
- ___ 1. Locate bank A on the serial interface card.

<u>Switch #</u>	<u>Position</u>	<u>Function</u>
1	Off	Switches 1, 2, and 3 select line speed of 2400 bps.
2	On	2400 bps
3	Off	2400 bps
4	Off	No parity
5	Off	No parity
6	Off	XON/XOFF pacing
7	Off	Always off

- ___ 2. Continue with the next phase.

Phase 3: Adjust Bank B Switch Settings on Serial Interface Card

- ___ 1. Check to see if the position of the switches in bank B are set as suggested in the table of suggested settings. If the positions are correct, go to the next step. If the positions are not correct, use a hard, pointed object to set the switches to the correct position as shown in the following illustration.



RSLF338-0

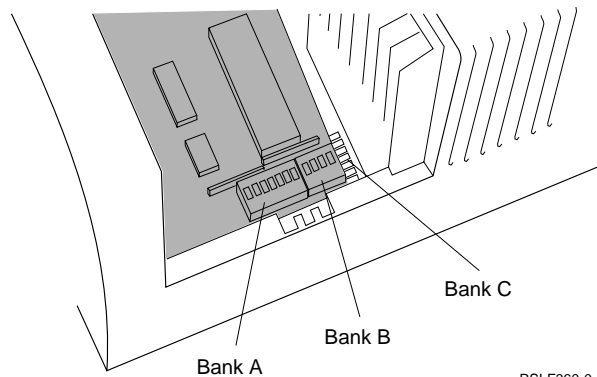
<u>Switch #</u>	<u>Position</u>	<u>Function</u>
1	Off	8 data bits
2	Off	1 stop bit (This stop bit was recorded on form C7.)
3	Off	Normal mode
4	Off	Always off

- ___ 2. Determine the next step:
- ___ 3. If the printer has not been previously used or changed, then the base printer card has the factory settings and need not be changed. In this case, skip Phase 4 and go to Phase 5 on page 9-27.
- ___ 4. If the printer has been previously used or adjusted, then the base printer card switches must be reset to the factory settings. In this case, continue with the next phase.

Phase 4: Adjust Switches on Base Printer Card

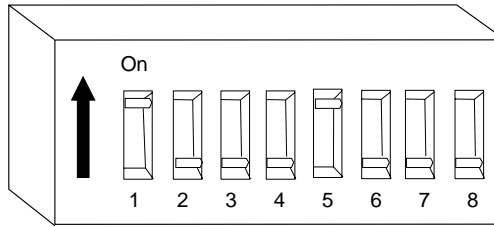
Note: This phase is required only if the printer has been previously used or adjusted.

- ___ 1. Locate the base printer card below the serial interface card.
- ___ 2. Locate the Bank C switches on the base printer card, as shown in the following illustration:



RSLF360-0

- ___ 3. Use a hard, pointed object to set the switches on the base printer card to the following positions:
 For the United States and Canada, the switches should be set to the following positions:



RSLF386-0

<u>Switch #</u>	<u>Position</u>	<u>Function</u>
1	on	13.6 inch print line
2	off	Normal zeros
3	off	No line feed after carrier return
4	off	11 inch form length
5	on	Character set 2
6	off	No automatic carrier return after line feed
7	off	Always off
8	off	

___ 4. Continue with the next phase.

Phase 5: Make the Printer Ready: For illustrations on how to make the printer ready, see "Phase 5: Make the Printer Ready" on page 9-22.

- ___ 1. Replace the access cover.
- ___ 2. Replace the continuous form guide.
- ___ 3. Connect the power cord to the power outlet.

You have completed setting up the 4202 printer. These printer settings take effect when the power for the printer is turned on.

The 7855 Modem That is Physically Connected to the System

At this time, you set up the 7855 modem that is physically connected to the system. This is the system-side modem for the 3151 display station and for the PS/2 work station running Client Access/400.

To configure the system-side 7855 modem, do the following:

- ___ 1. Locate the EIA-232 cable marked 21F9966.
- ___ 2. Plug one end into the modem and the other end into the asynchronous port on the personal computer.
- ___ 3. With the personal computer powered on, go to the Client Access/400 subdirectory.
- ___ 4. Change the communication parameters on the personal computer, using the MODE command. For example, to have the personal computer communicate with the modem at a line speed of 19200 with 8-bit word length and No parity, type:

```
MODE comX:19200,n,8
```

where *comX* is the communications port you are using. (In most cases, you use the com1 communications port.)

- ___ 5. At the Client Access/400 prompt (PCS>), type:

IAC

and press Enter.

You see the Client Access/400 IAC header, followed by these messages:

Enter Modem commands

Press ESC when finished

- ___ 6. Enter the modem commands as listed in Appendix C, "Suggested Settings for Modems." For the 7855 modem, follow these instructions:

- a. Type:

AT &F1

When you press Enter, the modem responds with an OK message.

- b. Type:

AT &C1&S1Y1&R3&I1

When you press Enter, the modem responds with an OK message.

Note: You can enter more than one command at a time.

- c. Type:

AT \A3\C2\K3\M14&AP8\N3

When you press Enter, the modem responds with an OK message.

- d. Type:

AT \R1&B8N1\V0%E1\Q3

When you press Enter, the modem responds with an OK message.

- e. Type:

ATE0Q1&W0&Y0

When you press Enter, the modem does not respond. You disabled the result code messages with the Q1 command.

- f. Press ESC to return to DOS.

You have now configured the system-side 7855 modem.

The PS/2 Work Station Running Client Access/400

At this time, you set up the PS/2 work station running Client Access/400. See your PS/2 work station books in order to set up the PS/2 work station. You also set up the 7855 modem that is physically connected to the PS/2 work station running Client Access/400.

To configure the 7855 modem that is physically connected to the PS/2 work station, do the following:

- ___ 1. Locate the EIA-232 cable marked 21F9966.
- ___ 2. Plug one end into the modem, and the other end into the asynchronous port on the personal computer.
- ___ 3. With the personal computer powered on, go to the Client Access/400 subdirectory.

- ___ 4. Change the communication parameters of the personal computer, using the MODE command. For example, to have the personal computer communicate with the modem at a line speed of 19200 with 8-bit word length and No parity, type:

```
MODE comX:19200,n,8
```

Replace *comX* with the communications port you are using. (In most cases, you use the com1 communications port.)

- ___ 5. At the Client Access/400 prompt (PCS>), type:

```
IAC
```

Then press Enter.

You see the Client Access/400 IAC header, followed by these messages:

```
Enter Modem commands  
Press ESC when finished
```

- ___ 6. Enter the modem commands as listed in Appendix C, "Suggested Settings for Modems." For the 7855 modem, follow these instructions:

- a. Type:

```
AT &F1
```

When you press Enter, the modem responds with an OK message.

- b. Type:

```
AT &C1&S1Y1&R3&I1
```

When you press Enter, the modem responds with an OK message.

Note: You can enter more than one command at a time.

- c. Type:

```
AT \A3\C2\K3\M14&AP8\N3
```

When you press Enter, the modem responds with an OK message.

- d. Type:

```
AT \R1&B8N1\V0%E1\Q3
```

When you press Enter, the modem responds with OK message.

- e. Type:

```
AT&W0&Y0
```

When you press Enter, the modem responds with an OK message.

- f. Press ESC to return to DOS.

You have now configured the 7855 modem attached to the PS/2 work station running Client Access/400.

Chapter 10. Connecting Cables for Work Stations and Modems

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This section provides instructions on how to connect cables between the ASCII work stations and the ASCII attachments.

Power off all work stations (display stations and modems) before connecting cables.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

DANGER

To prevent a possible electrical shock when installing the system, ensure that the power cords for all devices are unplugged before installing signal cables. (RSFTD202)

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

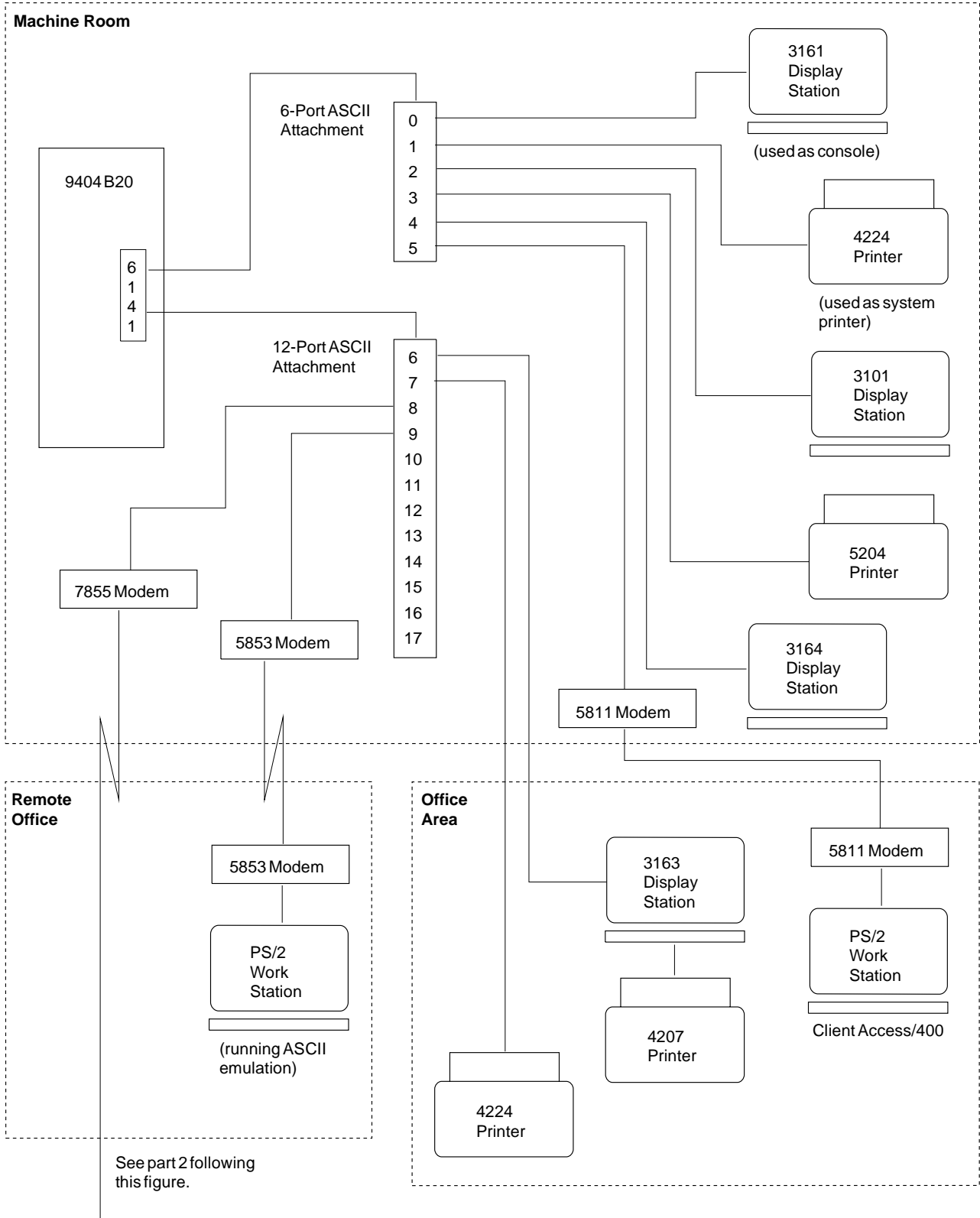
DANGER

To prevent a possible electrical shock during an electrical storm, do not connect or disconnect cables or station protectors for communications lines, display stations, printers, or telephones. (RSFTD003)

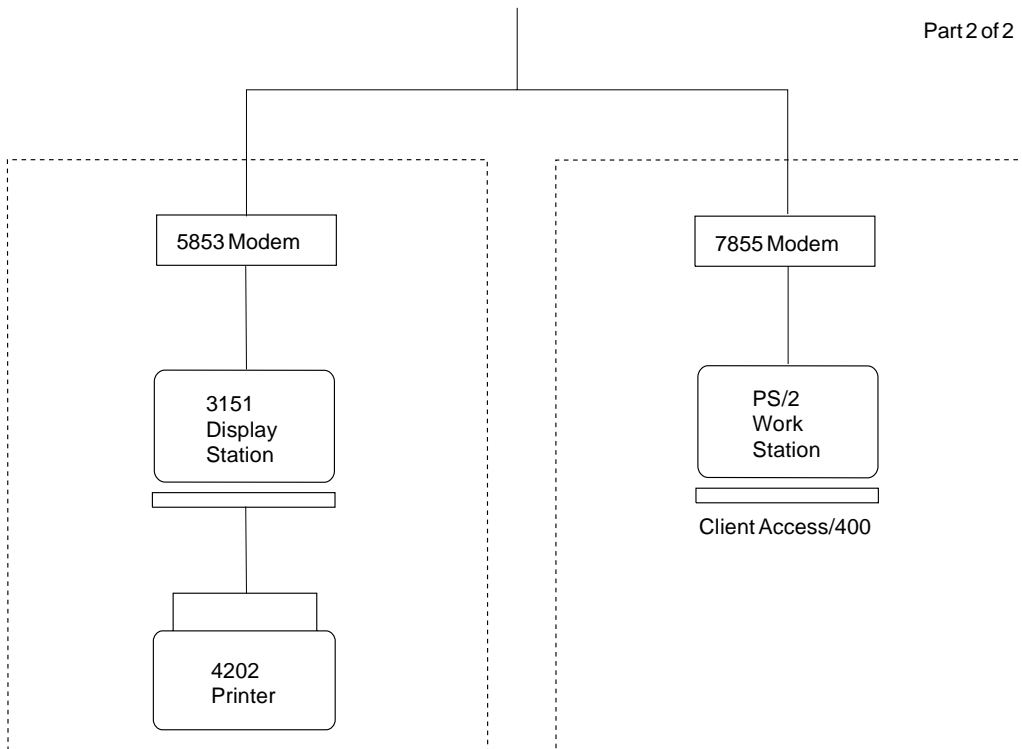
DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

Best Dressed's system configuration includes devices in several local and remote locations to illustrate how to set up, connect, and configure work stations requiring a variety of attachments and cables (see the system diagram on pages 10-3 and 10-4.) In this chapter, instructions for connecting cables are divided into three sections that reflect the variation in cabling requirements for the work stations located in Best Dressed's machine room, office area, and remote office.



RV3F099-0



Note: Only one of these display stations can call in to and use the system at any one time. This is possible because this port is designated for ASCII port sharing.

RV3F098-0

Learning about the Cables to Use

The importance of using the proper cables cannot be overstressed. Many problems encountered while connecting work stations are caused by the use of the wrong cables.

When Ordering Cables

Determine whether you need plug or receptacle connectors at the ends of the cables. For example, if a work station has the same port type as the ASCII attachment (receptacle, no protruding pins), you would need to order a cable with plug connectors on both ends. For other cable restrictions, see the *Physical Planning Reference*.

Note that the cables described in this section have two part numbers:

- The part number on the label attached to the cable
- The part number that you use when ordering a cable from your IBM marketing representative

Throughout this section, we identify the cables by the number on the label attached to the cable. However, to obtain the correct cable when you order, you must specify the part *order* number as indicated in the cable descriptions on page 10-5.

The following cables are used in Best Dressed's installation:

- EIA-232 *Direct* connection cables for connecting:
 - Work stations to ASCII attachments for work stations located in the machine room
 - Auxiliary printers to work stations
 - Modems to remote work stations

Note: Some printers require special parts in addition to the cables listed here to attach to the ASCII work station controller. See “ASCII Printers Supported” on page 1-7 for information concerning parts.

The following table shows the correct cables for connecting the various device combinations that require EIA-232 Direct cables:

Devices to be Connected	Part Number on Cable	Part Number to Order
PS/2 work station direct to ASCII attachment	21F9036 6.096 meters (20 feet)	85F8096
PS/2 work station to modem	21F9966 6.096 meters (20 feet)	21F9965
Display with receptacle port, direct to ASCII attachment or to modem	21F4339 6.096 meters (20 feet)	21F4505
Display with receptacle port, direct to ASCII attachment or to modem	21F4344 12.192 meters (40 feet)	21F4342
Display with plug port, direct to ASCII attachment or to modem	21F9966 6.096 meters (20 feet)	21F9965

- EIA-232 *modem* cable for connecting modems to the ASCII attachment.

Part Number on Cable:	Part Number to Order:
59X3833 (6.096 meters (20 feet) long)	69X7017

- EIA-422 cables for connecting work stations located less than 1219.2 meters (4000 feet) from the ASCII work station controller to the ASCII attachment. (In this example, EIA-422 cables are used for work stations located in the office area.)

Part Number on Cable:	Part Number to Order:
21F4348 (30.48 meters (100 feet) long)	21F4346

- An EIA-232 special direct connection cable for the 3101 display station.

Limited EIA-232 support can be achieved through the use of cables that have fewer wires than the cables listed above. Two frequently-used alternatives are 3-wire and 4-wire support. If you use one of these alternatives, enter *WIRE3 or *WIRE4 as the Attachment value on the C7 form and use this value when you create the configuration description for the device.

Diagrams of the above cables can be found in the *Physical Planning Reference*.

To ensure that you have accurate information to refer to when you create your device configuration descriptions, determine what type of cable you are using for each device and record that information accurately on the C7 and D3 forms.

If you use the incorrect cable, you could lose some function on your ASCII work station. For example, if you use the 3-wire connection cable, the ASCII Work Station Controller can not detect whether the power on your display station is turned on or off. For the full function that the ASCII Work Station Controller provides, it is best to use the direct connection cable.

One last point on the topic is that many times someone will give you a cable stating that it is an EIA-232 or RS-232 cable. If you cannot tell by the part number on the cable, the *only* way you can know for sure is to unscrew one of the ends of the cable and actually see where the wires are connected. Many times the wires that are in the actual cable are not connected to any pin at the end.

Removing the Covers on the ASCII Attachments

Look at the illustration of the device configuration on page 10-3 and notice the ASCII attachments.

Note that these ASCII attachments work somewhat like extension cords. The service representative connected the ASCII attachments to the system. Now you remove the covers from the attachments and use cables to connect work stations to the *ports* of the attachments. (Your 6-port attachment may not have a cover.)

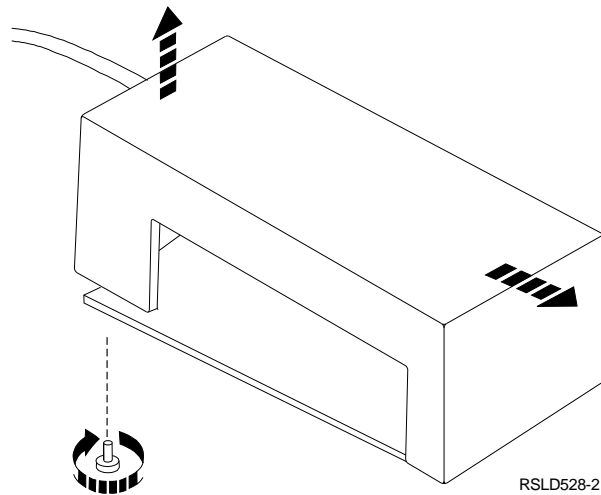
These *ports* are numbered consecutively on the attachments from port 0 on the 6-port attachment to port 17 on the 12-port attachment.

The console is always attached to *port 0* (the first port) of the ASCII attachment. For this reason, you attach the other work stations to the remaining ports of the ASCII attachment starting with port 1 and continuing consecutively, according to the port numbers you wrote on Form C7 in Chapter 8.

In order to connect work stations to the ASCII attachments, you need to remove the covers from the attachments.

Removing the cover from 6-port and 12-port attachments (if you have a cover)

1. Locate the attachment.
2. Loosen the large thumb-screw on the bottom.
3. Remove the cover from the ASCII attachment as shown in the following illustration:



4. Before connecting any cables, power off all displays, printers and modems.

Work Stations Located in the Machine Room

Follow these instructions to connect cables for work stations located in the machine room.

The 3161 Display Station

You do not need to connect this display station. This display station is used as the console so it was attached by the service representative.

You have completed connecting the cables for this 3161 display station.

IBM 4224 Printer

The following instructions explain how to connect the 4224 printer in the machine room to the 6-port ASCII attachment. The 4224 printer in the machine room is connected using a EIA-232 direct cable. (Instructions for connecting a 4224 printer using EIA-422 cable are on pages 10-13.)

1. Find the EIA-232 type *Direct* cable.

The cable should have one of the following part numbers on the label attached to the cable:

- 21F4339 (for a cable that is 6.096 meters (20 feet) long)
- 21F4344 (for a cable that is 12.192 meters (40 feet) long)

2. Plug the cable into the back of the 4224 printer.
3. Locate the form C7 that you completed for this 4224 printer. (In this example, this form is on page 8-11.)

On this form C7, find out which port of the ASCII attachment this 4224 printer attaches to. (In this example, this 4224 printer attaches to port 1 of the 6-port ASCII attachment.)

Ensure that the power to the 4224 printer is turned off and the printer is unplugged.

4. Plug the cable into the correct port on the attachment.

5. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.

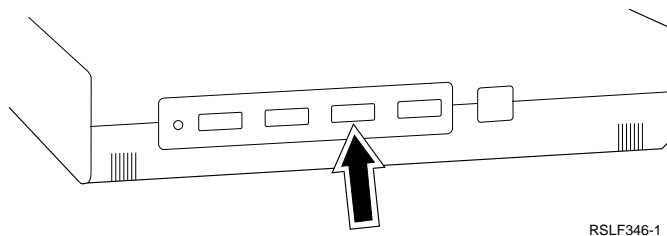
You have completed connecting the cables for this 4224 printer.

The 3101 Display Station

1. Find the special direct connection EIA-232 cable for connecting the 3101 display station.

There is no part number for this special direct connection cable, however a diagram of the cable is available in the *Physical Planning Reference*. The diagram can be found in the chapter on types of cables for ASCII devices.

2. Plug the cable into the 3101 display station as shown in the following illustration.



RSLF346-1

3. Locate the form C7 that you completed for this 3101 display station. (In this example, this form is on page 8-11.)

On this form C7, find out which port of the ASCII attachment this 3101 display station attaches to. (In this example, this 3101 display station attaches to port 2 of the 6-port ASCII attachment.)

4. Plug the cable into the correct port on the attachment.
5. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.

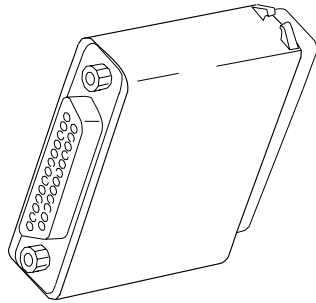
You have completed connecting the cables for this 3101 display station.

The 5204 Printer

1. Find an EIA-232 type *Direct* cable.

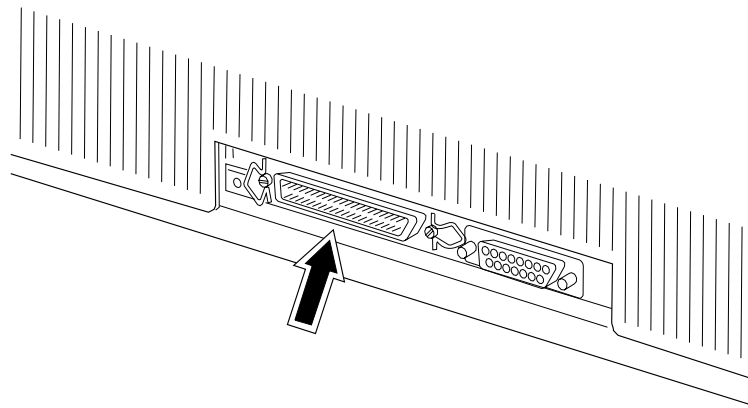
The cable should have one of the following part numbers on the label attached to the cable:

- 21F4344 (for a cable that is 12.192 meters (40 feet) long)
 - 21F4339 (for a cable that is 6.096 meters (20 feet) long)
2. Locate the serial cable connector required for the 5204 printer. This connector has the part number of 1319143.



RSLF383-0

3. Attach the connector to the cable.
4. Plug the connector into the 5204 printer.



RSLF351-0

5. Locate the form C7 that you completed for this 5204 printer station. (In this example, this form is on page 8-11.)
On this form C7, find out which port of the ASCII attachment this 5204 printer attaches to. (In this example, this 5204 printer attaches to port 3 of the 6-port ASCII attachment.)
6. Plug the cable into the correct port on the attachment.
7. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.

You have completed connecting the cables for this 5204 printer.

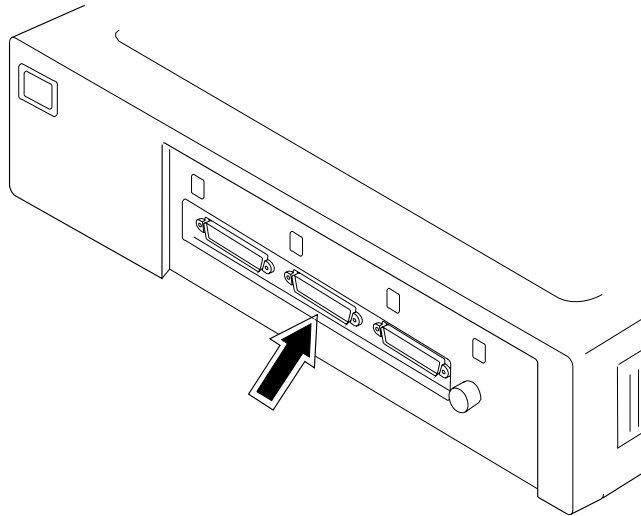
The 3164 Display Station

1. Find the EIA-232 type *Direct* cable. (In this example, this cable is already connected to the 3164 display station.)

The cable should have one of the following part numbers on the label attached to the cable:

- 21f4339 (for a cable that is 6.096 meters (20 feet) long)
- 21F4344 (for a cable that is 12.192 meters (40 feet) long)

2. Plug the cable into the 3164 display station as shown in the following illustration.



RSLF343-0

3. Locate the form C7 that you completed for this 3164 display station. (In this example, this form is on page 8-11.)
4. On this form C7, find out which port of the ASCII attachment this 3164 display station attaches to. (In this example, this 3164 display station attaches to port 4 of the 6-port ASCII attachment.)
5. Plug the cable into the correct port on the attachment.
6. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.

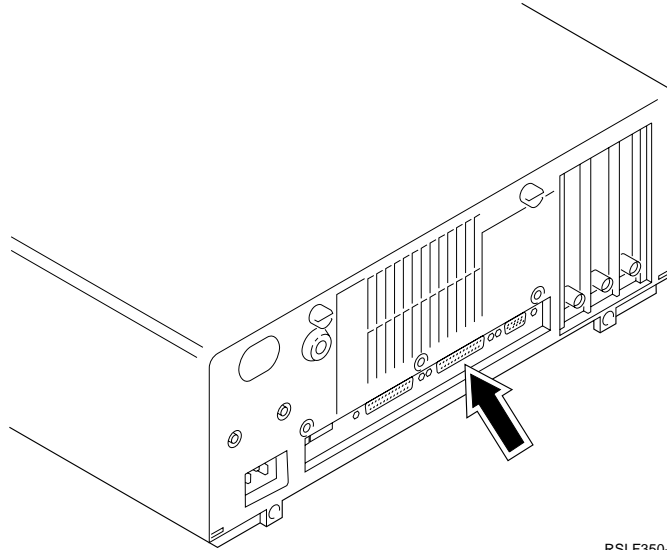
You have completed connecting the cables for this 3164 display station.

Work Stations Located in the Office Area

Follow these instructions to connect cables for work stations located in the local office area.

The Personal System/2 Work Station Running Client Access/400

- ___ 1. Locate an EIA-232 PS/2 work station cable.
The cable should have the part number 21F9966 on the label attached to the cable.
- ___ 2. Plug the cable into the asynchronous port on the back of the personal computer as shown in the following illustration.



RSLF350-0

Note: On a Personal System/2 (PS/2) work station, an asynchronous communications adapter card or port is a standard option.

- ___ 3. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.
- ___ 4. Plug the cable into the back of the 5811 modem.
- ___ 5. In the *machine room (where the system is)*, locate the EIA-232 modem cable.
The cable should have the part number 59X3833 on the label attached to the cable.
- ___ 6. Connect one end of the cable into the back of the modem.
- ___ 7. Locate the Form C7 (Part 2) that you completed for this PS/2 work station. (In this example, the completed example form is found on page 8-17.)
- ___ 8. On this form C7, find out which port of the ASCII attachment this PS/2 work station attaches to. (In this example, this PS/2 work station attaches to port 5 of the 6-port ASCII attachment.)
- ___ 9. Connect the other end of the cable to the 12-port ASCII attachment.
- ___ 10. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.
- ___ 11. Connect the two modems together. For instructions for connecting the two modems, refer to *5811 Modem Description and Planning Guide*, GA33-0081. For additional information refer to *Setup, Problem Analysis and Resolution*, GA33-0082.

Note: These instructions were not included because each setup has specific considerations.

You have completed connecting the cables for this PS/2 work station.

The 3163 Display Station with a 4207 Printer

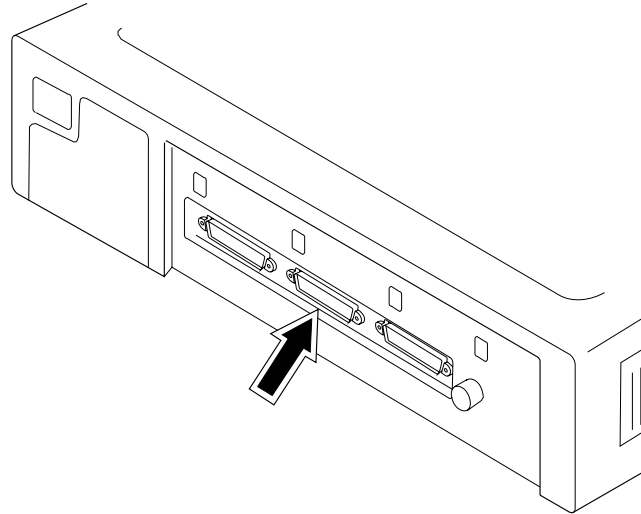
You now connect two cables:

- The cable between the printer and the display station
- The cable between the display station and the 12-port attachment

___ 1. Locate an EIA-422 cable.

The cable should have the part number 21F4348 on the label attached to the cable.

___ 2. Plug the cable into the back of the 3163 display station. The cable plugs into the socket shown in the following illustration.



RSLF348-0

___ 3. Locate the Form C7 (Part 1) that you completed for this 3163 display station. (In this example, the completed example form is found on page 8-12.)

___ 4. On this form C7, find out which port of the ASCII attachment this display station attaches to. (In this example, this display station attaches to port 6 of the 12-port ASCII attachment.)

___ 5. Connect the cable to the 12-port ASCII attachment.

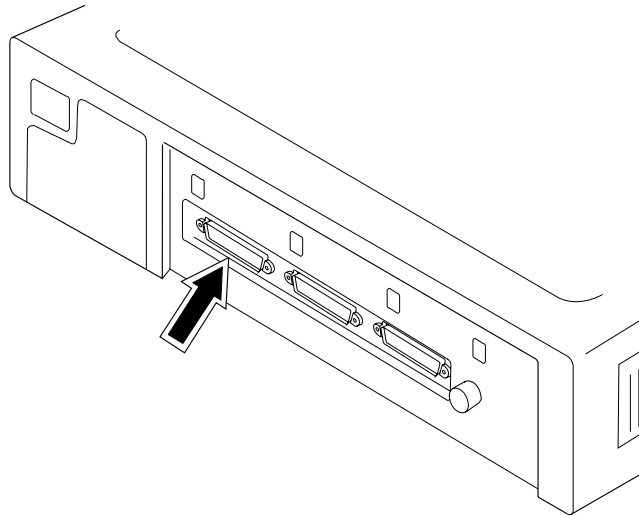
___ 6. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.

___ 7. Locate an EIA-232 Direct cable to connect the 3163 display station to the 4207 auxiliary printer.

The cable should have the part number 21F4339 on the label attached to the cable.

Note: The cable attaching the auxiliary printer must be an EIA-232 direct cable.

___ 8. Plug the cable into the back of the 3163 display station as shown in the following illustration.



RSLF349-0

- ___ 9. Plug the cable into the back of the 4207 printer.

You have completed connecting the cables for this 3163 display station and 4207 printer.

The 4224 Printer

The following instructions explain how to connect the 4224 printer located in the office area to the 12-port ASCII attachment using an EIA-422 cable. (Instructions for connecting a 4224 printer using EIA-232 Direct cable are on pages 10-7.)

- ___ 1. Locate an EIA-422 cable.
 - The cable should have the part number 21F4348 on the label attached to the cable.
- ___ 2. Plug the cable into the back of the 4224 printer.
- ___ 3. Locate the Form C7 (Part 1) that you completed for this 4224 printer. (In this example, the completed example form is found on page 8-12.)
- ___ 4. On this form C7, find out which port of the ASCII attachment this printer attaches to. (In this example, this printer attaches to port 7 of the 12-port ASCII attachment.)

- ___ 5. Connect the cable to the 12-port ASCII attachment.
- ___ 6. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.

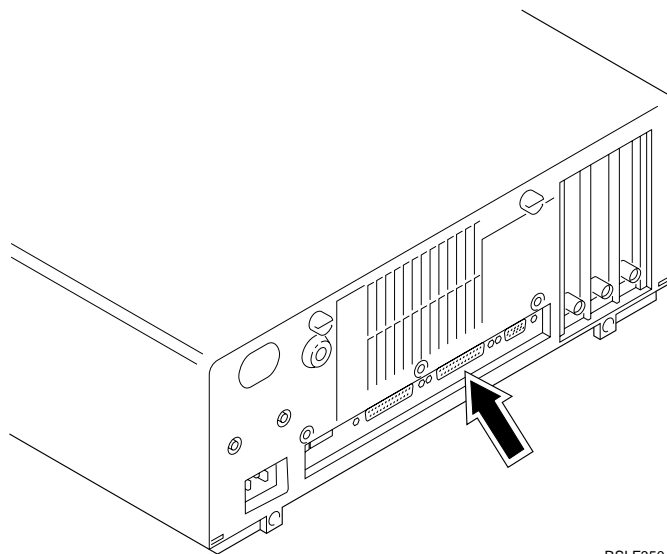
You have completed connecting the cable for this 4224 printer.

Work Stations Located in the Remote Office Area

Follow these instructions to connect cables for work stations located in the remote office area.

The Personal System/2 Work Station Running ASCII Emulation

- ___ 1. Locate an EIA-232 PS/2 work station cable.
The cable should have the part number 21F9966 on the label attached to the cable.
- ___ 2. Plug the cable into the asynchronous port on the back of the personal computer as shown in the following illustration.



RSLF350-0

- Note:** On a Personal System/2 (PS/2) an asynchronous communications adapter card or port is a standard option.
- ___ 3. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.
 - ___ 4. Plug the cable into the back of the 5853 modem.
 - ___ 5. In the *machine room (where the system is)*, locate the EIA-232 modem cable.
The cable should have the part number 59X3833 on the label attached to the cable.
 - ___ 6. Connect one end of the cable into the back of the 5853 modem.
 - ___ 7. Locate the Form C7 (Part 2) that you completed for this PS/2 work station. (In this example, the completed example form is found on page 8-17.)

- ___ 8. On this form C7, find out which port of the ASCII attachment this PS/2 work station attaches to. (In this example, this PS/2 work station attaches to port 9 of the 12-port ASCII attachment.)
- ___ 9. Connect the other end of the cable to the 12-port ASCII attachment.
- ___ 10. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.

You have completed connecting the cables for this PS/2 work station.

The Personal System/2 Work Station Running Under Client Access/400

- ___ 1. Locate an EIA-232 PS/2 work station cable.
The cable should have the part number 21F9966 on the label attached to the cable.
- ___ 2. Plug the cable into the asynchronous port on the back of the personal computer.
- ___ 3. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.
- ___ 4. Plug the cable into the back of the 7855 modem.
- ___ 5. See "The 7855 Modem That is Physically Connected to the System" on page 9-27 for instructions on how to connect a 7855 modem to the system.

You have completed connecting the cables for this PS/2 work station.

The 3151 Display Station with a 4202 Printer (Port Sharing)

You now connect three cables:

- The cable between the modem and the 12-port ASCII Attachment
- The cable between the display station and the modem
- The cable between the printer and the display station

- 1. In the machine room (where the system is) perform the following steps:

- ___ a. Locate an EIA-232 modem cable.

The cable should have the part number 59X3833 on the label attached to the cable.

- ___ b. Connect one end of the cable into the back of the 7855 modem.

- ___ c. Locate the Form C7 (Part 2) that you completed for this 3151 display station. (In this example, the completed example form is found on page 8-17.)

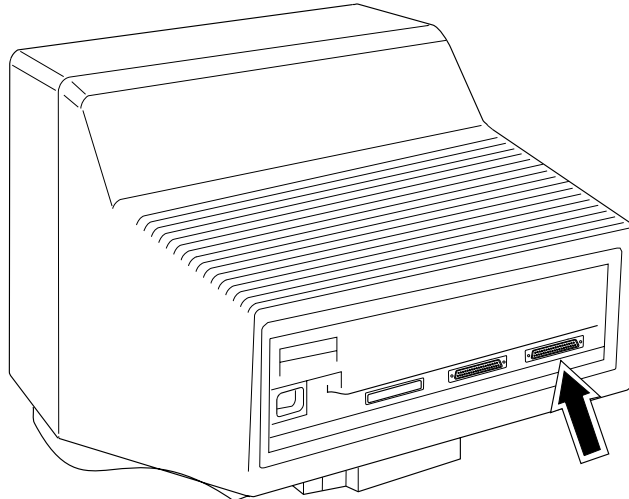
- ___ d. On this form, find out which port of the ASCII attachment the 7855 modem attaches to. (In this example, the 7855 modem attaches to port 8 of the 12-port ASCII attachment.)
 - ___ e. Connect the other end of the cable to the 12-port ASCII attachment.
 - ___ f. Tighten the two screws on the connector. This ensures a good connection and protects the equipment from cables accidentally falling out.
2. In the remote office, perform the following steps to connect the cable from the 3151 display station to the modem.

In this example, the cable has already been connected so you should go to step 3 on page 10-17.

- a. Locate an EIA-232 cable.

The cable should have the part number 21F4339 or part number 21F4344 on the label attached to the cable.

- b. If you have not already done so, plug the cable into the back of the 3151 display station as shown in the following illustration.



RSLF352-0

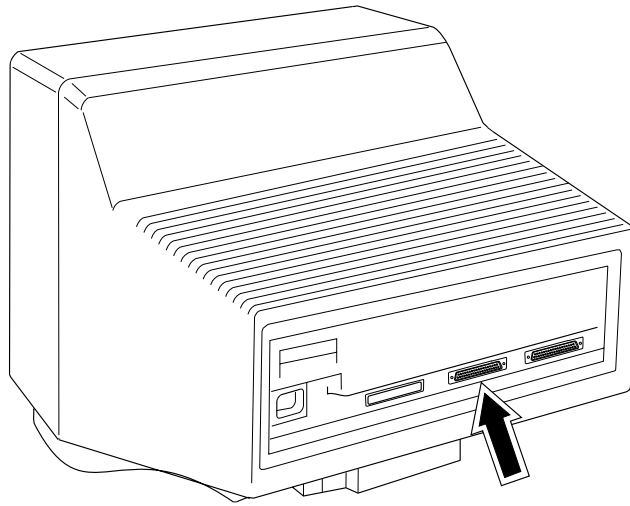
- c. Plug the cable into the back of the 5853 modem.

3. In the remote office, perform the following steps to connect the 3151 display station to the auxiliary 4202 printer.
 - a. Locate an EIA-232 direct cable to connect the 3151 display station to the 4202 auxiliary printer.

The cable should have the part number 21F4339 on the label attached to the cable.

Note: The cable attaching the auxiliary printer must be an EIA-232 direct cable.

- b. Plug the cable into the back of the 3151 display station as shown in the following illustration.



RSLF347-0

- c. Plug the cable into the back of the 4202 printer.

You have completed connecting the cables for this 3151 display station and 4202 printer.

Replacing the Covers on the ASCII Attachments

Replace the covers on any ASCII attachment that you used. You have completed connecting cables for the work stations (display stations and modems) in the example configuration. (Your 6-port attachment may not have a cover.)

Chapter 11. Creating Device Descriptions for ASCII Devices

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Starting Up the System

- ___ 1. Plug in the power cords for the following:
 - The system unit
 - All work stations and modems in the machine room
 - All work stations and modems in the office area
 - All work stations and modems in the remote office
- ___ 2. Turn on the power for all locally attached display stations, printers, and modems.
- ___ 3. Turn on the power to all remote display stations, printer, and modems.
- ___ 4. Power up the AS/400 if it is not already powered up.

Note: More details about display station keys can be found in step 8 of this procedure and in the *System Operation for New Users* book.
- ___ 5. Sign on to your system with a password that has the authority to create line, controller, and device descriptions, create user profiles and output queues, and work with the hardware configuration. You probably want to use your security officer password.
- ___ 6. Press the *Send* key.

The AS/400 Main Menu appears.

On the AS/400 Main Menu command line, type the following:

```
CHGMSGQ QSYSOPR *BREAK
```

This command puts the system operator's message queue into break mode. Break mode causes any messages that normally go to the operator's message queue to be displayed immediately.

Note: This is an optional command.
- ___ 7. Press the *Send* key.

Any messages that are currently in the queue are displayed.
- ___ 8. Press F3 (Exit) to return to the AS/400 Main Menu.

You will now use the console to configure each of the ASCII work stations used in the example network.

You need to familiarize yourself with the keyboard mapping of the console. See Appendix E, "Supported Keyboard Maps" for information on the keyboard mapping for your display type. In this example, the console is a 3161 display station.

Configuring the ASCII Work Station Controller

The AS/400 system has an automatic configuration feature that is enabled by default when the system is set up. When enabled, automatic configuration creates controller descriptions during the first IPL after the controllers are installed in the system.

The recommended procedure is to have the system automatically create the controller descriptions. Appendix J, "Configuring the ASCII Work Station Controller," however, does discuss how to manually create an ASCII Work Station Controller description.

The controller in this example was automatically configured.

Configuring Work Stations Located in the Machine Room

Follow these instructions to configure the work stations located in the machine room.

The 3161 Display Station as the Console

The 3161 display station in Best Dressed's configuration does not need to be configured because it is used as the console. The console is always set up by the service representative.

Note: The console must be attached to port 0 of the first work station controller.

The 4224 Printer as the System Printer

The following instructions explain how to configure the 4224 printer that is attached to the AS/400 using EIA-232 Direct cable (the printer located in the machine room). Instructions for configuring the 4224 printer attached with EIA-422 cable, which is located in the office area, are on page 11-12.

- ___ 1. The values used to configure the 4224 printer were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the information on page 8-11.)
- ___ 2. On any command line type the Create Device Description (Printer) command:
CRTDEVPRT
and press F4 (Prompts).
The Create Device Desc (Printer) display appears.

- ___ 3. Type the following values on this display:

<u>For:</u>	<u>Type:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCPRT1	This device description was recorded on form C7.
<i>Device class</i>	*LCL	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	4224	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

- ___ 4. Press the *Send* key.
Additional prompts appear on the display.
- ___ 5. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Emulated twinaxial device</i>	5224	This emulated twinaxial device was recorded on form C7.
<i>Port number</i>	1	This port number was recorded on form C7.
<i>Auxiliary printer</i>	*No	This auxiliary printer was recorded on form C7.
<i>Emulating ASCII device</i>	*No	Specifies that the device being configured is one of the supported ASCII device types for the Device type prompt, and that the device-specific restrictions for physical attachment, line speed, word length, type of parity, and stop bits are to be enforced.
<i>Physical attachment</i>	*Direct	This value was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.

___ 6. Press the *Send* key.

More prompts appear.

___ 7. On this display, type the following value:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Line Speed</i>	19200	This line speed was recorded on form C7.

___ 8. Page down to the next display.

Additional prompts appear.

___ 9. Type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Word length</i>	8	This word length was recorded on form C7.
<i>Type of parity</i>	*Even	This parity was recorded on form C7.
<i>Stop bits</i>	1	This stop bit was recorded on form C7.

___ 10. Page down to the next display.

An additional prompt is displayed.

___ 11. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Text 'description'</i>	System printer, telephone xxx-xxxx	Describe who uses the work station and their telephone number.

___ 12. Press the *Send* key to save your choices.

You have now completed configuring this 4224 Printer as the system printer.

The 3101 Display Station

- ___ 1. The values used to configure the 3101 display station were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the completed example form on page 8-11.)
- ___ 2. On any command line type the following Create Device display command:
CRTDEV DSP
and press F4 (Prompt).
The Create Device Description display appears on the console.

- ___ 3. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCDSP2	This device description was recorded on form C7.
<i>Device class</i>	*LCL	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	3101	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

- ___ 4. Press the *Send* key.

Additional prompts appear on the Create Device Description display.

- ___ 5. Type the following values on this display:

<u>For:</u>	<u>Type:</u>	<u>Explanation:</u>
<i>Port Number</i>	2	This port number was recorded on form C7.
<i>Emulating ASCII device</i>	*NO	Specifies that the device being configured is one of the supported ASCII device types for the Device type prompt, and that the device-specific restrictions for physical attachment, line speed, word length, type of parity, and stop bits are to be enforced.
<i>Physical attachment</i>	*Direct	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This value was recorded on the top of form C7.
<i>Keyboard language type</i>	*sysval	Instructs the system to use the QKBDTYPE system value.
<i>Line Speed</i>	9600	This line speed was recorded on form C7.

<u>For:</u>	<u>Type:</u>	<u>Explanation:</u>
<i>Word Length</i>	7	This word length was recorded on form C7.
<i>Type of parity</i>	*Even	This parity was recorded on form C7. This parameter provides a method for both the AS/400 system and the work station to check the data to make sure that what is received is correct.
<i>Stop bits</i>	1	This stop bit was recorded on form C7. This tells the AS/400 system that the terminal will only place one bit called a stop bit after the 7 data bits.

___ 6. Page down to the next display.

Additional prompts are displayed.

___ 7. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Text 'description'</i>	Programmer1, telephone xxx- xxxx	Describe who uses the work station and their telephone number.

___ 8. Press the *Send* key on the keyboard and the work station will be added to your device descriptions.

You have completed configuring the 3101 display station.

The 5204 Printer

The values used to configure the 5204 printer were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the information on page 8-11.)

___ 1. On any command line, type the following Create Device Description (Printer) command:

CRTDEVPRT

and press F4 (Prompt).

The Create Device Description display appears.

___ 2. On this display type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCPRT3	This device description was recorded on form C7.
<i>Device class</i>	*IcI	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	5204	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

___ 3. Press the *Send* key.

Additional prompts appear on the display.

___ 4. Type the following values on the display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Emulated twinaxial device</i>	5219	This emulated twinaxial device was recorded on form C7.
<i>Port number</i>	3	This port number was recorded on form C7.
<i>Auxiliary printer</i>	*No	This auxiliary printer was recorded on the top of form C7.
<i>Physical Attachment</i>	*DIRECT	This value was recorded on form C7.
<i>Attached controller</i>	CTL01	

___ 5. Press the *Send* key.

Additional prompts appear on the display.

___ 6. Type the following value on the display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Font identifier</i>	11	

___ 7. Page down to the next display.

Additional prompts are displayed.

___ 8. Release all the keys.

Additional prompts appear on the display.

___ 9. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Type of parity</i>	*Even	This parity was recorded on form C7.
<i>Line Speed</i>	19200	This line speed was recorded on form C7.
<i>Word Length</i>	8	This word length was recorded on form C7.
<i>Stop bits</i>	1	This stop bit was recorded on form C7.
<i>Text 'description'</i>	Programming, telephone xxx- xxxx	Describe who uses the work station and their telephone number.

- ___ 10. Press the *Send* key to save your choices. You have now completed configuring the 5204 Printer.

The 3164 Display Station

- ___ 1. The values used to configure the 3164 display station were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the completed example form on page 8-11.)
- ___ 2. On any command line, type the Create Device Display command:
CRTDEV DSP
and press F4 (Prompt).
The Create Device Description display appears on the console.
- ___ 3. Type the following values on the display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASC DSP4	This device description was recorded on form C7.
<i>Device class</i>	*lcl	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	3164	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

- ___ 4. Press the *Send* key.
Additional prompts appear on the Create Device Description display.
- ___ 5. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Port Number</i>	4	This port number was recorded on form C7.
<i>Emulating ASCII device</i>	*NO	Specifies that the device being configured is one of the supported ASCII device types for the Device type prompt, and that the device-specific restrictions for physical attachment, line speed, word length, type of parity, and stop bits are to be enforced.
<i>Physical attachment</i>	*Direct	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.
<i>Keyboard language type</i>	*sysval	Instructs the system to use the QKBDTYPE system value.
<i>Line Speed</i>	9600	This line speed was recorded on form C7.
<i>Word Length</i>	8	This word length was recorded on form C7.
<i>Parity</i>	*Even	This parity was recorded on form C7.
<i>Stop Bits</i>	1	This stop bit was recorded on form C7.

- ___ 6. Page down to the next display.
Additional prompts are displayed.
- ___ 7. On this display, type the following value:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Text 'description'</i>	Programmer 2, telephone xxx- xxxx	

- ___ 8. Press the *Send* key to save your choices. You have completed configuring the 3164 display station.

Configuring Work Stations Located in the Office Area

Follow these instructions to configure the work stations located in the local office area.

The Personal System/2 Work Station Running Client Access/400

For information on how to configure Client Access/400 asynchronous communications, see the *Client Access/400 for DOS Ext Memory Setup* book. Use the values on form C7 to fill in the prompts.

The 3163 Display

- ___ 1. The values used to configure the 3163 display station were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the information on page 8-12.) On any command line, type the following Create Device Description command:

CRTDEV DSP

and press F4.

The Create Device Description display appears.

___ 2. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCDSP6	This device description was recorded on form C7.
<i>Device class</i>	*lcl	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	3163	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

___ 3. Press the *Send* key.

Additional prompts appear.

___ 4. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Port Number</i>	6	This port number was recorded on form C7.
<i>Physical attachment</i>	*EIA422	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.
<i>Keyboard language type</i>	*sysval	Instructs the system to use the QKBDTYPE system value.
<i>Line Speed</i>	19200	This line speed was recorded on form C7.
<i>Word Length</i>	8	This word length was recorded on form C7.
<i>Type of Parity</i>	*Even	This parity was recorded on form C7.
<i>Stop bits</i>	1	This stop bit was recorded on form C7.

___ 5. Page down to the next display.

Additional prompts are displayed.

___ 6. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Text 'description'</i>	Shipping, xxx-xxxx	Describe who uses the work station and their telephone number.

___ 7. Press the *Send* key to save your choices.

You have completed configuring the 3163 display station.

The 4207 Printer Attached to the 3163 Display Station

On any command line, type the following Create Device Description command:

CRTDEVPRT

and press F4.

The Create Device Description (printer) display appears.

- ___ 1. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCPRT6	This device description was recorded on form C7.
<i>Device class</i>	*Icl	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	4207	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

- ___ 2. Press the *Send* key.

Additional prompts appear.

- ___ 3. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Emulated twinaxial device</i>	5219	
<i>Port number</i>	6	This port number was recorded on form C7.
<i>Auxiliary printer</i>	*Yes	This prompt asks if this work station is an auxiliary printer for a display station. The 4207 is connected to the 3163 display station, not to the AS/400 or to a modem, so it is an auxiliary printer.
<i>Emulating ASCII device</i>	*No	This Emulating ASCII device was recorded on form C7.
<i>Physical attachment</i>	*EIA422	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.
<i>Line Speed</i>	19200	This line speed was recorded on form C7.

- ___ 4. Press the *Send* key.

Additional prompts appear.

- ___ 5. Press the *Send* key.

Additional prompts appear.

- ___ 6. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Word length</i>	8	This word length was recorded on form C7.
<i>Type of Parity</i>	*Even	This parity was recorded on form C7.
<i>Stop bits</i>	1	This stop bit was recorded on form C7.

___ 7. Press the *Send* key.

Additional prompts appear.

___ 8. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Transform enabled</i>	*YES	The printer uses the host print transform function.
<i>Manufacturer type and model</i>	*IBM42071	The printer is an IBM 4207-1 Model X24 Proprinter.
<i>Paper source 1</i>	*MFRTPMDL	The default paper source 1 for an IBM 4207-1 printer is used.
<i>Paper source 2</i>	*MFRTPMDL	The default paper source 2 for an IBM 4207-1 printer is used.
<i>Envelope source</i>	*MFRTPMDL	The default envelope source for an IBM 4207-1 printer is used.
<i>ASCII code page 899 support</i>	*NO	ASCII code page 899 support is not used.
<i>Text 'description'</i>	Shipping Printer, telephone xxx-xxxx	Describe who uses the work station and their telephone number.

___ 9. Press the *Send* key to save your choices.

You have now completed configuring the 4207 printer attached to the 3163 display station.

The 4224 Printer

The following instructions explain how to configure the 4224 printer that is located in the office area. This printer is attached directly to the ASCII Work Station Controller with an EIA-422 cable. The instructions on page 11-3 explain how to configure a 4224 printer attached with an EIA-232 Direct cable.

___ 1. The values used to configure the 4224 printer were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the completed example form on page 8-12.)

___ 2. On any command line, type the following Create Device Description command:

CRTDEVPRT

and press F4.

The Create Device Description (printer) display appears.

___ 3. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCPRT7	This device description was recorded on form C7.
<i>Device class</i>	*lcl	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	4224	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

___ 4. Press the *Send* key.

Additional prompts (parameters) appear on the display.

___ 5. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Emulated twinaxial device</i>	5224	This emulated twinaxial device was recorded on form C7.
<i>Port number</i>	7	This port number was recorded on form C7.
<i>Auxiliary printer</i>	*No	This auxiliary printer was recorded on form C7.
<i>Emulating ASCII device</i>	*No	Specifies that the device being configured is one of the supported ASCII device types for the Device type prompt, and that the device-specific restrictions for physical attachment, line speed, word length, type of parity, and stop bits are to be enforced.
<i>Physical attachment</i>	*EIA422	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.

___ 6. Press the *Send* key.

Additional prompts appear.

___ 7. On this display type the following value:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Line Speed</i>	19200	This line speed was recorded on form C7.

___ 8. Page down to the next display.

Additional prompts appear.

___ 9. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Word length</i>	8	This word length was recorded on form C7.
<i>Type of Parity</i>	*EVEN	This parity was recorded on form C7.
<i>Stop bits</i>	1	This stop bit was recorded on form C7.
<i>Text 'description'</i>	Accounting and shipping, telephone xxx-xxxx	Describe who uses the work station and their telephone number.

___ 10. Press the *Send* key to save your choices.

You have now completed configuring the 4224 printer.

Configuring Work Stations Located in the Remote Office Area

Follow these instructions to configure the work stations located in the remote office area.

The Personal/System 2 Using ASCII Emulation

___ 1. The values used to configure the PS/2 Work Station Using ASCII Emulation were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the completed example form on page 8-17.)

___ 2. On any command line, type the following Create Device Description command:

CRTDEV DSP

and press F4 (Prompt).

___ 3. Select the following values on the display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCDSP9	This device description was recorded on form C7.
<i>Device class</i>	*lcl	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	3161	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

___ 4. Press the Enter key.

Additional prompts appear on the Create Device Description display.

___ 5. Select the following values on the display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Port Number</i>	9	This port number was recorded on form C7.
<i>Emulating ASCII device</i>	*YES	Specifies that the device being configured emulates an ASCII device.
<i>Physical attachment</i>	*Modem	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.
<i>Line Speed</i>	2400	This line speed was recorded on form C7.
<i>Word Length</i>	7	This word length was recorded on form C7.

Note: These values were copied from the part of form C7 that was filled out for the PS/2 work station in the remote office. (Refer to the completed example form on page 8-17).

- ___ 6. Page down to the next display.

Additional prompts are displayed.

- ___ 7. Type in the following values on the display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Type of Parity</i>	*Even	This parity was recorded on form C7.
<i>Stop bits</i>	1	This stop bit was recorded on form C7.
<i>Text 'description'</i>	Secretary, telephone xxx-xxxx	Describe who uses the work station and their telephone number.

- ___ 8. Press the *Send* key and the work station will be added to your device descriptions.

You have completed configuring the Personal/System2 in the office area.

The 3151 Display Station (Port Sharing)

- ___ 1. The values used to configure the 3151 display station were copied from form C7, part 2, that you filled out in Chapter 8, "Completing Forms." (Refer to the completed example form on page 8-17.)

Since *CALC was chosen for the device type, line speed, word length, and parity, other devices may share this port. They must have been set up and connected when the 3151 was connected. Although two columns were filled out on form C7 for port 8, only one device description needs to be created.

- ___ 2. On any command line type the following Create Device Description command:

```
CRTDEV DSP
```

and press F4 (Prompt).

The Create Device Description (display) appears on the console.

- ___ 3. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCDSP8	This device description was recorded on form C7.
<i>Device class</i>	*lcl	Specify here whether you connected to a local or remote controller (not work station). The ASCII Work Station Controller is a local controller.
<i>Device type</i>	*CALC	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

___ 4. Press the *Send* key.

Additional prompts appear.

___ 5. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Emulated Twinaxial Device</i>	*TYPE	This emulation was recorded on form C7.
<i>Port Number</i>	8	This port number was recorded on form C7.
<i>Physical attachment</i>	*modem	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.
<i>Keyboard language type</i>	*sysval	Instructs the system to use the QKBDTYPE system value.
<i>Line Speed</i>	*CALC	This line speed was recorded on form C7.
<i>Word Length</i>	*CALC	This word length was recorded on form C7.
<i>Type of Parity</i>	*CALC	This type of parity was recorded on form C7.
<i>Stop Bits</i>	1	This stop bit was recorded on form C7.

___ 6. Page down to the next display.

Additional options are displayed.

___ 7. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Text 'description'</i>	Salesperson, telephone xxx- xxxx	Describe the type of person who uses the work station and that person's telephone number.

___ 8. Press the *Send* key to save your choices.

You have completed configuring the 3151 display station.

The 4202 Printer Attached to the 3151 Display Station

- ___ 1. The values used to configure the 4202 printer attached to the 3151 display station were copied from form C7, part 1, that was filled out in Chapter 8, "Completing Forms." (Refer to the completed example form on page 8-17.) On any command line, type the following Create Device Description command:

CRTDEVPRT

and press F4.

The Create Device Description (printer) display appears.

- ___ 2. Type the following values on this display:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Device description</i>	ASCPRT8	This device description was recorded on form C7.
<i>Device class</i>	*Icl	The ASCII Work Station Controller is considered to be a local controller even when the work station is connected with a modem.
<i>Device type</i>	4202	This device type was recorded on form C7.
<i>Device model</i>	*ASCII	This device model was recorded on form C7.

- ___ 3. Press the *Send* key.

Additional prompts appear.

- ___ 4. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Emulated twinaxial device</i>	5224	This emulated twinaxial device was recorded on form C7.
<i>Port number</i>	8	This port number was recorded on form C7.
<i>Auxiliary printer</i>	*Yes	This prompt is asking if this work station is an auxiliary printer of a display station. The 4202 is directly connected to the 3151 display station, not to the AS/400 or to a modem. Therefore it is an auxiliary printer.
<i>Emulating ASCII device</i>	*No	Specifies that the device being configured is one of the supported ASCII device types for the Device type prompt, and that the device-specific restrictions for physical attachment, line speed, word length, type of parity, and stop bits are to be enforced.
<i>Physical attachment</i>	*Modem	This physical attachment was recorded on form C7.
<i>Attached controller</i>	CTL01	This attached controller was recorded on the top of form C7.

- ___ 5. Press the *Send* key.

Additional prompts appear.

___ 6. On this display, type the following value:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Line Speed</i>	2400	This line speed was recorded on form C7.

___ 7. Page down to the next display.

Different options appear.

___ 8. On this display, type the following values:

<u>For:</u>	<u>Select:</u>	<u>Explanation:</u>
<i>Word length</i>	8	This word length was recorded on form C7.
<i>Type of Parity</i>	*NONE	This parity was recorded on form C7.
<i>Stop bits</i>	1	This stop bit was recorded on form C7.
<i>Text 'description'</i>	Sales printer, telephone xxx- xxxx	Describe who uses the work station and their telephone number.

___ 9. Press the *Send* key.

You have now completed configuring the 4202 printer. Go to Chapter 12, "Verifying That the Network Is Working."

Chapter 12. Verifying That the Network Is Working

What follows next are step-by-step directions on how to verify that all of the devices are connected to the AS/400 system and that the system can communicate with the work stations.

Start Up the System

Perform the following steps:

1. Ensure that the power is turned on for all work stations (display stations and printers) and modems.
2. Start up the system if this has not already been done. Refer to "Starting Up the System" on page 11-2.

Vary on the work stations

- ___ 1. Go to the console and sign on to the system.
- ___ 2. On the command line of the AS/400 Main Menu, type:
WRKCFGSTS *DEV
Press the *Send* key.
- ___ 3. The Work with Configuration Status display appears. Look for the device names of your work stations on the list.

Notes:

- a. The device names do not necessarily appear in this order.
- b. Many work stations other than your own may be listed.
- c. DSP01 is the console.

To find your devices you might need to page ahead. To page ahead do the following:

- a. Press and release the *ESC* key.
- b. Press the *CTRL* key. While keeping the *CTRL* key pressed, press the letter "U" key.

To page back do the following:

- a. Press and release the *ESC* key.
- b. Press the *CTRL* key. While keeping the *CTRL* key pressed, press the letter "D" key.

- ___ 4. Vary on the work stations by typing a 1 in the Opt column next to the device names of all the work stations you want to vary on. You can type a 1 next to more than one device name on this display.
- ___ 5. Press the *Send* key.
- ___ 6. Press F5 (Refresh). You might need to press F5 more than once before the status of the work stations changes.

Look at the status column and compare the status of each work station with the following table:

Work station	Status	Result
Display stations attached through modems	The status should be <i>VARY ON PENDING</i>	A sign-on display <i>does not</i> actually appear on the display.
Display stations attached through modems	The status should be <i>SIGN-ON DISPLAY</i>	A sign-on display <i>does</i> actually appear on the display.
Printers attached through modems	The status should be <i>VARIED ON</i>	
Local printers	The status should be <i>VARIED ON</i>	
DSP01 (Console)	The status should be <i>ACTIVE</i>	

If the status for a work station does not match what is listed in the preceding table, find the status that does appear in the following table. Next to the status is the action you need to take.

Status	Action You Should Take
VARIED ON	___ 1. Refresh the display by pressing F5 on the console.
PENDING	___ 2. Check that the work station power is turned on.
	___ 3. Check the cable attaching the work station to see if it is loose or damaged. <ul style="list-style-type: none"> • If it is damaged, call for technical assistance. • If it is loose, push it in and ensure that it is secure. <p>In this example, the person to call is the system administrator at Best Dressed. If no one else could assist, a service representative would have been called.</p>
	___ 4. Go through the problem analysis checklist in Chapter 13, "Finding and Correcting Problems."
	___ 5. Call for technical assistance.

Status	Action You Should Take
VARIED OFF	<ul style="list-style-type: none"> ___ 1. Try to vary on the device by performing the following steps: <ul style="list-style-type: none"> a. Type a 1 next to the device name b. Press the <i>Send</i> key. ___ 2. Look for messages for that work station's device name. ___ 3. Use online help to try to resolve the problem. ___ 4. Call for technical assistance.
FAILED	<ul style="list-style-type: none"> ___ 1. On the command line, type: <pre>DSPMSG QSYSOPR</pre> <p>Messages appear on the display.</p> ___ 2. Look for the work station's device name. ___ 3. Use online help and try to resolve the problem. ___ 4. If you cannot resolve the problem, call for technical assistance.

Starting Dial/3X Support for the PS/2 Work Station Running ASCII Emulation

- ___ 1. Ensure that the PS/2 work station is plugged in and the power is turned on.

A DOS prompt appears, which is similar to this:

```
C: />
```

- ___ 2. At this prompt, type (in upper or lowercase):

```
3X
```

and then press the Enter key.

The Dial/3X main menu appears.

```

F1-Help      Dial/3X Async 5250 Emulation Operator Support  Dec 04,1989
              Main Menu                                     09:59:00 pm

=====Select an Option=====
"
" "====="
" "Direct"Terminal Printer Macro Screens Applications Config Info HangUp Quit"
" "====="
"          Select Connection ID to Dial and connect to Host system
"
"
"          Use Space Bar or Arrow Keys to Change Selection (and Description)
"          To Execute Selection, Press ___| or Key First Character of Choice
"
=====
"=====Communications Status=====
"          No Active Connection
"
=====
"=====Print Status=====
"LPT1: Printer is on and Ready      Buffer Size=4000  Print Data=0
"=====

```

- ___ 3. Press the Enter key.

The Select Connection display appears.

```
F1-Help      Dial/3X Dial and Connect Screen      Dec 04,1989
              Select Connection              10:00:32 pm

=====
      Key Connection ID: 1  --or--  Move Selection Bar --then-- Press Enter  "
Connection Description      Phone Number or other Info      Profile      "
  1 First Connection          xxxxx                          AS400        "
=====

-----End of Defined Connections-----

===== Dialing Defaults =====
" Dial Method: Dial with a Touch Tone Phone      "
" Profile Drive: C:/DIAL3X                        "
=====

=====
"ESC: Return, no dial          PgUp: Previous  PgDn: More "
"F2: Speed/Parity      F8: Change Profile Drive  F9: Change Dial Method"
=====
```

- ___ 4. Press the Enter key.

You have completed starting Dial/3X Support for the PS/2 work station running ASCII emulation.

Call up the AS/400 system from the 3151 display station

- ___ 1. In the remote office, perform the following steps:
- ___ a. On the 3151 display station keyboard, type (in uppercase):
ATDT xxxxxxx
Where xxxxxxx is the telephone number for the modem that is:
 - Physically connected to the ASCII attachment
 - Used to communicate with the 3151 display station(Type the telephone number *without* a hyphen.)
The telephone number can be found on Form C7 (Part 2) corresponding to the modem that is located in the machine room and the 3151 display station (ASCDSP8). (Refer to the completed form on page 8-17).
 - ___ b. Press the *Return* key.
 - ___ c. Press <CR> at least three times to get the system to perform automatic line speed, word length, and parity detection.
A sign-on display appears on the 3151 display station.
- ___ 2. In the machine room (where the system is) perform the following steps:
- ___ a. Go to the console (In the example, the console is a 3161 display station).
 - ___ b. On the console, ensure that you are on the Work with Configuration Status display and then press F5 (Refresh).

The status of each display should now be *SIGN-ON DISPLAY*.

Print the workstation controller description

You can test all printers in the configuration by printing the CTL01 controller description.

In the following steps we test the 4224 (ASCPRT1) in the machine room. You should test all of the printers in your configuration. You can start all of the printers, local and remote, from the console.

- ___ 1. On any command line, type:

WRKHDWRSC *LWS

and press the *Send* key.

The Work with Local Work Station Resources display appears.

- ___ 2. Move the cursor next to CTL01 and press F6.
___ 3. Press F3 to get back to the main menu.
___ 4. Type WRKJOB on the command line.
___ 5. Select option 4 (Work with spooled files). A display appears listing all spooled files.
___ 6. Locate the file named QSYSPRT in the list of spooled files.
This file contains the configuration for CTL01. You might have to page ahead through the list to find the file. To page ahead, do the following:
___ a. Press and release the *ESC* key.
___ b. Press the *Ctrl* key. While keeping the *Ctrl* key pressed, press the letter "U" key.
___ 7. If there is more than one file with the name QSYSPRT, determine which file is the one that you just created by looking at the date and time each of the files was opened.

To look at the date and time the file was opened, press the F11 key.

- ___ 8. On this display, look next to the file you just created. Verify that the name shown in the *Queue* column is the name of the queue that you want to print on. (In this example, the queue name is ASCPRT1).

Note: If the queue name is not identical to the queue that you want to print on, change the queue name by doing the following:

- a. Type 2 in the Opt column next to the file name.
b. Press F4.
c. Type the name of the output queue that you want for the printer (in this example, the name is ASCPRT1) and press the *Send* key.
d. Press F5 to refresh the screen.
___ 9. If the Sts (Status) of the file is HLD (Held), type 6 in the Opt column to the left of the file name and press the *Send* key. (This releases the file.)
The Sts (Status) changes to RDY (Ready).
___ 10. Start the printer writer for the printer and specify the device name of the printer you want to print the configuration list on.

In this example, you type the following command to print on the 4224 printer (named ASCPRT1) in the machine room:

```
STRPRTWTR ASCPRT1 QUSRSYS/ASCPRT1
```

Press the *Send* key. A message will appear indicating the status of the printer writer. Continue with the next step.

- ___ 11. Verify that the status of the printer device description has changed by performing the following steps:
 - ___ a. On any command line, type the Work with Configuration Status command:

```
WRKCFGSTS *DEV ASCPRT1
```
 - ___ b. Then press the *Send* key.

The Work with Configuration Status display appears.
 - ___ c. Look at the status column. The status for the printer that you started is *ACTIVE/WRITER*.
- ___ 12. On the command line, type

```
WRKWTR
```

and then press the *Send* key.

The Work with Printers display appears.
- ___ 13. Check the value under the STS (status) column next to your printer name (in this example, ASCPRT1).
 - ___ a. If the value in this column is Ready for Printing, go to step 11.
 - ___ b. If the value under the STS column is Message Waiting, type 7 next to the printer name and press the *Send* key.

Respond to any message on the Display Messages display with a letter "G" (go) and return to the Work with Printers display.
- ___ 14. Press F5 (Refresh) to refresh the display.
- ___ 15. Check the value in the Ready for Printing column.
 - ___ a. If the value is Message Waiting, repeat steps 13 through 14.
 - ___ b. If the value is STR, press F3 (Exit).

The configuration list prints on the printer that you selected (in this case, the 4224 printer in the machine room).

You have completed the step-by-step directions, verifying all of the devices that are connected to the AS/400 system and that the system can communicate with the work stations.

Chapter 13. Finding and Correcting Problems

This chapter helps you analyze and resolve some of the more common problems that arise when you are supporting ASCII work stations. The chapter has four sections:

- Specific error codes and steps to take to resolve the errors
- A general problem analysis checklist
- Common problems and steps to resolve the problems
- General information on the operation of the ASCII Work Station Controller and its attached devices

Resolving Specific Errors

The following table shows specific error codes and steps you can take to resolve the errors.

Type of error	Steps to resolve the error
PERM 149 errors in the AS/400 log	<p>This error is reported when the ASCII Work Station Controller receives either an unsolicited or incorrect response from the personal computer running Client Access/400. The two main causes are:</p> <ol style="list-style-type: none">1. The idle timer is not large enough to account for the network delay. You can correct the error by increasing the idle timer from the default of 40 to 100.2. The modems are buffering some responses from the personal computer. Check to ensure your modem is correctly configured. See Appendix C, "Suggested Settings for Modems" for information on correct modem configurations.
PERM 192 and 193 errors in the AS/400 log	<p>The ASCII Work Station Controller is trying to determine either the line communication parameters used, or the attached device type. To correct these errors, check to ensure your modem is correctly configured. See Appendix C, "Suggested Settings for Modems" for information on correct modem configurations.</p>
5119 errors that are reported by the personal computer	<p>The initial attempt to communicate through the modem did not complete. To fix the 5119 errors:</p> <ol style="list-style-type: none">1. Make sure that the configuration parameters match those on the AS/400 system.2. Check to ensure your modem is correctly configured. See Appendix C, "Suggested Settings for Modems" for information on correct modem configurations.3. Make sure that the cable that you have is correct for your configuration. See Chapter 10, "Connecting Cables for Work Stations and Modems" for information on the correct cables to use. <p>Note: If the modems disconnect abruptly during the negotiating period, use a switched automatic-dial response (SWAR) command. (The negotiating period is the time during which the modems communicate with each other in high-pitched tones.) Insert the SWAR command into the config.pcs file on the personal computer. This command allows you to specify a string that must be sent by the modem before starting negotiation.</p>

Problem Analysis Checklist

Follow each of the steps shown in the problem analysis checklist to resolve the most common ASCII work station problems.

- ___ 1. Check device descriptions as shown in Appendix A, "Suggested Settings for ASCII Display Stations."
- ___ 2. Check printer descriptions as shown in Appendix B, "Suggested Settings for ASCII Printers."
- ___ 3. Check modem descriptions as shown in Appendix C, "Suggested Settings for Modems."
- ___ 4. Check cabling as shown in Chapter 10, "Connecting Cables for Work Stations and Modems" for the type and usage. Cross reference with the *Physical Planning Reference* for information on which cables you should use for different work stations and modems.
- ___ 5. Run a wrap test on the port that is giving you problems. See "Running a Wrap Test" on page 13-4 for information on how to run a wrap test.

Resolving Common Problems

The following table shows common problems and steps you can take to resolve the problems.

Type of problem	Steps to resolve the problem
A device disconnects for no apparent reason, leaving no permanent errors in the error log or in the QSYSOPR message queue. Because the device disconnects without errors, the ASCII Work Station Controller assumes an operator is disconnecting the device.	<ol style="list-style-type: none">1. Check to ensure your modem is correctly configured. See Appendix C, "Suggested Settings for Modems" for information on correct modem configurations.2. Check to make sure that you are not accidentally typing the terminal disconnect sequence for your device.
A display station does not recognize keystrokes or does not update the display when expected.	<ol style="list-style-type: none">1. Press the key sequence CTRL/Q. This removes a possible XOFF state caused by accidentally entering CTRL/S.2. On IBM ASCII display stations, verify that the HOLD key has not been accidentally pressed. Press the HOLD key again to toggle this local display function off.
Status lights do not go away when you use the toggle indicator command.	Check to see if the Message Waiting light is on. If the Message Waiting light is on, you must look at the message that is waiting. After you have looked at the message, you can turn the status lights off.
A sign-on screen does not appear for original equipment manufacturer display stations attached using RS-422.	The plus (+) and minus (-) signal orientations on RS-422 attachments conform to the way IBM ASCII devices work for RS-422. Some original equipment manufacturer devices may work with opposite signal orientations. Check the original equipment manufacturer reference manuals for the device to see if the device works with opposite signal orientations. If the device works with opposite signal orientations, use a cable that exchanges plus (+) signals and minus (-) signals for receive and transmit.

Type of problem	Steps to resolve the problem
A flashing 0001 is on the left-hand corner of the display, when using a VT100 emulation package.	<p>A real VT100 runs with a setting of 2 stop bits. The default value for the Stop Bit field on the Create Device Description (CRTDEV DSP) display is 2 when configuring the device. If you are using an emulation package, the following two parameters must be changed on the device description for that port.</p> <ol style="list-style-type: none"> 1. EMULATING ASCII DEV = *YES 2. STOP BITS = 1
Client Access/400 starts, then stops communicating.	<p>Some networks require a higher level of control character transparency (data hiding). If you are running a device configured with a word length of 8, and parity set to *None, change the word length to 7, and the parity to *Even. The word length of 7 and *Even parity allow a higher level of control character transparency.</p>
Display highlighting attributes (such as underscore, reverse image, and column separators) do not appear on the ASCII display as expected.	<p>ASCII display stations do not support the same set of highlighting characteristics as the twinaxial display stations they emulate. For example, none of the AS/400-supported ASCII display stations support a column separator type of highlighting, which is supported on 3196 and 3197 twinaxial display stations. For a complete description of the attribute highlighting supported by ASCII displays attached to the ASCII Work Station Controller, see "Display Attributes" on page 3-3.</p> <p>Some applications depend on a type of highlighting attribute (for example, column separators) that is not supported for a given ASCII display station. You can satisfy this dependency by providing a substitute type of highlighting for the required highlighting.</p> <p>Use the Operating System/400 workstation customizing functions to provide a substitute type of highlighting for the required highlighting attribute. Using the customizing functions, you can retrieve the customizing source for your ASCII display station. You can then change the data in the attribute command (ATRCMD) tag within the retrieved source to change the mapping for the required highlighting attribute. (The ATRCMD tag follows the DSCNTBL tag in the retrieved source.) For more information on the ATRCMD tag and customizing ASCII display stations, see <i>Workstation Customization Programming</i> book.</p>

Understanding ASCII Work Station Controller Operation

The following information allows you to understand some areas of ASCII Work Station Controller operations that may cause problems or be confusing.

Warning: Do not plug or unplug the 12-port box while the system is powered on. You can damage the ASCII Work Station Controller card, or the 12-port box, or both.

How the Work Station Controller Communicates with Devices

ASCII Work Station Controller hardware can function in two different types of environments. The work station controller can be directly attached to devices, or attached by a modem to devices. Most work station controllers operate directly attached to devices.

A work station controller is different than a communications controller. A work station controller is wired as a DCE (data communications equipment). This allows the work station controller to communicate directly (using a straight-through cable) to attached devices. In contrast, a communication controller is wired as a DTE (data transmission exchange), requiring a null-modem cable to communicate to attached devices.

A special cross-over cable is used to attach modems to the work station controller. This cable allows the work station controller to communicate with devices attached to a modem (when the attachment type of *MODEM or *PTT is specified). This cable is **not** a null-modem cable. See the *Physical Planning Reference* for information on which cables you should use for work station controllers to communicate with devices attached to a modem.

Understanding the Protocol Used by Asynchronous Client Access/400

Personal computers running Client Access/400 while attached to the ASCII Work Station Controller use a protocol called SNA-A. This protocol is a form of synchronous data link control (SDLC) made to work on an asynchronous communications line. An asynchronous communications line is sometimes called SDLC/Async.

The SNA-A protocol uses the same type of format as SDLC, with a few minor variations. For example, you can trace a line using an asynchronous monitor. You cannot, however, directly map all of the function SDLC has into what is shown on the trace run from the asynchronous monitor. Different levels of transparency are used, and although frames are detectable, the reading of control fields using SDLC standards may not give you correct results.

Improving Performance when Running Asynchronous Client Access/400

To improve performance when running Client Access/400, configure both the personal computer and the AS/400 system for an 8-bit word length and **no** parity. This improves the overall throughput over using a 7-bit word length with parity.

Running a Wrap Test

To run a wrap test on a specific port:

1. Obtain a wrap plug. For the 9402 Models Cxx-Fxx System Unit, order part 21F1669. For the 9402, 9404, and 9406 System Units, order part 59X3832. Although different system units require different parts, the parts are functionally equivalent.
2. On any command line, type:

```
ANZPRB
```
3. Select option 1 (This AS/400 or attached devices) and press Enter.
4. Select option 3 (Hardware problem) and press Enter.

5. Select option 2 (Not an intermittent problem) and press Enter.
6. Enter the device name (Devname) for the port you are testing.
7. For the Description type, enter:
*DEV
8. Select option 6 (Will not vary on) and press Enter.
9. Select option 2 (Continue analysis) and press Enter.
10. Press Enter. Continue the analysis until you see a display that tells you to attach the wrap plug to the port you want to test.
11. Follow the instructions shown on the display to run the test.

Note: The display includes instructions to follow if the test fails. Be prepared to follow these instructions if your test fails.

Using Compression Capabilities of 9600 Baud Modems

When using 9600 baud modems that have compression capabilities, configure the AS/400 system and its modem, along with the work station and its modem, to communicate with each other at 19200 or 38400 baud. By sending and receiving data through both modems at 19200 or 38400 baud, the modems can utilize their compression capabilities. This allows them to achieve a higher throughput than is possible with straight 9600 baud communication.

Note: When configuring 9600 baud modems to run at 19200 or 38400 baud, set hardware flow control active on the modems. Otherwise, you may see devices dropping off intermittently, especially during system requests and when files are being uploaded.

Resolving Printer Problems

Some devices may not work without all signals being present. For example, some IBM printers require the signal line Data Set Ready (DSR) to be active. Typical 4-wire cables do not have this signal line available. Since the workstation controller always sends all signals, you can configure for a 3-wire or 4-wire attachment and use direct connect cable.

Part 3 – Appendixes

Appendix A. Suggested Settings for ASCII Display Stations

This appendix provides suggested settings for the ASCII display stations supported by the AS/400 system. For *each* supported display station, the following are provided:

- Suggested settings to adjust the display station
- Parameter values to be used during configuration on the AS/400 system for the display station

Although the suggested line speed is 19200 bps for all the display stations other than the IBM 3101, users having additional performance requirements may select a line speed of 38400 bps on devices that support this line speed. This applies to all the display stations directly attached to the AS/400 system. If your display station is attached to the system through modems, see the modem and display station user's guides shipped with your devices for specific recommendations.

The suggested settings need not be used, but the following display station settings must match the corresponding configuration values:

- Line speed
- Parity
- Word length
- Stop bits
- Attachment

The method of adjusting settings varies by the type of display station. Follow the instructions in the book shipped with the ASCII display station.

IBM 3101 (Model 23) Display Station

Following are suggested settings, by switch number, to adjust the IBM 3101-23 display station.

Note: The switch banks are from left to right on the keyboard.

S1

Switch	Function	Setting
1	Block or character mode	Down — Character
2	Communications mode	Down — Full duplex
3	RS-232-C and RS-422-A	Up — RS-232-C
4	PRTs/CRTs	Up — Permanent
5	Reverse channel	Down — Ignored with PRTs
6	Turnaround characters	Down — ETX
7	Turnaround characters	Down — ETX
8	Dual/Mono	Up — Dual

S2

Switch	Function	Setting
1	Stop bits	Up — 1 stop bit
2	Parity	Up — Even
3	Parity	Up — Even
4	Only for block mode	Not used
5	Reserved	Not used
6	X.25 only	Not used
7	Number of fill characters	Down — 0
8	Number of fill characters	Down — 0

S3

Switch	Function	Setting
1	Auto new line	Down — Do not advance cursor
2	Auto line feed	Down — No new line on CR
3	Chars produced with new line key	Up — CR
4	Scroll/No scroll	Down — No scroll
5	Reserved	Not used
6	Reserved	Not used
7	Reverse video	Down — green chars on dark background
8	Cursor	Down — Steady

S4

Switch	Function	Setting	Baud Rate
1	Baud rate main	Up	9600
2	Baud rate main	Down	9600
3	Baud rate main	Down	9600
4	Baud rate main	Up	9600
5	Baud rate aux	Up	9600
6	Baud rate aux	Down	9600
7	Baud rate aux	Down	9600
8	Baud rate aux	Up	9600

Figure A-1 on page A-3 provides the suggested parameter values for the IBM 3101-23 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-1. Suggested Configuration Parameters for the IBM 3101 Model 23

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	9600
Parity	Even
Word Length (bits)	7
Stop Bits	1

IBM 3151 Display Station

Following are suggested settings to adjust the IBM 3151 display station.

General Setup

Machine Mode	3151	Forcing Insert	Off
Screen	Normal	Tab	Field
Row and Column	24 X 80		
Scroll	Jump		
Auto LF	Off		
CRT Saver	Off		
Line Wrap	Off		
Operating Mode	Echo	Interface ¹	RS-232-C
Line Speed (bps)	19200	Line Control	IPRTS
Word Length (bits)	8	Break Signal (ms)	500
Parity	Even	Send Null Suppress	On
Stop Bit	1	Pacing ¹	On
Turnaround Character	ETX		

¹ Some models may not have this parameter.

Keyboard/Printer Setup

Keyboard	Setting	Printer	Setting
Enter	Send	Line Speed	19200
Return	New Line	Word Length (bits)	8
New Line	CR	Parity	Even
Send	Page	Stop Bit	1
Insert Character	Space	Characters	ALL

Figure A-2 provides the suggested parameter values for the IBM 3151 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See "System Configuration

Considerations” on page 2-16 for the display station attached through modems.

Figure A-2. Suggested Configuration Parameters for the IBM 3151

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

IBM 3161 Display Station

Following are suggested settings to adjust the IBM 3161 display station.

Setup Menu

Machine Mode	3161		
Operating Mode	ECHO		
		<u>Main Port</u>	<u>Auxiliary Port</u>
Interface	RS-232-C		
Line Control	IPRTS		
Line Speed (bps)	19200		19200
Parity	Even		Even
Turnaround Character	ETX		
Stop Bit	1		1
Word Length (bits)	8		8
Response Delay (ms)	100		
Break Signal (ms)	500		

Select Menu

ENTER=SEND	RETURN=NEW LINE	NEW LINE=CR	TAB=FIELD	LINE WRAP=OFF	
AUTO LF=OFF	SEND=PAGE	SEND NULL=OFF	INSERT=SPACE	TRACE=ALL	CRT SAVER=NO
SCROLL=OFF	PRINT=VIEWPORT	PRINT NULL=OFF	PRINT EOL=OFF	LINE END=CR-LF	

Figure A-3 provides suggested parameter values for the IBM 3161 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-3. Suggested Configuration Parameters for the IBM 3161

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

IBM 3162 Display Station

Following are suggested settings to adjust the IBM 3162 display station.

General Setup

Machine Mode	3162	CRT Saver	Off
Screen	Normal	Line Wrap	Off
Row & Column	24 x 80	Tab Field	Field
Scroll	Jump	Term ID	
Auto LF	Off		
Forcing Insert	Off		

Communication Setup

Operating Mode	Echo	Interface	RS-232C
Line Speed (bps)	19200	Line Control	IPRTS
Word Length (bps)	8	Break Signal (ms)	500
Parity	Even	Send Null Suppress	On
Stop Bits	1		
Turnaround Character	ETX		

Keyboard/Printer Setup

Keyboard	Setting	Printer	Setting
Enter	Send	Line Speed (bps)	19200
Return	New Line	Word Length (bits)	8
New Line	CR	Parity	Even
Send	Page	Stop	1
Insert Character	Space	Characters	All

Figure A-4 provides suggested parameter values for the IBM 3162 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-4. Suggested Configuration Parameters for the IBM 3162 (80-Column Mode)

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

IBM 3163 Display Station

Following are suggested settings to adjust the IBM 3163 display station.

Setup Menu

Machine Mode	3163	
Operating Mode	ECHO	
	<u>Main Port</u>	<u>Auxiliary Port</u>
Interface	RS-232C	
Line Control	IPRTS	
Line Speed (bps)	19200	19200
Parity	Even	Even
Turnaround Character	ETX	
Stop Bit	1	1
Word Length (bits)	8	8
Response Delay (ms)	100	
Break Signal (ms)	500	

Select Menu

ENTER=SEND	RETURN=NEW LINE	NEW LINE=CR	TAB=FIELD	LINE WRAP=OFF	
AUTO LF=OFF	SEND=PAGE	SEND NULL=OFF	INSERT=SPACE	TRACE=ALL	CRT SAVER=NO
SCROLL=OFF	PRINT=VIEWPORT	PRINT NULL= OFF	PRINT EOL=OFF	LINE END=CR-LF	

Figure A-5 provides suggested parameter values for the IBM 3163 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See "System Configuration Considerations" on page 2-16 for the display station attached through modems.

Figure A-5. Suggested Configuration Parameters for the IBM 3163

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

IBM 3164 (Color) Display Station

Following are suggested settings to adjust the IBM 3164 display station.

Setup Menu

Machine Mode	3164	
Operating Mode	ECHO	
	<u>Main Port</u>	<u>Auxiliary Port</u>
Interface	RS-232C	
Line Control	IPRTS	
Line Speed (bps)	19200	19200
Parity	Even	Even
Turnaround Character	ETX	
Stop Bit	1	1
Word Length (bits)	8	8
Response Delay (ms)	100	
Break Signal (ms)	500	

Select Menu

ENTER=SEND	RETURN=NEW LINE	NEW LINE=CR	TAB=FIELD	LINE WRAP=OFF	
AUTO LF=OFF	SEND=PAGE	SEND NULL=OFF	INSERT=SPACE	TRACE=ALL	CRT SAVER=NO
SCROLL=OFF	PRINT=VIEWPORT	PRINT NULL=OFF	PRINT EOL=OFF	LINE END=CR-LF	

Figure A-6 provides suggested parameter values for the IBM 3164 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See "System Configuration Considerations" on page 2-16 for the display station attached through modems.

Figure A-6. Suggested Configuration Parameters for the IBM 3164 (Color)

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

DEC VT 100 (101 Level) Display Station

Following are suggested settings to adjust the DEC VT 100 (101 LEVEL) display station.

Display Setup

Switch	Setting	Function
1	0101 =	Jump scroll, auto repeat On, dark background, block cursor
2	0011 =	Margin bell Off, keyclick Off, ANSI, Auto XON/XOFF On
3	0000 =	Shifted #, wraparound Off, newline Off, interlace Off
4	1110 =	Parity even, parity On, 8 bit characters, power 60 Hz T Speed 19200 R Speed 19200

Figure A-7 provides suggested parameter values for the device configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-7. Suggested Configuration Parameters for the DEC VT 100 (101 Level)

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	2

DEC VT 220 Display Station

Following are suggested settings to adjust the DEC VT 220 display station.

Display Setup

- 80 columns
- Interpret controls
- No auto wrap
- Jump scroll
- Light text/dark screen
- Block style cursor

General Setup

- VT 220 mode
- 7-bit controls
- User defined keys locked
- User features locked
- Multinational
- Application keypad
- Normal cursor keys
- No new line

Communications Setup

- Transmit=19200
- Receive=Transmit
- XOFF at 128
- 8 bits/Even parity
- 1 stop bit
- No local echo
- EIA Port, data leads only
- Disconnect
- 2 s delay
- Limited transmit

Keyboard Setup

- Typewriter keys
- Caps lock
- Auto repeat
- Keyclick
- No margin bell
- Warning bell
- No break
- No auto answerback

Figure A-8 provides suggested parameter values for the DEC VT 220 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-8. Suggested Configuration Parameters for the DEC VT 220

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

TeleVideo 910 Display Station

The following tables provide suggested settings, by switch number, to adjust the TeleVideo 910 display station.

S1

Switch	Function	Setting
1	Baud rate	Up 19200
2	Baud rate	Up 19200
3	Baud rate	Up 19200
4	Baud rate	Up 19200
5	8 bit word	Down
6	Parity	Up
7	Even parity	Up
8	1 stop bit	Down
9	Auto wraparound	Down – No Wrap
10	CR performs CR only	Down

S2

Switch	Function	Setting
1	Emulation	Down – TV 910
2	Emulation	Down – TV 910
3	60 Hz	Down
4	Cursor	User selectable
5	Cursor	User selectable
6	Communications mode	Up – Full duplex
7	Screen characteristics	Up – Green on black
8	Data set ready	Down – Connected
9	Data carrier detect	Up – Disconnected
10	Data terminal ready	Down – On

Figure A-9 on page A-12 provides suggested parameter values for the TeleVideo 910 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-9. Suggested Configuration Parameters for the TeleVideo 910

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

TeleVideo 925 Display Station

The following tables provide suggested settings, by switch number, to adjust the TeleVideo 925 display station.

S1

Switch	Function	Setting
1	Baud rate main RS-232-C	Up 19200
2	Baud rate main RS-232-C	Up 19200
3	Baud rate main RS-232-C	Up 19200
4	Baud rate main RS-232-C	Up 19200
5	8 bit word	Down
6	1 stop bit	Down
7	Baud rate printer	Up 19200
8	Baud rate printer	Up 19200
9	Baud rate printer	Up 19200
10	Baud rate printer	Up 19200

S2

Switch	Function	Setting
1	Duplex edit	Down
2	925 emulation	Down
3	Parity	Down – Even parity
4	Parity	Up – Even parity
5	Parity	Up – Even parity
6	Screen characteristics	Up – White on black
7	Full duplex	Up
8	Full duplex	Down
9	60 Hz	Up
10	CR only	Down

Figure A-10 provides suggested parameter values for the TeleVideo 925 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-10. Suggested Parameters for the TeleVideo 925

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

TeleVideo 955 Display Station

Following are suggested settings to adjust the TeleVideo 955 display station.

Main Port 1

BAUD: 19.2 WORD: 8 PRTY: Even STOP: 1 COMM: FDX HAND: XON

Main Port 2

BSIZ: 128 XDLY: No XCTR: Off COMP: 955 DATA: 8 IMDM: Off

Screen Form

COLM: 80 SCRL: Jump TOP: No BOTM: No WRAP: Off TOB: No

Screen Attributes

BACK: Dark CURS: BBLK ATTR: Space BASE: Page NORM: Full STAT: Norm

Keyboard 1

CHAR: U.S. KLIK: Off CR: CR DOWN: ^V EDTK: Dupe REPT: On

Keyboard 2

MBEL: Off TEST: Off BRK: Dis CLR: Enbl ESC: Enbl Hz: 60

Function Key

SAVE: On FSET: 1

Figure A-11 provides suggested parameter values for the TeleVideo 955 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-11. Suggested Configuration Parameters for the TeleVideo 955

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

Wyse WY30 Display Station

Following are suggested settings to adjust the Wyse WY30 display station.

Setup 1

HANDSHAKE=XON/XOFF	SCREEN=Dark	CURSOR=Block	BLINK=On	MODE=FDX
--------------------	-------------	--------------	----------	----------

Setup 2

DATA BITS=8	STOP BITS=1	PARITY=Even	BAUD RATE=19200
-------------	-------------	-------------	-----------------

Setup 3

BLK END=US/CR	AUTO NL=Off	CR=CR	AUTOSCRL=Off	LOCK=Caps	REPEAT=On
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Setup 4

CRT SAVER=Off	PROTECT=DIM	ATTRIBUTE=Page
---------------	-------------	----------------

Setup 5

COMPATIBLE MODE=WY30	ENHANCE=Off	KEYPAD=Applic	FKEYS=Remote	TEST=Off
----------------------	-------------	---------------	--------------	----------

Figure A-12 provides suggested parameter values for the Wyse WY30 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See "System Configuration Considerations" on page 2-16 for the display station attached through modems.

Figure A-12. Suggested Configuration Parameters for the Wyse WY30

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

Wyse WY50 Display Station

Following are suggested settings to adjust the Wyse WY50 display station.

Setup 1

HANDSHAKE=ON/XOFF	SCREEN=80	CURSOR=Block	BLINK=On	MODE=FDX
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Setup 2

DATA BIT=8	STOP BIT=1	PARITY=Even	MODEM PORT BAUD RATE=19200
------------	------------	-------------	----------------------------

Setup 3

BLK END=US/CR	AUTO NL=Off	CR=CR	AUTO SCRL=Off	AUX BAUD RATE=19200
---------------	-------------	-------	---------------	---------------------

Setup 4

SCRL=Jump	STATUS=On	S.SAVER=Off	PROT=Dim	Test=Off
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Setup 5

RET/ENTER=CR/CR	Keys?=US/UK	COMPATIBLE MODE=WY50	ENHANCE=Off
-----------------	-------------	----------------------	-------------

Figure A-13 provides suggested parameter values for the Wyse WY50 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-13. Suggested Configuration Parameters for the Wyse WY50

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

Wyse WY60 Display Station

Following are suggested settings to adjust the Wyse WY60 display station.

Display

COLUMNS=80	STATUS LINE=STANDARD	BACKGROUND=DARK
LINES=24	SCRL SPEED=JUMP	SCRN SAVER=OFF
PAGE LENGTH=1 * LINES	CURSOR=BLINK BLOCK	DISPLAY CURSOR=ON
ATTRIBUTE=CHAR	ANSWERBACK MODE=OFF	ANSWERBACK CONCEAL=OFF

General

PERSONALITY=WY 60	ENHANCE=ON	FONT LOAD=ON
COMM MODE=FULL DUPLEX	END OF LINE WRAP=OFF	SEND ACK=OFF
DATA/PRINTER=MODEM/AUX	AUTO SCRL=OFF	INIT TABS=OFF
RCVD CR=CR	MONITOR=OFF	WIDTH CHANGE CLEAR=OFF

Keyboard

KEYCLICK=ON	KEYLOCK=CAPS	KEY REPEAT=ON
RETURN=CR	ENTER=CR	CORNER=FUNCT
XMT LIMIT=NONE	FKEY XMT LIMIT=NONE	BREAK=250MS
WYSEWORD=OFF	LANGUAGE=US	MARGIN BELL=OFF

Communications

BAUD RATE=19200	DATA/STOP BITS=8/1	PARITY=EVEN
RCV/HANDSHAKE=XON/XOFF	XMT/HANDSHAKE=XON/XOFF	XPC/HANDSHAKE=XON/XOFF
AUX BAUD RATE=19200	AUX DATA/STOP BITS=8/1	AUX PARITY=EVEN
AUX RCV HANDSHAKE=XON/XOFF	AUX XMT HANDSHAKE=XON/XOFF	

Miscellaneous

BLOCK END=US/CR	LABELS=OFF	WPRT INTENSITY=DIM
AUTO PAGE=OFF	SAVE LABELS=OFF	WPRT REVERSE=OFF
TVI955 ATTRIBUTE=NOSPACE	PAGE EDIT=OFF	WPRT UNDERLINE=OFF
VP60 BLK END=NONE		TEST=OFF

Figure A-14 on page A-18 provides suggested parameter values for the Wyse WY60 display station configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See "System Configuration

Considerations” on page 2-16 for the display station attached through modems.

Figure A-14. Suggested Configuration Parameters for the Wyse WY60

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1

Dasher D220 Display Station Device Setup

Due to microcode constraints, some settings for the Dasher D220 device are required for particular values. These values are noted as *required* in Figure A-15. The other settings are recommended settings.

Figure A-15. Host Communications Port Dip Switches

1	Baud rate/Stop bits	Up	19200/1 stop *
2	Baud rate/Stop bits	Up	19200/1 stop *
3	Baud rate/Stop bits	Up	19200/1 stop *
4	Baud rate/Stop bits	Up	19200/1 stop *
5	Parity	Up	Mark parity (required)
6	Parity	Down	Mark parity (required)
7	Data Bits	Down	7 (required)
8	Terminal Mode	Up	ANSI (required)

Figure A-16. Print Port Dip Switches

1	Reserved (unused)	Not used
2	Baud rate	Not used
3	Baud rate	Not used
4	Baud rate	Not used
5	Printer Type Switch	Not used
6	Reserved (unused)	Not used
7	Reserved (unused)	Not used
8	50/60 Hz	Down 60 Hz

Figure A-17 provides suggested parameter values for the Dasher D220 device configuration on the AS/400 system.

Note: The value for the attachment parameter (Direct) is intended only for the directly attached display station. See “System Configuration Considerations” on page 2-16 for the display station attached through modems.

Figure A-17. Suggested Configuration Parameters for the Dasher D220

Parameter	Value
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Mark
Word Length (bits)	7
Stop Bits	1

Appendix B. Suggested Settings for ASCII Printers

This appendix provides suggested settings for the ASCII printers supported by the AS/400 system. For *each* supported printer, the following information is provided:

- Settings to adjust the printer
- Parameter values to be used during configuration on the AS/400 system for the printer

Note: Additional information for configuring ASCII printers that use the host print transform function is included in the *Printer Device Programming* book.

Within the description section for each printer, the first figure presented is for the directly attached printer, and the second figure presented is for the printer attached to the auxiliary port of a display station.

The suggested settings need not be used, but the following printer settings must match the corresponding configuration values:

- Line speed
- Parity
- Word length
- Stop bits
- Attachment

The method of adjusting settings varies by the type of printer. Follow the instructions in the book shipped with the ASCII printer.

Note: There are two different versions of serial interface cards for attaching Proprinters using a serial interface. P/N 6493187, which has a 28-pin connector, is used for some printers and P/N 23F4395, which has a 30-pin connector, is used for others. They are not interchangeable.

Special Considerations for Configuring Narrow-Carriage Printers:

Printers that support only 20.32 cm (8-inch) wide paper (such as the IBM 4201 Printer and the IBM 4207 Proprinter) must be configured in certain ways to handle printing large numbers of characters per line. Configure your printer in the following ways to handle the large number of characters per line expected in the printed output of some programs:

- Configure an IBM 4201 Printer to emulate an IBM 5256 Printer. This allows the printed output of a program to print 132 characters on the 20.32 cm (8-inch) print line. Configuring a 4201 printer to emulate a 5256 printer allows all output to print with a reduced character density (17.1 characters per inch).
- Configure an IBM 4207 Proprinter to emulate an IBM 5224 Printer or an IBM 5219 Printer. This allows the printed output of a program to print up to 132 characters on the 20.32 cm (8-inch) print line. Configuring a 4207 Proprinter to emulate a 5224 or a 5219 printer allows all output to print with 10, 12, or 17.1 characters per inch. The numbers of characters per inch printed is determined by the program.

If you configure your ASCII printer as described in the preceding list, print lines may wrap to the next line. Some programs fail and report an error when print lines wrap to the next line. (These programs fail because they detect an attempt to print past the edge of the page.)

If a program fails when print lines wrap to the next line, configure your narrow-carriage printer as a wide-carriage printer. You can configure an IBM 4201 Printer as an IBM 4202 Extended Proprinter. You can configure an IBM 4207 Proprinter as an IBM 4208 Proprinter. Configuring a narrow-carriage printer as a wide-carriage printer allows long print lines to wrap without reporting errors to the failing programs.

IBM 2380 Personal Printer Series II

The printer settings must be adjusted to match the AS/400 configuration. Following are suggested settings for the IBM 2380 Personal Printer Series II.

Serial Interface Unit P/N 79F4758 Switch Settings

Switches A1, A2, A3, A4:	'on, on, on, off' to indicate 19200 bps
Switch A5:	'off' to indicate 8 bits per data frame
Switches A6, A7:	'on, on' to indicate even parity
Switch A8:	'off' to indicate 1 stop bit
Switch A9:	'off' to indicate XON/XOFF
Switch A10:	'off'
Mode Switch 1, 2:	'off, off' to indicate RS-232

Base Printer Setup Options: Setup of the IBM 2380 Personal Printer Series II is menu driven. Press Alt then Setup to enter Setup Mode. Refer to the *IBM Personal Printer Series II 2380 and 2381 User's Reference* for a summary of setup options.

AS/400 Configuration Parameter

Values: Figure B-1 and Figure B-2 provide suggested parameter values for the IBM 2380 printer configuration on the AS/400 system.

Use Figure B-1 for printers directly attached to the AS/400 system, and Figure B-2 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-1. Suggested Configuration Parameters for the IBM 2380 Printer

Parameter	Value
Device Type	4201
Model	003
Emulated Device Type	5256
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-2. Suggested Configuration Parameters for the IBM 2380 Printer

Parameter	Value
Device Type	4201
Model	003
Emulated Device Type	5256
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 2381 Personal Printer Series II

The printer settings must be adjusted to match the AS/400 configuration. Following are suggested settings for the IBM 2381 Personal Printer Series II.

Serial Interface Unit P/N 79F4758 Switch Settings

Switches A1, A2, A3, A4:	'on, on, on, off' to indicate 19200 bps
Switch A5:	'off' to indicate 8 bits per data frame
Switches A6, A7:	'on, on' to indicate even parity
Switch A8:	'off' to indicate 1 stop bit
Switch A9:	'off' to indicate XON/XOFF
Switch A10:	'off'
Mode Switch 1, 2:	'off, off' to indicate RS-232

Base Printer Setup Options: Setup of the IBM 2381 Personal Printer Series II is menu driven. Press Alt then Setup to enter Setup Mode. Refer to the *IBM Personal Printer Series II 2380 and 2381 User's Reference* for a summary of setup options.

AS/400 Configuration Parameter

Values: Figure B-3 and Figure B-4 provide suggested parameter values for the IBM 2381 printer configuration on the AS/400 system.

Use Figure B-3 for printers directly attached to the AS/400 system, and Figure B-4 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-3. Suggested Configuration Parameters for the IBM 2381 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-4. Suggested Configuration Parameters for the IBM 2381 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 2390 Personal Printer Series II

The printer settings must be adjusted to match the AS/400 configuration. Following are suggested settings for the IBM 2390 Personal Printer Series II.

Serial Interface Unit P/N 79F4758 Switch Settings

Switches A1, A2, A3, A4:	'on, on, on, off' to indicate 19200 bps
Switch A5:	'off' to indicate 8 bits per data frame
Switches A6, A7:	'on, on' to indicate even parity
Switch A8:	'off' to indicate 1 stop bit
Switch A9:	'off' to indicate XON/XOFF
Switch A10:	'off'
Mode Switch 1, 2:	'off, off' to indicate RS-232

Base Printer Setup Options: Setup of the IBM 2390 Personal Printer Series II is menu driven. Press Alt then Setup to enter Setup Mode. Refer to the *IBM Personal Printer Series II 2390 and 2391 User's Reference* for a summary of setup options.

AS/400 Configuration Parameter

Values: Figure B-5 and Figure B-6 provide suggested parameter values for the IBM 2390 printer configuration on the AS/400 system.

Use Figure B-5 for printers directly attached to the AS/400 system, and Figure B-6 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-5. Suggested Configuration Parameters for the IBM 2390 Printer

Parameter	Value
Device Type	4207
Model	002
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-6. Suggested Configuration Parameters for the IBM 2390 Printer

Parameter	Value
Device Type	4207
Model	002
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 2391 Personal Printer Series II

The printer settings must be adjusted to match the AS/400 configuration. Following are suggested settings for the IBM 2391 Personal Printer Series II.

Serial Interface Unit P/N 79F4758 Switch Settings

Switches A1, A2, A3, A4:	'on, on, on, off' to indicate 19200 bps
Switch A5:	'off' to indicate 8 bits per data frame
Switches A6, A7:	'on, on' to indicate even parity
Switch A8:	'off' to indicate 1 stop bit
Switch A9:	'off' to indicate XON/XOFF
Switch A10:	'off'
Mode Switch 1, 2:	'off, off' to indicate RS-232

Base Printer Setup Options: Setup of the IBM 2391 Personal Printer Series II is menu driven. Press Alt then Setup to enter Setup Mode. Refer to the *IBM Personal Printer Series II 2390 and 2391 User's Reference* for a summary of setup options.

AS/400 Configuration Parameter

Values: Figure B-7 and Figure B-8 provide suggested parameter values for the IBM 2390 printer configuration on the AS/400 system.

Use Figure B-7 for printers directly attached to the AS/400 system, and Figure B-8 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-7. Suggested Configuration Parameters for the IBM 2391 Printer

Parameter	Value
Device Type	4208
Model	002
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-8. Suggested Configuration Parameters for the IBM 2391 Printer

Parameter	Value
Device Type	4208
Model	002
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4019 (Model 001 or E01) Printer

Note: System Serial Cable Connector part number 1319143 is required to attach the 4019 printer to the ASCII Work Station Controller.

Following are suggested settings to adjust the IBM 4019 (Model 001 or E01) printer.

From the operator panel, the user must select printer configuration mode to configure the serial interface. Detailed explanations of this procedure can be found in the user's guide for this printer.

The following describes which parameters must be specifically configured for the AS/400 ASCII attachment. You may want to initialize other options to tailor the operation of the printer for a specific use.

- Interface selection is set to 2 to select serial interface with XON/XOFF.
- Serial baud rate is set to 5 to select 19200 baud.
- Serial number of data bits is set to 2 to select 8 data bits.
- Serial parity is set to 1 to select even parity.

AS/400 Configuration Parameter

Values: Figure B-9 and Figure B-10 provide suggested parameter values for the IBM 4019 (Model 001 or E01) printer configuration on the AS/400 system.

Use Figure B-9 for printers directly attached to the AS/400 system, and Figure B-10 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-9. Suggested Configuration Parameters for the IBM 4019 (Model 001 or E01) Printer

Parameter	Value
Emulated Device Type	3812
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-10. Suggested Configuration Parameters for the IBM 4019 (Model 001 or E01) Printer

Parameter	Value
Emulated Device Type	3812
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM LaserPrinter 4029 Series (Models 10, 20, 30, 40)

Note: System Serial Cable Connector part number 1319143 is required to attach the 4029 printer to the ASCII Work Station Controller.

From the operator panel, the user must adjust the printer settings to match the AS/400 configuration. Following are suggested settings for the IBM LaserPrinter 4029 Series printer.

- Press Main Menu until Interface is displayed.
- Press List + until =Serial is displayed.
- Hold Alt while you press Save to save the choice as a user default setting.
- Press Main Menu once. Protocol is displayed.
- Press List + until XON/XOFF is displayed.
- Hold Alt while you press Save to save the choice as a user default setting.
- Press Main Menu once. Baud is displayed.
- Press List + until 19200 is displayed.
- Hold Alt while you press Save to save the choice as a user default setting.
- Press Main Menu once. Data Bits is displayed.
- Press List + until 8 is displayed.
- Hold Alt while you press Save to save the choice as a user default setting.
- Press Main Menu once. Parity is displayed.
- Press List + until Even is displayed.
- Hold Alt while you press Save to save the choice as a user default setting.

Other Printer Setup Options: For a summary of the function menus and optional values, refer to the *IBM LaserPrinter 4029 Series User's Guide*.

AS/400 Configuration Parameter

Values: Figure B-11 and Figure B-12 provide suggested parameter values for the IBM LaserPrinter 4029 Series printer configuration on the AS/400 system.

Use Figure B-11 for printers directly attached to

the AS/400 system, and Figure B-12 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-11. Suggested Configuration Parameters for the IBM LaserPrinter 4029 Series

Parameter	Value
Device Type	4019
Model	001
Emulated Device Type	3812
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-12. Suggested Configuration Parameters for the IBM LaserPrinter 4029 Series

Parameter	Value
Device Type	4019
Model	001
Emulated Device Type	3812
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4037 (Model 5E)

The printer settings must be adjusted to match the AS/400 configuration. The emulation mode must be set to IBM PPDS. Following are suggested settings for the IBM 4037 printer.

Serial Interface Adapter P/N 1363110 Switch Settings

- Switches 1, 2, 3, 4: 'on, on, on, off' to indicate 19200 bps
- Switch 5: 'off' to indicate 8 bits per data frame
- Switches 6, 7: 'on, on' to indicate even parity
- Switch 8: 'off' to indicate 1 stop bit
- Switch 9: 'on' to indicate XON/XOFF
- Switch 10: 'off' to indicate normal operation
- Switch 11: 'off' to indicate normal/reverse RS-422
- Switch 12: 'off' to indicate RS-232

AS/400 Configuration Parameter

Values: Figure B-13 and Figure B-14 provide suggested parameter values for the IBM 4076 printer configuration on the AS/400 system.

Use Figure B-13 for printers directly attached to the AS/400 system, and Figure B-14 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-13. Suggested Configuration Parameters for the IBM 4037 Printer

Parameter	Value
Device Type	4019
Model	001
Emulated Device Type	3812
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-14. Suggested Configuration Parameters for the IBM 4037 Printer

Parameter	Value
Device Type	4019
Model	001
Emulated Device Type	3812
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM ExecJet Printer 4072

The printer settings must be adjusted to match the AS/400 configuration. Following are suggested settings for the IBM ExecJet Printer 4072.

Serial Interface Card P/N 1232334 Switch Settings

Switches 1, 2, 3:	'on, on, off' to indicate 19200 bps
Switches 4, 5:	'on, on' to indicate even parity
Switch 6:	'off' to indicate 8 bits per data frame
Switch 7:	'off' to indicate 1 stop bit
Switch 8:	'off' to indicate XON/XOFF
Switch 9, 10:	'off, off'
Slide Switch 1, 2:	'Right, Right' to indicate RS-232
Jumper 1, 2, 3, 4:	'on, on, on, on' to enable control lines

Base Printer Switch Bank 1

Switches 1, 2:	'off, on' for 5202 mode
Switches 3:	'on' for serial interface.
Switch 4, 5, 6, 7, 8:	'off, off, off, off, off'

Base Printer Switch Bank 2

Switches 1, 2, 3:	'on, off, off' for Code Page 850.
Switch 4, 5, 6, 7, 8, 9, 10:	'off, off, off, off, off, off, off'

AS/400 Configuration Parameter

Values: Figure B-15 and Figure B-16 provide suggested parameter values for the IBM 4072 printer configuration on the AS/400 system.

Use Figure B-15 for printers directly attached to the AS/400 system, and Figure B-16 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-15. Suggested Configuration Parameters for the IBM 4072 Printer

Parameter	Value
Device Type	5204
Model	001
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-16. Suggested Configuration Parameters for the IBM 4072 Printer

Parameter	Value
Device Type	5204
Model	001
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM ExecJet II Printer 4076

The printer settings must be adjusted to match the AS/400 configuration. The emulation mode must be set to IBM PPDS. Following are suggested settings for the IBM ExecJet II Printer 4076.

Serial Interface Adapter P/N 1363110 Switch Settings

- Switches 1, 2, 3, 4: 'on, on, on, off' to indicate 19200 bps
- Switch 5: 'off' to indicate 8 bits per data frame
- Switches 6, 7: 'on, on' to indicate even parity
- Switch 8: 'off' to indicate 1 stop bit
- Switch 9: 'on' to indicate XON/XOFF
- Switch 10: 'off' to indicate normal operation
- Switch 11: 'off' to indicate normal/reverse RS-422
- Switch 12: 'off' to indicate RS-232

AS/400 Configuration Parameter

Values: Figure B-17 and Figure B-18 provide suggested parameter values for the IBM 4076 printer configuration on the AS/400 system.

Use Figure B-17 for printers directly attached to the AS/400 system, and Figure B-18 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-17. Suggested Configuration Parameters for the IBM 4076 Printer

Parameter	Value
Device Type	4208
Model	002
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-18. Suggested Configuration Parameters for the IBM 4076 Printer

Parameter	Value
Device Type	4208
Model	002
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4201 (Model 2) Printer

Following are suggested settings to adjust the IBM 4201-2 (Proprinter II) printer.

Serial Interface Card P/N 6493187 Switch Settings

Switches A1, A2, A3:	'on, on, on' to indicate 19200 bps
Switches A4, A5:	'on, on' to indicate even parity
Switch A6:	'off' to indicate XON/XOFF
Switch A7:	'off'
Switch B1:	'off' to indicate 8 bits per data frame
Switch B2:	'off' to indicate 1 stop bit
Switch B3:	'off'
Switch B4:	'off'

Base Printer Card Switch Settings

Switch 1:	'off'
Switch 2:	'off'
Switch 3:	'off'
Switch 4:	'off' for the United States and Canada, 'on' for other countries
Switch 5:	'on' to select character set 2
Switch 6:	'off'
Switch 7:	'on'
Switch 8:	'off' (if this switch is present)

AS/400 Configuration Parameter

Values: Figure B-19 and Figure B-20 provide suggested parameter values for the IBM 4201-2 printer configuration on the AS/400 system.

Use Figure B-19 for printers directly attached to the AS/400 system, and Figure B-20 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-19. Suggested Configuration Parameters for the IBM 4201-2 Printer

Parameter	Value
Emulated Device Type	5256
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-20. Suggested Configuration Parameters for the IBM 4201-2 Printer

Parameter	Value
Emulated Device Type	5256
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4201 (Model 3) Printer

Following are suggested settings to adjust the IBM 4201-3 (Proprinter III) printer.

Serial Interface Card P/N 23F4395 Switch Settings

- Switches 1, 2, 3, 4: 'on, on, on, off' to indicate 19200 bps
- Switch 5: 'off' to indicate 8 bits per data frame
- Switches 6, 7: 'on, on' to indicate even parity
- Switch 8: 'off' to indicate 1 stop bit
- Switch 9: 'off' to indicate XON/XOFF
- Switch 10: 'off'
- Mode Switch: 'off' to indicate RS232

Base Printer Card Switch Settings

- Switch 1: 'off'
- Switch 2: 'off'
- Switch 3: 'on'
- Switch 4: 'off'
- Switch 5: 'off'
- Switch 6: 'off'
- Switch 7: 'on' to select code page 850
- Switch 8: 'on' to select character set 2
- Switch 9: 'off'
- Switch 10: 'off' for the United States and Canada,
'on' for other countries.
- Switch 11: 'off'
- Switch 12: 'off'

Note: 4201-3 Base Printer Card switches are not hardware switches; they are located in nonvolatile RAM (NV-RAM). To access and change settings, turn the printer off, then depress the Online and Quiet/Park keys while powering on.

AS/400 Configuration Parameter

Values: Figure B-21 and Figure B-22 provide suggested parameter values for the IBM 4201-3 printer configuration on the AS/400 system.

Use Figure B-21 for printers directly attached to the AS/400 system, and Figure B-22 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-21. Suggested Configuration Parameters for the IBM 4201-3 Printer

Parameter	Value
Emulated Device Type	5256
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-22. Suggested Configuration Parameters for the IBM 4201-3 Printer

Parameter	Value
Emulated Device Type	5256
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4202 (Model 1) Printer

Following are suggested settings to adjust the IBM 4202-1 (Proprinter XL) printer.

Serial Interface Card P/N 6493187 Switch Settings

Switches A1, A2, A3:	'on, on, on' to indicate 19200 bps
Switches A4, A5:	'on, on' to indicate even parity
Switch A6:	'off' to indicate XON/XOFF
Switch A7:	'off'
Switch B1:	'off' to indicate 8 bits per data frame
Switch B2:	'off' to indicate 1 stop bit
Switch B3:	'off'
Switch B4:	'off'

Base Printer Card Switch Settings

Switch 1:	'on'
Switch 2:	'off'
Switch 3:	'off'
Switch 4:	'off' for the United States and Canada, 'on' for other countries
Switch 5:	'on' to select character set 2
Switch 6:	'off'
Switch 7:	'off'
Switch 8:	'off' (if this switch is present)

AS/400 Configuration Parameter

Values: Figure B-23 and Figure B-24 provide suggested parameter values for the IBM 4202-1 printer configuration on the AS/400 system.

Use Figure B-23 for printers directly attached to the AS/400 system, and Figure B-24 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-23. Suggested Configuration Parameters for the IBM 4202-1 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-24. Suggested Configuration Parameters for the IBM 4202-1 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4202 (Model 2) Printer

Following are suggested settings to adjust the IBM 4202-2 (Proprinter II XL) printer.

Serial Interface Card P/N 6493187 Switch Settings

- Switches A1, A2, A3: 'on, on, on' to indicate 19200 bps
- Switches A4, A5: 'on, on' to indicate even parity
- Switch A6: 'off' to indicate XON/XOFF
- Switch A7: 'off'
- Switch B1: 'off' to indicate 8 bits per data frame
- Switch B2: 'off' to indicate 1 stop bit
- Switch B3: 'off'
- Switch B4: 'off'

Base Printer Card Switch Settings

- Switch 1: 'on'
- Switch 2: 'off'
- Switch 3: 'off'
- Switch 4: 'off' for the United States and Canada,
'on' for other countries
- Switch 5: 'on' to select character set 2
- Switch 6: 'off'
- Switch 7: 'off'
- Switch 8: 'off' (if this switch is present)

AS/400 Configuration Parameter

Values: Figure B-25 and Figure B-26 provide suggested parameter values for the IBM 4202-2 printer configuration on the AS/400 system.

Use Figure B-25 for printers directly attached to the AS/400 system, and Figure B-26 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-25. Suggested Configuration Parameters for the IBM 4202-2 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-26. Suggested Configuration Parameters for the IBM 4202-2 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4202 (Model 3) Printer

Following are suggested settings to adjust the IBM 4202-3 (Proprinter III XL) printer.

Serial Interface Card P/N 23F4395 Switch Settings

Switches 1, 2, 3, 4:	'on, on, on, off' to indicate 19200 bps
Switch 5:	'off' to indicate 8 bits per data frame
Switches 6, 7:	'on, on' to indicate even parity
Switch 8:	'off' to indicate 1 stop bit
Switch 9:	'off' to indicate XON/XOFF
Switch 10:	'off'
Mode Switch:	'off' to indicate RS-232

Base Printer Card Switch Settings

Switch 1:	'off'
Switch 2:	'off'
Switch 3:	'off'
Switch 4:	'off'
Switch 5:	'off'
Switch 6:	'off'
Switch 7:	'on' to select code page 850
Switch 8:	'on' to select character set 2
Switch 9:	'off'
Switch 10:	'off' for the United States and Canada, 'on' for other countries
Switch 11:	'off'
Switch 12:	'off'

Note: 4202-3 Base Printer Card switches are not hardware switches; they are located in nonvolatile RAM (NV-RAM). To access and change settings, turn the printer off,

then depress the Online and Quiet/Park keys while powering on.

AS/400 Configuration Parameter

Values: Figure B-27 and Figure B-28 provide suggested parameter values for the IBM 4202-3 printer configuration on the AS/400 system.

Use Figure B-27 for printers directly attached to the AS/400 system, and Figure B-28 for printers attached through the auxiliary port display station.

Direct Attach

Figure B-27. Suggested Configuration Parameters for the IBM 4202-3 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-28. Suggested Configuration Parameters for the IBM 4202-3 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

1 Must match display station settings

IBM 4207 (Model 1) Printer

Following are suggested settings to adjust the IBM 4207-1 (Proprinter X24) printer.

Serial Interface Card P/N 6493187

Switch Settings:

Switches A1, A2, A3:	'on, on, on' to indicate 19200 bps
Switches A4, A5:	'on, on' to indicate even parity
Switch A6:	'off' to indicate XON/XOFF
Switch A7:	'off'
Switch B1:	'off' to indicate 8 bits per data frame
Switch B2:	'off' to indicate 1 stop bit
Switch B3:	'off'
Switch B4:	'off'

Base Printer Card Switch Settings

Switch 1:	'off'
Switch 2:	'off'
Switch 3:	'off'
Switch 4:	'off' for the United States and Canada, 'on' for other countries
Switch 5:	'on' to select character set 2
Switch 6:	'off'
Switch 7:	'off'

AS/400 Configuration Parameter

Values: Figure B-29 and Figure B-30 provide suggested parameter values for the IBM 4207-1 printer configuration on the AS/400 system.

Use Figure B-29 for printers directly attached to the AS/400 system, and Figure B-30 for printers

attached through the auxiliary port of a display station.

Direct Attach

Figure B-29. Suggested Configuration Parameters for the IBM 4207-1 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-30. Suggested Configuration Parameters for the IBM 4207-1 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4207 (Model 2) Printer

Following are suggested settings to adjust the IBM 4207-2 (Proprinter X24E) printer.

Serial Interface Card P/N 23F4395

Switch Settings:

Switches 1, 2, 3, 4:	'on, on, on, off' to indicate 19200 bps
Switch 5:	'off' to indicate 8 bits per data frame
Switches 6, 7:	'on, on' to indicate even parity
Switch 8:	'off' to indicate 1 stop bit
Switch 9:	'off' to indicate XON/XOFF
Switch 10:	'off'
Mode Switch:	'off' to indicate RS232

Base Printer Card Switch Settings

Switch 1:	'off'
Switch 2:	'off'
Switch 3:	'off'
Switch 4:	'off'
Switch 5:	'off'
Switch 6:	'on' to select code page 850
Switch 7:	'on' to select character set 2
Switch 8:	'off'
Switch 9:	'off'
Switch 10:	'off'
Switch 11:	'off'

Note: 4207-2 Base Printer Card switches are not hardware switches; they are located in nonvolatile RAM (NV-RAM). To access and change settings, turn the printer off, then depress the Online key while powering on.

AS/400 Configuration Parameter

Values: Figure B-31 and Figure B-32 provide suggested parameter values for the IBM 4207-2 printer configuration on the AS/400 system.

Use Figure B-31 for printers directly attached to the AS/400 system, and Figure B-32 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-31. Suggested Configuration Parameters for the IBM 4207-2 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-32. Suggested Configuration Parameters for the IBM 4207-2 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4208 (Model 1) Printer

Following are suggested settings to adjust the IBM 4208-1 (Proprinter XL24) printer.

Serial Interface Card P/N 6493187 Switch Settings

Switches A1, A2, A3:	'on, on, on' to indicate 19200 bps
Switches A4, A5:	'on, on' to indicate even parity
Switch A6:	'off' to indicate XON/XOFF
Switch A7:	'off'
Switch B1:	'off' to indicate 8 bits per data frame
Switch B2:	'off' to indicate 1 stop bit
Switch B3:	'off'
Switch B4:	'off'

Base Printer Card Switch Settings

Switch 1:	'off'
Switch 2:	'off'
Switch 3:	'off'
Switch 4:	'off' for the United States and Canada, 'on' for other countries
Switch 5:	'on' to select character set 2
Switch 6:	'off'
Switch 7:	'off'

AS/400 Configuration Parameter

Values: Figure B-33 and Figure B-34 provide suggested parameter values for the IBM 4208-1 printer configuration on the AS/400 system.

Use Figure B-33 for printers directly attached to the AS/400 system, and Figure B-34 for printers

attached through the auxiliary port of a display station.

Direct Attach

Figure B-33. Suggested Configuration Parameters for the IBM 4208-1 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-34. Suggested Configuration Parameters for the IBM 4208-1 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4208 (Model 2) Printer

Following are suggested settings to adjust the IBM 4208-2 (Proprinter XL24E) printer.

Serial Interface Card P/N 23F4395 Switch Settings

Switches 1, 2, 3, 4:	'on, on, on, off' to indicate 19200 bps
Switch 5:	'off' to indicate 8 bits per data frame
Switches 6, 7:	'on, on' to indicate even parity
Switch 8:	'off' to indicate 1 stop bit
Switch 9:	'off' to indicate XON/XOFF
Switch 10:	'off'
Mode Switch:	'off' to indicate RS232

Base Printer Card Switch Settings

Switch 1:	'off'
Switch 2:	'off'
Switch 3:	'on'
Switch 4:	'off'
Switch 5:	'off'
Switch 6:	'on' to select code page 850
Switch 7:	'on' to select character set 2
Switch 8:	'off'
Switch 9:	'off'
Switch 10:	'off'
Switch 11:	'off'

Note: 4208-2 Base Printer Card switches are not hardware switches; they are located in nonvolatile RAM (NV-RAM). To access and change settings, turn the printer off, then depress the Online key while powering on.

AS/400 Configuration Parameter

Values: Figure B-35 and Figure B-36 provide suggested parameter values for the IBM 4208-2 printer configuration on the AS/400 system.

Use Figure B-35 for printers directly attached to the AS/400 system, and Figure B-36 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-35. Suggested Configuration Parameters for the IBM 4208-2 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-36. Suggested Configuration Parameters for the IBM 4208-2 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4216 (Model 10) Printer

Following are suggested settings to adjust the IBM 4216-10 (Personal Pageprinter) printer.

From the operator panel, the user must choose a test to run that will allow setup parameters to be displayed and altered. Detailed explanations of this procedure can be found in the user's guide for this printer.

The following describes which test must be run specifically for the AS/400 ASCII attachment. You may want to run other tests to tailor the operation of the printer for a specific use.

Test 212:	Set to 850 to select code page 850.
Test 410:	Set to 1 to select serial interface.
Test 411:	Set to 12 to select 8 data bits, even parity, and 1 stop bit.
Test 412:	Set to 192 to select 19200 baud.
Test 413:	Set to 1 to select XON/XOFF protocol.
Test 423:	Set to 1 to select character set 2.
Test 440:	Set to 1.

AS/400 Configuration Parameter

Values: Figure B-37 and Figure B-38 provide suggested parameter values for the IBM 4216-10 printer configuration on the AS/400 system.

Use Figure B-37 for printers directly attached to the AS/400 system, and Figure B-38 for printers

attached through the auxiliary port of a display station.

Direct Attach

Figure B-37. Suggested Configuration Parameters for the IBM 4216-10 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-38. Suggested Configuration Parameters for the IBM 4216-10 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4224 (Models 301, 302, and 3E3) Printers

The following provides the suggested settings to adjust the IBM 4224-301, 4224-302, or 4224-3E3 printers.

From the operator panel, the user must choose a test to run that will allow setup parameters to be displayed and altered. Detailed explanations of this procedure can be found in the user's guide for this printer.

The following describes which test must be run specifically for the AS/400 ASCII attachment. You may want to run other tests to tailor the operation of the printer for a specific use.

Test 303:	Language. Set to '003' to indicate Multinational Character Set.
Test 304:	Set Alarm State. Set to '001' to indicate enable alarm.
Test 305:	Select Baud Rate. Set to '006' to indicate 19200 bps.
Test 315:	Select Interface Type. Set to '001' to indicate RS-232.
Test 317:	Pacing Protocol. Set to '000' to indicate XON/XOFF.
Test 318:	Parity Option Selection. Set to '002' to indicate even parity.

AS/400 Configuration Parameter

Values: Figure B-39 and Figure B-40 provide suggested parameter values for the configuration of IBM 4224-301, 4224-302, and 4224-3E3 printers on the AS/400 system.

Use Figure B-39 for printers directly attached to

the AS/400 system, and Figure B-40 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-39. Suggested Configuration Parameters for the IBM 4224-301, 4224-302, and 4224-3E3 Printers

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-40. Suggested Configuration Parameters for the IBM 4224-301, 4224-302, and 4224-3E3 Printers

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4226 Printer (Model 302)

System Serial Cable Connector part number 1319143 is required to attach the 4226 printer to the ASCII Work Station Controller.

The printer settings must be adjusted to match the AS/400 configuration. Following are suggested settings for the IBM 4226 Printer.

- With the printer powered off, set Switch 1 (next to the printer cable connection) OFF (out).
- Turn printer power on, press Menu/Quit to enter the function menu.
- Press Item ↑ until the Interface message appears on the display.
- Press Scroll ↑ until the Serial RS-232 message appears on the display.
- Press Store to save the selected value.
- Press Item ↓ once. Data Speed is displayed.
- Press Scroll ↑ until 19200 bps is displayed.
- Press Store to save the selected value.
- Press Item ↓ once. Data Bits is displayed.
- Press Scroll ↑ until 8 is displayed.
- Press Store to save the selected value.
- Press Item ↓ once. Parity is displayed.
- Press Scroll ↑ until Even is displayed.
- Press Store to save the selected value.
- Press Item ↓ once. Stop Bits is displayed.
- Press Scroll ↑ until 1 is displayed.
- Press Store to save the selected value.
- Press Item ↓ once. Protocol is displayed.
- Press Scroll ↑ until XON/XOFF is displayed.
- Press Store to save the selected value.

Other Printer Setup Options: For a summary of the function menus and optional values, refer to the *IBM 4226 Printer User's Reference*.

AS/400 Configuration Parameter

Values: Figure B-41 and Figure B-42 on page B-23 provide suggested parameter values for the IBM 4226 Printer configuration on the AS/400 system.

Use Figure B-41 for printers directly attached to the AS/400 system, and Figure B-42 on page B-23 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-41. Suggested Configuration Parameters for the IBM 4226 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-42. Suggested Configuration Parameters for the IBM 4226 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4232 Printer (Model 302)

The printer settings must be adjusted to match the AS/400 configuration. The 4224 Emulation Mode must be set to NO. For a listing of the function menus and optional values, refer to the *IBM 4232 Model 302 Operator Panel Instructions*.

From the operator panel, the user must select printer configuration mode to configure the serial interface. Detailed explanations of this procedure can be found in the user's guide for this printer.

The following describes which parameters must be specifically configured for the AS/400 ASCII attachment. You may want to initialize other options to tailor the operation of the printer for a specific use.

- Interface selection is set to select serial interface with XON/XOFF.
- Serial baud rate is set to select 19200 baud.
- Serial number of data bits is set to select 8 data bits.
- Serial parity is set to select even parity.

AS/400 Configuration Parameter

Values: Figure B-43 and Figure B-44 provide suggested parameter values for the IBM 4232 Printer configuration on the AS/400 system.

Use Figure B-43 for printers directly attached to the AS/400 system, and Figure B-44 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-43. Suggested Configuration Parameters for the IBM 4232 Printer

Parameter	Value
Device Type	4202
Model	001
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-44. Suggested Configuration Parameters for the IBM 4232 Printer

Parameter	Value
Device Type	4202
Model	001
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 4234 (Model 13) Printer

Following are suggested settings to adjust the IBM 4234-13 printer.

From the operator panel, the user must choose a menu selection that will allow setup parameters to be displayed and altered. Detailed explanations of this procedure can be found in the user's guide for this printer.

The following describes which menu selections must be run specifically for the AS/400 ASCII attachment. You may want to use other menu selections to tailor the operation of the printer for a specific use.

- Secondary Menu 1: Set to '002' to indicate personal computer Multinational Character Set.
- Secondary Menu 5: Set '19200' to indicate 19200 bps.
- Secondary Menu 6: Set to 'even' to indicate even parity.
- Secondary Menu 7: Set to '8' to indicate 8 bits/character.
- Secondary Menu 8: Set compatibility options:
- 1 Form feed processing – 'off'
 - 2 Automatic line feed – 'off'
 - 3 Automatic carrier return – 'off'
 - 4 Characters per inch selection – 'off'
 - 5 Serial break sequence detection – 'off'
 - 6 Link error recovery – 'off'
 - 7 Serial interface mode – 'off'
 - 8 Change font processing mode – 'on'
 - 9 Serial pacing protocol – 'on'
 - 10 Serial stop bit encoding – 'off'
 - 11 Interface type – 'on'
 - 12 Personal computer character set selection – 'on'

AS/400 Configuration Parameter

Values: Figure B-45 and Figure B-46 provide suggested parameter values for the IBM 4234-13 printer configuration on the AS/400 system.

Use Figure B-45 for printers directly attached to the AS/400 system, and Figure B-46 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-45. Suggested Configuration Parameters for the IBM 4234-13 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-46. Suggested Configuration Parameters for the IBM 4234-13 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard
1 Must match display station settings	

IBM 5204 Printer

Following are suggested settings to adjust the IBM 5204 (Quickwriter) printer.

Note: System Serial Cable Connector part number 1319143 is required to attach the 5204 printer to the ASCII Work Station Controller.

There are three banks of eight dual inline package (DIP) switches on this printer. The following describes the defaults for the switches related specifically to AS/400 ASCII support.

DIP Switch Bank A

Switch 1: 'on' to select character set 2

Switches 2, 3, 4, 5, 6, 7, 8:
'off, off, off, off, off, off, off'

DIP Switch Bank B

Switch 1: 'off' to select Internal Font

Switch 2: 'on' to select code page 850

Switches 3, 4, 5, 6, 7, 8:
'off, off, off, off, off, off'

DIP Switch Bank C

Switches 1, 2, 3: 'on, on, on' to indicate
19200 bps
serial interface

Switches 4, 5: 'on, on' to indicate even
parity

Switch 6: 'off' to indicate XON/XOFF

Switch 7: 'off' to indicate 8 bits per
word

Switch 8: 'off'

AS/400 Configuration Parameter

Values: Figure B-47 and Figure B-48 provide suggested parameter values for the IBM 5204 printer configuration on the AS/400 system.

Use Figure B-47 for printers directly attached to the AS/400 system, and Figure B-48 for printers

attached through the auxiliary port of a display station.

Direct Attach

Figure B-47. Suggested Configuration Parameters for the IBM 5204 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-48. Suggested Configuration Parameters for the IBM 5204 Printer

Parameter	Value
Emulated Device Type	5219
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 6252 (Model AS8) Printer

Following are suggested settings to adjust the IBM 6252-AS8 printer.

From the operator panel, the user must choose a function that allows setup parameters to be displayed and altered. Detailed explanations of this procedure can be found in the user's guide for this printer.

The following describes which functions must be run specifically for the AS/400 ASCII attachment. You may want to use other functions to tailor the operation of the printer for a specific use.

Function 40: System interface – RS-232-C

Function 41: Attachment feature 1 – 'off'

Attachment feature 2 – 'off'

Attachment feature 3 – 'off'

Attachment feature 4 – 'on'

Attachment feature 5 – 'off'

Attachment feature 6 – 'off'

Function 42: Baud rate – 19200

Data interface – 8 bits

Data parity – even

Stop bits – 1

Data pacing – XON/XOFF

AS/400 Configuration Parameter

Values: Figure B-49 and Figure B-50 provide suggested parameter values for the IBM 6252-AS8 printer configuration on the AS/400 system.

Use Figure B-49 for printers directly attached to the AS/400 system, and Figure B-50 for printers

attached through the auxiliary port of a display station.

Direct Attach

Figure B-49. Suggested Configuration Parameters for the IBM 6252-AS8 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-50. Suggested Configuration Parameters for the IBM 6252-AS8 Printer

Parameter	Value
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 6408 Printer (Models A00 and CTA)

The printer settings must be adjusted to match the AS/400 configuration. The Emulation Mode must be set to Proprinter III XL. For a listing of the function menus and optional values, refer to the *IBM 6408 Line Matrix Printer Setup Guide*.

From the operator panel, the user must select printer configuration mode to configure the serial interface. Detailed explanations of this procedure can be found in the setup guide for this printer.

The following describes which parameters must be specifically configured for the AS/400 ASCII attachment. You may want to initialize other options to tailor the operation of the printer for a specific use.

- Interface selection is set to select serial interface with XON/XOFF.
- Serial baud rate is set to select 19200 baud.
- Serial number of data bits is set to select 8 data bits.
- Serial parity is set to select even parity.

AS/400 Configuration Parameter

Values: Figure B-51 and Figure B-52 provide suggested parameter values for the IBM 6408 Printer configuration on the AS/400 system.

Use Figure B-51 for printers directly attached to the AS/400 system, and Figure B-52 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-51. Suggested Configuration Parameters for the IBM 6408 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-52. Suggested Configuration Parameters for the IBM 6408 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

IBM 6412 Printer (Models A00 and CTA)

The printer settings must be adjusted to match the AS/400 configuration. The Emulation Mode must be set to Proprinter III XL. For a listing of the function menus and optional values, refer to the *IBM 6412 Line Matrix Printer Setup Guide*.

From the operator panel, the user must select printer configuration mode to configure the serial interface. Detailed explanations of this procedure can be found in the setup guide for this printer.

The following describes which parameters must be specifically configured for the AS/400 ASCII attachment. You may want to initialize other options to tailor the operation of the printer for a specific use.

- Interface selection is set to select serial interface with XON/XOFF.
- Serial baud rate is set to select 19200 baud.
- Serial number of data bits is set to select 8 data bits.
- Serial parity is set to select even parity.

AS/400 Configuration Parameter

Values: Figure B-53 and Figure B-54 provide suggested parameter values for the IBM 6412 Printer configuration on the AS/400 system.

Use Figure B-53 for printers directly attached to the AS/400 system, and Figure B-54 for printers attached through the auxiliary port of a display station.

Direct Attach

Figure B-53. Suggested Configuration Parameters for the IBM 6412 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	No
Attachment	Direct
Line Speed (baud rate)	19200
Parity	Even
Word Length (bits)	8
Stop Bits	1
Print Quality	Standard

Auxiliary

Figure B-54. Suggested Configuration Parameters for the IBM 6412 Printer

Parameter	Value
Device Type	4202
Model	003
Emulated Device Type	5224
Auxiliary Printer	Yes
Attachment	1
Line Speed (baud rate)	1
Parity	1
Word Length (bits)	1
Stop Bits	1
Print Quality	Standard

¹ Must match display station settings

Appendix C. Suggested Settings for Modems

This appendix provides suggested settings for the modems supported by the AS/400 system.

The method for adjusting settings may vary by the modem type. Always consult your modem book for specific information regarding the setting adjustments.

General Modem Settings

Some display stations require data set ready (DSR) and/or data carrier detect (DCD) to be active before they will operate properly. For these displays, DSR and DCD must be configured as active on the display modem before the telephone line connection is established. The display modem must drive these lines active before the connection is established. The display stations that require these settings include:

- IBM 3101
- TeleVideo 955
- Dasher D220

The display setup and system configuration considerations include the following:

- The attachment should be either modem or PTT as described in "System Configuration Considerations" on page 2-16.
- The line speed (baud rate) must be set to the speed supported by the modem.
- The following settings should be set as described in this section:
 - Parity
 - Word length
 - Stop bits

Figure C-1 shows the general settings for modems.

Figure C-1. General Modem Settings

Setting	System Modem	Display/PC Modem
Async Mode	Yes	Yes
Auto Answer	Yes	No
Command Recognition	No/Dumb	Yes/Smart
Auto Dial	N/A	Yes
RJ11 Jack	Yes	Yes
Result Code/Command Echo	Disable	Enable
Hang up on DTR Transition	Yes	Yes
Hang up on DTR Transition	Yes	Yes
DCD Track Carrier	Yes	Yes
XON/XOFF Flow Control ¹	Yes	Yes
CTS/RTS Flow Control ¹	Yes	Yes
DSR Normal RS-232 Operation	Yes	Yes

¹ For modems that have the capability, configure them to support both XON/XOFF and RTS/CTS flow control simultaneously.

If modems do not have the capability, the following applies:

- Modems attached to PCs running PC support should always be configured for CTS/RTS flow control.
- Models attached to Display Stations should be configured for XON/OFF flow control.

IBM 5811 and IBM 5812 Modems

For 4-wire point-to-point link, use the following settings for both primary modems:

Switch Settings (SW1)

<u>SWA</u>			<u>SWB</u>		
1	Down	(Asynchronous)	1	Down	(Receive impedance)
2	Up	(Asynchronous)	2	Up	(150 ohms)
3	Up	(Control/primary)	3	Up	(Not used)
4	Down	(Point-to-point)	4	Down	(No LPDA-1)
5	Up	(Asynchronous)	5	Down	(No LPDA-1)
6	Down	(19,200 Bps)	6	Up	(Antistreaming disabled)
7	Down	(19,200 Bps)	7	Up	(Not used)
8	Down	(19,200 Bps)	8	Down	(Transmit impedance B9 and B10)
9	Up	(4-wire data link)	9	Down	(Transmit impedance)
10	Up	(RTS/RFS short delay)	10	Up	(150 ohms)

Figure C-2. Suggested Configuration Parameters for an IBM 5811 or IBM 5812 Modem

Parameter	Value
Attachment	See note
Line Speed (Baud Rate)	19200
Parity	EVEN
Word Length (Bits)	8
Stop Bits	1

Note: The attachment type should be determined from the information as described in “System Configuration Considerations” on page 2-16.

IBM 5841 Modem

Hardware Switches

The switches on the back of the modem should be set as follows:

Switch Settings (SW1)

1	On	(RSLD from remote modem)
2	On	(Configuration not reset with loss of DSR)
3	On	(N/A)
4	On	(Asynchronous mode)
5	On	(DTR from DTE)
6	On	(N/A)
7	Off	(DTE RTS, CTS=DCE ready to send)
8	Off	(MODEM DSR = modems connected)

Note: Turn off the power to the modem when setting switches and turn the power back on after switches are set.

Figure C-3. Suggested Configuration Parameters for an IBM 5841

Parameter	Value
Attachment	See Note 1
Line Speed (Baud Rate)	1200 (See Note 2)
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Notes:

1. The attachment type should be determined from the information as described in “System Configuration Considerations” on page 2-16.
2. This modem may be equipped with front panel switches. The switch labeled FS (Full Speed) should be released to operate at this baud rate.

IBM 5842 Modem

Hardware Switches

The switches on the back of the modem should be set as follows:

Switch Settings (SW1)

1	On	(RSLD from remote modem)
2	On	(Configuration not reset with loss of DSR)
3	On	(N/A)
4	On	(Asynchronous mode)
5	On	(DTR from DTE)
6	On	(N/A)
7	Off	(DTE RTS, CTS=DCE ready to send)
8	Off	(MODEM DSR = modems connected)

Note: Turn the power to the modem off when setting switches and turn the power back on after the switches are set.

Figure C-4. Suggested Configuration Parameters for an IBM 5842

Parameter	Value
Attachment	See Note 1
Line Speed (Baud Rate)	2400 (See Note 2)
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Notes:

1. The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.
 2. This modem may be equipped with front panel switches. The switch labeled FS (Full Speed) should be released to operate at this baud rate.
-

IBM 5853 Modem

Hardware Switches

Switch Settings (SW1)

1	On	(Change to non-ECL on error conditions)
2	On	(Configuration not reset with loss of DTR)
3	Off	(Modems do not control data flow between themselves)
4	On	(Modem's DTE speed = modem's telephone line speed)
5	Off	(Modem uses ready for sending lead to control data flow)
6	On	(Carrier detected lead represents carrier on the line)
7	On	(Modem's RFS lead on = modem ready for sending and CTS on)
8	On	(Modem's DSR lead on represents modem connected condition)

Note: Turn the power to the modem off when setting switches and turn the power back on after the switches are set.

Figure C-5. Suggested Configuration Parameters for an IBM 5853

Parameter	Value
Attachment	See Note 1
Line Speed (Baud Rate)	2400 (See Note 2)
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Notes:

1. The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.
 2. This modem may be equipped with front panel switches. The switch labeled FS (Full Speed) should be released to operate at this baud rate.
-

IBM 7855 Modem

The following procedure can be used to set up the IBM 7855 for use with the ASCII Work Station Controller.

The IBM 7855 can be programmed via AT commands issued from a display station. The IBM 7855 can also be programmed via the buttons on the front of the modem which allow the user to move around a configuration menu.

Configure the modems in either of the following ways:

- The following table includes the AT commands which should be issued to each of the IBM 7855 modems (except where noted for the *AS/400 system modem only*).
- Alternatively, the buttons may be used to program the IBM 7855 modem as described in the *IBM 7855 Guide to Operations*. The LCD messages which appear are included in the following table. For any changes which may be made in the display format or sequence of these messages, see the *IBM 7855 Guide to Operations*.

Figure C-6 (Page 1 of 3). IBM 7855 Recommended Settings

AT Command	Function	7855 LCD Display
AT&F1	Retrieve AT factory profile	<ul style="list-style-type: none"> • First setup • Asynchronous AT
AT&C1	RLSD active when connection established	<ul style="list-style-type: none"> • Total customize • DTE interface • Signals • From 7855 to DTE • RLSD (109) • RLSD On..CONNECT
AT&S1	DSR active when connection established	<ul style="list-style-type: none"> • Total customize • DTE interface • Signals • From 7855 to DTE • DSR (107) PSN • DSR On...CONNECT
ATY1	Disconnect when hook	<ul style="list-style-type: none"> • Total customize • Telco interface • Adaptation • PSN • Disconnect • To Telco line • Call End..REMOTE
AT&R3	RFS control - delay	<ul style="list-style-type: none"> • Total customize • DTE interface • Signals • From 7855 to DTE • RFS (106) PSN • RFS On...DELAY
AT&I1	Report DTE speed	<ul style="list-style-type: none"> • Total customize • DTE interface • Commands, results • Async speed message • Rate used...DTE
ATA3	ECL block size - 256	<ul style="list-style-type: none"> • Total customize • ECL control • Operating • Compression..YES • Block size...256
ATC2	ECL startup	<ul style="list-style-type: none"> • Total customize • ECL control • Starting • ECL start...AUTO • Accepted.CONNECT • Forced abort..NO
ATK3	Break control	<ul style="list-style-type: none"> • Total customize • DTE interface • Signals • Break signals • From DTE....SLOW • From Telco..SLOW

Figure C-6 (Page 2 of 3). IBM 7855 Recommended Settings

AT Command	Function	7855 LCD Display
ATM14	DTE interface speed -19.2K	<ul style="list-style-type: none"> • Total customize • DTE interface • Async DTE speed • DTE Speed..19200
AT&AP8	Telco speed - 12000	<ul style="list-style-type: none"> • Total customize • Telco interface • PSN Telco speed • PSN bps 12000 TC
ATN3	ECL startup - Auto	<ul style="list-style-type: none"> • Total customize • ECL control • Starting • ECL start...AUTO
ATIR1	Flow control - DTE uses XOFF/XON	<ul style="list-style-type: none"> • Total customize • DTE interface • DataFlow control • To stop 7855 • DTE using...CHAR
AT&Bwp1	Set line parameters w = Wordlength (7 or 8) p = Parity (EOSMN)	<ul style="list-style-type: none"> • Total customize • DTE interface • Datatype • Idle/Data...ASYN • ASYNC Format.wp1
ATV0	ECL result messages disabled	<ul style="list-style-type: none"> • Total customize • DTE interface • Commands, results • ECL messages • Messages.....OFF
AT%E1	Retrain control enabled	<ul style="list-style-type: none"> • Total customize • Telco interface • Automatic change • Retrain • Retrain....SHORT
ATIQ3	Use both RTS/CTS and XOFF/XON to stop DTE	<ul style="list-style-type: none"> • Total customize • DTE interface • Data flow control • To stop DTE • 7855 using...both
ATE0	Character echo disabled (AS/400 system modem only)	<ul style="list-style-type: none"> • Total customize • DTE interface • Commands, results • Async cmd echo • Cmd echo.....OFF
ATQ1	Result Code Messages disabled (AS/400 system modem only)	<ul style="list-style-type: none"> • Total customize • DTE interface • Commands, results • Messages • Messages.....OFF
AT&W0	Store configuration - Profile 0	<ul style="list-style-type: none"> • <Exit Enter> • Remain unlocked • Save profile 0

Figure C-6 (Page 3 of 3). IBM 7855 Recommended Settings

AT Command	Function	7855 LCD Display
AT&Y0	Powerup profile - Profile 0	<ul style="list-style-type: none"> • First setup • Power on profile • Profile....NVM 0

Figure C-7. Suggested Configuration Parameters for an IBM 7855

Parameter	Value
Attachment	Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.
Line Speed (Baud Rate)	19,200
Parity	NONE
Word Length (Bits)	8
Stop Bits	1

Cermetek Spectrum 9600 FR Series

The switches on the back of the modem should be set as follows:

Switch Settings

1	Up	Asynchronous
2	Up	N/A
3	Up	Disables international calling tone
4	Up	Selects internal clocking
5	Up	Selects AT commands
6	Down	Connects in error control mode
7	Up	8 data bits
8	Up	8 data bits
9	Up	PSTN operation
10	Down	Factory set – Do not change
11	Up	Trellis forward error control
12	Down	2-wire operation
13	Down	DC1/DC3 (XON/XOFF) flow control
14	Up	DC1/DC3 (XON/XOFF) flow control
15	Up	Disables MI/MIC function
16	Down	Reserved
17	Down	Disables local analog loopback test
18	Down	Disables local digital loopback test
19	Down	Disables self test
20	Down	Disables remote digital loopback test
21	Up	DTR follows RS-232 operation
22	Up	DSR follows RS-232 operation
23	Up	RTS follows RS-232 operation
24	Up	DCD follows RS-232 operation

Option Settings through Display Stations

Send the following commands to the modem through the displays keyboard (all other settings should be set to the factory default):

Figure C-8. System Modem Settings

Command	Function
ATEO	Disables character echo in command state
ATQ1	Disables status messages

Figure C-9. Display Modem Settings

Command	Function
ATE1	Enables character echo in command state
ATQ0	Enables status messages

Figure C-10. Suggested Configuration Parameters for Cermetek Spectrum Modem 9600 FR Series Modem

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	9600
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

Concord 224 Autodial Modem

Set switches SW1-7 and SW1-8 to ON. Set all other switches to OFF. These settings provide 7 data bit operation plus a parity bit or 8 data bit operation without a parity bit.

Figure C-11. Suggested Configuration Parameters for a Concord Data System 224 Autodial Modem

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	2400
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

Hayes Smartmodem 1200

Switch Settings (SW1)

1	Up	(Hang up on on-to-off transition of DTR)
2	Up	(Verbose result codes)
3	Up	(Up at system, down at terminal, disable/enable result codes)
4	Down	(Down at system, up at terminal, disable/enable char echo)
5	Up	(Autoanswer)
6	Up	(DCD Lead tracks data carrier from remote modem)
7	Up	(RJ-11/RJ-41S/RS-45S Telco Jack)
8	Up	(Up at WSC, down at terminal, disable/enable command recognition)
9	Up	(Bell 212A mode)
10	Up	(Modem returns to command state on on-to-off of DTR)

The modem automatically detects and adjusts speed and format if autoanswer and autodialing are used.

Figure C-12. Suggested Configuration Parameters for a Hayes Smartmodem 1200

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	1200
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

At 110 or 300 bps, a character format with 8 or 9 data bits is accepted. At 1200 bps, only character formats with 8 data bits are accepted. Valid formats are as follows:

110, 300, and 1200 bps

Parity	Data Bits	Stop Bits
Mark	7	1 or more
Space	7	1 or more
Even	7	1 or more
Odd	7	1 or more
None	7	2 or more
None	8	1 or more

110, 300 bps only

Parity	Data Bits	Stop Bits
Even	8	1 or more
Odd	8	1 or more

Hayes Smartmodem 2400

The following procedure can be used to program the Smartmodem 2400 for auto-answer operation:

1. Program the modem using the following commands (the order of the last three commands is important):

Command	Function
AT&F	(Retrieve the factory configuration)
ATB11	(Bell 212A standard for communication at 1200 bps)
ATL2 ¹	(Medium speaker volume)
ATM1 ¹	(Speaker on until carrier detected)
AT&J0 ¹	(RJ-11/RJ-41S/RS-45S Telco Jack)
AT&L0 ¹	(Dial up operation) (Not supported by some modems)
AT&M0 ¹	(Asynchronous Mode)
AT&C1	(Track presence of data carrier with carrier detect lead)
AT&D2	(Hang up on on-to-off transition of DTR)
AT&S1	(DSR operates according to EIA-232C)
ATS0=1	(Auto answer and answer on first ring)
ATE0	(E0 at system, E1 at terminal, disable/enable char echo)
ATQ1	(Q1 at system, Q0 at terminal, disable/enable result codes)
AT&W	(Storage configuration)

¹ Default option does not have to be set on Hayes modems, but is shown here for other modems with comparable command sets.

2. For the Smartmodem 2400, remove the front cover from the modem and move the strap to the Dumb position on the modem to be attached to the system end of the network.

The modem automatically detects and adjusts speed and format. Valid formats are as follows:

Parity	Data Bits	Stop Bits
Mark	7	1 or more
Space	7	1 or more
Even	7	1 or more
Odd	7	1 or more
None	7	2 or more
None	8	1 or more

Figure C-13. Suggested Configuration Parameters for a Hayes Smartmodem 2400

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	2400
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

Hayes Smartmodem 9600 and Hayes ULTRA Smartmodem 9600

The following procedure can be used to program the Smartmodem 9600 and the ULTRA Smartmodem 9600 for auto-answer operation.

Program the modem using the following commands (the order of the last three commands is important):

Command	Function
AT&F	(Retrieve the factory configuration)
ATL2 ¹	(Medium speaker volume)
ATM1 ¹	(Speaker on until carrier detected)
AT&J0 ¹	(RJ-11/RJ-41S/RS-45S Telco Jack)
AT&L0 ¹	(Dial up operation) (Not supported by some modems)
AT&C1	(Track presence of data carrier with carrier detect lead)
AT&D2	(Hang up on on-to-off transition of DTR)
AT&S1	(DSR operates according to EIA-232C)
ATS0=1	(Auto answer and answer on first ring, system end ONLY)
ATS36=3	(Present constant speed interface, system end ONLY)
ATE0	(E0 at system, E1 at terminal, disable/enable char echo)
ATQ1	(Q1 at system, Q0 at terminal, disable/enable result codes)
AT&W	(Storage configuration)

¹ Default option does not have to be set on Hayes modems, but is shown here for other modems with comparable command sets.

The modem automatically detects and adjusts speed and format. Valid formats are as follows:

Parity	Data Bits	Stop Bits
Mark	7	1 or more
Space	7	1 or more
Even	7	1 or more

Parity	Data Bits	Stop Bits
Odd	7	1 or more
None	7	2 or more
None	8	1 or more

Figure C-14. Suggested Configuration Parameters for Hayes Smartmodem 9600 and Hayes ULTRA Smartmodem 9600

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	19200
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

Microcom AX/2400/C, AX/9624/C and QX/4232/HS

The following procedure can be used to program the Microcom modems for auto-answer operation:

1. To set up the Microcom to accept AT commands, do the following:
 - a. Remove the front faceplate and set switch number 2 to the Down position.
 - b. Set all switches at the rear of the modem to the Up position.
 - c. Replace the front faceplate and press the reset button on the rear of the modem.
2. Program the modem using the following commands (the order of the last three commands is important):

Command	Function
AT&F	(Retrieve the factory configuration)
ATM11	(Speaker on until carrier detected)
AT&M01	(Asynchronous mode)
AT&C1	(Track presence of data carrier with carrier detect lead)
AT&D2	(Hang up on on-to-off transition of DTR)
AT&S1	(DSR operates according to EIA-232C)
ATS0=1	(Auto answer and answer on first ring)
AT\J0	(Present constant speed interface)
AT%Bn	(Set modem speed at n BPS; where n = 2400, 4800, or 9600)
AT%C1	(Enable data compression)
ATN3	(Set auto-reliable mode)

Command	Function
ATV1	(V0 at system, V1 at terminal, disable/enable MNP return codes)
AT\Q2	(DTE hardware flow control)
AT&W	(Storage configuration)

¹ Default option does not have to be set on Microcom modems, but is shown here for other modems with comparable command sets.

Note: When using a Microcom modem for Client Access/400, specify the line speed at which the modem is operating by entering the following line in the CONFIG.PCS file (replacing NNNN with the appropriate line speed):

SWAR CONNECT NNNN/REL

The modem automatically detects and adjusts speed and format. Valid formats are:

Parity	Data Bits	Stop Bits
Mark	7	1 or more
Space	7	1 or more
Even	7	1 or more
Odd	7	1 or more
None	7	2 or more
None	8	1 or more

Figure C-15. Suggested Configuration Parameters for a Microcom AX/2400/C

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	2400
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

Racal-Vadic 2400PA Modem

Set the options as indicated.

Options	Setting
01 Standard options	2 Disabled
02 DSR control	3 DSR normal
03 CXR control	1 CXR normal (True Carrier)
04 Auto answer	1 Enabled
05 Local copy	1 Enabled
06 Dial mode	1 Automatic selection

Options		Setting	
07	Blind dial	1	Disabled
08	Call progress	1	Enabled
09	Response mode	1	Full words
10	Character length	1	10 bits (7 data bits with parity or 8 data bits without parity)
11	Disconnect control	1	Enabled
12	Overspeed control	1	Disabled
13	Control clock	1	Disabled
14	Async/sync	1	Asynchronous mode
15	Auto redial	1	No redial
16	Speed select	1	Disabled
17	Flow control	2	XON/XOFF
18	Speed conversion	1	Disabled
19	Error control mode	1	Automatic
20	Error control protocol	1	Originate side start
21	CTS control	2	CTS follows CXR (Carrier)

Note: Options may differ on some models. Consult your modem book and the display modem options.

Figure C-16. Suggested Configuration Parameters for a Racal-Vadic 2400PA Modem

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	2400
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

Telebit T2000

The following procedure can be used to program the Telebit T2000 for auto-answer operation:

1. Program the modem using the following commands (the order of the last three commands is important):

AT Command	Enhanced	Function
AT&F	AT~&F	(Retrieve the factory configuration)
AT&C1	-----	(Track presence of data carrier with carrier detect lead)
AT&D2	ATS52=1	(Hang up on on-to-off transition of DTR)
AT&S1	ATS53=2	(DSR operates according to EIA-232C)
AT&K3	ATS58=2	(Enable hardware flow control)
ATS0=1	ATS0=1	(Auto answer and answer on first ring, system end ONLY)
ATS37=9	ATS50=0	(enable 'PEP' mode)

AT Command	Enhanced	Function
----	ATS66=1	(Constant interface speed, system end ONLY)
----	ATS51=5	(Set DTE interface speed to 19200, system end ONLY)
----	ATS110=1	(enable 'PEP' Data Compression)
ATX3	ATX3	(enable 'PEP' result codes, Terminal ONLY)
ATE0	ATE0	(E0 at system, E1 at terminal, disable/enable char echo)
ATQ1	ATQ1	(Q1 at system, Q0 at terminal, disable/enable result codes)
AT&W	AT&W	(Storage configuration)

The modem automatically detects and adjusts speed and format. Valid formats are as follows:

Parity	Data Bits	Stop Bits
Mark	7	1 or more
Space	7	1 or more
Even	7	1 or more
Odd	7	1 or more
None	7	2 or more
None	8	1 or more

Figure C-17. Suggested Configuration Parameters for a Telebit T2000

Parameter	Value
Attachment	See Note
Line Speed (Baud Rate)	19200
Parity	EVEN
Word Length (Bits)	7
Stop Bits	1

Note: The attachment type should be determined from the information as described in "System Configuration Considerations" on page 2-16.

Appendix D. IBM Keyboard Reference Chart

The following is a keyboard chart that applies to all IBM ASCII display station keyboards supported by the AS/400 system, except the keyboard for the IBM 3101 display station. It can be placed on the IBM ASCII keyboards and used as a keyboard template. Complete lists of key sequences for each of the supported IBM display station keyboards are in the keyboard tables in Appendix E.

For other ASCII display stations supported by the AS/400 system, it is recommended that the users create their own keyboard templates, using the IBM keyboard chart as an example. Specific information for each supported ASCII keyboard is in the keyboard tables in Appendix E.

ATTN	CTRL A	FIELD +	ESC +	CLEAR	CLEAR
BACKSPACE	BACKSPACE	FIELD -	ESC - or ESC M	HEX MODE	ESC \ (grave accent)
CURSOR UP	↑	FIELD EXIT	RETURN	TEST REQ	CTRL T
CURSOR DN	↓	FIELD MARK	CTRL F	F1-F12	F1-F12
CURSOR LEFT	←	HELP	ESC ?	F13-F24	SHIFT F1-F12 (not 3151 MODEL 11)
CURSOR RIGHT	→	HOME	HOME		
CURSOR SELECT	↔	INSERT	INSERT (INSLN on 3164)		
DELETE	CTRL C	NEW LINE	LF (CTRL RETURN)		
DUP	DELETE	PA1-PA3	PA1-PA3		
ENTER	CTRL D	PRINT	CTRL P (PRINT on 3151, 3162)		
ERASE EOF	SEND	ROLL ↓	ESC CTRL D		
	ERASE EOF	ROLL ↑	ESC CTRL U		
	or CTRL E	SYS REQ	ESC S		
ERASE INP	ERASE INP	→	TAB →		
ERROR RESET	ESC R or CTRL R	←	←TAB		
	(RESET on 3151 and 3162)				
				<u>AS/400 LOCAL FUNCTIONS</u>	
				SCREEN REFRESH	ESC CTRL A
				KEYBOARD INDICATORS ON/OFF	ESC CTRL W
				DISPLAY STATION DISCONNECT	ESC CTRL R

RV2F905-0

Figure D-1. IBM Keyboard Chart

Appendix E. Supported Keyboard Maps

This appendix lists how AS/400 functions are mapped on the ASCII display station keyboards supported on the AS/400 system.

Mapping Table Arrangements

The tables are presented in the following format:

- Each keyboard is identified by the type of the supported ASCII display station.
- There is a separate section for each supported ASCII display station. These sections are arranged in alphabetical order by manufacturer and, when there is more than one type by a manufacturer, in numeric order by type number.

Personal computers running on the AS/400 ASCII Work Station Controller require the use of an emulation program, and the mapping is the same as that provided for the ASCII display station being emulated. For more information, see the *Client Access/400 for DOS Ext Memory User Guide*.

- Each section presents the following three tables for each keyboard:

- AS/400 basic functions, such as Help, Backspace, and cursor movement keys.

The table shows the AS/400 basic functions and the key or key sequences to press on the ASCII keyboard for the given AS/400 basic function.

- AS/400 OfficeVision text editing functions, such as tab, word underline, and top of page.

The table shows the AS/400 text functions and the key or key sequences to press on the ASCII keyboard for the given AS/400 text function.

- Display station local functions, such as turning status indicators on or off. The local functions only affect the display station; they have no effect on the AS/400 system or on other users.

The table shows the local functions and the key or key sequences to press on the ASCII keyboard for the given display station local function.

Mapping Table Notations

Note the following when using the keyboard mapping tables or preparing your own keyboard template and reference chart from the provided keyboard mapping tables:

- Alternative key sequences are listed if more than one ASCII key sequence can be used for a function.
- The following format is used for ASCII key sequences:
 - Alphabetic characters shown in lowercase must be entered as lowercase. Alphabetic characters shown in uppercase may be entered either as uppercase or lowercase, unless uppercase only is specifically indicated.
 - If separate keys must be pressed and released for a given key sequence, those keys are separated by a space. For example, the key sequence ESC M is entered by first pressing and releasing the ESC key, and then pressing and releasing the key for the character M.
 - If one key must be held down at the same time that another key is pressed, those keys are separated by a slash (/). For example, the key sequence CTRL/D is entered by pressing and holding the CTRL key, and then pressing the key for the character D.
 - Some single ASCII keys in the table are described with more than one word. ASCII keys shown in the table in parentheses represent a single ASCII key rather than an ASCII key sequence. For example, (Up Arrow) is the single ASCII key with an upward arrow on it.

See Appendix D, “IBM Keyboard Reference Chart,” for an example of a keyboard reference chart if one is needed for your keyboard.

See the user’s manual for each display station if detailed information is required for the character codes of each listed ASCII key or key sequence.

Displaying Mapping Tables

The work station customization function of the AS/400 system allows a user to display and customize the device mapping tables used for a particular ASCII display station. The table that maps ASCII keyboard functions into AS/400 keyboard functions is one of these tables.

The RTVWSCST (Retrieve Work Station Customizing Object Source) command can be used to retrieve device mapping table data for a given type of ASCII display. The retrieved mapping table data is placed in a source file member. The mapping table information can then be viewed and changed using AS/400 source entry utility (SEU) which is an application development tool. This tool is used to create and change source members.

The ASCII keyboard-to-AS/400 keyboard function mapping information is contained in the source file member as hexadecimal character codes. Refer to the *Workstation Customization Programming* book for complete information on the RTVWSCST command and the mapping table data.

Keyboard Mapping for the IBM 3101 Display Station (Basic Functions)

Figure E-1. Keyboard Mapping of AS/400 Basic Functions for IBM 3101

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	ALT/A	Test	ALT/T or ESC T
Backspace	Backspace	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	ESC 1 or PF1
Cursor Left	(Left Arrow)	F2	ESC 2 or PF2
Cursor Right	(Right Arrow)	F3	ESC 3 or PF3
Cursor Select	ALT/C	F4	ESC 4 or PF4
Delete	DEL	F5	ESC 5 or PF5
Duplicate	ALT/D	F6	ESC 6 or PF6
Enter	(New Line)	F7	ESC 7 or PF7
Erase EOF	ALT/E	F8	ESC 8 or PF8
Erase Input	ESC I	F9	ESC 9
Error Reset	ALT/R or ESC R	F10	ESC 0
Field +	ESC P	F11	ESC -
Field -	ESC M	F12	ESC =
Field Exit	ESC (New Line)	F13	ESC !
Field Mark	ALT/F	F14	ESC @
Help	ESC ?	F15	ESC #
Home	ESC H (Uppercase only)	F16	ESC \$
Insert	ESC DEL	F17	ESC %
New Line	ALT/J or ESC J	F18	ESC (circumflex accent)
PA1	ESC ESC 1	F19	ESC &
PA2	ESC ESC 2	F20	ESC *
PA3	ESC ESC 3	F21	ESC (
Print	ALT/P	F22	ESC)
Page Up (Roll Down)	ESC ALT/D	F23	ESC -
Page Down (Roll Up)	ESC ALT/U	F24	ESC +
SYS REQ	ESC S		
Field Advance	→		
Field Backspace	ESC →		
Clear	Clear		

Keyboard Mapping for the IBM 3101 Display Station (Text Functions)

Figure E-2. Keyboard Mapping of AS/400 Text Functions for IBM 3101

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC →	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC ESC (New Line)	Beginning of Line	ESC ESC (Left Arrow)
REQ Carrier RTRN	See Field Exit	End of Line	ESC ESC (Right Arrow)
TAB	See Field Advance		
Back TAB	See Field Backspace		
Forward TAB	ESC ESC ESC →		

Keyboard Mapping for the IBM 3101 Display Station (Local Functions)

Figure E-3. Keyboard Mapping of AS/400 Local Functions for IBM 3101

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC ALT/A	XOFF	ALT/S
Turn Indicators On or Off	ESC ALT/W	XON	ALT/Q
Display Station Disconnect	ESC ALT/R		

Keyboard Mapping for IBM 3151 and IBM 3162 Display Stations (Basic Functions)

Figure E-4. Keyboard Mapping of Basic Functions for IBM 3151 and IBM 3162

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	CTRL/A	Test	CTRL/T or ESC T
Backspace	(Back Space)	HEX	ESC grave accent
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	F1
Cursor Left	(Left Arrow)	F2	F2
Cursor Right	(Right Arrow)	F3	F3
Cursor Select	CTRL/C	F4	F4
Delete	Delete	F5	F5
Duplicate	CTRL/D	F6	F6
Enter	Send or Enter	F7	F7
Erase EOF	ERASE EOF or CTRL/E	F8	F8
Erase Input	(Erase Input)	F9	F9
Error Reset	Reset	F10	F10
Field +	ESC +	F11	F11
Field -	ESC - or ESC M	F12	F12
Field Exit	Return	F13	Shift/F11
Field Mark	CTRL/F	F14	Shift/F21
Help	ESC ?	F15	Shift/F31
Home	Home	F16	Shift/F41
Insert	Insert	F17	Shift/F51
New Line	LF	F18	Shift/F61
PA11	PA11 or ESC P1	F19	Shift/F71
PA21	PA11 or ESC P2	F20	Shift/F81
PA31	PA11 or ESC P3	F21	Shift/F91
Print	Print	F22	Shift/F101
Page Up (Roll Down)	ESC CTRL/D	F23	Shift/F111
Page Down (Roll Up)	ESC CTRL/U	F24	Shift/F121
SYS REQ	ESC S		
Field Advance	TAB →		
Field Backspace	← TAB		
Clear	Clear		

¹ IBM 3151 Models 31 and 41 only.

Keyboard Mapping for IBM 3151 and IBM 3162 Display Stations (Text Functions)

Figure E-5. Keyboard Mapping of Text Functions for IBM 3151 and IBM 3162

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB →	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P	Display Symbols	ESC ESC Home
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H	Bottom of Page	ESC ESC (Down Arrow)
End	ESC ESC J	Beginning of Line	ESC ESC (Left Arrow)
Carrier Return	ESC ESC Return	End of Line	ESC ESC (Right Arrow)
REQ Carrier RTRN	See Field Exit		
TAB	See Field Advance		
Back TAB	See Field Backspace		
Forward TAB	ESC ESC ESC TAB →		

Keyboard Mapping for IBM 3151 and IBM 3162 Display Stations (Local Functions)

Figure E-6. Keyboard Mapping of Local Functions for IBM 3151 and IBM 3162

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the IBM 3151 Model 11 Display Station (F13 through F24)

For F13 through F24 on 3151 Model 11, press ESC ESC, followed by the characters shown in Figure E-7 for each country.

	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24
France	1	2	3	4	5	6	7	8	9	0	°	-
Germany	!	"	\$	\$	%	&	/	()	=	?	~
Canadian (French)	!	"	/	\$	%	?	&	*	()	-	+
Italy	!	"	£	\$	%	&	/	()	=	?	^
Spain	!	"	middle dot	\$	%	&	/	()	=	?	¿
UK	!	"	£	\$	%	&	'	()	#	=	—
Belgium	1	2	3	4	5	6	7	8	9	0	°	-
Denmark	!	"	#	intl money	%	&	/	()	=	?	~
Finland	!	"	#	intl money	%	&	/	()	=	?	~
Norway	!	"	#	intl money	%	&	/	()	=	?	~
Portugal	!	"	#	\$	%	&	/	()	=	?	»
Swiss (French)	+	"	*	31014dh%	%	&	/	()	=	?	~
Swiss (German)	+	"	*	31014dh%	%	&	/	()	=	?	~
US	!	@	#	\$	%	^	&	*	()	-	+

Figure E-7. Keyboard Mapping of F13 through F24 for IBM 3151 Model 11

Keyboard Mapping for IBM 3161 and IBM 3163 Display Stations (Basic Functions)

Figure E-8. Keyboard Mapping of Basic Functions for IBM 3161 and IBM 3163

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	CTRL/A	Test	CTRL/T or ESC T
Backspace	Backspace	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	F1
Cursor Left	(Left Arrow)	F2	F2
Cursor Right	(Right Arrow)	F3	F3
Cursor Select	CTRL/C	F4	F4
Delete	Delete	F5	F5
Duplicate	CTRL/D	F6	F6
Enter	Send or Enter	F7	F7
Erase EOF	Erase EOF or CTRL/E	F8	F8
Erase Input	Erase Input	F9	F9
Error Reset	CTRL/R or ESC R	F10	F10
Field +	ESC +	F11	F11
Field -	ESC - or ESC M	F12	F12
Field Exit	Return	F13	Shift/F1
Field Mark	CTRL/F	F14	Shift/F2
Help	ESC ?	F15	Shift/F3
Home	Home	F16	Shift/F4
Insert	Insert or (INS LN) ¹	F17	Shift/F5
New Line	LF	F18	Shift/F6
PA1	PA1	F19	Shift/F7
PA2	PA2	F20	Shift/F8
PA3	PA3	F21	Shift/F9
Print	CTRL/P	F22	Shift/F10
Page Up (Roll Down)	ESC CTRL/D	F23	Shift/F11
Page Down (Roll Up)	ESC CTRL/U	F24	Shift/F12
SYS REQ	ESC S		
Field Advance	TAB →		
Field Backspace	← TAB		
Clear	Clear		

¹ IBM 3161 only.

Keyboard Mapping for IBM 3161 and IBM 3163 Display Stations (Text Functions)

Figure E-9. Keyboard Mapping of Text Functions for IBM 3161 and IBM 3163

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB →	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P	Display Symbols	ESC ESC Home
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H	Bottom of Page	ESC ESC (Down Arrow)
End	ESC ESC J	Beginning of Line	ESC ESC (Left Arrow)
Carrier Return	ESC ESC Return	End of Line	ESC ESC (Right Arrow)
REQ Carrier RTRN	See Field Exit		
TAB	See Field Advance		
Back TAB	See Field Backspace		
Forward TAB	ESC ESC ESC TAB →		

Keyboard Mapping for IBM 3161 and IBM 3163 Display Stations (Local Functions)

Figure E-10. Keyboard Mapping of Local Functions for IBM 3161 and IBM 3163

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the IBM 3164 Display Station (Basic Functions)

Figure E-11. Keyboard Mapping of Basic Functions for IBM 3164

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	CTRL/A	Test	CTRL/T or ESC T
Backspace	(Backspace)	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	F1
Cursor Left	(Left Arrow)	F2	F2
Cursor Right	(Right Arrow)	F3	F3
Cursor Select	CRTL/C	F4	F4
Delete	Delete	F5	F5
Duplicate	CTRL/D	F6	F6
Enter	Send or Enter	F7	F7
Erase EOF	ERASE EOF or CTRL/E	F8	F8
Erase Input	(Erase Input)	F9	F9
Error Reset	CTRL/R or ESC R	F10	F10
Field +	ESC +	F11	F11
Field -	ESC - or ESC M	F12	F12
Field Exit	Return	F13	Shift/F1
Field Mark	CTRL/F	F14	Shift/F2
Help	ESC ?	F15	Shift/F3
Home	Home	F16	Shift/F4
Insert	(INS LN)	F17	Shift/F5
New Line	LF	F18	Shift/F6
PA1	PA1	F19	Shift/F7
PA2	PA2	F20	Shift/F8
PA3	PA3	F21	Shift/F9
Print	CTRL/P	F22	Shift/F10
Page Up (Roll Down)	ESC CTRL/D	F23	Shift/F11
Page Down (Roll Up)	ESC CTRL/U	F24	Shift/F12
SYS REQ	ESC S		
Field Advance	TAB →		
Field Backspace	← TAB		
Clear	Clear		

Keyboard Mapping for the IBM 3164 Display Station (Text Functions)

Figure E-12. Keyboard Mapping of Text Functions for IBM 3164

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB →	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P	Display Symbols	ESC ESC Home
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H	Bottom of Page	ESC ESC (Down Arrow)
End	ESC ESC J	Beginning of Line	ESC ESC (Left Arrow)
Carrier Return	ESC ESC Return	End of Line	ESC ESC (Right Arrow)
REQ Carrier RTRN	See Field Exit		
TAB	See Field Advance		
Back TAB	See Field Backspace		
Forward TAB	ESC ESC ESC TAB →		

Keyboard Mapping for the IBM 3164 Display Station (Local Functions)

Figure E-13. Keyboard Mapping of Local Functions for IBM 3164

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the DEC VT 100 Display Station (Basic Functions)

Figure E-14. Keyboard Mapping of Basic Functions for DEC VT 100

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	CTRL/A or ESC A	Test	ESC T or CTRL/T
Backspace	(Backspace)	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	ESC 1
Cursor Left	(Left Arrow)	F2	ESC 2
Cursor Right	(Right Arrow)	F3	ESC 3
Cursor Select	CTRL/C	F4	ESC 4
Delete	DEL	F5	ESC 5
Duplicate	CTRL/D	F6	ESC 6
Enter	Return or Enter	F7	ESC 7
Erase EOF	CTRL/E	F8	ESC 8
Erase Input	ESC I	F9	ESC 9
Error Reset	CTRL/R or ESC R	F10	ESC 0
Field +	ESC P	F11	ESC -
Field -	ESC M	F12	ESC =
Field Exit	(Line Feed)	F13	ESC !
Field Mark	CTRL/F	F14	ESC @
Help	ESC h or ESC ?	F15	ESC #
Home	ESC H (uppercase only)	F16	ESC \$
Insert	ESC DEL	F17	ESC %
New Line	ESC (Line Feed) or ESC RTN	F18	ESC (Circumflex accent)
PA1	ESC ESC 1	F19	ESC &
PA2	ESC ESC 2	F20	ESC *
PA3	ESC ESC 3	F21	ESC (
Print	CTRL/P	F22	ESC)
Page Up (Roll Down)	ESC D	F23	ESC -
Page Down (Roll Up)	ESC U	F24	ESC +
SYS REQ	ESC S		
Field Advance	TAB		
Field Backspace	ESC TAB		
Clear	ESC L or CTRL/L		

Keyboard Mapping for the DEC VT 100 Display Station (Text Functions)

Figure E-15. Keyboard Mapping of Text Functions for DEC VT 100

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC (Line Feed)		
REQ Carrier RTRN	See Field Exit	Beginning of Line	ESC ESC (Left Arrow)
TAB	See Field Advance		
Back TAB	See Field Backspace	End of Line	ESC ESC (Right Arrow)
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for the DEC VT 100 Display Station (Local Functions)

Figure E-16. Keyboard Mapping of Local Functions for DEC VT 100

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the DEC VT 220 Display Station (Basic Functions)

Figure E-17. Keyboard Mapping of Basic Functions for DEC VT 220

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	CTRL/A	Test	ESC T or CTRL T
Backspace	F12	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	ESC 1 or PF1
Cursor Left	(Left Arrow)	F2	ESC 2 or PF2
Cursor Right	(Right Arrow)	F3	ESC 3 or PF3
Cursor Select	CTRL/C	F4	ESC 4 or PF4
Delete	DEL	F5	ESC 5
Duplicate	CTRL/D	F6	ESC 6
Enter	Return or Enter	F7	ESC 7
Erase EOF	CTRL/E	F8	ESC 8
Erase Input	ESC I	F9	ESC 9
Error Reset	CTRL/R or ESC R	F10	ESC 0
Field +	ESC P	F11	ESC -
Field -	ESC M	F12	ESC =
Field Exit	F13	F13	ESC !
Field Mark	CTRL/F	F14	ESC @
Help	ESC h or ESC ?	F15	ESC #
Home	ESC H (uppercase only)	F16	ESC \$
Insert	ESC DEL	F17	ESC %
New Line	ESC F13 or ESC RETURN	F18	ESC (circumflex accent)
PA1	ESC F1 or ESC ESC 1	F19	ESC &
PA2	ESC F2 or ESC ESC 2	F20	ESC *
PA3	ESC F3 or ESC ESC 3	F21	ESC (
Print	CTRL/P	F22	ESC)
Page Up (Roll Down)	ESC CTRL/D	F23	ESC -
Page Down (Roll Up)	ESC CTRL/U	F24	ESC +
SYS REQ	ESC S		
Field Advance	TAB		
Field Backspace	ESC TAB		
Clear	ESC L or CTRL/L		

Keyboard Mapping for the DEC VT 220 Display Station (Text Functions)

Figure E-18. Keyboard Mapping of Text Functions for DEC VT 220

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC F13		
REQ Carrier RTRN	See Field Exit	Beginning of Line	ESC ESC (Left Arrow)
TAB	See Field Advance		
Back TAB	See Field Backspace	End of Line	ESC ESC (Right Arrow)
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for the DEC VT 220 Display Station (Local Functions)

Figure E-19. Keyboard Mapping of Local Functions for DEC VT 220

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the TeleVideo 910 Display Station (Basic Functions)

Figure E-20. Keyboard Mapping of Basic Functions for TeleVideo 910

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	ESC A	Test	ESC T or CTRL/T
Backspace	ESC (Backspace)	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	ESC 1 or FUNCT/1
Cursor Left	(Left Arrow)	F2	ESC 2 or FUNCT/2
Cursor Right	(Right Arrow)	F3	ESC 3 or FUNCT/3
Cursor Select	CTRL/C	F4	ESC 4 or FUNCT/4
Delete	DEL	F5	ESC 5 or FUNCT/5
Duplicate	CTRL/D	F6	ESC 6 or FUNCT/6
Enter	Return or Enter	F7	ESC 7 or FUNCT/7
Erase EOF	CTRL/E	F8	ESC 8 or FUNCT/8
Erase Input	ESC Y	F9	ESC 9 or FUNCT/9
Error Reset	CTRL/R or ESC R	F10	ESC 0
Field +	ESC P	F11	ESC -
Field -	ESC M	F12	ESC =
Field Exit	ESC (Line Feed)	F13	ESC !
Field Mark	CTRL/F	F14	ESC @
Help	ESC h or ESC ?	F15	ESC #
Home	Home	F16	ESC \$
Insert	ESC DEL	F17	ESC %
New Line	ESC RTN	F18	ESC (circumflex accent)
PA1	ESC ESC 1	F19	ESC &
PA2	ESC ESC 2	F20	ESC *
PA3	ESC ESC 3	F21	ESC (
Print	CTRL/P	F22	ESC)
Page Up (Roll Down)	ESC D	F23	ESC -
Page Down (Roll Up)	ESC U or ESC (Up Arrow)	F24	ESC +
SYS REQ	ESC S		
Field Advance	TAB		
Field Backspace	(Back Tab)		
Clear	(Clear Space)		

Keyboard Mapping for the TeleVideo 910 Display Station (Text Functions)

Figure E-21. Keyboard Mapping of Text Functions for TeleVideo 910

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC ESC		
	Line Feed	Beginning of Line	ESC ESC (Left Arrow)
REQ Carrier RTRN	See Field Exit		
TAB	See Field Advance	End of Line	ESC ESC (Right Arrow)
Back TAB	See Field Backspace		
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for the TeleVideo 910 Display Station (Local Functions)

Figure E-22. Keyboard Mapping of Local Functions for TeleVideo 910

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the TeleVideo 925 Display Station (Basic Functions)

Figure E-23. Keyboard Mapping of Basic Functions for TeleVideo 925

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	ESC A	Test	CTRL/T or ESC T
Backspace	ESC (Left Arrow)	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)	F1	F1
Cursor Down	(Down Arrow)	F2	F2
Cursor Left	(Left Arrow)	F3	F3
Cursor Right	(Right Arrow)	F4	F4
Cursor Select	CTRL/C	F5	F5
Delete	DEL or (CHAR Delete)	F6	F6
Duplicate	CTRL/D	F7	F7
Enter	Return or Enter	F8	F8
Erase EOF	CTRL/E	F9	F9
Erase Input	(Page Erase)	F10	F10
Error Reset	CTRL/R or ESC R	F11	F11
Field +	CTRL/P	F12	ESC =
Field -	ESC M	F13	ESC ! or Shift/F1
Field Exit	(Line Feed)	F14	ESC @ or Shift/F2
Field Mark	CTRL/F	F15	ESC # or Shift/F3
Help	ESC h or ESC ?	F16	ESC \$ or Shift/F4
Home	Home	F17	ESC % or Shift/F5
Insert	(CHAR INS)	F18	ESC (circumflex accent) or Shift/F6
New Line	EXC Return or EXC (Line Feed)	F19	ESC & or Shift/F7
PA1	ESC ESC 1	F20	ESC * or Shift/F8
PA2	ESC ESC 2	F21	ESC (or Shift/F9
PA3	ESC ESC 3	F22	ESC) or Shift/F10
Print	Print	F23	ESC - or Shift/F11
Page Up (Roll Down)	ESC D or ESC (Down Arrow)	F24	ESC +
Page Down (Roll Up)	ESC U or ESC (Up Arrow)		
SYS REQ	ESC S		
Field Advance	TAB		
Field Backspace	(Back TAB)		
Clear	(Clear Space)		

Keyboard Mapping for the TeleVideo 925 Display Station (Text Functions)

Figure E-24. Keyboard Mapping of Text Functions for TeleVideo 925

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC (Line Feed)		
REQ Carrier RTRN	See Field Exit	Beginning of Line	ESC ESC (Left Arrow)
TAB	See Field Advance		
Back TAB	See Field Backspace	End of Line	ESC ESC (Right Arrow)
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for the TeleVideo 925 Display Station (Local Functions)

Figure E-25. Keyboard Mapping of Local Functions for TeleVideo 925

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the TeleVideo 955 Display Station (Basic Functions)

Figure E-26. Keyboard Mapping of Basic Functions for TeleVideo 955

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	ESC A	Test	ESC T or CTRL/T
Backspace	ESC (Left Arrow)	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	F1
Cursor Left	(Left Arrow)	F2	F2
Cursor Right	(Right Arrow)	F3	F3
Cursor Select	CTRL/C	F4	F4
Delete	DEL or (CHAR DEL)	F5	F5
Duplicate	CTRL/D	F6	F6
Enter	Return or Enter	F7	F7
Erase EOF	CTRL/E	F8	F8
Erase Input	(Page Erase)	F9	F9
Error Reset	CTRL/R or ESC R	F10	F10
Field +	CTRL/P	F11	F11
Field -	ESC M or ESC -	F12	F12
Field Exit	(Line Feed)	F13	Shift/F1 or F13
Field Mark	CTRL/F	F14	Shift/F2 or F14
Help	ESC h or ESC ?	F15	Shift/F3 or F15
Home	Home	F16	Shift/F4 or F16
Insert	(CHAR Insert)	F17	Shift/F5
New Line	ESC Return or ESC (Line Feed)	F18	Shift/F6
PA1	ESC ESC 1	F19	Shift/F7
PA2	ESC ESC 2	F20	Shift/F8
PA3	ESC ESC 3	F21	Shift/F9
Print	Print	F22	Shift/F10
Page Up (Roll Down)	ESC D or ESC (Down Arrow)	F23	Shift/F11
Page Down (Roll Up)	ESC U or ESC (Up Arrow)	F24	Shift/F12
SYS REQ	ESC S		
Field Advance	TAB		
Field Backspace	(Back TAB)		
Clear	(Clear Space)		

Keyboard Mapping for the TeleVideo 955 Display Station (Text Functions)

Figure E-27. Keyboard Mapping of Text Functions for TeleVideo 955

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC (Line Feed)		
REQ Carrier RTRN	See Field Exit	Beginning of Line	ESC ESC (Left Arrow)
TAB	See Field Advance		
Back TAB	See Field Backspace	End of Line	ESC ESC (Right Arrow)
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for the TeleVideo 955 Display Station (Local Functions)

Figure E-28. Keyboard Mapping of Local Functions for TeleVideo 955

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the Wyse WY30 Display Station (Basic Functions)

Figure E-29. Keyboard Mapping of Basic Functions for Wyse WY30

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	ESC A	Test	CTRL/T
Backspace	ESC (Left Arrow)	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	FUNCT/1
Cursor Left	(Left Arrow)	F2	FUNCT/2
Cursor Right	(Right Arrow)	F3	FUNCT/3
Cursor Select	CTRL/C	F4	FUNCT/4
Delete	(DEL CHAR)	F5	FUNCT/5
Duplicate	CTRL/D	F6	FUNCT/6
Enter	Return or Enter	F7	FUNCT/7
Erase EOF	CTRL/E	F8	FUNCT/8
Erase Input	(CLR LINE) or ESC I	F9	FUNCT/9
Error Reset	CTRL/R or ESC R	F10	FUNCT/0
Field +	ESC P	F11	FUNCT/-
Field -	ESC M or ESC -	F12	FUNCT/=
Field Exit	ESC (Line Feed)	F13	FUNCT/q
Field Mark	CTRL/F	F14	FUNCT/w
Help	ESC h or ESC ?	F15	FUNCT/e
Home	Home	F16	FUNCT/r
Insert	(INS CHAR)	F17	FUNCT/t
New Line	ESC Return	F18	FUNCT/y
PA1	ESC ESC 1	F19	FUNCT/u
PA2	ESC ESC 2	F20	FUNCT/i
PA3	ESC ESC 3	F21	FUNCT/o
Print	CTRL/P	F22	FUNCT/p
Page Up (Roll Down)	(Down Arrow Page) or ESC D	F23	FUNCT/[
Page Down (Roll Up)	(Up Arrow Page) or ESC U or ESC (Up Arrow)	F24	FUNCT/]
SYS REQ	ESC S		
Field Advance	TAB		
Field Backspace	ESC TAB		
Clear	(Clear Page)		

Keyboard Mapping for the Wyse WY30 Display Station (Text Functions)

Figure E-30. Keyboard Mapping of Text Functions for Wyse WY30

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC		
	ESC (Line Feed)	Beginning of Line	ESC ESC (Left Arrow)
REQ Carrier RTRN	See Field Exit		
TAB	See Field Advance	End of Line	ESC ESC (Right Arrow)
Back TAB	See Field Backspace		
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for the Wyse WY30 Display Station (Local Functions)

Figure E-31. Keyboard Mapping of Local Functions for Wyse WY30

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for Wyse WY50 and Wyse WY60 Display Stations (Basic Functions)

Figure E-32. Keyboard Mapping of Basic Functions for Wyse WY50 and WY60

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
ATTN	ESC A	Test	ESC T or CTRL/T
Backspace	ESC (Left Arrow)	HEX	ESC (grave accent)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	F1
Cursor Left	(Left Arrow)	F2	F2
Cursor Right	(Right Arrow)	F3	F3
Cursor Select	CTRL/C	F4	F4
Delete	DEL or (CHAR DEL)	F5	F5
Duplicate	CTRL/D	F6	F6
Enter	Return or Enter	F7	F7
Erase EOF	CTRL/E	F8	F8
Erase Input	(DEL Line)	F9	F9
Error Reset	CTRL/R	F10	F10
Field +	CTRL/P	F11	F11
Field -	ESC M or ESC -	F12	F12
Field Exit	ESC (Down Arrow)	F13	F13 or Shift/F1
Field Mark	CTRL/F	F14	F14 or Shift/F2
Help	ESC h or ESC ?	F15	F15 or Shift/F3
Home	Home	F16	F16 or Shift/F4
Insert	(INS CHAR)	F17	Shift/F5
New Line	ESC Return	F18	Shift/F6
PA1	ESC ESC 1	F19	Shift/F7
PA2	ESC ESC 2	F20	Shift/F8
PA3	ESC ESC 3	F21	Shift/F9
Print	Print	F22	Shift/F10
Page Up (Roll Down)	(Prev Page) or ESC D	F23	Shift/F11
Page Down (Roll Up)	(Next Page) or ESC U or ESC (Up Arrow)	F24	Shift/F12
SYS REQ	ESC S		
Field Advance	TAB		
Field Backspace	ESC TAB		
Clear	(CLR SCRN)		

Keyboard Mapping for Wyse WY50 and Wyse WY60 Display Stations (Text Functions)

Figure E-33. Keyboard Mapping of Text Functions for Wyse WY50 and Wyse WY60

AS/400 Text Functions	ASCII Keys	AS/400 Text Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underline	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underline	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H		
End	ESC ESC J	Bottom of Page	ESC ESC (Down Arrow)
Carrier Return	ESC ESC		
	ESC (Down Arrow)	Beginning of Line	ESC ESC (Left Arrow)
REQ Carrier RTRN	See Field Exit		
TAB	See Field Advance	End of Line	ESC ESC (Right Arrow)
Back TAB	See Field Backspace		
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for Wyse WY50 and Wyse WY60 Display Stations (Local Functions)

Figure E-34. Keyboard Mapping of Text Functions for Wyse WY50 and Wyse WY60

AS/400 Function	ASCII Keys	AS/400 Function	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XON	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Keyboard Mapping for the Dasher D220 Display Station (Basic Functions)

Figure E-35. Keyboard Mapping of Basic Functions for Dasher D220

Functions	ASCII Keys	Functions	ASCII Keys
ATTN	CTRL/A	Test	ESC T or CTRL/T
Backspace	CTRL/B	HEX	ESC (single opening quotation mark)
Cursor Up	(Up Arrow)		
Cursor Down	(Down Arrow)	F1	ESC 1 or F1
Cursor Left	(Left Arrow)	F2	ESC 2 or F2
Cursor Right	(Right Arrow)	F3	ESC 3 or F3
Cursor Select	CTRL/C	F4	ESC 4 or F4
Delete	DEL	F5	ESC 5 or F5
Duplicate	CTRL/D	F6	ESC 6 or F6
Enter	(New Line)	F7	ESC 7 or F7
Erase EOF	CTRL/E	F8	ESC 8 or F8
Erase Input	(Erase EOL) or ESC I	F9	ESC 9 or F9
Error Reset	CTRL/R or ESC R	F10	ESC 0 or F10
Field +	ESC P	F11	ESC - or F11
Field -	ESC M	F12	ESC = or F12
Field Exit	CR	F13	ESC !, F13, or Shift/F1
Field Mark	CTRL/F	F14	ESC @, F14, or Shift/F2
Help	ESC ?	F15	ESC #, F15, or Shift/F3
Home	Home	F16	ESC \$ or Shift/F4
Insert	ESC DEL	F17	ESC % or Shift/F5
New Line	ESC (New Line)	F18	ESC ^ or Shift/F6
PA1	ESC ESC 1	F19	ESC & or Shift/F7
PA2	ESC ESC 2	F20	ESC * or Shift/F8
PA3	ESC ESC 3	F21	ESC (or Shift/F9
Print	CTRL/P	F22	ESC) or Shift/F10
Roll Down (Page Up)	ESC D or C3	F23	ESC _ or Shift/F11
Roll Up (Page Down)	ESC U or C1	F24	ESC + or Shift/12
SYS REQ	ESC S		
Field Advance	Tab		
Field Backspace	ESC Tab		
Clear	ESC L or (Erase Page)		

Keyboard Mapping for the Dasher D220 Display Station (Text Functions)

Figure E-36. Keyboard Mapping of Text Functions for Dasher D220

Functions	ASCII Keys	Functions	ASCII Keys
Required TAB	ESC ESC TAB	Center	ESC ESC C
Word Underscore	ESC ESC W	Bold	ESC ESC B
1/2 Index Up	ESC ESC Y	Next Stop Code	ESC ESC N
Begin Underscore	ESC ESC U	Required Space	ESC ESC Space
Page End	ESC ESC P		
Stop Code	ESC ESC S	Top of Page	ESC ESC (Up Arrow)
1/2 Index Down	ESC ESC H	Bottom of Page	ESC ESC (Down Arrow)
End	ESC ESC J		
Carrier Return	ESC ESC CR		
Req Carrier Return	See Field Exit	Beginning of Line	ESC ESC (Left Arrow)
TAB	See Field Advance		
Back TAB	See Field Backspace	End of Line	ESC ESC (Right Arrow)
Forward TAB	ESC ESC ESC TAB		

Keyboard Mapping for the Dasher D220 Display Station (Local Functions)

Figure E-37. Keyboard Mapping of Local Functions for Dasher D220

Functions	ASCII Keys	AS/400 Functions	ASCII Keys
Refresh Screen	ESC CTRL/A	XOFF	CTRL/S
Turn Indicators On or Off	ESC CTRL/W	XOFF	CTRL/Q
Display Station Disconnect	ESC CTRL/R		

Appendix F. EBCDIC to ASCII Character Translations

The ASCII Work Station Controller translates EBCDIC character codes into ASCII character codes depending on the device type, language, and keyboard type selected during device configuration. This also determines the translation of ASCII character codes into EBCDIC for data entered from the keyboard of an ASCII display station.

In some cases, not all characters in the EBCDIC character set will exist in a given ASCII character set. If a given EBCDIC character also exists in the ASCII character set, that character will be translated into the same character in the ASCII character set. If a character in the EBCDIC character set is not in the ASCII character set, that character will be translated into either a substitute graphic character or into a space.

Figure F-1 on page F-2 lists those EBCDIC characters that will be translated into substitute characters. For each such character, the table shows the EBCDIC code (in the multinational EBCDIC code page), the substitute character, and the United States ASCII code for that substitute character.

Any EBCDIC character that is not listed in Figure F-1 on page F-2 and that is not in a given ASCII character set will be translated into a space character (ASCII code hex 20).

The work station customizing functions of the AS/400 system enable the user to modify the EBCDIC to ASCII character translations used for a given display. A user can also separately modify the translation done for character data entered from the keyboard of an ASCII display (ASCII to EBCDIC character translations). Refer to "Customizing Work Stations Attached to an ASCII Work Station Controller" on page 3-15 for further information on the work station customizing functions.

Figure F-1 (Page 1 of 2). EBCDIC to ASCII Substitute Character Mapping

EBCDIC Code (Hex)	Graphic	U.S. ASCII Code (Hex)	ASCII Substitute Graphic
1C	Dup	2A	ASCII asterisk
42	a circumflex small (â)	61	ASCII a
43	a diaeresis small (ä)	61	ASCII a
44	a grave small (à)	61	ASCII a
45	a acute small (á)	61	ASCII a
46	a tilde small (ã)	61	ASCII a
47	a overcircle small (å)	61	ASCII a
48	c cedilla small (ç)	63	ASCII c
49	n tilde small (ñ)	6E	ASCII n
51	e acute small (é)	65	ASCII e
52	e circumflex small (ê)	65	ASCII e
53	e diaeresis small (ë)	65	ASCII e
54	e grave small (è)	65	ASCII e
55	i acute small (í)	69	ASCII i
56	i circumflex small (î)	69	ASCII i
57	i diaeresis small (ï)	69	ASCII i
58	i grave small (ì)	69	ASCII i
62	A circumflex capital (Â)	41	ASCII A
63	A diaeresis capital (Ä)	41	ASCII A
64	A grave capital (À)	41	ASCII A
65	A acute capital (Á)	41	ASCII A
66	A tilde capital (Ã)	41	ASCII A
67	A overcircle capital (Å)	41	ASCII A
68	C cedilla capital (Ç)	43	ASCII C
69	N tilde capital (Ñ)	4E	ASCII N
71	E acute capital (É)	45	ASCII E
72	E circumflex capital (Ê)	45	ASCII E
73	E diaeresis capital (Ë)	45	ASCII E
74	E grave capital (È)	45	ASCII E
75	I acute capital (Í)	49	ASCII I
76	I circumflex capital (Î)	49	ASCII I
77	I diaeresis capital (Ï)	49	ASCII I
78	I grave capital (Ì)	49	ASCII I
8D	y acute small	79	ASCII y
AA	Exclamation point inverted (¡)	21	ASCII exclamation point
AB	Question mark inverted (¿)	3F	ASCII question mark
B8	One half (½)	2B	ASCII plus (+)

Figure F-1 (Page 2 of 2). EBCDIC to ASCII Substitute Character Mapping

EBCDIC Code (Hex)	Graphic	U.S. ASCII Code (Hex)	ASCII Substitute Graphic
BE	Acute accent	27	ASCII apostrophe
CB	o circumflex small (ô)	6F	ASCII o
CC	o diaeresis small (ö)	6F	ASCII o
CD	o grave small (ò)	6F	ASCII o
CE	o acute small (ó)	6F	ASCII o
CF	o tilde small (õ)	6F	ASCII o
DB	u circumflex small (û)	75	ASCII u
DC	u diaeresis small (ü)	75	ASCII u
DD	u grave small (ù)	75	ASCII u
DE	u acute small (ú)	75	ASCII u
DF	y diaeresis small (ÿ)	79	ASCII y
EB	O circumflex capital (Ô)	4F	ASCII O
EC	O diaeresis capital (Ö)	4F	ASCII O
ED	O grave capital (Ò)	4F	ASCII O
EE	O acute capital (Ó)	4F	ASCII O
EF	O tilde capital (Õ)	4F	ASCII O
FB	U circumflex capital (Û)	55	ASCII U
FC	U diaeresis capital (Ü)	55	ASCII U
FD	U grave capital (Ù)	55	ASCII U
FE	U acute capital (Ú)	55	ASCII U

Appendix G. Level of ASCII Display Stations Tested

The following are the levels of information for the display stations tested with the ASCII Work Station Controller.

DEC VT100	User's Guide, 3rd Edition June 1981
DEC VT220	Owner's Manual, 1st Edition September 1983
TeleVideo 910	TeleVideo No. 200500 Rev D, Copyright TeleVideo Systems Inc; April 1983
TeleVideo 925	B300012-001, Rev B, Copyright TeleVideo Systems Inc; 19 May 1982
TeleVideo 955	Display Operator's Manual, Document 131969-00, 15 March 1985
Wyse WY30	User's Guide, June 1985
Wyse WY50	11-83 Preliminary Publication, 01-84 Initial Publication, Copyright 1983
Wyse WY60	User's Guide, September 1986
Dasher D220	User's Manual Rev 01, October 1984, Copyright Data General Corporation, 1983

Appendix H. Forms

This appendix contains all the forms for recording the information you need to configure the ASCII Work Station Controller and the ASCII work stations attached to the controller. You may need several copies of these forms, depending on the number of devices attached to your system. Use the forms included here as your originals. Make copies of them and record the device configuration specifications on the copies.

The following forms are included in this appendix:

- Form X1, Recording Resource Names
- Form C7, Diagram for Devices Attached without a Modem to the ASCII Work Station Controller (Part 1)
- Form C7, Diagram for Devices Attached with a Modem to the ASCII Work Station Controller (Part 2)
- Form D3, ASCII Work Station Controller Index

X1

Recording Resource Names

Lines

Line Name	Location/Card Slot	Resource Name

Work Station Controllers

Controller Name	Location/Card Slot	Resource Name

Tape Controllers

Controller Name	Serial Number	Resource Name

Tape and Diskette Units

Device Name	Serial Number	Resource Name

Note: You may copy as necessary.

RSLH505-5

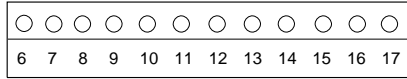
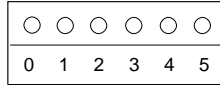
C7 Diagram for Devices Attached without a Modem to the ASCII Work Station Controller (Part 1)

System _____ Controller Description Name _____

Service for Cabling _____ Controller Type _____

Telephone Number _____ Controller Model _____

Port Diagram



Port Number

Port Number

Port Number

Port Number

Location				
Telephone Number				
Device Name				
Device Type, Model				
Emulated Device Type				
Attachment ^{1,2,4}				
Line Speed ^{1,2}				
Word Length ^{1,2}				
Parity ^{1,2}				
Stop Bits ^{1,2}				
Auxiliary Printer				

Auxiliary Printer ³

Location				
Device Name				
Device Type, Model				
Emulated Device Type				

1 This parameter must also match the parameters configured on the system for the device on this port.
 2 Refer to the *ASCII Work Station Reference* for additional settings that are required on the device.
 3 The configuration values on the system for this printer must match that of the display station that it attaches to. The recommended physical settings for this printer is that of the display station it attaches to.
 4 This setting may be referred to as 'interface' on the display station or printer setup parameters.

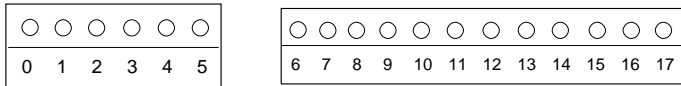
Note: You may copy as necessary.

C7 Diagram for Devices Attached with a Modem to the ASCII Work Station Controller (Part 2)

Page Number _____

System _____ Controller Description Name _____
 Service for Cabling _____ Controller Type _____
 Telephone Number _____ Controller Model _____

Port Diagram



Port Number

Port Number

Port Number

Port Number

Modem 1 (Local)

Location				
Telephone Number				
Modem Type, Model				

Modem 2 (Remote)

Location				
Telephone Number				
Modem Type, Model				

Display Station ³

Location				
Telephone Number				
Device Name				
Device Type, Model				
Emulated Device Type				
Attachment ^{1,2,4}				
Line Speed ^{1,2}				
Word Length ^{1,2}				
Parity ^{1,2}				
Stop Bits ^{1,2}				
Auxiliary Printer				

Auxiliary Printer ³

Location				
Device Name				
Device Type, Model				
Emulated Device Type				

¹ This parameter must also match the parameters configured on the system for the device on this port.
² Refer to the *ASCII Work Station Reference* for additional settings that are required on the device.
³ The configuration values on the system for this printer must match that of the display station that it attaches to. The recommended physical settings for this printer is that of the display station it attaches to.
⁴ This setting may be referred to as 'interface' on the display station or printer setup parameters.

Note: You may copy as necessary.

RV2X006-0

D3 ASCII Work Station Controller Index

System _____ **Card Address** _____ **Work Station Controller Name** _____
Service for Cabling _____ **Location of ASCII 6-Port Work Station Attachment** _____ **Controller Type** _____
Telephone Number _____ **Location of ASCII 12-Port Work Station Attachment** _____ **Controller Model** _____

Cabling Choices:

- EIA-422
- EIA-232 3-Wire
- EIA-232 4-Wire
- EIA-232 Modem
- EIA-232 PTT
- EIA-232 Direct

Ports	Type of Cabling/ Attachment	Your Form C7 Page Number
0	-----	-----
1	-----	-----
2	-----	-----
3	-----	-----
4	-----	-----
5	-----	-----

Ports	Type of Cabling/ Attachment	Your Form C7 Page Number
6	-----	-----
7	-----	-----
8	-----	-----
9	-----	-----
10	-----	-----
11	-----	-----
12	-----	-----
13	-----	-----
14	-----	-----
15	-----	-----
16	-----	-----
17	-----	-----

Note: Only 18 work stations can be active at one time.

Note: You may copy as necessary.

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Appendix I. 3812 Printer Emulation

This appendix describes the processing for emulation of the IBM 3812 SCS printer. Because the 3812 data stream is an extension of the IBM 5219 data stream, just the processing that is in addition to or different from the existing 5219 emulation is described here. The most significant variation from 5219 emulation is the automatic page orientation recalculation and Computer Output Reduction (COR) functions. Both of these are discussed in detail.

Supported ASCII Printers

At the time of configuration, the user specifies the printer type and the specific emulation. The ASCII Work Station Controller supports the following ASCII printers with 3812 emulation:

- IBM 4019
- IBM 4029
- IBM 4072
- IBM 4216
- IBM 5204

Page Orientation Recalculation and Computer Output Reduction

The 3812 incorporates an algorithm into its basic data stream processing that allows output page formats from the host, that would not otherwise fit on a narrow piece of paper, to be changed. It allows the host to send data to a narrow carriage printer instead of a wide carriage printer. The algorithm may cause the paper to rotate and the settings, such as LPI and CPI, to be reduced. The automatic reduction of settings is known as Computer Output Reduction (COR). Information on how the settings are reduced in COR is discussed later in this appendix.

Page Orientation Recalculation Algorithm

A subset of the page orientation recalculation algorithm used in an IBM 3812 printer is implemented in the 3812 emulation. This subset assumes 8 1/2 by 11-inch paper in the first two source drawers of the ASCII printers. The algorithm used is one of the following:

- If the page orientation has been explicitly set by a Set Text Orientation (STO) since the last Set Initial Conditions (SIC) and last STO with the default parameter, or if envelopes (that use a fixed orientation) are selected, that explicit orientation is always used. No automatic rotation or reduction is allowed.
- There are two cases based on the page presentation surface size compared to the usable, physical paper size. (The page presentation surface size is the page width and page depth set up by the data stream and is referred to as the page size. The usable physical paper size is 8 1/2 by 11 inches, minus any printer-specific required margins, and is known as the paper size.)
 - If the page size is less than or equal to the paper size, the page can be printed without any reduction in normal portrait or right landscape format. For example, if the page size fits on the paper in portrait format, then portrait is used. Otherwise, landscape format is used if the page rotation function is available on the attached ASCII printer.

- If the page size is larger than the paper size in the available page orientations, the quality parameter (Q) which can be specified by the PPM control is checked. For example, if the value of Q is 2 or 3, then normal portrait format is used, and COR is not allowed.

Otherwise, Q=1 and COR mode is entered. COR is entered in right landscape format if the page depth is less than the page width and if the rotation function is available on the ASCII printer. Otherwise, portrait format is used in COR.

Various controls may trigger the page orientation recalculation algorithm. A list of the controls follow:

- SIC** Set Initial Conditions: Causes recalculation based on the initial settings of the environment, data processing (DP) or word processing (WP).
- STO** Set Text Orientation: Causes recalculation (if necessary) based on the STO parameter specified.
- PPM** Page Presentation Media: Causes recalculation based on a new form type (such as paper instead of envelopes), a new paper size (different source drawer selection), or a new quality setting.
- SPPS** Set Presentation Page Size: Causes recalculation based on a new page size.
- SHF** Set Horizontal Format: If received on a page boundary, causes recalculation based on a new page width.
- SVF** Set Vertical Format: If received on a page boundary, causes recalculation based on a new page depth.
- SCD** Set Character Density: If received on a page boundary, causes recalculation based on new page width.
- SFG** Set FID (Font ID) through GFID (Global Font ID): If received on a page boundary, causes recalculation based on new page width.
- SLD** Set Line Distance: If received on a page boundary when auto-new-page is active, causes recalculation based on a new page depth.
- SSLD** Set Single Line Distance: If received on a page boundary when auto-new-page is active, causes recalculation based on a new page depth.

Computer Output Reduction (COR)

The 3812 emulation COR differs from an IBM 3812 printer's COR in some areas. A description of the COR for the 3812 emulation follows.

The objective of COR is to allow the page size specified by the data stream to fit on the paper size. This is accomplished by reducing the CPI or the LPI and by adjusting the various other settings accordingly. Because the host does not know that the 3812 is in COR mode, all the settings changed on entering COR are restored on exiting COR. In addition, if settings are modified during COR by their respective controls, they are usually adjusted for immediate use in COR, and their unchanged values are also saved for restoring on exit from COR.

In COR, right landscape format is used if the page depth is less than the page width and if the page rotation function is available on the ASCII printer.

Horizontal Settings: If the page width already fits on the paper in the selected COR orientation, the horizontal parameters are not adjusted. If the page width does not fit, the following happens:

- **Font Width:** Because the maximum print position (MPP, which is the page width divided by the font width) characters at the current font width do not fit on the paper, the largest resident monospaced font width supported by the attached printer which does not fit on the paper at the current MPP value in the COR orientation is used. If no resident font width is small enough, the smallest available width is used. The following settings are adjusted accordingly:
 - **Left Margin:** The left margin is scaled so that the number of characters to the left margin is the same in COR as it was before COR.
 - **Right Margin:** The right margin is scaled so that the number of characters to the right margin is the same in COR as it was before COR.
 - **Right Edge:** The right edge for justification is scaled so that the number of characters to the right edge is the same in COR as it was before COR.
 - **Tab Stops:** All tab stops are scaled so that the number of characters to each tab stop is the same in COR as it was before COR.
- **Page Width:** The page width is set to the font width used in COR multiplied by the MPP value. This new page width fits on the paper size in the COR orientation.

Vertical Settings: If the page depth already fits on the paper in the selected COR orientation, no adjustment of vertical settings is done. Otherwise, the page depth does not fit, and the following is done:

- **Line Distance:** MPL (the page depth divided by the line distance) lines at the current line distance do not fit on the paper; therefore, the largest line distance which fits on the paper at the current MPL value in the COR orientation is used. The following setting is adjusted accordingly:
 - **Top Margin:** The top margin is scaled so that the number of lines in the top margin is the same in COR as it was before COR.
- **Page Depth:** The page depth is set to the line spacing used in COR multiplied by the MPL value. This new page depth fits on the paper size in the COR orientation.

Since the printer settings used in COR are scaled and do not necessarily reflect the settings which the host has specified, many of the controls which specify these settings function differently in COR. The following controls fall into this category:

- Set Character Distance (SCD)
- Set FID (Font ID) through GFID (Global Font ID) (SFG)
- Set Line Distance (SLD)
- Set Single Line Distance (SSLD)
- Set Horizontal Margin (SHM)
- Set Vertical Margin (SVM)
- Justify Text Field (JTF)
- Set Horizontal Tab Stops (STAB)

Data Stream Protocols

The 3812 emulation program supports the same 5250 Data Stream controls as the IBM 3812 SCS printer. Note that the controls are not always supported in the same way as an IBM 3812 printer. This is described in the following sections.

Single-Byte Controls

With the exception of the controls listed below, all single-byte controls supported by the IBM 3812 printer are supported by 3812 emulation. The 3812 emulation controls that differ from the IBM 3812 printer follow:

- Bell/Stop (BEL/STP): This control is completely ignored for both the DP and WP modes.
- Substitute (SUB): The Graphic Exception character set by the DG parameter of the SGEA command for the substitute control. The default DG value is the hyphen.
- Superscript (SPS): The printers do a reverse half-index and use full-height characters.
- Subscript (SBS): The printers do a forward half-index and use full-height characters.
- Backspace and Numeric Backspace (BS and NBS): Backspaces are always allowed to go past the left margin. Also, an additional 2 pels are moved for each uninterrupted group of backspaces, unit backspaces, and absolute horizontal PP controls to produce bold print.
- Unit Backspace (UBS): Unit backspaces are always allowed to go past the left margin. Also, an additional 2 pels are moved for each uninterrupted group of unit backspaces, backspaces, and absolute horizontal PP controls to produce bold print.

Multiple-Byte Controls

With the exception of the controls listed below, multiple-byte controls supported by the IBM 3812 SCS printer are supported by 3812 emulation. The 3812 emulation controls that differ from the IBM 3812 printer follow. These multiple-byte controls have been divided into two categories:

- New Multiple-Byte Controls: Controls that the 5219 does not support.
- Differing Multiple-Byte Controls: Controls that differ from either the 5219 emulation or the 3812 printer implementation of the control.

New Multiple-Byte Controls

The following are the new multiple-byte controls:

- Begin Emphasis (BES) and End Emphasis (EES): BES makes all text bold until an EES or SIC control is received. This control is also supported with 5219 emulation.
 - BES ESC Sequence: 2BD1038Aca.
 - The mandatory parameter **ca** is not used.
 - A missing parameter causes an EC=3, and the control is ignored.
 - EES ESC Sequence: 2BD1nn8Exx.
 - nn = byte length (valid values are 02 or 03).

- xx = optional parameter is not used.
- For both controls, extra parameters cause an EC=2.
- Receiving BES while emphasis is already active results in an EC=1, and emphasis remains active.
- Receiving EES while emphasis is inactive results in an EC=1, and emphasis remains inactive.
- Set Text Orientation (STO): This control can occur any number of times, anywhere on the page. On the IBM 3812 SCS printer, characters are printed at the current print position, left to right, in the new orientation. Supported ASCII printers may have different results if a rotate command is received in the middle of the page. The page can immediately be ejected, and a new page started in the new orientation, or the rotate can be saved until the next page is fed.

For attached printers which have fewer possible orientations than the four supported by the IBM 3812 printer, the nearest orientation is substituted when an unsupported orientation is requested. For example, if left landscape is requested but not supported, right landscape is used (if it is supported). Also, this control defines the physical locations of the top, bottom, right, and left margins of the paper. For example, the top margin is always at the top of the text as you hold the paper to read it, even if you must hold the paper sideways as you do with the landscape format.

- STO ESC Sequence: 2BD306F6ccccpppp.
 - cccc (2 bytes): Character rotation parameter that is not used.
 - pppp (2 bytes): Page rotation parameter.
 - 0000 = normal portrait format (upright text) and exit COR mode.
 - 2D00 = landscape left (270 degree clockwise text rotation) and exit COR mode.
 - 5A00 = portrait upside down (180 degree clockwise text rotation) and exit COR mode.
 - 8700 = landscape right (90 degree clockwise text rotation) and exit COR mode.
 - FFFE = select COR mode for current drawer.
 - FFFF = causes page orientation to be recalculated using the entire recalculation algorithm.
 - OTHER = not valid parameters cause an EC=4, and the STO is ignored.
 - Missing or extra parameters cause an EC=3, in addition to causing the control to be ignored.

Differing Multiple-Byte Controls

The following are the differing multiple-byte controls for 3812 printer emulation:

- Set CGCS (Coded Graphic Character Set) through Local ID (SCGL):
 - The default local ID is 'FF'X.
 - An illegal parameter causes EC=4 with no code page change.
 - Some local IDs (LCIDs) have different meanings than for the 5219, and more LCID values are supported:

- Local ID '00'X selects multi-national code page 500.
 - Local ID '05'X selects Canadian French code page 297.
 - Local ID '0B'X selects Katakana code page 290.
 - Local ID '0D'X selects Spain code page 284.
 - Local ID '18'X selects Greek-Latin code page 423.
 - Local ID '65'X selects New Spanish Word Processing code page 256.
- Set GCGID (Graphic Character Set ID) through GCID (SCG):
 - The GCGID parameter is not used.
 - The CPGID parameter by itself selects the code page, and no validation of GCGID/CPGID pairs is performed. The following code pages are supported:

037	259
273	274
275	277
278	280
281	282
284	285
290	297
330M	340
420	423
424	500
870	871
880	892
893	905
 - In addition, the 3812 emulation automatically maps some CPGIDs into different CPGIDs:
 - Code page 029 is mapped into 871.
 - Code page 030 is mapped into 905.
 - Code page 045 is mapped into 330M.
 - Code page 038 is mapped into 256.
 - Code page 256 is mapped into 500.
 - Code page 257 is mapped into 880.
 - Code page 258 is mapped into 870.
 - Code page 276 is mapped into 297.
 - Code page 279 is mapped into 297.
 - Code page 283 is mapped into 284.
 - An illegal parameter causes an EC=4, and no code page change is done.
 - Set Character Distance (SCD):
 - The CD parameter of SCD controls received during COR is saved and used on exit from COR. The CD parameter specified is also used to select the font in COR if the font width fits on the paper in the COR orientation. Otherwise, the maximum monospaced resident font width supported by the attached printer is selected. If there is no resident font width small enough, the smallest available font width is used.
 - This control encountered on a page boundary causes the page orientation to be recalculated.
 - Set FID (Font ID) through GFID (Global FID), (SFG):
 - GFID parameter has possible values of 1 through X'FFFF'.

- FWD (font width) parameter can have any 2-byte value except for 0.
- FA (font attribute) parameter is used to select proportional fonts and must be specified correctly in the data stream.
- Typographic Fonts (GFID >=512):
 - A typographic font selected during any kind of justification (SJM or JTF, or vice versa) causes an EC=2 and cancels the justify function.
 - The 3812 emulation assumes that the font attribute for typographic fonts is specified correctly in the data stream.
 - The code page is changed to 500, and an ASCII code page is requested on the attached printer.
 - The correct code pages are restored when the font is changed back from a typographic to a non-typographic font. The character set that was originally active before the typographic font is restored unless an SCG or SCGL control has since requested a new code page. In that case, the latest code page requested is restored. The appropriate ASCII code page is also selected on the attached printer.
- In COR mode, the SFG control is ignored, but the parameters are saved, so that when ending COR mode, the font set by this command is selected.
- This control encountered on a page boundary causes the page orientation to be recalculated.
- Set Line Density (SLD):
 - If the LD value specified fits on the paper at the current MPL in the COR orientation, that LD value is used. Otherwise, the maximum LD value (MPL lines that still fit on the paper) in the COR orientation is used.
 - This control encountered on a page boundary with auto-page-end active causes the page orientation to be recalculated.
- Set Single Line Distance (SSLD):
 - The 3812 ignores the control if there is a parameter that is not valid.
 - The LD value is limited to a maximum value of 1700/1440 (or 85/72) to be consistent with the SLD control. This is .85 lpi (lines per inch). Also, it is limited to a minimum of 72 lpi, corresponding to an LD of 20/1440. In COR, if the LD value specified fits on the paper at the current MPL in the COR orientation, that LD value is used. Otherwise, the maximum LD value (MPL lines that still fit on the paper) in the current COR orientation is used.
 - This control encountered on a page boundary with auto-page-end active causes the page orientation to be recalculated.
- Set Line Spacing (SLS):
 - The LS parameter can be anything from 0 to 255. This represents the number of 1/2 lines to be advanced after running a line indexing control (NL, RNL, LF, IRT, IRS).
 - An LS of 0 does not change the current setting.
- Set Print Setup (SPSU):
 - This control is ignored by the 3812 along with all its parameters.
- Set Graphic Error Action (SGEA):

- An incorrect DG value not in the range from '40'X to 'FF'X causes the entire control to be ignored.
- The UCO option of the SGEA command is not used. The default graphic is printed for all missing EBCDIC code points.
- Set Horizontal Format (SHF):
 - This control encountered on a page boundary causes the page orientation to be recalculated.
- Set Vertical Format (SVF):
 - This control encountered on a page boundary causes the page orientation to be recalculated.
 - The MPL parameter is optional. The default MPL value is 66 lines.
- Set Vertical Margins (SVM):
 - If this control is received in COR, the top margin is saved so that it can be restored on exit from COR. It is scaled for immediate use in COR so that the number of lines in the top margin is the same in COR as out of COR.
- Set Horizontal Margins (SHM):
 - If this control is received in COR, the left and right margin parameters are saved so they can be restored on exit from COR. They are also scaled for immediate use in COR so that the number of characters from the left edge to each margin is the same in COR as out of COR.
- Set Initial Conditions (SIC):
 - Text orientation: the page orientation is recalculated according to the DP or WP initial settings and the configured paper size.
 - Emphasis: Bold is made inactive.
 - Code Page: 500 is selected for WP mode instead of 256. The configured language is selected for DP mode.
 - Page Depth: 11 inches (66 lines at 6 LPI) is set for both the DP and WP modes.
 - Page Width: 8.0 inches (96 columns at 12 CPI).
- Set Presentation Page Size (SPPS):
 - The maximum width is 20160 (14 inches) and the maximum depth is 21600 (15.0 inches).
 - Parameters that are not valid cause no change to that parameter.
 - If this control is received during COR, the saved page width and page depth are updated to the specified values.
 - If this control is received on a page boundary (it is only allowed on page boundaries), it causes the page orientation to be recalculated based on the new page width and depth.
- Page Presentation Media (PPM):
 - The FC parameter is optional.
 - FC=2 selects envelopes and changes the page size to 8.5 inches wide by 4.0 inches deep. An SPPS can override this default envelope size, if it is run after the PPM control.

- If envelopes are selected during COR mode, COR is exited immediately.
- The page orientation algorithm is overridden if envelopes are selected. Automatic changes to the orientation and COR mode are not permitted.
- The SD parameter is ignored if envelopes are selected. However, the value is received and stored for future paper selection.
- The DDO parameter is not used.
- The D parameter is not used, but causes an error if >1.
- The Q (Quality) parameter specifies whether COR is allowed, *not* print quality. COR is permitted only if Q=1.
- If this control is received on a page boundary, it causes the page orientation to be recalculated.
- Justify Text Field (JTF):
 - Justification is not allowed with typographic fonts (GFID >= 512). An EC=2 error is detected, and the typographic font takes precedence.
 - JTF is not allowed while SJM is active. The SJM remains active.
 - The percent rule (PR) parameter is not used. The PR value is always 100%.
 - If a JTF is received while in COR mode, the right edge (RE) parameter position is scaled so that the number of characters to the right edge is the same in COR as out of COR.
 - In addition to the text field ending delimiters recognized by the 5219, vertical PP controls are also field ending delimiters.
- Set Justify Mode (SJM):
 - Justification is not allowed with typographic fonts (GFID >= 512) as for the JTF function. An EC=2 error is detected, and the typographic font takes precedence.
 - An *SJM occurring while JTF active* error causes the SJM control to be ignored. The JTF remains active.
 - The 3812 ignores ST parameters that are not valid.
 - The percent rule (PR) parameter is not used. The PR value is always 100%.
- Set Horizontal Tab Stops (STAB):
 - If a STAB is received while in COR mode, and the tab stop type is fixed, the tab stops are immediately scaled so that the number of characters to each tab stop is the same in COR as out of COR. Tab stops are restored to their original value on exit from COR.
- Released Left Margin (RLM):
 - The RLM control is ignored.
- Begin Underscore (BUS):
 - The MODE parameter is ignored.
 - The BYPASS value of '00'X or '01'X underlines all white space including space due to tabs and absolute horizontal PP controls.

- Begin Overstrike (BOS):
 - The CHAR parameter can range from '40'X to 'FF'X.
 - CHAR parameters which are unprintable default to the SGEA Default Graphic (DG) parameter and do not flag exceptions.
- Presentation Position Controls (XXPP):
 - For absolute horizontal PP controls which move to the left, the cursor is offset by two pels to produce bold print when characters are overstruck.
 - Vertical PP controls end justified text fields.

Appendix J. Configuring the ASCII Work Station Controller

If you do not use the AS/400's automatic configuration feature, you will need to create a configuration description for the ASCII work station controller. This appendix explains how to create a configuration description using the menus for local device configuration.

Note: If the console on your system is an ASCII display station, the system uses the controller description, QCTL, and the device description, QCONSOLE, during an attended IPL. You must create your own device and controller description for the console and its work station controller to be used during an IPL if you choose not to use automatic configuration for them.

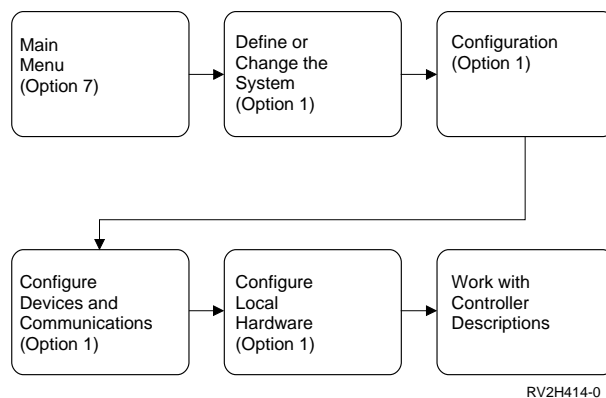
Creating Configuration Descriptions for ASCII Work Station Controllers

For each ASCII Work Station Controller you are configuring on your system, be sure you have completed:

- Form D3, ASCII Work Station Controller Index. List the device and cabling selection for each port on the ASCII attachments connected to the controller.
- Form C7 (Part 1 or Part 2), Diagram for Devices Attached to the ASCII Work Station Controller. List configuration specifications for each device connected to a port on the controller or the ASCII attachments.
- Form X1, Recording Resource Names. List the resource name for each ASCII Work Station Controller you are configuring.

Instructions for filling out these forms are contained Chapter 8, "Completing Forms."

To configure your ASCII Work Station Controllers, use the same menu paths as for local controllers. The following shows the menus and options to select:



1. From the AS/400 Main Menu, select option 7 (Define or change the system). The Define or Change the System menu is shown.
2. From the Define or Change the System menu, select option 1 (Configuration). The Configuration menu is shown.
3. From the Configuration menu, select option 1 (Configure devices and communications). The Configure Devices and Communications menu is shown.

4. From the Configure Devices and Communications menu, select option 1 (Configure local hardware). The Configure Local Hardware menu is shown.
5. From the Configure Local Hardware menu, select option 1 (Work station controllers). The Work with Controller Descriptions display is shown.

The local and ASCII Work Station controller descriptions that have already been created for your system are listed on this display. If this is the first work station controller you are configuring, no work station controller descriptions are listed.

6. From the Work with Controller Descriptions display, press F6 (Create).

The Create Controller Description display is shown. This display asks you for the name of the controller to be configured.

For the controller name, refer to the ASCII Work Station Controller Index, Form D3. The name of the controller is listed at the top with the controller information beside the entry *Work Station Controller Name*.

D3 ASCII Work Station Controller Index

Example

System _____	Card Address _____	Work Station Controller Name <u>CTLO1</u>
Service for Cabling _____	Location of ASCII 6-Port Work Station Attachment _____	Controller Type <u>6141</u>
Telephone Number _____	Location of ASCII 12-Port Work Station Attachment _____	Controller Model <u>1</u>

RSLH595-0

Note: You can also access the Create Controller Description display by using the Work with Hardware Resources (WRKHDWRSC) command.

- Type
WRKHDWRSC *LWS
to work with local work station controllers.
- Select option 7 (Add configuration description) in the option field of the ASCII controller you want to configure.
- When the Create Controller Description display is shown, the controller type/class is already filled in with information detected by the system. Enter the name of your controller.
- When you type your controller name, a list of prompts is shown, with values for the prompts already filled in with information detected by the system. You can accept this information by pressing Enter, or you can change these values. Pressing F10 (Additional parameters) allows you to change the parameters that are not automatically displayed.

7. On the Create Controller Description display, type the controller name at the *New controller description* prompt.
8. Press the Enter key. A list of prompts is shown. Some of these prompts are already filled in. These represent the system defaults. You do not need to change these unless the system defaults do not match your configuration.

Notes:

- a. All of the prompts in the following list may not be shown on the display, depending on the choices you make for the other prompts.
- b. You do not need to press F10. The additional prompts that you need for your configuration are shown automatically.

The following is a description of each prompt and the valid choices.

Controller type	Type the controller type. This should be the number (2637, 6041, or 6141) that is listed at the top of the ASCII Work Station Controller Index, Form D3.
Controller model	Type the model of the work station controller. The model number should be recorded at the top of the ASCII Work Station Controller Index, Form D3.
Resource name	Type the resource name for this ASCII work station controller. The resource name should be recorded on the Recording Resource Names Form, Form X1.
Online at IPL	<p>This entry determines whether or not the ASCII controller description can be automatically used when you do an IPL.</p> <p>Type *YES if you do want to be able to automatically use this controller and the devices attached to it when you do an IPL.</p> <p>Type *NO if you do not want to be able to automatically use this controller and the devices attached to it when you do an IPL.</p>
Device wait timer	<p>This entry specifies the device wait time-out value between the subsystem and the controller. This value is used to limit the amount of time the subsystem waits for an action to complete that does not require a user response. For example, if the subsystem sends a request to a display station to turn on the message-waiting light, and a response to that request is not received before the amount of time specified for this value runs out, the display station is varied off.</p> <p>For user jobs, the <i>Device wait timer</i> prompt is also used. However, an exception is signaled by the work station function manager if a time out occurs. User programs can monitor for this exception and take appropriate action when received.</p> <p>The time-out value specified is used for all ASCII display stations and printers attached to this controller.</p> <p>Type a value, 2 through 600, that specifies the maximum number of seconds that the system is to wait. The default value is 10.</p>
Text description	<p>Type text that briefly describes the controller and its location. It can be up to 50 characters.</p> <p>Leave *BLANK if no text is to be specified.</p>

9. After typing all this information, press the Enter key to create your ASCII Work Station controller description. The Work with Controller Descriptions display is shown.
10. Press F5 to verify that the controller description has been created. The controller description you just completed is shown in the list on this display.

If, for some reason, the controller description cannot be created, an error display is shown. You can correct the entries that are not valid on the error display, or you can go back to the Work with Controller Descriptions display and start over.
11. After you have created your first ASCII work station controller description, you can continue creating other ASCII work station controller descriptions from the Work with Controller Descriptions display by pressing F6.

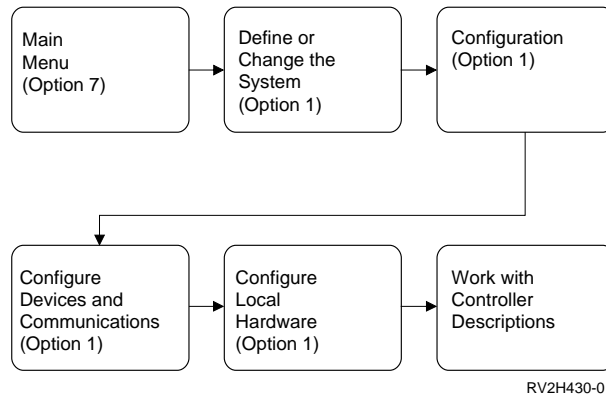
Use the information already filled in on the ASCII Work Station Controller Index, Form D3, and repeat this process for each ASCII Work Station Controller you are configuring.
12. After you have created all your ASCII Work Station Controller descriptions, press F5 to verify that all new descriptions have been added to the list on the Work with Controller Descriptions display. Press F14 to work with status if you want to vary on the controllers. Then, press the Enter key to return to the Configure Local Hardware menu.
13. After you have configured the ASCII Work Station Controllers on your system, create the configuration descriptions for the work stations attached to the ASCII Work Station Controller. Information on how to configure devices attached to the ASCII Work Station Controller is in Chapter 11, "Creating Device Descriptions for ASCII Devices."

Adding an ASCII Work Station Controller

If you are using automatic configuration, configuration descriptions for new ASCII Work Station Controllers are created automatically as controllers are added to the system.

If you are not using automatic configuration, you must create configuration descriptions for new ASCII Work Station Controllers. The procedure for configuring a new ASCII controller is the same as that described in "Creating Configuration Descriptions for ASCII Work Station Controllers" on page J-1. Begin by ensuring that you have the correct information recorded for each new ASCII Work Station Controller on Forms D3, C7, and X1. Instructions for filling out these forms are contained in Chapter 8, "Completing Forms."

To add a new ASCII Work Station Controller, use the menus for local controllers:



1. On the Work with Controller Descriptions display, press F6 (Create).
2. On the Create Controller Description display, type the controller name for the new ASCII controller. For the controller type or class, *LWS is already filled in. Press the Enter key.
3. A list of prompts is shown. (These prompts are described on page J-3.)
 - *Controller type*
 - *Controller model*
 - *Resource name*
 - *Online at IPL*
 - *Device wait timer*
 - *Text description*

Type the specifications for the ASCII work station controller you are configuring as indicated.

Note: Some of the prompts are only shown when you press F10 to display additional prompts.

Moving a Display Station Attached to an ASCII Work Station Controller

If you change the physical location of a display station that is attached to an ASCII Work Station Controller, but do not change the controller port it is attached to, then you do not have to alter the configuration description. However, you *do* have to change the configuration description for the display station if you connect it to a different port on the same work station controller, or connect it to another controller.

If you move the display station to a different port on the same work station controller, you must change the port number in the description of the display station.

If you move the display station to a different work station controller, you must delete the existing display station description, and then create a new one with the new controller name specified. Before deleting the existing description, print a copy of the description to use as a record, or use option 9 (Retrieve source) on the Work with Device Descriptions display to keep a copy of the CL source for the description.

Moving an ASCII Printer Attached to an ASCII Work Station Controller

If you change the physical location of an ASCII printer without changing the port to which it connects on the work station controller, you do not need to alter the configuration description.

However, you *do* need to change the configuration description for an ASCII printer under the following circumstances:

- If you move the printer to a different port on the same work station controller you must change the port number in the configuration description for the printer.
- If the printer was attached to the auxiliary port of an ASCII display station, and after the move will be attached to a port on the ASCII work station attachment, you must delete the existing printer description, and create a new one with a value of *NO in the *Auxiliary printer* prompt.

Before you delete the existing description, print a copy of the description to use as a record. Otherwise, use option 9 (Retrieve source) on the Work with Device Descriptions display to save a copy of the configuration source for the description.

- If the printer was attached to a port on the ASCII work station attachment, and after the move will be attached to the auxiliary port of an ASCII display station, you must delete the existing printer description, and create a new one with a value of *YES in the *Auxiliary printer* prompt.

Before deleting the existing description, print a copy of the description to use as a record. Otherwise, use option 9 (Retrieve source) on the Work with Device Descriptions display to save a copy of the configuration source for the description.

Also, if *YES is specified in the *Auxiliary printer* prompt, the following prompts must match the prompts specified for the ASCII display station this printer is attached to:

- Physical attachment
 - Line speed
 - Word length
 - Type of parity
 - Stop bits
- If you are moving the printer to a different work station controller, you must delete the existing printer description, and create a new one with the new controller name specified.

Before deleting the existing description, print a copy of the description to use as a record. Otherwise, use option 9 (Retrieve source) on the Work with Device Descriptions display to save a copy of the configuration source for the description.

Bibliography

The books below are listed with their full titles and base order numbers.

AS/400 books

The following AS/400 publications are helpful in accomplishing the tasks and understanding the concepts of this book:

- *9404 Models Bxx-Fxx Cable Attachment*, SA41-3133, provides information about attaching ASCII work stations to the AS/400 9402 System Unit.
- *9402 Models 1xx and Axx-Fxx Cable Attachment*, SA41-3132, provides information about attaching ASCII work stations to the 9404 System Unit.
- *9406 Models Bxx-Fxx Cable Attachment*, SA41-3134, provides information about attaching ASCII work stations to the 9406 System Unit.
- *Local Device Configuration*, SC41-3121, presents required work station configuration information.
- *Client Access/400 for DOS Ext Memory Setup*, SC41-3500 and *Client Access/400 for OS/2 Setup*, SC41-3520, present general information on Client Access/400, in addition to information on Client Access/400 asynchronous communications.
- *Client Access/400 for DOS and OS/2 Technical Reference*, SC41-3563, provides detailed information on the Client Access/400 applications.
- *Client Access/400 for DOS Ext Memory User Guide*, SC41-3501, and *Client Access/400 for OS/2 User Guide*, SC41-3521, describe how to use the various Client Access/400 applications.
- *Physical Planning Reference*, SA41-3109, discusses required planning information.
- *System API Reference*, SC41-3801, discusses programming application interfaces.
- *Total System Package Installation*, SA41-3129, discusses required planning information.

- *Printer Device Programming*, SC41-3713, discusses programming and configuration considerations for ASCII printers that use the host print transform function.
- *Workstation Customization Programming*, SC41-3605, discusses customizing work station displays, keyboards, and ASCII printers.

Related Hardware Books

The following publications are helpful in understanding some of the related hardware. These are not AS/400 publications:

- *IBM Proprinter Serial Interface Card Setup Instructions*, GC31-0063, provides more detailed information on this interface card.
- *IBM 5811 Modem Description and Planning Guide*, GA33-0081, describes the planning and the preparation of the environment for the installation of the IBM 5811-20, 5812-10, -18 modems, and the 5810 enclosure. This book is intended for managers and planners who have a basic understanding of data telecommunication links and who intend to install a data telecommunication link using the IBM 5811 and 5812 modems, and the 5810 enclosure. The site preparation information in this book is also useful to others who prepare the site for the setting up of the modems.
- *IBM 5811 Modem Setup, Problem Analysis and Resolution*, GA33-0082, is intended for the user at the central and remote site who will set up and perform problem analysis on the 5811-20 or 5812-10 modems. This book gives you instructions to set up and initially check the IBM 5811-20 or 5812-10 modems. This book gives you the procedures to check out the modem and to determine the faulty element (modem, line, DTE, power supply transformer).
- *IBM 5841 Modem 1200 BPS Guide to Operations*, GA27-3649, provides more detailed information on this modem.

Glossary

This glossary includes terms and definitions from:

- The *American National Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies may be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018. Definitions are identified by the symbol (A) after the definition.
- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Committee (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition; definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

adapter. A part that electrically or physically connects a device to a computer or to another device.

adapter card. The electrical circuits on a logic card that connect one device to another or to a computer.

addressing. In data communications, the way that the sending or control station selects the station to which it is sending data.

alphanumeric. Pertaining to the letters A through Z or a through z; numbers 0-9; and special symbols \$, #, @, ., or _.

alternative console. A display device assigned by the operating system to function as the console if the console is not working.

American National Standard Code for Information Interchange (ASCII). The code developed by the American National Standards Institute for information exchange among data processing systems, data communications systems, and associated equipment. The ASCII character set consists of 7-bit control characters and symbolic characters, plus one parity bit.

application program interface (API). A functional interface supplied by the operating system or a separately orderable licensed program that allows an application program written in a high- or low-level language

to use specific data or functions of the operating system or the licensed program.

ASCII. See *American National Standard Code for Information Interchange (ASCII)*.

ASCII port sharing. A function that allows the user to have different ASCII devices (programmable or nonprogrammable work stations) share the same port, at different times, without needing to manually create a configuration description for each new device.

asynchronous communications. A method of communications supported by the operating system that allows an exchange of data with a remote device, using either a start-stop line or an X.25 line. Asynchronous communications includes the file transfer support and the interactive terminal facility support.

attachment. An entire device or feature attached to a processing unit, including required adapters. Contrast with *adapter*.

attribute. A characteristic or trait of one or more items. employee's attributes.

automatic configuration. A function that names and creates the descriptions of network devices and controllers attached to a preexisting line. The objects are also varied on at a user's request.

automatic dial. A function of the system that allows a system to automatically dial a remote station over a switched line without the assistance of an operator.

bit. A contraction of binary digit. Either of the binary digits, 0 or 1. Compare with *byte*.

bps. Bits per second.

buffer. (1) A routine or an area of storage that corrects for the different speeds of data flow or timings of events, when transferring data from one device to another. (2) A portion of storage used to hold input or output data temporarily.

bus. One or more conductors used for transmitting signals or power.

byte. A group of 8 adjacent bits. In the EBCDIC coding system, 1 byte can represent a character. In the double-byte coding system, 2 bytes represent a character.

card. A plug-in circuit assembly.

card enclosure. The frame that holds the logic cards.

CCITT. The International Telegraph and Telephone Consultative Committee.

CD-ROM. High-capacity read-only memory in the form of an optically read compact disc.

character. Any letter, number, or other symbol in the data character set that is part of the organization, control, or representation of data.

character codes. In Client Access/400, the ASCII or EBCDIC values assigned to the symbols or functions that are used by a computer.

character set. A group of characters used for a specific reason; for example, the set of characters the display station can display, the set of characters a printer can print, or a particular set of graphic characters in a code page; for example, the 256 EBCDIC characters.

character string. A sequence of consecutive characters that are used as a value.

clocking. In communications, a method of controlling the number of data bits sent on a communications line in a specified time.

code page. (1) A particular assignment of hexadecimal identifiers to graphic characters. (2) In AFP* support, a font file that associates code points and graphic character identifiers.

command. A statement used to request a function of the system. A command consists of the command name abbreviation, which identifies the requested function, and its parameters.

command line. The blank line on a display where commands, option numbers, or selections can be entered.

communications line. The physical link (such as a wire or a telephone circuit) that connects one or more work stations to a communications controller, or connects one controller to another.

compression. A function that removes repetitive characters, spaces, or strings of characters from the data being processed and replaces the repetitive characters with control characters. Compression reduces the amount of storage space required for the data.

CONFIG.PCS. In Client Access/400, the default configuration file for the PC Support functions.

configuration. The physical and logical arrangement of devices and programs that make up a data processing system.

configure. To describe the interconnected arrangement of the devices, programs, communications, and optional features installed on a system.

console. A display station from which an operator can control and observe the system operation. For example, an operator can install the operating system, do an attended IPL, or sign on the system after using the End System (ENDSYS) command.

control language (CL). The set of all commands with which a user requests system functions.

controller. A device that coordinates and controls the operation of one or more input/output devices (such as work stations) and synchronizes the operation of such devices with the operation of the system as a whole.

controller description. An object that contains a description of the characteristics of a controller that is either directly attached to the system or attached to a communications line. The system-recognized identifier for the object type is *CTLD.

data circuit-terminating equipment (DCE). The equipment installed at the user's premises that provides all the functions required to establish, maintain, and end a connection, and the signal conversion and coding between the data terminal equipment and the line. See also *data terminal equipment (DTE)* and *modem*.

data communications. The sending and receiving of data between computers, remote devices, or both according to selected protocols.

data link. The physical connection (communications lines, modems, controller, work stations, other communications equipment), and the rules (protocols) for sending and receiving data between two or more locations in a data network.

data terminal equipment (DTE). That part of a data link that sends data, receives data, and provides the data communications control function according to protocols.

default. A value that is automatically supplied or assumed by the system or program when no value is specified by the user.

device configuration. The physical placement of display stations, printers, and so forth; and the configuration descriptions that describe the physical configuration to the system and describe how the configuration will be used by the system.

device description. An object that contains information describing a particular device or logical unit (LU) that is attached to the system. A device description is a description of the logical connection between two LUs

(local and remote locations). The system-recognized identifier for the object type is *DEVD.

device name. The symbolic name of an individual device.

device type. The generic name for a group of devices. For example, 5219 for IBM 5219 Printers.

disconnect (DISC). In communications, the transmission control character that is part of the sequence for disconnecting a switched line.

disconnect (DISC) character. In data communications, the part of the BSC transmission control sequence for ending the connection on a switched line.

display attribute. In computer graphics, a property that is assigned to a display element, to a display segment, or to the complete display image; for example, a bright intensity or particular color.

display screen. The part of the display device, which is similar to a television (TV) picture tube, used to display information entered or received at a display station.

display station. A device that includes a keyboard from which an operator can send information to the system and a display screen on which an operator can see the information sent to or the information received from the system.

document. Any collection of data stored in a document object.

draft. A printed copy of a document that is not yet completed.

duplex. (1) Pertaining to communications in which data can be sent and received at the same time. Contrast with *half-duplex*. (2) In AFP support, pertaining to printing on both sides of a sheet of paper.

EBCDIC. See *extended binary-coded decimal interchange code (EBCDIC)*.

EBCDIC character. Any one of the symbols included in the 8-bit EBCDIC set.

EIA. Electronic Industries Association.

EIA-232. In data communications, a specification of the Electronic Industries Association (EIA) that defines the interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) using serial binary data interchange.

electronic customer support. A part of the operating system that allows a customer to access: the question-

and-answer (Q & A) function; problem analysis, reporting, and management; IBM product information; and technical information exchange.

emulation. Imitation of one system or device by another.

end-of-text (ETX) character. The BSC transmission control character used to end a logical set of records that began with the start-of-text character.

error log. A record of machine checks, device errors, and media statistics.

ETX. See *end-of-text (ETX) character*.

expansion unit. A feature that can be connected to a system unit to provide additional storage and processing capacity.

extended binary-coded decimal interchange code (EBCDIC). A coded character set consisting of 8-bit coded characters.

file. A generic term for the object type that refers to a database file, a device file, or a save file. The system-recognized identifier for the object type is *FILE.

file name. The name used by a program to identify a file.

flow. The passing of a message from one process to another. The passing of messages of a particular type between processes. For example, Distributed Relational Database Architecture* (DRDA*) flows are those that consist only of messages described by the DRDA protocol as part of the DRDA protocols.

font. (1) An assortment of characters of a given size and type style. (2) A particular type style (for example, Bodini or Times Roman) that contains definitions of character sets, marker sets, and pattern sets.

font ID. A number that identifies the character style and size for certain printers.

form type. A 10-character identifier, assigned by the user, that identifies each type of form used for printed output.

full duplex. Synonym for *duplex*.

function key. A keyboard key that allows the user to select keyboard functions or programmer functions.

graphic character. A character that can be displayed or printed.

graphic character set. A set of graphic characters in a code page.

half-duplex. Pertaining to data communications that can be sent in only one direction at a time. Contrast with *duplex*.

hex. See *hexadecimal*.

hexadecimal. Pertaining to a numbering system with a base of 16.

hexadecimal string. In REXX, any sequence of zero or more hexadecimal digits (0-9, a-f, or A-F), optionally separated by blanks, delimited by apostrophes or quotation marks, and immediately followed by the symbol x or X.

highlight. To define text to be shown in contrast with other text by underlining, italics, bold-face; or on a display, high-intensity (brightness of characters), blinking, or reverse image. You can highlight words, parts of words, or information typed into a form using the text definition function of OfficeVision/400.

host print transform. An Operating System/400 print function that converts an SNA character string (SCS) data stream into an ASCII data stream. The ASCII data stream is then formatted and sent to an ASCII printer through one or more hardware connections, such as Client Access/400, 3477, or 3487 work stations. This single location of the transform allows for consistent ASCII printing through any of the hardware connections.

IAC. See *Interpret As Command (IAC)*.

IBM Network Control Program (NCP). An IBM licensed program that provides communications controller support for single domain, multiple domain, and interconnected network capability.

IBM OfficeVision/400 Version 3. The IBM licensed program that allows users to prepare, send, and receive mail; schedule items on calendars; maintain directories of names and addresses; file and retrieve documents; and create and maintain distribution lists. OfficeVision/400 also provides word processing functions and the capability to work on behalf of other users.

image. An electronic representation of an original document recorded by a scanning device.

initial program load (IPL). The process that loads the system programs from the system auxiliary storage, checks the system hardware, and prepares the system for user operations.

initialize. To set the addresses, switches, or the contents of storage to zero, or to the starting value set by the manufacturer.

interactive. Pertaining to the dialog-like exchange of information between people and a computer.

interface. A shared boundary. An interface might be the hardware to connect two devices or it might be a part of main storage, or registers used by two or more computer programs.

Interpret As Command (IAC). In TELNET, a character that identifies the character or characters following it as a command for TELNET to process.

IPL. See *initial program load (IPL)*.

justify. To adjust text so that line endings are even.

Katakana. A graphic Japanese character set that is used to write non-Japanese words phonetically in Japanese.

keyboard type. The physical key arrangement and assignments for the keyboard shipped from the factory.

line. (1) The physical path in data transmission. (2) In OSI Communications Subsystem/400, a physical communications line that connects an OSI node to an X.25 subnetwork. Each line is associated with a data terminal equipment (DTE) address at the OSI node from which the line originates.

line data. Data prepared for printing on line printers. Line data can contain carriage-control characters and table-reference characters (TRC) for spacing and font selections. Line data is created on the System/370* computer.

local. Pertaining to a device or system that is connected directly to your system or a file that is read directly from your system, without the use of a communications line. Contrast with *remote*.

local controller. A functional unit within the system that controls the operation of one or more directly attached input/output devices or communications lines.

local work station. A work station that is connected directly to the system without a need for data transmission functions.

mapping. A representation of one thing to another.

mapping table. An object that contains a set of hexadecimal characters used to map data from one character set and code page to another.

medium. The disk, tape, or diskette used to store information in a save or restore operation.

menu. A displayed list of items from which a user can make a selection. The system-recognized identifier for the object type is *MENU.

modem (modulator/demodulator). A device that converts data from the computer to a signal that can be

sent over a communications line (modulator), and converts the communications signal received to data for the computer (demodulator). See also *data circuit-terminating equipment (DCE)*.

monochrome. Consisting of a single color.

multinational character set (MNCS). A set of graphic characters that support the languages within a specific language group.

national language support (NLS). The ability for a user to communicate with hardware and software products in a language of choice to obtain results that are culturally acceptable.

network. A collection of data processing products connected by communications lines for exchanging information between stations.

network architecture. The logical structure and operating principles of a computer network. (T) The operating principles of a network include those of services, functions, and protocols.

NLS. See *national language support (NLS)*.

normal response mode (NRM). An operational mode of an unbalanced data link in which the secondary station starts transmission only as the result of receiving explicit permission, by polling, from the primary station.

online. Pertaining to the operation of a functional unit that is under the continual control of the system.

original equipment manufacturer (OEM). A manufacturer of equipment that can be marketed by another manufacturer.

output. Information or data received from a computer that is shown on a display, printed on the printer, or stored on disk, diskette, or tape.

output queue. An object that contains a list of spooled files to be written to an output device, such as a printer or a diskette. The system-recognized identifier for the object type is *OUTQ.

overstrike. Pertaining to a character or symbol that occupies the same space as another character or symbol.

pacing. In SNA, a technique by which the receiving system controls the rate of transmission of the sending system to prevent overrun.

parameter. A value supplied to a command or program that is used either as input or to control the actions of the command or program.

parity. The state of being either even-numbered or odd-numbered. A parity bit is a binary number added to a group of binary numbers to make the sum of that group either always odd (odd parity) or always even (even parity).

parity bit. A binary digit added to a group of binary digits to make the sum of all the digits, including the added binary digit, either odd or even as preestablished. (T)

PC Support asynchronous communications. The support that connects the personal computer or Personal System/2 work station to the ASCII Work Station Controller on the AS/400 system.

performance. That part of the system that is evident in elapsed time. Performance is largely determined by three factors: throughput, response time, and availability.

physical file. A description of how data is to be presented to or received from a program and how data is actually stored in the database. A physical file contains one record format and one or more members.

physical file member. A named subset of the data records in a physical file.

pin. Part of an electrical connection.

pitch. The number of characters printed per inch.

Plug'N'Go* Application Solution. A Plug'N'Go software offering, and related documentation, that can be installed by the end user. These applications can be easily added by inserting a tape, selecting a menu option, and answering a few questions.

point. In AFP support, a unit of measurement used mainly for describing type sizes. Each pica has 12 points, and an inch has approximately 72 points.

point-to-point. Pertaining to data transmission between two locations without the use of any intermediate display station or computer.

poll. To determine if any remote device on a communications line is ready to send data.

polling. (1) The process whereby stations are invited, one at a time, to transmit. (2) The process whereby a controlling station contacts the attached devices to avoid contention, to determine operational status, or to determine readiness to send or receive data.

port. System hardware where the I/O devices are attached.

Post Telephone and Telegraph Administration (PTT). An organization, usually a government depart-

ment, that provides data communication services in countries other than the USA and Canada. Examples of PTTs are the Bundespost in Germany and the Nippon Telephone and Telegraph Public Corporation in Japan.

power cord. The electrical connection between the AC power source and the computer.

PRI. See *primary rate interface (PRI)*.

primary rate interface (PRI). In ISDN, an interface that provides 23 (or 30 in Europe) 64 000 bps data channels (B-channels) and one 64 000 bps signaling channel (D-channel). Also known as *23/30B + D*.

printer file. A device file that determines what attributes printed output will have. A particular printer may or may not support all of the attributes specified in a printer file.

printer writer. A system program that writes spooled files to a printer.

problem analysis. The process of finding the cause of a problem. For example, a program error, device error, or user error.

processing. The action of performing operations and calculations on data.

profile. Data that describes the characteristics of a user, program, device, or remote location.

program. A sequence of instructions that a computer can interpret and run.

programmable work station (PWS). A work station that has some degree of processing capability and allows the user to change its functions.

protocol. A set of rules controlling the communication and transfer of data between two or more devices or systems in a communications network.

Protocol 1 (P1). The message transfer protocol used to relay X.400 messages between message transfer agents (MTAs).

Protocol 2 (P2). The message protocol used between user agents to convey the syntax and structure of an X.400 message and to specify what a recipient user agent does with the message.

PTT. See *Post Telephone and Telegraph Administration (PTT)*.

P1. See *Protocol 1 (P1)*.

P2. See *Protocol 2 (P2)*.

queue. A list of messages, jobs, files, or requests waiting to be read, processed, printed, or distributed in a predetermined order.

recovery. The process of rebuilding databases after a system failure.

remote. Pertaining to a device, system, or file that is connected to another device, system, or file through a communications line. Contrast with *local*.

resident. Remaining in main storage.

resource name. A name assigned by the system to a line, controller, or device that is connected to the system.

restore. To copy data from tape, diskette, or a save file to auxiliary storage. Contrast with *save*.

save. To copy specific objects, libraries, or data by transferring them from main storage or auxiliary storage to a media such as tape, diskette, or a save file. Contrast with *restore*.

SCS. See *SNA character string (SCS)*.

SDLC. See *synchronous data link control (SDLC)*.

security officer. A person assigned to control all of the security authorizations provided with the system. A security officer can, for example, remove password or resource security; or add, change, or remove security information about any system user.

shift. A keyboard action to allow uppercase or other characters to be entered.

SNA. See *Systems Network Architecture (SNA)*.

SNA character string (SCS). In SNA, a data stream composed of EBCDIC controls, optionally intermixed with end-user data, that is carried within a request/response unit.

spacebar. A control key for the spacing function.

special-character keyboard set. In Client Access/400, an optional keyboard set, used by Western European countries and the Americas, that contains special characters like the Spanish tilde or the international currency symbol.

standard. In OSI, a synonym for *international standard*.

stop code. In the OfficeVision/400 program, a position marked in a document where you can insert variable information.

store. To put or keep data in a storage device.

subscript. A symbol, number, or letter written immediately below and to the right or left of another character. For example, the number 2 in the chemical formula for water, H₂O, is a subscript.

subsystem. An operating environment, defined by a subsystem description, where the system coordinates processing and resources.

superscript. A symbol, number, or letter written immediately above and to the right or left of another character. For example, a footnote can be identified in text with a superscript number. Contrast with *subscript*.

switched line. In data communications, a connection between computers or devices that is established by dialing.

synchronization (SYN) character. In binary synchronous communications, the transmission control character that provides a signal to the receiving station for timing the characters received.

synchronous data link control (SDLC). (1) A form of communications line control that uses commands to control the transfer of data over a communications line. (2) A communications discipline conforming to subsets of the Advanced Data Communication Control Procedures (ADCCP) of the American National Standards Institute (ANSI) and High-Level Data Link Control (HDLC) of the International Organization for Standardization (ISO), for transferring synchronous, code-transparent, serial-by-bit information over a communications line. Transmission exchanges may be duplex or half-duplex over switched or nonswitched lines. The configuration of the connection may be point-to-point, multipoint, or loop.

system unit. A part of a computer that contains the processing unit, and may contain devices such as disk units and tape units.

Systems Network Architecture (SNA). In IBM networks, the description of the layered logical structure, formats, protocols, and operational sequences that are used for transmitting information units through networks, as well as controlling the configuration and operation of networks.

throughput. (1) The measure of the amount of work performed by a computer over a period of time, for example, number of jobs per day. (2) In data communications, the total traffic between stations over a period of time.

toggle. Pertaining to a switching device, such as a toggle key on a keyboard, that allows a user to switch between two types of operations.

transparency. In asynchronous communications, a method of hiding certain ASCII control characters from modems or asynchronous devices.

vary off. To make a device, controller, line, or network interface unavailable for its normal, intended use.

vary on. To make a device, controller, line, or network interface available for its normal, intended use.

VT100. A character-mode work station. Characters are sent immediately to the host system when a key is pressed.

work station. A device used to transmit information to or receive information from a computer, for example, a display station or printer.

work station controller (WSC). An I/O controller card in the card enclosure that provides the direct connection of local work stations to the system.

workstation customization. An Operating System/400 function that allows a user to tailor ASCII workstations and printers for use with the AS/400 system. Most twinaxial keyboards can also be customized. Character presentation, font specifications, and control key sequences are examples of characteristics that can be customized.

wrap connector. A test connector that connects the output of a controller or cable to the input of the controller or cable. A wrap test then verifies that the controller or cable output and input circuits are working correctly.

wrap test. (1) In communications, a test that checks attachment or controller circuitry (without checking the connected device) by returning the output of the attachment of controller circuitry as input. For example, when irrecoverable communications adapter or machine errors occur, the wrap test can transmit a specific character pattern to or through the modem in a loop and then compare the character pattern received to what was transmitted. (2) For devices, a diagnostic test that returns the output of a device as input.

WSC. See *work station controller (WSC)*.

X.25. A CCITT Recommendation that defines the physical level (physical layer), link level (data link layer), and packet level (network layer) of the OSI reference model. An X.25 network is an interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) operating in the packet mode, and connected to public data networks by dedicated circuits. X.25 networks use the connection-mode network service.

5250 emulation. Any one of many licensed programs that allow a personal computer to perform like a 5250

display station or printer and to use the functions of an AS/400 system.

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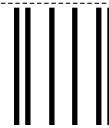
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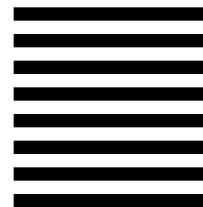
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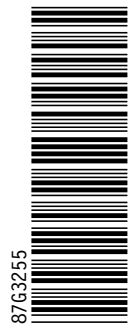
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