Personal Communications
3270 for DOS (Full-Function Mode)

IBM

Reference

Version 4.1

SC31-8265-00

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3270 for DOS (Full-Function Mode)

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Reference

Version 4.1

SC31-8265-00

Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page xi.

First Edition (March 1996)

This edition applies to Version 4.1 of Personal Communications and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters. Make sure you are using the correct edition for the level of the product.

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Contents

Chapter 1. Administration Utilities 1-1
PCSINFO Facility 1-1
PCSMON Trace-Capture Program 1-2
Taking a Trace 1-2
PCSPTU Printer Trace Utility 1-5
PCSGSTAT Gateway Status Utility 1-6
Entering the Gateway Status Utility 1-6
Displaying the Gateway Link Message Log 1-7
Gateway Status Utility Link Message Log Entries 1-8
Displaying the Session Status 1-11
Terminating the Gateway 1-16
Refreshing OIA Data in the Link Log 1-16
HLLAPI EBCDIC-ASCII Translation Table Editor (PCSHLLED) 1-17
Subcommands 1-18
Example 1-18
Making Changes By Using a Definition File 1-18

Chapter 2. Printer Definition Table 2-1
Customizing the Printer Definition Table 2-1
Printer Definition File Format 2-1
Printer Definition Tables 2-2
Example Printer Definition File 2-2
Supplemental Explanation of PDF Statements 2-9
SCS TAB Setting 2-10
Printer Definition File Field Names and Symbols 2-10
Printer Color Mixing 2-13
Printer Session Data Stream Support 2-14
3270 Data Stream 2-14
SCS Data Stream 2-15
Delimiting Print Jobs 2-17
Structured Fields 2-17

Chapter 3. Transferring Files 3-1
File-Transfer Methods 3-1
Requirements 3-1
Considerations 3-1
Sending and Receiving Files 3-2
Using the VM/CMS SEND Command 3-3
Using the VM/CMS RECEIVE Command 3-7
Using the MVS/TSO SEND Command 3-10
Using the MVS/TSO RECEIVE Command 3-15
Using the CICS SEND Command 3-19
Using the CICS RECEIVE Command 3-22
Configuring File-Transfer Code Translation 3-25
Making Changes Interactively 3-25
Making Changes by Using a Definition File 3-26
PCSXFRED Subcommands 3-26
Optional Parameters of PCSXFRED 3-27

Chapter 4. Country Codes, Code Pages, and Character Sets 4-1

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Country Codes and Code Pages 4-3
Keyboard Country ID and Shift Support 4-5
Code Pages and Character Sets 4-7
Host Code Page Tables 4-8

Chapter 5. Keyboard Layouts 5-1
Keyboard Layouts for Enhanced and AT Keyboards 5-2

Chapter 6. APL Support 6-1
Installation Instructions 6-1
APL Keyboard Layouts 6-2
Printing APL Characters 6-4
Using Presentation-Space Copy for APL Characters 6-4

Chapter 7. Redefining Keys, Screen Attributes, and Alarms 7-1
Making Changes Interactively 7-1
Making Changes Using a Definition File 7-1
Using the Definition Lines 7-2
Keyboard Definition Lines 7-3
PC/3270 Keyboard Functions 7-4
Session Control Functions 7-6
3270 Program Function Keys 7-7
Special Key Function Definitions 7-8
EBCDIC Values 7-8
APL Values 7-8
Color Definition Lines 7-9
Beep Definition Lines 7-13
Rule Definition Lines 7-14
Set Lines 7-14
Logical Terminal Delimiters 7-15
SHOW Statement 7-15
Sample Definition File 7-16
Key Number Assignments 7-17

Chapter 8. Automatic Access, Dial, and Logon Control 8-1
Using the PCSDIAL Program 8-1
Auto-Dial Modems 8-1
Menu-Driven Auto-Dial 8-2
Manual-Dial Modems 8-4
Using PCSLOGON 8-4
Using the Utility's Editing Functions 8-5
Mode Option 8-5
Entry Option 8-6
Starting the Automatic Access Utility 8-7
Creating Dial Directory Files 8-9
Creating and Editing PAD-Access Information 8-16
Creating and Editing Logon Control Files 8-17
Using a Logon Response File 8-29
Building the Example Response File 8-30
Using the Example Response File 8-34

Chapter 9. Swapping Tasks 9-1
DOS 5.0 Task Swapper 9-1
Supported Environment 9-2

Using PC/3270 LAN Memory Management with DOS 5.0 Task Swapper . . . 9-2
Starting PC/3270 from the DOSSHELL Program List 9-3
Using LAN Memory Management with a 3270 Emulation Program Version 3 Gateway 9-3
Using LAN Memory Management with the DOS LAN Requester or PC LAN Program 9-4

Chapter 10. Using GDDM-PCLK 10-1
PCSPCLK Enhancements 10-1
PCSPCLK Parameters 10-1
GDDM Version and Service Level 10-2
Installing GDDM-PCLK When Using PCSPCLK 10-2
GDDM-PCLK Jump Logical Terminal Key Ctrl+F10 10-3
Restrictions When Using PCSPCLK 10-3
Using PC/3270 and PCSPCLK with the DOS 5.0 DOSSHELL 10-4

Chapter 11. Messages 11-1
PC/3270 Messages 11-2
Document-Distribution File-Transfer Messages 11-68
Interchange Document Profile Messages 11-72
LAN Memory-Management Module Messages 11-73
XMA Messages 11-74
File-Transfer Messages 11-76

Appendix A. Problem Determination A-1
Solutions A-1
Network Station Attachment Problem Determination A-4
Reporting a Problem to IBM A-9

Appendix B. Unpacking Files from PC/3270 Diskettes B-1

Appendix C. Installation/Configuration Worksheets C-1

Glossary X-1

Index X-11

Figures

1-1. Gateway Status Utility Logo Panel 1-6
1-2. GATEWAY STATUS UTILITY Menu 1-7
1-3. Example of LINK MESSAGE LOG Panel 1-8
1-4. Example STATUS DEFINITION MENU 1-11
1-5. Example NETWORK STATION STATUS Panel 1-12
1-6. Example NETWORK STATION STATUS panel 1-13
1-7. Gateway Termination Menu 1-16
3-1. VM/CMS SEND Command Elements 3-3
3-2. VM/CMS RECEIVE Command Elements 3-7
3-3. MVS/TSO SEND Command Elements 3-10
3-4. MVS/TSO RECEIVE Command Elements 3-15
3-5. CICS SEND Command Elements 3-19
3-6. CICS RECEIVE Command Elements 3-22
7-1. Key Numbers for the Host Connected Keyboard 7-17
7-2. Key Numbers for the Enhanced 101 Keyboard 7-17
7-3. Key Numbers for the IBM PC AT Keyboard 7-18
7-4. Key Numbers for the IBM PC XT Keyboard 7-18
7-5. Key Numbers for the Space Saving Keyboard 7-18
7-6. Key Numbers for the Enhanced 102 Keyboard 7-19
8-1. Automatic Dial Execution Panel I 8-3
8-2. Automatic Dial Execution Panel II 8-4
8-3. Select PCSAAU Options Panel 8-7
8-4. Select Advanced Dial Options Panel 8-8
8-5. Name Automatic Access File Panel 8-9
8-6. Directory Setup, Dial Information Panel 8-10
8-7. Directory Setup, Modem Selection Panel 8-11
8-8. Directory Setup, IIN Unique Parameters Panel 8-12
8-9. Directory Setup, Modem General Parameters panel 8-13
8-10. Directory Setup, Modem Commands/Responses Panel 8-14
8-11. X.25 Logon Information Panel 8-16
8-12. Logon Information Panel 8-18
8-13. Information Services Welcome Panel 8-30
8-14. Information Network Logon Panel 8-31
8-15. INFORMATION NETWORK PRODUCT SELECTION Panel 8-32
8-16. PROFS Main Menu 8-33

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Tables

2-1. Printer Symbol Definitions 2-10
2-2. Color Mixes 2-13
2-3. 3270 Data Stream Commands 2-14
2-4. 3270 Data Stream Orders 2-14
2-5. 3270 Data Stream Control Codes 2-15
2-6. Supported SCS Control Codes 2-15
2-7. Begin/End of File Query Reply Format 2-17
2-8. Begin/End of File Structured Field Format 2-18
4-1. Keyboard Type 4-1
4-2. Country Code 4-4
4-3. Keyboard Country ID and Shift Support 4-5
4-4. Code Page and Character Set 4-7
7-1. Special Character Names 7-4
7-2. Cursor Movement Functions 7-5
7-3. Session Control Functions 7-6
7-4. 3270 Program Function Keys 7-7
7-5. Special Key Function Definitions 7-8
7-6. Examples of Color Redefinitions 7-10
7-7. Default BEEP Alarm Parameters 7-13
8-1. Command Abbreviations 8-20
8-2. Keyboard Command Summary 8-22
8-3. Conditional Logic Command Summary 8-23
8-4. String and Character Handling Command Summary 8-24
8-5. Execution Control Command Summary 8-25
8-6. Timeout and Alarm Control Command Summary 8-26
8-7. Special Key Command Summary 8-27
8-8. Clock Command Summary 8-29
C-1. Configuration Worksheet C-1

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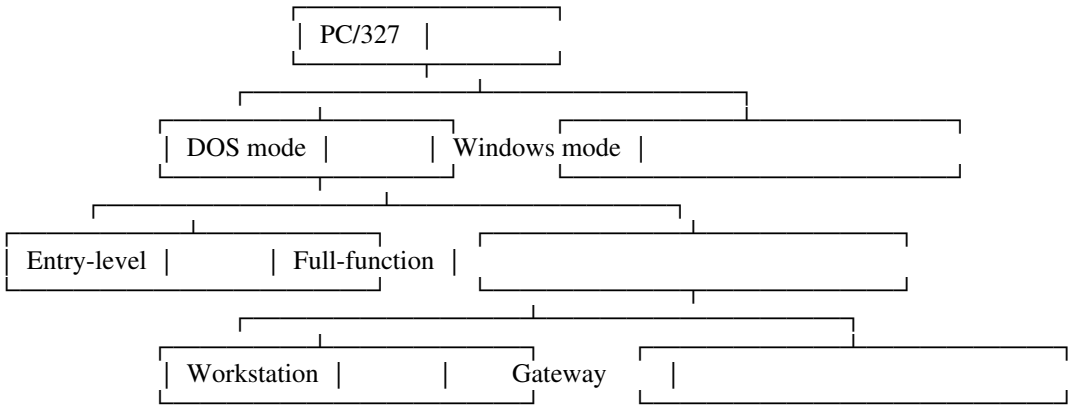
About This Product

IBM* Personal Communications/3270 (hereafter called ***PC/3270***) has two basic modes: ***DOS mode*** and ***Windows** mode***.

For a workstation, ***Windows mode*** provides 3270 emulation functions under Microsoft** Windows.

DOS mode consists of two submodes; ***Entry-level DOS mode*** and ***Full-function DOS mode***.

Entry-level DOS mode provides Control Unit Terminal (Cut) or Home3270 (3270 emulation via an asynchronous connection through a protocol converter or the AEA of an IBM 3174 controller). ***Full-function DOS mode*** provides other connectivities for a workstation or a gateway.



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The following table summarizes the PC/3270 publications for each mode:

Mode	Submode	Connectivity	Identification Color	Publications
DOS	Full-function	DFT 3174 Peer Communication LAN (802.2 protocol) LAN (NetBIOS protocol) LAN (TCP/IP protocol) LAN (NetWare IPX/SPX protocol) SDLC Hayes Autosync SNA over Async Asynchronous Communication for IBM IN X.25	Light orange	*Up and Running for DOS (Full-Function Mode)*, SC31-8262-00 *Reference for DOS (Full-Function Mode)*, SC31-8265-00 *Programmer's Guide for Windows and DOS (Full-Function Mode)* , SC31-8266-00
	Entry-level	CUT Home3270	Light yellow	*Up and Running for DOS (Entry-Level Mode)*, SC31-8263-00 *Programmer's Guide for DOS (Entry-Level Mode)*, SC31-8267-00
Windows	—	DFT 3174 Peer Communication LAN (802.2 protocol) LAN (NetBIOS protocol) LAN (TCP/IP protocol) LAN (NetWare IPX/SPX protocol) SDLC Hayes Autosync SNA over Async Asynchronous Communication for IBM IN Home3270 CUT (as a console or Port 0 utility of 3174)	Light blue	*Up and Running for Windows*, SC31-8261-00 *Reference for Windows*, SC31-8264-00 *Programmer's Guide for Windows and DOS (Full-Function Mode)* , SC31-8266-00
		X.25	Not available	

For the U.S. only.
Common publications for Full-Function DOS and Windows Modes.

Group	Publications	DOS (Full-function)	DOS (Entry-level)	Windows
Ship Group	*Up and Running*	*Yes*	*Yes*	*Yes*
Nonship Group	*Reference*	*Yes*		*Yes*
	Programmer's Guide	*Yes*	*Yes*	*Yes*

Common publications for Full-Function DOS and Windows Modes.

About This Book

This book provides information related to *PC/3270 for Full-function DOS mode* only. Throughout this book, PC means all supported IBM* personal computers and IBM Personal System/2* (PS/2*) computers. When only one model or architecture of the personal computer is referred to, only that type is specified.

Who Should Read This Book

This book is intended for the person who installs and uses PC/3270 on an IBM PC.

How to Use This Book

This book contains reference information that you might need to refer to during installation and operation of PC/3270.

The PC/3270 package is designed to use various communications adapters, PCs, and host systems. These packages are not fully described here. Refer to the appropriate documentation for the products you use.

Organization

This book has the following chapters and appendixes:

Chapter 1, Administration Utilities describes the following utility programs for a system administrator:

PCSINFO Facility
PCSMON Trace-Capture Program
PCSPTU Printer Trace Utility
PCSGSTAT Gateway Status Utility

Chapter 2, Printer Definition Table describes how to modify or build a printer definition table for use by PC/3270.

Chapter 3, Transferring Files describes how to transfer files between a PC and IBM host systems.

Chapter 4, Country Codes, Code Pages, and Character Sets describes the country codes, code pages, and character sets.

Chapter 5, Keyboard Layouts describes keyboards supported by PC/3270.

Chapter 6, APL Support describes the APL support of the PC/3270.

Chapter 7, Redefining Keys, Screen Attributes, and Alarms describes how to change the default definitions of keys, screen attributes, and alarms.

Chapter 8, Automatic Access, Dial, and Logon Control describes how to create the files that establish the connection with the host system and that log on to the network or an application.

Chapter 9, Swapping Tasks describes how to install and use the PC/3270 LAN Memory Management modules with the IBM DOS 5.0 Task Swapper.

Chapter 10, Using GDDM-PCLK describes the **PCSPCLK.EXE** program, which has been modified to provide enhanced performance and usability when the IBM GDDM-PCLK Version 1.1 product is used.

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Chapter 11, Messages explains PC/3270 error messages and required user actions for the errors.

Appendix A, Problem Determination contains information about problem solving.

Appendix B, Unpacking Files from PC/3270 Diskettes describes how to use a file on PC/3270 diskettes.

Appendix C, Installation/Configuration Worksheets contains worksheets for installation.

This book also contains a glossary and an index.

Highlighting Conventions

This book uses the following highlighting conventions:

UPPERCASE	Uppercase type indicates DOS and host programs, commands, and options.
Bold	Bold type indicates prompts and messages as displayed on the screen.
Bold Monospace	Bold monospace type indicates text that you enter to accomplish the actions stated for the example. Lowercase bold monospace used in example text generally indicates a variable. On example screens, bold monospace type indicates the literal text displayed. Bold monospace is also used for file and directory names.
Monospace	Monospace type indicates variables for placeholders, parameters, and file names. When you enter a command, replace all variables with the appropriate file name, number, or option. On an example display screen, regular monospace type indicates a variable quantity other than a default value. Monospace type is also used for examples.
Italics	Italic type indicates a special emphasis in text, or a reference citation.
Bold Italics	Bold italic type indicates a term that is defined in the immediate context of its use.

Command Syntax Special Characters

In this book, special characters used in showing the command syntax have the following meanings or uses:

( ) Parentheses enclose operands that govern the action of certain command options. Type the parentheses as part of the command.

[ ] Brackets indicate an optional command argument. If you do not use the optional item, the program selects a default action.

... Ellipsis after an argument indicates that you can repeat the preceding item any number of times. Do not type the ellipsis.

[ ] Inconsistency In Chapter 7, brakets are uses to enclose function names. Less-than and greater-than signs are used to indicate optional items.

/ A slash must precede the TSO (host time share option) password. A slash must also precede parameters of PC DOS commands entered from the command line.

\ A backslash is included as part of any DOS directory name. An initial backslash indicates the first-level directory and an additional backslash is inserted in the directory name to indicate another level.

All directives, operands, and other syntax are typed in uppercase or lowercase, unless otherwise indicated.

Related Publications

Although it is assumed that you are familiar with the operation of the PC and the related languages, you might want to refer to the following publications. Ask your IBM representative for ordering information.

Personal Communications/3270 Version 4.1 Up and Running for DOS (Full-Function Mode)

Personal Communications Version 4.1 Programmer's Guide for Windows and DOS (Full-Function Mode)

IBM Personal System/2 National Language Supplement

IBM PC DOS User's Guide, Version 3.30 and 4.01

IBM PC DOS Reference, Version 3.30 and 4.01

IBM PC DOS Version 5.00 User's Guide and Reference

IBM PC DOS Version 5.00 Keyboards and Code Pages

IBM PC 3270 Emulation Program, Version 3.00, Systems Planner and User's Reference

IBM 3270 Information Display System: IBM 3274 Control Unit Description and Programmer's Guide

IBM 3270 Information Display System: Data Stream Programmer's Reference

IBM 3270 Information Display System: Reference Summary

IBM Local Area Network Technical Reference

IBM PC Network Technical Reference

IBM X.25 Co-Processor Support Program: Programmer's Reference

Chapter 1. Administration Utilities

PC/3270 DOS mode provides the following utility programs:

PCSINFO Facility
PCSMON Trace-Capture Program
PCSPTU Printer Trace Utility
PCSGSTAT Gateway Status Utility
PCSHLLED HLLAPI EBCDIC-ASCII Translation Table Editor

PCSINFO Facility

In response to requests from our service staff for an easy way to collect information that will help us to resolve problems, the PCSINFO facility is provided. This facility can be used with any version of PC/3270.

PCSINFO captures the following information:

Major components of your PC
CONFIG.SYS contents
AUTOEXEC.BAT contents
PC/3270 configuration file contents
PC/3270-related system information

The above information is used by PC/3270 technical support personnel for problem resolution.

You can start PCSINFO by entering:

PCSINFO [d:][fn.bat]

where **d:** and **fn.bat** specify the PC/3270 configuration file. If **fn.bat** is omitted, PC3270.BAT is assumed as a default.

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PCSMON Trace-Capture Program

PC/3270 has a facility that enables you to capture and study the data and the communication-protocol information that passes between network stations and gateways and the host system; this can be very useful in resolving communications problems. Tracing can be carried out at network stations and at gateways; at gateways, the upstream and downstream links can be traced.

The information from each communication link specified in a configuration file is saved in a separate trace table. The tables can be formatted by the PCSMON program and can be displayed, saved, or printed.

Notes:

1. The trace function is not active unless a trace table has been specified when you start PC/3270.
2. When a trace table is full, the oldest entries are overwritten.
3. Trace tables are removed from memory when you stop PC/3270.

Taking a Trace

Setting Up to Trace

You must specify the trace option when you load PC/3270. Do this by one of the following three ways:

1. The following example loads PC/3270 and provides a 10KB trace table for each link in the configuration file (this is usually adequate):

   pc327 /T=1

   To make effective use of the trace table, up to 64 bytes of the PIU will be saved in one entry of the table by default. If you want to save the full PIU, add **F** to the **/T** parameter; for example **/T=F1** .

2. Edit the configuration file, as shown; again, this provides a trace table for each link in the configuration file:

   Set CMGR.TRACE=1

3. Edit one or more lines of the configuration file, as shown below, to specify a trace table for those links only:

   C:\PC327 \PCSTKR .....n=snalantrace1.....T=1

Note: If you use methods 2 and 3, your entries will be removed if you use the CONFIG program to modify the configuration.

The following are the valid trace names for DOS mode:

Note: The trace name must be entered in lowercase letters.

adlctrace For PCSADLC.

asynchtrace For PCSASYNC.

dfttracen For PCSDFT (non-SNA DFT); n is the corresponding adapter number specified in the configuration file.

hamtrace For PCSHAM.

sdlctrace For PCSSDLC.

snadfttracen For PCSSDFT (SNA DFT); n is the adapter number specified in the configuration.

snalantracei For PCSTKR; i is the internal task number for 802.2 addressing. There is one 802.2 task for each upstream (host) link and one 802.2 task for all downstream (network station) links, if any, for each adapter.

For a network station: i is the number of an 802.2 connection to a unique address, that is, to a particular gateway; numbers are allocated in the sequence in which the connections are specified in the configuration file. Therefore, if you specify connections to three gateways, for example, there will be three trace tasks, numbered 1, 2, 3. When you run PCSMON, you must specify the task you want to format.

For a gateway: The task numbers are assigned to all the downstream tasks first and then to the upstream task.

If there is only one LAN adapter, n will have the following values:

0 The downstream links to all workstations
1 The upstream link

If there are two adapters, n will have the following values:

0 The downstream links to workstations from adapter 0
1 The downstream links to workstations from adapter 1
2 The upstream link

vlantracem For PCSVLAN; m is the session number for the LAN through 3270 Emulation Program Version 3 gateway attachment.

x25trace For PCSQLLC.

Memory Usage:

1. Each table that you specify uses the amount of memory that you define; this means that, if your configuration file includes three links and you use the command /T=10, the tables will occupy 30KB of memory.
2. The trace tables use base memory.

Starting Trace Program (PCSMON.EXE)

Enter the command:

PCSMON [**N=**tracename]

where N=tracename specifies the name of the trace table to be formatted. If this option is omitted, PCSMON searches for a trace table with a name matching the default tracename for the first connection specified in the configuration file.

You can add the following parameters to the **PCSMON** command:

/W (Watch) The trace data will be displayed on the DOS-session panel as it is generated; press any key to stop the display (data will continue to be entered in the trace table).

/C (Compact) The hexadecimal form of the data will be omitted from the trace table; only the alphanumeric form will be entered in the table.

> filename The trace data will be saved in the file you name.

> LPTn The trace data will be printed.

You can combine these parameters to watch and save, for instance.

If you are not sure what trace name to use, look in the configuration file for the line that specifies the link you want to trace.

Saving Trace Information

To save the formatted output of the PCSMON program in a file, use DOS output redirection.

The syntax is:

PCSMON >xxxxxxx.TRC

The current contents of a PC/3270 trace table are saved in the xxxxxxx.TRC file if tracing is in effect for a communications component.

Security Considerations

The trace facility, though it is intended primarily to help resolve communications problems, lets the user of a gateway trace communications between every network station and the gateway; the data entered in the trace tables will include user passwords and other data that might be confidential.

If this presents a security risk, you should control access to the trace-formatting program, **PCSMON.EXE**.

PCSPTU Printer Trace Utility

PCSPTU is helpful for printer problem-determination, in the same way as PCSMON is useful for communication problem-determination. PCSPTU outputs traces of the printer data stream between the host and PC/3270 and between PC/3270 and the printer. When you want a trace, do the following:

1. Enter the following command at the DOS command prompt:

   PCSPTU filename.ext

2. Initiate your printing operation as usual.
3. When printing has finished, press the Esc key to exit PCSPTU mode.

You will have a trace in the file filename.ext.

PCSGSTAT Gateway Status Utility

If your network is configured for the gateway function, you can use the Gateway Status Utility to do the following:

View the link message log.
View the status of all sessions allocated to a specific network station.
View the status of all network stations that are connected to the gateway network.
Terminate the gateway.

Entering the Gateway Status Utility

The logo panel of the Gateway Status Utility is displayed automatically when the gateway is loaded. You can also enter the utility program from DOS.

To enter the Gateway Status Utility from DOS, do the following:

1. If you are using a hard disk, change to the directory where your Personal Communications/3270 (PC/3270) programs are stored. If you are using diskettes, insert the diskette that includes the utilities.
2. Enter **PCSGSTAT** at the DOS prompt. A logo panel is displayed as shown in Figure 1-1.

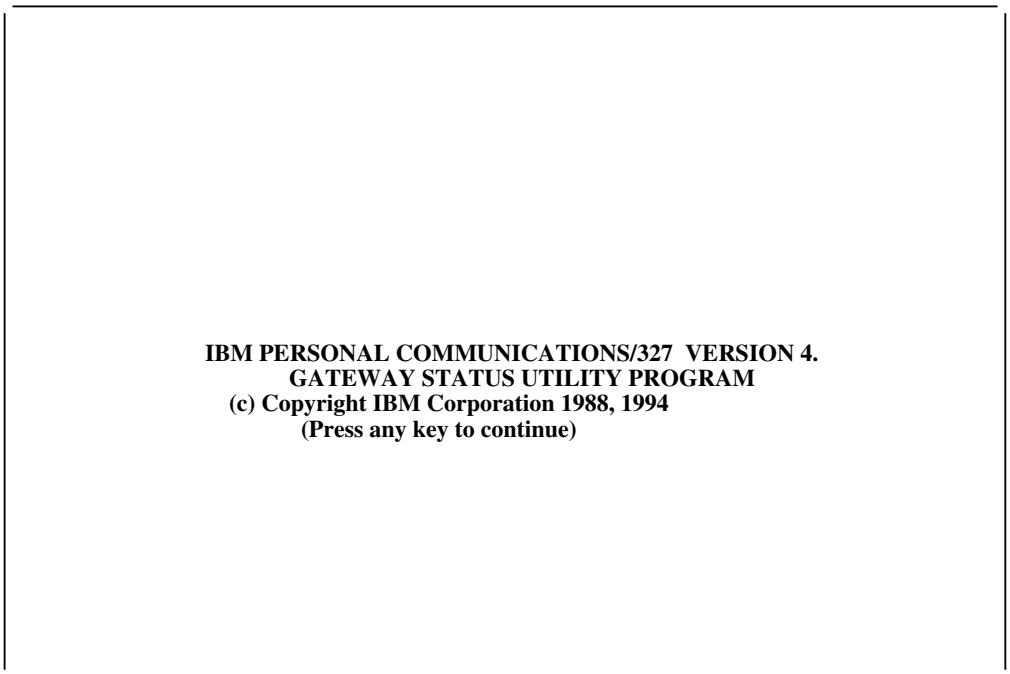


Figure 1-1. Gateway Status Utility Logo Panel

3. Press any key to continue. The main menu is displayed as shown in Figure 1-2.

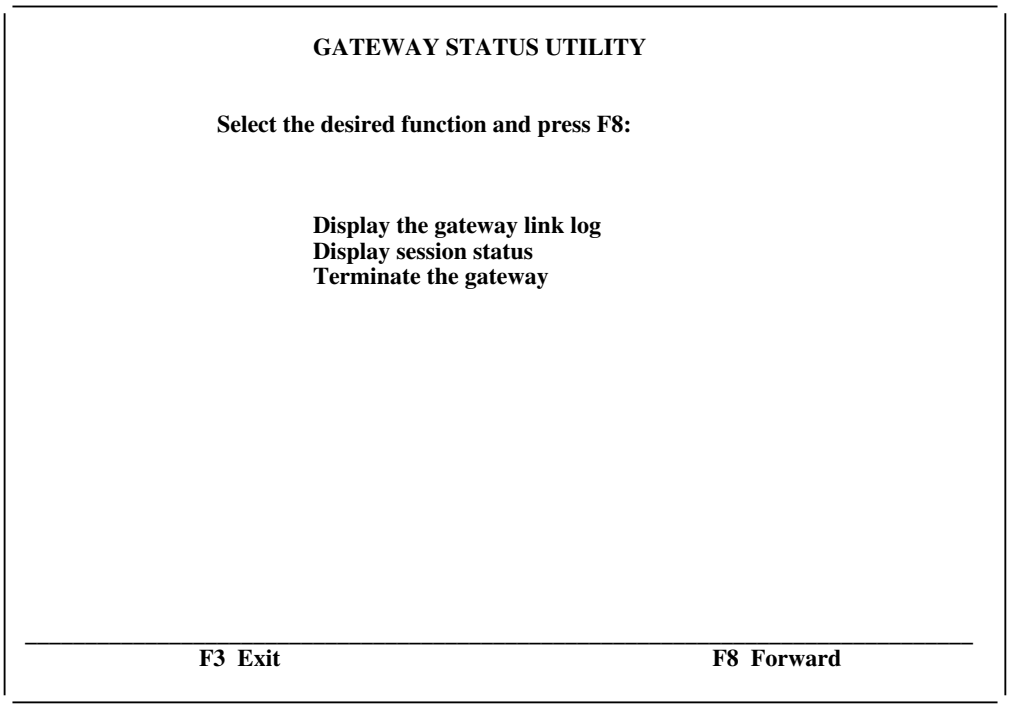


Figure 1-2. GATEWAY STATUS UTILITY Menu

4. Highlight the option you need. To move the highlighted bar, use the Cursor Up, Cursor Down, Tab, Shift+Tab, or Enter keys. Press F8.

The following sections explain how to use each option. To exit to DOS at any time, press F3.

Note: The Power-On-Reset and Exit PC/3270 key sequences do not function if you are using a gateway.

Displaying the Gateway Link Message Log

Selecting **Display the gateway link log** on the GATEWAY STATUS UTILITY menu allows you to view the messages in the link log. The LINK MESSAGE LOG panel is displayed.

The entries provide the time that messages were received, to help you identify problems with gateway operations. If any messages are received while you are viewing this panel, they will be added to the list on the panel. An example of the panel is shown in Figure 1-3.

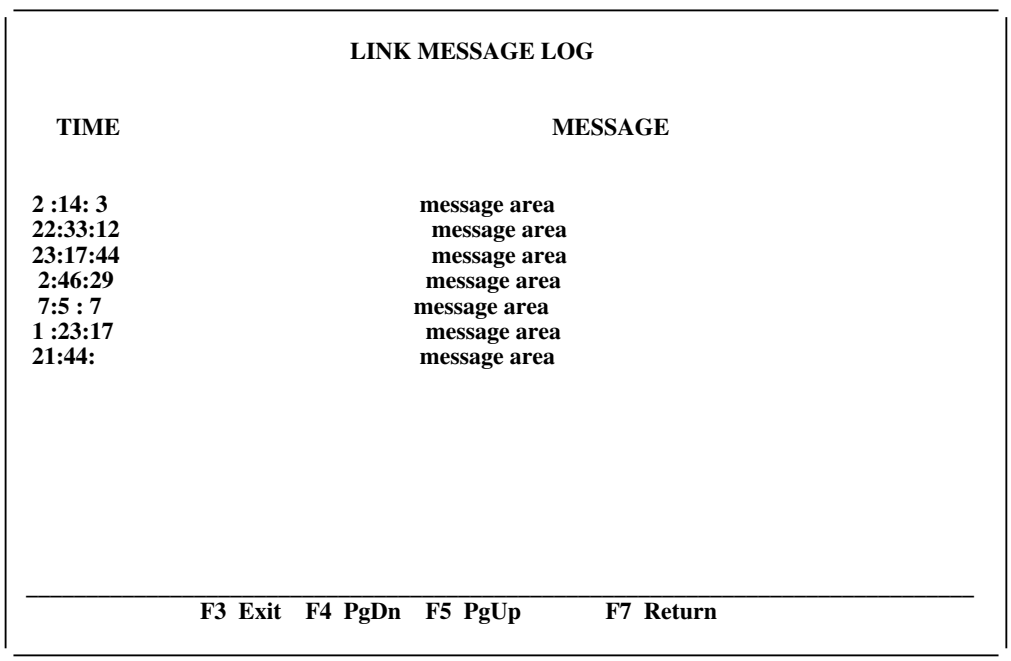


Figure 1-3. Example of LINK MESSAGE LOG Panel

Press F4 to view additional messages. To review Panels, press F5.

Press F7 to return to the main menu, or press F3 to return to DOS.

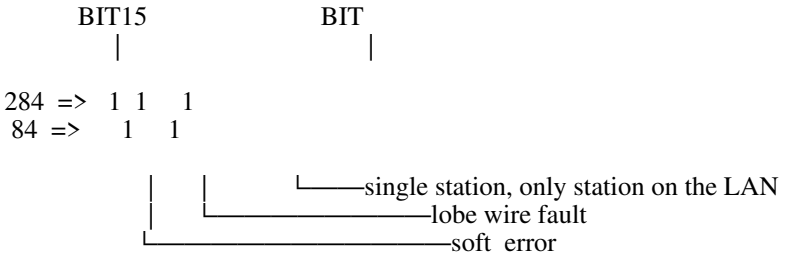
Gateway Status Utility Link Message Log Entries

Network Status (Code=xxxx, Link Name=nnnnnaa)

This type of message indicates that the adapter used for the links between the gateway and the network stations has reported a network status change that has caused the adapter to be closed. xxxx is a hexadecimal number indicating the status code. These codes are described in the *IBM LAN Technical Reference.*

nnnnn is either TRNET or PCNET, indicating the adapter type. *aa* is the adapter number.

Here is an example:



As can be seen, several status codes can be reported at the same time. Lobe wire fault is the only one of these three that cause the adapter to close. Lobe wire fault generally means that the cable is not connected to the MAU/CAU or has come loose. This condition causes a PC/3270 gateway to stop.

The reporting of the status utility can be tested by disconnecting the cable at the MAU/CAU. It is found that this causes a lobe wire fault and the adapter to close. Then PC/3270 re-opens the adapter, followed by another lobe wire fault and so on. If the cable is disconnected at the PC, the adapter fails to open and the network status reporting condition is never reached, although a lobe media failure is reported. This behavior can vary according to the device driver and adapter used.

The fault almost certainly is in the cabling, so carefully check the connections and wiring in accordance with the procedures set out in the problem-determination information for the wiring system.

Sometimes the whole PC hangs when a Token-Ring cable is suddenly disconnected from the PC. This has nothing to do with PC/3270 itself.

Adapter Check (Code=xxxx, Link Name=nnnnnaa)

This entry indicates that the LAN adapter used for downstream links between the gateway and the network stations has reported an adapter check that caused the adapter to close. xxxx is a hexadecimal number indicating the reason code. These codes are described in the *LAN Technical Reference*. *nnnnn* is either TRNET or PCNET, indicating the adapter type. *aa* is the adapter number.

PC-Detected Error (Code=xxxx, Link Name=nnnnnaa)

This entry indicates that the LAN adapter used for downstream links between the gateway and the network stations has reported a PC system-detected error that caused the adapter to close. xxxx is a hexadecimal number indicating the error code. These codes are described in the *LAN Technical Reference*. *nnnnn* is either TRNET or PCNET, indicating the adapter type. *aa* is the adapter number.

Adapter Open Failure (Code=xxxx, Link Name=nnnnnaa)

This entry indicates that the LAN adapter used for downstream links between the gateway and the network stations has reported an error return code from DIR.INITIALIZE, DIR.OPEN.ADAPTER, or DLC.OPEN.SAP. xxxx is a hexadecimal number indicating the return code. Two of the most commonly seen codes are 30 and 46. All of the codes are described in the *LAN Technical Reference*.

nnnnn is either TRNET or PCNET, indicating the adapter type. *aa* is the adapter number.

COMM Check xxx

This entry indicates that a communication check has been generated by the host (upstream) link. Some of these are generated each time a link comes up and are immediately cleared and do not indicate a problem. These are the same codes that appear on the OIA line of a local session in the gateway. These codes are described under OIA Messages in the *Personal Communications/3270 Version 4.1 Up and Running for DOS (Full-Function Mode)*.

MACH Check xxx

This entry indicates that a machine check has been generated by the host (upstream) link. These are the same codes that appear on the OIA line of a local session in the gateway. These codes are described under OIA Messages in the *Personal Communications/3270 Version 4.1 Up and Running for DOS (Full-Function Mode)*.

PROG Check xxx

This entry indicates that a program check has been generated by the host (upstream) link. These are the same codes that appear on the OIA line of a local session in the gateway. These codes are described under OIA Messages in the *Personal Communications/3270 Version 4.1 Up and Running for DOS (Full-Function Mode)*.

-RSP on Unbind - Host DAF=xx

This entry indicates that the gateway sent an unbind to the host for a particular session and the host returned a negative response. This error is very rare and indicates a serious problem with that session. The gateway will mark that session as permanently unavailable.

Initialization Failure - nnnnnnnn DLC(DLCNAME)

This entry can be generated because of a problem with either the upstream or the downstream data link control (DLC) program.

nnnnnnnn is either Upstream or Downstream.

When reported for an upstream DLC, this indicates that the host name used by the upstream DLC was not recognized.

When reported for a downstream DLC, this indicates that no internal link station table was found for this DLC.

This error is very rare. In either case, run INSTALL again.

Displaying the Session Status

Selecting **Display Session Status** at the GATEWAY STATUS UTILITY menu allows you to display the status of all sessions allocated to your gateway or the status of a single workstation in the network. When you select this option, the STATUS DEFINITION MENU is displayed, as shown in Figure 1-4.

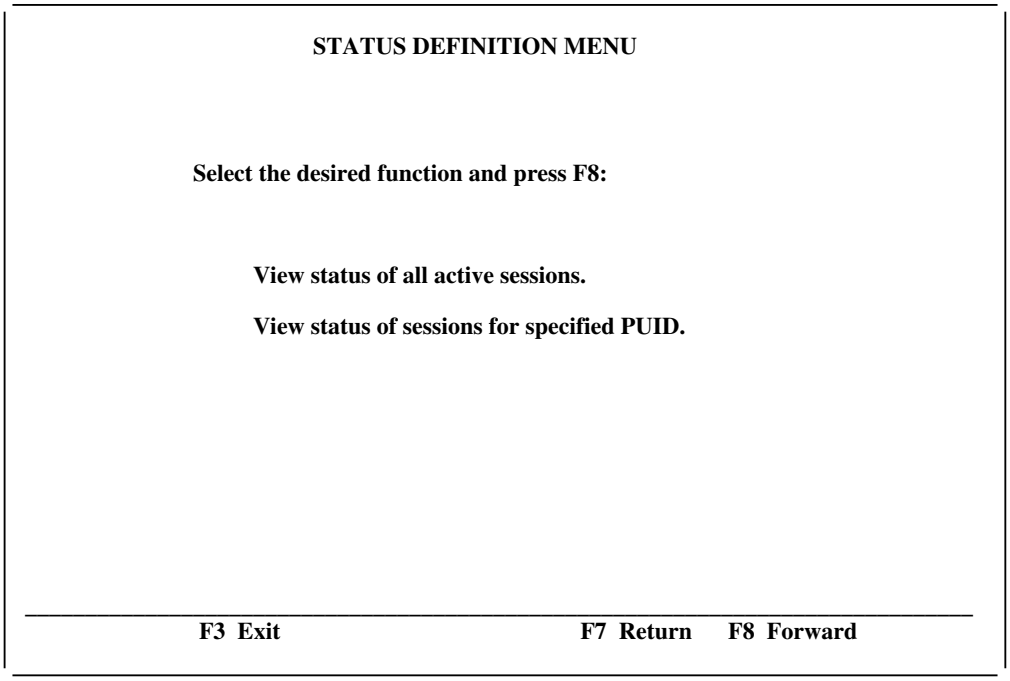


Figure 1-4. Example STATUS DEFINITION MENU

To view the status of sessions:

1. Move the cursor to the option you need.
2. If you select the option **View status of sessions for specified PUID**, the message **Enter a PUID and press F8** is displayed. Type the PUID number.
3. Press F8 to proceed.

Viewing the Status of Network Stations

If you choose to view the status of active network stations, a panel is displayed that gives you information of the kind shown in Figure 1-5.

```
                         NETWORK STATION STATUS

PUID    PU STATE    DEST. ADDRESS    WSLU    GWLU      LU STATE    HOST STATE

23456   A-4682      123456789AB
                                  2       23    B-12345678    A-5436
                                  3       27    I-23456789    I-A345
                                  4       14    A-3456789A    A-FF54

56789   A- 843      3456789ABCDE
                                  2       25    B-98765432    A-4437
                                  3       21    B-87654321    A-3434
                                  4       29    I-7654321     I- 99
                                  5        3    A- 885522     A-4437
                                  6       17    A-34575674    A-4432

45678   A-3244      23456789ABCD
                                  2       12    A-29945844    A-3378
                                  3       28    A-87654321    A-4111
                                  4        8    A-7654321     A-789


        F3 Exit   F4 PgDn   F5 PgUp   F6 Refresh   F7 Return
```

Figure 1-5. Example NETWORK STATION STATUS Panel

To view additional entries, press F4. Press F6 if you need to refresh the screen. To return to the STATUS DEFINITION MENU, press F7. To return to DOS, press F3.

Viewing the Status of One Network Station

If you choose to view the status of one network station, a screen is displayed giving you status information for that station only. An example is shown in Figure 1-6.

```
                    NETWORK STATION STATUS

PUID    PU STATE   DEST. ADDRESS    WSLU    GWLU    LU STATE    HOST STATE

56789   A- 843    3456789ABCDE
                                 2       25    B-98765432    A-4437
                                 3       21    B-87654321    A-3434
                                 4       29    I-7654321     I- 99
                                 5        3    A- 885522     A-4437
                                 6       17    A-34575674    A-4432

        F3 Exit                  F6 Refresh    F7 Return
```

Figure 1-6. Example NETWORK STATION STATUS panel

Press F7 to return to the STATUS DEFINITION MENU, or press F3 to return to DOS.

The following fields of the panel need some clarification:

Destination Address
This is the active address of the workstation's LAN adapter.

WSLU This is the number of the LU as configured in the workstation; its range is therefore 02–09.

GWLU This is the number of the LU as configured at the host and in the gateway; its range is therefore 02–FE.

Gateway Status Utility State Flags

Here is an example of the information displayed on the Network Station Status screen:

```
                    NETWORK STATION STATUS

PUID    PU STATE   DEST. ADDRESS    WSLU    GWLU    LU STATE    HOST STATE
     A-4C       1  5A
                                 2       3     B-5   C     A-A
                                 3       4     A-5   8     A-A
```

The following explains the meaning of the PU state flags:

A XID0 or XID3 was received from network station (0x0800)

I No XID0 or XID3 was received from the network station

0x8000 ACTPU response is pending from the network station
0x4000 ACTPU response was received from the network station
0x2000 DACTPU response is pending from the network station
0x1000 Send ACTPU to the network station
0x0800 XID0 or XID3 was received from the network station
0x0400 A link was established with the network station
0x0200 Quiescing the network station (Request Disconnect Normal was received)
0x0100 Purge SSCP-PU data sent by the network station
0x0080 NMVT segment has been queued
0x0040 Processing a NMVT RU
0x0020 Drop the network station when the DACTPU sequence is complete (Request Disconnect Immediate was received)

The following explains the meaning of the LU state flags:

A Active, ACTLU has been received from host (0x10000000)
B Bound, BIND has been received from host (0x00020000)
I Inactive

The LU status field is made up of two 2-byte flag masks. The first flag mask (bytes 0 and 1) contains the following flags:

0x8000 ACTLU response is pending from the network station
0x4000 ACTLU response was received from the network station
0x2000 Send ACTLU to the network station
0x1000 SSCP-LU session was established with the host
0x0800 ACTLU response is owed to the host
0x0400 DACTLU response is pending from the network station
0x0200 Send DACTLU to the network station
0x0100 DACTLU response is owed to the host
0x0080 Notify response is pending from the host
0x0040 Send Notify Power Off to the host
0x0020 Send Notify Power On to the host
0x0010 Send Power Off to the host
0x0008 Host SSCP-LU request is outstanding
0x0004 Network Station SSCP-LU request is outstanding
0x0002 Session is bound
0x0001 UNBIND/BIND forthcoming received

The second flag mask (bytes 2 and 3) contains the following flags:

0x8000 BIND response is owed to the host
0x4000 UNBIND response is owed to the host
0x2000 LU-LU Expedited response is owed to the network station
0x1000 Send UNBIND to the host
0x0800 Purge host normal flow SSCP-LU chain
0x0400 Purge host normal flow LU-LU chain
0x0200 Host normal flow SSCP-LU end chain
0x0100 Host normal flow LU-LU end chain
0x0080 Host normal flow SSCP-LU end segment
0x0040 Host normal flow LU-LU end segment
0x0020 Gateway sent UNBIND to the host
0x0010 Network station SSCP-LU data queued
0x0008 Network station sent UNBIND to the host

The following explains the meaning of the host state flags:

A At least one SSCP-LU session is active (0x80)
I No SSCP-LU sessions are active

0x80 At lease one SSCP-LU session is active for this host
0x40 Upstream DLC terminated
0x20 Upstream DLC initialized

Terminating the Gateway

Selecting **Terminate the gateway** on the GATEWAY STATUS UTILITY menu allows you to terminate the gateway for all stations. When this option is selected, the gateway termination menu is displayed as shown in Figure 1-7.

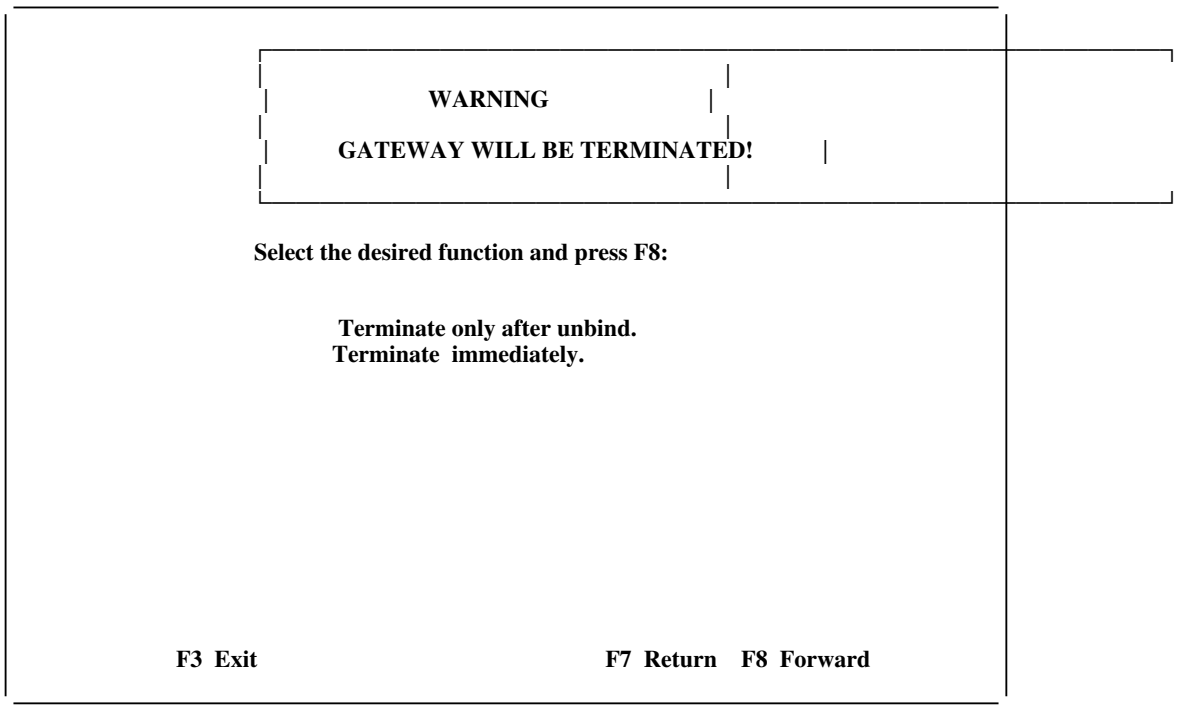


Figure 1-7. Gateway Termination Menu

If you are using an SDLC or LAN attachment, you can choose to terminate the gateway immediately or after all active sessions are completed and all stations are unbound.

Notes:

1. The PC/3270 gateway does not support **Terminate only after unbind** for DFT attachment. When you select either option with a DFT attachment, all sessions, bound or unbound, are terminated immediately.
2. When your gateway is terminated, all messages in the link message log are lost.

The maximum time required to terminate the gateway is determined during configuration and can be up to 16 minutes.

Refreshing OIA Data in the Link Log

When you are running the Gateway Status Utility, you can refresh OIA information in the host link log. To refresh the OIA information, switch the logical terminal (hot key) to DOS (running in the suspend mode) and then back to the host session. The updated information is reflected in the host link log. This is useful if you lose your host connection temporarily.

HLLAPI EBCDIC-ASCII Translation Table Editor (PCSHLLED)

PCSHLLED is a tool that enables you to customize the HLLAPI EBCDIC-ASCII translation table. This translation table is used for the following HLLAPI functions.

```
 5 - Copy Presentation Space
 6 - Search Presentation Space
 8 - Copy Presentation Space to String
15 - Copy String to Presentation Space
3  - Search Field
33 - Copy String to Field
34 - Copy Field to String
```

PCSHLLED has three optional parameters:

Parameter Meaning

-q Quiet. This suppresses the PCSHLLED version message.

-t Table display. This displays the current HLLAPI ASCII-to-EBCDIC and EBCDIC-to-ASCII translation tables.

If you want to store the table into a file (for example, **HLL.TBL**), enter:

```
PCSHLLED    -t   >    hll.tbl
```

The following are the default tables for Host Code Page 037 and PC Code Page 437:

```
                ASCII -> EBCDIC                                  EBCDIC -> ASCII

    - -1-2-3 -4-5-6-7 -8-9-a-b -c-d-e-f          - -1-2-3 -4-5-6-7 -8-9-a-b -c-d-e-f
 -   1 2 3 372d2e2f 16 525 b  c d e f     -    1 2 3 ff 9ff7f ffffff b  c d e f
1- 1 111213 b6b53226 18193f27 1c1d1e1f    1- 1 111213 ffff 8ff 1819ffff 1c1d1e1f
2- 4 5a7f7b 5b6c5 7d 4d5d5c4e 6b6 4b61    2- ffffffff ff a171b ffffffff ff 5 6 7
3- f f1f2f3 f4f5f6f7 f8f97a5e 4c7e6e6f    3- ffff16ff ffffff 4 ffffffff ffffff1a
4- 7cc1c2c3 c4c5c6c7 c8c9d1d2 d3d4d5d6    4- 2 ff8384 85a ff86 87a49b2e 3c282bb3
5- d7d8d9e2 e3e4e5e6 e7e8e9ba e bbb 6d    5- 26828889 8aa18c8b 8de12124 2a293baa
6- 79818283 84858687 88899192 93949596    6- 2d2fff8e ffffff8f 8 a57c2c 255f3e3f
7- 979899a2 a3a4a5a6 a7a8a9c  6ad a1 7    7- ff9 ffff ffffffff ff6 3a23 4 273d22
8- 68dc5142 43444748 52535457 56586367    8- ff616263 64656667 6869aeaf fffffff1
9- 719c9ecb cccddbdd dfecfc4a b1b24 4     9- f86a6b6c 6d6e6f7  7172a6a7 91ff92ff
a- 4555cede 49699a9b ab4 5fb8 b7aa8a8b    a- e67e7374 75767778 797aada8 ffffffff
b- 4 4 4 4f 4 4 4 4  4 4 4 4  4 4 4 4     b- 5e9c9dfa ff1514ac abff5b5d ffffffff
c- 4 4 4 4  4 4 4 4  4 4 4 4  4 4 4 4     c- 7b414243 44454647 4849ff93 9495a2ff
d- 4 4 4 4  4 4 4 4  4 4 4 4  4 4 4 4     d- 7d4a4b4c 4d4e4f5  5152ff96 8197a398
e- 4 594 4  4 4 a 4  4 4 4 4  4 4 4 4     e- 5cf65354 55565758 595afdff 99ffffff
f- 4 8f4 4  4 4 e14  9 4 b34  4 ea4 ff    f- 3 313233 34353637 3839ffff 9affffff
```

Parameter Meaning

-d Definition-file display. This displays the current HLLAPI ASCII-to-EBCDIC conversion in PCSHLLED definition-file format.

If you want to store the definitions into a file (for example, **HLL.DEF**), enter:

```
PCSHLLED    -d   >    hll.def
```

The following is a sample of the output for PC Code-Page 437, Host Code-Page 037:

```
A2E
A2E  1  1
      :
A2E 3  f
A2E 31 f1
A2E 32 f2
      :
A2E fe 4
A2E ff ff
```

Subcommands

If you issue no parameters, the following information is displayed:

```
PCSHLLED    Version  4.      Level  1
 Enter q to quit
"
```

You can issue two definition commands here:

```
A2E  ascii_char    ebcdic_char
```

or

```
E2A ebcdic_char ascii_char
```

where

A2E ; Changes an ASCII to EBCDIC translation

E2A ; Changes an EBCDIC to ASCII translation

ascii_char ; ASCII character code point in hexadecimal notation or ASCII character enclosed with single quotes

ebcdic_char ; EBCDIC character code point in hexadecimal notation

Note: You can use either A2E or E2A; an ASCII-to-EBCDIC change is automatically reflected in the EBCDIC-to-ASCII translation table and vice versa.

Example

```
Any comment should start with ' '

ASCII 12 is converted to EBCDIC 5F , and EBCDIC 5F to ASCII 12

A2E 12 5f

EBCDIC BD is converted to ASCII '“' , and the ASCII '“' to EBCDIC BD

E2A bd '“'
```

Making Changes By Using a Definition File

This method allows you to change the default contents of a table by using a file which contains A2E or E2A command lines. Create the file (for example, **MYHLL.DEF**) by using an appropriate editor.

To active the definition file for the current use of HLLAPI only, enter:

```
PCSHLLED  <  MYHLL.DEF
```

If you want to make your re-definition effective every time you start PC/3270, create a new **.BAT** file to start PC/3270. The file should contain the following command lines:

```
 rem PC/327  Start BAT file created by CONFIG.EXE
call  PC327 .BAT
 rem Your personal HLLAPI ASCII-EBCDIC translation table
 PCSHLLED < MYHLL.DEF
exit
```

However, if you selected **Yes** for **Start the 3270 Setup and Utility program in the DOS session**, meaning that PCSUTIL is automatically loaded, insert the line beginning with PCSHLLED just before the PCSUTIL statement.

Administration Utilities

Chapter 2. Printer Definition Table

If you are using a printer that is not directly supported by PC/3270, you can use the printer table compiler to build a printer definition table for use by PC/3270. The input to the printer table compiler is a text file that defines how characters and control codes are sent to the printer and how printer output is formatted. You can create this file by using a text editor that produces an ASCII file or by modifying one of the printer definition tables supplied with PC/3270. The printer definition files are files that have an extension of **.PDF**.

Customizing the Printer Definition Table

Use the following statement to invoke the PCSPTC printer table compiler:

PCSPTC infile[.PDF] [outfile[.PDT]] [/LIST] [/QUIET]

The parts of the PCSTBLD statement are as follows:

PCSPTC — The command that invokes the Printer table compiler.

infile — The name of the file that is input to the printer table compiler. This printer definition file must have the extension **.PDF**.

outfile — The name of the file that is output by the printer table compiler and contains the compiled printer definition table. This file must have the extension **.PDT**. If this file name is omitted, the printer table compiler uses the default file name of infile**.PDT**.

/LIST — Causes the printer table compiler to produce a listing in the file infile**.LST**.The printer table compiler will also accept /L, /LI, and /LIS for this option.

/QUIET — Suppresses error messages to the screen. The printer table compiler will also accept /Q, /QU and /QUI for this option.

No space is required between the /LIST and /QUIET options.

The compiled printer definition table (with the extension **.PDT**) is used as input to the printer support options during installation or configuration.

Note: Place the printer definition table (**.PDT**) file on the backup copy of Diskette 1, Installation.

Printer Definition File Format

The printer definition file consists of a macro definitions section and a definitions section. In the *macro definitions section*, you can equate a sequence of hexadecimal numbers, decimal numbers, and ASCII characters with a name that is used in place of that sequence in the definitions section. In the *definitions section*, the left side of each statement contains the name of a character or control command.

You enter a string of hexadecimal numbers, decimal numbers, ASCII characters, or previously defined macro names on the right side of each statement that defines the character or the command that is sent to the printer.

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Different printer manuals define printer control strings in different ways. Some printer manuals describe control sequences as a string of hexadecimal numbers, while others use symbols such as esc J 1 K. The printer table compiler accepts either format and allows you to define macros for more readable files. The right side of each statement in the definitions section of the printer definition file can be any of the following:

Single characters that are interpreted as their ASCII value
Two-digit numbers that are interpreted as hexadecimal values
Three-digit numbers that are interpreted as decimal values
Previously defined macros that are expanded by the printer table compiler.

If you leave the right side of a statement blank or if you delete it, the character or control code is interpreted as a null string. If a character or control code is defined more than once in the file, the last definition is used. If an error is detected in a statement, the printer table compiler ignores the statement and goes to the next statement.

After you have created your printer definition file, use the printer table compiler to compile it. The resulting file has the extension **.PDT**.

The symbols / indicate the beginning of a comment and the symbols / indicate the end of a comment. Comments can be entered anywhere point in your printer definition table and are ignored by the printer table compiler.

A macro definition cannot contain another macro definition.

You can find a sample file, **IBM42 2.PDF**, on your PC/3270 diskettes. You can copy this file and modify the copy to create your custom printer definition table.

Printer Definition Tables

Standard printer definition table file names are of the form **IBM**nnnnn**.PDT**, and tables containing code page fonts are of the form **PRN**nnnnn**.PDT**, where nnnnn is a machine type.

Example Printer Definition File

The following example is an annotated version of a printer definition file for the IBM 4202 Proprinter. (This is an example only. The actual file might differ.)

Example 4202 Proprinter Definition

```
/                                                  /
/                                                                                  /
/      PRINTER SESSION DEFINITION FILE FOR: Proprinter XL 42 2-1                  /
/                                                                                  /
/                                                  /
/                                                  /
/                                  Macro  Definitions                                  /
/ Define values here that will be used commonly throughout your          /
/ definitions.   Then use the left hand side of the equate as you        /
/ define your characters and control strings.   The printer compiler    /
/ will substitute the right hand side of the equate for each              /
/ occurrence of the left hand side throughout the file.                  /
/                                                                                  /
/ Macro names must be at least three characters long and may not        /
/ begin with a number.                                                          /
/                                                                                  /
/ Format                                                                           /
/ A Macro Name is associated with a value or string of values by the  /
```

```
/ EQU statement.    The right hand side of an EQU statement must be a     /
/ string of zero or more two digit hexadecimal numbers.    If a macro     /
/ definition is more than one line long, you may extend it to the         /
/ next line by ending the first line with a comma.    In this manner      /
/ you may define a macro which is many lines long by terminating each /
/ line except the last with a comma.    No macro names are allowed on     /
/ right hand side.                                                        /
/                                                  /
BEGIN_MACROS
/ The following values are standard for most printers.    Check your      /
/ printer manual to verify that these are correct for your printer      /
NUL EQU                    / Nul character                          /
BEL EQU  7                 / Beeper                                   /
BAK EQU  8                 / Back Space                               /
TAB EQU  9                 / Tab                                      /
LFF EQU  A                 / Line Feed                                /
VTB EQU  B                 / Vertical Tab                             /
FFF EQU  C                 / Form Feed                                /
CRR EQU  D                 / Carriage Return                          /
P 5 EQU 1B 57  1           / 5 Pitch-Characters/inch          /
                           / Same as Double Wide                     /
SEL EQU 11                 / Select Printer                           /
P1  EQU 12                 / 1  Pitch-Characters/inch         /
CDW EQU 1B 57              / Cancel Double Wide contin.     /
CDL EQU 14                 / Cancel Double Wide line          /
ESC EQU 1B                 / Escape                                   /
CAN EQU 18                 / Cancel Data                              /
SPA EQU 2                  / Space                                    /
P17 EQU 12  F              / 17.1 Pitch-Characters/inch     /
CS2 EQU 1B 36              / Select Character Set 2           /
CS1 EQU 1B 37              / Select Character Set 1           /
P12 EQU 1B 3A              / 12 Pitch-characters/inch         /
SVT EQU 1B 42              / Set Vertical Tabs                        /
SFL EQU 1B 43              / Set Form Length                          /
SHT EQU 1B 44              / Set Horizontal Tabs                      /
SDS EQU 1B 47              / Start Double Strike                      /
CDS EQU 1B 48              / Cancel Double Strike                     /
SSP EQU 1B 4E              / Set skip perforation                     /
CSP EQU 1B 4F              / Cancel skip perforation          /
CAT EQU 1B 52              / Cancel all tabs Clears VT      /
                           / and sets HT every 8 position /
CSS EQU 1B 54              / Cancel Subscript or Superscr /
SSO EQU 1B 53              / Set Superscript over                     /
SSU EQU 1B 53  1           / Set Subscript under                      /
SUL EQU 1B 2D  1           / Start Underline                          /
CUL EQU 1B 2D              / Cancel Underline                         /
LL6 EQU 1B 41  C 1B 32 /  Set line length 6 lines/inch /
LL8 EQU 1B 41  9 1B 32 /  Set line length 8 lines/inch /
LL  EQU 1B 41  7 1B 32 /  Set line length 1  lines/inc /
                           / actually 7/72 inch               /
SDQ EQU 1B 49              / Select Draft Printing Quality                /
SLQ EQU 1B 49  2           / Select Letter Printing Quality               /
END_MACROS
/                              Session  Parameters                        /
/ These parameters determine the way in which output will be              /
/ formatted for your printer.                                                 /
/ Numeric Parameters                                                          /
/ These parameters should be defined with a two digit hex number          /
/ or a three digit decimal number.    The range of the number is zero     /
/ to 255 (decimal).                                                           /
MAXIMUM_PAGE_LENGTH= 66                 / Printed lines per page          /
MAXIMUM_PRINT_POSITION=132              / Printed characters per line  /
INTERV_REQ_TIMER=  1
RESELECT_TIME_EXCPT_52 4=  1
INTERV_TIMER_ON_PE_ONLY?=NO
/ YES/NO Parameters                                                           /
/ These parameters should be defined with either "YES" or "NO" on the /
/ right hand side of the '='                                                  /
COMPRESS_LINE_SPACING?=NO               / Should blank or null lines     /
                                        / be printed?                    /
FORM_FEED_ANY_POSITION?=YES             / Should the form feed be         /
```

Printer Definition Table

```
                                                    /  valid in any position?           /
OVERRIDE_FORMATTED_PRINT?=YES              /  Should nulls be printed as    /
                                                   /  blanks?                          /
AUTO_NEWLINE_AT_MAX_POS?=NO
/                                  Control  Codes                                      /
/  These definitions tell the emulator what control strings to send to /
/  your printer to issue control commands.                                  /
/                                                                                      /
/  Format                                                                              /
/  The name of the control command should always be at the beginning     /
/  of a line followed by a '=' and then a definition string.                /
/  A Definition String is any combination of macro names, hexadecimal  /
/  numbers, and characters separated by blanks.    A macro must have        /
/  previously defined in the macro definitions section above. A             /
/  hexadecimal number must be two digits ( ,..,F) long. and a               /
/  character must be preceded and followed by a blank.    If a              /
/  definition string will not fit on a line, it may be continued           /
/  as many lines as you wish by ending each line except the last with  /
/  a comma;    ','.      You made add any comments you wish to by including /
/  them between a slash     and a  slash where slash is the symbol /.      /

/  START_JOB is the control string which will be sent to your printer  /
/  at the beginning of each print job.                                      /
START_JOB=SEL CDW CDL CUL CDS CS2
/  END_JOB is the string which will be sent to your printer at the end /
/  of each print job.                                                              /
END_JOB=CAT CDW CDL CUL CDS FFF
BACKSPACE=BAK
BEL=BEL
CARRIAGE_RETURN=CRR
NEW_LINE=CRR LFF
LINE_FEED=LFF
FORM_FEED=FFF
HORIZONTAL_TAB=TAB
VERTICAL_TAB=VTB
START_SUBSCRIPT=SSU
END_SUBSCRIPT=CSS
START_SUPERSCRIPT=SSO
END_SUPERSCRIPT=CSS
DUP=
FIELD_MARK=;
/  The following commands specify control codes for which most PC          /
/  printers require command strings which contain a variable value        /
/  or values somewhere in the middle of the string.                          /
/  Place the word "value(s)" in the position of your definition             /
/  string where the Personal Communications 327  should fill in             /
/  the hexadecimal value(s) indicated.                                      /
/  For example, on the IBM Proprinter, the SET_HORIZONTAL_TABS              /
/  definition is:                                                           /
/  SET_HORIZONTAL_TABS=ESC D values NUL                                                /
SET_HORIZONTAL_TABS=SHT values NUL      /  "values" are the tab stops     /
                                                   /  in column numbers                /
SET_VERTICAL_TABS=SVT values NUL         /  "values" are the tab stops     /
                                                   /  in line numbers                  /
SET_HORIZONTAL_MARGINS=
SET_PAGE_LENGTH=SFL value                    /  "value"=number of lines       /
SET_AUTO_PERFORATION_SKIP=SSP value
                                                   /  "value"=number of lines to /
                                                   /  skip over the perforation       /
                                                   /  between pages.    Used to set  /
                                                   /  top and bottom margins.          /
SET_VARIABLE_LINE_DENSITY=ESC A value ESC 2
                                                   /  "value"=number of points.  /
                                                   /  A point is 1/72 of an inch.  /
SET_CHARACTER_SET=
/ SET_CHARACTER_SET=ESC I NULL    selects the normal font                          /
/ SET_CHARACTER_SET=ESC I  2    selects the NLQ (near letter quality)  /
/ SET_CHARACTER_SET=ESC I  4    selects the normal downloaded font        /
/ SET_CHARACTER_SET=ESC I  6    selects the NLQ downloaded font             /
/ SET_CHARACTER_SET=CS1             selects the Character set 1                  /
/ SET_CHARACTER_SET=CS2             selects the Character set 2                  /
```

```
/ These control codes set the printer lines per inch and characters    /
/ per inch to fixed amounts.                                           /
/ If your printer does not support setting the line density in points /
/ then you can enter control strings for the following commands.       /
/ When Personal Communications 327 gets a command from the host to    /
/ set the lines per inch, it will round it to the closest line per    /
/ inch setting that you provide. Note that if you provide a command /
/ for the SET_VARIABLE_LINE_DENSITY command above that it will be     /
/ used and any control strings you provide for the set lines per inch /
/ commands below will not be used.                                     /

SET_6_LINES_PER_INCH=LL6
SET_8_LINES_PER_INCH=LL8
SET_1 _LINES_PER_INCH=LL              / 7/72 inch or 9/96 inch         /
SET_1 _CHARACTERS_PER_INCH=P1
SET_12_CHARACTERS_PER_INCH=P12
SET_15_CHARACTERS_PER_INCH=           / The proprinter does not        /
                                      / support 15 pitch except in     /
                                      / graphs mode                    /
SET_17_CHARACTERS_PER_INCH=P17        / Condensed mode                 /
START_DOUBLE_WIDTH_CHARACTERS=P 5
END_DOUBLE_WIDTH_CHARACTERS=CDW

/ These control codes are used to select the source drawer number      /
/ when your printer has the dual drawer sheetfeed option.              /
SELECT_DRAWER1=
SELECT_DRAWER2=
SELECT_DRAWER3=
/ These control codes select the print mode (quality of print).        /
SELECT_DRAFT_QUALITY=SDQ
SELECT_LETTER_QUALITY=SLQ
SELECT_ENHANCED_QUALITY=
SELECT_SETUP_QUALITY=
/                          Color Specifications                        /
START_COLOR_BLUE=
END_COLOR_BLUE=
START_COLOR_GREEN=
END_COLOR_GREEN=
START_COLOR_CYAN=
END_COLOR_CYAN=
START_COLOR_RED=
END_COLOR_RED=
START_COLOR_MAGENTA=
END_COLOR_MAGENTA=
START_COLOR_YELLOW=
END_COLOR_YELLOW=
START_COLOR_BLACK=
END_COLOR_BLACK=
START_COLOR_WHITE=
END_COLOR_WHITE=

/                        Highlight Specifications                      /
/ These definitions will determine how things which are sent by the    /
/ host to be displayed or printed as underlined, reverse video, or     /
/ blinking will be highlighted on your printer.                        /

START_HIGHLIGHT_INTENSE=SDS           / This is double strike          /
END_HIGHLIGHT_INTENSE=CDS
START_HIGHLIGHT_UNDERLINE=SUL
END_HIGHLIGHT_UNDERLINE=CUL
START_HIGHLIGHT_REVERSE_VIDEO=
END_HIGHLIGHT_REVERSE_VIDEO=
START_HIGHLIGHT_BLINK=
END_HIGHLIGHT_BLINK=

/                        Character Definitions                         /
/ The remainder of the definitions are for printable characters.       /
/ See your users guide for the actual character referred to by each    /
/ character name.                                                      /
/ Format                                                               /
/ The format of a character definition is the same as for a control    /
/ code.                                                                /
```

```
SPACE=SPA
EXCLAMATION_POINT=21
QUOTATION_MARKS=22
NUMBER_SIGN=23
DOLLAR_SIGN=24
PERCENT_SIGN=25
AMPERSAND=26
APOSTROPHE=27
LEFT_PARENTHESIS=28
RIGHT_PARENTHESIS=29
ASTERISK=2A
PLUS_SIGN=2B
COMMA=2C
HYPHEN=2D
PERIOD=2E
SLASH=2F
ZERO=
ONE=1
TWO=2
THREE=3
FOUR=4
FIVE=5
SIX=6
SEVEN=7
EIGHT=8
NINE=9
COLON=3A
SEMICOLON=3B
LESS_THAN_SIGN=3C
EQUAL_SIGN=3D
GREATER_THAN_SIGN=3E
QUESTION_MARK=3F
AT_SIGN=4
A_CAPITAL=A
B_CAPITAL=B
C_CAPITAL=C
D_CAPITAL=D
E_CAPITAL=E
F_CAPITAL=F
G_CAPITAL=G
H_CAPITAL=H
I_CAPITAL=I
J_CAPITAL=J
K_CAPITAL=K
L_CAPITAL=L
M_CAPITAL=M
N_CAPITAL=N
O_CAPITAL=O
P_CAPITAL=P
Q_CAPITAL=Q
R_CAPITAL=R
S_CAPITAL=S
T_CAPITAL=T
U_CAPITAL=U
V_CAPITAL=V
W_CAPITAL=W
X_CAPITAL=X
Y_CAPITAL=Y
Z_CAPITAL=Z
LEFT_BRACKET=5B
BACKSLASH=5C
RIGHT_BRACKET=5D
CIRCUMFLEX_ACCENT=5E
UNDERLINE=5F
GRAVE_ACCENT=6
A_SMALL=a
B_SMALL=b
C_SMALL=c
D_SMALL=d
E_SMALL=e
F_SMALL=f
```

```
G_SMALL=g
H_SMALL=h
I_SMALL=i
J_SMALL=j
K_SMALL=k
L_SMALL=l
M_SMALL=m
N_SMALL=n
O_SMALL=o
P_SMALL=p
Q_SMALL=q
R_SMALL=r
S_SMALL=s
T_SMALL=t
U_SMALL=u
V_SMALL=v
W_SMALL=w
X_SMALL=x
Y_SMALL=y
Z_SMALL=z
LEFT_BRACE=7B
VERTICAL_BAR=B3
RIGHT_BRACE=7D
TILDE_ACCENT=7E
C_CEDILLA_CAPITAL=8
U_DIAERESIS_SMALL=81
E_ACUTE_SMALL=82
A_CIRCUMFLEX_SMALL=83
A_DIAERESIS_SMALL=84
A_GRAVE_SMALL=85
A_OVERCIRCLE_SMALL=ESC 4C  8     6 6A AA AA 6A 1E  2
C_CEDILLA_SMALL=87
E_CIRCUMFLEX_SMALL=88
E_DIAERESIS_SMALL=89
E_GRAVE_SMALL=8A
I_DIAERESIS_SMALL=8B
I_CIRCUMFLEX_SMALL=8C
I_GRAVE_SMALL=8D
A_DIAERESIS_CAPITAL=8E
A_OVERCIRCLE_CAPITAL=8F
E_ACUTE_CAPITAL=9
AE_DIPTHONG_SMALL=91
AE_DIPTHONG_CAPITAL=92
O_CIRCUMFLEX_SMALL=93
O_DIAERESIS_SMALL=94
O_GRAVE_SMALL=95
U_CIRCUMFLEX_SMALL=96
U_GRAVE_SMALL=97
Y_DIAERESIS_SMALL=98
O_DIAERESIS_CAPITAL=99
U_DIAERESIS_CAPITAL=9A
/                                                  /
/ The following character is printed by printing an o    (6F) then       /
/ backspacing(BAK) and over printing with a slash(2F).                     /
/                                                  /
O_SLASH_SMALL=6F BAK 2F
POUND_SIGN=9C
O_SLASH_CAPITAL=4F BAK 2F
/                                                  /
/ The following escape sequence defines the character in all points  /
/ addressable mode (APA).    The ESC 4C starts the APA mode.    The         /
/  8    is the count low and count high and defines eight bytes of     /
/ APA data. The    44 28 1  28 44       are the eight bytes of data. /
/ A bit set to 1 prints the dot and a bit set to   does not print.     /
/ The most significant bit prints as the top dot.    The least              /
/ significant bit prints as the bottom dot.    The first byte is           /
/ printed on the left following the last character.    The next byte     /
/ is printed to the right one dot column to the right of the last       /
/ byte etc..    Refer to the Proprinter Guide to Operations for             /
/ more information.                                                                /
/                                                  /
MULTIPLY_SIGN=ESC 4C  8      44 28 1  28 44
```

```
A_ACUTE_SMALL=A
I_ACUTE_SMALL=A1
O_ACUTE_SMALL=ESC 4C  8     C 12 12 52 92 12  C
U_ACUTE_SMALL=A3
N_TILDE_SMALL=A4
N_TILDE_CAPITAL=A5
ORDINAL_INDICATOR_FEMININE=A6
ORDINAL_INDICATOR_MASCULINE=A7
QUESTION_MARK_INVERTED=A8
REGISTERED_TRADEMARK_SYMBOL=ESC 4C  9    7E 81 BD A9 B9 A5 81 7E
LOGICAL_NOT=AA
ONE_HALF=AB
ONE_QUARTER=AC
EXCLAMATION_POINT_INVERTED=AD
LEFT_ANGLE_QUOTES=AE
RIGHT_ANGLE_QUOTES=AF
A_ACUTE_CAPITAL=ESC 4C  8     6  C 54 A4 14  C  6
A_CIRCUMFLEX_CAPITAL=ESC 4C  8     6 4C 94 A4 94 4C  6
A_GRAVE_CAPITAL=ESC 4C  8     6  C 14 A4 54 4C  6
COPYRIGHT_SYMBOL=ESC 4C  9    7E 81 99 A5 A5 A5 81 7E
CENT_SIGN=9B
YEN_SIGN= 9D
A_TILDE_SMALL=ESC 4C  9     6 2A 2A CA AA 5E 42 8
A_TILDE_CAPITAL=ESC 4C  8     6 4C 94 A4 54 4C 86
INTERNATIONAL_CURRENCY_SYMBOL=ESC 4C  9    82 54 28 44 44 28 54 82
ETH_ICELANDIC_SMALL=EB
ETH_ICELANDIC_CAPITAL=ESC 4C  8    92 FE 92 92 44 7C 38
E_CIRCUMFLEX_CAPITAL=ESC 4C  8    3E 6A AA AA AA 62 22
E_DIAERESIS_CAPITAL=ESC 4C  8    3E AA AA 2A 2A A2 A2
E_GRAVE_CAPITAL=ESC 4C  8    3E 2A 2A AA 6A 22 22
I_DOTLESS_SMALL=ESC 4C  8          12 1E  2
I_ACUTE_CAPITAL=ESC 4C  8          52 9E 12
I_CIRCUMFLEX_CAPITAL=ESC 4C  8       4  92 9E 92 4
I_DIAERESIS_CAPITAL=ESC 4C  8       4  52 1E 52 4
VERTICAL_LINE_BROKEN=ESC 4C  8            77
I_GRAVE_CAPITAL=ESC 4C  8          12 9E 52
O_ACUTE_CAPITAL=ESC 4C  8     E 11 11 51 81 11  E
SHARP_S_SMALL=ESC 4C  8     2 3E 4  52 52 2A  4
O_CIRCUMFLEX_CAPITAL=ESC 4C  8    1C 22 62 A2 A2 62 1C
O_GRAVE_CAPITAL=ESC 4C  8    1C 22 22 A2 62 22 1C
O_TILDE_SMALL=ESC 4C  8     C 12 52 92 52 92 8C
O_TILDE_CAPITAL=ESC 4C  8    1C 22 62 A2 62 A2 9C
MICRO_SYMBOL=E6
THORN_ICELANDIC_SMALL=ESC 4C  8     2 FC    48 3  3
THORN_ICELANDIC_CAPITAL=ESC 4C  8    81 FF FF 42 24 3C 18
U_ACUTE_CAPITAL=ESC 4C  8    3C  2 42 82  2  2 3C
U_CIRCUMFLEX_CAPITAL=ESC 4C  8    3C  2 42 82 82 42 3C
U_GRAVE_CAPITAL=ESC 4C  8    3C  2  2 82 42  2 3C
Y_ACUTE_SMALL=ESC 4C  8    2  1  4A 84  8 1  2
Y_ACUTE_CAPITAL=ESC 4C  8    2  1  48 86  8 1  2
OVERLINE=ESC 4C  8    8  8  8  8  8  8  8
ACUTE_ACCENT=ESC 4C  8          4  8
SYLLABLE_HYPHEN=ESC 4C  8    1  1  1
PLUS_OR_MINUS_SIGN=F1
THREE_QUARTERS=ESC 4C  9    89 AA 74  8 16 2A 47 82
PARAGRAPH_SYMBOL=ESC 4C  8    6  F  FE       FE
SECTION_SYMBOL=ESC 4C  8    3  4B A9 A5 95 D2  C
DIVIDE_SIGN=F6
CEDILLA=ESC 4C  8             3  C  C
DEGREE_SYMBOL=F8
DIAERESIS=ESC 4C  8       8  8       8  8
MIDDLE_DOT_ACCENT=F9
ONE_SUPERSCRIPT=ESC 4C  8          48 F8  8
THREE_SUPERSCRIPT=ESC 4C  8          88 A8 A8 D8
TWO_SUPERSCRIPT=ESC 4C  8       48 98 A8 A8 48
REQUIRED_SPACE=FF
/                                                  /
/                    PC/327  Internal Data Area.                    /
/  Do not change these statement.                                  /
/                                                  /
TOP_MARGIN=
LEFT_MARGIN=
```

```
DYNAMIC_START_JOB=
DYNAMIC_END_JOB=
DYNAMIC_SET_PAGE_LENGTH=
PRINTER_ID=42  2
/                        End of Definition File                        /
```

Supplemental Explanation of PDF Statements

The PDF statements listed below have the following functions.

MAXIMUM_PAGE_LENGTH
Printed lines per page. If you change this value, you must change the value in the "SET_PAGE_LENGTH=SFL value" statement to be the same.

MAXIMUM_PRINT_POSITION
Printed characters per line.

COMPRESS_LINE_SPACING?
(For LU3 only) Whether blank or null lines are to be printed if all characters on that line are nulls.

FORM_FEED_ANY_POSITION?
Whether a form feed is to be valid in any position. If NO, a form feed will be valid only in the following positions:

First print-position of the buffer
After a valid new line operation
First print-position of a line

OVERRIDE_FORMATTED_PRINT?
Whether nulls are to be printed as blanks.

INTERV_REQ_TIMER
Specifies an approximate time to suppress -RSP (SC=0802) for a printer-intervention-is-required condition, counted in 20-second quantities. The printer-intervention-is-required condition means: out of paper, printer power is off, printer cable error, or paper jam. Valid values are: 001–254 and 000 (special case).

For example, if INTERV_REQ_TIMER=006 is specified, -RSP will be sent to the host about 2 minutes after an Intervention-is-required condition occurs. If INTERV_REQ_TIMER=000 is specified, -RSP will never be returned to the host if an intervention-is-required condition occurs.

INTERV_TIMER_ON_PE_ONLY?
If YES, the INTERV_REQ_TIMER is valid only for the out-of-paper condition. For other intervention-is-required conditions, a -RSP will be sent to the host within 20 seconds.

RESELECT_TIME_EXCPT_5204
Specifies a time to suppress -RSP (SC=0802) for a printer-is-not selected condition in 1-minute increments. This condition means that the printer is not in the Ready-to-print state; for instance, the start/stop switch on the printer panel might have been pressed. Valid values are: 001–010 and 000 (special case).

For example, if RESELECT_TIME_EXCPT_5204=003 is specified, -RSP will be sent to the host approximately 3 minutes after the start/stop switch was pressed. If

RESELECT_TIME_EXCPT_5204=000 is specified, -RSP will never be returned to the host after the start/stop switch was pressed. If a printer is 5204 or follow-on, this statement has no effect. In this case, the INTERV_REQ_TIMER value takes its place.

ESC/P_LINE_FEED?

If YES, the line feed (LF) function is emulated when the line feed command is received. This is useful when you do not want a line feed accompanied by a carriage return (CR) on a printer using the ESC/P printer language. If NO, the value defined in the LINE_FEED statement is sent to the printer.

SCS TAB Setting

A PC/3270 printer session LU type 1 can accept any number of tab positions and the host printer session can send any number of tabs to the printer session. However, the PC printer you are using might support fewer tab positions than the host application sets; for example, the IBM Proprinter supports 27 tab positions.

If the number of tab positions that the host application sets exceeds the maximum number of positions that the printer supports, your printed output will not look as you expect it to. You can avoid this situation by modifying the PDF file and reconfiguring PC/3270 as follows:

Modify the SET_HORIZONTAL_TABS statement as follows:

SET_HORIZONTAL_TABS=

Save the file under a new name.

Compile the PDF file (with PCSPTC.EXE)

Reconfigure the PC/3270 startup BAT file (with CONFIG.EXE), specifying the new .PDT in the appropriate places.

Printer Definition File Field Names and Symbols

The following table lists the symbols that are defined for printer definition files.

Table 2-1 (Page 1 of 3). Printer Symbol Definitions

Field Name	Symbol
SPACE	
EXCLAMATION_POINT	!
QUOTATION_MARKS	"
NUMBER_SIGN	#
DOLLAR_SIGN	$
PERCENT_SIGN	%
AMPERSAND	&
APOSTROPHE	'
LEFT_PARENTHESIS	(
RIGHT_PARENTHESIS	)
ASTERISK	*
PLUS_SIGN	+
COMMA	,
HYPHEN	-
PERIOD	.

Table 2-1 (Page 1 of 3). Printer Symbol Definitions

Field Name	Symbol
SLASH	/
ZERO	0
ONE	1
TWO	2
THREE	3
FOUR	4
FIVE	5
SIX	6
SEVEN	7
EIGHT	8
NINE	9
COLON	:
SEMICOLON	;
LESS_THAN_SIGN	<
EQUAL_SIGN	=

Table 2-1 (Page 2 of 3). Printer Symbol Definitions

Field Name	Symbol
GREATER_THAN_SIGN	>
QUESTION_MARK	?
AT_SIGN	@
A_CAPITAL	A
B_CAPITAL	B
C_CAPITAL	C
D_CAPITAL	D
E_CAPITAL	E
F_CAPITAL	F
G_CAPITAL	G
H_CAPITAL	H
I_CAPITAL	I
J_CAPITAL	J
K_CAPITAL	K
L_CAPITAL	L
M_CAPITAL	M
N_CAPITAL	N
O_CAPITAL	O
P_CAPITAL	P
Q_CAPITAL	Q
R_CAPITAL	R
S_CAPITAL	S
T_CAPITAL	T
U_CAPITAL	U
V_CAPITAL	V
W_CAPITAL	W
X_CAPITAL	X
Y_CAPITAL	Y
Z_CAPITAL	Z
LEFT_BRACKET	[
BACKSLASH	\
RIGHT_BRACKET	]
CIRCUMFLEX_ACCENT	^
UNDERLINE	_
GRAVE_ACCENT	`
A_SMALL	a
B_SMALL	b
C_SMALL	c
D_SMALL	d
E_SMALL	e
F_SMALL	f
G_SMALL	g
H_SMALL	h

Table 2-1 (Page 2 of 3). Printer Symbol Definitions

Field Name	Symbol
I_SMALL	i
J_SMALL	j
K_SMALL	k
L_SMALL	l
M_SMALL	m
N_SMALL	n
O_SMALL	o
P_SMALL	p
Q_SMALL	q
R_SMALL	r
S_SMALL	s
T_SMALL	t
U_SMALL	u
V_SMALL	v
W_SMALL	w
X_SMALL	x
Y_SMALL	y
Z_SMALL	z
LEFT_BRACE	{
VERTICAL_BAR	|
RIGHT_BRACE	}
TILDE_ACCENT	~
C_CEDILLA_CAPITAL	Ç
U_DIAERESIS_SMALL	ü
E_ACUTE_SMALL	é
A_CIRCUMFLEX_SMALL	â
A_DIAERESIS_SMALL	ä
A_GRAVE_SMALL	à
A_OVERCIRCLE_SMALL	å
C_CEDILLA_SMALL	ç
E_CIRCUMFLEX_SMALL	ê
E_DIAERESIS_SMALL	ë
E_GRAVE_SMALL	è
I_DIAERESIS_SMALL	ï
I_CIRCUMFLEX_SMALL	î
I_GRAVE_SMALL	ì
A_DIAERESIS_CAPITAL	Ä
A_OVERCIRCLE_CAPITAL	Å
E_ACUTE_CAPITAL	É
AE_DIPTHONG_SMALL	æ
AE_DIPTHONG_CAPITAL	Æ
O_CIRCUMFLEX_SMALL	ô
O_DIAERESIS_SMALL	ö

Printer Definition Table

Table 2-1 (Page 3 of 3). Printer Symbol Definitions

Field Name	Symbol
O_GRAVE_SMALL	ò
U_CIRCUMFLEX_SMALL	û
U_GRAVE_SMALL	ù
Y_DIAERESIS_SMALL	ÿ
O_DIAERESIS_CAPITAL	Ö
U_DIAERESIS_CAPITAL	Ü
O_SLASH_SMALL	ø
POUND_SIGN	£
O_SLASH_CAPITAL	Ø
MULTIPLY_SIGN	×
A_ACUTE_SMALL	á
I_ACUTE_SMALL	í
O_ACUTE_SMALL	ó
U_ACUTE_SMALL	ú
N_TILDE_SMALL	ñ
N_TILDE_CAPITAL	Ñ
ORDINAL_INDICATOR_FEMININE	a
ORDINAL_INDICATOR_MASCULINE	o
QUESTION_MARK_INVERTED	¿
REGISTERED_TRADEMARK_SYMBOL	®
LOGICAL_NOT	¬
ONE_HALF	½
ONE_QUARTER	¼
EXCLAMATION_POINT_INVERTED	¡
LEFT_ANGLE_QUOTES	«
RIGHT_ANGLE_QUOTES	»
A_ACUTE_CAPITAL	Á
A_CIRCUMFLEX_CAPITAL	Â
A_GRAVE_CAPITAL	À
COPYRIGHT_SYMBOL	©
CENT_SIGN	¢
YEN_SIGN	¥
A_TILDE_SMALL	ã
A_TILDE_CAPITAL	Ã
E_CIRCUMFLEX_CAPITAL	Ê
E_DIAERESIS_CAPITAL	Ë
I_ACUTE_CAPITAL	Í
I_CIRCUMFLEX_CAPITAL	Î
I_DIAERESIS_CAPITAL	Ï
VERTICAL_LINE_BROKEN	¦
I_GRAVE_CAPITAL	Ì
O_ACUTE_CAPITAL	Ó
O_CIRCUMFLEX_CAPITAL	Ô

Table 2-1 (Page 3 of 3). Printer Symbol Definitions

Field Name	Symbol
O_GRAVE_CAPITAL	Ò
O_TILDE_SMALL	õ
O_TILDE_CAPITAL	Õ
MICRO_SYMBOL	µ
U_ACUTE_CAPITAL	Ú
U_CIRCUMFLEX_CAPITAL	Û
U_GRAVE_CAPITAL	Ù
ACUTE_ACCENT	´
SYLLABLE_HYPHEN	-
PLUS_OR_MINUS_SIGN	±
THREE_QUARTERS	¾
PARAGRAPH_SYMBOL	¶
SECTION_SYMBOL	§
DIVIDE_SIGN	÷
DEGREE_SYMBOL	°
ONE_SUPERSCRIPT	
THREE_SUPERSCRIPT	
TWO_SUPERSCRIPT	
REQUIRED_SPACE	
INTERNATIONAL_CURRENCY_SYMBOL	¤
ETH_ICELANDIC_SMALL	ð
ETH_ICELANDIC_CAPITAL	Ð
SHARP_S_SMALL	ß
THORN_ICELANDIC_SMALL	þ
THORN_ICELANDIC_CAPITAL	Þ
Y_ACUTE_SMALL	ý
Y_ACUTE_CAPITAL	Ý
OVERLINE	¯
CEDILLA	¸
DIAERESIS	..
MIDDLE_DOT_ACCENT	.

Printer Color Mixing

Some printers, such as the IBM 5182, compose certain colors by mixing colors. Colors are mixed by printing the text in one color and then printing over the same text in another color on a second pass.

PC/3270 will compose a color if the color is not defined in the printer definition table of a color printer that is capable of mixing colors. Therefore, if you are using a printer that composes some colors by mixing two colors, you must leave the definition of the composed colors blank in the Printer Definition File. Only the composite colors defined in Table 2-2 are created by double-printing the primary colors.

Table 2-2. Color Mixes

Composite Color	Primary Colors
Red	yellow, magenta
Green	yellow, cyan
Blue	magenta, cyan

For example, to create red, you must define yellow and magenta. The primary colors must be defined in the printer definition table.

Printer Session Data Stream Support

There are two types of host-directed print data streams supported by PC/3270: the 3270 data stream and the SNA character string (SCS) data stream.

3270 Data Stream

The 3270 data stream is a buffer-oriented data stream. The print data is formatted as if it were going to be displayed on a screen. The host system sends commands to format the presentation space. These commands can change the presentation space in any location at any time. Once the host system completes formatting the presentation space, it issues a START PRINT command and the presentation space is printed as accurately as the printer hardware allows. The 3270 data stream can be sent to PC/3270 workstations over an SNA LU3 session or a non-SNA DFT printer session.

Table 2-3 lists the commands that can be sent in the 3270 data stream.

Table 2-3. 3270 Data Stream Commands

Command	Meaning
W	Write
EW	Erase/Write
EWA	Erase/Write Alternate
RB	Read Buffer
RM	Read Modified
RMA	Read Modified All
EAU	Erase All Unprotected
WSF	Write Structured Field

The RB, RM, and RMA commands cannot be used with an SNA attachment.

Table 2-4 lists the orders that can be sent in the 3270 data stream.

Table 2-4. 3270 Data Stream Orders

Order	Meaning
SBA	Start Buffer Address
SSF	Start Field
IC	Insert Cursor
PT	Program Tab
RA	Repeat to Address
EUA	Erase Unprotected to Address
SFE	Start Field Extended
SA	Set Attribute
MF	Modify Field

The last three orders in this list manage the color, extended highlighting, and programmed symbols attributes for fields and individual characters. The programmed symbols attribute is not supported by PC/3270.

In addition to the commands and orders in the preceding list, there are special printer formatting control codes that can be included in the 3270 data stream.

Table 2-5 lists the control codes that can be sent in the 3270 data stream.

Table 2-5. 3270 Data Stream Control Codes

Code	Description
NL	New Line control code moves the print position to the left margin and down one line.
CR	Carriage Return control code moves the print position to the left margin.
EM	End of Message control code ends the print operation.
FF	Form Feed control code moves the print position to the left margin at the top of the next page.

Note: NL, CR, and EM are valid only if a line-length format specified by the WCC is not used. The FF code is valid in any buffer position.

PC/3270 printer support interprets each 3270 attribute and printer control code and translates them into a sequence of one or more PC printer control codes. For more information about the 3270 data stream, refer to *IBM 3270 Information Display Data Stream Programmer's Reference*.

SCS Data Stream

The SCS data stream is a sequential data stream that is oriented toward line printers. The characters are translated according to the host system code page and printed according to the attributes and formatting specified by the control commands. The way in which SCS characters are printed depends only on the control codes that precede them. Therefore, it is not necessary to buffer the characters before they are printed. The SCS data stream flows across the SNA LU1 session only.

The valid SCS control codes supported by PC/3270 are listed in Table 2-6.

Table 2-6 (Page 1 of 2). Supported SCS Control Codes

Code	Value	Command
NL	X'15'	New Line
LF	X'25'	Linefeed (Index)
CR	X'0D'	Carriage Return
FF	X'0C'	Form Feed
BS	X'16'	Backspace
BEL	X'2F'	Bell Function
IRS	X'1E'	Interchange-Record Separator
SA	X'28'	Set Attribute

Table 2-6 (Page 2 of 2). Supported SCS Control Codes

Code	Value	Command
TRN	X'35'	Transparent
NUL	X'00'	Null
HT	X'05'	Horizontal Tab
VT	X'0B'	Vertical Tab
SHF	X'2B C1'	Set Horizontal Format
SVF	X'2B C2'	Set Vertical Format
SLD	X'2BC 6'	Set Line Density
SPD	X'2BD2 xx29'	Set Print Density
VCS	X'04 xx'	Vertical Channel Select
ENP	X'14'	Enable Presentation
INP	X'24'	Inhibit Presentation
GE	X'08'	Graphic Escape
PPM	X'2BD2 xx48'	Page Presentation Media

Note: The ENP and INP commands are accepted, but are ignored, in an LU1 session.

For more information about the SCS printer data stream, refer to *IBM Systems Network Architecture - Sessions Between Logical Units*.

Delimiting Print Jobs

Many print jobs can be sent over a single PC/3270 printer session. PC/3270 allows multiple sessions and applications to share a single PC printer on a between-jobs basis. PC/3270 needs to know when each print job starts and ends so that printers can be shared properly and begin and end job strings can be sent at the appropriate times. The emulator recognizes a number of different methods of delimiting print jobs:

By Session PC/3270 printer support assumes, by default, that all print jobs are delimited by sessions. That is, in the absence of all other indicators, PC/3270 assumes that a print job begins when a printer session is started and ends when it is reset.

Time-Out Interval On non-SNA DFT sessions, print jobs can be delimited by a user-specified time-out interval. A print job on a non-SNA DFT printer session begins when the first host-outbound data for that job is received, and ends when no host-outbound data is received for a period of time exceeding the user-specified non-SNA DFT timeout interval. For PC/3270, this interval is specified during configuration.

By Brackets On an SNA session with an LU1 or LU3 host application, PC/3270 can use bracket indicators to delimit print jobs. The emulator opens the printer when it receives the begin bracket, then it processes and prints data. The emulator closes the printer after it receives an end bracket.

When the emulator receives another begin bracket, it again opens a printer and begins processing a print job.

Structured Fields The host can use structured fields to indicate to the device that a new file is beginning or that the current file is completed. PC/3270 delimits print jobs with Begin of File and End of File structured fields (SF) to perform host-directed printing. Structured fields are described in the next section.

Structured Fields

The host uses **Begin of File** and **End of File** structured fields to indicate to a device that a file is beginning or ending.

Begin/End of File Query Reply

The Begin/End of File query reply indicates that a device supports Begin of File and End of File to delineate print jobs. The PC/3270 sends a query reply, as shown in Table 2-7, to the host in response to a Read Partition General query.

Table 2-7. Begin/End of File Query Reply Format

Byte	Contents	Description
0–1	X'0005'	The length of this structure
2	X'81'	Query reply
3	QCODE X'9F'	Begin/End of File
4	FLAGS	Reserved; must be set to 0's

Begin/End of File Structured Fields

Begin/End of File structured fields are accepted on either LU1 or LU3 sessions. Table 2-8 shows the format of the Begin/End of File structured fields.

Table 2-8. Begin/End of File Structured Field Format

Byte	Bit	Contents	Description
0–1		X'0007'	The length of this structure
2–3		X'0F85'	Begin/End of File
4		PID	Partition ID
5		FLAG1	
	0–1	B'00'	Reserved
		B'01'	End of File is being sent
		B'10'	Begin of File is being sent
		B'11'	Reserved
	2–7		Reserved.
6		FLAG2	Reserved; must be set to 0's.

This byte indicates whether Begin of File or End of File is being sent.

Processing Begin/End of File Structured Fields: When the Begin/End of File structured fields are used with brackets or non-SNA timeout intervals, the Begin/End of File SFs take precedence over the brackets or time-out intervals in determining when a print job begins or ends. Refer to the following examples:

Begin/End of File structured fields overriding brackets:

Begin Bracket, Begin of File Structured Field, ...Data...,
End Bracket

The device will wait indefinitely until the End of File structured fields is received before ending the print job.

Begin/End of File structured fields overriding non-SNA time-out intervals:

Begin of File structured fields, ...Data..., pause > timeout value

The device will wait indefinitely until the End of File structured fields is received before ending the print job.

Inconsistent use of Begin/End of File structured fields and brackets:

Begin Bracket, ...Data1...,
Begin of File Structured Fields,...Data2..,
End of File Structured Fields, ...Data3...,
End Bracket

When you use the Begin of File and End of File structured fields inconsistently with brackets, the results are unpredictable. In the preceding example, the device might process Data1, Data2, and Data3 as separate jobs or combine two or more of them into one file.

For predictable results, each data block must be enclosed by a Begin of File structured field and an End of File structured field. The following example shows three print jobs all delimited by Begin/End of File structured fields:

Begin Bracket, Begin of File Structured Field, ...Data1...,
End of File Structured Field,(job1)
Begin of File Structured Field, ...Data2..., End of File Structured Field, (job2)
Begin of File Structured Field, ...Data3..., End of File Structured Field,
End Bracket(job3)

PC/3270 always keeps track of brackets and time-out intervals. After the emulator receives a Begin of File structured field, it takes no action on Begin Brackets, End Brackets, or time out until it receives an End of File structured field. Once a valid End of File SF is processed, the emulator defaults to delimiting jobs by brackets or time-out intervals until it receives the next Begin of File structured field.

Begin/End of File Structured Field Error Conditions: PC/3270 does not accept transmission of data belonging to two separate print jobs in the same chain. To be accepted by the emulator, Begin of File structured fields must be the first structured field of a chain and End of File structured fields must be the last structured field of a chain.

PC/3270 rejects transmission in the following instances:

The emulator receives an End of File structured field without first receiving a Begin of File structured field.

The emulator receives a second Begin of File structured field without receiving an intervening End of File structured field.

The emulator receives a Begin of File structured field that is not the first structured field following a **write structured field** command (LU2, LU3, and non-SNA sessions) or a Function Management Header 1 (LU1 sessions).

The emulator receives an End of File structured field that is not the last structured field following a **write structured field** command (LU2, LU3, and non-SNA sessions) or a Function Management Header 1 (LU1 sessions).

Processing SCS Data Streams: When processing an SCS data stream, PC/3270 treats Begin/End of File structured fields as follows:

A Begin of File structured field indicates that all SCS data in the same transmission until an End of File structured field is received is part of a new print job.

An End of File structured field indicates that any SCS data received in the same chain as the End of File structured field is the last data of the current print job.

Processing 3270 Data Streams: When processing a 3270 data stream, PC/3270 treats Begin/End of File structured fields as follows:

A Begin of File structured field indicates that the next presentation space print (initiated by a **write type** command with the start print bit turned on in the write control character) is the first in a print job.

An End of File structured field indicates that the last presentation space print was the last of the current print job. The emulator immediately sends a terminate string to the printer to close the printer session.

If PC/3270 receives a Begin of File structured field and an End of File structured field without at least one presentation space separating them, it ignores the structured fields.

Printer Definition Table

Chapter 3. Transferring Files

You can send data files to and receive them from IBM host systems that are running:

VM/CMS	Virtual Machine/Conversational Monitor System
MVS/TSO	Multiple Virtual Storage/Time Sharing Option
MVS/CICS	Customer Information Control System running under MVS
VSE/CICS	CICS running under Virtual Storage Extended
OV/MVS	OfficeVision/MVS

File-Transfer Methods

You can transfer files in the following ways with PC/3270:

1. By using the **SEND** and **RECEIVE** commands at the DOS prompt.
2. By using the file transfer utility, which provides panels and stored profiles to make file transfer easy; this is described in the *Personal Communications/3270 Version 4.1 Up and Running for DOS (Full-Function Mode)*.
3. By using the **TRANSFER** program; this method is used only for OfficeVision and is described in the *Personal Communications/3270 Version 4.1 Up and Running for DOS (Full-Function Mode)*.

Requirements

A file transfer program, IND$FILE, must be installed on your host system. Ask your system administrator for additional file transfer procedures and precautions.

If you run PC/3270 from diskettes, the SEND and RECEIVE command files must be on one of your work diskettes. Be sure, too, that you have enough free space on a formatted diskette before you attempt to receive large files.

Considerations

You should not use the following words as VM file names or file types, as MVS dataset names, or as CICS file names, because they are reserved for use as option commands. However, if it is essential for you to use them for files, you must add a \ (backslash), as a separate word, immediately after the file name, even if you do not specify any options.

ASCII, APPEND, TIME, CLEAR, NOCLEAR, SILENT, QUIET, PROGRESS, JISCII, SO, NOSO, BLANK, USER, CRLF, BINARY, NOCRLF

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Sending and Receiving Files

The PC is the point of reference for the SEND and RECEIVE commands. You SEND from the PC to the host and RECEIVE from the host to the PC.

To send or receive a file, do the following;

1. Make sure you are logged on to your host.
2. Make sure the **Ready** message of the host system is displayed, unless you are transferring files through the command option of the ISPF application. Note that, in the latter case, you must specify the NOCLEAR option for the file-transfer command.

   If your screen is blank, make sure that no applications are running and that your host session is not in a *holding* state.

   Note: If you receive any messages from host application programs while you are transferring files, the transfer might fail. To prevent messages from interfering, enter the appropriate host command to set messages off temporarily. When file transfer is finished, set messages on again.
3. Switch to your DOS session.
4. If you use a hard disk, make sure the **SEND.EXE** and **RECEIVE.EXE** files are in your current directory or in your path.
5. Type the appropriate SEND or RECEIVE command at the DOS prompt.

   Details on the SEND and RECEIVE commands and their options are explained on the following pages.
6. These progress messages are displayed;

Data Bytes: nnnnn **Packets:** nnn

TRANS 3 File transfer complete

Data Bytes: nnnnn **Packets:** nnn
Bytes/sec: nnnn **Millisec/packet:** nnnn **Seconds:** nnnnn

Using the VM/CMS SEND Command

Use the following information when entering the SEND command to VM/CMS:

The terms in Figure 3-1 are commands and information that you must provide. Enter them as shown (including parentheses). You can use either uppercase or lowercase letters.

Note: There must not be a space between **h:** and **fn**.

Figure 3-1 shows the parts of the VM/CMS SEND command.

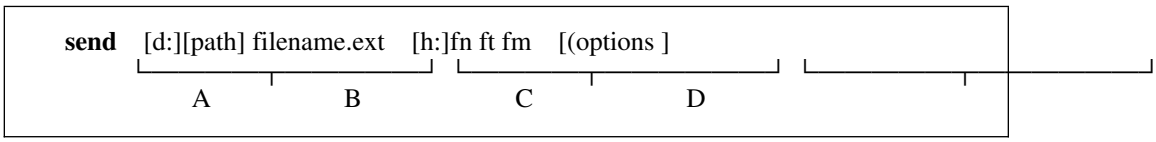


Figure 3-1. VM/CMS SEND Command Elements

A The PC drive and path of the file to send.

B The name of the PC file to send.

C Host session specifications for the file to be sent to the host.

- h: Short name of the session (can be omitted if it is 'a')
- fn File name
- ft File type
- fm File mode

D Optional changes made to the file during transfer. More than one option can be selected. Valid options are:

APPEND
ASCII
CRLF
LRECL n
NOCLEAR
PKTSIZE n
PROGRESS
QUIET
RECFM x
RETRY
TIME n

The parts of the command to SEND to CMS are:

SEND The command.

d: The name of the diskette or hard disk drive on which the file is located.

\path The path to the subdirectory that the file is in.

filename.ext The name of the file to be sent, including the extension.

h: The short name of the host session to which you want to send the file. The default is a:.

fn ft fm
: The name the file is to have on your VM/CMS disk. You must specify the file name (fn) and file type (ft). You may omit file mode (fm) if you want the file placed on your A-disk. You can create a new name or use a name that is already on your disk. If you use a new name, the file that you send is added to your disk. If you use the name of an existing file, the file that you send either replaces or is added to the old file. (Refer to the APPEND option on page 3-4.)

(options
: These options can be specified:

  APPEND
  : Specifies that the file being sent is to be added to the end of an existing VM/CMS file. Omit this option if you want the file to replace an existing file. You cannot specify the LRECL n or RECFM x option if you use this APPEND option.

  ASCII
  : Specifies ASCII-to-EBCDIC character translation.

  CRLF
  : Specifies preserving the carriage return and line feed codes. You need the ASCII and CRLF options for text or source files that you want to view or edit, such as SCRIPT files. You do not need them for binary files, such as programs.

  LRECL n
  : Specifies the file's record length. Include a record length only if you want the file to have a record length on your VM/CMS disk other than 80. Replace n with the record length you want. If you omit this option, the record length is set to 80 for fixed-length records or to a maximum of 80 for variable-length records.

  NOCLEAR
  : Suppresses the sending of a Clear command at the beginning of the file transfer.

  PKTSIZE n
  : Specifies the size n in bytes of the packet sent to the host. Replace n with an integer value from 256 through 32000. The SNA default is 2500; the non-SNA default is 7160. If you are configured for a LAN attachment through a 3270 Emulation Program Version 3 gateway (LAN via NetBIOS) in a non-SNA environment, the packet size must not exceed 13000 bytes. A blank space is required between PKTSIZE and n. If you have configured for a Telnet 3270 connection, the packet size must not exceed 8000 bytes.

  PROGRESS
  : Suppresses the display of the progress messages.

  QUIET
  : Suppresses all SEND and RECEIVE utility messages, except error messages.

  RECFM x
  : Specifies the file record format. Use this parameter to specify variable-length or fixed-length records in the file. Replace x with V for variable or F for fixed. By default, the file will have fixed-length records unless you specify the CRLF option; then the file has variable-length records unless you specify otherwise.

RETRY
: Retries the file transfer until it is completed or you perform some operations (for example, press Ctrl-Break) if there is a problem in the emulator session.

TIME n
: Specifies the length of time n, in seconds, that the program waits for a response from the host before it sends an error message. Replace n with an integer value in the range from 20 through 65536. The default is 20. To avoid an error message, specify an adequate value. In cases of large packet sizes, large block sizes, or for slow communication lines such as SDLC and ASYNCH, a value of 150 seconds is recommended. A blank space is required between TIME and n.

Examples

The following examples show the command syntax you can use to send files. The parameters of the SEND command can be combined into a single set of parentheses. These examples depict common usage of the SEND command to send files from a PC to a VM/CMS host.

Sending a PC file from your default drive and adding it as a new file on your VM/CMS A-disk:

SEND pc.txt a:cmsfile script a (ASCII CRLF LRECL 72 RECFM V

Note: If you use a command that exceeds one line, do not press Enter when you fill one line; continue typing your command.

This command sends a PC file named **PC.TXT** from your default drive to your host in your host session named **A**. You do not need to specify the PC drive if the file you are sending is on the current drive. The command creates a new file named **CMSFILE** with a file type of SCRIPT on your A-disk. The records in the file can vary in length up to 72 characters.

Sending a PC file from your default drive to replace a file on your VM/CMS A-disk:

SEND pc.txt a:cmsfile script a (ASCII CRLF

This command sends a PC file named **PC.TXT** from your default drive to your VM/CMS A-disk in your host session named **A**. You do not need to name the PC drive if the file you are sending is on the default drive. The file replaces a **SCRIPT** file named **CMSFILE**. The new **CMSFILE** has the same record length and format as the old **CMSFILE**.

If you do not have a file called **CMSFILE SCRIPT** on your A-disk, **PC.TXT** is added to your A-disk as a new file called **CMSFILE SCRIPT**. The records in the file can vary in length up to 80 characters.

Sending a binary PC file from a drive other than your default drive:

SEND a:pc.exe c:cmsfile exebin b

This command sends a PC file named **PC.EXE** from a diskette in drive A to your VM/CMS B-disk in your host session named **C**. It is a new file or it replaces a file named **CMSFILE**.

The records in the file can vary in length up to 80 characters.

Sending a file from your hard disk and adding it to the end of a file on your VM/CMS A-disk:

SEND c:pc.txt cmsfile script a (ASCII CRLF APPEND

This command sends a PC file named **PC.TXT** from your hard disk to your host session. You do not need to name the host session if you are sending to the **A** session. The file is added to the end of a SCRIPT file named **CMSFILE** on your VM/CMS A-disk.

Sending a file from a subdirectory on your hard disk to your VM/CMS A-disk:

SEND c:\sd1\pc.txt cmsfile script a (ASCII CRLF

This command sends a file named **PC.TXT** from subdirectory **SD1** on your hard disk to your host session. It replaces a SCRIPT file named **CMSFILE** on your VM/CMS A-disk.

Using the VM/CMS RECEIVE Command

Use the following information when entering the RECEIVE command to VM/CMS:

The terms in Figure 3-2 are commands and information you must provide. Enter them as shown (including parentheses). You can use either uppercase or lowercase letters.

Note: There must not be a space between **h:** and **fn**.

Figure 3-2 shows the parts of the VM/CMS RECEIVE command.

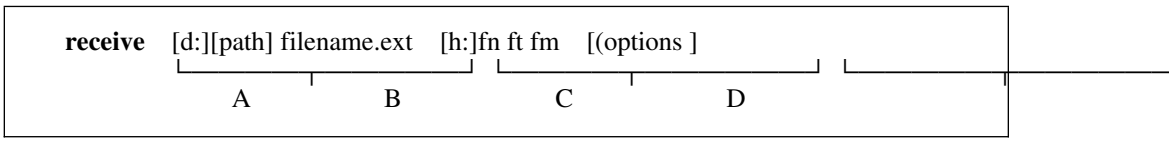


Figure 3-2. VM/CMS RECEIVE Command Elements

A The PC drive and path of the file to be received.

B The name of the PC file to be received.

C Host session specifications for the file to be received from the host.

- h: Short name of the session (can be omitted if it is 'a')
- fn File name
- ft File type
- fm File mode

D Optional changes made to the file during transfer. More than one option can be selected. Valid options are:

APPEND
ASCII
CRLF
NOCLEAR
PKTSIZE n
PROGRESS
QUIET
RETRY
TIME n

The parts of the command to RECEIVE from CMS are:

RECEIVE The command.

d: The name of the diskette or hard disk drive on which the file is to be received.

\path The path indicating the directory to which the file is to be stored.

filename.ext The name of the PC file, including the extension. Use a new name or one that already exists. If you use a new name, the file that you receive is added to your diskette or hard disk. If you use the name of an existing file, the file that you receive either replaces or supplements the existing file. (Refer to the APPEND option.)

h: The short name of the host session from which you want to get the file. The default is a:.

fn ft fm The name of the file you want to receive from your VM/CMS disk. The file name fn is required. If you omit the file type (ft) and file mode (fm), the transfer program searches until it finds the file name on any of your VM/CMS disks.

(options

These options can be specified:

APPEND
Specifies that the file being received is to be added to the end of an existing file. Do not use APPEND if you want the VM/CMS file that is to be received to replace an existing file.

ASCII Specifies EBCDIC-to-ASCII character translation.

CRLF Specifies the carriage return and line feed codes. You need ASCII and CRLF for text or source files that you want to view or edit, such SCRIPT files. You do not need them for binary files, such as programs.

NOCLEAR
Suppresses the sending of a Clear command at the beginning of the file transfer.

PKTSIZE n
Specifies the size n in bytes of the packet sent from the host. Replace n with an integer value in the range from 256 through 32000. The SNA default is 4000; the non-SNA default is 7160. If you are configured for a LAN attachment through a 3270 Emulation Program Version 3 gateway in a non-SNA environment, packet size should not exceed 13000 bytes. A blank space is required between PKTSIZE and n. If you have configured for a Telnet 3270 connection, the packet size must not exceed 8000 bytes.

PROGRESS
Suppresses the display of the progress messages.

QUIET Suppresses all SEND and RECEIVE messages, except error messages.

RETRY
Retries the file transfer until it is completed or you perform some operations (for example, press Ctrl-Break) if there is a problem in the emulator session.

TIME n

Specifies the length of time in seconds that the program waits for a response from the host before it sends an error message. The value n is an integer value in the range from 20 through 65536. The default is 20. To avoid an error message, specify an adequate value. In cases of large packet sizes, large block sizes, or for slow communication lines such as SDLC and ASYNCH, a value of 150 seconds is recommended. A blank space is required between TIME and n.

Examples

The following examples show the command syntax that you can use to receive files from a VM/CMS host. The parameters of the RECEIVE command can be combined into a single set of parentheses. These examples depict common usage of the RECEIVE command to transfer files from a VM/CMS host to a PC.

Receiving a file from your VM/CMS A-disk at your default drive for a PC session:

RECEIVE pc.txt a:cmsfile script a (ASCII CRLF

This command sends a SCRIPT file CMSFILE from your VM/CMS A-disk in a host session named **A** to your PC session. It adds the file to your default drive (diskette or hard disk) with the name **PC.TXT**.

Receiving a file from your VM/CMS B-disk and replacing a file on a drive other than your default:

RECEIVE a:pc.txt a:cmsfile script b (ASCII CRLF

This command sends a SCRIPT file named **CMSFILE SCRIPT** from your VM/CMS B-disk in a host session named **A** to a drive other than the default for your PC session. It replaces a file named **PC.TXT** on a diskette in drive A.

Receiving a file from your VM/CMS A-disk and adding it to the end of a file on your hard disk:

RECEIVE c:pc.txt a:cmsfile script a (ASCII CRLF APPEND

This command sends a SCRIPT file named **CMSFILE SCRIPT** from your VM/CMS A-disk in a host session named **A** to your PC session. It adds the contents of **CMSFILE** to the end of a file named **PC.TXT** on your hard disk.

Receiving a file from your VM/CMS A-disk and placing it in a subdirectory on your default drive:

RECEIVE \sd1\pc.txt a:cmsfile script a (ASCII CRLF

This command sends a SCRIPT file named **CMSFILE SCRIPT** from your VM/CMS A-disk to your default drive. It creates or replaces a file named **PC.TXT** in a subdirectory named **\SD1**.

Using the MVS/TSO SEND Command

Use the following information when entering the SEND command to the MVS/TSO host:

The terms in Figure 3-3 are commands and information you must provide. Enter them as shown (including parentheses). You can use either uppercase or lowercase letters.

Note: There must not be a space between **h:** and **fn**.

Figure 3-3 shows the parts of the MVS/TSO SEND command.

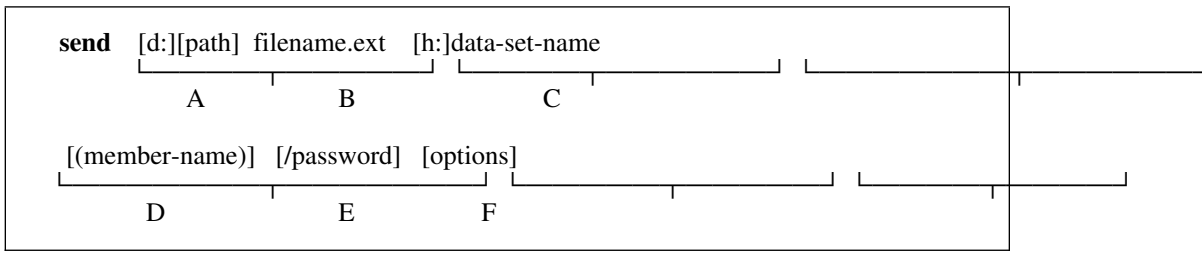


Figure 3-3. MVS/TSO SEND Command Elements

A The PC drive and path of the file to send.

B The name of the PC file to send.

C Short name of the host session and the data-set name of the file to send.

D Member name if the file is put in a partitioned data set.

E Password of the data set if it has one.

F Optional changes made to the file during transfer. More than one option can be specified. Valid options are:

APPEND
ASCII
BLKSIZE(n)
CRLF
LRECL(n)
NOCLEAR[1]
PKTSIZE(n)
PROGRESS
QUIET
RECFM(x)
RETRY
SPACE(n[,n1]) unit
TIME(n)

The parts of the MVS/TSO SEND command are:

SEND The command.

d: The name of the diskette or hard disk drive where the file is located.

[1] You must use the NOCLEAR option when you are transferring files while in ISPF command mode on the host.

\path The path indicating the directory where the file is located.

\filename.ext The name of the file to be sent. Include the extension if the file has one.

h: The name of the MVS/TSO host session to which you want to send the file. You can omit this name if you have only one host. If you have more than one host, this is the short name of the MVS/TSO host session. The default short name is **A**.

data-set-name The data-set name that the file you send is to have on your MVS/TSO volume; this name is required. Enclose the data-set name with the member name in single quotation marks if you are using a fully qualified data-set name.

Creates a new name or uses a data-set name already on your TSO volume. If you use a new name, the file that you send is added to your MVS/TSO volume. If you use the name of an existing data set, the file that you send either replaces or supplements the existing data set. Refer to the APPEND option.

(member-name) The member name if the file is to be put into a partitioned data set. If you use member-name, you cannot use LRECL(n), BLKSIZE(n), RECFM(x), and SPACE(n,[n1]) unit.

Note: If someone else is using the partitioned data set, you cannot send the file to your MVS/TSO host.

/password The password of the data set, if the data set has a password.

options

These options can be specified:

APPEND

Specifies that the file being sent is added to the end of an existing MVS/TSO data set. Omit this option if you want the file to replace an existing MVS/TSO data set. You cannot use LRECL(n), RECFM(x), SPACE(n[,n1]) unit, or BLKSIZE(n) options if you use the APPEND option.

ASCII Specifies ASCII-to-EBCDIC character translation.

BLKSIZE(n)

The size of the blocks of data in a new data set on your MVS/TSO volume. This is optional. To set the block size for a new data set, replace n with the new size. If you omit this option, the block size is determined in the following manner:

If the record format is variable, the block size will be 6233.

If the record format is fixed, the block size will be the largest multiple of the record length that is less than 6233:

BLKSIZE = LRECL (6233/LRECL)

If you use the (member-name) or APPEND options, do not use this option.

CRLF Specifies the global use of carriage return and line feed codes.

You need to specify ASCII and CRLF options for sending text or source files that you want to view or edit, such as SCRIPT files. You do not need them for binary files.

LRECL(n)
: Specifies the record length for a new data set on your MVS/TSO volume, where n is a whole number from 1 through 32760 representing the number of characters per record. If you want to set the record length for a new data set, replace n with the new length. If you omit this option, the record length is set to 80 for fixed-length records and to 255 for variable-length records. If you use the (member-name) or APPEND options, do not use this option.

NOCLEAR
: Suppresses the sending of a Clear command at the beginning of the file transfer. This option is required for ISPF command mode.

PKTSIZE (n)
: Specifies the size n, in bytes, of the packet sent to the host. Replace n with an integer value in the range from 256 through 32000. The SNA default is 4000; the non-SNA default is 7160. If you are configured for a LAN attachment through a 3270 Emulation Program Version 3 gateway in a non-SNA environment, the packet size should not exceed 13000 bytes. If you have configured for a Telnet 3270 connection, the packet size must not exceed 8000 bytes.

PROGRESS
: Suppresses the display of the progress messages.

QUIET
: Suppresses all send and receive messages, except error messages.

RECFM(x)
: The record format for a new data set on your MVS/TSO volume, where x = V, F, or U. For variable-, fixed-, or undefined-length records in the data set, replace the x with V, F, or U respectively.

  If you omit this option, the record format of the host data set is determined by the setting of the CR/LF parameter. If you specify CR/LF, the data set will have variable-length records. If you do not specify CR/LF, it will have fixed-length records. If you use the (member-name) or APPEND options, do not use this option.

RETRY
: Retries the file transfer until it is completed or you perform some operations (for example, press the Ctrl-Break) if there is a problem in the emulator session.

SPACE(n[,n1]) unit
: Specifies an amount of space to be set aside for a new data set on your MVS/TSO volume. To set aside a certain number of blocks, tracks, or cylinders for the new data set:

  Provide unit as the type of space you want (AVBLOCK, TRACKS, or CYLINDERS).

  Give n as the amount of space that you want the data set to occupy (in the unit of measure you select).

  If the data set needs more space than you ask for with n, give n,n1 where n1 is the size of additional space to be used only when necessary.

These values are similar to the values on the ALLOCATE command of MVS/TSO.

If you omit this option, you get space for one block. The length of the block is set by the BLKSIZE(n) or LRECL(n) options. If you use the (member-name) or APPEND options, do not use this option.

TIME (n)
Specifies the length of time, in seconds, the program waits for a response from the host before it sends an error message. Replace n with an integer value in the range from 20 through 65536. The default is 20. To avoid an error message, specify an adequate value. In cases of large packet sizes, large block sizes, or for slow communication lines such as SDLC or ASYNCH, a value of 150 seconds is recommended.

Examples

The following examples show command syntax you can use to send files from your PC to an MVS/TSO host. The example case is given and followed by the command syntax, and then concluded with an explanation.

Sending a file from your default drive to replace a file on the MVS/TSO host:

SEND pc.txt g:ds.script ASCII CRLF

This command sends a PC file named **PC.TXT** from your default drive to your MVS/TSO host in a host session named **G**. It creates or replaces a data set named **DS.SCRIPT** on your MVS/TSO volume.

Sending a file from a drive other than the default to your MVS/TSO host:

SEND a:pc.txt g:ds.script ASCII CRLF

This command sends a PC file named **PC.TXT** from a diskette in drive A to your MVS/TSO host in a host session named **G**. It replaces a data set named **DS.SCRIPT** on your MVS/TSO volume.

Sending a file from your default drive to your MVS/TSO host and adding it to the end of an MVS/TSO data set:

SEND a:pc.txt g:ds.script ASCII CRLF APPEND

This command sends a PC file named **PC.TXT** from a diskette in drive A to your MVS/TSO host in a host session named **G**. It adds the file to the end of a data set named **DS.SCRIPT** on your MVS/TSO volume.

Sending a file to your MVS/TSO host and adding it to the end of a set that has a password:

SEND a:pc.txt g:ds.script/odyssey8 ASCII CRLF APPEND

This command sends a PC file named **PC.TXT** from a diskette in drive A to your MVS/TSO host in a host session named **G**. It adds the file to the end of a data set named **DS.SCRIPT** on your MVS/TSO volume. This data set has a password of odyssey8.

Sending a file from a subdirectory on your hard disk to a partitioned data set on your MVS/TSO host:

SEND c:\sd1\pc.txt g:ds.script (m1) ASCII CRLF

This command sends a PC file named **PC.TXT** from a subdirectory named **\SD1** on your hard disk to your MVS/TSO host in a host session named **G**. It creates

or replaces a member named **M1** in a partitioned data set named **DS.SCRIPT** on your MVS/TSO volume.

Sending a file to a partitioned data set that has a password:

SEND a:pc.txt g:ds.script (m2)/ili11 ASCII CRLF APPEND

This command sends a PC file named **PC.TXT** from a diskette in drive A to your MVS/TSO host in a host session named **G**. It adds the file as a member named **M2** to a partitioned data set named **DS.SCRIPT** on your MVS/TSO volume. This data set has a password of ili11.

Sending a file from your default drive and adding it as a new data set on your MVS/TSO volume:

SEND pc.txt g:ds.script/aeneid2 ASCII CRLF LRECL(132)
BLKSIZE(132) RECFM(V) SPACE(2 ,1) TRACKS

This command sends a PC file named **PC.TXT** from your default drive to your MVS/TSO host. It adds the file as a new data set named **DS.SCRIPT** on your MVS/TSO volume. A password of aeneid2 is assigned. The records in the data set can vary in length up to 132 characters. Data blocks are the same length as the records. Twenty tracks are set aside for this data set. If more tracks are needed, they are added in groups of 10.

Using the MVS/TSO RECEIVE Command

Use the following information when entering the RECEIVE command to MVS/TSO:

The terms in Figure 3-4 are commands or information you must provide. Enter them as shown (including parentheses). You can use either uppercase or lowercase letters.

Note: There must not be a space between **h:** and **fn**.

Figure 3-4 shows the parts of the MVS/TSO RECEIVE command.

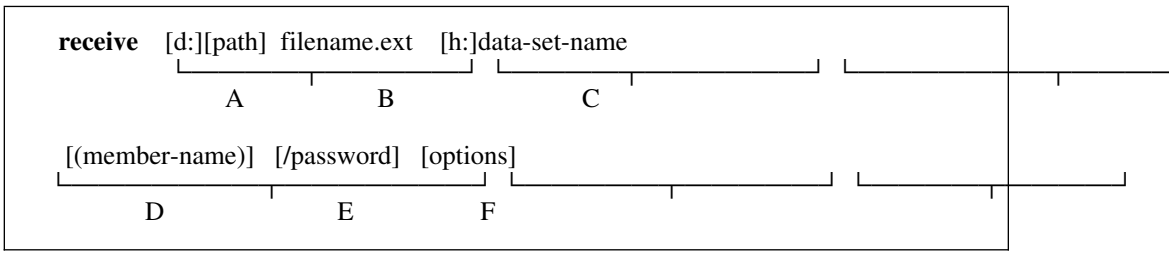


Figure 3-4. MVS/TSO RECEIVE Command Elements

A The PC drive and path to the directory where the file is to be stored.

B The name of the PC file to receive.

C The short name of the host session, and the data-set name of the file you are receiving.

D Member name if the file is put in a partitioned data set.

E Password of the data set, if any.

F Optional changes made to the file during transfer. More than one option can be specified. Valid options are:

APPEND
ASCII
CRLF
NOCLEAR
PKTSIZE(n)
PROGRESS
QUIET
RETRY
TIME(n)

The parts of the command to RECEIVE a file from MVS/TSO are:

RECEIVE The command.

d: Specifies the name of the diskette or hard disk drive where the file is to be located. Use **A:**, **B:**, **C:**, or **D:**. This is optional if the file is received on the current drive.

\path Specifies the subdirectory where you want the data set located. This is optional.

\filename.ext Specifies the name the file is to have on your diskette or hard disk. Creates a new name or uses a name that is already on your diskette or hard disk.

If you use a new name, the data set that you receive is added to your diskette or hard disk. If you use the name of an existing file, the data set that you receive either replaces or supplements the existing file. (Refer to the APPEND option on page 3-16.)

h: Specifies the short name of the MVS/TSO session where the data set is located. If you have only one host, this part is optional. Use this option if you have more than one host. The default short name is **A**.

data-set-name Specifies the name of the data set or the partitioned data set that contains the member you want to send to your PC session. You must use the qualified name. Enclose the data-set name with the member name in single quotation marks if you are using a fully qualified data-set name.

(member-name) Specifies the member name of a partitioned data set to send to your PC session. This is optional. Use it only if the data set is a member of a partitioned data set.

/password Specifies the password of the data set. Use this only if the data set has a password.

options

These options can be specified:

APPEND
Adds the data set to the end of an existing file. Omit this if you want the MVS/TSO data set to replace an existing PC file.

ASCII Specifies EBCDIC-to-ASCII character translation.

CRLF Specifies the use of carriage return and line feed codes. You need ASCII and CRLF for text or source files that you want to view or edit, such as SCRIPT files. You do not need them for binary files.

NOCLEAR
Suppresses the sending of a Clear command at the beginning of the file transfer. This option is required for ISPF command mode.

PKTSIZE(n)
Specifies the size n, in bytes, of the packet sent from the host. Replace n with an integer value in the range 256 through 32000. The Systems Network Architecture (SNA) default is 4000; the non-SNA default is 7160. If you are configured for a LAN attachment through a 3270 Emulation Program Version 3 gateway in a non-SNA environment, packet size must not exceed 13000 bytes. If you have configured for a Telnet 3270 connection, the packet size must not exceed 8000 bytes.

PROGRESS
Suppresses the display of the progress messages.

QUIET Suppresses all send and receive messages except error messages.

RETRY
Retries the file transfer until it is completed or you perform some operations (for example, press Ctrl-Break) if there is a problem in the emulator session.

TIME(n)
: Specifies the length of time, in seconds, the program waits for a response from the host before it sends an error message. Replace n with an integer value in the range from 20 through 65536. The default is 20. To avoid an error message, specify an adequate value. In cases of large packet sizes, large block sizes, or for slow communication lines such as SDLC and ASYNCH, a value of 150 seconds is recommended.

Examples

The following examples show command syntax you can use to receive files from your MVS/TSO host to your PC. The example case is given, followed by the command syntax, then concluded with an explanation.

Receiving a data set from an MVS/TSO host to the default drive for your PC session:

RECEIVE pc.txt g:ds.script ASCII CRLF

This command sends a data set named **DS.SCRIPT** from your MVS/TSO volume in a host session named **G** to your DOS session. It creates or replaces the file on the default drive with the name **PC.TXT**.

Receiving a data set from an MVS/TSO host to a drive other than your default drive:

RECEIVE A:pc.txt g:ds.script ASCII CRLF

This command sends a data set named **DS.SCRIPT** from your MVS/TSO volume in a host session named **G**. It replaces a file named **PC.TXT** on a diskette in drive A.

Receiving a data set from an MVS/TSO host and adding it to a PC file:

RECEIVE a:pc.txt g:ds.script ASCII CRLF APPEND

This command sends a data set named **DS.SCRIPT** from your MVS/TSO volume in a host session named **G**. It adds the data set to the end of a file named **PC.TXT** on the diskette in drive A.

Receiving a data set from an MVS/TSO host and placing it in a subdirectory on your hard disk:

RECEIVE c:\sd1\pc.txt ds.script ASCII CRLF

This command sends a data set named **DS.SCRIPT** from your MVS/TSO volume in a host session named **G**. It creates or replaces a file named **PC.TXT** in a subdirectory named **\SD1** on your hard disk.

Receiving a data set that has a password from an MVS/TSO host to your default drive:

RECEIVE A:pc.txt g:ds.script/odyssey8 ASCII CRLF APPEND

This command sends a data set named **DS.SCRIPT** from your MVS/TSO volume in a host session named **G**. The data set has the password odyssey8. The data set is added to the end of a file named **PC.TXT** on the diskette in drive A.

Receiving a member of a partitioned data set from an MVS/TSO host at your DOS session:

RECEIVE c:\sd1\pc.txt g:ds.script (m1) ASCII CRLF

This command sends a member named **M1** from a partitioned data set named **DS.SCRIPT** in a host session named **G**. The member is placed on your hard disk in a subdirectory named **\SD1**. It replaces or creates a file named **PC.TXT**.

Receiving a member of a partitioned data set that has a password to your DOS session:

RECEIVE a:pc.txt g:ds.script (m2)/ili1 ASCII CRLF APPEND

This command sends a member named **M2** from a partitioned data set named **DS.SCRIPT** in a host session named **G**. The data set has a password of ili1. The member is added to a file named **PC.TXT** on the diskette in drive A.

Using the CICS SEND Command

Use the following information when issuing the SEND command to CICS:

The terms in Figure 3-5 are commands and information you must provide. Enter them as shown (including parentheses). You can use either uppercase or lowercase letters.

Note: There must not be a space between **h:** and **fn**.

Figure 3-5 shows the parts of the CICS SEND command.

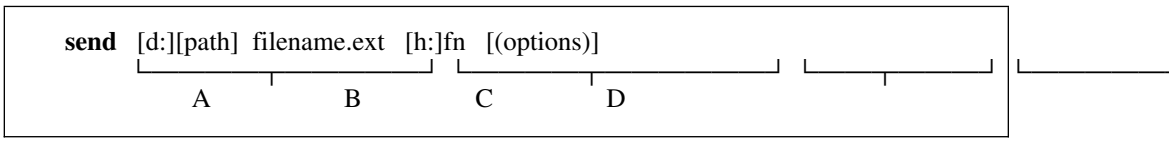


Figure 3-5. CICS SEND Command Elements

A The PC drive and path of the file to send.

B The name of the PC file to send.

C Short name of the host session and the host file name of the file to send.

D Optional changes made to the file during transfer. More than one option can be specified. Valid options are:

ASCII
BINARY
CRLF
NOCLEAR
NOCRLF
PROGRESS
QUIET
RETRY
TIME n

The parts of the CICS SEND command are:

SEND The command.

d: Specifies the name of the diskette or hard disk drive where the file is located.

\path Specifies the path to the subdirectory that the file is in.

\filename.ext Specifies the name of the file to be sent, including the extension.

h: Specifies the short name of the host session where you want to send the file. If you have only one host, this part is optional. The default is session **A**.

fn Specifies the name the file is to have on your CICS disk. You must specify the file name. You can create a new name or use a name that is already on the disk.

(options
These options can be specified:

ASCII Specifies ASCII-to-EBCDIC character translation. The default is ASCII CRLF. You need these options for text or source files that you want to view or edit, such as SCRIPT files. You do not need them for binary files.

Notes:

1. CRLF and NOCRLF are mutually exclusive options.
2. BINARY and ASCII are mutually exclusive options.
3. CRLF and ASCII imply each other if one is specified but not the other.
4. BINARY and NOCRLF imply each other if one is specified but not the other.

BINARY
Specifies that the data in the file is binary data. The data can be encrypted information, compiled programs, or other data. It is not translated by the host file transfer program but copied unaltered into a temporary storage queue.

CRLF Specifies carriage return and line feed codes in the text file.

NOCLEAR
Suppresses the sending of a Clear command at the beginning of file transfer. This option is required for ISPF command mode.

NOCRLF
Specifies that the PC file does not consist of logical records delimited by carriage return and line feed characters. No concatenation or splitting of records is performed by the CICS file transfer program.

The file is written into temporary storage using one item on the queue to represent each inbound data buffer. The items on the CICS temporary storage queue can be of different lengths, but none can be more than 32767 characters.

PROGRESS
Suppresses the display of the progress messages.

QUIET Suppresses all send and receive messages except error messages.

RETRY
Retries the file transfer until it is completed or you perform some operations (for example, press Ctrl-Break) if there is a problem in the emulator session.

TIME n
Specifies the length of time, in seconds, the program waits for a response from the host before it sends an error message. Replace n with an integer value in the range from 20 through 65536. The default is 20. To avoid an error message, specify an adequate value. In cases of large packet sizes, large block sizes, or for slow communication lines such as SDLC and ASYNCH, a value of 150 seconds is recommended. A blank space is required between TIME and n.

Examples

The following examples show command syntax you can use to send files from your PC to your CICS host. The example case is given, followed by the command syntax, then concluded with an explanation.

Sending a PC file from your default drive and adding it as a new file on your CICS host:

SEND pc.txt a:cicsfile (ASCII CRLF)

Note: You must enter the complete CICS SEND command on one line.

This command sends a PC file named **PC.TXT** from your default drive on your PC to your host session **A**. You do not need to provide the PC drive name if the file you are sending is on the current drive. The command creates a new file named **CICSFILE**.

Sending a basic PC file from a drive other than your default to replace a file on your CICS host:

SEND a:myprog.exe a:basprog (BINARY)

This command sends a PC file named **MYPROG.EXE** from a diskette in drive A to your CICS host in your host session named **A**. It is written to a file named **BASPROG**, replacing any existing file by that name in host session **A**.

Using the CICS RECEIVE Command

Use the following information when receiving files from CICS:

The terms in Figure 3-6 are commands and information you must provide. Enter them as shown (including parentheses). You can use either uppercase or lowercase.

Note: There must not be a space between **h:** and **fn**.

Figure 3-6 shows the parts of the CICS RECEIVE command.

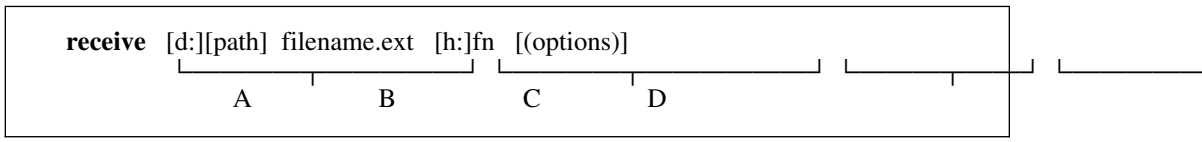


Figure 3-6. CICS RECEIVE Command Elements

A The PC drive and path where the file is to be received.

B The name of the PC file.

C Short name of the host session (h:) from which you are receiving the file and the host file name (fn).

D Optional changes made to the file during transfer. More than one option can be specified. Valid options are:

ASCII
BINARY
CRLF
NOCLEAR
NOCRLF
PROGRESS
QUIET
RETRY
TIME n

The parts of the RECEIVE command are:

RECEIVE The command.

d: Specifies the name of the diskette or hard disk drive where the file is to be received.

\path Specifies the path to the subdirectory where the file is to be located.

\filename.ext Specifies the name of the PC file, including the extension. You can create a new name or use a name that is already on your PC diskette or hard disk. If you use a new name, the file that you receive is added to your diskette or hard disk. If you use the name of an existing file, the file that you receive either replaces or supplements the existing file. Refer to the APPEND option.

h: The short name of the CICS session where the data set is located. If you have only one host, this is optional. The default session is **A**.

fn Specifies the name of the file you want to receive from your CICS host.

(options

These options can be specified:

ASCII Specifies EBCDIC-to-ASCII character translation. The default is ASCII CRLF. You need ASCII and CRLF options for text or source files that you want to view or edit, such as SCRIPT files. You do not need them for binary files.

Notes:

1. CRLF and NOCRLF are mutually exclusive options.
2. BINARY and ASCII are mutually exclusive options.
3. CRLF and ASCII imply each other if one is specified but not the other.
4. BINARY and NOCRLF imply each other if one is specified but not the other.
5. The assumed defaults, if the optional parameters are omitted, are CRLF ASCII.

BINARY

The data in the file is binary data. The data can be encrypted data, compiled programs, or other data. It is not translated by the host file transfer program but is copied without changes into the PC file.

CRLF Specifies the use of the carriage return and line feed codes.

NOCLEAR

Suppresses the sending of a Clear command at the beginning of file transfer. This option is required for ISPF command mode.

NOCRLF

The host computer file does not consist of logical records. The items in a temporary storage queue are sent in order and concatenated in your PC into a single string of data.

PROGRESS

Suppresses the display of the progress messages.

QUIET Suppresses all send and receive messages except error messages.

RETRY
Retries the file transfer until it is completed or you perform some operations (for example, press Ctrl-Break) if there is a problem in the emulator session.

TIME n
Specifies the length of time, in seconds, the program waits for a response from the host before it sends an error message. Replace n with an integer value in the range from 20 through 65536. The default is 20. To avoid an error message, specify an adequate value. In cases of large packet sizes, large block sizes, or for slow communication lines such as SDLC and ASYNCH, a value of 150 seconds is recommended. A blank space is required between TIME and n.

Examples

The following examples show command syntax you can use to receive files from your CICS host to your PC. The example case is given and followed by the command syntax, and then concluded with an explanation.

Receiving a file from your CICS host at your default drive for a PC session:

RECEIVE pc.txt A:cicsfile (ASCII CRLF)

This command sends a file named **CICSFILE** from your CICS host in session **A** to your PC session. It adds the file to your default drive (diskette or hard disk) with the name **PC.TXT**.

Receiving a basic file from your CICS host and replacing a file on a drive other than your default:

RECEIVE a:myprog.exe a:myprog (BINARY)

This command sends a file named **MYPROG** from your CICS host in session **A** to a drive other than the default for your PC session. It replaces a file named **MYPROG.EXE** on a diskette in drive A.

Configuring File-Transfer Code Translation

When you transfer a file between the host and the PC using the ASCII option, the host-system file-transfer program performs translation from EBCDIC to ASCII or vice versa, according to the host and PC code-pages specified during PC/3270 configuration. However, you might want to use different translation from that supplied by IBM. The PCSXFRED utility is provided for those users who want to configure the file-transfer translation table.

The PCSXFRED utility is a DOS program that can be run in the DOS session when PC/3270 is running. There are two ways to change the default ASCII-EBCDIC translation table:

Making changes interactively
Making changes by using a definition file

Making Changes Interactively

This method allows you to change the default table temporarily; the changes are effective only until you terminate PC/3270.

To make changes interactively to the default ASCII-EBCDIC translation table, type **PCSXFRED** at the DOS prompt and press Enter (—┘).

Then you can use the A2E or E2A subcommands to change the current definition; the syntax of these commands is shown on the next page.

To end PCSXFRED, type **QUIT**.

Making Changes by Using a Definition File

This method allows you to change the default table contents by using a file that contains A2E or E2A subcommand lines. Create the file (for example, **MYXFER.DEF**) using an appropriate editor.

To activate the definition file for the current PC/3270 session only, enter:

PCSXFRED < MYXFER.DEF

If you want to make your redefinition effective every time you start PC/3270, create a new BAT file to start PC/3270; this should contain the following command lines:

```
rem PC/327  Startup BAT file created by CONFIG.EXE
call PC327 .BAT
rem your personal IND$FILE ASCII_EBCDIC translation table
PCSXFRED < MYXFER.DEF
exit
```

However, if you selected YES for "Start the 3270 Setup and Utility program in the DOS session" (that means PCSUTIL is automatically loaded), insert the PCSXFRED into the PC/3270 startup BAT file just before the PCSUTIL statement.

PCSXFRED Subcommands

There are two definition commands to redefine the ASCII-EBCDIC translation table:

A2E ascii_char ebcdic_char
E2A ebcdic_char ascii_char

where

A2E Changes an ASCII to EBCDIC translation

E2A Changes an EBCDIC to ASCII translation

ascii_char Is an ASCII character code point in hexadecimal notation, or an ASCII character enclosed with single quotation marks

ebcdic_char Is an EBCDIC character code point in hexadecimal notation

You can use either A2E or E2A; an ASCII-to-EBCDIC change is automatically reflected in the EBCDIC-to-ASCII translation table and vice versa. The changes are applied to both SEND and RECEIVE commands.

Here are examples:

```
 Any comment should start with ' '

 ASCII 12 is converted to EBCDIC 5F, and EBCDIC 5F to ASCII 12
a2e 12 5f

 ASCII '[' is converted to EBCDIC AD, and EBCDIC AD to ASCII '['
a2e '[' AD

 EBCDIC FE is converted to ASCII E4, and ASCII E4 to EBCDIC FE
e2a fe e4

 EBCDIC BD is converted to ASCII ']', and ASCII ']' to EBCDIC BD
e2a BD ']'
```

Optional Parameters of PCSXFRED

PCSXFRED has three optional parameters:

Parameter Meaning

-q Quiet option; this suppresses the PCSXFRED version message.

-t Table display option; this displays the current (PCSXFRED invocation time) PC/3270 ASCII-to-EBCDIC and EBCDIC-to-ASCII conversion table.

If you want to store the table into a file (for example, **XFER.TBL**), enter:

PCSXFRED -t > xfer.tbl

The table below is an example of the output.

```
ASCII -> EBCDIC                                  EBCDIC -> ASCII

    - -1-2-3 -4-5-6-7 -8-9-a-b -c-d-e-f          - -1-2-3 -4-5-6-7 -8-9-a-b -c-d-e-f
 -   1 2 3 372d2e2f 16 525 b  c d e9f      -    1 2 3 ec 9ca7f e2d2d3 b  c d ea9
1- 1 111213 b6b53226 18193f27 1c1d1e1f      1- 1 111213 efc5 8cb 1819dcd8 1c1d1e1f
2- 4 5a7f7b 5b6c5 7d 4d5d5c4e 6b6 4b61      2- b7b8b9bb c4 a171b cccdcfd  d1 5 6 7
3- f f1f2f3 f4f5f6f7 f8f97a5e 4c7e6e6f      3- d9da16dd dedfe  4 e3e5e9eb b b19e1a
4- 7cc1c2c3 c4c5c6c7 c8c9d1d2 d3d4d5d6      4- 2 c98384 85a f286 87a49b2e 3c282bb3
5- d7d8d9e2 e3e4e5e6 e7e8e9ba e bbb 6d      5- 26828889 8aa18c8b 8de12124 2a293baa
6- 79818283 84858687 88899192 93949596      6- 2d2fb28e b4b5b68f 8 a57c2c 255f3e3f
7- 979899a2 a3a4a5a6 a7a8a9c  6ad a1 7      7- ba9 bcbd bef3c c1 c26 3a23 4 273d22
8- 68dc5142 43444748 52535457 56586367      8- c3616263 64656667 6869aeaf c6c7c8f1
9- 719c9ecb cccddbdd dfecfc4a b1b23eb4      9- f86a6b6c 6d6e6f7  7172a6a7 91ce92 f
a- 4555cede 49699a9b ab f5fb8 b7aa8a8b      a- e67e7374 75767778 797aada8 d4d5d6d7
b- 3c3d624f 6465662  21227 23 727374be      b- 5e9c9dfa 9f1514ac abfc5b5d e4febfe7
c- 7677788  24158c8d 8e41 617 28299d2a      c- 7b414243 44454647 4849e893 9495a2ed
d- 2b2c 9 a acadaeaf 1b3 31fa 1a333435      d- 7d4a4b4c 4d4e4f5  5152ee96 8197a398
e- 3659 838 bc39a bf ca3afe3b  4cfda14      e- 5cf 5354 55565758 595afdf5 99f7f6f9
f- e18f4675 fdebeeed 9 efb3fb b9eabdff      f- 3 313233 34353637 3839dbfb 9af4eaff
```

-d Definition file display option; this option displays the current PC/3270 ASCII-to-EBCDIC and EBCDIC-to-ASCII conversion in PCSXFRED definition-file-format.

If you want to store the output into a file (for example, **XFER.DEF**), enter:

PCSXFRED -d > xfer.def

The following is an example of the output.

```
a2e                    :
a2e  1  1              :
a2e  2  2          a2e f1 8f
a2e  3  3          a2e f2 46
a2e  4 37          a2e f3 75
a2e  5 2d          a2e f4 fd
a2e  6 2e          a2e f5 eb
a2e  7 2f          a2e f6 ee
a2e  8 16          a2e f7 ed
a2e  9  5          a2e f8 9
a2e  a 25          a2e f9 ef
a2e  b  b          a2e fa b3
a2e  c  c          a2e fb fb
a2e  d  d          a2e fc b9
a2e  e  e          a2e fd ea
      :               a2e fe bd
      :               a2e ff ff
```

Chapter 4. Country Codes, Code Pages, and Character Sets

This chapter contains information useful in providing national language support for a network station or a gateway.

The **Country** option defaults to the current DOS country code. The countries are listed in"Country Codes and Code Pages" on page 4-3 ; the actual list available to you might be different.

The **PC code page** option defaults to the current active code page. The **Host code page** option defaults to the one for the keyboard country. The PC and Host code page options are listed in"Code Pages and Character Sets" on page 4-7 .

For the **Keyboard type** option, the following selections are available:

Host-connected	Host-connected keyboard (122-key)
AT	PC AT keyboard
XT	PC XT, PC, and PC Portable keyboard
Space-saving	Space-saving keyboard
Enhanced	Enhanced keyboard

Table 4-1 (Page 1 of 2). Keyboard Type

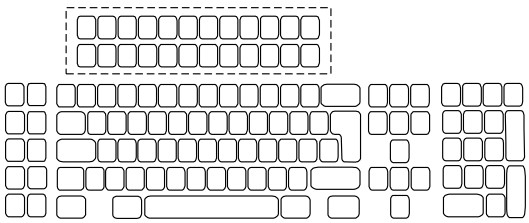
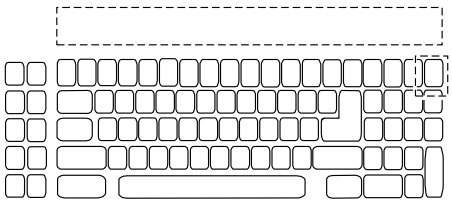
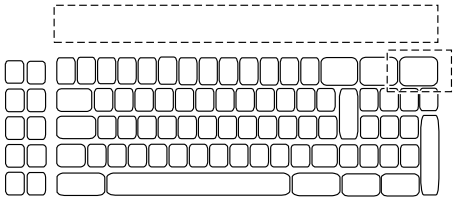
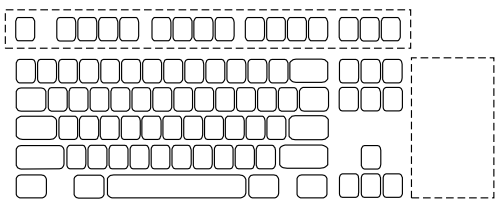
Keyboard Type (Characteristics)	Figure
Host Connected (dual row functions keys)	
AT (no top function keys; single sized key on top-right corner)	
XT (no top function keys; double sized key on top-right corner)	
Space Saving (one line of function keys; no numeric keypad) (Not EMEA)	

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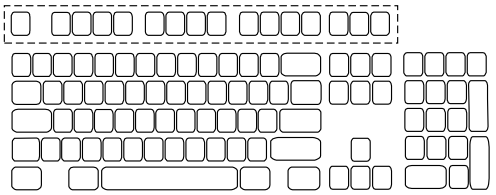
Table 4-1 (Page 2 of 2). Keyboard Type

Keyboard Type (Characteristics)	Figure
Enhanced (single row of function keys; includes numeric keypad)	

PC/3270 matches the keyboard type that you are using by interrogating the BIOS of the PC. If the keyboard type setting does not match what is actually used, the key mapping will be incorrect.

Note: If you are using one type of keyboard to configure an installation for use on systems with another keyboard type, select the keyboard type of the *target* system.

Country Codes and Code Pages

During customization, you can select a PC country code and code pages for PC and host. For DOS mode, you can also select a PC country code and code page for your PC (but not for the gateway or host) by inserting a line in your **CONFIG.SYS** file of the form:

COUNTRY=xxx,nnnn d:\path\country.SYS

where:

xxx — Is the three digit international country code for the telephone system. Available country codes include those listed in Table 4-2 on page 4-4.

nnnn — Is the code page number used to set the keyboard map for the PC. Available PC keyboard map selections include those listed in the **PC Code Page** column of Table 4-4 on page 4-7.

\path — Is the directory where a country information file resides.

country.SYS — Is a country information file. The country information file determines some characteristics of character mapping for the keyboard and the display. A file named **COUNTRY.SYS** is provided with PC DOS. Other country information files might be provided in a national language supplement or perhaps in the PC/3270 product for your country.

The following table shows the country codes.

Table 4-2. Country Code

Country	Country Code
Albania	355
Australia	061
Belgium	032
Bosnia / Herzegovina	387
Brazil	055
Bulgaria	035
Canada (French-speaking)	002
Croatia	384
Czech	042
Denmark	045
Finland	358
France	033
FYR Macedonia	389
Germany	049
Greece	030
Hungary	036
Iceland	354
Italy	039
Japan	081
Latin America	003
Netherlands	031
Norway	047
Poland	048
Portugal	351
Romania	040
Russia	007
Serbia / Montenegro	381
Slovakia	042
Slovenia	386
Spain	034
Sweden	046
Switzerland	041
Turkey	090
United Kingdom	044
U.S.	001

Keyboard Country ID and Shift Support

The following table shows the keyboard country ID and shift support for each country.

Table 4-3 (Page 1 of 2). Keyboard Country ID and Shift Support

Keyboard Country	Enhanced Keyboard ID	Enhanced Keyboard Lock Mode	Host Connected Keyboard ID	Host Connected Keyboard Lock Mode
Albania	452	C	452	C
Austria	129	S	129	S
Belgium	120	S	120	S
Brazil	275	C	–	–
Canada (Bilingual)	058	C	277	S
Cyrillic				
Bosnia / Herzegovina - Serbian	450	C	–	–
Bulgaria	442	C	–	–
FYR Macedonia	449	C	–	–
Russia (441)	441	C	–	–
Russia (443)	443	C	–	–
Serbia / Montenegro	443	C	–	–
Denmark	159	C	281	S
Finland	153	C	285	S
France (120)	120	S	–	–
France (189)	189	S	251	S
Germany	129	S	129	S
Greece	319	S	319	S
Iceland	197	C	197	S
Italy (141)	141	C	–	–
Italy (142)	142	C	293	S
Latin America (Spanish)	171	C	309	S
Latin 2				
Bosnia / Herzegovina - Croatian	234	C	234	S
Croatia	234	C	234	S
Czech	243	C	–	–
Hungary	208	C	–	–
Poland	214	C	–	–
Romania (Moldavia)	446	C	–	–
Slovakia	245	C	–	–
Slovenia	234	C	–	–
Netherlands	143	C	101	S
Norway	155	C	281	S
Portugal	163	C	163	S
Spain	173	C	071	S
Sweden	153	C	285	S
Switzerland (French)	150F	C	150F	S
Switzerland (German)	150G	C	150G	S
Turkey (179)	179	C	402	S
Turkey (440)	440	C	–	–
U.K. (166)	166	C	166	C
U.K. (168)	168	C	–	–

Table 4-3 (Page 2 of 2). Keyboard Country ID and Shift Support

Keyboard Country	Enhanced Keyboard ID	Enhanced Keyboard Lock Mode	Host Connected Keyboard ID	Host Connected Keyboard Lock Mode
U.S. (English)	101G	C	101	S

Note:

– Not selectable
S Shift lock on key 30
C Caps lock on key 30

Code Pages and Character Sets

The following table shows the code pages and character sets.

Table 4-4. Code Page and Character Set

Country	Host CPGID/GCSGID	PC CPGID/GCSGID
Albania	500-1/697-1	850/980 or 437/919
Austria	273-1/697-1 or 500-1/697-1	437/919 or 850/980
Belgium	037-1/697-1 or 500-1/697-1	437/919 or 850/980
Brazil	037-1/697-1 or 500-1/697-1	437/919 or 850/980
Canada (Bilingual)	037-1/697-1 or 500-1/697-1	863/993 or 850/980
Cyrillic		
Bosnia / Herzegovina - Serbian	1025/1150	855/985 or 915/1150
Bulgaria	1025/1150	855/985 or 915/1150
FYR Macedonia	1025/1150	855/985 or 915/1150
Russia	1025/1150	866/996 or 915/1150
Serbia / Montenegro	1025/1150	855/985 or 915/1150
Denmark	277-1/697-1 or 500-1/697-1	865/996 or 850/980
Finland	278-1/697-1 or 500-1/697-1	437/919 or 850/980
France	297-1/697-1 or 500-1/697-1	437/919 or 850/980
Germany	273-1/697-1 or 500-1/697-1	437/919 or 850/980
Greece	875/925	869/998
Iceland	871-1/697-1 or 500-1/697-1	861/991 or 850/980
Italy	280-1/697-1 or 500-1/697-1	437/919 or 850/980
Latin America (Spanish)	284-1/697-1 or 500-1/697-1	437/919 or 850/980
Latin 2 (Multilingual) Bosnia / Herzegovina - Croatian Croatia Czech Hungary Poland Romania (Moldavia) Slovakia Slovenia	870/959	852/982 or 912/959
Netherlands	037-1/697-1 or 500-1/697-1	437/919 or 850/980
Norway	277-1/697-1 or 500-1/697-1	865/995 or 850/980
Portugal	037-1/697-1 or 500-1/697-1	860/990 or 850/980
Spain	284-1/697-1 or 500-1/697-1	437/919 or 850/980
Sweden	278-1/697-1 or 500-1/697-1	437/919 or 850/980
Switzerland (French)	500-1/697-1	437/919 or 850/980
Switzerland (German)	500-1/697-1	437/919 or 850/980
Turkey	1026/1152	857/987
U.K.	285-1/697-1 or 500-1/697-1	437/919 or 850/980
U.S.	037-1/697-1 or 500-1/697-1	437/919 or 850/980

Host Code Page Tables

The following show the host code page table for each country.

Host Code Page 0037/1 USA, Canada

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	°	µ	^	{	}	\	0
-1	(RSP)	é	/	É	a	j	~	£	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	·	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	§	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	`	i	r	z	¾	I	R	Z	9
-A	¢	!	¦	:	«	ª	¡	[	(SHY)	¹	²	³
-B	.	$	,	#	»	º	¿	]	ô	û	Ô	Û
-C	<	*	%	@	ð	æ	Ð	¯	ö	ü	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	|	¬	?	"	±	¤	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00273/1 Germany, Austria

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	°	µ	¢	ä	ü	Ö	0
-1	(RSP)	é	/	É	a	j	ß	£	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	{	ë	[	Ë	c	l	t	·	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	@	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	~	Ñ	`	i	r	z	¾	I	R	Z	9
-A	Ä	Ü	ö	:	«	ª	¡	¬	(SHY)	¹	²	³
-B	.	$	,	#	»	º	¿	|	ô	û	Ô	Û
-C	<	*	%	§	ð	æ	Ð	¯	¦	}	\	]
-D	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	!	^	?	"	±	¤	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00277/1 Denmark, Norway

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	¦	@	°	µ	¢	æ	å	\	0
-1	(RSP)	é	/	É	a	j	ü	£	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	·	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	§	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	}	ï	$	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	`	i	r	z	¾	I	R	Z	9
-A	#	¤	ø	:	«	ª	¡	¬	(SHY)	¹	²	³
-B	.	Å	,	Æ	»	º	¿	|	ô	û	Ô	Û
-C	<	*	%	Ø	ð	{	Ð	¯	ö	~	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
-E	+	;	>	=	þ	[	Þ	´	ó	ú	Ó	Ú
-F	!	^	?	"	±	]	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00278/1 Finland, Sweden

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	°	µ	¢	ä	å	É	0
-1	(RSP)	`	/	\	a	j	ü	£	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	{	ë	#	Ë	c	l	t	·	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	[	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	}	ï	$	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	é	i	r	z	¾	I	R	Z	9
-A	§	¤	ö	:	«	ª	¡	¬	(SHY)	¹	²	³
-B	.	Å	,	Ä	»	º	¿	|	ô	û	Ô	Û
-C	<	*	%	Ö	ð	æ	Ð	¯	¦	~	@	Ü
-D	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	!	^	?	"	±	]	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00280/1 Italy

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	[	µ	¢	à	è	ç	0
-1	(RSP)	]	/	É	a	j	ì	#	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	·	C	L	T	3
-4	{	}	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	@	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	\	~	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	ù	i	r	z	¾	I	R	Z	9
-A	°	é	ò	:	«	ª	¡	¬	¯ (SHY)	¹	²	³
-B	.	$	,	£	»	º	¿	|	ô	û	Ô	Û
-C	<	*	%	§	ð	æ	Ð	¯	ö	ü	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	¨	¦	`	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	!	^	?	"	±	¤	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00284/1 Spain, Latin America

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	°	µ	¢	{	}	\	0
-1	(RSP)	é	/	É	a	j	¨	£	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	·	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	§	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	¦	ß	#	`	i	r	z	¾	I	R	Z	9
-A	[	]	ñ	:	«	ª	¡	^	¯ (SHY)	¹	²	³
-B	.	$	,	Ñ	»	º	¿	!	ô	û	Ô	Û
-C	<	*	%	@	ð	æ	Ð	¯	ö	ü	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	~	ò	ù	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	|	¬	?	"	±	¤	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00285/1 United Kingdom

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	°	µ	¢	{	}	\	0
-1	(RSP)	é	/	É	a	j	¯	[	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	·	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	§	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	`	i	r	z	¾	I	R	Z	9
-A	$	!	¦	:	«	ª	¡	^	¯ (SHY)	1	2	3
-B	.	£	,	#	»	º	¿	]	ô	û	Ô	Û
-C	<	*	%	@	ð	æ	Ð	~	ö	ü	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	|	¬	?	"	±	¤	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00297/1 France

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	[	`	¢	é	è	ç	0
-1	(RSP)	{	/	É	a	j	¨	#	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	·	C	L	T	3
-4	@	}	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	]	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	\	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	µ	i	r	z	¾	I	R	Z	9
-A	°	§	ù	:	«	ª	¡	¬	(SHY)	¹	²	³
-B	.	$	,	£	»	º	¿	|	ô	û	Ô	Û
-C	<	*	%	à	ð	æ	Ð	¯	ö	ü	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	~	ò	¦	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	!	^	?	"	±	¤	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00500/1 International (Belgium, Switzerland)

The column indicates the first digit and the row indicates the second digit.

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ø	Ø	°	µ	¢	{	}	\	0
-1	(RSP)	é	/	É	a	j	~	£	A	J	÷	1
-2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
-3	ä	ë	Ä	Ë	c	l	t	·	C	L	T	3
-4	à	è	À	È	d	m	u	©	D	M	U	4
-5	á	í	Á	Í	e	n	v	§	E	N	V	5
-6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
-7	å	ï	Å	Ï	g	p	x	¼	G	P	X	7
-8	ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
-9	ñ	ß	Ñ	`	i	r	z	¾	I	R	Z	9
-A	[	]	¦	:	«	ª	¡	¬	¯ (SHY)	¹	²	³
-B	.	$	,	#	»	º	¿	|	ô	û	Ô	Û
-C	<	*	%	@	ð	æ	Ð	¯	ö	ü	Ö	Ü
-D	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
-E	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
-F	!	^	?	"	±	¤	®	×	õ	ÿ	Õ	(EO)

Host Code Page 00870/2 Latin 2, Multilingual/ROECE

The column indicates the first digit and the row indicates the second digit.

	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP)	&	-	ˇ	˘	°	ą	·	{	}	\	0
-1	(RSP)	é	/	É	a	j	~	Ą	A	J	÷	1
-2	â	...	Â	...	b	k	...	...	B	K	S	2