

Personal Communications
Version 4.3 for OS/2



Reference

Personal Communications
Version 4.3 for OS/2



Reference

Note:

Before using this information and the product it supports, be sure to read the general information under “Appendix D. Notices” on page 483.

First Edition (September 2000)

This edition applies to Version 4.3 of Personal Communicaitons for OS/2, and to all subsequent releases and modifications until otherwise indicated in new editions.

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Contents

Figures	ix
--------------------------	-----------

Tables	xi
-------------------------	-----------

About This Book	xiii
----------------------------------	-------------

Who Should Read This Book	xiii
How to Use This Book	xiii
Organization.	xiii
Highlighting Conventions	xiv
Command Syntax Symbols	xv
What's New in this Edition	xv

Part 1. General Information	1
--	----------

Chapter 1. Personal Communications Highlights	3
--	----------

Chapter 2. Problem Determination (PD)	7
--	----------

Symptoms	7
Environment	7
Problem Type	7
Problem Area	8
Problem Re-Creation.	8
Problem-Source Identification (PSI)	8
First Failure Support Technology (FFST/2)	8
Trace Services	10
SDLC and LAN Trace Selections	15
Trace Selections for Emulator Type	16
Additional Connectivity Trace Selections.	17
CMPD	17
Command Line Parameters	18
Problem Reporting (PR)	18

Chapter 3. Subsystem Management Online Facility	19
--	-----------

Using Subsystem Management	19
Controlling the APPC Attach Manager	19
Starting or Stopping the Access Feature Kernel	19
Using SNA Subsystem Management	19
Using X.25 Services.	24

Chapter 4. Printing	25
--------------------------------------	-----------

Printing from Printer Sessions	25
Printing from Display Sessions	26
PC/3270 Printer Functions	26
Printing Attribute Bytes	26
Printing the Underline Attribute	27
Printing the Reverse Attribute	27
Scalable APL Font Support on Printers	27
Setting Up the Printer	28
Printer Definition Table (PDT) Files	28

Chapter 5. Transferring Files	33
--	-----------

Sending Files to the Host System	33
Receiving Files from the Host System.	35
Using List Files	36
Creating List Files	36
Editing Lists	36
Creating a Template	37
Adding Templates	38
Replacing and Deleting Templates.	38
Testing Templates	38
Import/Export (PC/3270 Only).	39
Transferring Files Using Import/Export	39
Creating IDP Files	40
Setting Transfer Types	40
PC400 File Options	41
PC/3270 File Options	41
PC400 Logical Record Length (LRECL)	42
Record Format	42
Logical Record Length (LRECL)	42
TSO Allocation Parameter (MVS/TSO)	43
Additional Options.	43
Adding or Changing Transfer Types	43
Setting Transfer Options	44
File Transfer Timeout	44
Extension for PC400 List Files	44
Status Window	44
PC Code Page	44
Host Command	44
File Transfer Directory.	45
Clearing Sessions before Transfer (PC/3270 only)	45
File Transfer Packet Size (PC/3270 only).	45
Extension for PC/3270 List Files	45
Status Window	45
PC Code Page	45
Host Command	45
File Transfer Directory.	45
Changing Transfer Options	45
Setting Translation Tables.	46
Changing Translation Tables.	46
Customizing Translation Tables.	46

Chapter 6. Configuration, Installation, and Distribution (CID)	49
---	-----------

Software Distribution Manager (SDM)	
Considerations	50
Determine the Type of Code Server and Client	50
Transferring Product Data	51
Preparing Response Files	51
Directories Created by the Installation Program	52
Sample Software Distribution Manager (SDM)	
Profile for NetView DM/2 Server	53
Configuration	53
System Configuration (PCSSETUP.EXE)	54
Session Configuration (PCSWS.EXE)	54
Multiple Session Configuration (PCSBAT.EXE).	54
Access Feature Configuration	54

Private Files (Configuration Files)	54
Installation (INSTALL.EXE)	55
Parameters	55
Return Codes.	56
Creating Response Files	57
General Response File	58
Specific Response File	58
File Format	58
CID Examples	61
Sample Response File	69
Installation Record Keywords	70
Session-Oriented Record Keywords	72
3270 Record	72
5250 Record	74
Communication Record	77
Session Record	78
File Record	78
Connection- and Communication-Oriented Record Keywords	79
AEA Record (for 3270 Only)	79
APPC3270 Record (for 3270 Only)	80
ASYNCR Record (for 3270 Only)	80
CNDFT Record (for 3270 Only)	81
CSDFT Record (for 3270 Only)	82
CT Record (for 5250 Only)	82
CUT Record (for 3270 Only)	83
CUT5250 Record (for 5250 Only)	83
HPO Record (for 3270 Only)	84
LU Record.	85
NW4SAA Record (for 3270 Only)	86
RUI Record (for 3270 Only)	86
Telnet3270 Record (for 3270 Only)	87
Telnet5250 Record (for 5250 Only)	87
GUI and Miscellaneous Record Keywords	88
API Record	88
AutoDial Record.	89
Colors Record	89
Graphics Record (for 3270 Only)	93
HotSpot Record	94
Keyboard Record	94
Macro Record	96
Mouse Record	97
Poppad Record	97
Printers Record	98
Tool Bar Record	99
Transfer Record	99
Window Record	101

Chapter 7. Configuring and Using SSL Security for Personal

Communications	105
What is SSL?	105
Preparation for SSL Communication.	105
Server and Related Client Configuration	105
Client Configuration	106
Establishing an SSL-Based Session	107
Secure Session Icon	108
Configuring Personal Communications for SSL Support	108
Host Definition.	108

Advanced Security Setup	108
Pop-up Messages	109
Changing the Password of a Client's Key Database	110
Using Certificate Wizard.	110
Using Certificate Management.	110
Configuring SSL for Connecting to a Server Using a Certificate from a Well-Known CA.	110
Configuring SSL for Connecting to a Server Using a Certificate from an Unknown CA.	111
Opening a Key Database and Adding a Root Certificate	111
Opening a Key Database and Adding a Personal Certificate	112
Obtaining a Personal ID Certificate from a Known Certificate Authority (CA)	114
Configuring SSL for Connecting to a Server Using a Self-signed Certificate	114
Using the Command Line Mode for Managing Certificates	115
Security References	117
Problem Determination	118

Chapter 8. Code Pages 119

Country Codes	119
Keyboard Country ID and Shift Support	121
Code Pages and Character Sets	122
Host Code Page Tables	124
Host Code Page 037-1/697-1 Brazil, Canada, Netherlands, Portugal, U.S..	125
Host Code Page 273-1/697-1 Austria, Germany	126
Host Code Page 275-1/697-1 Brazil	127
Host Code Page 277-1/697-1 Denmark, Norway	128
Host Code Page 278-1/697-1 Finland, Sweden	129
Host Code Page 280-1/697-1 Italy	130
Host Code Page 284-1/697-1 Latin America (Spanish), Spain	131
Host Code Page 285-1/697-1 United Kingdom	132
Host Code Page 297-1/697-1 France	133
Host Code Page 420 Arabic Bilingual	134
Host Code Page 424/941 Israel (Hebrew - Bulletin Code)	135
Host Code Page 500-1/697-1 International.	136
Host Code Page 803 Israel (Hebrew - Old Code)	137
Host Code Page 838/1279 Thailand	138
Host Code Page 870/959 Latin 2 - EBCDIC Multilingual.	139
Host Code Page 871-1/697-1 Iceland	140
Host Code Page 875/925 Greek	141
Host Code Page 924-1/1353-1 International	142
Host Code Page 1025/1150 Cyrillic	143
Host Code Page 1026/1 Latin 5 - Turkey	144
Host Code Page 1047/103 Latin 1 (Open Systems)	145
Host Code Page 1140-1/695-1 Brazil, Canada, Netherlands, Portugal, U.S..	146
Host Code Page 1141-1/695-1 Austria, Germany	147
Host Code Page 1142-1/695-1 Denmark, Norway	148
Host Code Page 1143-1/695-1 Finland, Sweden	149
Host Code Page 1144-1/695-1 Italy	150

Host Code Page 1145-1/695-1 Latin America, Spain	151
Host Code Page 1146-1/695-1 United Kingdom	152
Host Code Page 1147-1/695-1 France	153
Host Code Page 1148-1/695-1 International	154
Host Code Page 1149-1/695-1 Iceland	155
Host Code Page 1153/1375 Latin 2 - EBCDIC Multilingual	156
Host Code Page 1154/1381 Cyrillic	157
Host Code Page 1155/1378 Latin 5 - Turkey	158
Host Code Page 1160/1395 Thailand	159
Host Code Page 00310 APL/TEXT	160

Chapter 9. Keyboards 161

Character Positions	161
Default Key Functions Mapping (Keyboard Layout)	162
Key Function Abbreviations for PC/3270	162
Key Function Abbreviations for PC400	168
APL Keyboard Layouts	173
Key Map for Home3270	176

Chapter 10. Migration 181

Migrating to Personal Communications Version 4.3	181
CM/2 Migration Utility	181
Instructions	182
Command Line Parameters.	183
Context sensitive help	183
Naming Conventions and Output from Migration	184
Considerations for CID	184
Migrated Keywords	184
PCOMM 4.1 Migration Utility.	185
Overview.	185
Instructions	185

Chapter 11. Where to Get More Information 189

Online Help	189
How to Use Online Help	189
Messages	189
OIA Messages	189
Personal Communications Library	190
Related Publications	190
Problem Reporting (PR)	191
Contacting IBM	192
Support Options	192

Part 2. Personal Communications/3270 193

Chapter 12. Building a Printer Definition Table (PDT) for PC/3270 . . . 195

Customizing the PDT	195
PDF Format	195
Example PDF	196
Supplemental Explanation of PDF Statements	203
SCS TAB Setting	204
PDF Field Names and Symbols	204

Printer Color Mixing	209
Printer Session Data Stream Support	210
3270 Data Stream	210
SCS Data Stream	211
Delimiting Print Jobs	212
Structured Fields (SFs)	213

Chapter 13. File Transfer Commands for PC/3270 217

File Transfer Methods	217
Requirements and Restrictions.	217
Sending and Receiving Files from the OS/2 Command Prompt.	217
Using the VM/CMS SEND Command	218
Using the VM/CMS RECEIVE Command	221
Using the MVS/TSO SEND Command	223
Using the MVS/TSO RECEIVE Command.	228
Using the CICS SEND Command.	231
Using the CICS RECEIVE Command	233
Configuring File-Transfer Code Translation	235

Chapter 14. Considerations for PC/3270 Installation and Use. 237

IEEE 802.2 Support	237
Host Session Window Operations	237
Cursor Color	237
IBM Custom Color (Display Setup - Palette)	237
Releasing Insertion Mode with the Attention Key	238
Scroll Bar.	238
Scroll Lock Key.	238
PC/3270 Screen Size Control	238
Customizing a Display Translation Table	239
Edit Function	240
Edit Function Restrictions at CUT Attachment	240
Edit Function Restrictions at Home3270 Attachment	240
Pasting Data to Lotus 1-2-3 from the Clipboard	241
File Transfer from the OS/2 Command Prompt	241
Graphic Functions.	242
API Considerations	247
Print Processing	247
Miscellaneous Considerations	250

Part 3. Personal Communications/400 251

Chapter 15. Building PC400 Printer Definition Tables (PDTs). 253

Customizing the PDT	253
PDF Format	253
Example of PDFs	254
Printer Control Codes	255
Programming Notes	257
Restrictions and Notes for Printer Codes and Printer Setup	258
PFT Migration Utility.	259

Chapter 16. Field Attribute Codes. . . . 293

Chapter 17. Data Transfer for PC400 295

Data Transfer Function Overview.	295
Transferring Files from an AS/400 System to a Workstation	295
Transferring Files from a Workstation to an AS/400 System.	296
Preparing for Data Transfer.	298
Required Software Products	298
Transfer Function	298
Data Transfer Program	299
Data Concepts of the AS/400 System and Your Workstation	300
Creating a Workstation-to-AS/400 Transfer Request	302
Creating an AS/400-to-Workstation Transfer Request	310
Items to Be Specified	312
Saving, Opening, Changing, and Executing a Transfer Request	327
Limited Usage of File Names and Field Names	329
Examples of Transfer Requests for Receiving	330
Receiving Part of an AS/400 File	331
Receiving Records Joined from Several AS/400 Files	331
Receiving Records Using File Qualifiers	332
Receiving with Field Missing Records Joined	333
Receiving with Records in a Same File Joined	333
Specifying Records to Be Included in a Group	334
Specifying Summary Records to Be Transferred	335
Functions Available from Pull-Down Menu	336
File.	336
Setup (Only for AS/400>PC Transfer)	336
File-Description Files	339
Creating a File-Description File	340
File-Description File Format	340
Example	346
Data Conversions	346
Record Size	347
Data Types	347
Binary Data	348
Character Data for SBCS.	348
Double-Precision Data	348
Date, Time, and Time-Stamp Data Types	349
Hexadecimal Data.	349
Integer Data.	349
Packed Decimal Data.	349
Single-Precision Data.	350
Zoned Decimal Data	350
Personal Computer File Types.	350
AS/400 System-to-Personal Computer Performance Considerations	368

Chapter 18. File Transfer for PC400 369

PC File Transfer with the CRLF Option.	369
Transfer to a Physical Source File.	369
Transfer to a Physical File	370
Use of the DSPMBRLST Command	370
Restrictions for Transferred File Size.	371

Chapter 19. Considerations for PC400

Installation and Use	373
IEEE 802.2 Support	373
General PC400 Workstation Window Operations	373
Scroll-Bar.	373
API Considerations	374
DOS Mode EHLLAPI.	374
Print Processing	374
Font Pitch	374
Spool Function	374
CPI/LPI of Device Fonts	374
Printable Area	374
Printing Using PDT Mode	374
Unprintable Characters	375
Printing Using the OS/2 Printer Drivers	375
Setting the Code Page	375
Transferring Files	375
WAIT Option for Transferring Multiple Files	375

Part 4. Personal Communications/SNA 377

Chapter 20. SNA Client/Server Concepts 379

Terminology.	379
APPC Concepts	379
Introducing APPC and CPI-C	380
What Is a Transaction Program?	380
What Is the Difference between APPC and APPN?	381
Side Information Definitions	382
APPC Issues and Considerations	382
Improving Productivity Using APPC	382
Improving Productivity Using CPI-C	382
What Is a Logical Unit?	383
LU Types.	383
Dependent and Independent LUs.	383
What Is a Session?	384
What Is a Conversation?	384
A Conversation between Two TPs	385
Parallel Sessions between LUs.	385
SNA Communications	386
Dependent Logical Unit Requester Support	386
Using DLUR	386
Data Compression.	387
Encryption	388
Subsystem Management Services.	389

Chapter 21. Introducing SNA over TCP/IP 391

What Does SNA over TCP/IP Do?	391
Connecting SNA over TCP/IP Access Nodes over an IP Network	392
Connecting an SNA over TCP/IP Access Node to a VTAM Host Processor over an IP Network	392
Using a Single SNA over TCP/IP Gateway to Connect an IP Network to an SNA Network	392
Using Parallel Gateways to Increase the Number of LU-LU Sessions.	393

Chaining Gateways to Connect Multiple SNA and IP Networks	394
Using Gateways to Support Dependent LU Communication	395
How Does SNA over TCP/IP Work?	401
SNA over TCP/IP Access Node	401
SNA over TCP/IP Gateway	402
Protocol Flows for SNA over TCP/IP	403
Application Program Interface Support	405
Network Interface Protocol Support	405
TCP/IP Support Services	405

Chapter 22. Introducing Sockets over SNA 407

What Does Sockets over SNA Do?	407
Connecting Sockets over SNA Access Nodes on Different Operating Systems	407
Connecting an SNA Network with an IP Network Using Sockets over SNA Gateway	408
Connecting an SNA Network with IP Networks Using Sockets over SNA Gateway and a TCP/IP Router.	409
Connecting Remote IP Networks Using an SNA Backbone Network and Sockets over SNA Gateway	410
How Does Sockets over SNA Work?	411
Generating an LU 6.2 Call from a Socket Call	412
Mapping an IP Address to an SNA Network-Qualified Name	412
Routing and Mapping Data over SNA and IP Networks.	412
Application Program Support Provided by Sockets over SNA	412
Requirements for Full-Duplex Enablement.	413
Restrictions on Using Sockets over SNA	413

Part 5. Appendixes 415

Appendix A. Messages 417

Personal Communications Messages.	417
File Transfer Messages	460

Appendix B. Deleting Unnecessary Files 465

Productivity Tools	465
Administration Tools	466
Other Tools	466
Fonts	466
Links	466
Link Utility	467

Helps/README	467
------------------------	-----

Appendix C. TCP62 for IBM Access Feature for OS/2 Warp 469

Introduction to TCP62	469
Writing TCP62 Programs	469
TN62API() Entry Point	470
Migration Considerations	470
Dynamic Name Generation.	471
TCP62 API Support	472
START_TN62	472
VCB Structure	472
Supplied Parameters	473
Returned Parameters	475
STOP_TN62	475
VCB Structure	476
Supplied Parameters	476
Returned Parameters	476
DEFINE_LOCAL_LU_TN62	476
VCB Structure	476
Supplied Parameters	477
Returned Parameters	478
DEFINE_PARTNER_LU_TN62.	478
OVERLAY Structure	479
Supplied Parameters	479
Returned Parameters	479
TCP62 Return Codes	480
(TN62_ERROR,	
TN62_NODE_RUNNING_NO_ANYNET)	480
(TN62_ERROR,	
TN62_CONFIGURATION_FILE_ERROR)	480
(TN62_ERROR, TN62_NODE_NOT_STARTED)	480
TN62_ERROR,	
TN62_NODE_START_INCOMPLETE)	480
(AP_OK, TN62_PARAMETERS_NOT_USED)	481
(TN62_ERROR,	
TN62_NAME_GENERATION_ERROR)	481
(AP_PARAMETER_CHECK,	
INVALID_CP_NAME)	481
(AP_PARAMETER_CHECK,	
INVALID_LU_NAME)	481
(AP_PARAMETER_CHECK,	
INVALID_FQ_LU_NAME)	482

Appendix D. Notices 483

Trademarks	484
----------------------	-----

Glossary 485

Index 497

Figures

1. Configuration, Installation, and Distribution Process Flow	50	32. Using AnyNet SNA over TCP/IP to Connect a VTAM Application and an OS/2 SNA Application over an IP Network	392
2. An Example of Configuration, Installation, and Distribution	61	33. Using a Single Gateway to Connect an IP Network to an SNA Network	393
3. An Example of a Specific Response File (SAMPLE.RSP – 1 of 4)	62	34. Using Parallel Gateways to Increase the Number of LU-LU Sessions	394
4. An Example of a Specific Response File (SAMPLE.RSP – 2 of 4)	63	35. Chaining Gateways to Connect Multiple SNA Networks	395
5. An Example of a Specific Response File (SAMPLE.RSP – 3 of 4)	64	36. Chaining Multiple Gateways to Connect Multiple IP Networks	395
6. An Example of a Specific Response File (SAMPLE.RSP – 4 of 4)	65	37. Dependent LU Communication Support for Downstream Workstations over a Subarea Network	396
7. An Example of a LAN Response File (LAN.RSP – 1 of 3)	66	38. Dependent LU Communication Support for Downstream Workstations over an APPN Network	397
8. An Example of a LAN Response File (LAN.RSP – 2 of 3)	67	39. Dependent LU Communication Support for Downstream Workstations over an IP Network	398
9. An Example of a LAN Response File (LAN.RSP – 3 of 3)	68	40. Dependent LU Communication Support for Native SNA Nodes	399
10. An Example of a .WS File Created at the Target (SESSION1.WS)	68	41. Chaining Gateways to Support Dependent LU Communication over an SNA Backbone	400
11. An Example of a .WS File Created at the Target (SESSION2.WS)	69	42. Using Gateways to Support Dependent LU Communications among Multiple Networks	401
12. An Example of a .BCH File Created at the Target (SAMPLE.BCH)	69	43. Structure of an SNA over TCP/IP for OS/2 Access Node	402
13. Type-2 APL Keyboard	175	44. Structure of an SNA over TCP/IP for OS/2 Gateway Node	403
14. Type-3 APL Keyboard	175	45. Dependent LU Communication Support for Downstream Workstations using a SNA Gateway and	404
15. Type-4 APL Keyboard	176	46. SNA Network with Multiple Operating Systems	408
16. Common Control Code of the Keyboard Core Segment for the 122-Key Keyboard	176	47. Socket Applications on IP and SNA Networks Communicating through a	409
17. Common Control Code of the Keyboard Core Segment for the Enhanced Keyboard	177	48. Socket Applications on IP and SNA Networks Communicating through a and a TCP/IP Router	410
18. Common Control Code of the Keyboard Core Segment for the Japanese Keyboard	177	49. Socket Applications on IP and SNA Networks Communicating through Multiple Sockets over SNA Gateway	411
19. Control Code Map of the Keyboard Core Segment for the U.S. 122-Key Keyboard	178	50. Structure of an OS/2 Node Running Sockets over SNA	411
20. Control Code Map of the Keyboard Core Segment for the U.S. Enhanced Keyboard	179	51. Socket Applications Compatible with Sockets over SNA	413
21. VM/CMS SEND Command Syntax	218		
22. VM/CMS RECEIVE Command Syntax	221		
23. MVS/TSO SEND Command Syntax	224		
24. MVS/TSO RECEIVE Command Syntax	228		
25. CICS SEND Command Syntax	231		
26. CICS RECEIVE Command Syntax	233		
27. A Session between Two LUs	384		
28. A Conversation between Two TPs	385		
29. Parallel Sessions between LUs	385		
30. DLUR Connection to a Host through a Communications Server Gateway	387		
31. Using SNA over TCP/IP to Connect SNA Applications over an IP Network	392		

Tables

1. File Options for Transfer Files	41	14. Begin/End of File SF Format	213
2. Summary of Response File Installation Functions and Keywords	71	15. Migration from the PFT to the PDF	261
3. Installation Process Performed by Each Reinstall Keyword Value	72	16. Meanings of Field Attribute Codes	293
4. Reconfiguration Process Performed by Each Reconfigure Keyword Value	72	17. File-Type Indicators	340
5. Code Pages and Character Sets	122	18. Time Formats	341
6. Other Control Code Map of Key Segment B	177	19. Time Separators.	341
7. Printer Symbol Definitions	204	20. Date Formats	342
8. Color Mixes	209	21. Date Separators.	342
9. 3270 Data Stream Commands	210	22. Decimal Separators	342
10. 3270 Data Stream Orders.	210	23. Data Type Indicators	343
11. 3270 Data Stream Control Codes	211	24. Valid SBCS Data Types for File Types	343
12. Supported SCS Control Codes	211	25. Allowable Data Length Limits for Personal Computer SBCS Data Types.	344
13. Begin/End of File Query Reply Format	213	26. Allowable Data Length Limits for AS/400 Data Types	345
		27. Binary-to-ASCII Field Length Mapping	351

About This Book

This book is for users of: IBM Personal Communications Version 4.3 for OS/2; this product supports connections to AS/400, S/390, and S/3X hosts. In this publication, the following terms are used to denote functions unique to the particular host environment:

PC400 AS/400 host

PC/3270 S/390 host

Throughout this book, *workstation* refers to all supported personal 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 Personal Communications on a workstation.

How to Use This Book

This book contains reference information that you might need to refer to when installing or operating Personal Communications.

Personal Communications is designed to use various communication adapters and to work with other workstation and host system software. Refer to the appropriate documentation for the products you use.

Organization

This book has five parts divided into the following chapters:

Part 1: General Information

- “**Chapter 1. Personal Communications Highlights**” on page 3, describes the functions of Personal Communications.
- “**Chapter 2. Problem Determination (PD)**” on page 7, describes where to find more information and how to report problems to IBM.
- “**Chapter 3. Subsystem Management Online Facility**” on page 19, describes how to display and control various SNA subsystem activities.
- “**Chapter 4. Printing**” on page 25, describes how to set up printers.
- “**Chapter 5. Transferring Files**” on page 33, describes how to transfer files between a host system and a workstation.
- “**Chapter 6. Configuration, Installation, and Distribution (CID)**” on page 49, describes the configuration, installation, and distribution methods of Personal Communications.
- “**Chapter 7. Configuring and Using SSL Security for Personal Communications**” on page 105, describes the support for Secure Sockets Layer (SSL) in Personal Communications.
- “**Chapter 8. Code Pages**” on page 119, describes the country codes, code pages and character sets supported by Personal Communications.

- **“Chapter 9. Keyboards” on page 161**, describes the keyboards supported by Personal Communications.
- **“Chapter 10. Migration” on page 181**, explains how to migrate to Personal Communications 4.2.

Part 2: Personal Communications/3270

- **“Chapter 12. Building a Printer Definition Table (PDT) for PC/3270” on page 195**, explains how to create and change the printer definition table (PDT) used for PC/3270.
- **“Chapter 13. File Transfer Commands for PC/3270” on page 217**, explains file transfer for PC/3270.
- **“Chapter 14. Considerations for PC/3270 Installation and Use” on page 237**, provides technical information, considerations, and restrictions for PC/3270.

Part 3: Personal Communications/400

- **“Chapter 15. Building PC400 Printer Definition Tables (PDTs)” on page 253**, explains how to create and change the printer definition table (PDT) used for PC400.
- **“Chapter 16. Field Attribute Codes” on page 293**, describes field attribute codes.
- **“Chapter 17. Data Transfer for PC400” on page 295**, explains file description files and data conversion for the PC400 data transfer facility.
- **“Chapter 18. File Transfer for PC400” on page 369**, explains file transfer for PC400.
- **“Chapter 19. Considerations for PC400 Installation and Use” on page 373**, provides technical information, considerations, and restrictions for PC400.

Part 4: Personal Communications/SNA

- **“Chapter 20. SNA Client/Server Concepts” on page 379**, explains SNA Client/Server concepts and networking communications protocols.
- **“Chapter 21. Introducing SNA over TCP/IP” on page 391**, describes the primary tasks involved with planning, configuring, and troubleshooting the IBM Anynet SNA over TCP/IP access node and gateway functions.
- **“Chapter 22. Introducing Sockets over SNA” on page 407**, describes the primary tasks involved with planning, configuring, and troubleshooting the IBM Anynet Sockets over SNA access node and gateway functions.

Part 5: Appendixes

- **“Appendix A. Messages” on page 417**, explains information Personal Communications displays in the message window.
- **“Appendix B. Deleting Unnecessary Files” on page 465**, explains how to delete unnecessary Personal Communications files.
- **“Appendix C. TCP62 for IBM Access Feature for OS/2 Warp” on page 469**, provides detailed information about TCP62 functionality.

This book also contains a glossary and an index.

Highlighting Conventions

This book uses the following highlighting conventions:

UPPERCASE

Uppercase type indicates OS/2 and host programs, commands, and options.

Bold Bold type indicates the names of window controls, such as lists, check boxes, entry fields, menu choices, and push buttons.

Italics Italics indicate:

- Special emphasis in text or a reference citation.
- Variables that you supply a value for.

Example type

Example type indicates information that the user is instructed to type at a command prompt or in a window.

Command Syntax Symbols

Parentheses, brackets, ellipses, and slashes have the following meanings or uses:

- () Parentheses enclose operands that govern the action of certain command options.
- [] Brackets indicate an optional command argument. If you do not use the optional item, the program selects a default.
- ... Ellipsis after an argument indicates that you can repeat the preceding item any number of times.
- / For 3270, a slash must precede the Time Sharing Option Extensions (TSO/E) password. A slash must also precede parameters of OS/2 commands entered from the command line. For 5250, a slash must precede parameters of IBM DOS commands entered from the command line.
- \ A backslash is included as part of any 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.

What's New in this Edition

Additional enhancements for Personal Communications Version 4.3 for OS/2 include:

- Support for Secure Sockets Layer (SSL).
- Support for Java programming using:
 - Javabeans
 - Host Access Class Library

Euro Sign

Code page tables have been changed to support the new euro sign.

Printer support for this currency sign depends on the printer and printer driver supporting it.

New code pages

Personal Communications Version 4.3 extends the additional support provided in service updates for Version 4.2, and now provides new or updated support for these code pages:

- 420 (Arabic)
- 424 (Israel)
- 838 (Thailand)
- 1047 (Latin 1 Open Systems)
- 1140 (Canada, Netherlands, Portugal, U. S.)

- 1141 (Austria, Germany)
- 1142 (Denmark, Norway)
- 1143 (Finland, Sweden)
- 1144 (Italy)
- 1145 (Latin America, Spain)
- 1146 (United Kingdom)
- 1147 (France)
- 1148 (International)
- 1149 (Iceland)
- 1153 (Latin 2)
- 1154 (Cyrillic)
- 1155 (Latin 5 —Turkey)
- 1160 (Thailand)
- Personal Communications now uses the IBM CDRA Tables (for SBCS versions only).

Part 1. General Information

Chapter 1. Personal Communications Highlights

Personal Communications provides the following:

- **System/390 Connections**

LAN LAN via IEEE 802.2
 LAN via NetWare** for SAA
 Telnet3270
 3270 via AS/400 (passthru)
 APPC3270 via LAN

COAX

 SNA Distributed Function Terminal
 Non-SNA Distributed Function Terminal
 Control Unit Terminal (CUT)
 3174 Peer Communication

COM port

 Hayes** AutoSync
 SNA-over-Async
 IBM Global Network Connection
 Advantis (IIN)
 Home3270

SDLC

 Synchronous Data Link Control
 3270 via AS/400 (passthru)
 APPC3270 via SDLC

5250 3270 via AS/400 (passthru) (twinax)

Advanced

 Advanced 3270 Connections
 Advanced APPC3270 Connections

- **AS/400 Connections**

LAN LAN via IEEE 802.2
 Telnet5250

SDLC

 Synchronous Data Link Control

5250 Twinaxial Data Link Control (APPC)
 Twinaxial Data Link Control (Console)

COM port

 SNA-over-Async
 SNA-over-Async (Console)

Hayes AutoSync

Advanced

Advanced 5250 Connections

- **System/3X Connections**

5250 Twinaxial Data Link Control (Console)

- **Installation and Configuration**

- Partial installation option
- Program sharing on a network server
- Configuration, installation, distribution (CID)
- Automatic detection of installed communication adapters
- Dynamic change of communication configurations
- Automatic Dial Facility (Async, SDLC, Home3270, SNA-A, Hayes AutoSync)

- **Migration**

- Migration from Communications Manager/2

- **Host Session Function**

- Up to 26 sessions
- Variable screen size and automatic font scaling
- Function settings (of the host code page, for example) for each session

- **Host Graphics Support**

- Built-in vector graphics support for the GDDM product and other graphics applications
- Programmable symbol set (PSS) support

- **File Transfer Function**

- Easy operation through graphical user interface (GUI) windows
- Batch transfer of multiple files
- Concurrent file transfer through multiple sessions
- Background file transfer
- File transfer invocation by macro
- OfficeVision/MVS Import/Export functions
- ALMCOPY utility provides high-speed file transfers and allows wildcard characters (VM only)

Highlights

- **Edit (Cut and Paste) Function**

By using the OS/2 Clipboard, a selected area can be edited as follows:

- Copy
- CopyAppend
- CopyLink
- Cut
- Paste
- Paste Next
- Paste Stop at Protected Line
- Paste to Trim Rectangle
- Support of spreadsheet data format

- **Graphical User Interface (GUI)**

- Customizable 3D iconic tool bar

- 3D button hotspots
- Pop-up keypad
- Macro function, including record and play
- Keyboard function setup and remapping
- Mouse button function setup and remapping
- Display setup (cursor type, graphics, sound, colors, for example)
- Automatic font size adjustment or fixed font size
- Window appearance setup
- Menu bar setup
- 3270 Light Pen emulation by using a mouse
- *Information Notebook*
- Online help
- **Print Function**
 - Printer session (for PC/3270: SCS, LU 3, or non-SNA)
 - Graphical local print
 - Printing with the OS/2 printer drivers
 - Print function by printer definition table (PDT) and printer definition file (PDF)
 - Multiple host print functions in multiple sessions
 - Print job control by SNA bracket timeout
 - PFT-to-PDT conversion tool
 - PC400 print function by OS/400 Host Print Transform (HPT)
 - PC400 printing supported by the AS/400 Advanced Print Support Utility
 - ZipPrint
- **Programming Interface**
 - 32-bit Advanced Program-to-Program Communication (APPC)
 - 32-bit Emulator High-Level Language Application Programming Interface (EHLLAPI)
 - Dynamic Data Exchange (DDE)
 - 32-bit LU Application (LUA)
 - Personal Communications API (PCSAPI)
 - REXX EHLLAPI
 - DOS box or WIN-OS/2 EHLLAPI
- **PC400 Client Function**
 - Shared folders
 - Data transfer
 - PC Organizer feature
 - Text Assist feature
 - Enhanced Programmable Terminal User Interface (ENPTUI)

Chapter 2. Problem Determination (PD)

Problem determination (PD) is the first stage in solving your problem.

Symptoms

Recognize the differences between what you expect to see and what you do see.

Environment

Recognize the environment in which the problem occurs:

- Personal Communications configuration
 - Personal Communications version and level
 - The name of the workstation profile
- Workstation configuration
 - The machine type and model, the system memory, the video adapter
 - The communication adapter you are using
 - Other adapters (especially communication adapters) installed
 - The printer type and model
 - Other auxiliary devices installed
- Software configuration
- OS/2 version and level
- Communication device-driver version and level
- Other communication programs (such as MPTS, Communications Server, NetWare) that are running and using resources
- Printer driver version and level
- Host configuration
 - The upstream host connection and configuration

Problem Type

Categorize your problem into one of the following types:

- **Installation Problem.** Note the error message and take the required action by consulting “Appendix A. Messages” on page 417 or refer to the *Message Reference*.
- **Configuration or Setup Problem.** If Personal Communications did not connect to the host (that is, if the host screen did not appear), verify that your hardware, software, and Personal Communications configurations are correctly set up for your host environment. To help you isolate what is wrong, look up any OIA messages in the online help, or any error messages in “Appendix A. Messages” on page 417 or in the online help. You might also need to ask your system administrator to verify that your Personal Communications setup values are correctly configured for your host system.
- **Operational Problem.** Although you were able to connect to the host, you might have difficulty completing some operations or using certain Personal Communications functions. Look up any OIA messages in the online help and any error messages in “Appendix A. Messages” on page 417, or refer to the *Message Reference* and study the help and *Quick Beginnings* to see how the operation should be performed.

Problem Area

You also need to identify where the problem is:

1. Installation and configuration
2. Printer
3. API
4. Other Personal Communications functional area

Problem Re-Creation

As the final step of the problem determination process, try to re-create the problem; the problem-re-creation procedure and the probability of the recurrence of the problem are key factors in isolating it. If the problem is intermittent, any factor that you think is related to it becomes important information.

Problem-Source Identification (PSI)

The second stage is to try to identify the real cause of the problem; this depends largely on the problem area:

- **Installation and Configuration.** Make sure that your personal computer hardware and software are configured correctly. You might also need to contact your system administrator to verify that your Personal Communications setup values are correct for your host system.
- **Printer.** Identify the operation you are having the problem with:
 - Local print
 - Host-directed print (LU 1)
 - Host-directed print (LU 2)
 - Host-directed print (LU 3)
 - Host-directed print (non-SNA)

Also identify which printer mode you are using:

- PDT mode: Personal Communications-proprietary printer-driver mode
- GPI mode: OS/2 printer-driver mode

Then check that you have installed the correct printer driver and make sure that you have configured the driver appropriately. If you are using PDT mode, check the content of your PDF file, especially if you have customized it. Depending on the problem you are having, you might need to run a link-line trace as described in the Administration Tools online help.

- **Other Personal Communications Functional Area.** Make sure that you can explain why you think that the source of the problem is in Personal Communications.

First Failure Support Technology (FFST/2)

FFST/2 is a software problem determination tool for OS/2 system software and applications. FFST/2 is designed to capture error data when the error occurs, provide immediate problem notification to predefined locations, and furnish a unique error code identification. Because FFST/2 remains inactive until a software error is detected, impact on system performance is minimal.

The services FFST/2 provides include:

- Pop-up messages
- A message log formatter
- Access to the OS/2 system error log
- A dump formatter
- A message console
- A command line interface for FFST/2 initialization and configuration

Accessing and Initializing FFST/2

FFST/2 is automatically installed with Personal Communications. To access FFST/2, select the **FFST/2** folder from the desktop. The FFST/2 folder opens and displays the following choices:

- Dump Formatter
- Message Console
- Message Log Formatter
- System Error Log
- Start FFST/2
- Stop FFST/2

Unless you modify the FFST/2 configuration, FFST/2 is automatically started at system startup. FFST/2 runs in the background.

If FFST/2 is not automatically started, select **Start FFST/2** or type:

EPW

at the OS/2 command prompt. Refer to *IBM Communications Server for OS/2 Warp Command Reference* for more information on the EPW command.

1.

These are windows that "pop up" on the screen to let you know when an error occurs. Many pop-up messages allow you to select **Help** to view help for the message.

2.

This is the message logging facility. Use this facility to find Personal Communications messages in the default FFST/2 message log (OS2MLOG.DAT).

When you receive a message, the first thing you should do is view the message in the message log formatter. Read the entire message and the message help and perform the actions indicated. If the message instructs you to look in the system error log or the FFST/2 dump formatter, note the time of the message and the problem ID to help you find the appropriate entries in the system error log and the dump formatter.

See "Using the FFST/2 Message Log" on page 10 for more information.

3.

The system error log is an OS/2 facility that contains information about the error and the environment in which the error occurred. The message log formatter often contains messages that describe how to extract information from the system error log. Be sure to check the message log formatter before checking the system error log.

4.

This is a customized dump facility that can contain detailed information about the error and the environment in which the error occurred. This facility is used to supply and format detailed information about alerts. FFST/2 supports an SNA generic alert and alert routing service that can route alerts to the host for attention.

5.

The message console is a window you can activate to view messages as they are logged. This service provides a similar function to the message log formatter; however, the message console only displays messages that were received while the console was active. Use the message log formatter for most problem determination and use the message console for configuring FFST/2.

6.

You can use the command line interface instead of or in addition to the window interface.

You can select **Stop FFST/2** to disable FFST/2; however, if an error occurs, FFST/2 might start automatically.

Using the FFST/2 Message Log

The FFST/2 message log is the record of messages that are logged by FFST/2. The default name of this log is OS2MLOG.DAT. Additional logs can be generated, such as, UPGRADE.LOG and VERIFY.LOG.

The FFST/2 message log is the focal point of Personal Communications and Access Feature problem determination. After viewing messages and information in this log, you can see related information in the system error log and dump formatter.

Viewing the Message Log: Select **Message Log Formatter** from the FFST/2 folder or type

MSGLOGF

at the OS/2 command line.

The Open window appears. The Open window shows, by default, the message log file that is specified during FFST/2 configuration.

- The easiest way to select a message log file to view is to double-click on one of the message log file names listed under **Files**. This list contains only files identified as FFST/2 message log files.
- If the desired message log file is in a directory other than the default, you need to select the appropriate directory to see the file.
- You can type any file name in the **File Name** entry field. The message log formatter ensures that the file is an FFST/2 message log file.

Select a message log file and select **Open**. The Message Log Formatter window appears.

See the *IBM Communications Server for OS/2 Warp Problem Determination Guide* for more information about formatting the message log, using the error log, using the FFST/2 dump formatter, using the FFST/2 message console, and using the FFST/2 command line reference.

Trace Services

The Trace Services tool, located in the Personal Communications Administration Tools folder, helps you determine the cause of problems. Trace Services records the sequence of events related to a communications application programming interface (API) and also records data related to a communications link. This record is referred to as a *trace*.

Traces can be activated or deactivated through the window-driven Trace program or through the CMTRACE command. Refer to the *IBM Communications Server for OS/2 Warp Command Reference* for more information on this command.

IBM Service Representatives or advanced users can analyze traces to identify and resolve communications problems. Application programmers can also use Trace Services to trace SNA events that occur in their programs.

Refer to *Application Programming Guide* for information on setting up traces to identify and resolve problems with application programs.

Before using Trace Services, note the following points:

- You should trace Sockets over SNA events only if directed to do so by an IBM Service Representative. Tracing significantly impacts the performance of Sockets over SNA.
- Any prior-release autotrace selections you might have saved in your configuration are lost when you upgrade to Personal Communications and Access Feature because in prior versions, Trace Services functions independently from your configuration.
- You can start traces before you activate a configuration. Once started, traces are active even after you close the Trace Services window or restart your workstation.
- When you are re-creating a communications problem to trace, stop and restart Personal Communications using the same configuration that was being used when communications problems occurred.
- Record the time and date Personal Communications is started so that error and message log entries associated with re-creation of this problem can be identified and isolated by time and date.
- Make sure that system activity is minimal when you use Trace Services. Traces can be slowed or otherwise affected by other active application programs.
- Select the trace choices before you re-create the problem. The choices are saved until you stop them.
- After traces are started, they are active until you select **Stop** or **Stop All** from the Trace Services window (even if you restart your computer).

Performing a Trace

You can start Trace Services from the Personal Communications Administration Tools folder.

You can use the Trace Services window to:

- Select which product to trace
- Select trace choices for that product
- Select a path and file name for the trace file
- Start selected traces
- View active traces
- View inactive traces
- Stop selected traces
- Stop all traces
- Save the trace buffer
- Clear the trace buffer

Use the following procedure to perform a trace.

- Select a trace choice.
Select items from the following trace categories:
 - APIs
 - DLCs
 - Events
- Select **Start** to start the selected traces.
See “Start” on page 12 for more information.
- Select **Stop All** to stop all the selected traces after you have re-created the problem.

See “Stop All” for more information.

- Type the trace file name (use the extension .trc).

Note: If you expect to have a very large amount of data, you should be sure the trace file will reside on a disk with sufficient available storage.

Supply a path and file name for your trace file or select **File** from the menu bar.

Select **Select filename...** to display the Filename Selection window.

From the Filename Selection window, you can select a drive, directory, and file name for your trace file. The values in the fields default to the current drive and directory.

- To change the drive, select the arrow to the right of **Drive** and select from the list of items.
- To change the directory, double-click on the directory you want in the **Directories** list.
- To select a file name, click on the file name you want in the **Files** list or type a file name in the **Filename** entry field.

When the file name you want is displayed in the **Filename** entry field, select **OK**.

The Trace Services window reappears.

- Select **Save** to save the trace data to the selected file name.

See “Save” for more information.

Start:

- **Start** is not active until you have selected an item in the **Trace selections** list.
- The selected traces are running in the background.
- You can toggle between viewing the active and inactive traces by selecting **Toggle view**.
- You can close or minimize the Trace Services window while you attempt to re-create the problem.
- If you want to start additional traces without affecting the traces you have already started, toggle to **Viewing inactive traces** and select the traces you want to start and select **Start**. The Trace Services window is refreshed with the active traces.
- You can view the status of traces by using the Trace Status Details window.

Stop All:

- If you want to stop some traces and leave other traces active, toggle to **Viewing active traces** and select the traces you want to stop and select **Stop**. The Trace Services window is refreshed with the remaining active traces.
- **Stop All** stops all traces, not just the selected traces.
- **Stop** and **Stop All** cannot be selected until you have started traces.
- **Stop** and **Stop All** stop traces started from the Trace Services window or from the command line.
- If you want to clear the trace buffer after stopping traces instead of saving the data to a file, select **File** from the menu bar and select **Clear trace buffer**.

Save:

- If you have not selected a trace file name, the Filename Selection window appears. Supply a trace file name and select **OK** to continue the save.
- You can save trace data without stopping trace selections. This allows you to retain your trace selections and continue tracing while you examine a portion of the trace data. No trace data is lost.

Viewing the Trace Status

From the Trace Services window menu bar, select **Options** and then select **Trace Status Details....**

The Trace Status Details window appears.

This window displays status information using the following fields:

RAS daemon

Indicates whether the problem determination background process is active or inactive.

Trace Indicates whether traces are active or inactive.

Wrap count

Indicates the number of times each trace buffer has been written to. For example, if you set the trace buffer size to 16 using the Trace Buffer Defaults window and **Wrap count** reads 1, all 16 trace buffers have been written to one time. As the trace continues, the data in the 16 trace buffers is overwritten.

Note: Unsaved trace data has been overwritten when **Wrap count** has a value of 1 or greater.

Segments allocated

Indicates how many segments have been allocated for the trace. The number appearing in this field matches the trace buffer size defined in the Trace Buffer Defaults window.

Current segment

Indicates which of the allocated segments the trace is currently writing to. For example, if 10 segments have been allocated and **Current segment** reads 5, the trace is currently writing to the 5th of 10 segments.

Offset into segment

Indicates what position within the segment the trace is writing data to. This field tells you how much data has been written to the current segment.

Trace notices

This field can contain messages concerning the status of traces.

If traces are stopped, you can reactivate them by selecting **Start** in the Trace Services window. The trace choices that were previously active will already be selected in the trace selections lists.

Formatting a Trace File

Read the following information before using the Format Trace window.

- You can use the Format Trace window to format an SNA trace file into an easier-to-use form. It formats trace records for some of the application programming interfaces (APIs): ACDI, APPC, LUA, APPC send events, and DLC data.

- The Format Trace window is based on the FMTTRACE command, which is invoked from the command line. For information on the FMTTRACE command, refer to the online *Command Reference*.
- Use caution if you are formatting trace files that were generated using a small trace record length (see “Changing Trace Buffer Defaults” on page 15 for more information). Formatted records might contain incorrect data when a trace record is longer than the trace record length, and important fields are truncated.

Use the following procedure to format a trace file.

1. Select **File** from the Trace Services menu bar and select **Format Trace file....**
The Format Trace window appears.

2. Select the parameters to format your trace file.

- **Trace input file** defaults to the path and file name you selected from the Filename Selection window.

You can type a different trace file name if you want.

- **Output file format**

You can produce two types of formatted output: a detail file (with 1 line per formatted field) and a summary file (in sequence diagram form with 1 line per trace event).

You can select one or both of the following options:

- Select **Detail** to produce a detail output file. This type of file has the extension DET. The default is not to produce a detail output file.
- Select **Summary** to produce a summary output file. This type of file has the extension SUM. The default is to produce a summary output file.

- **Output formatted event type selection**

You can select one or more of the following options:

- Select **API trace** to format the API data
- Select **line flow trace** to format the line flow data
- Select **uppercase hex** to use uppercase alphabetic characters in hexadecimal output, such as X'BC2F'
- Select **interleave raw trace** with detail trace to include the corresponding raw trace data for each formatted detail trace record in the detail file
- Select **Test RTS trace** to format the Test RTS trace.

- **Selection of trace records based on ID**

Most APPC verbs have associated transaction program (TP) and conversation IDs. DLC data has an associated local form session identifier (LSFID) in the transmission header (TH). Trace records can be included or excluded from formatting, based on their ID.

You can select one of the following options:

- Select **APPC API - TP ID** to format the APPC API trace records with a transaction program ID matching X'xxxxxxx'. (You supply the transaction program ID to search for.)
- Select **APPC API - conversation ID** to format the APPC API trace records with a conversation ID matching X'xxxxxxx'. (You supply the conversation ID to search for.)
- Select **DLC data - LSFID** to format the DLC data trace records with a send LSFID matching X'xxxxx'. (You supply the LSFID to search for.)

3. Select **Format Trace** after you have selected parameters to format the trace file.

Note: Select **Cancel** if you do not want to format a trace file and want to close the Format Trace window.

Changing Trace Buffer Defaults

Trace Services uses a buffer to store trace information. You can specify the size of this buffer from the Trace Buffer Defaults window.

Use the following procedure to change trace buffer defaults:

1. Select **Options** from the Trace Services menu bar and select **Trace buffer defaults....**

The Trace Buffer Defaults window appears.

2. Select the **Trace buffer size**.

If you require a storage size smaller than the default of 1024 KB, you can specify it from this window. Specify the storage size of the trace in multiples of 64 KB segments. You can specify up to a maximum of 16 segments, which is equivalent to 1024KB of storage.

3. Select the **Trace record length**.

You can change the record length from the default maximum of 512. See “Formatting a Trace File” on page 13 for possible consequences of changing this default.

4. Select **Change** after you have modified the trace buffer defaults to activate your changes.

Note: Select **Cancel** if you do not want to change the trace buffer defaults and want to close the Trace Buffer Defaults window.

SDLC and LAN Trace Selections

LAN Connection Traces

Common trace events for 3270, APPC3270, and 5250 emulation using a LAN connection are as follows:

APIs	DLCs	Events
	IBMTRNET	APPC_CCB APPC_INT APPC_LOCAL_PATH APPC_PROCESS APPC_SNDRCV APPC_XID SERVICES_INT

SDLC Connection Traces

Common trace events for 3270, APPC3270, and 5250 emulation using an SDLC connection, including SNA over Async and Hayes Autosync, are as follows:

APIs	DLCs	Events
SNAPHONE CXM CMI SNAPHONE CXM GCCI SNAPHONE XXX GCCI SNAPHONE XXX SCPI	SDLC	APPC_CCB APPC_INT APPC_LOCAL_PATH APPC_PROCESS APPC_SNDRCV APPC_XID SERVICES_INT SNAPHONE CXM MODULE SNAPHONE CXM QUEUE SNAPHONE CXM RETURN CODE SNAPHONE XXX DIALOG SNAPHONE XXX EVENT
Note: XXX denotes the Port Connection Managment name. The SNAPHONE traces should only be used if you are experiencing difficulty with the physical connection.		

The SDLC protocol driver used by Personal Communications uses the OS/2 System Trace Facility, which is a facility used for tracing device drivers. TRACEBUF=63 must be added into the user's CONFIG.SYS file and the system must be restarted. To start the trace, type

TRACEDLC

To stop the traces, type

TRACE OFF

To view the traces, type

TRACEFMT

This will launch the trace facility.

The traces can be saved as formatted or unformatted files. If sending traces to IBM, send unformatted traces. If you would like to look at the traces, save them as formatted. You can then format the SDLC records by typing

DLCTFM filename.ext > filename.tfm

For other DLCTFM parameters, type

DLCTFM ?

Trace Selections for Emulator Type

3270

Traces that should be selected for 3270 emulation using a LAN or SDLC connection include:

APIs	DLCs	Events
LUA_RUI		PCOMM ruitrace

APPC3270

Traces that should be selected for APPC3270 emulation using a LAN or SDLC connection include:

APIs	DLCs	Events
APPC		PCOMM ap32trace

5250

Traces that should be selected for 5250 emulation using a LAN or SDLC connection include:

APIs	DLCs	Events
APPC		PCOMM ctacstrace

Additional Connectivity Trace Selections

Trace selections for Attachments that do not require the use of the Access Feature SNA subsystem include:

Events	Connectivity Type
PCOMM aeatrace	COM port - Home 3270
PCOMM hpotrace	COM port - IBM Global Network
PCOMM asynctrace	COM port - Advantis (IIN)
PCOMM cuttrace	COAX - Control Unit Terminal
PCOMM dfttrace	COAX - non-SNA Distributed Function Terminal
PCOMM snadfttrace	COAX - SNA Distributed Function Terminal
PCOMM nwaretrace	Netware SAA - client LAN Telnet 3270 / LAN Telnet 5250
PCOMM telnettrace	COM port - SNA-over-Async (Console)
PCOMM adlctrace	5250 - Twinaxial Data Link Control (Console)
PCOMM cut52trace	

For traces for other advanced connectivities, such as X.25, see the *IBM Communications Server Problem Determination Guide*.

CMPD

CMPD is a utility that executes diagnostic commands to determine the state of Personal Communications and other products. It also automatically collects certain files that can be used for problem determination. Once collected, CMPD compresses these files to save space. You can send these files to your local support personnel or to IBM Service to aid in problem determination.

Note: Issue the CMPD command immediately after a problem occurs. Performing other actions may effect the quality of the trace.

To collect problem determination information in the compressed file *pmr_number*, use the following command statement:

CMPD *pmr_number*

The full command, if all parameters are used, would be as follows:

```
>> [drive] [path] CMPD pmr_number [msg_number] [ffstdrive] >
> [lapsdrive] <<
```

Command Line Parameters

drive The drive where the CMPD.CMD file resides. Specify a drive only if it is not the drive you are currently using.

lapsdrive

The drive where the LAPS is installed. Specify a drive only if it is not the drive where Personal Communications is installed.

path The path where the CMPD.CMD file resides. Use this parameter only if the file is not in the path you are currently using.

pmr_number

Specifies an 8-character string used to name output files. If you have already contacted IBM, you might have been assigned a pmr number. If so, use that number; otherwise, you can use any 8-character string.

msg_number

Specifies a message number from Personal Communications to wait for before gathering diagnostic information.

ffstdrive

Specifies the drive where FFST/2 logs are stored. Specify a drive only if it is not C:.

Refer to *Communications Server for OS/2 Command Reference* for more information.

Problem Reporting (PR)

If your problem persists and you think that the source is in Personal Communications, see "Contacting IBM" on page 192 for information on how to report the problem to IBM.

Chapter 3. Subsystem Management Online Facility

Subsystem Management Online Facility

Using Subsystem Management

To start Subsystem Management, select the **Administration Tools** folder and select **Subsystem Management** or type ACSSBMGT at a command prompt and press Enter.

To use a Subsystem Management function, select a service from the displayed list and choose an option from the menu bar. A dimmed option or service might not be available because of the keylock status or because a subsystem component has not been started.

If a subsystem component (such as APPC, X.25, or the Access Feature kernel) returns an unexpected error code to subsystem management, or if that subsystem is inactive, the system displays the following message:

```
CSM0001 Subsystem Management cannot perform the requested APPC function at  
this time, or the function is not available.
```

For more information on this message, select **HELP** on the message window or refer to the FFST/2 message log.

The following sections describe the Communications Subsystem Management tasks you can perform when the keylock function is unlocked.

Controlling the APPC Attach Manager

When the APPC attach manager is active, it processes incoming allocation requests to execute transaction programs. You can control whether transaction programs are started by request from other machines by controlling the APPC attach manager.

To start or stop the APPC attach manager from the Subsystem Management window, select **APPC Attach manager** from the list and select **Start** or **Stop** from the Service menu.

Starting or Stopping the Access Feature Kernel

The Access Feature kernel allocates and tracks Access Feature resources. It also allows user-written applications to start Access Feature services.

To start or stop the Access Feature kernel from the Subsystem Management window, select **Communications Manager kernel** from the list and select **Start** or **Stop** from the Service menu.

Using SNA Subsystem Management

SNA subsystem management allows you to do the following things:

- Display and deactivate transaction programs
- Display and control LU 6.2 sessions
- Display non-LU 6.2 sessions
- Display gateway sessions

- Display and control logical links
- Display and control data link controls
- Display the signed-on users
- Display incoming call answer status
- Display physical units (PUs)

To use SNA Subsystem Management from the Subsystem Management window, select **Details** from the menu bar and then select **SNA Subsystem** from the associated menu.

To start or stop SNA Subsystem Management from the Communications Subsystem Management window, select **SNA Subsystem** from the list and select **Start** or **Stop** from the Service menu.

The following sections describe components of SNA Subsystem Management

Displaying or Deactivating Transaction Programs

The Transaction program function allows you to display and deactivate active transaction programs. To access the Transaction Programs functions from the SNA Subsystem Management window, select **Details** from the menu bar and then select **Transaction programs** from the SNA Subsystems list. The Transaction Programs window appears. This window lists the names and IDs of each active transaction program.

Displaying Details about a Transaction Program: When you select **Details...** from the Program menu, the Transaction Program Details window appears.

Deactivating a Transaction Program: To deactivate a transaction program from the Transaction Programs window, select a transaction program from the list and select **Deactivate** from the Program menu. An error message appears telling you if the transaction program was not successfully deactivated.

To deactivate a transaction program from the Transaction Program Details window, select a transaction program from the list and select **Deactivate** from the Program menu. An error message appears telling you if the transaction program was not successfully deactivated.

Controlling LU 6.2 Sessions

When you select **LU 6.2** from the SNA Subsystem menu, the LU 6.2 window appears. The LU 6.2 Sessions window displays the local LU alias, partner LU alias, partner LU, and mode name and number of sessions. Multiple sessions for a single mode local LU and partner LU are compressed into one line.

Displaying Details on an LU 6.2 Session: To display detailed information about an LU 6.2 session, select **Details...** from the Session menu. The LU 6.2 Sessions Details window appears and displays the following details about the session:

- Local LU alias
- Local LU network name
- Partner LU alias
- Partner LU network name
- Mode name designating network properties for the session
- Mode session limit
- Number of sessions
- Session ID

- Logical link name
- Transaction program conversation ID
- Transaction program name

Establishing LU 6.2 Sessions: To establish an LU 6.2 session from the LU 6.2 Sessions window, select **Establish...** from the Establish menu bar. The Establish LU 6.2 Session window appears.

Changing LU 6.2 Session Limits: To change APPC session limits, select **Change Limits...** from the Session menu. The Change APPC Session Limits window appears. You can use the entry fields on this window to change the number of sessions for the local LU and partner LU, the number of sessions for which the source LU is guaranteed to be the contention winner, and the number of automatically activated sessions.

Deactivating Sessions: To deactivate a session from the LU 6.2 Session window, select a session from the list and select **Deactivate** from the Session menu. Select **Deactivate all** from the Session menu to deactivate all sessions in the list.

Note: CP-CP sessions are not included in the list.

Displaying Non-LU 6.2 Sessions

To display information about LU 1, 2, and 3 and LUA 0, 1, 2, and 3 type sessions from the Subsystem Management window, select **Non-LU 6.2 Sessions** from the SNA Subsystem menu. The Non-LU 6.2 Sessions window appears. This window displays the session ID, the name of the logical link, and the DLC type for each active session.

To display Non-LU 6.2 Session Details, select a session from the list and **Details...** from the Session menu. The Non-LU 6.2 Session Details window appears.

To deactivate LUA sessions, use CMSESS.

Displaying or Deactivating Logical Links

Logical Links Services allow you to:

- Display link status
- Activate links
- Deactivate links
- Display adapters with links

For example, suppose that a connection to a specific workstation is not operating as expected. You can display the current status of the link between the two workstations using Logical Links Services. If an active link is affecting your program, you can deactivate the link.

To display a logical link from the Subsystem Management window, select **Logical Links** from the SNA Subsystem menu. The logical link display by link name, but it can also be sorted by adjacent partner name or destination address. The Logical Links window appears.

Displaying Logical Link Details: To display detailed information about a link from the Logical Links window, select a link from the list and select **Details...** from the Link menu. The Logical Link Details window appears.

Displaying ISDN Link Details: If the logical link is using ISDN communication facilities, the **ISDN Details...** push button appears on the window. Selecting this push button displays the ISDN Link Details window.

Displaying Additional ISDN Link Details: Selecting the **Details...** push button of the ISDN Link Details window causes the ISDN Link Details, part 2 window to appear.

Activating or Deactivating a Logical Link: To activate a logical link from the Logical Links window, select a logical link from the list and select **Activate** from the Link menu. The logical link status is updated to reflect the change. You cannot activate a backup link.

To deactivate a logical link from the Logical Links window, select a logical link from the list and select **Deactivate abnormal** (immediate stop) or **Deactivate normal** (normal stop) from the Link menu. The logical link status is updated on the Logical Links window.

You can make a link *nonactivatable* by using the command line interface CMLINKS na linkname. If the link cannot be activated an enable command (CMLINKS e linkname) is issued. When the link is nonactivatable, local requests result in state check with a secondary return code of 000002B6, and remote activations result in a CV22 with sense code 081F0002.

HPR Connections

The HPR Connections component of Subsystem Management allows you to display or deactivate HPR connections.

To display the HPR connection information from the Subsystem Management window, select **HPR Connections** from the SNA Subsystem menu. The HPR Connections window appears.

The HPR Connections window displays the following:

- Details...
- Statistics...
- Switch
- Switch all
- Deactivate
- Deactivate all

Displaying HPR Connections Details: To display detailed information about a connection from the HPR Connections window, select a connection from the list and select **Details...** from the Connections menu. The HPR Connections Details window appears. This window displays the HPR connections within the SNA subsystem.

Deactivating an HPR Connection: To deactivate an HPR connection from the HPR Connections window, select a connection from the list and select **Deactivate all** (immediate stop) or **Deactivate** (normal stop) from the Connections menu. The connection status is updated on the HPR Connections window. Selecting Deactivate only deactivates the HPR connection that was selected.

HPR Connections Statistics: To display HPR RTP Performance Statistics about a connection from the HPR Connections window, select a connection from the list

and select **Details...** from the Connections menu. The HPR Connections Details window appears. This window displays HPR RTP Performance data.

HPR Switch Options: To switch an HPR connection from the HPR Connections window, select a connection from the list and select **Switch all** (immediate stop) or **Switch** (normal stop) from the Connections menu. The connection status is updated on the HPR Connections window.

For more information about these items, see the online help text.

Data Link Controls

The Data Link Control component of subsystem management allows you to display, activate, or deactivate a data link control.

Displaying Data Link Control Details: To display the data link control information from the Subsystem Management window, select **Data Link Controls** from the list and select **Details...** from the Service menu. The Data Link Controls window appears. This window displays the DLCs within the SNA subsystem.

Activating or Deactivating a Data Link Control: The Data Link Controls window allows you to activate or deactivate a DLC to trace problems with data link controls. For example, suppose you are having a problem with a program and you are not sure which session is causing the problem. You can deactivate the DLC for a specific adapter and bring down all sessions on that DLC.

To activate or deactivate a DLC, select a DLC name from the list and select **Activate** or **Deactivate**, as appropriate, from the DLC menu. The **Status** field changes to reflect the condition of the DLC.

Displaying the Signed-On Users for an LU

To display the signed-on users for an LU from the Subsystem Management window, select **Signed-On Users** from the SNA Subsystem menu. The Signed-On User List window appears. This window lists the LU alias names that have signed-on users and the number of users signed onto the LU. Select an LU alias from the list and select **Details...** from the Alias menu. The Signed-On User List Details window appears. This window lists the signed-on users for the selected LU.

Physical Units

To display information about physical units from the Subsystem Management window, select **Physical units** from the SNA Subsystem menu. The Physical Units window appears.

To display detailed information about a physical unit, select a physical unit and select **Details...** from the Physical Units menu. The Logical Unit Information window appears.

Incoming Call Answer Status

To display information about incoming call answer status from the Subsystem Management window, select **Incoming call answer status** from the SNA Subsystem menu. The Incoming Call Answer Status window appears.

Changing the Status of an Incoming Call Directory Entry: To change the status of an incoming call directory entry, select the name of the entry, then select **Calls** from the Incoming Call Answer Status menu bar. You can select either **Answer** or **Reject** to change the status of the entry dependent on what the current status is for the selected entry.

Using X.25 Services

X.25 subsystem management allows you to:

- Connect, autoconnect, or disconnect X.25 physical links
- Display X.25 physical links

Controlling X.25 Physical Links

The X.25 Physical Links function allows you to:

- Display X.25 physical link status
- Place an X.25 physical link in connect mode
- Place an X.25 physical link in auto-connect mode
- Place an X.25 physical link in disconnect mode

Displaying X.25 Physical Links

To display the status of the X.25 physical links from the Subsystem Management window, select **X.25 Physical Links** from the list and **Details...** from the Service menu. The X.25 Physical Links window appears. This window displays all the X.25 physical links.

Connecting, Autoconnecting, or Disconnecting a Physical Link

To connect, autoconnect, or disconnect a physical link from the X.25 Physical Links window, select the link name from the list and select **Connect**, **Autoconnect**, or **Disconnect**, as appropriate, from the Link menu. The **Link Status** and **Link Mode** fields are updated to reflect the change.

Controlling SNA X.25 Virtual Circuits

The SNA X.25 Virtual Circuit function allows you to:

- Display SNA X.25 virtual circuits
- Deactivate SNA X.25 virtual circuits

Displaying SNA X.25 Virtual Circuits: To display the SNA X.25 virtual circuits from the Subsystem Management window, select **SNA X.25 Virtual Circuits** from the list and **Details...** from the Service menu. The SNA X.25 Virtual Circuits window appears.

Deactivating a Virtual Circuit: To deactivate a virtual circuit from the SNA X.25 Virtual Circuits window, select a virtual circuit from the list and select **Deactivate** from the Circuit menu.

Chapter 4. Printing

You can use Personal Communications to print from display or printer sessions.

From display sessions, you can print all (**Print Screen**) or part (**Trim Print**) of the screen of your session window on a workstation printer.

From printer sessions, you can direct printing from an S/390, AS/400, or S/3X system to a workstation printer.

Configure a printer session to designate a workstation printer as a system printer that will use either the printer definition tables (PDTs) provided with Personal Communications or the OS/2 printer drivers.

- Use PDT files for Personal Communications to print files based on printer control information, such as control codes and the printer output format, defined in the PDT.
- Use OS/2 printer drivers for Personal Communications to print files based on printer setup parameters, such as scaling, duplex options, and page orientation, that you define in **Printer Setup**.

When you configure a printer session, refer to the online help for detailed information for each parameter.

From a PC/3270 session, you can also use the ZipPrint utility provided in the Productivity Tools folder to print PROFS or OfficeVision (OV) notes, calendars, documents, CMS files, XEDIT workspaces, and host session screens. See the online help for more information. For considerations and restrictions on printing, refer to "Chapter 19. Considerations for PC400 Installation and Use" on page 373 . The Information notebook also describes configuring for printing.

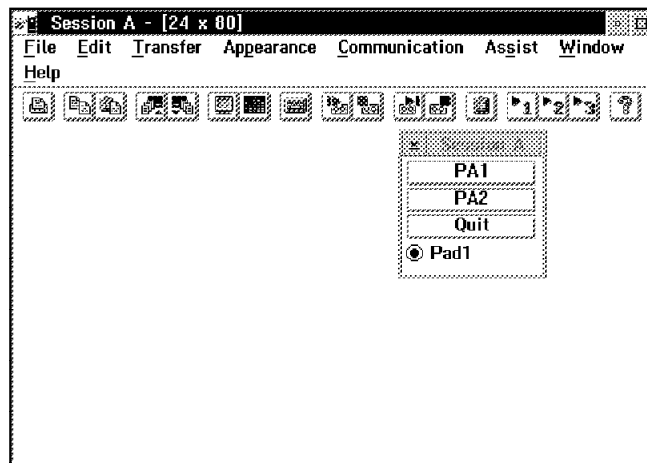
Printing from Printer Sessions

Personal Communications lets you direct printouts from both AS/400 and S/390 hosts to your workstation. When you use a printer session, your workstation printer becomes a system printer.

To use a printer session, configure your workstation for a printer session. Refer to the online help for more information when configuring the printer session.

The pop-up keypad on the PC/3270 printer session screen mimics the operation of the printer operation panel. Make all settings from the Use the printer session

pop-ups rather than the workstation printer operation panel.



The window for status on the PC400 printer session screen mimics the operation of the system printer operation panel, which displays the status of the printer session and can be used to start, stop, or cancel the current job. Use the Printer Session Status dialog box rather than the workstation printer operation panel.

Printing from Display Sessions

When display sessions are used, the entire contents of the session window (**Print Screen**) or only part of the session window (**Trim Print**) can be printed.

To print only part of the session window, drag the mouse to create a trimming rectangle around the part of the dialog box you want to print and then select **Print Screen** from the File pull-down menu.

PC/3270 Printer Functions

Printing

Printing Attribute Bytes

You need to change your workstation profile to specify how attribute bytes should be printed with LU 3 and Print Screen. For example, to prevent a space character from being inserted between two fields when the second character has a reverse attribute, add one of the following parameters to the printers keyword in your profile:

```
[printers]
FAPosDraw=NONE
or
FAPosDraw=HERE
or
FAPosDraw=PREV
```

Where:

NONE

Prints a space character using the default attribute. This is the default.

HERE

Prints a space character using the attribute that is specified by the attribute byte.

PREV

Prints a space character using the attribute that was used for the field immediately before the attribute character.

For example: if you have the following series of field attributes and the default attribute for the first string is "ABC":

"ABC"+Attribute Byte(Underline)+"DEF"+Attribute Byte(Underline)+"GHI"

The print output varies, depending on the setting of FAPosDraw, as follows:

FAPosDraw=NONE

ABC DEF GHI

FAPosDraw=HERE

ABC DEF GHI

FAPosDraw=PREV

ABC DEF GHI

Note: Add the **printers** keyword if it does not exist in your workstation profile.

Printing the Underline Attribute

The underline attribute cannot be printed with some fonts because of a system restriction. If you are not using PDT mode, select another font and then try printing again.

To select another font, complete these steps:

1. Select **File** from the menu bar and then select **Printer Control** and **Text**.
2. Select a generic font; that is, one not shown in brackets ([]) from the Font list and then select **OK**.

Printing the Reverse Attribute

The reverse attribute cannot be printed with some fonts because of a system restriction. To solve this problem, add the following line to the workstation profile:

```
[printers]  
REVERSE=N
```

After you make this change, all reversed characters print as normal characters.

Note: Add the **printers** keyword if it does not exist in your workstation profile.

Scalable APL Font Support on Printers

When APL characters are printed, Personal Communications uses the APL fonts provided for *displays* because special APL characters are not provided for printer devices. Normally, display devices have lower resolution than printers. Therefore, in some cases, and especially when using page printers with high resolution, APL characters print rather small.

To print larger APL characters, install a scalable APL font. To do so, complete these steps:

1. Open the OS/2 System folder.
2. Open the System Setup folder.
3. Start the Font Palette.

4. Select **Edit font...**
5. Select **Add...**
6. Insert the Personal Communications media that contains APL2.AFM and APL2.PFB into the drive, then select **Add...**
7. Select **APL2.AFM** in the Font files list box and then select **Add**.

Note: If you are using network printers, install the scalable APL font on the print servers.

Setting Up the Printer

Select **File** from the menu bar and then select **Printer Setup** to change the printer to be used for both display and printer sessions and to set specific information (forms orientation, resolution, and so on) for each printer driver.

Select **File** from the menu bar and then select **Print Screen** to print the contents of the display session.

Personal Communications can perform printing functions with the OS/2 printer drivers or with the printer definition table (PDT) files provided by Personal Communications.

Printer Definition Table (PDT) Files

Printer Definition Table (PDT) files define the transfer of characters and control codes to a printer, as well as the printer output format. If a PDT file is selected, the OS/2 printer driver does not generate any data for the output. Instead, Personal Communications generates print output based on printer control information defined in the PDT file.

Printer driver setup for using a PDT file

When you use a PDT file, you might not get the expected printout if the printer driver you selected uses the data translation function for base printing. In this case, select the **IBMNULL** driver in the printer object setting.

If the **Use PDT** option is used, the PDT file to be used at printing can be selected.

The PDT files provided by Personal Communications and the corresponding printers are listed in the following table:

PDT Name (Personal Communications)	Printer Name/Model
IBM3812.PDF	IBM 3812 Page Printer Model 2
IBM3816.PDF	IBM 3816 Page Printer II
PRN3812.PDF	IBM 3812 Page Printer Model 2 IBM 3816 Page Printer II
IBM38521.PDF	IBM 3852 Color Printer
PRN38521.PDF	IBM 3852 Color Printer
IBM38522.PDF	IBM 3852 Color Jetprinter Model 2
PRN38522.PDF	IBM 3852 Color Jetprinter Model 2

PDT Name (Personal Communications)	Printer Name/Model
IBM4019.PDF	IBM 4019 LaserPrinter IBM 4019 LaserPrinter E IBM 4029 Laser Printer
PRN4019.PDF	IBM 4019 LaserPrinter IBM 4019 LaserPrinter E IBM 4029 Laser Printer
IBM4072.PDF	IBM 4072 ExecJet Printer
PRN4072.PDF	IBM 4072 ExecJet Printer
IBM4201.PDF	IBM 4201 Proprinter IBM 4201 Proprinter II IBM 4201 Proprinter III, Model 3 IBM 2380 Personal Printer Series 2
IBM4202.PDF	IBM 4202 Proprinter XL Model 1 IBM 4202 Proprinter XL Model 2 IBM 4202 Proprinter III XL Model 2 IBM 4202 Proprinter III XL Model 3 IBM 4216 Personal Pageprinter IBM 2381 Personal Printer Series 2
PRN4202.PDF	IBM 4201 Proprinter IBM 4201 Proprinter II IBM 4201 Proprinter III Model 3 IBM 4202 Proprinter XL Model 1 IBM 4202 Proprinter XL Model 2 IBM 4202 Proprinter III XL Model 2 IBM 4202 Proprinter III XL Model 3 IBM 4207 Proprinter X24 IBM 4207 Proprinter X24E IBM 4208 Proprinter XL24 IBM 4208 Proprinter XL24E IBM 4216 Personal Pageprinter IBM 2380, 2381, 2390, 2391 printers
IBM4207.PDF	IBM 4207 Proprinter X24 IBM 4207 Proprinter X24E IBM 2390 Personal Printer Series 2
IBM4208.PDF	IBM 4208 Proprinter XL24 IBM 4208 Proprinter XL24E IBM 2391 Personal Printer Series 2
IBM5152.PDF	IBM 5152 Graphics Printer Model 2
PRN5152.PDF	IBM 5152 Graphics Printer Model 2
IBM5201.PDF	IBM 5201 Quietwriter Printer Model 1 IBM 5201 Quietwriter Printer Model 2
IBM5202.PDF	IBM 5202 Quietwriter III IBM 5204 Quietwriter Printer
PRN5202.PDF	IBM 5201 Quietwriter Printer Model 1 IBM 5201 Quietwriter Printer Model 2 IBM 5202 Quietwriter III IBM 5204 Quietwriter Printer
IBM5216.PDF	IBM 5216 Wheelprinter
PRN5216.PDF	IBM 5216 Wheelprinter
IBM5223.PDF	IBM 5223 Wheelprinter E
PRN5223.PDF	IBM 5223 Wheelprinter E

PDT Name (Personal Communications)	Printer Name/Model
HPLJII.PDF	HP LaserJet II HP LaserJet IID HP LaserJet IIP
ACTLZR2.PDF	Epson Action Laser2 LQ2500 mode
BJ300.PDF	Canon BJ300 CAPSL mode
LBP4.PDF	Canon LBP4 ISO mode
LQ870.PDF	Epson LQ870/1170

The PDT files provided by PC400 and the corresponding printers are listed in the table below:

PDT Name (PC400)	Printer Name/Model
IBM3812.PDT	IBM 3812 Page Printer Model 2
IBM3816.PDT	IBM 3816 Page Printer II
IBM4019.PDT	IBM 4019 LaserPrinter IBM 4019 LaserPrinter E IBM 4029 LaserPrinter
IBM4070.PDT	IBM 4070 IJ
IBM4070E.PDT	IBM 4070 IJ - Epson Mode
IBM4212.PDT	IBM 4212 Pro Printer 24P
IBM4072.PDT	IBM 4072 ExecJet Printer
IBM4201.PDT	IBM 4201 Proprinter IBM 4201 Proprinter II IBM 4201 Proprinter III Model 3 IBM 2380 Personal Printer Series 2
IBM4202.PDT	IBM 4202 Proprinter XL Model 1 IBM 4202 Proprinter XL Model 2 IBM 4202 Proprinter III XL Model 3 IBM 4216 Personal Pageprinter IBM 2381 Personal Printer Series
IBM4207.PDT	IBM 4207 Proprinter XL24 IBM 4207 Proprinter XL24E IBM 2390 Personal Printer Series 2
IBM4208.PDT	IBM 4208 Proprinter X24 IBM 4208 Proprinter X24E IBM 2391 Personal Printer Series 2
IBM4226.PDT	IBM 4226-302 Printer
IBM5152.PDT	IBM 5152 Graphics Printer Model 2
IBM5182.PDT	IBM 5182 Color Printer
IBM5201.PDT	IBM 5201 Quietwriter Printer Model 1 IBM 5201 Quietwriter Printer Model 2
IBM5202.PDT	IBM 5202 Quietwriter III IBM 5204 Quietwriter Printer
IBM5216.PDT	IBM 5216 Wheelprinter
IBM5223.PDT	IBM 5223 Wheelprinter E
IBM38521.PDT	IBM 3852 Color Printer
IBM38522.PDT	IBM 3852 Color Jetprinter Model 2
ACTLZR2.PDT	Epson Action Laser2 LQ2500 mode

CPQPM20.PDT	Compaq** PageMarq 15 - HP Mode Compaq PageMarq 20 - HP Mode
EAP2250.PDT	Epson AP2250
EAP3250.PDT	Epson AP3250
EAP5500.PDT	Epson AP5000 Epson AP5500
EFX850.PDT	Epson FX850
EFX1170.PDT	Epson FX1170
EFX5000.PDT	Epson DFX5000 Epson DFX8000
ELQ510.PDT	Epson LQ510
ELQ860.PDT	Epson LQ860
ELX810.PDT	Epson LX810
ELQ1070.PDT	Epson LQ570 Epson LQ1070
ELQ2550.PDT	Epson LQ2550
EPLPCL4.PDT	Epson EPL7000 - HP Mode
EPLPCL5.PDT	Epson EPL8000 - HP Mode
ESQ1170.PDT	Epson SQ1170
LQ870.PDT	Epson LQ870/1170
HPLJII.PDT	HP LaserJet Series II** HP LaserJet Series II D HP LaserJet Series II P
HPLJIII.PDT	HP LaserJet Series III HP LaserJet Series IIIP HP LaserJet Series IIISi
HPLJIIID.PDT	HP LaserJet Series IIID IBM 4039 LaserPrinter - HP Mode
HPLJ4.PDT	HP LaserJet 4
HPDJ550C.PDT	HP Desk Jet 550C
HPDSKJT.PDT	HP Desk Jet 500
BJ300.PDT	CANON BJ300 CAPSL mode
LBP4.PDT	CANON LBP4 ISO mode
NEC6300.PDT	NEC P6200 Pinwriter NEC P6300 Pinwriter
PANLBP4.PDT	Panasonic** KX-P4410 - HP Mode Panasonic KX-P4420 - HP Mode Panasonic KX-P4450i - HP Mode
PANLBP5.PDT	Panasonic KX-P4430 - HP Mode Panasonic KX-P4451 - HP Mode
PAN1123.PDT	Panasonic KX-P1123 - Epson Mode
PAN1124.PDT	Panasonic KX-P1124 - Epson Mode Panasonic KX-P1624 - Epson Mode
PAN1180.PDT	Panasonic KX-P1180 - Epson Mode Panasonic KX-P1180i - Epson Mode Panasonic KX-P1191 - Epson Mode
PAN1695.PDT	Panasonic KX-P1695 - Epson Mode
PAN2123.PDT	Panasonic KX-P2123 - Epson Mode
PAN2124.PDT	Panasonic KX-P2124 - Epson Mode
PAN2180.PDT	Panasonic KX-P2180 - Epson Mode

PAN2624.PDT	Panasonic KX-P1124i - Epson Mode Panasonic KX-P1654 - Epson Mode Panasonic KX-P2624 - Epson Mode
-------------	--

When the PDT files for the printer being used do not exist, you can create your own PDT files. To create PDT files, create printer definition files (PDFs) and then convert them into PDT files.

PDFs are saved to the **PDFPDT** subdirectory in the **PCOMOS2** directory.

For an explanation of how to create PDFs, refer to the *Information Notebook*.

Using the PFT Migration Utility

You can migrate a PC/Support 400 PFT to a PDF by using this utility. For details on the PFT Migration Utility, refer to "PFT Migration Utility" on page 259 .

Chapter 5. Transferring Files

Personal Communications File Transfer enables one or more files to be transferred between a host system and workstation at the same time.

For Personal Communications, transfer types and translation tables can be defined in advance to facilitate user processing.

PC400 Information

Before files are sent or received, *Personal Communications Tools* (PC400 Program Package with quarter-inch tape, part number 85G8665) must be installed on the host system.

File Transfer, described in this chapter, is quite different from the PC400 function, *Data Transfer*, described in “Chapter 17. Data Transfer for PC400” on page 295 . The main differences are listed here:

Type of Transfer	Products required on an AS/400 system	Access Method	Sending and receiving unit	Type of connection to an AS/400 system
File Transfer	Personal Communications Tools (APVAFILE)	Transfer menu in session window	Entire file	Display session
Data Transfer	PC Support/400 V2R2 or V2R3 or OS/400 V3R1 or later(1)	Data Transfer icon	Field, record, or file in a database	Router session

Note 1: OS/400 provides the host transaction program for Data Transfer.

Sending Files to the Host System

For PC400, when a file is transferred from a workstation to the host system, the specified file or member is automatically created if its name cannot be found in the host system.

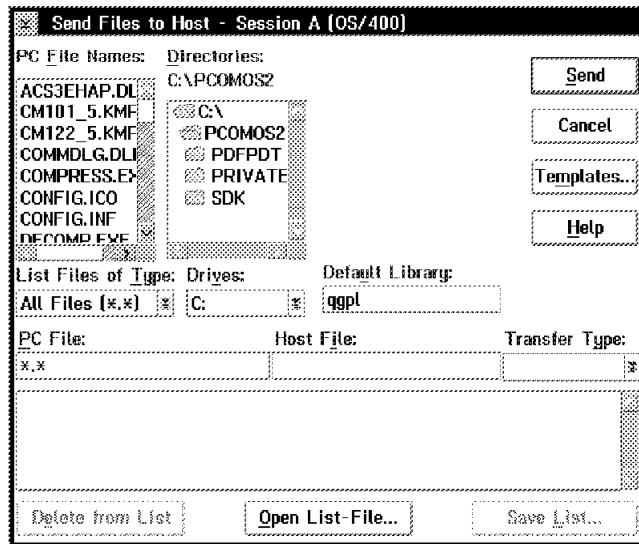
At this time, the default parameters for the **CL**command executed in the host system are used as the attributes for this file or member. Therefore, preparing a file on the host system in advance is recommended for storing attributes.

For details of the parameters used as the file attributes specified with the **CL** command, see *AS/400 Programming: Control Language (CL) Reference Guide Version 2*.

To send a file from a workstation to the host system, complete these steps:

1. Sign on to the host system.
2. Select **Transfer** from the menu bar of the session window.
3. Select the host system you use in the Transfer pull-down menu.
4. Select **Send File To Host** or the **Send** button on the tool bar.

The Send File To Host window appears.



Using List File

Select **Open List-File**; then select the list to be used for transfer. (For details of how to create list files, see 36 .)

5. Specify the name of the PC file to be sent to the host system.
Select the name from the list box, or enter the file name in the **PC File** text box. The selected file name is displayed in the list box.

Easy mouse operation

Move the cursor to the name of the file to be transferred in the **PC File** list box. Double-click the left mouse button. The workstation automatically starts transferring the selected file to the host system. At the same time, the host file name and transfer type are automatically assigned by means of a template.

6. Enter a host file name assigned after the transfer; then select the transfer type.
If a template is provided, the host file name and the generated transfer type appear automatically. To create a template, refer to "Creating a Template" on page 37 .
To specify or change the host file name, highlight the host file name in the list box; then enter the desired file name in the **Host File** text box.
To specify or change the transfer type, highlight the transfer type in the list box; then select the desired transfer type in the **Transfer Type** drop-down list box. For transfer type, refer to "Setting Transfer Types" on page 40 .
7. Select **Send**.

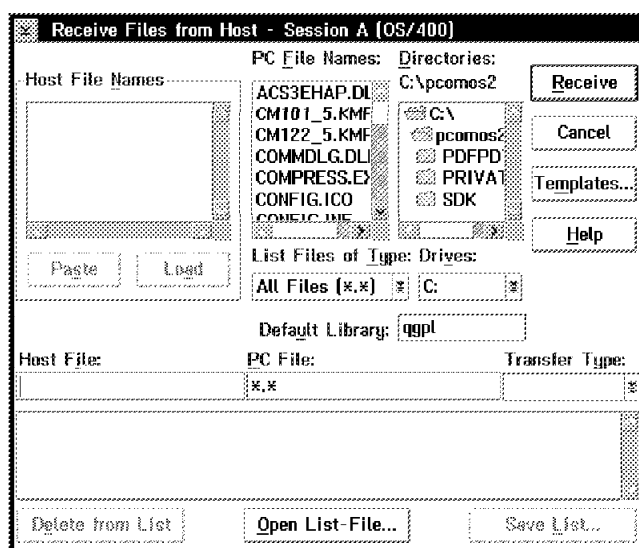
The file is sent to the host system. The send status appears in the Send a File Status window. After the file has been sent, the session window appears.

Receiving Files from the Host System

To transfer a file from the host system to a workstation, complete these steps:

1. Sign on to the host system.
2. Select **Transfer** from the menu bar of the session window.
3. Select the host system you use in the Transfer pull-down menu.
4. Select **Receive File from Host** or the **Receive** button from the tool bar.

The Receive File from Host window appears.



Using List Files

Select **Open List-File**; then select the list to be used for transfer. (For an explanation of how to create list files, see page 36.)

5. Specify the name of the host file to be transferred. Enter the name in the **Host File** text box, or specify it by selecting **Paste** or **Load** as follows.

Using the Paste button

Selecting **Paste** after copying the host file names into the OS/2 clipboard displays the file name in the **Host File Names** list. Select the desired file from the list.

Using the Load button

If an OS/2 application program that uses Dynamic Data Exchange (DDE) is designed to provide file lists to the workstation, the program can be used for loading the file lists. Select **Load**; then select the desired file from the file list provided by the application program.

For PC400, to change the name of the library containing the host file to transfer, enter the host file name in the **Default Library** text box.

6. Enter a workstation file name assigned after the transfer in the text box, or select it from the list. After that, select the transfer type from drop-down list box.
If a template is provided, the workstation file name and the generated transfer type appear automatically. The selected file name is displayed in the list box. To create a template, refer to “Creating a Template” on page 37 .
To specify or change the workstation file name, highlight the workstation file name in the list box; then enter the desired file name in the **PC File** text box.
To specify or change the transfer type, highlight the transfer type in the list box; then select the desired transfer type in the **Transfer Type** drop-down list. For the transfer type, refer to “Setting Transfer Types” on page 40 .
7. Select **Receive**.
The file is received. The receive status appears in the Receive a File Status window. After the file has been received, the session window appears.

Using List Files

You can transfer a large number of files as a single group. If the same files are transmitted frequently, the file list can be saved in a send/receive list file for reuse.

A list file is common to both transmission and reception. The default list file extension is **.SRL**. (To change the extension, see page “Extension for PC/3270 List Files” on page 45 .

Creating List Files

To create a list file, complete these steps:

- Select **Transfer** from the menu bar of the session window.
- Select **Send File to Host** or **Receive File from Host**.
The Send File to Host or Receive File from Host window appears.
- Select a file to be transferred from the **Host File Name** or **PC File Name** list box using either of the following two methods:
- Select the desired file name in the **PC file name** list box.
- Specify the file name in the **PC file** text box. For more information, refer to “Sending Files to the Host System” on page 33 or “Receiving Files from the Host System” on page 35 .

Information on the selected file appears in the lower part of the window.

- After all desired files have been selected, select **Save List**.
The Save File-Transfer List File as window appears.
- Enter a list name, and select **OK**.
The list file is saved, and the window is closed.

Editing Lists

To edit the contents of a previously created list, complete these steps:

- As explained in step 1 of the “Creating List Files” procedure, display the Send File to Host or Receive File from Host window.
- Select **Open List-File**.
The Open File-Transfer List File window appears.
- Select the name corresponding to the list file to be edited; then select **OK**.

- The contents of the selected list appear in the Send File to Host or Receive File from Host window.
- Edit the contents of the list file.

Changing the contents of a list

Select a file to be changed from the list, and overwrite the items to be changed in the text box.

Deleting a file from the list

Select a file to be deleted from the list; then select **Delete from List**.

Adding a file to the list

Select a file to be added from the list of host or workstation files, or enter the name of the file to be added in the text box.

- After the contents have been edited, select **Save List**.
The Save File-Transfer List File as window appears.
- Enter a list name; then select **OK**.
The list file is saved, and the window is closed.

Creating a Template

A *template* is a rule used by the workstation to automatically generate a workstation or host file name and transfer type when a file to be sent or received is selected.

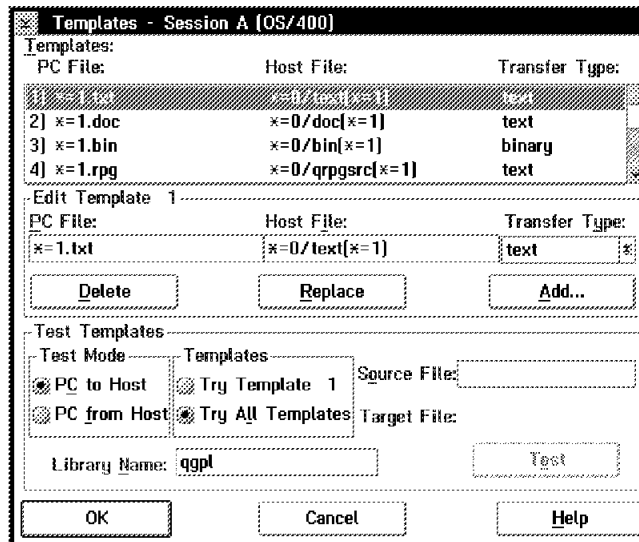
Up to 32 templates can be created. They are automatically numbered from 1 to 32.

When the user specifies a file to be transferred, the workstation retrieves the templates, starting from template 1. It uses the first matched template to generate a name for the transferred file.

To use a template, complete these steps:

1. Select **Transfer** from the menu bar.
2. Select the host system you use in the Transfer pull-down menu.
3. Select **Send File to Host** or **Receive File From Host**.
The Send File to Host or Receive File from Host window appears.
4. Select **Templates**.

The Templates window appears.



(The contents of the window depend on the connected host system.)

Adding Templates

The list box for the Templates window lists the currently registered templates. The numbers on the left side of the list are the template numbers.

To add a template, complete these steps:

1. Select a template to be used for generation from the list box.
The contents of the selected template appear under the list box.
2. Change the workstation and host file names by overwriting them; then select the transfer type. (For details of the transfer types, see “Setting Transfer Types” on page 40 .)
3. Select **Add**.
The window for determining where in the list to display a template to be added appears.
4. Select a template number. Determine whether to display the template to be added before or after the template having that number. Select **OK**.
The generated template added to the list appears.

Replacing and Deleting Templates

To change the contents of a currently registered template, or to delete a template, complete these steps:

1. Select the template to be changed or deleted from the template list box.
The contents of the selected template appear under the list box.
2. To change the contents, overwrite the changed part; then select **Replace**.
To delete a template, select **Delete**.
The selected template is changed or deleted, and the contents of the template list box are changed.

Testing Templates

To test the contents of an added or changed template without actually transmitting any files, complete these steps:

1. Select a template to be tested from the template list box.
The number of the selected template appears in the **Test Templates** field in the lower part of the window.
2. Select or enter data for the following items:

Test mode

Determine which mode is to be used for the test: the mode in which a file is transmitted from a workstation to the host system, or the mode in which a file is transmitted from the host system to a workstation.

Templates

Determine which templates to test: only the template selected in step 1 or all registered templates.

Source file

Enter the name of the file to be tested.

- Select **Test**.

Using the selected template for **Target File** displays an automatically created file name assigned after the transfer.

Note: Testing templates does not transfer the actual files.

Import/Export (PC/3270 Only)

Import/Export is an office system communication program. It is one of the application programs executed under the IBM Customer Information Control System (CICS).

Executing the *Import/Export* command loads a module to be transferred into memory. Afterward, you can call either Import or Export from the menu on the host screen and run it.

The workstation receives two files using Export. One is the received file, and the other is the *interchange document profile* (.IDP), which contains document header information.

When you send a file by using Import, an IDP file that contains transmission information is required. Before importing a file, you can create an IDP file. If you start to import without creating an IDP file, an IDP file is created automatically.

For an explanation of how to create IDP files, refer to “Creating IDP Files” on page 40 .

Transferring Files Using Import/Export

To transmit files using Import/Export, complete these steps:

1. Verify that the window of the host session on which files are to be transferred is active and ready for file transfer.
2. Select **Transfer** from the menu bar of the session window and then select **Import/Export**.
The Import/Export Status icon appears.
3. Select **Import** or **Export** from the host application menu.
4. Specify the host and workstation file names of the file to be transferred, and select Import or Export.

When Import or Export starts, the **Import/Export Status** icon is maximized, and the Import/Export Status window appears.

After the file has been transferred, the window is closed.

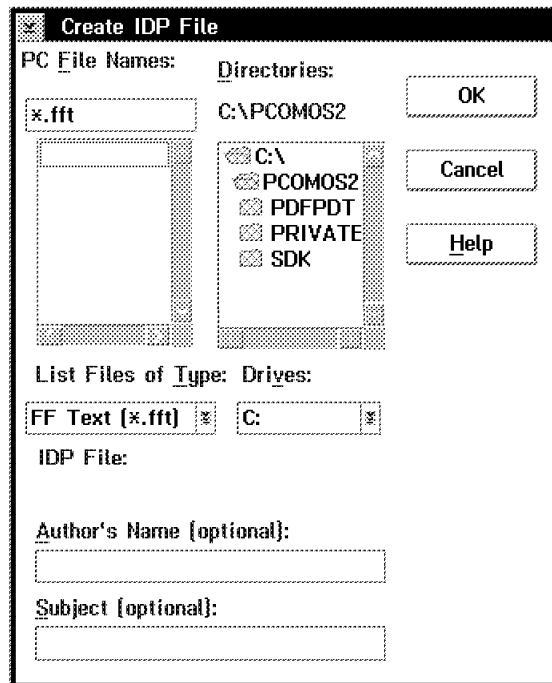
Creating IDP Files

To send a file to the host system using Import, an IDP file having information about the file is required. To import a file, create an IDP with **Create IDP File**.

To create an IDP file, complete these steps:

1. Select **Transfer** from the menu bar of the session window and then select **Setup**.
2. Select **Create IDP File** from the submenu.

The Create IDP File window appears.



3. Enter the name of an IDP file to be created in the text box, or select it from the list.

Note: Specify the IDP file as the same file name to be transferred, and the extension (*.IDP).

4. Select **OK**.

The specified value is saved to an IDP file, and the Create IDP File window is closed.

Setting Transfer Types

Transfer types define the option information used for controlling File Transfer. Up to 16 transfer types can be defined for each host system. Text, binary, and append are initially set as the transfer types.

Selecting the **Transfer-Type Definition** command enables setting of the following items:

PC400 File Options

The next table lists the file options and corresponding modes and contents of the data exchange in which the options can be used.

File Option	Conversion Details
ASCII	Converts 1-byte workstation codes to EBCDIC codes when a file is sent. Converts EBCDIC codes to 1-byte workstation codes when a file is received.
CRLF	Converts codes as follows when a file is sent: <ul style="list-style-type: none">• Does not remove CRLF (X'0D0A') from the end of each line. The code is treated as a delimiter for each record.• Removes EOF (X'1A') from the end of the file. Converts codes as follows when a file is received: <ul style="list-style-type: none">• Adds CRLF (X'0D0A') to the end of each line.• Adds EOF (X'1A') to the end of the file. Removes EOF from the existing file, and appends EOF to the end of the added file when APPEND is specified.
APPEND	Appends the sent file to the existing host file. Appends the received file to the existing workstation file.
SRC	When a file is sent with this option specified, the host file, the receiver, is recognized as a source physical file . With this option unspecified, it is recognized as a database physical file . When a file is received, this option is ignored. The host application programs determine the type of the received file.

PC/3270 File Options

The file options that can be used depend on the type of the connected host system, and the host code page selected when the workstation is configured. Table 1 lists the file options and the host systems and modes in which the options can be used.

Table 1. File Options for Transfer Files

File Option	Host System	Conversion Details
ASCII	VM/CMS MVS/TSO CICS	Converts 1-byte workstation codes to EBCDIC codes when a file is sent. Converts EBCDIC codes to 1-byte workstation codes when a file is received.

Table 1. File Options for Transfer Files (continued)

File Option	Host System	Conversion Details
CRLF	VM/CMS MVS/TSO CICS	<p>Converts codes as follows when a file is sent:</p> <ul style="list-style-type: none"> • Does not remove CRLF (X'0D0A') from the end of each line. The code is treated as a delimiter for each record. • Removes EOF (X'1A') from the end of the file. <p>Converts codes as follows when a file is received:</p> <ul style="list-style-type: none"> • Adds CRLF (X'0D0A') to the end of each line. • Adds EOF (X'1A') to the end of the file. Removes EOF from the existing file, and appends EOF to the end of the added file when APPEND is specified.
APPEND	VM/CMS MVS/TSO	<p>Appends the sent file to the existing host file. Appends the received file to the existing workstation file.</p>

PC400 Logical Record Length (LRECL)

Enter the logical record length (host record byte count), used for sending a file to the host system, in the **LRECL** text box. The maximum value is 32,766.

This item is valid only when there are no files in the host system. When a file exists in the host system, the value specified in this item is ignored and the file is sent using the logical record length of the file in the host system.

Record Format

Record Format is valid only for VM/CMS and MVS/TSO. It is valid if APPEND is not specified for file transmission. Any of the following items can be selected:

- Default value
- Fixed (fixed length)
- Variable (variable length)
- Undefined mode (for MVS/TSO only)

If the default value is selected, the record format is selected automatically by the host system.

Specifying **Variable** for VM file transfer enables host disk space to be used efficiently.

Logical Record Length (LRECL)

Logical record length is valid only for VM/CMS and MVS/TSO. It is valid if APPEND is not specified for file transmission.

Enter the **logical record length** to be used (host record byte count) in the **LRECL** text box. If **Variable** and **Undefined Mode** are specified as the record format, the logical record length is the maximum record length within a file. The maximum value is 32,767.

The record length of a file sent from a workstation to the host system might exceed the logical record length specified here. If so, the host file transfer program divides the file by the logical record length.

To send a file containing long records to the host system, specify a sufficiently large logical record length.

Because the record length of a workstation file exceeds the logical record length, a message does not appear normally if each record is divided. To display a message, add the following specification to the **[Transfer]** item of the workstation profile:

DisplayTruncateMessage = Y

TSO Allocation Parameter (MVS/TSO)

TSO Allocation Parameter is valid only for MVS/TSO. It is valid when **APPEND** is not specified for file transmission. The following items can be specified:

[Allocation Amounts]

Allocation amounts

Enter the number of tracks or cylinders allocated to this file transfer.

Secondary

If the primary allocation is not sufficient for the entire file transfer, enter additional storage capacity allocated to the file transfer.

[Allocation Units] Ask your system manager whether to use **TRACKS**, **CYLINDERS**, or **AVBLOCK** as the unit.

TRACKS

Specify this parameter to allocate a host file by track.

CYLINDERS

Specify this parameter to allocate a host file in units of cylinders.

AVBLOCK

Specify this parameter to allocate a host file in units of blocks.

[Block size] This item is used only to create a new data set. Enter the block size of a new host data set, in bytes, in the text box. If this item is omitted, the workstation assumes the value that appears in the **Logical Record Length** box. The maximum value is 32,767. If **AVBLOCK** is selected, the block size is the block size of the new data set.

Additional Options

The required host command options can be entered in the **Additional Options** text box.

Adding or Changing Transfer Types

To add or change transfer types, complete these steps:

- Select **Transfer** from the menu bar of the session window and then select **Setup**.

- Select **Define Transfer Types** from the submenu.
The Define Transfer-Types window appears.
- Enter transfer-type names in the **Transfer-Type Names** text box, or select them from the list.
- Select or enter the required items.
To add transfer types, select **Add**. To replace them, select **Replace**. To delete transfer types, after selecting them from the transfer-type name list, select **Delete**.
- After the transfer types have been added, replaced, or deleted, select **OK**.
After you have selected the transfer types, the Define Transfer-Types window is closed.

Setting Transfer Options

The following sections describe the file transfer options you can define.

File Transfer Timeout

The interval during which the workstation waits for a response from the host system can be entered (in seconds). If the host system does not respond, transfer is canceled and an error message appears. You can specify a number from 20 to 65535. The default is 30. Specify an appropriate value such that the error message does not appear too early.

If a packet size is relatively large for low-speed lines, such as SDLC or asynchronous communication, specify 150 seconds.

Extension for PC400 List Files

You can specify the default extension for **List** used for File Transfer. Up to three alphanumeric characters can be entered. The default value is **.SRL**.

Status Window

The method of displaying the File Transfer progress status can be selected. Select one of the following option buttons. The default value is **Show in Session**.

Show in Session

When File Transfer starts, the status window appears. The name of the file being transferred and the transfer progress appear.

Show in icon

When File Transfer starts, the status icon appears on the screen. When the status icon is restored, the status window appears.

PC Code Page

When a file is transferred, EBCDIC codes are converted to 1-byte workstation codes, and vice versa. A default value is 437.

Host Command

The host command to be called when file transfer starts can be entered. If nothing is entered in this text box, **APVAFILE** is used.

File Transfer Directory

The directory that appears first in the Send File to Host or Receive File from Host window can be specified.

Clearing Sessions before Transfer (PC/3270 only)

Before a file is transferred, whether to transfer a Clear command to the host system can be specified. Select any of the following option buttons:

Default value

The Clear command is not sent.

Yes Before a file is transferred, a Clear command is sent.

No The Clear command is not sent.

File Transfer Packet Size (PC/3270 only)

The amount of memory (in bytes) used by the workstation for transmission and reception. If a large value is entered, a file is transferred more quickly, but the memory overhead is larger. The range you can set is from 256 to 32,000.

Extension for PC/3270 List Files

The default extension for **List** used for file transfer can be specified. Up to three alphanumeric characters can be entered. The default value is **.SRL**.

Status Window

The method of displaying the file transfer progress status can be selected. Select any of the following option buttons. The default value is **Show in Session**.

Show in Session

When file transfer starts, the status window appears. The name of the file being transferred and the transfer progress appear.

Show in icon

When file transfer starts, the status icon appears on the screen. When the status icon is restored, the status window appears.

PC Code Page

When a file is transferred, EBCDIC codes are converted to 1-byte workstation codes, and vice versa. A valid value is automatically selected from among 437, 819, 850, 860, 861, 863, and 865 depending on the current PC code page setting. (For an explanation of how to select host code pages, see the help for host code page.)

Host Command

The host command to be called when file transfer starts can be entered. If nothing is entered in this text box, **INDxFILE** is used for 3270 sessions; **APVAFILE** is used for 5250 sessions.

File Transfer Directory

The directory that appears first in the Send File to Host or Receive File from Host window can be specified.

Changing Transfer Options

To change miscellaneous items, complete these steps:

1. Select **Transfer** from the menu bar of the session window and then select **Setup**.
2. Select **Miscellaneous Settings** from the submenu.
The Miscellaneous Settings window appears.
3. Change the required settings.
4. Select **OK**.
After all the settings have been changed, the Miscellaneous Settings window is closed.

Setting Translation Tables

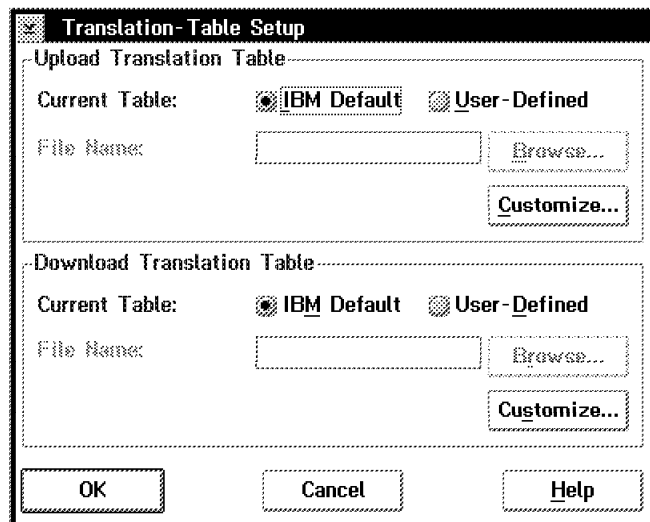
The translation tables used for sending or receiving files can be changed or customized.

Changing Translation Tables

To change a translation table, complete these steps:

1. Select **Transfer - Setup** from the menu bar of the session window.
2. Select **Translation Table** from the submenu.

The Translation-Table Setup window appears.



3. The table currently being used for file transfer appears in the selection status. Select **IBM Default** or **User-Defined**.
4. If **User-Defined** is selected, enter a translation table name in the text box, or select a file name by selecting **Browse**.
5. Select **OK**.

After the translation table has been set, the Translation-Table Setup window is closed.

Customizing Translation Tables

A user-specific translation table for transmission or reception can be created, or an existing translation table can be edited.

To create or edit a translation table, complete these steps:

1. Select **Customize** for the transmitting (upload) or receiving (download) translation table in the Translation-Table Setup window.

The Customize Translation window appears.

Customize Translation (File-Transfer Download) - [Untitled]																
File Help																
		0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E- F-
-0	00	10	B7	D9	20	26	2D	BA	C3	F8	E6	5E	7B	7D	5C	30
-1	01	11	B8	DA	C9	82	2F	90	61	6A	7E	9C	41	4A	F0	31
-2	02	12	B9	16	83	88	B2	BC	62	6B	73	9D	42	4B	53	32
-3	03	13	BE	DD	84	89	8E	BD	63	6C	74	FA	43	4C	54	33
-4	EC	EF	C4	DE	85	8A	B4	BE	64	6D	75	9F	44	4D	55	34
-5	09	C5	0A	DF	A0	A1	B5	F3	65	6E	76	15	45	4E	56	35
-6	CA	08	17	E0	F2	8C	B6	C0	66	6F	77	14	46	4F	57	36
-7	7F	CB	1B	04	86	8B	8F	C1	67	70	78	AC	47	50	58	37
-8	E2	18	CC	E3	87	8D	80	C2	68	71	79	AE	48	51	59	38
-9	D2	19	CD	E5	A4	E1	A5	60	69	72	7A	FC	49	52	5A	39
-A	D3	DC	CF	E9	9B	21	7C	3A	AE	A6	AD	5B	E8	EE	FD	DB
-B	0B	D8	D0	EB	2E	24	2C	23	AF	A7	A8	5D	93	96	F5	FB
-C	0C	1C	D1	B0	3C	2A	25	40	C6	91	D4	E4	94	81	99	9A
-D	0D	1D	05	B1	28	29	5F	27	C7	CE	D5	FE	95	97	F7	F4
-E	0E	1E	06	9E	2B	3B	3E	3D	C8	92	D6	BF	A2	A3	F6	EA
-F	A9	1F	07	1A	B3	AA	3F	22	F1	0F	D7	E7	ED	98	F9	FF

If a translation table is not selected, or if **New** is selected from the **File** menu, the default values appear in the table.

Translation source codes

Workstation code point codes when an upload translation table is edited.

Host code point codes when a download translation table is edited.

Translation target codes

Host code point codes when an upload translation table is edited.

Workstation code point codes when a download translation table is edited.

- Double-click on the code to be changed in the table, and change the value in the window that subsequently appears.
- Select **Save** for editing, or **Save As** for creation from the **File** pull-down menu.
- If **New** is selected, enter a translation table name in the Save Translation File as window, and select **OK**.

The translation table is saved, and the Save Translation File as window is closed.

Chapter 6. Configuration, Installation, and Distribution (CID)

This chapter describes configuration, installation, and distribution (CID) for Personal Communications, including its remote and local configuration and installation. Personal Communications supports CID, as do other OS/2 products such as OS/2 Versions 3.0 and 4.0 and Communications Server.

CID is a tool used by network administrators to enable efficient configuration, installation, and distribution for multiple distributed workstations. A network administrator can prepare response files for a group of workstations and distribute the response files by diskettes or through a LAN server. The administrator can install Personal Communications in each of the workstations through the network, and receive the results of the installation. This process is called the *response file preparation*.

Response file installation can preserve personalized features on a workstation during an upgrade migration. However, the response file installation does not change the workstation configuration unless the process completes without any errors.

Personal Communications will no longer provide communication stacks for connections which require SNA. These connections will now use the Access Feature. The Personal Communications installation and CID support will provide a link to Access Feature CID. The installation dialog will dynamically build an Access Feature response file based on your selections. Installations will then use this response file to install the required Access Feature runtime code. This creates a single installation process for the two products. For CID, an Access Feature RSP will be linked to the Personal Communications response file by the **AFRspFile** keyword. Although a separate response file must be created for Personal Communications and Access Feature, the installation will be done using Personal Communications CID.

Note: For LAN and SDLC connections, a separate MPTS CID must be done.

Figure 1 on page 50 below shows the CID flow.

- A** shows the private files being created by workstation users using the panel process after Personal Communications is installed.
- B** shows the process of creating response files, which is required if you want to perform response file installation. In addition, an Access Feature response file must be created for Twinax, LAN and SDLC connectivities, (MPA, SNA over Async, and Hayes Autosync) which require SNA support. This can be done using Advanced Configuration or the configuration dialogs, which will guide you through a basic configuration. Refer to Communications Server Response File Reference for more detailed information on Access Feature response files.
- C** shows the process performed by the network administrator and the workstation user.

The process performed by the network administrator is either:

- Installation using the response file
- Installation without using the response file

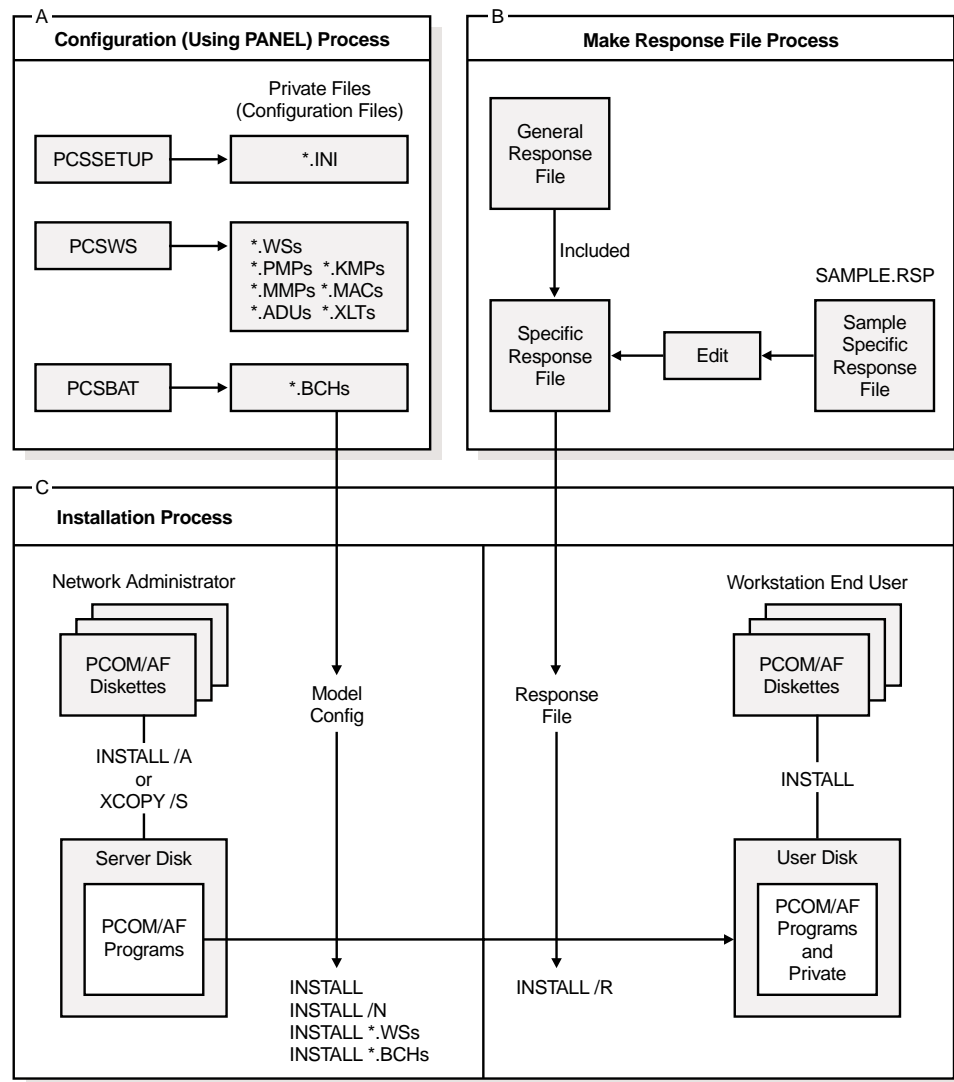


Figure 1. Configuration, Installation, and Distribution Process Flow

Software Distribution Manager (SDM) Considerations

To install Personal Communications by CID, perform the procedures explained in this section before the actual installation.

Determine the Type of Code Server and Client

Before transferring the product data to the hard disk, you must determine the type of code server you wish to create and the type of clients you will be installing.

There are two types of CID servers:

Type	Command	Description
I	xcopy /S	This will create a server that does not have emulation selected.
II	install /a	This will create a server with emulation selected.

Create Type I servers if:

- Clients can select the emulation type
- Clients do not share code in the server

Create Type II servers if,

- Clients should have the same emulation as the server and cannot change the emulation type.
- Clients will share code (executable files) in the server.

Transferring Product Data

Create a product image according to the type of code server you wish to create. The CD-ROM can be used as a Type I server image or used to create a product image.

Type I Servers (XCOPY Command)

If you wish to create a Type I code server and do not want to use the CD-ROM, use the **XCOPY** command to copy Personal Communications files from the CD-ROM to a directory that becomes the source path for performing a remote installation.

For example:

```
XCOPY E:\OS2\INSTALL\EMULATOR D:\CID\IMG\PCOMOS2 /S
```

also,

```
XCOPY E:\OS2\INSTALL\OS2ACCES D:\CID\IMG\OS2ACCES /S
```

These commands copy files from the CD-ROM to a directory in drive D.

Type II Servers (INSTALL Command)

Use the Personal Communications **INSTALL** command to create a Type II code server. The directory in which the code server will be created and the type of emulation selected will be prompted from the installation dialogs. The response file templates provided by Personal Communications will not be copied to the code server. For example:

```
C:\INSTALL /A
```

If you specify *D:\CID\IMG\PCOMOS2* as the target directory in the installation dialog, this command copies files from the CD-ROM drive to a directory in drive D.

Preparing Response Files

A sample response file (PCOMOS2.RSP) is provided with Personal Communications; you can modify it for your own environment. This response file contains lower-level (lchild") response files that can be used to establish the host connection, customize the graphical user interface (GUI) of the session window, and customize the Personal Communications main module (PCSWS.EXE).

CID Client Installation

This section describes the installation of clients from the two types of code servers. Each example assumes the following values:

Source path (/S)	D:\ CID\ IMG\ PCOMOS2
Target path (/T)	C:\ PCOMOS2
Response file (/R)	D:\ CID\ RSP\ PCOMOS2\ PCOMOS2.RSP

```
General response file path (/G) D:\ CID\ RSP\ PCOMOS2\ GNL
Error log file (/L1)          D:\ CID\ LOG\ PCOMOS2\ ERROR.LOG
History log file (/L2)        D:\ CID\ LOG\ PCOMOS2\ HISTORY.LOG
```

Client Installation from Type I (XCOPY) Servers

If you used the **XCOPY /S** command to copy the data, files, enter the following command:

```
INSTALL /R:D:\ CID\ RSP\ PCOMOS2\ PCOMOS2.RSP /S:D:\ CID\ IMG\ PCOMOS2
/T:C:\PCOMOS2 /G:D:\CID\RSP\PCOMOS2\GNL /L1:D:\CID\LOG\PCOMOS2\ERROR.LOG
/L2:D:\CID\LOG\PCOMOS2\HISTORY.LOG
```

The emulation type to install will be determined by the response file

The clients will not share executable code with the server.

You can also install clients without using response files. In this case, the target directory and the emulation type will be prompted for each client.

Client Installation from Type II (INSTALL) Servers

If you do not want clients to share executable files with the server, enter the following command:

```
INSTALL /R:D:\ CID\ RSP\ PCOMOS2\ PCOMOS2.RSP /S:D:\ CID\ IMG\ PCOMOS2
/T:C:\PCOMOS2 /G:D:\CID\RSP\PCOMOS2\GNL /L1:D:\CID\LOG\PCOMOS2\ERROR.LOG
/L2:D:\CID\LOG\PCOMOS2\HISTORY.LOG
```

If you want clients to share executable files with the server, enter the following command:

```
INSTALL /N /R:D:\ CID\ RSP\ PCOMOS2\ PCOMOS2.RSP /S:D:\ CID\ IMG\ PCOMOS2
/T:C:\PCOMOS2 /G:D:\CID\RSP\PCOMOS2\GNL /L1:D:\CID\LOG\PCOMOS2\ERROR
/L2:D:\CID\LOG\PCOMOS2\HISTORY.LOG
```

The emulation type installed in clients will be the same as the server. The installation keyword for the emulation type will be ignored.

Directories Created by the Installation Program

At installation, the program creates the CMLIB directory for Access Feature related files and also creates the following subdirectories in the root Personal Communications directory:

- **OLD_WS**
- **OLD_CFG**
- **PDFPDT**
- **PRIVATE**
- **SAMPLES**
- **SDK**

Subdirectories other than **PRIVATE** can contain files only when they are selected to be installed or when saving required files during migration.

The PRIVATE Subdirectory

This is almost empty when you first install Personal Communications, but if you create and save configurations, the following types of files are stored here:

Personal files in the PRIVATE subdirectory:

- Workstation (session) profiles (*.WS)
- Batch files (to start multiple sessions) (*.BCH)
- Keyboard files (*.KMP)
- Pop-up keypad files (*.PMP)
- Mouse files (*.MMP)
- Macro files (*.MAC)
- File-transfer translation files (*.XLT)
- Automatic dial facility files (*.ADU)
- User profile (*.UPR) (for PC400 only)

The SDK Subdirectory

This has several subdirectories, each of which contains the executable and source files for a sample program. These programs are designed only to illustrate the use of a programming interface, but they are usable. Try them.

The PDFPDT Subdirectory

This directory contains PDF and PDT files used by the Personal Communications Print function in PDT mode.

Sample Software Distribution Manager (SDM) Profile for NetView DM/2 Server

Following is a sample SDM profile for NetView DM/2 Server. NetView DM/2 is a product in the IBM SDM family of products.

```
TargetDir = C:\PCOMOS2

Section Catalog
Begin
  ObjectType = Software
  GlobalName = PCOMOS2.CLIENT.WKSTNAME.REF.4.00
  Description = "Personal Communications for OS/2 Version 4.0"
End

Section Install
Begin
  Program = SA:\IMG\PCOMOS2\INSTALL.EXE
  Pargs = /R:$(ResponseFile) /S:$(SourceDir) /L1:$(LogFile1) /L2:$(LogFile2)
  ResponseFile = SB:\RSP\PCOMOS2\$(WorkStatName).RSP
  SourceDir = SA:\IMG\PCOMOS2
  LogFile1 = SB:\LOG\PCOMOS2\$(WorkStatName).L1
  LogFile2 = SB:\LOG\PCOMOS2\$(WorkStatName).L2
End
```

Configuration

Personal Communications provides four types of configuration:

1. System configuration
2. Session configuration
3. Multiple session configuration
4. Access Feature configuration

System Configuration (PCSSETUP.EXE)

System configuration is set up automatically when Personal Communications is running. For example, the device drivers used by Personal Communications are added to the **CONFIG.SYS** file. Personal Communications provides **PCSSETUP** (the System Setup Program) to let you change these settings after the installation.

Session Configuration (PCSWS.EXE)

Session configuration is set up from each workstation (session) window by **PCSWS** after Personal Communications has been installed. These settings are saved in the workstation profile (filename.**WS**) in the **PRIVATE** subdirectory. Refer to *Quick Beginnings* for setting up the session configuration.

Multiple Session Configuration (PCSBAT.EXE)

Personal Communications provides **PCSBAT** to start multiple host session windows and other OS/2 Presentation Manager programs simultaneously. These settings are saved in the batch file (filename.**BCH**) in the **PRIVATE** subdirectory. Refer to *Quick Beginnings* for setting up the multiple session configuration.

Access Feature Configuration

Personal Communications provides Access Feature configuration and configuration dialog, which guide the user through more commonly used Access Feature connectivities. Advanced configuration is identical to the CM/2 configuration for SNA.

Private Files (Configuration Files)

The following types of files are Personal Communications private files. They are generated by **PCSSETUP.EXE**, **PCSWS.EXE**, and **PCSBAT.EXE**. All private files created by the Personal Communications configuration process are flat ASCII files and can be delivered to the clients as model configuration files. The specific changes for the clients are made by configuring at the clients' side.

- **PCSSETUP.EXE**
 - Installation control file (install.**INI**)
- **PCSWS.EXE**
 - Workstation (session) profiles (filename.**WS**)
 - Session control file (pcswin.**INI**)
 - Keyboard files (filename.**KMP**)
 - Pop-up-keypad files (filename.**PMP**)
 - Mouse files (filename.**MMP**)
 - Macro files (filename.**MAC**)
 - Automatic Dial Facility files (filename.**ADU**)
 - File-transfer translation files (filename.**XLT**)
- **PCSBAT.EXE**
 - Batch files (to start multiple sessions) (filename.**BCH**)
 - Access Feature configuration files (filename.**BCH**, **.CFG**, **.CF2**, **.RSP**, **.SEC**)

Installation (INSTALL.EXE)

When installing Personal Communications, you answer prompts in several dialogs. However, if you want to install it with the default options, just click on the **OK** button in each dialog.

The installation process is as follows:

1. You are prompted to specify the target directory. The system checks the free disk space.
2. You are prompted to specify the type (full or partial) of installation you want. Program files are copied to the target directory according to the type of installation you selected. The **PRIVATE** subdirectory is created in the target directory. A Personal Communications folder is created, and icons are added to it on the OS/2 Desktop.
3. Install will only allow Access Feature to load SNA and its API. For connectivities that require SNA, the necessary files from Access Feature will automatically be loaded.

Parameters

The installation program **INSTALL.EXE** supports the following parameters. Any combination of these parameters can be specified except for CID parameters. Parameters must be delimited by spaces.

- **No parameter.** Specify no parameter when you want to install all Personal Communications programs from the CD-ROM or through the network server.
- **/A (for centralized installation).** Use this parameter to install Personal Communications in a network server from the CD-ROM. This parameter does not create the **PRIVATE** subdirectory and does not set up the system settings.
- **/N (for centralized installation).** Use this parameter when installing Personal Communications in a network server using the **/A** parameter, and when the installed programs must to be shared by the client workstations. The **PRIVATE** subdirectory is created, and the system settings are set up, but the program files are not copied to the target directory.

Note: Access Feature files will be copied to the client machine.

- **Workstation (session) profiles.** Workstation (session) profiles are profiles (filename.WS) provided by the system administrator to install Personal Communications. The profile contains the descriptions of all the settings that feature each Personal Communications workstation. Each profile specified can cause a PCSWS icon to be added to the Personal Communications folder.
- **Batch files (to start multiple sessions).** Batch files (to start multiple sessions) are files (filename.BCH) offered by the system administrator to install Personal Communications. The batch file contains single or multiple profiles. Each batch file specified can cause a PCSBAT icon to be added to the Personal Communications folder.
- **CID parameters.** Following are CID parameters (full path specification is required):

Parameters

Usage

/R:response_file_name

Specifies the drive, path, and name of the user-specific response file.

/S:source_path

Specifies the drive and path of the product code image files on the code

server. Product code images are created by **INSTALL /A** or **XCOPY /S**. This parameter overrides the value specified by the keyword **SourcePath** in the response file.

/G:general_path

Specifies the drive and path of the general response file on the SDM code server. A general response file is referred to by an **include** keyword within specific response files.

/T:target_path

Specifies the target drive and the root path where to install, configure, or maintain at the client workstation's side. This parameter overrides the value specified by the keyword **TargetPath** in the response file.

/L1:path\filename

Specifies the drive, the path, and the name of the product-specific log files on the SDM code server. The parameter **/L1** is required for the error log file.

/L2:path\filename

Specifies the drive, the path, and the name of the product-specific log files on the SDM code server. The parameter **/L2** is required for the history log file.

/M

Specifies, when used along with **/R:**, the target communication stack to be used for CID migration. If **/M:S**, the migration is to standalone Personal Communications V4.1. If **/M:C**, the migration is to Personal Communications V4.1 using CM/2 communication.

/RAF:response_file_name

Specifies the drive, path, and name of an Access Feature response file (only for an SNA API installation).

/RPC:response_file_name

Specifies the drive, path, and name of a Personal Communications response file.

/SAF:AF_source_path

Specifies the drive, and path to Access Feature.

/TAF:target_drive

Specifies the drive letter, optionally followed by a colon.

- **/D**. Deletes all files for Personal Communications, including the personal files in the Personal Communications PRIVATE directory. This parameter will also remove the Personal Communications folder and any changes made in CONFIG.SYS.
- **/Q**. Suppresses information windows. This parameter is valid with the **/D** and **/R** parameters. The Quiet Mode (**/Q**) option can be entered from the command line only, not from a response file.
-

Return Codes

Personal Communications returns the following return codes:

Return code

Explanation

FE 00 Successful program termination. Reboot the system and do not run the program again.

00 00 Successful program termination. Do not reboot the system.

- 08 00 The data resource was not found. Do not reboot the system.
- 08 04 Access to the data resource is denied, because it is already in use.
- 08 08 Access to the data resource is denied, because it is not authorized.
- 08 12 A data path was not found.
- 08 16 The product is not configured.
- 12 00 A storage medium exception (I/O error) took place.
- 12 04 The device is not ready.
- 12 08 There is not enough disk space.
- 16 00 The program was started incorrectly.
- 16 04 An unexpected condition took place.

Creating Response Files

Personal Communications provides a complete ASCII configuration response file, which you can use as a template to prepare a response file for your configuration; edit it to match your configuration needs. Use any editor that creates an ASCII file, such as the OS/2 system editor.

This section describes the structure and syntax of a response file, and it explains how to prepare your own. The tables in the following sections show how to specify values for each of the keywords.

- “Installation Record Keywords” on page 70
- “Session-Oriented Record Keywords” on page 72
- “Connection- and Communication-Oriented Record Keywords” on page 79
- “GUI and Miscellaneous Record Keywords” on page 88

A *response file* is a product-specific flat ASCII file containing keyword=value statements that are interpreted by the Personal Communications installation program. It contains the values that you need to specify during the installation and configuration processes. It has the file extension **RSP**.

The response files contains:

- The control information that determines the type of operations performed during remote installation
- The names of files and directories needed during the process
- The parameters for customizing Personal Communications during the configuration process
- The parameters for selecting optional Personal Communications features
- The names of the included response files
- The user-exit information: an optional exit to a user-supplied program that is called before the files are copied during the installation

There are two kinds of response files in Personal Communications CID:

- General response file
- Specific response file

General Response File

The *general* (or *group*) *response file* is optionally used and contains all the common keywords used for a group of similar client workstations. You can include the general response files in the specific response file by using the **INCLUDE** keyword.

Specific Response File

The *specific response file* contains information specific for each client workstation, such as communication-related information.

A sample of the specific response file (**SAMPLE.RSP**) is shown in this manual as a template for creating specific response files. See Figure 3 on page 62 through Figure 6 on page 65 . The **/R:** CID parameter of **INSTALL.EXE** specifies the specific response file name used for remote installation and configuration.

File Format

Each entry in the response file is generally in the form keyword=value, where the keyword is on the left side of the statement and identifies the configuration or the installation parameter, and value is on the right side of the statement and is either a character string or a list of one or more keyword=value statements:

```
keyword = value
keyword = (
    keyword = value
    keyword = value
    ...
)
```

Note that the following representation causes a syntax error:

```
keyword = value

keyword = ( keyword = value
            keyword = value )
```

Response File Keyword Types

The keyword types are:

- **Record and field keywords.** Keywords that set configuration values are referred to as record and field keywords. The record keyword identifies the record and is followed by a list of keyword=value pairs (field keywords) that assign values to the parameters.
- **List keywords.** List keywords provide keywords to name, copy, or delete response file records.
- **Installation keywords.** Installation keywords manipulate installation and configuration files and control the response file installation.

Response File Syntax Rules

A response file has the following syntax rules:

- Blank lines and lines whose first nonblank characters is an asterisk (*), a number sign (#), or a semicolon (;) are considered comment lines and are ignored. The space characters are defined as tabs, blanks or spaces, and new lines. Following are examples of valid comment lines:

```
* This line has an asterisk in column 1
* This line has an asterisk in column 10
* The line above uses a new line sequence
*** This is also a valid comment line
```

- Comments are not allowed on the same line as a keyword=value pair.

- A comment line can contain up to 384 bytes.
- In some cases, value or =value is optional; these cases are explicitly defined in the context.
- You cannot have more than one keyword=value pair in a single line.
- Keywords begin with alphanumeric characters and do not contain embedded blanks or equal signs (=).
- Keywords are not case sensitive.
- Blanks leading and trailing the values are removed.
- You cannot use left parenthesis--(--for a value because it is used as a delimiter of a list. A left parenthesis is used to delimit the list following the keyword = ... on the same line.
- A right parenthesis--) is used to delimit a list. It must be on a line by itself.
- Response files do not have indentation restrictions. You can start and end at any column in the file.
- Response files can be nested using include statements.
- If you specify more than one statement for a single keyword, the last value specified is used.
- If you specify **include** statements, they are processed in the order they are specified within the response file. Therefore, in the case below, the included response file (a) is processed before the included response file (b).

```

:
include = filename (a)
include = filename (b)
:

```

Assigning Values to Response File Keywords

A value is a string of characters that is placed on the right of a response file assignment statement. The value can also be a list of one or more keyword=value pairs as shown below.

```

keyword = (
    keyword = value
    keyword = value
    :
    :
)

```

The data type of the values you specify for the keywords can be one of the following types:

Boolean value:

```

0    n or N = No
1    y or Y = Yes

```

Note: You cannot specify the words *NO* and *YES*.

Characters: You can specify characters.

Integers: You can specify integers.

Special Characters: The value can be a special character such as a blank or an asterisk (*). These values are explicitly defined when used.

WSName and Deleting and Copying Record Values

You can use the response file list keywords to name (with the **WSName** keyword) or to copy values in a record. Not all record keywords can be used for the list keywords.

WSName Record Values: The **WSName** keyword is used when multiple instances of a record keyword are allowed. It identifies which record is to be created or modified. It is usually required. The following example shows the format of the **WSName** keyword:

```
keyword = (  
  WSName = value  
  keyword = value  
  keyword = value  
  ...  
)
```

Deleting Record Values: The **delete** keyword causes all information associated with keywords to be removed. When the **delete** keyword is encountered in a list, all keywords in the list except for the **WSName** keyword are ignored. The following example shows the format of the **delete** keyword.

```
keyword = (  
  WSName = a.ws  
  delete  
)
```

To reset the values in a record, first delete the record with the **delete** keyword. Then, create it using the necessary keywords.

The **delete** keyword is not in the **keyword = value** format.

Copying Record Values: The **copy** keyword allows you to reset one instance of a record using another. Most configuration lists that accept the **WSName** keyword to identify records accept the **copy** keyword. The following example of the **copy** keyword shows a record named *a.ws* being reset or initialized with the information of the record *b.ws*.

```
keyword = (  
  WSName = a.ws  
  copy = b.ws  
)
```

You must add **keyword=value** pairs to override the values set by the **WSName** and **copy** keywords.

The **copy** keyword works differently when used outside the lists.

Specifying Controls for Response File Installation

You can use the installation keywords to manipulate installation and configuration files and to control the installation of Personal Communications functions. The installation keywords do not appear as lists. Each **keyword = value** pair is treated separately.

Copy: This keyword names the source file and destination file to be copied during installation. Response file installation continues if it encounters an error using this keyword and logs the error in the response file installation log. You can use this keyword more than once in a response file.

The **copy** keyword used inside lists differs from its usage outside lists. Outside lists, the **copy** keyword is used to copy files. Inside lists, the **copy** keyword (a list keyword) allows you to create or modify one instance of a record using another instance to initialize the data.

Include: This keyword specifies another response file to include in the current response file. The included response file is processed entirely before proceeding with the including response file. The included response files are processed in order as if their contents were substituted for the **include** keyword in the including response file. When the end of an included file is reached, processing resumes at the next line of the response file that contained the **include** keyword. This keyword can appear more than once in a response file.

During processing, response file installation searches for **filespec**, if it is not the fully qualified file specification in the current directory, in the directory specified with /G:, and in the directories specified in the PATH and DPATH environment variables. The failure of response file installation to find an include file is a critical error.

CID Examples

The following figure shows how the workstation profiles and the batch file are created from the example response file when you configure two sessions at the target workstation.

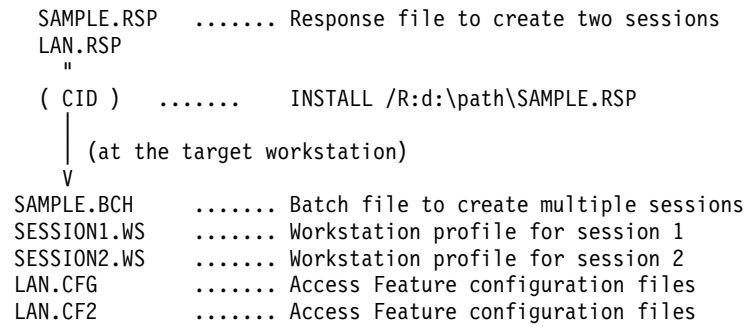


Figure 2. An Example of Configuration, Installation, and Distribution

The files used in this example are listed below:

SAMPLE.RSP	Example of specific response files. Figure 3 on page 62 through Figure 6 on page 65 .
LAN.RSP	An example of the LAN response file Figure 7 on page 66 through Figure 9 on page 68 .
SESSION1.WS SESSION2.WS	Examples of the workstation profiles. Figure 10 on page 68 and Figure 11 on page 69 .
SAMPLE.BCH	An example of the batch file. Figure 12 on page 69 .

```

*=====*
*                                     *
*           Personal Communications   *
*           Sample Response File     *
*                                     *
* Name:    SAMPLE.RSP               *
*                                     *
*-----*
* Comment lines are lines that contain only white space characters, *
* or have an asterisk (*) (or, number sign (#)) as the first no-white *
* space characters. *
*=====*

*-----*
*                                     *
* Start of installation functions *
*                                     *
*-----*
*-----*
*      * NOP      - Used to specify if no operation is required.
*      *           This keyword has the highest priority.
*      *           Value:  0, N=NO  1, Y=YES
*      *           Default: 0
*-----*
NOP=
*-----*
*      * TargetPath - Path where to install Personal Communications.
*      *           Value:  Fully-qualified Path Name
*      *           If the value is not specified, the default is used.
*      *           Default: bootdrive:\PCOMOS2\
*-----*
TargetPath=
*-----*
*      * SourcePath - Path where Personal Communications product images
*      *           exist.
*      *           Value:  Fully-qualified Path Name
*      *           Default: The directory of running INSTALL.EXE
*-----*
SourcePath=
*-----*
*      * ReMove    - Specifies if Removal of Code code
*      *           and/or other files are necessary.
*      *           Value:  0=No, 1=Remove Code  2=Remove All
*      *           Default: 0
*-----*
ReMove=
*-----*
*      * Reinstall - Specifies if Reinstall is required when current
*      *           version already exists on TargetPath. Not
*      *           referenced if Remove=1 or 2.
*      *           Value:  0, N=No  1, Y=Yes
*      *           Default: 0
*-----*
Reinstall=

```

Figure 3. An Example of a Specific Response File (SAMPLE.RSP – 1 of 4)

```

*-----*
* ReConfigure- Specifies whether to reconfigure an already created
*               configuration file or to configure a new
*               configuration file.
*               Not referenced if Remove=1 or 2.
*               Value: 0,N=No 1,Y=Yes
*               Default: 1
*-----*
Reconfigure=
*-----*
* Migrate      - Specifies whether or not to merge configuration.
*               Not referenced if Remove=1 or 2.
*               Value: 0,N=No 1,Y=Yes
*               Default: 1
*-----*
Migrate=
*-----*
* SelectFile - Selective installation files.
*               Value: Personal Communications product files
*               not to be installed with preceding "!"
*               (eg. !ALTANSI.FON !ALTAPL.FON !PDFPDT\*.*)
*               Default: Blank (=Full installation)
*-----*
SelectFile=
*-----*
* Administrator - Administrator option (same as /A option)
*               Value: 0,N=No 1,Y=Yes
*               Default: 0
*-----*
Administrator=
*-----*
* EmulType     - Emulation type to install
*               Value: 0=Both,1=3270,2=5250
*               Default: Version of Personal Communications already installed. If
*               Personal Communications is not installed, default is 1.
*-----*
EmulType=
*-----*
* NetWork      - NetWork option (same as /N option)
*               Value: 0,N=No 1,Y=Yes
*               Default: 0
*-----*
NetWork=
*-----*
* ServerPath   - Path where Personal Communications product files are
*               installed by INSTALL with administrator (/A) option
*               It should be specified if selected NetWork=1.
*               Value: Fully-qualified Path Name
*               Default: The directory of running INSTALL.EXE
ServerPath=
*-----*
* Folder       - Indicates whether to create product folder on OS/2
*               desktop.
*               Value: 0,N=No 1,Y=Yes
*               Default: 1
*-----*
Folder=
*-----*
* AFRspFile    - Access Feature response file to install and configure Access Feature.
*               File name is specified with a fully qualified
*               path name.
*-----*
AFRspFile= C:\LAN.RSP

```

Figure 4. An Example of a Specific Response File (SAMPLE.RSP – 2 of 4)

```

*=====*
*                                          *
* Start of configuration functions          *
*                                          *
*   This is a sample response file to create 2 sessions as follows:
*       Session-1: LAN, 43x80, Display
*       Session-2: DFT, 32x80, Printer
*                                          *
*=====*
*-----*
*   Session - Creates .WS file and Icon for the session
*-----*
Session= (
    *-----*
    * WSName      - Workstation profile name which you create.
    *              Value:   file name
    *              Default: MY.WS
    *-----*
    WSName=session1.ws
    *-----*
    * IconName    - The title of Icon
    *              Value:   Text
    *              Default: WSName
    *-----*
    IconName=LAN session
)

*-----*
* Specify your configuration to be changed or added
*   to the .WS file specified by WSName. (Default is MY.WS)
*
*-----*
Communication= (
    WSName=session1.ws
    AutoConnect=Y
    Link=rui
    LinkType=slan
    Session=3270
)
RUI= (
    WSName=session1.ws
    LUName=#LUA0002
    StartCM=Y
    StopCM=Y
    AutoReconnect=Y
    AFConfigFile=LAN
)
3270= (
    WSName=session1.ws
    ScreenSize=43x80
    SessionType=Display
)

```

Figure 5. An Example of a Specific Response File (SAMPLE.RSP – 3 of 4)

```

*-----*
* Session - Creates .WS file and Icon for the session
*-----*
Session= (
    WSName=session2.ws
    IconName=DFT session
)

*-----*
* Specify your configuration to be changed or added
*   to the .WS file specified by WSName. (Default is MY.WS)
*-----*
Communication= (
    WSName=session2.ws
    AutoConnect=N
    Link=csdft
    Session=3270
)
3270= (
    WSName=session2.ws
    ScreenSize=32x80
    SessionType=Printer
)

```

Figure 6. An Example of a Specific Response File (SAMPLE.RSP – 4 of 4)

The following figure shows the Access Feature response referenced by the **AFRspFile** installation keyword.

```

CMDEFAULTCONFIG=1
CMUSERCFG=LAN
ATTACH_MANAGER=(
    START=1
)
LAN_DLC=(
    NAME=0
    ADAPTER_TYPE=2
    CSM_LAN_ID=NETID
    DISABLE_REACT=0
    FREE_LINK=0
    HPR_LLERP_OPTION=1
    HPR_SUPPORT=1
    LINK_ESTABLISHMENT_RETRANSMISSION=8
    LOCAL_SAP=04
    MAX_ACTIVATION_ATTEMPTS=0
    MAX_I_FIELD_SIZE=2224
    MAX_LINK_STATION=4
    BRANCH_EXTENDER_SUPPORT=0
    PER_INCOMING_CALLS=0
    RECEIVE_COUNT=4
    RETRANSMISSION_THRESHOLD=8
    SEND_ALERT=0
    SEND_COUNT=4
)
LOCAL_CP=(
    CP_ALIAS=CPNAME
    DLUR_MULTISUBNET_SUPPORT=1
    FREE_UNUSED_SESSIONS=0
    FREE_UNUSED_SESSIONS_TIMEOUT=10
    HOST_FP_LINK_NAME=HOSTLINK
    HOST_FP_SUPPORT=1
    MAX_COMPRESSION_LEVEL=0
    MAX_COMPRESSION_TOKENS=0
    NAME=NETID.CPNAME
    NAU_ADDRESS=0
    NODE_ID=05D00000
    NODE_TYPE=3
    NW_FP_SUPPORT=0
    BRANCH_EXTENDER_SUPPORT=0
    SEARCH_REQUIRED=0
)

```

Figure 7. An Example of a LAN Response File (LAN.RSP – 1 of 3)

```

LOGICAL_LINK=(
  NAME=HOSTLINK
  ACTIVATE_AT_STARTUP=0
  ADAPTER_NUMBER=0
  ADJACENT_NODE_TYPE=0
  AUTO_REACTIVATE=0
  CONNECTION_TYPE=0
  COST_PER_BYTE=0
  COST_PER_CONNECT_TIME=-1
  CP_SESSION_SUPPORT=1
  DESTINATION_ADDRESS=44444444444404
  DLC_NAME=IBMTRNET
  EFFECTIVE_CAPACITY=-1
  ETHERNET_FORMAT=0
  HOST_BACKUP_LINK=0
  HPR_MLTG_NUMBER=0
  HPR_SUPPORT=-1
  INACTIVITY_TIMEOUT=0
  LIMITED_RESOURCE=-1
  LIMITED_RESOURCE_TIMEOUT=30
  LINK_STATION_ROLE=-1
  MAX_ACTIVATION_ATTEMPTS=0
  MAX_I_FIELD_SIZE=2224
  NODE_ID=05D00000
  BRANCH_EXTENDER_UPLINK=-1
  PROPAGATION_DELAY=-1
  SECURITY=-1
  SOLICIT_SSCP_SESSION=1
  USER_DEFINED_1=-1
  USER_DEFINED_2=-1
  USER_DEFINED_3=-1
)
LUA=(
  NAME=#LUA0002
  HOST_LINK_NAME=HOSTLINK
  NAU_ADDRESS=2
)

```

Figure 8. An Example of a LAN Response File (LAN.RSP – 2 of 3)

```

    ACTIVATE_AT_STARTUP=0
SNA_DEFAULTS=(
    ALIVE_TIMER=60
    DEFAULT_MODE_NAME=BLANK
    DEFAULT_TP_CONV_SECURITY_RQD=0
    DEFAULT_TP_OPERATION=2
    DEFAULT_TP_PROGRAM_TYPE=0
    DISABLE_DLUR_REGISTRATION=0
    IMPLICIT_INBOUND_PLU_SUPPORT=1
    MAX_HELD_ALERTS=10
    MAX_MC_LL_SEND_SIZE=32767
    MOBILE=0
    PATH_SWITCH_TIMER_HIGH=120
    PATH_SWITCH_TIMER_LOW=480
    PATH_SWITCH_TIMER_MEDIUM=240
    PATH_SWITCH_TIMER_NET=60
    RETRY_COUNT=6
    ROUTE_SETUP_TIMEOUT=10
    TN3270E_AUTOMATIC_LOGOFF=0
    TN3270E_KEEPA_LIVE_FREQ=60
    TN3270E_KEEPA_LIVE_TIMER=10
    TN3270E_KEEPA_LIVE_TYPE=0
    TN3270E_PORT=23
)
WORKSTATION=(
    LOAD_ACDI=1
    LOAD_SNA_APPC=1
    LOAD_SRPI=1
    LOAD_X25_API=1
    USE_ACDI_API=0
    USE_ARTIC_ADAPTER_WITHOUT_X25=0
    USE_LAN_PROTOCOLS_USING_ISDN=0
)

```

Figure 9. An Example of a LAN Response File (LAN.RSP – 3 of 3)

```

+-----+
| [Profile]                                     |
| ID=WS                                         |
| Description=LAN session                      |
|                                              |
| [Communication]                             |
| AutoConnect=Y                               |
| Link=rui                                    |
| LinkType=slan                               |
| Session=3270                                |
|                                              |
| [RUI]                                        |
| LUName=#LUA0002                             |
| StartCM=Y                                   |
| StopCM=Y                                   |
| AutoReconnect=Y                             |
| AFConfigFile=LAN                           |
|                                              |
| [3270]                                       |
| ScreenSize=43x80                           |
| SessionType=Display                         |
+-----+

```

Figure 10. An Example of a .WS File Created at the Target (SESSION1.WS)

```

+-----+
| [Profile]                                     |
| ID=WS                                       |
| Description=DFT session                    |
|                                           |
| [Communication]                             |
| AutoConnect=N                             |
| Link=cdfdt                                |
| Session=3270                               |
|                                           |
| [3270]                                     |
| ScreenSize=32x80                           |
| SessionType=Printer                         |
+-----+

```

Figure 11. An Example of a .WS File Created at the Target (SESSION2.WS)

```

+-----+
| [Profile]                                     |
| ID=BCH                                     |
| Description=                               |
|                                           |
| [Batch]                                     |
| Run1=C:\PCOMOS2\PCSW.S.EXE C:\PCOMOS2\PRIVATE\SESSION1.WS |
| Run2=C:\PCOMOS2\PCSW.S.EXE C:\PCOMOS2\PRIVATE\SESSION2.WS |
+-----+

```

Figure 12. An Example of a .BCH File Created at the Target (SAMPLE.BCH)

Sample Response File

Personal Communications provides sample response file templates which you can copy and fill in. You can find these files on the product CD-ROM under the subdirectory RSP. The following table lists the response file templates.

File Name	Feature Configured or Illustrated
PADLCC.RSP	Async console SNA-over-Async parameters
PAEA.RSP	Home3270 parameters
PAPPC.RSP	APPC parameters
PASYNC.RSP	Advantis** (IIN) parameters
PCNDFT.RSP	Non-SNA DFT parameters
PCOMOS2.RSP	Installation and session parameters
PCSDFT.RSP	SNA DFT parameters
PCT.RSP	Communication tower parameters
PCUT.RSP	3270 CUT parameters
PCUT5.RSP	5250 CUT parameters
PFILE.RSP	Workstation file parameters
PHPO.RSP	IBM Global Network Connection parameters
PLU.RSP	SNA logical unit parameters
PNW4SAA.RSP	NetWare** for SAA parameters
PRUI.RSP	LUA interface parameters
PTDLC.RSP	Twinaxial data link parameters

File Name	Feature Configured or Illustrated
PTDLCP.RSP	AS/400 passthrough twinaxial data link parameters
PTELNET.RSP	TCP/IP Telnet3270 parameters
PTELNET5.RSP	TCP/IP Telnet5250 parameters
PAPI.RSP	Application programming interface parameters
PCOLORS.RSP	Workstation colors parameters
PDIAL.RSP	Automatic Dial utility parameters
PGRAPH.RSP	3270 host graphics colors parameters
PHOTSPT.RSP	Workstation hot spot parameters
PKBD.RSP	Workstation keyboard parameters
PMACRO.RSP	Workstation macro parameters
PMOUSE.RSP	Workstation mouse parameters
PPOPPAD.RSP	Workstation pop-up keypad parameters
PPRT.RSP	Workstation printers parameters
PTBAR.RSP	Tool-bar parameters
PXFER.RSP	Workstation transfer parameters
PXLATE.RSP	Workstation translation parameters
PWINDOW.RSP	Workstation window parameters

In the following sections, the variable values of keywords are denoted using the following symbols:

Symbol Used	Meaning
Character "c" as in ccccc	Character variable The number of "c"s represents the number of characters.
Character "n" as in nnnnn	Integer variable. The number of "n"s represents the number of digits.
Character "x" as in xxxxx	Hexadecimal variable. The number of "x"s represents the number of digits.
Character "d" as in ddddd	The number of "d"s represents the number of digits.
-	Value does not exist.

Note: The **quiet** keyword is no longer available in the response file syntax for CID installations.

Installation Record Keywords

This section lists and shows what to specify for each installation record keyword.

The following table describes an overall Personal Communications response file syntax.

Table 2. Summary of Response File Installation Functions and Keywords

Keyword	Description	Value	Default
NOP	No operation	0, N=No 1, Y=Yes	0
TargetPath	Where to install the code	Fully qualified path name	bootdrive:\PCOMOS2
SourcePath	Path to the source code	Fully qualified path name	Path of INSTALL.EXE
SelectFile	Selective installation	File names, "!" with file names means do not install	BLANK (=Full)
EmulType	Emulation type to install	0=Both 1=3270 2=5250	Defaults to the version of Personal Communications that is already installed. If Personal Communications is not installed, the default is 1.
Administrator	Administrator option	0, N=No 1, Y=Yes	0
NetWork	Network installation	0, N=No 1, Y=Yes	0
ServerPath	Path to the source code on a server	Fully qualified path name	SourcePath
Folder	Folder creation	0, N=No 1, Y=Yes	1
Remove	Remove code or remove all	0=No, 1=Remove Code, 2=Remove All	0
Reinstall*1	Reinstall when the same version already exists on TargetPath	0, N=No 1, Y=Yes	0
Reconfigure*1	Specifies whether to reconfigure an already created configuration file or to configure a new configuration file	0, N=No 1, Y=Yes	1
Migrate*1	Specifies whether to merge the configuration file	0, N=No 1, Y=Yes	1
Copy	Copies one file to another	filespec path, where filespec specifies the source file and path specifies the target file and path	-
Include	Includes other response files	filespec, where filespec specifies the file to include	-
Version*2	Associates a response file with a version of the product	namespec	-
AFRspFile	Fully qualified Access Feature response file name	filespec, where filespec specifies the source response file and path	-

Table 2. Summary of Response File Installation Functions and Keywords (continued)

Keyword	Description	Value	Default
Notes:			
*1	For more details, see Table 3 and Table 4 .		
*2	namespec must be as follows: IBM Personal Communications OS/2 Product * 4.3 The last string "4.3" should be the version of package. If it is greater than the version of package, CID fails.		

Table 3 shows what happens when you try to install Personal Communications, using each Reinstall keyword value, to a system that has Personal Communications already or not already installed in the target directory

Table 3. Installation Process Performed by Each Reinstall Keyword Value

Reinstall value	Personal Communications Is Not Installed	Personal Communications Is Already Installed
1 (Yes)	Installation is performed	Installation is performed
0 (No)*	Installation is performed	Installation is <i>not</i> performed
Note: * Default		

Table 4 shows what happens when you try to reconfigure Personal Communications, using each Reconfigure keyword value in combination with each Migrate keyword value.

Table 4. Reconfiguration Process Performed by Each Reconfigure Keyword Value

	Migrate = 1 (Yes) *	Migrate = 0 (No)
Reconfigure = 1 (Yes)*	Data in the response file is merged with data in an existing WS file, or a new WS file is created from data in the response file if the WS file does not exist in the target directory.	An existing WS file is replaced with only data in the response file, or a new WS file is created from data in the response file if the WS file does not exist in the target directory.
Reconfigure = 0 (No)	Configuration is <i>not</i> performed	Configuration is <i>not</i> performed
Note: * Default		

Session-Oriented Record Keywords

This section lists and shows what to specify for each session-oriented record keyword.

3270 Record

The field keywords described in the following table are used to configure the 3270 session.

To define the 3270 record, use the **3270** keyword. For example:

```
3270 = (
    WSName = MY.WS
    ScreenSize = 24x80
    SessionType = Display
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
ScreenSize	nn×nn	24x80	Screen size of the host session (24x80, 32x80, 43x80, 27x132, 48x80, 62x160, 24x132)
SessionType	Display, Printer	Display	Use the workstation for the display or printer emulation
HostGraphics	1/0 or Y/N	N	Host Graphics support
HostCodePage	nnn-c	037-U	Host code page 273-A : Austria 037-B : Belgium 870-BH : Bosnia/Herzegovina 037-Z : Brazil 1025-B : Bulgaria 037-C : Canada 870-CR : Croatia 870-CZ : Czech 277-D : Denmark 278-F : Finland 297-F : France 1025-M : FYR Macedonia 273-G : Germany 875-G : Greece 870-H : Hungary 871-I : Iceland 280-I : Italy 930-JK : Japan Katakana 930-JKE: Japan Katakana-Extended 939-JLE: Japan Latin-Extended 284-L : Latin America 500-M : Multinational 037-N : Netherlands 277-N : Norway 870-P : Poland 037-P : Portugal 870-R : Romania 1025-R : Russia 1025-S : Serbia/Montenegro 870-SK : Slovakia 870-SV : Slovenia 284-S : Spain 278-S : Sweden 1026-T : Turkey 285-U : U.K. 037-U : United States
LtNumber	xx	FF(See note 1)	LT number
LuNumber	xx	FF(See note 1)	LU number
NativeGraphics	1/0 or Y/N	N	Enable the native graphics feature
QueryReplyMode	Auto, Fixed	Auto	Query replay that is usable is sent according to the workstation window sizes

Keyword	Values	Default	Description
CharacterCellSize	nn × nn	9 × 16	Specify the dimensions of the character cell
LoadPSS	1/0 or Y/N	N	Specifies whether the Programmed Symbol Set function is enabled.
Note: 1 When FF is specified, the value is automatically set.			

5250 Record

The field keywords described in the following table are used to configure the 5250 session.

To define the 5250 record, use the **5250** keyword. For example:

```
5250 = (
    WSName = MY.WS
    ScreenSize = 24x80
    SessionType = Display
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
ScreenSize	nn×nn	24x80	Screen size of the host session (24x80, 27x132)
SessionType	Display, Printer, Router	Display	Session type

Keyword	Values	Default	Description
HostCodePage	nnn-c	037-U	Host code page 273-A : Austria 500-A : Austria MNCS 500-B : Belgium MNCS 870-BH : Bosnia/Herzegovina 037-Z : Brazil 1025-B : Bulgaria 500-C : Canada MNCS 870-CR : Croatia 870-CZ : Czech 277-D : Denmark 500-D : Denmark MNCS 278-F : Finland 500-FI : Finland MNCS 297-F : France 500-F : France MNCS 1025-M : FYR Macedonia 273-G : Germany 500-G : Germany MNCS 875-G : Greece 870-H : Hungary 871-I : Iceland 280-I : Italy 500-I : Italy MNCS 930-JK : Japan Katakana 931-JL : Japan Latin 939-JLE : Japan Latin-Extended 284-L : Latin America 037-N : Netherlands 500-N : Netherlands MNCS 277-N : Norway 500-NO : Norway MNCS 870-P : Poland 037-P : Portugal 500-P : Portugal MNCS 870-R : Romania 1025-R : Russia 1025-S : Serbia/Montenegro 870-SK : Slovakia 870-SV : Slovenia 284-S : Spain 500-SP : Spain MNCS 278-S : Sweden 500-SW : Sweden MNCS 500-SF : Switzerland/French 500-SG : Switzerland/Germany 1026-T : Turkey 285-U : U.K. 500-UK : U.K. MNCS 037-U : United States 500-US : United States MNCS
WorkStationID	(string)	-(See note 1)	Workstation ID
PartnerLU	caaaaaaa.caaaaaaa Where c is A-Z, a is A-Z, #, @, \$	APPN.-	Fully qualified partner LU name (system location name)
LocalLU	caaaaaaa.caaaaaaa Where c is A-Z, a is A-Z, #, @, \$	APPN.-	Fully qualified local LU name (workstation location name)
StatusIcon	Show, Hide	Hide	Display Router Session status icon or not
AutoLogon	1/0 or Y/N	N	Bypass APPC logon panel

Keyword	Values	Default	Description
UserProfile	(string)	-(See note 2)	Name of the user profile that includes the user ID and password
MsgQueue	(string)	QSYSOPR	Message queue
MsgLibrary	(string)	*LIBL	Message library
HostFont	(string)	Courier10	Host font
HostPrintTransform	1/0 or Y/N	N	Host print transform
ASCII899	1/0 or Y/N	N	ASCII899 support (HPT)
ManufacturerType	(string)	*IBM 3812	Manufacturer type and model (HPT)
PaperSource1	*NONE *MFRTYPMDL *LETTER *LEGAL *EXECUTIVE *A4 *A5 *B5 *CONT80 *CONT132	*MFRTYPMDL	Size of the paper source (HPT)
PaperSource2	*NONE *MFRTYPMDL *LETTER *LEGAL *EXECUTIVE *A4 *A5 *B5 *CONT80 *CONT132	*NONE	Size of the paper source (HPT)
EnvelopType	*NONE *MFRTYPMDL *EXECUTIVE *B5 *C5 *DL *MONARCH *NUMBER9	*NONE	Size of the paper source (HPT)
WsObject	(string)	QWPDEFAULT	Workstation customization object (HPT)
WsLibrary	(string)	*LIBL	Workstation customization library (HPT)
Notes: 1 When no value is specified, the values is set as follows: For display Snn For printer Pnn			

- 2** If you do not specify this value, the User Profile Panel, where you can specify a value, is displayed.

Communication Record

The field keywords described in the following table are used to specify the type of communication link to select to establish the host session.

To define the communication record, use the **Communication** keyword. For example:

```
Communication = (
    WSName = MY.WS
    AutoConnect = 1
    Link = rui
    Linktype = slan
    Session = 3270
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
AutoConnect	1/0 or Y/N	Y	The host connection is established automatically or not
Link	aea, APPC3270, ascon, async, cndft, csdft, CT, cut, cut52, hpo, nw4saa, rui, telnet3270, telnet5250	(*1)	Link type(*2)
LinkType	adlc, advap32, advap52, adv3270, ham, peer, sdhc, sdhpass, slan, slanpass, tdlc, tdlcpass	None	Specifies the configuration type used by Access Feature(*3)
Session	3270, 5250	(*1)	Session type
*1 Must be specified. *2 See table below. *3 See table below.			

Keyword *2	Description
<i>For 3270 session:</i>	
nw4saa (NW4SAA)	NetWare for SAA
telnet3270 (Telnet3270)	TCP/IP
csdft (CSDFT)	SNA DFT
cndft (CNDFT)	non-SNA DFT
cut (CUT)	CUT
async (ASYNCR)	Advantis(IIN)
aea (AEA)	Home3270
rui	Access Feature 3270 Connection
APPC3270	Access Feature APPC3270 Connection
hpo	IBM Global Network Connection
<i>For 5250 session:</i>	
telnet5250 (Telnet5250)	TCP/IP
cut52 (CUT5250)	Twinax Console

Keyword *2	Description
ascon (ADLCASCON)	Async Console
CT	Access Feature 5250 Connection

LinkType *3	Description
<i>If RUI:</i>	
slan	LAN via 802.2
slanpass	3270 via AS/400
adv3270	Advanced 3270 Connections
peer	3270 Peer Communication
ham	Hayes Auto
adlc	SNA over Async
sdlc	SDLC
sdlcpass	3270 via AS/400
tdlcpass (TDLCPASS)	Twinax via AS/400 pass-through
<i>If APPC3270:</i>	
slan	APPC3270 via LAN
advap32	Advanced APPC3270 Connections
sdlc	APPC3270 via SDLC
<i>If CT:</i>	
slan	LAN via 802.2
advap52	Advanced 5250 Connections
ham	Hayes Auto
adlc	SNA over Async
sdlc	SDLC
tdlc	Twinax

Session Record

The field keywords described in the following table are used to define the workstation profile.

To define the session record, use the **Session** keyword. For example:

```
Session =(
  WSName = MY.WS
  IconName = Session
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
IconName	(string)	WSName	The title of the icon

File Record

The field keywords described in the following table are used to define the workstation profile.

To define the file record, use the **File** keyword. For example:

```
File =(
    WSName = MY.WS
    SaveOnExit = 1
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
SaveOnExit	1/0 or Y/N	Y	Save the workstation profile when the session is terminated

Connection- and Communication-Oriented Record Keywords

This section lists and shows what to specify for each of the connection-oriented and communication-oriented record keywords.

AEA Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session using the Home3270 attachment.

To define the Home3270 record, use the **AEA** keyword. For example:

```
AEA = (
    WSName = MY.WS
    ComPortNumber = 1
    LineSpeed = 1200
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
ComPortNumber	1, 2, 3, 4	1	Communication port number. 1:COM1 2:COM2
LineSpeed	110, 150, 300, 600, 1200, 2400*, 4800*, 9600*, 19200**, 14400, 38400, 57600	1200	Line speed in bits per second.
DataBits	7,8	7	Data bits
Parity	NONE, ODD, EVEN, MARK SPACE	ODD	Parity
StopBits	1, 2	1	Stop bits
Pacing	1/0 or Y/N	Y	XON/XOFF pacing
RolmPhone	1/0 or Y/N	N	Attached to a ROLM** phone with DCM or not
ProtocolConv	9370, 3174, 7171, 3708, 3708A	3708	Attached protocol converter type
AutoDial	1/0 or Y/N	N	Use auto-dial facility
EnableA0	1/0 or Y/N	Y	Display X'A0'-X'FF' characters as they are, or convert to X'20'-X'7F'

Keyword	Values	Default	Description
ADFfilename	(string)	PCSDIALADU	Name of file to store auto-dial facility parameters

APPC3270 Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the SNA LU 6.2 session for APPC3270 connection.

To define the APPC3270 record, use the **APPC3270** keyword. For example:

```
APPC3270 = (
    WSName = MY.WS
    StartCM = Y
    StopCM = Y
    AFConfigFile = LAN
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
PLUName	cccccccc or cccccccc.cccccccc	- or -.-	Partner LU name (partner LU alias or fully qualified partner LU name)
ModeName	cccccccc	-	Mode name (#INTER) (via CM/2 only)
LocalLUName	cccccccc.cccccccc	-.-	Fully qualified local LU name
StartCM	1/0 or Y/N	Y	Automatically start communications at startup
StopCM	1/0 or Y/N	Y	Automatically stop communications at last session stop
AutoReconnect	1/0 or Y/N	Y	Reconnect session automatically
AFConfigFile	xxxxxxx	--	Access Feature configuration file name. This name must match the name specified on the CMUSERCFG keyword in the Access Feature response file.

ASYNCR Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session using the Advantis(IIN) attachment.

To define the ASYNCR record, use the **ASYNCR** keyword. For example:

```
ASYNCR = (
    WSName = MY.WS
    ComPortNum = 1
    Speed = 1200
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
ComPortNum	1, 2, 3, 4	1	Communication port number
Speed	300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400	1200	Line speed
X25	xx	80	Bits and parity Most significant bit shows the word length <pre> bbbb bbbb | | *-----* 8N=00, 70=20, 7E=60 *- 1=8 bits, 0=7 bits 80=8N, 20=70, 60=7E </pre>
BlockID	xxx	F02	Block ID (3 hex digits)
PuID	xxxxx	00000	PUID (5 hex digits) The 3rd bit of PuID reflects the compression bit
LinkAddress	xx	C1	Link station address (hex 2 digits)
ADF	0, 1, 2	0	Auto Dial (0=None, 1=DIRECT, 2=PAD)
PCSDIALfile	(string)	PCSDIAL.ADU	File name to store auto-dial parameters
PADResponseTimeout	03 ... 18	03	PAD response timeout (seconds)
PADPollDelay	00, 05, ... 70, 75	00	PAD poll delay
PADBufferSize	272 ... 2000	1904	PAD buffer size
InactiveTimeout	0, 5, 10, 30, 60, 120	0	Inactivity timer in minutes

CNDFT Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session using the non-SNA DFT attachment.

To define the CNDFT record, use the **CNDFT** keyword. For example:

```

CNDFT = (
    WSName = MY.WS
    Adapter = 1
    BufferAddress = CE
)

```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
Adapter	0, 1, 2, 3	0	Adapter number
BufferAddress	C0 ... DE	CE	First two hex digits of RAM address; CE means CE000h.
CCA	1/0 or Y/N	N	Y means using CCA3270 card

CSDFT Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session using the SNA DFT attachment.

To define the CSDFT record, use the **CSDFT** keyword. For example:

```
CSDFT = (  
    WSName = MY.WS  
    Adapter = 1  
    BufferAddress = CE  
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
Adapter	0, 1, 2, 3	0	Adapter number
BufferAddress	C0 ... DE	CE	First two hex digits of RAM address; CE means CE000h
CCA	1/0 or Y/N	N	Y means using CCA3270 card

CT Record (for 5250 Only)

The field keywords described in the following table are used to configure the parameters required to establish a 5250 session using a Twinax, an SDLC (MPA, SNA over Async, or Hayes Autosync), a LAN, or an Advanced Access Feature connection.

For example:

```
CT = (  
    WSName = MY.WS  
    AutoRecovery = Y  
    AFConfigFile = LAN  
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
LocalLUName	(string)	--(1)	Local LU name
LocalLUalias	(string)	--(1)	Local LU alias name
PartnerLUName	(string)	--(1)	Fully qualified partner LU name
PartnerLUalias	(string)	--(1)	Partner LU alias
ModeName	(string)	--(1)	Mode name
StartCM	1/0 or Y/N	Y	Automatically start communications at startup
AutoRecovery	1/0 or Y/N	Y	Automatic recovery facility
PLU_IS_ALIAS	1/0 or Y/N	Y	Alias name is used for partner name

Keyword	Values	Default	Description
AFConfigFile	xxxxxxx	--	Access Feature configuration file name. This name must match the name specified on the CMUSERCFG keyword in the Access Feature response file.

CUT Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session using the CUT attachment.

To define the CUT record, use the **CUT** keyword. For example:

```
CUT = (
    WSName = MY.WS
    Adapter = 0
    BufferAddress = CE
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
Adapter	0, 1, 2, 3	0	Adapter number
BufferAddress	C0 ... DE	CE	First two hex digits of RAM address; CE means CE000h
CCA	1/0 or Y/N	N	Y means using CCA3270 card,
NumLock	1/0 or Y/N	N	Y means Numeric Lock is on (seconds)
KeyboardType	E, (S)	E	Keyboard type (Emulation/Standard); PC/3270 supports only emulation type
CULanguage	0, 1	0	Control unit language; 0:US 1:AG PC/3270 supports US or AG

CUT5250 Record (for 5250 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 5250 session using the CUT attachment.

To define the CUT5250 record, use the **CUT5250** keyword. For example:

```
CUT5250 = (
    WSName = MY.WS
    StationAddress = 00
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
StationAddress	00 ... 06	00	Station address

HPO Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session using the IBM Global Network Connection.

To define the IBM Global Network Connection record, use the **HPO** keyword. For example:

```
HPO = (  
    WSName = MY.WS  
    ComPortNum = 1  
    Speed = 1200  
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
ComPortNum	1,2,3,4	1	Communication port number
Speed	300, 1200, 2400, 4800, 9600, 14400, 19200, 28800 38400	9600	Line speed
AutoDial	0, 1	0	Auto Dial (0 = None, 1 = DIRECT)
PCSDIALfile	(string)	PCSDIAL.ADU	File name to store auto-dial parameters
InactiveTimeout	None, 5, 10, 30, 60, 120	60	Idle timeout (minutes)
Encryption	0, 1	1	Encryption level (0 = None, 1 = DES)

Keyword	Values	Default	Description
GWLocation	cc	US	Advantis Gateway Location (Abbreviation of Country/Region Name)
			Value Meaning
			AU Australia
			AT Austria
			BE Belgium
			BR Brazil
			CA Canada
			CL Chile
			CY Cyprus
			DK Denmark
			FI Finland
			FR France
			DE Germany
			GR Greece
			HK China (Hong Kong S.A.R.)
			ID Indonesia
			IE Ireland
			IT Italy
			LU Luxembourg
			MX Mexico
			AN Netherland Antilles
			NL Netherlands
			NZ New Zealand
			NO Norway
			PE Peru
			ZA South Africa
			ES Spain
			SE Sweden
			CH Switzerland
			TH Thailand
			TR Turkey
			GB United Kingdom
			US United States

LU Record

The field keywords described in the following table are used to configure the parameters required for the SNA Logical Unit characteristic.

To define the LU record, use the **LU** keyword. For example:

```
LU = (
    WSName = MY.WS
    CompEnabled = 1
    CompBufSize = 4096
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
CompEnabled	1/0 or Y/N	N	VTAM compression Y Enable N Disable
CompBufSize	dddd	4096	Compression buffer size

NW4SAA Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session attached to NetWare for SAA Gateway.

To define the NW4SAA record, use the **NW4SAA** keyword. For example:

```
NW4SAA = (
    WSName = MY.WS
    Server = server
    UserID = user
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
Server	(string)	-	Server name
UserID	(string)	-	User name
Service	(string)	-	Service name
LUCategory	Any, Public, Dedicated, Pooled	Any	LU category
LUName	(string)	-	Dedicated LU name if "Dedicated"; LU pool name if "Pooled"; N/A if "Any" or "Public"

RUI Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish a 3270 session using a Twinax, an SDLC (MPA, SNA over Async, or Hayes Autosync), a LAN, or an Advanced Access Feature connection.

To define the RUI record, use the **RUI** keyword. For example:

```
RUI = (
    WSName = MY.WS
    StartCM = Y
    StopCM = Y
    AFConfigFile = LAN
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
LUName	cccccccc	-	LUA LU name
StartCM	1/0 or Y/N	Y	Automatically start communications
StopCM	1/0 or Y/N	Y	Automatically stop communications at the last session stop
AutoReconnect	1/0 or Y/N	Y	Reconnect the session automatically
AFConfigFile	xxxxxxxx	--	Access Feature configuration file name. This name must match the name specified on the CMUSERCFG keyword in the Access Feature response file.

Telnet3270 Record (for 3270 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 3270 session using the TCP/IP protocol.

To define the Telnet3270 record, use the **Telnet3270** keyword. For example:

```
Telnet3270 = (
    WSName = MY.WS
    HostName = host1
    HostPortNumber = 23
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
AutoReconnect	1/0 or Y/N	N	Automatically reconnect after logoff
HostName	String (up to 64 characters)	--	The 32-bit internet address of a Telnet 3270 host, in dotted decimal notation (for example, 9.68.99.1) or the name of a host, in string (for example, tn3270srv.yamato.ibm.com)
HostPortNumber	1-32767 (integer)	23	Target host's Telnet port number
TerminalType	3278, 3279	3278	Terminal type
ExtendedColor	1/0 or Y/N	Y	Enable or disable extended data stream
LUName	cccccccc	-	LU name

Telnet5250 Record (for 5250 Only)

The field keywords described in the following table are used to configure the parameters required to establish the 5250 session using the TCP/IP protocol.

To define the Telnet5250 record, use the **Telnet5250** keyword. For example:

```
Telnet5250 = (
    WSName = MY.WS
    HostName = host1
    HostPortNumber = 23
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
AutoReconnect	1/0 or Y/N	N	Automatically reconnect after logoff
HostName	String (up to 64 characters)	--	The 32-bit internet address of a Telnet 5250 host, in dotted decimal notation (for example, 9.68.99.1) or the name of a host, in string (for example, tn5250srv.yamato.ibm.com)
HostPortNumber	1-32767 (integer)	23	Target host's Telnet port number
TerminalType	5555, 3179, 3477	3179	Terminal type

GUI and Miscellaneous Record Keywords

This section lists and shows what to specify for both the GUI and the miscellaneous record keywords.

API Record

The field keywords described in the following table are used to activate and deactivate the APIs provided by PC400.

To define the API record, use the **API** keyword. For example:

```
API = (
    WSName = MY.WS
    DDE/HLL = Y
    PcCodePage = 819
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
DDE/HLL	1/0 or Y/N	Y	DDE/HLL is enabled or not
PcCodePage	dddd	(See Description)	Personal computer code page that is used by API: for example 437, 813, 819, 850, 852, 855, 857, 860, 861, 863, 865, 866, 869, 897, 915, 1041
DosBoxHll	1/0 or Y/N	N	Dos Box EHLLAPI(API) is enabled or not
SRPI	1/0 or Y/N	N	SRPI is enabled or not: this keyword is not valid for asynchronous connection (Lynk=Async)

AutoDial Record

The field keywords described in the following table are used to control the Automatic Dial utility.

To define the AutoDial record, use the **AutoDial** keyword. For example:

```
AutoDial = (  
    WSName = MY.WS  
    DialList = N  
    TermDialList = Y  
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
DialList	1/0 or Y/N	Y	Show AutoDial Utility when dialing
TermDialList	1/0 or Y/N	Y	Exit Auto Dial Utility after connection
ManualDial	1/0 or Y/N	N	Dial a telephone number manually

Colors Record

The field keywords described in the following table are used to customize the colors in the session window.

To define the colors record, use the **Colors** keyword. For example:

```
Colors = (  
    WSName = MY.WS  
    ForeText = 9 5 11 3 10 9 15 5 11 3 7 3 9 10 3 7 5 3 3 10 9  
    BackText = 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name

Keyword	Values	Default	Description
BackText	0: Black 1: Brown 2: Gray 3: White 4: Orange 5: Red 6: Mustard 7: Yellow 8: Dark Green 9: Green 10: Dark Turquoise 11: Turquoise 12: Dark Blue 13: Blue 14: Purple 15: Pink	(Depends on the display driver)	<p>Specifies the background color by setting the color palette index to the following position:</p> <pre> color index integer BackText = xx xx xx xx ... xx 01 02 03 04 ... 21 ----- Position meaning 01: Normal, unprotected 02: Intensified, unprotected 03: Normal, protected 04: Intensified, protected 05: Extended, blue 06: Extended, green 07: Extended, pink 08: Extended, red 09: Extended, turquoise 10: Extended, white 11: Extended, yellow 12: Extended, default highlight 13: Extended, default 14: OIA, status indicators 15: OIA, information indicators 16: OIA, attention indicators 17: OIA, error indicators 18: OIA, background 19: Screen color 20: Divider line 21: Rule line </pre>

Keyword	Values	Default	Description
ForeText	0: Black 1: Brown 2: Gray 3: White 4: Orange 5: Red 6: Mustard 7: Yellow 8: Dark green 9: Green 10: Dark turquoise 11: Turquoise 12: Dark blue 13: Blue 14: Purple 15: Pink	(Depends on the display driver)	<p>Specifies the foreground color by setting the color palette index to the following position:</p> <pre> color index integer ForeText = xx xx xx xx...xx 01 02 03 04...21 | |-----| | Position meaning </pre> <p>01: Normal, unprotected 02: Intensified, unprotected 03: Normal, protected 04: Intensified, protected</p> <p>05: Extended, blue 06: Extended, green 07: Extended, pink 08: Extended, red 09: Extended, turquoise 10: Extended, white 11: Extended, yellow 12: Extended, default highlight 13: Extended, default</p> <p>14: OIA, status indicators 15: OIA, information indicators 16: OIA, attention indicators 17: OIA, error indicators 18: OIA, background</p> <p>19: Screen color 20: Divider line 21: Rule line</p>

Keyword	Values	Default	Description
BackGraf	: Black 1: Brown 2: Gray 3: White 4: Orange 5: Red 6: Mustard 7: Yellow 8: Dark green 9: Green 10: Dark turquoise 11: Turquoise 12: Dark blue 13: Blue 14: Purple 15: Pink	(Depends on the display driver)	<p>Specifies the background graphic color by setting the color palette index to the following position:</p> <pre> | | color index integer ForeGraf = xx xx xx xx...xx 01 02 03 04...17 | |-----| | | Position meaning 01: Default 02: Blue 03: Red 04: Pink 05: Green 06: Turquoise 07: Yellow 08: White 09: Black 10: Dark Blue 11: Orange 12: Purple 13: Dark Green 14: Dark Turquoise 15: Mustard 16: Gray 17: Brown </pre>
ForeGraf	0: Black 1: Brown 2: Gray 3: White 4: Orange 5: Red 6: Mustard 7: Yellow 8: Dark Green 9: Green 10: Dark Turquoise 11: Turquoise 12: Dark Blue 13: Blue 14: Purple 15: Pink	(Depends on the display driver)	<p>Specifies the foreground graphic color by setting the color palette index to the following position:</p> <pre> | | color index integer ForeGraf = xx xx xx xx ... xx 01 02 03 04 ... 17 | |-----| | | Position meaning 01: Default 02: Blue 03: Red 04: Pink 05: Green 06: Turquoise 07: Yellow 08: White 09: Black 10: Dark Blue 11: Orange 12: Purple 13: Dark Green 14: Dark Turquoise 15: Mustard 16: Gray 17: Brown </pre>

Keyword	Values	Default	Description
BlinkAttr	Same as above	0 0	<p>Specifies the blink attribute by setting the color palette index to the following position:</p> <pre> color index integer | ForeGraf = xx xx 01 02 | |-----| | Position meaning 01: Foreground color for blink 02: Background color for blink </pre>

Graphics Record (for 3270 Only)

The field keywords described in the following table are used to customize the 3270 host graphics capabilities.

To define the graphics record, use the **Graphics** keyword. For example:

```

Graphics = (
    WSName = MY.WS
    Redraw = Retained
    CursorStyle = 4
)

```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
Redraw	Bitmap, Retained, Host	Retained	<p>Specifies how displayed pictures are redrawn</p> <p>Bitmap: A bit map is used to redraw.</p> <p>Retained: Redraw is held on retained mode.</p> <p>Host: No redraw is held until the host sends the graphics data.</p>
CursorStyle	1, 2, 3, 4, 5	1	<p>Specifies one of five graphics cursor styles:</p> <p>1: White target</p> <p>2: White cross</p> <p>3: XOR'd target</p> <p>4: XOR'd cross</p> <p>5: XOR'd cross hair</p>

Keyword	Values	Default	Description
CursorMovement	0, 1	0	Specifies whether the cursor move keys move the text cursor or the graphics cursor. 0: Text cursor is moved 1: Graphics cursor is moved

HotSpot Record

The field keywords described in the following table are used to set up a HotSpot record.

To define the HotSpot record, use the **HotSpot** keyword. For example:

```
HotSpot = (
    WSName = MY.WS
    template2 = PF nn
    ShowItem = PF
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
template1 template2 template3 :	PF PFnn PF FPnn PF Fnn PF nn macro string cursor URL	PF PFnn PF FPnn PF Fnn PF nn	HotSpot template
ShowItem	PF macro URL	None	3D Hotspot (Show Hotspot)

Keyboard Record

The field keywords described in the following table are used to configure the parameters required for the keyboard operation.

To define the keyboard record, use the **Keyboard** keyword. For example:

```
Keyboard = (
    WSName = MY.WS
    TypeAHead = Y
    Language = United States
)
```

If you change the Keyboard settings, the [Keyboard] section is added to the workstation profile (filename.**WS**) file, where the parameters are specified.

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
TypeAHead	1/0 or Y/N	Y	"Keyboard Buffering" setting is Yes or No

Keyword	Values	Default	Description
SpotConversion	1/0 or Y/N	Y	An input window of FEP at the location of the cursor; it works only in a DBCS session
Language	cccccccccccc (See *3)	*1	Language*3
IBMDefaultKeyboard	1/0 or Y/N	Y	If the user uses customized key mapping, No is set
DefaultKeyboard	filename	-	If the user uses customized key mapping, the file name filename. KMP is written
CUAKeyboard	1: 3270 2: 5250 3: 3270 and 5250	Corresponds to emulation installed.	Function mapping
Notes: *1 The default value depends on the HostcodePage keyword of the 3270 or 5250 record. *2 The Japanese keyboard is available only when the personal computer code page is 932 or 942. *3 Do not include spaces in the keyword value. See following list for values of language keyword.			

Value of Language	Meaning
Albania	Albania
Austria	Austria
Belgium	Belgium
Bosnia/Herzegovina	Bosnia/Herzegovina
Brazil(274)	Brazil 274 (Enhanced only)
Brazil(275)	Brazil 275 (Enhanced only)
Bulgaria	Bulgaria (Enhanced only)
Canada (French)	Canada Bilingual
Croatia	Croatia
Czech	Czech (Enhanced only)
Denmark	Denmark
Finland	Finland
France(120)	France 120 (Enhanced only)
France(189)	France 189 (Enhanced only)
France(251)	France 251 (Host connected only)
Germany	Germany
Greece	Greece (Enhanced only)
Hungary	Hungary (Enhanced only)
Iceland	Iceland 197
Italy(141)	Italy 141 (Enhanced only)
Italy(142)	Italy 142 (Enhanced only)
Italy(293)	Italy 293 (Host connected only)

Japanese(*2)	Japan
Latin-America(Spanish)	Latin America
Macedonia	FYR Macedonia (Enhanced only)
Netherlands	Netherlands
Norway	Norway
Poland	Poland (Enhanced only)
Portugal	Portugal
Romania	Romania (Enhanced only)
Russia(441)	Russia 441 (Enhanced only)
Russia(443)	Russia 443 (Enhanced only)
Serbia	Serbia (Enhanced only)
Slovakia	Slovakia (Enhanced only)
Slovenia	Slovenia
Spain	Spain
Sweden	Sweden
Switzerland(French)	Switzerland (French)
Switzerland(German)	Switzerland (German)
Turkey(179)	Turkey 179 (Enhanced only)
Turkey(440)	Turkey 440 (Enhanced only)
Turkey(402)	Turkey 402 (Host connect only)
United-Kingdom(166)	United Kingdom 166
United-Kingdom(168)	United Kingdom 168 (Enhanced only)
United-States	United States
System	For current system language

Macro Record

The field keywords described in the following table are used to set up Macro.

To define the macro record, use the **Macro** keyword. For example:

```
Macro = (
    WSName = MY.WS
    OpenMacro = C:\PCOMOS2\PRIVATE\MY.MAC
)
```

If you change the macro settings, the [Macro] section is added to the workstation profile (filename.WS) file, and parameters are described there.

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
OpenMacro	filename	-	The specified macro is automatically run when PCSWS.EXE is started.

Mouse Record

The field keywords described in the following table are used to customize the mouse.

To define the mouse record, use the **Mouse** keyword. For example:

```
Mouse = (  
    WSName = MY.WS  
    IBMDefaultMouse = Y  
)
```

If you change the mouse settings, the [Mouse] section is added to the workstation profile (filename.**WS**) file, and parameters are described there.

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
IBMDefaultMouse	1/0 or Y/N	Y	If the user uses a customized mouse setting, No is set
DefaultMouse	filename	-	If the user uses a customized mouse setting, the file name filename. MMP is written

Poppad Record

The field keywords described in the following table are used to customize the pop-up keypad.

To define the pop-up keypad record, use the **Poppad** keyword. For example:

```
Poppad = (  
    WSName = MY.WS  
    StickeyPoppad = Y  
    IBMDefaultPoppad = 0  
    DefaultPoppad = C:\PCOMOS2\PRIVATE\MY.PMP  
)
```

If you change the pop-up keypad settings, the [Poppad] section is added to the workstation profile (filename.**WS**) file, and parameters are described there.

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
StickeyPoppad	1/0 or Y/N	N	If Yes is set to it, it is displayed until you explicitly close the poppad. Otherwise, it is automatically closed when you select a function.
IBMDefaultPoppad	1/0 or Y/N	Y	If the user uses a customized poppad, Yes is set.
DefaultPoppad	filename	-	If the user uses a customized poppad, the file name filename. PMP is written.

Printers Record

The field keywords described in the following table are used to configure the parameters required for the printer session and operation.

To define the printers record, use the **printers** keyword. For example:

```
printers = (
    WSName = MY.WS
    MPP = 132
    MPL = 66
)
```

Keywor	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
ATRN	Y/N	Y	ASCII transparent
AutoOrient	Y/N	-	Automatic orientation (for 5250 Only)
BWSwapPrint	Y/N	Y	Black/white swap print for graphic printer (for 3270 Only)
CPI	0-255	0	Characters per inch
Drawer1Form	String	-	Drawer 1 form name
Drawer2Form	String	-	Drawer 2 form name
Drawer1Orient	COR PORTRAIT LANDSCAPE	COR	Drawer 1 orientation (for 5250 Only)
Drawer2Orient	COR PORTRAIT LANDSCAPE	COR	Drawer 2 orientation (for 5250 Only)
EnvelopForm	String	-	Envelope hopper form name
FFAnyPos	Y/N	N	Specifies if FF is effective at any position on an LU 2, LU 3, or non-SNA session.
LPI	0-255	0	Lines per inch
Magnification	1-4	1	Graphics print magnification (for 3270 Only)
MPP	1-255	132	Maximum print position
MPL	1-255	66	Maximum print line
noSFLonBBI	Y/N	N	Do not send SFL on BBI.
PDT	Y/N	N	PDT mode
PDFPATH	Path name	-	PDF file directory
PDTPATH	Path name	-	PDT file directory
PDTFIELD	Path name	-	PDT file name
printer	String	-	Current printer driver
PRTOPT1	Y/N	N	Suppress null lines
PRTOPT2	Y/N	Y	Print nulls as spaces
PRTOPT3	Y/N	N	Suppress auto NL CR at MPP+1 (for 3270 Only)

Keyword	Values	Default	Description
PRTOPT4	Y/N	N	Suppress auto NL NL at MPP+1 (for 3270 Only)
PRTOPT5	Y/N	N	Ignore FF at fist print position (for 3270 Only)
PRTOPT6	Y/N	Y	Print FF as space followed by characters (for 3270 Only)
Tractor	Y/N	N	Ignore TM/BM
UseDefault	Y/N	Y	Use default settings
Note: If PDT mode is used, the printer settings in the PDT file are used.			

Tool Bar Record

The field keywords described in the following table are used to configure the tool bar.

To define the tool-bar record, use the **Toolbar** keyword. For example:

```
Toolbar = (
    WSName = MY.WS
    BarFile = c:\PCOMOS2\PRIVATE\MY.bnp
)
```

If you change the tool-bar setting, the [Toolbar] section is added to the workstation profile (filename.WS) file, and parameters are described there.

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
BarFile	filename	-	The specified tool bar is automatically run when PCSWS.EXE is started.

Transfer Record

The field keywords described in the following table are used to configure the parameters required for File Transfer.

To define the transfer record, use the **Transfer** keyword. For example:

```
Transfer = (
    WSName = MY.WS
    HostSystem = 2
    DefaultVMDisk = a
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
HostSystem	1 , 2, 3 (for PC/3270) 4 (for PC400)	2 (for PC/3270) 4 (for PC400)	1=VM 2=MVS 3=CICS 4=OS/400
DefaultVMDisk	a, b, c, d	a	Default VM minidisk (2 characters such as a1 or b2 are also accepted)

Keyword	Values	Default	Description
DefaultDataSet	Data set name	None	Default data set name for MVS/TSO
DefaultLibrary	Library name	qgpl	Default library name for OS/400
DefaultDirectory	Directory	PC/3270 or PC400	Default directory (PC/3270 or PC400 installed directory at initialization)
IBMDefaultXlateUp	1/0 or Y/N	Y	Y=Use IBM translation table for upload N=Use user-defined translation table for upload
IBMDefaultXlateDn	1/0 or Y/N	Y	Y=Use IBM translation table for download N=Use user-defined translation table for download
DefaultXlateUp	File name	None	User-defined translation table for upload
DefaultXlateDn	File name	None	User-defined translation table for download
TimeOut	20-65535	30	Timeout value (seconds)
StatusWindow	0, 1	0	0=Show in session window 1=Show in icon
ClearSession	1,2,3	1	1=Default (Clear in VM, CICS) 2=Clear 3=No clear
ListFileExtension	Extension	srl	File extension for list file
HostCommand	Command name	None	User-defined host file transfer command name
PacketSize	256-32000	12288	File send or receive buffer size for PC/3270
PCCodePage	Workstation code page	Current code page(*1)	Workstation code page
XferTypesXXn	Type-optional string	(*2)	XX=VM, MVS, CICS, OS400 n=1-32 (*3)
TemplateXXn	Template	(*4)	XX=VM, MVS, CICS, OS400 n=1-32
ResumeSendFileName	File name	None	Resume file name for upload
ResumeRecvFileName	File name	None	Resume file name for download
EnhancedProtocol	1/0 or Y/N	Y	Y = Use enhanced protocol N = Use normal protocol Only available for IBM Global Network Connection

Keyword	Values	Default	Description
Notes:			
*1	SBCS session current PC Code Page 932/942 for DBCS (Japan) session.		
*2	In Personal Communications, the default types of "text", "binary", "append" (except CICS) are predefined.		
*3	In Personal Communications, the types are defined in the format, for example, XferTypesMVS1=text (JISCI CRLF RECFM(V) LRECL(133))		
*4	In Personal Communications, there are many templates predefined initially.		

Window Record

The field keywords described in the following table are used to customize the session window.

To define the window record, use the **Window** keyword. For example:

```
Window = (
    WSName = MY.WS
    SessFlags = 8C68
    ViewFlags = 4E00
)
```

Keyword	Values	Default	Description
WSName	Workstation profile name	MY.WS	Workstation profile name
SessFlags	xxxx	8C68	<p>Specifies the session window status in 4 hexadecimal digits:</p> <p>0001 Mouse pointer shape is +</p> <p>0002 Dotted column separator</p> <p>0004 Maximized without title bar</p> <p>0008 Cursor shape is underlined</p> <p>0010 Beep for valid key type</p> <p>0020 Beep for incorrect key type</p> <p>0040 Application program makes beep</p> <p>0080 Update alarm is on</p> <p>0100 Trim rect with sizing handles</p> <p>0200 Trim rect remains for edit</p> <p>0400 Nonblinking cursor</p> <p>0800 Row/column indicator is on</p> <p>1000*1 3270 numeric lock is on</p> <p>2000 User-defined title for icon</p> <p>4000 User-defined icon is used</p> <p>8000 (Reserved)</p>

Keyword	Values	Default	Description
ViewFlags	xxxx	4E00	<p>Specifies the session window appearance status in 4 hexadecimal digits:</p> <p>0001</p> <p>| (Not used)</p> <p>0080</p> <p>0100 Rule line is on</p> <p>0200 Rule line follows cursor</p> <p>0400 Rule line style: horizontal</p> <p>0800 Rule line style: vertical</p> <p>1000*2 SO/SI display is on</p> <p>2000*2 Alternate viewing mode</p> <p>4000 Scroll with scroll bar</p> <p>8000 (Reserved)</p>
CaptionFormat	xxxx c	2A '-'	<p>Specifies the format of the caption title of the session window in 4 hexadecimal digits and one character:</p> <p>0001 Session short name</p> <p>0002 Session long name</p> <p>0004 Alternative name</p> <p>0008 Session dimension (R x C)</p> <p>0010 Status (DDE or USER)</p> <p>0020 Separator is used</p> <p>0040 Session type (not used)</p> <p>0080 Session profile name</p> <p>0100 Application program in use</p> <p>c Used as a separator for the above elements</p>
UserTitle	(string)	PCSWS	Specifies the session alternative name used in the above setting
IconTitle	(string)	(null)	Specifies the caption title of the iconic session window
IconFile	filename index	PCSWS.EXE 1	Specifies the file name and icon index in which the icon is used when the session window is iconic
InsertCursor	1/0 or Y/N	N	Specifies whether the insert cursor is enabled. The insert cursor has a half-block shape in insert mode.
MFIColor	1/0 or Y/N	N	Specifies whether the MFI color palette is to be used for the display driver that can display more than 16 colors

Keyword	Values	Default	Description
Notes:			
*1	3270 only.		
*2	DBCS only.		

Chapter 7. Configuring and Using SSL Security for Personal Communications

The purpose of basing communications on Secure Sockets Layer(SSL) is to provide privacy and integrity during communication over an unsecured TCP/IP connection between a client and a target server. This chapter briefly describes how to configure the Personal Communications client to use this mode.

Personal Communications provides several ways to manage certificates:

- “Using Certificate Wizard” on page 110.
- “Using Certificate Management” on page 110.
- “Using the Command Line Mode for Managing Certificates” on page 115.

What is SSL?

SSL is an industry-standard protocol that provides X.509 certificate-based authentication and encryption for unsecured connections. Personal Communications supports client and server side certificate-issuer authentication and encryption of emulation sessions in compliance with the SSL V3 standard. Server side certificate-issuer authentication means that the target server presents its X.509 certificate for the Personal Communications client to inspect for certificate-issuer authenticity before initiating an encrypted session.

SSL client authentication allows a server to confirm a user’s identity. Using the same techniques as those used for server authentication, SSL-enabled server software can check that a client’s certificate and public ID are valid and have been issued by a certificate authority (CA) listed in the server’s list of trusted CAs. This confirmation might be important if the server, for example, is a bank sending confidential financial information to a customer; in that case it is important to check the recipient’s identity.

Privacy and integrity are mediated by X.509 certificates, which act as electronic ID cards. Usually these are issued by external Certificate Authorities (CAs), whose business is the issuing of Internet certificates. Some of these CAs are widely-trusted because of their vetting protocols and performance records. That is, those CAs are thorough in verifying the identity of a certificate requester before issuing a commercial use certificate. Also, the operations of the CAs are secure enough to prevent theft of encryptions keys and other materials that can be used to counterfeit their certificates.

Preparation for SSL Communication

There is a division of labor for SSL configuration tasks. The configurations of the client and the server are coordinated to achieve the required compatibility. The following sections describe the preparation tasks required for client configuration and server configuration.

Server and Related Client Configuration

The administrator of a target server must have completed at least one of the following:

- **Equip the server with an appropriate class X.509 certificate from a well-known Certificate Authority (CA).** The administrator will have created a public/private key pair, submitted a request to the CA for a certificate, and received and activated that server certificate. By definition a *well-known CA* is one whose root certificates are already stored in the Personal Communications PCommClientKeyDb.kdb database file—see “Configuring SSL for Connecting to a Server Using a Certificate from a Well-Known CA” on page 110 for a list of these.

Note: You must also equip the client PCommClientKeyDb.kdb database file with a X.509 personal certificate from the same certificate authority (CA) to enable client authentication.

- **Equip the server with an appropriate class X.509 certificate from an unknown CA.** The procedure is the same as the step above with the added necessity of obtaining the root certificate from the *unknown* CA. Usually the administrator of the target server will distribute the appropriate root certificate which must then be added to the PCommClientKeyDb.kdb database file.

Note: You must also equip the client PCommClientKeyDb.kdb database file with a X.509 personal certificate from the same certificate authority (CA) to enable client authentication.

- **Equip the server with a self-signed X.509 certificate.** The administrator of the target server can do this as an interim measure while waiting for a CA’s certificate. A copy of that certificate must be added to the client PCommClientKeyDb.kdb database file. The distribution must be done in a secure manner to guard the privacy and integrity offered by SSL.

Notes:

1. You must also equip the client PCommClientKeyDb.kdb database file with a X.509 self-signed personal certificate from the same certificate authority (CA) to enable client authentication.
2. A copy of this certificate must also be added to the server’s key database.

Client Configuration

The following elements must be configured on the client side to enable SSL:

- **PCommClientKeyDb.kdb** is a certificate management database that is automatically created in the Personal Communications private subdirectory when Personal Communications is installed. It is password protected. The default password is *pcomm* and is generated when PCommClientKeyDb.kdb is initially created by Personal Communications. To assure the continued integrity of PCommClientKeyDb.kdb, change the default password to a password or passphrase that is not easily guessed. See “Changing the Password of a Client’s Key Database” on page 110 for instructions on changing the password. As installed, this database contains a list of well known CAs and their root certificates that will be sufficient for the majority of SSL client users for server-side authentication. If the target server uses a certificate from one of those well-known CAs, the client user does not need to modify the PCommClientKeyDb.kdb other than to change the default password for server-side authentication. See the notes in “Server and Related Client Configuration” on page 105.
- **PCommClientKeyDb.sth** is a password stash file that is automatically created when Personal Communications is installed. The password or passphrase used to protect PCommClientKeyDb.kdb is encrypted and stored in this stash file for use by Personal Communications. Every time the password is changed on

PCommClientKeyDb.kdb, this stash file must be regenerated. Otherwise, the SSL-mode will not operate. See “Changing the Password of a Client’s Key Database” on page 110 for instructions on changing the password.

Note: The use of a password stash file is strongly discouraged; the protection for these files is not strong.

Note



Using Password for ClientKeyDb.kdb instead of PCommClientKeyDb.sth: Personal Communications allows the option to not use the PCommClientKeyDb.sth password stash file. To operate in this manner, erase the PCommClientKeyDb.sth file from the Personal Communications private subdirectory; then, during SSL session configuration, select the **Prompt for Password Once** radio button from the **Advanced Security Setup** panel.

- The **Enable Security** checkbox must be set in the telnet configuration of Personal Communications to operate in SSL mode. A client operating in SSL mode cannot establish a connection with a server that is operating in ordinary Telnet mode. Likewise, a client operating in ordinary Telnet mode cannot establish a connection with a server operating in SSL mode. See “Configuring Personal Communications for SSL Support” on page 108 for information on enabling security.
- Check the **Send Personal Certificate to Server if Requested** check-box on the **Advanced Security Setup** panel for client authentication. If this field not checked, only server-side authentication is performed. See “Opening a Key Database and Adding a Root Certificate” on page 111 for details.

Establishing an SSL-Based Session

Upon establishing a preliminary connection with a target server, the Personal Communications client is presented a certificate by that server; if you have enabled client certificate authentication, your certificate is likewise presented to the server. The digital signature of the CA is authenticated using a published *root* certificate of the issuing CA. The client automatically decrypts certain information on the presented certificate using a *public* key on the CAs root certificate. This step is successful only when the presented certificate was encrypted using a well-guarded, unique, and corresponding *private* key, known only to the CA. This process can detect (and reject) intentional alterations (forgeries) and the rare garbling that can occur over data circuits.

Personal Communications also allows users to use self-signed certificates for this purpose.

Once this certificate-issuer authentication step succeeds, the client and server negotiate to agree on an encryption key to be used during the ensuing data exchange session.

Secure Session Icon

When an SSL connection is established, a padlock icon is displayed in the Personal Communications status bar. Depending on the level of encryption, the icon is accompanied by a number (**0, 40, 56, 128, 168**). If the session is not SSL-based, the icon shows as unlocked.

You can display information about the security aspects of your session by selecting **Security > Client** from the **Communication** menu, or **Security > Server** from the **Communication** menu.

Configuring Personal Communications for SSL Support

Whether you are configuring a TN3270 or TN5250 session, a single restriction is that the underlying protocol must be TCP/IP. Once you have selected the Connection to Host for your configuration, do the following to enable SSL:

1. Double-click **Start/Configure Session** icon in the Personal Communications folder; or, from an active session, select **Configure** from the **Communication** menu. When the dialog box appears, click **OK**.
2. In the Customize Communication panel, choose the appropriate Type of Host, Interface and Attachment values for the desired Telnet host. Click the **Configure** button.
3. Click the **Configure Link** button on the Customize Communications panel.
4. You will then be presented with the panel for configuring Telnet; there are two aspects:

Basic Telnet Setup

Advanced Security Setup

Host Definition

For the **Host Definition** property page:

1. Specify the normal host name and LU parameters under **Primary**.
2. Specify the **Port Number** under **Primary**. It is likely that it will not be the default port value for Telnet. The administrator of the destination server might have set up a specific port number to handle SSL service.
3. Click **Enable Security**.

Note: If the **Enable Security** checkbox is greyed-out, then SSL support is not installed. Check Personal Communications Installation information to see if an error occurred during product installation.

4. For server authentication only, no additional setup is required. For client authentication, click the **Security Setup** button; the Advanced Security Setup panel is displayed.. Select the desired radio button for key database password option. Check the **Send Personal Certificate to Server if Requested** check-box and select the desired radio button to select or be prompted for the personal certificate. Click **OK**.
5. Click **OK**.
6. Click **OK**.

The connection will start after a few moments.

Advanced Security Setup

For the **Advanced Security Setup** panel:

1. In the **Key Database Password** group box, you have option whether or not to use the key database password stash file. Check the **Use Password Stash (STH) File** radio button to use key database stash file and not to be prompted for the key database file password. This option can be used with or without Client Authentication function.
2. In the **Personal Client Certificate from Key database** group box, you determine when and how the client certificate will be chosen for sending to the server. If you want to enable client authentication and have the personal client certificate from the key database file sent to the server when requested, check the **Send Personal Certificate to Server if Requested** check box. Click the **Send Personal Certificate Trusted by Server** radio button if one do not want to be prompted to select a Personal Client Certificate from Key Database file. Personal Communications will send the Personal Client Certificate trusted by Server.

If you want to choose the personal client certificate, click the **Select or Prompt for Personal Client Certificate** radio button; you will be prompted to select a personal client certificate during session establishment, when the server requests the client certificate.

To preselect a personal client certificate during configuration, click on the **Select now** radio button; the Enter Key Database Password screen is displayed. Enter the **Key Database Password** and select from the **Personal Certificate Label** drop-down list, and click **OK**.
3. Click **OK**.
4. Click **OK**.

The connection will start after a few moments.

Pop-up Messages

During session establishment, your workstation may display pop-up messages in order to solicit from you:

- The password for accessing the PCommClientKeyDb.kdb database
- The location of the PCommClientKeyDb.kdb

If you chose to be prompted for personal client certificate information (see “Advanced Security Setup” on page 108), the Select Client Personal Certificate Label Name screen is displayed at connection time, when the server requests the client personal certificate. The **Server Certificate Information** list-box displays the information about the certificate issued to the server, as well as the issuer. Information includes common name, organization, locality and e-mail. This is provided for information purpose only; none of the information can be selected. The **Server Trusted Root List** list-box displays the information about the trusted root supported by server. This is also provided for information purpose only; none of the information can be selected. Click the **Select Personal Certificate Label Name** drop-down list and select the personal certificate to be sent to the server for client authentication. Click **OK** after selection.

If you chose to be prompted once for the key database password (see “Advanced Security Setup” on page 108), the Enter Key Database Password screen is displayed at connection time, when the server requests the client personal certificate. Enter the key database password and click **OK**.

Changing the Password of a Client's Key Database

The key database file created when Personal Communications is installed has a default set of root certificates that will handle a majority of server certificates without modification to the file. This initial file is accessible using certificate management. The default password *pcomm*.

Certificates can be managed using Certificate Wizard, Certificate Manager, or using the command line mode. For information on using the command line mode, see "Using the Command Line Mode for Managing Certificates" on page 115.

Using Certificate Wizard

The wizard is provided to allow users to easily change a password or add a certificate to a key database file. To access the Certificate Wizard, do the following:

1. Double-click the **Certificate Wizard** icon in the Personal Communications folder.
2. Select the **Change the password to your key database** radio button on the Welcome to the Personal Communications Certificate Wizard panel, click **Next**, and proceed through the wizard following the instructions on each panel.

Using Certificate Management

To change the password using Certificate Management, do the following:

1. Double-click the **Certificate Management** icon in the Personal Communications folder.
2. From the **Key Database File** menu, select **Open**.
3. Select the PCommClientKeyDb.kdb file from the Personal Communications private subdirectory.
4. Click **Open**.
5. Type the current password for the file in the Password entry field.
6. From the **Key Database File** menu, select **Change Password**.
Follow the guidelines issued by your network manager for selecting a password or passphrase that is not easily guessed.
7. Type the new password in the New Password entry field.
8. Type the new password again in the Confirm New Password entry field.
9. To set a password expiration time, click **Set expiration time** and enter the number of days until expiration.
10. Click **Stash the password** to *stash* the password of the current database encrypted.

Note: Personal Communications cannot access the certificates in your file if this checkbox is not selected.

11. Click **OK**.

Configuring SSL for Connecting to a Server Using a Certificate from a Well-Known CA

The procedures in this section explain how to configure security for connecting to a server using a certificate issued by a well-known CA. The following CA signed root certificates are already stored in the key database and marked as trusted certificates:

- Thawte Personal Premium CA

- Thawte Personal Freemail CA
- Thawte Personal Basic CA
- Thawte Premium Server CA
- Thawte Server CA
- RSA Secure Server CA
- VeriSign Class 3 Public Primary CA
- VeriSign Class 2 Public Primary CA
- VeriSign Class 1 Public Primary CA

Following is a summary of the steps required:

1. Confirm that the server you want to connect to has a certificate from a well-known CA.
2. Configure Personal Communications for SSL support. See “Configuring Personal Communications for SSL Support” on page 108 for details.

Configuring SSL for Connecting to a Server Using a Certificate from an Unknown CA

The procedures in this section explain how to configure security for connecting to a server using a certificate issued by an unknown CA; that is, a CA that is not already defined in the PCommClientKeyDb.kdb file.

Following is a summary of the steps required:

1. Confirm that the server you want to connect with has a certificate from an unknown CA.
2. Request the root certificate for the unknown CA from your server administrator.
3. Open the PCommClientKeyDb.kdb file and add the root certificate to it.
4. For client authentication, obtain a personal certificate from this unknown CA and add it to the PCommClientKeyDb.kdb file.

Opening a Key Database and Adding a Root Certificate

When you get the root certificate file from your server administrator, make sure that it is in one of the following formats, based on the normal file extensions:

.ARM Base64-encoded ASCII data (armored 64 format)

.DER Binary DER data

Only a certificate in one of these formats can be added to the keyring database.

Note: In many cases, instead of providing a root certificate file, the server administrator may create the key database file and password stash file at the server. After adding the root certificate, the server administrator can copy the files to each client. If this is done, it is important that the names and location match as follows:

- Key database file: PCommClientKeyDb.kdb
- Password stash file: PCommClientKeyDb.sth
- These files are located in the Personal Communications private subdirectory.

If the server administrator provided only a root certificate file, use the certificate wizard or certificate management utility to open the key database file and add the root certificate.

Certificates can be managed using certificate wizard, certificate management, or command line mode. For information on using the command line mode, see “Using the Command Line Mode for Managing Certificates” on page 115.

Using Certificate Wizard

The wizard is provided to allow users to easily change a password or add a certificate to a key database file. To use the certificate wizard, do the following:

1. Double-click the **Certificate Wizard** icon in the Personal Communications folder.
2. Select one of the following radio buttons on the Welcome to the Certificate Wizard panel:

Import a certificate

Create a self-signed certificate

3. Click **Next** and proceed through the wizard following the instructions on each panel.

Using Certificate Management

To use certificate management to open a key database and add a root certificate, do the following:

1. Double-click the **Certificate Management** icon in the Personal Communications folder.
2. From the **Key Database File** menu, select **Open**.
3. Select the PCommClientKeyDb.kdb file.
4. Click **Open**.
5. Type the password in the **Password** entry field and click **OK**.
6. Select **Signer Certificates** from the drop-down listbox.
7. Click **Add** to receive the certificate.
The Add CA's Certificate from a File panel appears.
8. Select the format dictated by your server administrator from the **Data Type** listbox.
9. Type the full path to the root certificate file in the **Certificate file name** entry field.
10. Click **Browse**, open the certificate file, and click **OK**.
11. Enter a label for the certificate and click **OK**.
12. Click **View/Edit**.
13. Activate the **Set the certificate as a trusted root**, and click **OK**.

Opening a Key Database and Adding a Personal Certificate

When you get the personal certificate file from your server administrator or a CA, make sure that it is in one of the following formats:

- PKCS12 file
- CMS key database file
- Keyring file
- Base64-encoded ASCII data (armored 64 format)
- Binary DER data

Only a certificate in one of these formats can be added to the keyring database.

Notes:

1. In many cases, instead of providing a personal certificate file, the server administrator may create the key database file and password stash file at the server. After adding the personal certificate, the server administrator can copy the files to each client. If this is done, it is important that the names and location match as follows:

Key database file

PCommClientKeyDb.kdb

Password Stash file

PCommClientKeyDb.sth

These files are located in the Personal Communications private subdirectory.

2. If the server administrator provided only a personal certificate file, use the certificate management to open the key database file and add the root certificate.

Using Certificate Management

To use certificate management to open a key database and add a personal certificate, do the following:

1. Double-click the **Certificate Management** icon in the Personal Communications folder.
2. From the **Key Database File** menu, select **Open**.
3. Select the PCommClientKeyDb.kdb file.
4. Click **Open**.
5. Type the password in the **Password** entry field and click **OK**.
6. Select **Personal Certificates** from the drop-down listbox.
7. Click **Import for KDB, DYR and P12 format files** to import the certificate.
The Import Key panel appears.
8. Select the format dictated by your server administrator from the **Key file Type** listbox.
9. Type the full path to the root certificate file in the **Certificate file name** entry field.
10. Click **Browse**, open the certificate file, and click **OK**.
11. Enter the **Key Label**, or accept the default, and click **OK**.
12. Click **Receive for ARM and DER format files**.
The Add CA's Certificate from a File panel appears.
13. Select the format dictated by your server administrator from the **Data Type** listbox.
14. Type the full path to the root certificate file in the **Certificate file name** entry field.
15. Click **Browse**, open the certificate file, and click **OK**.
16. Enter a label for the certificate and click **OK**.

Using Certificate Wizard

The wizard is provided to allow users to easily change a password or add a certificate to a key database file. To use the certificate wizard, do the following:

1. Double-click the **Certificate Wizard** icon in the Personal Communications folder.

2. Select the **Import a certificate** radio button on the Welcome to the Personal Communications Certificate Wizard panel, click **Next**.
3. Select the **Import a client certificate** radio button on the Import Certificate panel, click **Next** and proceed through the wizard following the instructions on each panel.

Note: The certificate wizard only supports importing a PKCS12 file.

Obtaining a Personal ID Certificate from a Known Certificate Authority (CA)

A personal ID certificate uniquely identifies you, and can be obtained from known certificate authorities. One such certificate authority is VeriSign™. To obtain a Personal ID certificate from VeriSign:

1. Open the VeriSign web page at <http://digitalid.verisign.com/> with a web browser.
2. Select **Personal IDs** from the page.
3. Follow the instructions on the next web page to install a **Digital ID** (either **full-service** or **trial**) in your web browser.

After the certificate has been installed in your browser, you must store it in the key database:

1. From the browser, export the certificate into a new key file.
2. Open the Personal Communications client key database file.
3. Click on **Export/Import** to import the certificate. The **Export/Import Key** dialog appears.
4. Click the **Key** button.

Note: The key file type must be PKCS12 file.

5. Enter the name of the file in the first field, the path to the file in the second field; click **OK**.
6. At the password prompt, enter your password and click **OK**.

Configuring SSL for Connecting to a Server Using a Self-signed Certificate

Although using self-signed certificates is highly discouraged, a server administrator can use them while waiting on a purchased CA certificate. Once the CA certificate is available, the server and all clients should be reconfigured to switch from the self-signed certificate to the purchased one.

Following is a summary of the steps required:

1. Confirm that the server you want to connect with has a self-signed certificate.
2. Request from your server administrator the root certificate for the self-signed certificate.
3. Open the PCommClientKeyDb.kdb file and add the root certificate to it.

The steps required by a client in this scenario are the same as those for the Unknown CA scenario. See “Opening a Key Database and Adding a Root Certificate” on page 111 for the steps involved.

Using the Command Line Mode for Managing Certificates

The command line mode for managing certificates allows users to create batch files to change a password or add a certificate for a large number of key database files.

Note: Before using the command line mode, be sure to make backup copies of the following files:

PCommClientKeyDb.kdb

The key database.

PCommClientKeyDb.sth

The stash file where the password is stashed.

Pcsgsk.pro

A sample profile.

From the command prompt, the command line mode has the following syntax:

```
pcsgsk [-h | -?] <filename>.pro | -e | -g
```

The options have the following significance:

-h or -?

Displays the syntax shown above.

<filename>.pro

Based on the information specified in <filename>.pro, change the password of a key database, and/or add a certificate to the key database.

The <filename>.pro must be a fully qualified path, or the name of a file that exists in the Personal Communications private subdirectory. A default profile PCSGSK.PRO has been provided in the \private subdirectory.

-e Displays a list of possible error codes and their associated messages.

-g Launches the Certificate Wizard instead of the command line mode.

The following shows the different ways to invoke the command line mode:

pcsgsk -?

Displays the syntax.

pcsgsk pcsgsk.pro

Changes the password of a key database as specified by parameters in the text file pcsgsk.pro which resides in the Personal Communications private subdirectory.

pcsgsk -e

Displays the possible error codes and the associated messages on the screen.

pcsgsk -g

Launches the Certificate Wizard.

A sample profile, PCSGSK.PRO, is provided in the Personal Communications private subdirectory.

The rules for specifying parameter in the profile are as follows:

1. The file must contain a -----BEGIN PROFILE----- line with 5 hyphens before and 5 hyphens after BEGIN PROFILE, and must also contain a succeeding -----END PROFILE----- line with 5 hyphens before and 5 hyphens after END PROFILE.

Active parameter information must be between -----BEGIN PROFILE----- and -----END PROFILE-----. Everything prior to the BEGIN PROFILE line and after the END PROFILE line is ignored.

Note: The BEGIN PROFILE line, all active parameters, and the END PROFILE line *must* be in English.

2. Each parameter must be specified on a separate line of the profile. A parameter line must have the following form:

Keyword=String

Valid keywords are:

KbdFile=

Used to specify the name of a key database. This parameter is required.

KbdFilePwd=

Used to specify the current password of the key database. This parameter is required.

Note: As default behavior, leading and trailing spaces in a password string are not treated as part of the password. However, imbedded spaces are retained. For example,

NewPwd= Multi-word password

The password is: *Multi-word password*.

To retain leading and trailing spaces, use the PwdSpaces= keyword.

NewPwd=

Used to specify the new password to be set.

Note: As default behavior, leading and trailing spaces in a password string are not treated as part of the password. However, imbedded spaces are retained. For example,

NewPwd= Multi-word password

The password is: *Multi-word password*.

To retain leading and trailing spaces, use the PwdSpaces= keyword.

PwdSpaces=

Set this parameter to **Yes** only if you want any leading or trailing spaces to be included in the passwords specified for KbdFilePwd= or NewPwd=. Normally, you will *not* want to set this parameter to **Yes**. For example:

NewPwd= Multi-word password

If PwdSpaces= is not set to Yes, the password is Multi-word password.

If PwdSpaces= is set to Yes, the password begins with the string "*Multi-word password*" with five leading spaces plus any trailing spaces.

Warning

Many ASCII editors can leave trailing spaces at the end of lines without giving any obvious indication.

CertFile=

Used to specify the fully qualified path of a certificate file to be added to the database. This must be a fully qualified path name.

CertLabel=

Used to provide a label to identify the certificate being added to the database.

3. Either operation; changing the password or adding a certificate; can be specified or both.
If the NewPwd= parameter is specified, the password will be changed to the new password.
If the CertFile= and the CertLabel= parameters are specified, the certificate will be added to the key database.
4. A line is treated as a comment if it is not the first line or last line and if it is not a keyword line.
5. To preserve the security of passwords, both the new password and the old password will be deleted from the profile during processing. This is true even if the attempted operation fails. For example, if the program cannot find the specified key database, and therefore cannot change the password, the old password and the new password *will* be deleted from the profile.
6. After processing, two lines will be added to the end of the profile, after the -----END PROFILE----- line, that specify the results of the attempted operation. These lines are as follows:

ResultPwd=nnnn

Specifies the status of the change-password operation.

ResultCert=nnnn

Specifies the status of the add-certificate operation.

The values possible for nnnn can be found by invoking PCSGSK with the -e option, as described above, which causes the possible error codes and the associated messages to be displayed on the screen.

Security References

Personal Communications supports server and client authentication. The following publications are available on the World Wide Web and provide more information:

- *SSL-Talk FAQ Version 1.0.3*
<http://www.consensus.com/security/ssl-talk-faq.html>
- *Introduction to SSL*
http://www.camb.opengroup.org/~fjh/Papers/cook/ssl_intro.html
- *SSL Version 3.0 Specification*
<http://home.netscape.com/eng/ssl3/index.html>

For an introduction to and a history of public key cryptography and privacy, refer to *Simson Garfinkel, PGP: Pretty Good Privacy, O'Reilly and Associates, 1995* ISBN: 1565920988.

Problem Determination

Here is some information to help you avoid problems that might be related to SSL configuration.

1. With server-side authentication, the common name in the sever's certificate is always compared to the name you type in the Host Name field on the client. These names must match exactly. You cannot:

- Type the IP address in one place and the host name in the other.
- Type wrt05306 in one place and WTR5306 in the other.
- Type wtr05036 in one place and wtr05036.raleigh.ibm.com in the other.

Note: This information is only available from the target server administrator.

2. Make sure that SSL is enabled in both the Personal Communications client and the SSL server.
3. Makes sure that the port number in the Advanced configuration panel on the client matches the port number defined in the server.
4. For each different server using a self-signed certificate, you must add a copy of each of the server certificates to your keyring.
5. Be sure there is a root certificate of the proper class to correspond with the class and issuer of the certificate on the server.

Note: Notify your server administrator of any problems prior to contacting IBM Service.

Chapter 8. Code Pages

This chapter contains information useful in providing national language support.

The **Country** option defaults to the current OS/2 country code. The countries are listed in “Country Codes” ; the actual list available to you might vary.

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 122.

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

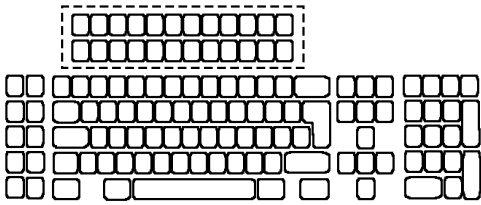
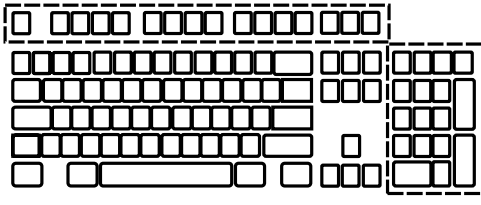
Host-connected

Host-connected keyboard (122-key)

Enhanced

Enhanced keyboard.

Table 7-1. Keyboard Types

Keyboard type (characteristics)	Figure
Host Connected (dual-row function keys)	
Enhanced (single-row function keys)	

Personal Communications matches the keyboard type that you are using by interrogating the BIOS of the workstation. 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

The following table shows the country codes.

Table 7-2. Country Code

Country	Country Code
Albania	355
Arabic	785
Austria	043
Belgium	032
Bosnia/Herzegovina	387
Brazil	055
Bulgaria	359
Canada (Bilingual)	002
Croatia	385
Czech	421
Denmark	045
Finland	358
France	033
FYR Macedonia	389
Germany	049
Greece	030
Hungary	036
Iceland	354
Israel	972
Italy	039
Latin America	003
Netherlands	031
Norway	047
Poland	048
Portugal	351
Romania	040
Russia	007
Serbia/Montenegro	381
Slovakia	422
Slovenia	386
Spain	034
Sweden	046
Switzerland	041
Thailand	066
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 7-3. 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	448	C	452	C
Arabic	238	C	238	C
Austria	129	S	129	S
Belgium	120	S	120	S
Bosnia/Herzegovina	234	C	234*	S
Brazil (274)	274	C	-	-
Brazil (275)	275	C	-	-
Bulgaria	442	C	-	-
Canada (Bilingual)	058	C	277	S
Croatia	234	C	234*	S
Czech	243	C	-	-
Denmark	159	C	281	S
Finland	153	C	285	S
France (120)	120	C	-	-
France (189)	189	S	251	S
France (251)	189	S	251	S
FYR Macedonia	449	C	-	-
Germany	129	S	129	S
Greece	319	S	-	-
Hungary	208	C	-	-
Iceland	197	C	197	S
Israel	115	C	115	C
Italy (141)	141	C	-	-
Italy (142)	142	C	293	S
Italy (293)	142	C	293	S
Latin America (Spanish)	171	C	309	S
Netherlands	143	C	101	S
Norway	155	C	281N	S
Poland	214	C	-	-
Portugal	163	C	163	S
Romania	446	C	-	-
Russia (441)	441	C	-	-
Russia (443)	443	C	-	-
Serbia/Montenegro	450	C	-	-

Keyboard Country	Enhanced Keyboard ID	Enhanced Keyboard Lock Mode	Host-Connected Keyboard ID	Host-Connected Keyboard Lock Mode
Slovakia	245	C	-	-
Slovenia	234	C	234*	S
Spain	173	C	071	S
Sweden	153	C	285	S
Switzerland (French)	150F	C	150F	S
Switzerland (German)	150G	C	150G	S
Thailand	191	C	191	C
Turkey (179)	179	C	-	-
Turkey (402)	-	-	402*	S
Turkey (440)	440	C	-	-
United-Kingdom (166)	166	C	166	C
United-Kingdom (168)	168	C	-	-
United-States	101G	C	101	S
Notes: X Selectable - Not selectable S Shift lock on key 30 C Caps lock on key 30 * Supports OS/2 mode emulators				

Code Pages and Character Sets

The following table shows the code pages and character sets.

Table 5. Code Pages and Character Sets

Country	Host CPGID/GCSGID	PC CPGID/GCSGID
Albania	500-1/697-1 or 924/1153	850/980 or 437/919 or 858/988
Arabic	420/235 or 420/1461	1008/1162 or 1008/1464
Austria	273-1/697-1 or 1141-1/695-1 or 1148-1/924-1	437/919 or 850/980 or 858/988
Belgium	500-1/697-1 or 924/1153 or 1148-1/924-1	437/919 or 850/980 or 858/988
Bosnia/Herzegovina	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 852/1232 or 852/1376
Brazil	037-1/697-1 or 500-1/697-1 or 275-1/697-1 or 924/1153 or 1140-1/695-1	437/919 or 850/980 or 858/988
Bulgaria	1025/1150 or 1154/1381	850/980 or 915/1150 or 858/988 or 855/1235 or 872/1382
Canada (Bilingual)	037-1/697-1 or 1140/695-1	863/993 or 850/980 or 858/988

Table 5. Code Pages and Character Sets (continued)

Country	Host CPGID/GCSGID	PC CPGID/GCSGID
Croatia	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 855/1235 or 872/1382
Czech	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 855/1235 or 872/1382
Denmark	277-1/697-1 or 1142-1/695-1	865/996 or 850/980 or 858/988
Finland	278-1/697-1 or 1143-1/695-1	437/919 or 850/980 or 858/988
France	297-1/697-1 or 1147-1/695-1	437/919 or 850/980 or 858/988
FYR Macedonia	1025/1150 or 1154/1381	855/985 or 850/980 or 858/988 or 855/1235 or 872/1382
Germany	273-1/697-1 or 1141-1/695-1	437/919 or 850/980 or 858/988
Greece	875/925	869/998 or 869/1249 or 869/1372
Hungary	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 852/1232 or 852/1376
Iceland	871-1/697-1 or 1149-1/695-1	861/991 or 850/980 or 858/988
Israel	424/941 or 424/1349 or 424/1356 or 803/1357	802/1217 or 867/1361
Italy	280-1/697-1 or 1144-1/695-1	437/919 or 850/980 or 858/988
Latin-America (Spanish)	284-1/697-1 or 1145-1/695-1	437/919 or 850/980 or 858/988
Netherlands	037-1/697-1 or 1140-1/695-1	437/919 or 850/980 or 858/988
Norway	277-1/697-1	865/995 or 850/980 or 858/988
Poland	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 852/1232 or 852/1376
Portugal	037-1/697-1 or 1140-1/695-1	860/990 or 850/980 or 858/988
Romania	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 852/1232 or 852/1376
Russia	1025/1150 or 1154/1381	866/996 or 850/980 or 858/988 or 866/1190 or 898/1384
Serbia/Montenegro	1025/1150 or 1154/1381	855/985 or 850/980 or 858/988 or 855/1235 or 872/1382
Slovakia	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 852/1232 or 852/1376
Slovenia	870/959 or 1153/1375	852/982 or 850/980 or 858/988 or 852/1232 or 852/1376
Spain	284-1/697-1 or 1145-1/695-1	437/919 or 850/980 or 858/988
Sweden	278-1/697-1 or 1143-1/695-1	437/919 or 850/980 or 858/988
Switzerland (French)	500-1/697-1	437/919 or 850/980 or 858/988
Switzerland (German)	500-1/697-1	437/919 or 850/980 or 858/988
Thailand	838/1279 or 1160/1395	874/1279 or 1161/1396
Turkey	1026/1152 or 1155/1378	857/987 or 857/1237 or 850/980 or 858/988 or 857/1379
United-Kingdom	285-1/697-1 or 1146-1/695-1	437/919 or 850/980 or 858/988
United-States	037-1/697-1 or 1047/103 or 1140-1/695-1	437/919 or 850/980 or 858/988

Table 5. Code Pages and Character Sets (continued)

Country	Host CPGID/GCSGID	PC CPGID/GCSGID
Multinational	500-1/697-1 or 924/1153 or 1148-1/924-1	850/980 or 858/988
Note: X Selectable - Not selectable		

Host Code Page Tables

The following sections provide the host code page for each country.

Host Code Page 037-1/697-1 Brazil, Canada, Netherlands, Portugal, U.S.

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	^ SD150000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	Ê LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	¢ SC040000	! SP020000	¡ SM650000	: SP130000	« SP170000	ª SM210000	¿ SP030000	[SM060000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	đ LD630000	æ LA510000	Ð LD620000	- SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	⌋ SM660000	? SP150000	" SP040000	± SA020000	☒ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00037

Austria, Germany

Host Code Page 273-1/697-1 Austria, Germany

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	ä LA170000	ü LU170000	Ö LO180000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ß LS610000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	[SM060000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	~ SD190000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ä LA180000	Ü LU180000	ö LO170000	: SP130000	« SP170000	ª SM210000	ı SP030000	¬ SM660000	(SHY) SP320000	ı ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	- SM150000	ı SM650000	}	\	\] SM080000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	☒ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00273

Host Code Page 275-1/697-1 Brazil

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	õ LO190000	é LE110000	\ SM070000	0 ND100000
-1	(RSP) SP300000	}	/	[	a	j	~	£	A	J	÷	1
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	` SD130000	î LI150000	@ SM050000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	! SM650000	ì LI130000	] SM080000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ã LA190000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	É LE120000	\$ SC030000	ç LC410000	:	«	ª	ì SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	Ç LC420000	, SP080000	Õ LO200000	»	º	í SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ã LA200000	ð LD630000	æ LA510000	Ð LD620000	- SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	ƒ SC010000	® SM530000	× SA070000	{ SM110000	ÿ LY170000	# SM010000	(EO)

Code Page 00275

Host Code Page 277-1/697-1 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) SP010000	& SM030000	- SP100000	! SM650000	@ SM050000	° SM190000	μ SM170000	¢ SC040000	æ LA510000	å LA270000	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	}	ï LI170000	\$ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	# SM010000	☒ SC010000	ø LO610000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	Å LA280000	, SP080000	Æ LA520000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ø LO620000	ð LD630000	{ SM110000	Ð LD620000	– SM150000	ö LO170000	~ SD190000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	‚ SD410000	Ý LY120000	“ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	[SM060000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Host Code Page 278-1/697-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	ä LA170000	å LA270000	É LE120000	0 ND100000
-1	(RSP) SP300000	` SD130000	/ SP120000	\ SM070000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	# SM010000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	[SM060000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	}	ï LI170000	\$ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	é LE110000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	§ SM240000	☒ SC010000	ö LO170000	:	« SP170000	ª SM210000	ı SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	Å LA280000	,	Ä LA180000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ö LO180000	ð LD630000	æ LA510000	Ð LD620000	– SM150000	¡ SM650000	~ SD190000	@ SM050000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00278

Host Code Page 280-1/697-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	μ SM170000	¢ SC040000	à LA130000	è LE130000	ç LC410000	0 ND100000
-1	(RSP) SP300000	] SM080000	/ SP120000	É LE120000	a LA010000	j LJ010000	ì LI130000	# SM010000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	{ SM110000	} SM140000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	~ SD190000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ù LU130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	é LE110000	ò LO130000	: SP130000	« SP170000	ª SM210000	ì SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	– SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	¡ SM650000	` SD130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	☒ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00280

Host Code Page 284-1/697-1 Latin America (Spanish), Spain

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	! SM650000	ß LS610000	# SM010000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	ñ LN190000	: SP130000	« SP170000	 SM210000	ì SP030000	^ SD150000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	Ñ LN200000	» SP180000	 SM200000	í SP160000	! SP020000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	– SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	 SD410000	Ý LY120000	~ SD190000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	☒ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00284

United Kingdom

Host Code Page 285-1/697-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	— SM150000	[SM060000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	\$ SC030000	! SP020000	¡ SM650000	: SP130000	« SP170000	ª SM210000	ï SP030000	^ SD150000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	£ SC020000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	~ SD190000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	☒ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00285

Host Code Page 297-1/697-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	` SD130000	¢ SC040000	é LE110000	è LE130000	ç LC410000	0 ND100000
-1	(RSP) SP300000	{ SM110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	# SM010000	À LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	@ SM050000	}	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	] SM080000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	μ SM170000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	§ SM240000	ù LU130000	:	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	,	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	à LA130000	ð LD630000	æ LA510000	Ð LD620000	– SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	! SM650000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	☒ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00297

Arabic

Host Code Page 420 Arabic Bilingual

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) SP010000	& SM030000	- SP100000	ح AH450003	ش AS230000	ظ AZ450000	غ AG310003	ك AK010003	؛ SP140007	؟ SP150007	× SA070000	0 ND100000
-1	(RSP) SP300000	أ AA310002	/ SP120000	خ AH470000	a LA010000	j LJ010000	÷ SA060000	ل AL010000	A LA020000	J LJ020000	(NSP) SP310000	1 ND010000
-2	و AX100000	ؤ AW310000	ة AT020000	ذ AH470003	b LB010000	k LK010000	s LS010000	لا AL220000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ـ AX100004		ت AT010000	د AD010000	c LC010000	l LL010000	t LT010000	ي AL220003	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ـ SM860000		ت AT010003	ذ AD470000	d LD010000	m LM010000	u LU010000	لا AL320000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	ل SM870000	ع AY310000	ث AT470000	ر AR010000	e LE010000	n LN010000	v LV010000	لا AL320003	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ء AX300000	ا AA010000	ث AT470003	ز AZ010000	f LF010000	o LO010000	w LW010000		F LF020000	O LO020000	W LW020000	6 ND060000
-7	آ AA210000	ا AA010002	ج AG230000	س AS010000	g LG010000	p LP010000	x LX010000		G LG020000	P LP020000	X LX020000	7 ND070000
-8	آ AA210002	ب AB010000	ح AG230003	س AS010003	h LH010000	q LQ010000	y LY010000	لا AL020000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	أ AA310000	ب AB010003	ح AH450000	، SP080007	i LI010000	r LR010000	z LZ010000	لا AL020003	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	ع SC040000	!	!	:	ش AS230003	ع AC470000	خ AG310004	ل AL010003	(SHY) SP320000	ى AA020000	ا ND010001	
-B	.	\$	,	#	ص AS450000	ع AC470002	ف AF010000	م AM010000	ه AH010003	ى AA020002	٢ ND020001	٦ ND060001
-C	<	*	%	@	ص AS450003	ع AC470003	ف AF010003	م AM010003		ي AY010000		٧ ND070001
-D	(	)	_	'	ض AD450000	ع AC470004	ق AQ010000	ن AN010000	٤ AH010004	ي AY010002	٣ ND030001	٨ ND080001
-E	+	;	>	=	ض AD450003	غ AG310000	ق AQ010003	ن AN010003		ي AY010003	٤ ND040001	٩ ND090001
-F	|	٧	?	"	ط AT450000	غ AG310002	ك AK010000	ه AH010000	و AW010000	.	٥ ND050001	(EO)

Code Page 00420

Host Code Page 424/941 Israel (Hebrew - Bulletin Code)

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) SP010000	& SM030000	- SP100000			° SM190000	μ SM170000	^ SD150000	{ SM110000	}	\ SM070000	0 ND100000
-1	א HX330000	י HY010000	/ SP120000	ת HT010000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	ב HB010000	ך HK610000	ע HX350000		b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ג HG010000	כ HK010000	ף HP610000		c LC010000	l LL010000	t LT010000	• SM570000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ד HD010000	ל HL010000	פ HP010000	(RSP) SP300000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	ה HH010000	ם HM610000	ץ HS610000		e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ו HW010000	מ HM010000	צ HS450000		f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	ז HZ010000	ן HN610000	ק HQ010000		g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ח HH450000	נ HN010000	ר HR010000	= SM100000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ט HT450000	ס HS010000	ש HS210000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	¢ SC040000	! SP020000	! SM650000	: SP130000	« SP170000			[SM060000	(S̄HY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000			] SM080000				
-C	< SA030000	* SM040000	% SM020000	@ SM050000				- SM150000				
-D	(SP060000	) SP070000	— SP090000	‘ SP050000		’ SD410000		“ SD170000				
-E	+ SA010000	; SP140000	> SA050000	= SA040000				’ SD110000				
-F	| SM130000	⌈ SM660000	? SP150000	" SP040000	± SA020000	☒ SC010000	® SM530000	×				(EO)

Code Page 00424

International

Host Code Page 500-1/697-1 International

This code page is used in the following countries: Austria, Belgium, Canada (French), Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	! SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(S̄HY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	- SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	✕ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00500

Host Code Page 803 Israel (Hebrew - Old Code)

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) SP010000	א HX330000	- SP100000									0 ND100000
-1			/ SP120000		ב HB010000	ג HK610000			A LA020000	J LJ020000		1 ND010000
-2					ד HG010000	ה HK010000	ו HP610000		B LB020000	K LK020000	S LS020000	2 ND020000
-3					ז HD010000	ח HL010000	ט HP010000		C LC020000	L LL020000	T LT020000	3 ND030000
-4					י HH010000	כ HM610000	ל HS610000		D LD020000	M LM020000	U LU020000	4 ND040000
-5					מ HW010000	נ HM010000	ס HS450000		E LE020000	N LN020000	V LV020000	5 ND050000
-6					ע HZ010000	פ HN610000	צ HQ010000		F LF020000	O LO020000	W LW020000	6 ND060000
-7					ק HH450000	ר HN010000	ש HR010000		G LG020000	P LP020000	X LX020000	7 ND070000
-8					ת HT450000	י HS010000	ך HS210000		H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9					ך HY010000	ל HX350000	ם HT010000		I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	\$ SC030000	!		:								
-B	.	א	,	#								
-C	<	*	%	@								
-D	()	_	'								
-E	+	;	>	=								
-F	|	א	?	"								(EO)

Code Page 00803

Thailand

Host Code Page 838/1279 Thailand

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) SP010000	& SM030000	- SP100000	฿ SC130000	◎ BQ400000	๗ BQ500000	๘ BQ600000	○ ND100002	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	! BZ100300	/ SP120000	๑ BE400000	a LA010000	j LJ010000	~ SD190000	๑ ND010002	A LA020000	J LJ020000	๗ BZ300300	1 ND010000
-2	ก BK100000	ข BC100000	ฃ BT100000	ด BT600000	b LB010000	k LK010000	s LS010000	๒ ND020002	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ช BK200000	ค BX100000	ฅ BT200000	ท BT700000	c LC010000	l LL010000	t LT010000	๓ ND030002	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ป BK300000	จ BS100000	ฉ BT300000	ธ BT800000	d LD010000	m LM010000	u LU010000	๔ ND040002	D LD020000	M LM020000	U LU020000	4 ND040000
-5	ค BK400000	ช BX200000	ฅ BT400000	น BN300000	e LE010000	n LN010000	v LV010000	๕ ND050002	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ค BK500000	ฅ BX300000	น BN200000	บ BB100000	f LF010000	o LO010000	w LW010000	๖ ND060002	F LF020000	O LO020000	W LW020000	6 ND060000
-7	ข BK600000	ญ BY100000	ด BD200000	ป BP100000	g LG010000	p LP010000	x LX010000	๗ ND070002	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ง BN100000	ฅ BD100000	ต BT500000	ฬ BP200000	h LH010000	q LQ010000	y LY010000	๘ ND080002	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	[SM060000	]	^ SD150000	` SD130000	i LI010000	r LR010000	z LZ010000	๙ ND090002	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	๑ SC040000	!	! SM650000	:	๑ BF100000	๒ BR100000	๓ BS300000	๔ BQ200000	๕ BZ200300	๖ BQ300000	๗ BA700000	๘ BZ400000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	พ BP300000	๑ BR200000	๒ BS400000	๓ BA200000	๔ BI200000	๕ BE200000	๖ BQ100000	๗ BZ500000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	พ BF200000	๑ BL100000	๒ BH100000	๓ BA100000	๔ BU100000	๕ BE300000	๖ BE100000	๗ BN400000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	๑ BP400000	๒ BL200000	๓ BL300000	๔ BA300000	๕ BU200000	๖ BO200000	๗ BZ100000	๘ BZ400300
-E	+ SA010000	; SP140000	> SA050000	= SA040000	๑ BM100000	๒ BW100000	๓ BO100000	๔ BA400000	๕ BU300000	๖ BA500000	๗ BZ200000	๘ BZ500300
-F	| SM130000	๑ SM660000	? SP150000	" SP040000	๑ BY200000	๒ BS200000	๓ BH200000	๔ BI100000	๕ BU400000	๖ BA600000	๗ BZ300000	(EO)

Code Page 00838

Host Code Page 870/959 Latin 2 - EBCDIC Multilingual

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) SP010000	& SM030000	- SP100000	˘ SD210000	˘ SD230000	° SM190000	ą LA430000	· SD290000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	Ą LA440000	À LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ę LE430000	Â LA160000	Ę LE440000	b LB010000	k LK010000	s LS010000	ż LZ290000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	Ť LT420000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ţ LT410000	ű LU270000	" SD250000	Ű LU280000	d LD010000	m LM010000	u LU010000	Ż LZ300000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA230000	î LI150000	Ă LA240000	Î LI160000	f LF010000	o LO010000	w LW010000	ž LZ210000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	č LC210000	ĭ LL210000	Č LC220000	Ĭ LL220000	g LG010000	p LP010000	x LX010000	ž LZ110000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	í LL110000	Ç LC420000	Ĭ LL120000	h LH010000	q LQ010000	y LY010000	Ž LZ220000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ć LC110000	ß LS610000	Ć LC120000	` SD130000	i LI010000	r LR010000	z LZ010000	Ž LZ120000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	| SM130000	: SP130000	ś LS110000	ł LL610000	Ś LS120000	Ł LL620000	(šŷ) SP320000	Ě LE220000	ď LD210000	Ď LD220000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	ň LN210000	ń LN110000	Ň LN220000	Ŋ LN120000	ô LO150000	ů LU250000	Ô LO160000	Ů LU260000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ď LD610000	š LS210000	Đ LD620000	Š LS220000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	í LR110000	ĭ LT210000	Ř LR120000	Ť LT220000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ř LR210000	¸ SD430000	Ř LR220000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	ş LS410000	Ŕ SC010000	Ş LS420000	× SA070000	ő LO250000	ě LE210000	Ő LO260000	(EO)

Code Page 00870

Iceland

Host Code Page 871-1/697-1 Iceland

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	þ LT630000	æ LA510000	' SD110000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ö LO170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	Ð LD630000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Þ LT640000	Æ LA520000	! SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ð LD620000	` SD130000	} SM140000	@ SM050000	- SM150000	~ SD190000	ü LU170000	^ SD150000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	{ SM110000	}] SM080000	[SM060000	\ SM070000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	Ö LO180000	? SP150000	" SP040000	± SA020000	✕ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00871

Host Code Page 875/925 Greek

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) SP010000	& SM030000	- SP100000	.. SD170000	./ SD730000	o SM190000	' SD110000	£ SC020000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	A GA020000	K GK020000	/ SP120000	À GA120000	a LA010000	j LJ010000	~ SD190000	ά GA110000	Α LA020000	Ј LJ020000		1 ND010000
-2	B GB020000	Λ GL020000	T GT020000	Έ GE120000	b LB010000	k LK010000	s LS010000	έ GE110000	Β LB020000	Κ LK020000	Σ LS020000	2 ND020000
-3	Γ GG020000	M GM020000	Υ GU020000	Ή GE720000	c LC010000	l LL010000	t LT010000	ή GE710000	С LC020000	Л LL020000	Т LT020000	3 ND030000
-4	Δ GD020000	N GN020000	Φ GF020000	(RSP) SP300000	d LD010000	m LM010000	u LU010000	ï GI170000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	E GE020000	Ξ GX020000	X GH020000	Ί GI120000	e LE010000	n LN010000	v LV010000	ί GI110000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	Z GZ020000	O GO020000	Ψ GP020000	Ό GO120000	f LF010000	o LO010000	w LW010000	ό GO110000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	H GE320000	Π GP020000	Ω GO320000	Υ GU120000	g LG010000	p LP010000	x LX010000	ύ GU110000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	Θ GT620000	P GR020000	Ϊ GI180000	Ψ GO720000	h LH010000	q LQ010000	y LY010000	ÿ GU170000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	I GI020000	Σ GS020000	ÿ GU180000	` SD130000	i LI010000	r LR010000	z LZ010000	ώ GO710000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	| SM130000	: SP130000	α GA010000	η GE310000	ν GN010000	ς GS610000	(SHT) SP320000	± SA020000	² ND021000	³ ND031000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	β GB010000	θ GT610000	ξ GX010000	τ GT010000	ω GO310000	½ NF010000	§ SM240000	© SM520000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	γ GG010000	ι GI010000	ο GO010000	υ GU010000	ί GI730000			€ SC200000
-D	(SP060000	) SP070000	— SP090000	' SP050000	δ GD010000	κ GK010000	π GP010000	φ GF010000	ύ GU730000	• SD630000		
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ε GE010000	λ GL010000	ρ GR010000	χ GH010000	‘ SP190000	’ SP200000	« SP170000	» SP180000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	ζ GZ010000	μ GM010000	σ GS010000	ψ GP610000	— SM120000	| SM650000	┘ SM660000	(EO)

Code Page 00875

International

Host Code Page 924-1/1353-1 International

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	Œ LO520000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	œ LO510000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	Ÿ LY180000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ý LY120000	!	Š LS220000	:	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SĦY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	,	# SM010000	» SP180000	º SM200000	¿ SP160000	š LS210000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD640000	- SD310000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	ž LZ210000	[SM060000	] SM080000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	Ž LZ220000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	^ SD150000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00924

Host Code Page 1025/1150 Cyrillic

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) SP010000	& SM030000	- SP100000	Ъ KN120000	Ц KC010000	Й KJ110000	Я KA150000	Ь KX110000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	ЛЪ KL410000	/ SP120000	Ѡ KC120000	а LA010000	ј LJ010000	~ SD190000	Ы KY010000	А LA020000	Ј LJ020000	§ SM240000	1 ND010000
-2	ђ KD610000	Њ KN110000	ѓ KG120000	Ћ KK120000	б LB010000	к LK010000	ѕ LS010000	з KZ010000	В LB020000	К LK020000	Ѕ LS020000	2 ND020000
-3	ѓ KG110000	ћ KC110000	Ё KE180000	(SHY) SP320000	с LC010000	l LL010000	t LT010000	ш KS210000	С LC020000	Л LL020000	Т LT020000	3 ND030000
-4	ё KE170000	ќ KK110000	Є KE160000	Ў KU240000	d LD010000	m LM010000	u LU010000	э KE130000	Д LD020000	М LM020000	У LU020000	4 ND040000
-5	є KE150000	ђ KU230000	Ѕ KZ160000	Џ KG220000	e LE010000	n LN010000	v LV010000	ш KS150000	Е LE020000	Н LN020000	В LV020000	5 ND050000
-6	s KZ150000	ц KG210000	І KI120000	ю KU150000	f LF010000	o LO010000	w LW010000	ч KC210000	Ф LF020000	О LO020000	W LW020000	6 ND060000
-7	i KI110000	Ѣ KU220000	Ї KI180000	а KA010000	g LG010000	p LP010000	x LX010000	ъ KU210000	Г LG020000	Р LP020000	Х LX020000	7 ND070000
-8	ï KI170000	№ SM000000	Ј KJ020000	Ѣ KB010000	h LH010000	q LQ010000	y LY010000	Ю KU160000	Н LH020000	Q LQ020000	У LY020000	8 ND080000
-9	j KJ010000	Ѣ KD620000	Љ KL420000	` SD130000	i LI010000	r LR010000	z LZ010000	А KA020000	І LI020000	Р LR020000	З LZ020000	9 ND090000
-A	[SM060000	] SM080000	| SM130000	: SP130000	д KD010000	к KK010000	р KR010000	Б KB020000	Х KH020000	Н KN020000	Т KT020000	З KZ020000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	е KE010000	л KL010000	с KS010000	Ц KC020000	И KI020000	О KO020000	У KU020000	Ш KS220000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ф KF010000	м KM010000	т KT010000	Д KD020000	Й KJ120000	П KP020000	Ж KZ220000	Э KE140000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	г KG010000	н KN010000	у KU010000	Е KE020000	К KK020000	Я KA160000	В KV020000	Щ KS160000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	х KH010000	о KO010000	ж KZ210000	Ф KF020000	Л KL020000	Р KR020000	Ь KX120000	Ч KC220000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	и KI010000	п KP010000	в KV010000	Г KG020000	М KM020000	С KS020000	Ы KY020000	(EO)

Code Page 01025

Latin 5, Turkey

Host Code Page 1026/1 Latin 5 - Turkey

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	ç LC410000	ğ LG230000	ü LU170000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ö LO170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	{ SM110000	ì LI130000	[SM060000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ı LI610000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ç LC420000	Ğ LG240000	Ş LS410000	:	«	ª	ı	¬	(SHY) SP320000	1	2	3
-B	· SP110000	İ LI300000	,	Ö LO180000	»	º	ı	|	ô	û	Ô	Û
-C	< SA030000	* SM040000	% SM020000	Ş LS420000	}	æ]	-	~	\	#	"
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	` SD130000	’ SD10000	\$ SC030000	” SD170000	ò	ù	Ò	Ù
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ı SM650000	Æ LA520000	@ SM050000	’ SD110000	ó	ú	Ó	Ú
-F	! SP020000	^ SD150000	? SP150000	Ü LU180000	± SA020000	☒ SC010000	® SM530000	×	õ	ÿ	Õ	(EO)

Code Page 01026

Host Code Page 1047/103 Latin 1 (Open Systems)

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¬ SM660000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	¢ SC040000	! SP020000	¡ SM650000	: SP130000	« SP170000	ª SM210000	ï SP030000	Ý LY120000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	¨ SD170000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	– SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	[SM060000	] SM080000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	^ SD150000	? SP150000	" SP040000	± SA020000	Ɔ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01047

Brazil, Canada, Netherlands, Portugal, U.S.

Host Code Page 1140-1/695-1 Brazil, Canada, Netherlands, Portugal, U.S.

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	^ SD150000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	¢ SC040000	! SP020000	¡ SM650000	: SP130000	« SP170000	ª SM210000	ï SP030000	[SM060000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	- SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01140

Host Code Page 1141-1/695-1 Austria, Germany

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	ä LA170000	ü LU170000	Ö LO180000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ß LS610000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE160000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	[SM060000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	~ SD190000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ä LA180000	Ü LU180000	ö LO170000	: SP130000	« SP170000	ª SM210000	ï SP030000	¬ SM660000	(S̄HY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	- SM150000	¡ SM650000	}	\	\] SM080000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01141

Denmark, Norway

Host Code Page 1142-1/695-1 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) SP010000	& SM030000	- SP100000	| SM650000	@ SM050000	° SM190000	μ SM170000	¢ SC040000	æ LA510000	å LA270000	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	}	ï LI170000	\$ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	# SM010000	€ SC200000	ø LO610000	:	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHT) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	Å LA280000	,	Æ LA520000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ø LO620000	ð LD630000	{ SM110000	Ð LD620000	- SM150000	ö LO170000	~ SD190000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	‚ SD410000	Ý LY120000	“ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	[SM060000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01142

Host Code Page 1143-1/695-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	ä LA170000	å LA270000	É LE120000	0 ND100000
-1	(RSP) SP300000	` SD130000	/ SP120000	\ SM070000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	# SM010000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	[SM060000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	}	ï LI170000	\$ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	é LE110000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	§ SM240000	€ SC200000	ö LO170000	:	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(S̄HY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	Å LA280000	,	Ä LA180000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ö LO180000	ð LD630000	æ LA510000	Ð LD620000	– SM150000	¡ SM650000	~ SD190000	@ SM050000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	ý LY110000	‚ SD410000	Ý LY120000	“ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	’ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01143

Host Code Page 1144-1/695-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	μ SM170000	¢ SC040000	à LA130000	è LE130000	ç LC410000	0 ND100000
-1	(RSP) SP300000	] SM080000	/ SP120000	É LE120000	a LA010000	j LJ010000	ì LI130000	# SM010000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	{ SM110000	} SM140000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	~ SD190000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ù LU130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	é LE110000	ò LO130000	: SP130000	« SP170000	ª SM210000	ï SP030000	¬ SM660000	(SĦY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	- SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	ý LY110000	¸ SD410000	Ý LY120000	” SD170000	¡ SM650000	` SD130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	’ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01144

Host Code Page 1145-1/695-1 Latin America, Spain

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	“ SD170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	| SM650000	ß LS610000	# SM010000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	ñ LN190000	: SP130000	« SP170000	ª SM210000	¡ SP030000	^ SD150000	(S̄HY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	\$ SC030000	, SP080000	Ñ LN200000	» SP180000	º SM200000	¿ SP160000	! SP020000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	– SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	’ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01145

United Kingdom

Host Code Page 1146-1/695-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\	0 ND100000
-1	(RSP) SP300000	é LE110000	/	É LE120000	a LA010000	j LJ010000	— SM150000	[SM060000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	\$ SC030000	!	¡ SM650000	:	« SP170000	ª SM210000	ï SP030000	^ SD150000	(S̄HY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	£ SC020000	,	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	~ SD190000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	⌋ SM660000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01146

Host Code Page 1147-1/695-1 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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	` SD130000	¢ SC040000	é LE110000	è LE130000	ç LC410000	0 ND100000
-1	(RSP) SP300000	{ SM110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	# SM010000	À LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	@ SM050000	}	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	] SM080000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	μ SM170000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	§ SM240000	ù LU130000	:	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(S̄HY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	,	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	à LA130000	ð LD630000	æ LA510000	Ð LD620000	- SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	¡ SM650000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	’ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01147

International

Host Code Page 1148-1/695-1 International

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	]	!	:	«	ª	¡	¬	(SHT) SP320000	1	2	3
-B	· SP110000	\$ SC030000	,	#	»	º	¿	|	ô	û	Ô	Û
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	-	ö	ü	Ö	Ü
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨	ò	ù	Ò	Ù
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	'	ó	ú	Ó	Ú
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	×	õ	ÿ	Õ	(EO)

Code Page 01148

Host Code Page 1149-1/695-1 Iceland

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	þ LT630000	æ LA510000	' SD110000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ö LO170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	Ð LD630000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	þ LT640000	Æ LA520000	ǀ SM650000	ː SP130000	« SP170000	ª SM210000	ı SP030000	¬ SM660000	(SİY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ð LD620000	` SD130000	} SM140000	@ SM050000	- SM150000	~ SD190000	ü LU170000	^ SD150000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	{ SM110000	] SM080000	[SM060000	\ SM070000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	Ö LO180000	? SP150000	" SP040000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01149

Latin 2

Host Code Page 1153/1375 Latin 2 - EBCDIC Multilingual

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) SP010000	& SM030000	- SP100000	˘ SD210000	˘ SD230000	˘ SM190000	ą LA430000	· SD290000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	Ą LA440000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ę LE430000	Â LA160000	Ę LE440000	b LB010000	k LK010000	s LS010000	ż LZ290000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	Ť LT420000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ţ LT410000	ű LU270000	" SD250000	Ű LU280000	d LD010000	m LM010000	u LU010000	Ż LZ300000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA230000	î LI150000	Ă LA240000	Î LI160000	f LF010000	o LO010000	w LW010000	ž LZ210000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	č LC210000	ĭ LL210000	Č LC220000	Ľ LL220000	g LG010000	p LP010000	x LX010000	ž LZ110000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	í LL110000	Ç LC420000	Ĺ LL120000	h LH010000	q LQ010000	y LY010000	Ž LZ220000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ć LC110000	ß LS610000	Ć LC120000	` SD130000	i LI010000	r LR010000	z LZ010000	Ž LZ120000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	| SM130000	: SP130000	ś LS110000	ł LL610000	Ś LS120000	Ł LL620000	(SĦY) SP320000	Ě LE220000	ď LD210000	Ď LD220000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	ň LN210000	ń LN110000	Ň LN220000	Ŋ LN120000	ô LO150000	ů LU250000	Ô LO160000	Ů LU260000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ď LD610000	š LS210000	Đ LD600000	Š LS220000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	‚ SD410000	Ý LY120000	“ SD170000	í LR110000	ĭ LT10000	Ř LR120000	Ť LT20000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ř LR210000	„ SD430000	Ř LR220000	' SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	ş LS410000	€ SC200000	Ş LS420000	× SA070000	ő LO250000	ě LE210000	Ő LO260000	(EO)

Code Page 01153

Host Code Page 1154/1381 Cyrillic

The column indicates the first digit, and the row indicates the second digit. If this code page is not used with a Cyrillic host machine, certain characters might not display properly.

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	Ъ KN120000	Ц KC010000	Й KJ110000	Я KA150000	Ь KX110000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	Љ KL410000	/ SP120000	Ѡ KC120000	а LA010000	ј LJ010000	~ SD190000	Ы KY010000	А LA020000	Ј LJ020000	€ SC200000	1 ND010000
-2	ђ KD610000	њ KN110000	ѓ KG120000	ќ KK120000	б LB010000	к LK010000	ѕ LS010000	з KZ010000	В LB020000	К LK020000	Ѕ LS020000	2 ND020000
-3	ѓ KG110000	ћ KC110000	Ѣ KE180000	ѣ ^(SHY) SP320000	с LC010000	l LL010000	t LT010000	ш KS210000	С LC020000	Л LL020000	Т LT020000	3 ND030000
-4	ё KE170000	ќ KK110000	Є KE160000	Ў KU240000	d LD010000	m LM010000	u LU010000	э KE130000	Д LD020000	М LM020000	U LU020000	4 ND040000
-5	ё KE150000	ђ KU230000	Ѕ KZ160000	Ц KG220000	e LE010000	n LN010000	v LV010000	ш KS150000	Е LE020000	Н LN020000	В LV020000	5 ND050000
-6	s KZ150000	ц KG210000	І KI120000	ю KU150000	f LF010000	o LO010000	w LW010000	ч KC210000	F LF020000	О LO020000	W LW020000	6 ND060000
-7	i KI110000	Ѣ KU220000	Ї KI180000	а KA010000	g LG010000	p LP010000	x LX010000	ъ KU210000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ï KI170000	N ² SM000000	J KJ020000	б KB010000	h LH010000	q LQ010000	y LY010000	Ю KU160000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	j KJ010000	Ѣ KD620000	Љ KL420000	` SD130000	i LI010000	r LR010000	z LZ010000	А KA020000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	]	| SM130000	: SP130000	д KD010000	к KK010000	р KR010000	Б KB020000	X KH020000	Н KN020000	Т KT020000	З KZ020000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	е KE010000	л KL010000	с KS010000	Ц KC020000	И KI020000	О KO020000	У KU020000	Ш KS220000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ф KF010000	м KM010000	т KT010000	Д KD020000	Й KJ120000	П KP020000	Ж KZ220000	Э KE140000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	г KG010000	н KN010000	у KU010000	Е KE020000	К KK020000	Я KA160000	В KV020000	Щ KS160000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	х KH010000	о KO010000	ж KZ210000	Ф KF020000	Л KL020000	Р KR020000	Ь KX120000	Ч KC220000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	и KI010000	п KP010000	в KV010000	Г KG020000	М KM020000	С KS020000	Ы KY020000	(EO)

Code Page 01154

Latin 5, Turkey

Host Code Page 1155/1378 Latin 5 - Turkey

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) SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	μ SM170000	¢ SC040000	ç LC410000	ğ LG230000	ü LU170000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ö LO170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	{ SM110000	ì LI130000	[SM060000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ı LI610000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ç LC420000	Ğ LG240000	Ş LS410000	:	« SP170000	 SM210000	ı SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	İ LI300000	, SP080000	Ö LO180000	» SP180000	 SM200000	ı SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ş LS420000	}	æ LA510000	] SM080000	- SD310000	~ SD190000	\ SM070000	# SM010000	" SP040000
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	` SD130000	 SD410000	\$ SC030000	” SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ı SM650000	Æ LA520000	@ SM050000	’ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	Ü LU180000	± SA020000	€ SC200000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 01155

Host Code Page 1160/1395 Thailand

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) SP010000	& SM030000	- SP100000	฿ SC130000	◎ BQ400000	๗ BQ500000	๘ BQ600000	○ ND100002	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SP300000	! BZ100300	/ SP120000	๑ BE400000	a LA010000	j LJ010000	~ SD190000	๑ ND010002	A LA020000	J LJ020000	๗ BZ300300	1 ND010000
-2	ก BK100000	จ BC100000	ฉ BT100000	ด BT600000	b LB010000	k LK010000	s LS010000	๒ ND020002	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ข BK200000	ฉ BX100000	๓ BT200000	ท BT700000	c LC010000	l LL010000	t LT010000	๓ ND030002	C LC020000	L LL020000	T LT020000	3 ND030000
-4	บ BK300000	๗ BS100000	๓ BT300000	ด BT800000	d LD010000	m LM010000	u LU010000	๔ ND040002	D LD020000	M LM020000	U LU020000	4 ND040000
-5	ค BK400000	๗ BX200000	๓ BT400000	น BN300000	e LE010000	n LN010000	v LV010000	๕ ND050002	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ค BK500000	๓ BX300000	๓ BN200000	บ BB100000	f LF010000	o LO010000	w LW010000	๖ ND060002	F LF020000	O LO020000	W LW020000	6 ND060000
-7	ข BK600000	๓ BY100000	๓ BD200000	ป BP100000	g LG010000	p LP010000	x LX010000	๗ ND070002	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ง BN100000	๓ BD100000	๓ BT500000	๓ BP200000	h LH010000	q LQ010000	y LY010000	๘ ND080002	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	[SM060000	] SM080000	^ SD150000	` SD130000	i LI010000	r LR010000	z LZ010000	๙ ND090002	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	๘ SC040000	! SP020000	! SM650000	: SP130000	๓ BF100000	๓ BR100000	๓ BS300000	๓ BQ200000	๓ BZ200300	๓ BQ300000	๓ BA700000	๓ BZ400000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	๓ BP300000	๓ BR200000	๓ BS400000	๓ BA200000	๓ BI200000	๓ BE200000	๓ BQ100000	๓ BZ500000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	๓ BF200000	๓ BL100000	๓ BH100000	๓ BA100000	๓ BU100000	๓ BE300000	๓ BE100000	๓ BN400000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	๓ BP400000	๓ BL200000	๓ BL300000	๓ BA300000	๓ BU200000	๓ BO200000	๓ BZ100000	๓ BZ400300
-E	+ SA010000	; SP140000	> SA050000	= SA040000	๓ BM100000	๓ BW100000	๓ BO100000	๓ BA400000	๓ BU300000	๓ BA500000	๓ BZ200000	๓ SC200000
-F	| SM130000	๓ SM660000	? SP150000	" SP040000	๓ BY200000	๓ BS200000	๓ BH200000	๓ BI100000	๓ BU400000	๓ BA600000	๓ BZ300000	(EO)

Code Page 01160

Host Code Page 00310 APL/TEXT

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) SP010000			◇ SL370000	~ SL460000	□ SL360000	- SL630000	α SL710000	{ SM110000	}	≡ SL300000	0 ND101000
-1	<u>A</u> LA480000	<u>J</u> LJ480000		^ SL510000	|| SF630000	|| SF580000	° SM190000	€ SL720000	(SP061000	) SP071000	1 ND012000	1 ND011000
-2	<u>B</u> LB480000	<u>K</u> LK480000	<u>S</u> LS480000	.. SL450000	— SF620000	|| SF590000	— SF100000	ℓ SL730000	+ SA011000	- SP101000	2 ND022000	2 ND021000
-3	<u>C</u> LC480000	<u>L</u> LL480000	<u>T</u> LT480000	⊠ SL270000	| SF640000	■ SF600000	• SM570000	ρ SL740000	▪ SM470000	⊞ SF050000	3 ND032000	3 ND031000
-4	<u>D</u> LD480000	<u>M</u> LM480000	<u>U</u> LU480000	1 SL860000	| SF650000	■ SF570000	π LN012000	ω SL750000	⊞ SF020000	⊞ SF040000		4 ND041000
-5	<u>E</u> LE480000	<u>N</u> LN480000	<u>V</u> LV480000	€ SL870000	| SF660000	■ SF610000			⊞ SF010000	⊞ SF030000		5 ND051000
-6	<u>F</u> LF480000	<u>Q</u> LO480000	<u>W</u> LW480000	⊢ SL340000				×	⊞ SF080000	⊞ SF090000		6 ND061000
-7	<u>G</u> LG480000	<u>P</u> LP480000	<u>X</u> LX480000	⊣ SL350000				\	⊞ SF070000	⊞ SF060000		7 ND071000
-8	<u>H</u> LH480000	<u>Q</u> LQ480000	<u>Y</u> LY480000	∨ SL500000				÷	§ SM240000	¶ SM250000		8 ND081000
-9	<u>I</u> LI480000	<u>R</u> LR480000	<u>Z</u> LZ480000									9 ND091000
-A				↑ SL610000	⊃ SL430000	∩ SL400000	∇ SL030000	⋈ SL170000	⊞ SL240000	≠ SL150000		
-B				↓ SL620000	⊂ SL420000	∪ SL410000	Δ SL060000	⋈ SL180000	! SL580000	≠ SL160000	⋈ SL040000	
-C				≤ SL560000	⊞ SM490000	⊥ SL230000	⊞ SL220000	⊞ SL260000	∇ SL050000	∇ SL320000	Δ SL330000	
-D				⌈ SL010000	○ SL080000	⌈ SL770000	⌈ SL780000	φ SL090000	⋈ SL070000	⊞ SL120000	⊞ SL110000	
-E				⌊ SL020000	± SA020000	≥ SL570000	≠ SL820000	⊞ SL280000	⊞ SL130000	⊞ SL140000	⊞ SL190000	
-F				→ SL600000	← SL590000	○ SL250000	| SL380000	⊞ SL100000	⊞ SL210000	⊞ SL200000	(EO)	

Code Page 00310

Chapter 9. Keyboards

This chapter describes the keyboards supported by the host system and Personal Communications. You select the keyboards during installation or customization procedures. You can use keyboard layouts to locate character positions or functions assignments on the keyboard.

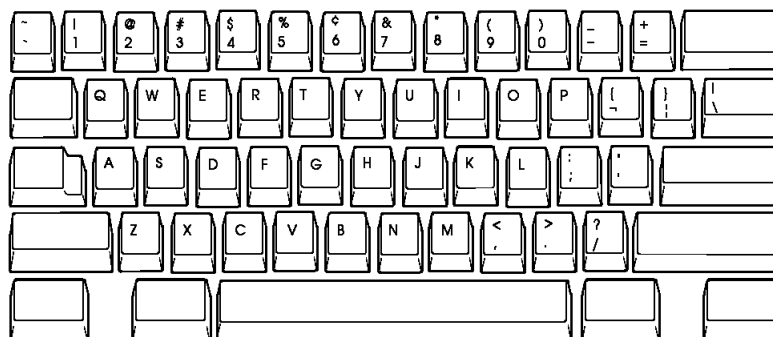
Character Positions

Depending on the country language selected, different characters can appear in different key positions. Refer to the *IBM OS/2 Keyboards and Code Pages* and *Personal System/2 National Language Supplement* for more information about the country and code page options. Ask your system administrator for information about host code pages.

The character positions, depending on the country language, are the same as those for OS/2, except the PS/2 101 keyboard.

Following is the character layout for the PS/2 101 keyboard:

Figure 8-1. PS/2 101 Keyboard



For keys with three or four characters shown, use the key combinations in the following table to produce the desired upper-right and lower-right characters. Lower-left characters require no additional keys. Use the shift key for upper-left characters.

Country	Lower-right character Enhanced template	Upper-right character all templates
Denmark Finland Norway Sweden	AltGr	Ctrl
All others	AltGr	None

Implementation of the diacritic keys for the Enhanced keyboard is the same as in OS/2.

Default Key Functions Mapping (Keyboard Layout)

The functions are positioned in the following shift status.

-Status-	
BASE	BASE : Normal shift
SHIFT	SHIFT : Up shift by pressing Shift
CTRL	CTRL : Control shift by pressing Ctrl
ALT	ALT : Alternate shift by pressing Alt
ALTGR	ALTGR : Shift by pressing Ctrl+Alt
CTRLSFT	CTRLSFT : Shift by pressing Ctrl+Shift

Key Function Abbreviations for PC/3270

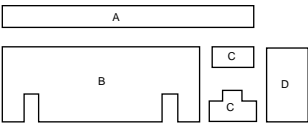
Following are the abbreviations of the functions: Keyboards

Face Name	Function Name
AltCr	Alternate Cursor
Apl	APL
Attn	Attention
BackSp	Backspace
BackTab	Backtab
BackWd	Backtab Word
Blue	Color Blue
Break	Break
ChgFmt	Change Format Toggle
ChgScr	Change Screen
Clear	Clear Screen
CrBnk	Cursor Blink
CrSel	Cursor Select
Delete	Delete Character
DelWd	Delete Word
Doc	Document Mode Toggle
Down	Cursor Down
Dup	Dup Field
EditCopy	Edit Copy
EditCut	Edit Cut
EditPst	Edit Paste
EditUndo	Edit Undo
EndFld	End Field
Enter	Enter
Entr/Ctl	Enter/Control
ErEOF	Erase EOF
ErFld	Erase Field
ErInp	Erase Input
FastDown	Fast Cursor Down
FastUp	Fast Cursor Up

Face Name	Function Name
FieldCol	Color Field Inherit
FieldHil	Highlighting Field Inherit
PSFldInh	PS Field Inherit
FieldTrn	Transparency Field Inherit
FldMk	Field Mark
FwdWd	Tab Word
Green	Color Green
GrpCsr	Graphic Cursor
Home	Home
Insert	Insert Toggle
JumpNext	Jump Next Session
Left	Cursor Left
LightPen	Light Pen
MarkDown	Mark Down
MarkLeft	Mark Left
MarkRigh	Mark Right
MarkUp	Mark Up
MoveDown	Move Mark Down
MoveLeft	Move Mark Left
MoveRigh	Move Mark Right
MoveUp	Move Mark Up
NewLine	New Line
Pause	Pause
PA1	Program Attention Key 1
PA2	Program Attention Key 2
PA3	Program Attention Key 3
PF1 - 24	Program Function Key 1 - 24
Pink	Color Pink
Play	Play
ProgSymA-ProgSymF	Programmed Symbol A-F
Quit	Quit
Record	Record
Red	Color Red
Rest/Ctl	Reset/Control
Reverse	Highlighting Reverse
Right	Cursor Right
RTM	Response Time Monitor
Rule	Rule
SysRq	System Request
Tab	Tab Field
Test	Test

Face Name	Function Name
TrnOp	Transparency Opaque
Turquoise	Color Turquoise
Underscr	Highlighting Underscore
Up	Cursor Up
White	Color White
WordWrap	Word Wrap Toggle
Yellow	Color Yellow
ACK	Ctrl-F (ACK)
BEL	Ctrl-G (BEL)
BS	Ctrl-H (BS)
CAN	Ctrl-X (CAN)
CR	Ctrl-M (CR)
DC1	Ctrl-Q (DC1)
DC2	Ctrl-R (DC2)
DC3	Ctrl-S (DC3)
DC4	Ctrl-T (DC4)
DLE	Ctrl-P (DLE)
EM	Ctrl-Y (EM)
ENQ	Ctrl-E (ENQ)
EOT	Ctrl-D (EOT)
ESC	Ctrl-[(ESC)
ESC_J	ESC_J
ETB	Ctrl-W (ETB)
ETX	Ctrl-C (ETX)
FF	Ctrl-L (FF)
FS	Ctrl- ²² (FS)
GS	Ctrl-] (GS)
HT	Ctrl-I (HT)
LF	Ctrl-J (LF)
NAK	Ctrl-U (NAK)
NUL	Ctrl-@ (NUL)
RS	Ctrl- ^o (RS)
SI	Ctrl-O (SI)
SO	Ctrl-N (SO)
SOH	Ctrl-A (SOH)
STX	Ctrl-B (STX)
SUB	Ctrl-Z (SUB)
SYN	Ctrl-V (SYN)
US	Ctrl-_(US)
VT	Ctrl-K (VT)

Type Enhanced Keyboard (101)



Segment C assignment:

75 Insert Dup EditCopy PA1 PA1 EditPst	80 Home FldMk Rule PA2 PA2 *****	85 ***** PA3 ChgScr JmpNext JmpNext *****
76 Delete EditCut DelWd DelWd *****	81 ErEOF ErFld ***** ErInp ErInp *****	86 ***** EditPst Test ***** ***** *****
79 Left MarkLeft MoveLeft BackWd BackWd *****	83 Up Markup Moveup FastUp FastUp *****	84 Down MarkDown MoveDown FastDn FastDn *****
88 Right MarkRight MoveRight FwdWd FwdWd *****	89 ***** ***** ***** ***** *****	***** ***** ***** ***** *****

Segment D assignment:

90 ***** ***** ***** ***** *****	95 ***** ***** ***** ***** TtnOp	100 ***** ***** Reverse Reverse *****	105 ***** ***** ***** ***** *****
91 Home ***** ***** ***** *****	96 Up ***** MoveUp FastUp FastUp FieldTrn	101 ***** ***** ***** ***** *****	106 ***** Tab ***** ***** *****
92 Left ***** MoveLeft ***** ***** ProgSymD	97 ***** ***** ***** ***** ProgSymE	102 Right ***** MoveRight UnderScr UnderScr ProgSymF	***** ***** ***** ***** *****
93 EndFld ***** ***** ***** ***** ProgSymA	98 Down ***** MoveDown FastDown FastDown ProgSymB	103 ESC_J ***** ***** FieldHil FieldHil ProgSymC	108 Enter Enter ***** ***** *****
99 Insert ***** ***** ***** PSFidlnh	104 Delete ***** ***** DelWd DelWd *****	***** ***** ***** ***** *****	***** ***** ***** ***** *****

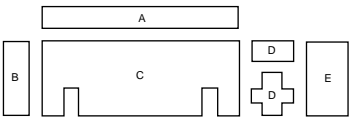
Segment A assignment:

110 Attn *****	112 PF1 PF13 ***** Doc Doc Red *****	113 PF2 PF14 ***** WordWrap WordWrap Pink *****	114 PF3 PF15 ***** ChgFmt ChgFmt Green *****	115 PF4 PF16 ***** Yellow *****	116 PF5 PF17 Record ***** Blue *****	117 PF6 PF18 Play ***** Turquoise *****	118 PF7 PF19 Pause ***** White *****	119 PF8 PF20 APL ***** FieldCol *****	120 PF9 PF21 CrSel ***** *****	121 PF10 PF22 CrBrk ***** *****	122 PF11 PF23 RTM AltCr AltCr *****	123 PF12 PF24 ***** GrpCsr GrpCsr *****	124 ***** SysRq ***** *****	125 ***** ***** *****	126 Clear ***** Break *****
----------------------	---	--	---	--	--	---	--	---	---	--	---	---	---	--------------------------------	---

Segment B assignment:

1 *****	2 *****	3 ***** NUL *****	4 *****	5 *****	6 *****	7 ***** RS *****	8 *****	9 *****	10 *****	11 *****	12 ***** US *****	13 *****	15 BackSp BackSp ***** EditUndo *****
16 Tab BackTab *****	17 ***** DC1 *****	18 ***** ETB *****	19 ***** ENQ *****	20 ***** DC2 *****	21 ***** DC4 *****	22 ***** EM *****	23 ***** NAK *****	24 ***** HT *****	25 ***** SI *****	26 ***** DLE *****	27 ***** ESC *****	28 ***** GS *****	29 ***** FS *****
30 *****	31 ***** SOH *****	32 ***** DC3 *****	33 ***** EOT *****	34 ***** ACK *****	35 ***** BEL *****	36 ***** BS *****	37 ***** LF *****	38 ***** VT *****	39 ***** FF *****	40 *****	41 *****	43 Newline Newline *****	
44 *****	46 ***** SUB *****	47 ***** CAN *****	48 ***** ETX *****	49 ***** SYN *****	50 ***** STX *****	51 ***** SO *****	52 ***** CR *****	53 *****	54 *****	55 *****	57 *****		
58 Rest/ctrl Rest/ctrl ***** Quit Quit *****	60 *****	61 ***** ***** ***** ***** *****									62 *****	64 Entr/ctrl Entr/ctrl *****	

Type 122 Keyboard



Segment A assignment:

122 PF13 PF13 Red Red -----	123 PF14 PF14 Pink Pink -----	124 PF15 PF15 Green Green -----	125 PF16 PF16 Yellow Yellow -----	126 PF17 PF17 Blue Blue -----	127 PF18 PF18 Turquoise Turquoise -----	128 PF19 PF19 RTM White White -----	129 PF20 PF20 FieldCol FieldCol -----	130 PF21 PF21 ----- ----- -----	131 PF22 PF22 CrBnk CrBnk -----	132 PF23 PF23 AltCr AltCr -----	133 PF24 PF24 GrpCr GrpCr -----
110 PF1 PF1 Doc Doc -----	111 PF2 PF2 WordWrap WordWrap -----	112 PF3 PF3 ChgFmt ChgFmt -----	113 PF4 PF4 ----- ----- -----	114 PF5 PF5 ----- ----- -----	115 PF6 PF6 ----- ----- -----	116 PF7 PF7 ----- ----- -----	117 PF8 PF8 Apl Apl -----	118 PF9 PF9 Reverse Reverse -----	119 PF10 PF10 ----- ----- -----	120 PF11 PF11 Underscr Underscr -----	121 PF12 PF12 FieldHil FieldHil -----

Segment B assignment:

70 Attn Attn ----- SysRq SysRq -----	65 Clear Clear ----- ----- -----
71 CrSel CrSel ----- ----- -----	66 Pause Pause ----- Erlnp -----
72 ----- ----- ----- ----- -----	67 ErEOF ErEOF ----- Record -----
73 ----- ----- ----- ----- -----	68 Play ----- ----- Test Test -----
74 ----- ----- ----- ----- -----	69 ----- ----- ----- ----- -----

Segment D assignment:

75 PA1 Dup ----- ----- -----	80 PA2 FldMk ----- ChgScr ChgScr -----	85 JmpNext JmpNext ----- PA3 PA3 -----
76 BackTab BackTab ----- ----- -----	81 Insert EditPst EditCopy -----	86 Delete EditCut ----- DelWd -----
78 Left MarkLeft MoveLeft BackWd BackWd -----	83 Rule ----- Home Home -----	88 Right MarkRigh MoveRight FwdWd FwdWd -----
84 Down MarkDow MoveDow FastDown FastDown -----		

Segment E assignment:

90 ----- ----- ----- ----- -----	95 ----- ----- ----- ----- -----	100 ----- ----- ----- TmOp -----	105 ----- ----- Break ----- -----
91 ----- ----- ----- ----- -----	96 ----- ----- ----- ----- -----	101 ----- ----- ----- FieldTrn -----	106 Tab Tab ----- ----- -----
92 ----- ----- ----- ----- -----	97 ----- ----- ----- ----- -----	102 ----- ----- ----- ----- -----	107 ----- ----- ----- ----- -----
93 ----- ----- ----- ----- -----	98 ----- ----- ----- ----- -----	103 ESC J ----- ----- -----	108 Enter Enter ----- ----- -----
99 ----- ----- ----- ----- -----	104 ----- ----- ----- ----- -----		

Segment C assignment:

1 *****	2 *****	3 ***** NUL	4 *****	5 *****	6 *****	7 ***** RS	8 *****	9 *****	10 *****	11 *****	12 ***** US	13 *****	15 BackSp BackSp ***** EditUndo
16 Tab Tab *****	17 ***** DC1	18 ***** ETB	19 ***** ENQ	20 ***** DC2	21 ***** DC4	22 ***** EM	23 ***** NAK	24 ***** HT	25 ***** SI	26 ***** DLE	27 ***** ESC	28 ***** GS	43 NewLine NewLine *****
30 *****	31 ***** SOH	32 ***** DC3	33 ***** EOT	34 ***** ACK	35 ***** BEL	36 ***** BS	37 ***** LF	38 ***** VT	39 ***** FF	40 *****	41 *****	42 ***** FS	
44 *****	45 *****	46 ***** SUB	47 ***** CAN	48 ***** ETX	49 ***** SYN	50 ***** SYX	51 ***** SO	52 ***** CR	53 *****	54 *****	55 *****	57 *****	
58 Rest/Ctl Rest/Ctl ***** Quit Quit		60 *****				61 *****				62 *****		64 Entr/Ctrl Entr/Ctrl *****	

Key Function Abbreviations for PC400

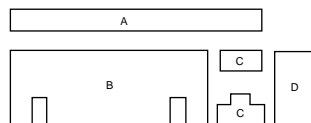
Following are the abbreviations of the functions:

Face Name	Function Name
AltCr	Alternate Cursor
Attn	Attention
BackSp	Backspace
BackTab	Backtab
BackWd	Backtab Word
BegLin	Begin of Line
Bold	Begin Bold
BotPag	Bottom of Page
Center	Center Text
Clear	Clear Screen
CrBnk	Cursor Blink
CrRtn	Carrier Return
Delete	Delete Character
DelWd	Delete Word
Down	Cursor Down
Dup	Dup Field
EditCopy	Edit Copy
EditCut	Edit Cut
EditPst	Edit Paste
EditUndo	Edit Undo
EndB/U	End Bold/Underscore

Face Name	Function Name
EndLin	End of Line
Entr/Ctl	Enter/Control
ErEOF	Erase EOF
ErInp	Erase Input
FastDown	Fast Cursor Down
FastUp	Fast Cursor Up
FldExit	Field Exit
FldMinus	Field-
FldMk	Field Mark
FldPlus	Field+
FwdWd	Tab Word
HalfDn	Half Index Down
HalfUp	Half Index Up
Help	Help
Home	Home
HostPrn	Host Print
Insert	Insert Toggle
JmpNext	Jump Next Session
Left	Cursor Left
MarkDown	Mark Down
MarkLeft	Mark Left
MarkRigh	Mark Right
MarkUp	Mark Up
MoveDown	Move Mark Down
MoveLeft	Move Mark Left
MoveRigh	Move Mark Right
MoveUp	Move Mark Up
NewLine	New Line
NxtCol	Next Column
NxtStp	Next Stop Code
Pause	Pause One Second
Pause	Pause
PF 1 - 24	Program Function Key 1 - 24
PgEnd	End of Page
Play	Play
Quit	Quit
RBckSp	Required Backspace
Record	Record
Rest/Ctl	Reset/Control
Right	Cursor Right
RollDown	Roll Down

Face Name	Function Name
RollUp	Roll Up
RqdSpc	Required Space
RqdTab	Required Tab
Rule	Rule
StpCde	Stop Code
Symbol	Insert Symbol
SysRq	System Request
Tab	Tab Field
TestRq	Test Request
TopPag	Top of Page
TxtCde	Display Text Codes
UndLn	Begin Underscore
WrUnd	Word Underscore

PS/2 Enhanced Keyboard (101)



Segment C assignment:

75 Insert Dup EditCopy TxtCde EditPst	80 Home FldMk Rule ----- ----- -----	85 RollDown RollDown ----- JmpNext JmpNext
76 Delete EditCut DelWd DelWd ----- -----	81 ErEOF ----- ----- ErInp ErInp ----- -----	86 RollUp EditPst ----- ----- ----- -----

79 Left MarkLeft MoveLeft BackWd BackWd -----	83 Up MarkUp MoveUp FastUp FastUp -----	84 Down MarkDown MoveDown FastDown FastDown -----	89 Right MarkRight MoveRight FwdWd FwdWd -----
---	---	---	--

Segment D assignment:

90 ----- ----- ----- ----- -----	95 ----- ----- ----- ----- -----	100 ----- ----- ----- ----- -----	105 FldMinus FldMinus CrRtn FldMinus FldMinus
91 Home ----- ----- ----- -----	96 Up ----- TopPag FastUp FastUp -----	101 RollDown ----- ----- ----- -----	106 FldPlus FldPlus CrRtn FldPlus FldPlus
92 Left ----- BegLin ----- -----	97 ----- ----- ----- ----- -----	102 Right ----- EndLn ----- -----	
93 ErEOF ----- ----- ----- -----	98 Down ----- BotPag FastDown FastDown -----	103 RollUp ----- ----- ----- -----	108 FldExit FldExit ----- ----- -----
99 Insert ----- ----- ----- -----	104 Delete ----- DelWd DelWd -----		

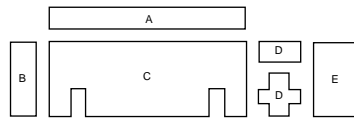
Segment A assignment:

110 Attn ----- ----- -----	112 PF1 PF13 ----- ----- ----- -----	113 PF2 PF14 ----- ----- -----	114 PF3 PF15 ----- ----- -----	115 PF4 PF16 ----- ----- -----	116 PF5 PF17 Record ----- ----- -----	117 PF6 PF18 Play ----- ----- -----	118 PF7 PF19 Pause ----- ----- -----	119 PF8 PF20 ----- ----- -----	120 PF9 PF21 ----- ----- -----	121 PF10 PF22 CrBnk ----- ----- -----	122 PF11 PF23 AltCr ----- ----- -----	123 PF12 PF24 ----- ----- -----	124 ----- ----- ----- ----- -----	125 ----- ----- ----- ----- -----	126 Clear ----- HostPm TestRq ----- -----
--	--	---	---	---	---	---	--	---	---	---	---	--	--	--	---

Segment B assignment:

1 ----- ----- ----- -----	2 ----- ----- ----- -----	3 ----- ----- ----- -----	4 ----- ----- ----- -----	5 ----- ----- ----- -----	6 ----- ----- ----- -----	7 ----- ----- ----- -----	8 ----- ----- ----- -----	9 ----- ----- ----- -----	10 ----- ----- ----- -----	11 ----- ----- ----- -----	12 ----- ----- ----- -----	13 ----- ----- ----- -----	15 BackSp BackSp RBckSp EditUndo ----- -----
16 Tab BackTab RqdTab ----- ----- -----	17 ----- ----- ----- -----	18 ----- ----- ----- -----	19 ----- ----- ----- -----	20 ----- ----- ----- -----	21 ----- ----- ----- -----	22 ----- ----- ----- -----	23 ----- ----- ----- -----	24 ----- ----- ----- -----	25 ----- ----- ----- -----	26 ----- ----- ----- -----	27 ----- ----- ----- -----	28 ----- ----- ----- -----	29 ----- ----- ----- -----
WrdUnd						HalfUp		UndLn		PgEnd			
30 ----- ----- ----- -----		31 ----- ----- ----- -----	32 ----- ----- ----- -----	33 ----- ----- ----- -----	34 ----- ----- ----- -----	35 ----- ----- ----- -----	36 ----- ----- ----- -----	37 ----- ----- ----- -----	38 ----- ----- ----- -----	39 ----- ----- ----- -----	40 ----- ----- ----- -----	41 ----- ----- ----- -----	43 FidExit NewLine CrRun ----- -----
Symbol		StpCde		NxtCol		HalfDn		EndB/U					
44 ----- ----- ----- -----		46 ----- ----- ----- -----	47 ----- ----- ----- -----	48 ----- ----- ----- -----	49 ----- ----- ----- -----	50 ----- ----- ----- -----	51 ----- ----- ----- -----	52 ----- ----- ----- -----	53 ----- ----- ----- -----	54 ----- ----- ----- -----	55 ----- ----- ----- -----	57 ----- ----- ----- -----	
				Center		Bold		NxtStp					
58 Rest/Ctl Rest/Ctl ----- Quit Quit -----		60 ----- ----- ----- -----				61 ----- ----- ----- -----		ReqSpC				64 Entr/Ctrl Entr/Ctrl ----- -----	

Host Connect Keyboard



Segment A assignment:

122 PF13 PF13 HostPm -----	123 PF14 PF14 -----	124 PF15 PF15 -----	125 PF16 PF16 -----	126 PF17 PF17 -----	127 PF18 PF18 -----	128 PF19 PF19 -----	129 PF20 PF20 -----	130 PF21 PF21 -----	131 PF22 PF22 CrBnk CrBnk -----	132 PF23 PF23 AltCr AltCr -----	133 PF24 PF24 -----
110 PF1 PF1 Help -----	111 PF2 PF2 -----	112 PF3 PF3 -----	113 PF4 PF4 -----	114 PF5 PF5 -----	115 PF6 PF6 -----	116 PF7 PF7 -----	117 PF8 PF8 -----	118 PF9 PF9 -----	119 PF10 PF10 -----	120 PF11 PF11 -----	121 PF12 PF12 -----

Segment B assignment:

70 Attn Attn SysRq SysRq -----	65 Clear Clear -----
71 ----- ----- ----- -----	66 Pause Pause Erlnp -----
72 ----- ----- ----- -----	67 ErEOF ErEOF Record -----
73 ----- ----- ----- -----	68 Play ----- TestRq TestRq -----
74 ----- ----- ----- -----	69 ----- ----- ----- -----

Segment D assignment:

75 Dup Dup -----	80 FldMk FldMk -----	85 JmpNext JmpNext -----
76 BackTab BackTab -----	81 Insert EditPst EditCopy TxtCde -----	86 Delete EditCut ----- DelWd -----
	82 Up MarkUp MoveUp FastUp FastUp -----	
78 Left MarkLeft MoveLeft BackWd BackWd -----	83 Rule Rule ----- Home Home -----	88 Right MarkRigh MoveRight FwdWd FwdWd -----
	84 Down MarkDow MoveDow FastDown FastDown -----	

Segment E assignment:

90 ----- ----- ----- -----	95 ----- ----- ----- -----	100 ----- ----- ----- -----	105 ----- ----- ----- -----
91 ----- ----- ----- -----	96 ----- TopPag ----- -----	101 RollDown ----- -----	106 Tab Tab CrRtn FldPlus FldPlus -----
92 ----- BegLin ----- -----	97 ----- ----- ----- -----	102 ----- EndLin ----- -----	107 ----- ----- CrRtn FldMinus FldMinus -----
93 ----- ----- ----- -----	98 ----- BotPag ----- -----	103 RollUp ----- -----	108 FldExit FldExit ----- -----
99 ----- ----- ----- -----	104 ----- ----- ----- -----		

Segment C assignment:

1 *****	2 *****	3 *****	4 *****	5 *****	6 *****	7 *****	8 *****	9 *****	10 *****	11 *****	12 *****	13 *****	15 BackSp BackSp RBackSp EditUndo *****
16 Tab Tab RqdTab *****	17 *****	18 ***** WrldUnd	19 *****	20 *****	21 *****	22 ***** HalfUp	23 ***** UndLn	24 *****	25 *****	26 ***** PgEnd	27 *****	28 *****	43 FidExit NewLine *****
30 *****	31 ***** Symbol	32 ***** StpCde	33 ***** NxtCol	34 *****	35 *****	36 ***** HalfDn	37 ***** EndB/U	38 *****	39 *****	40 *****	41 *****	42 *****	
44 *****	46 *****	47 *****	48 ***** Center	49 *****	50 ***** Bold	51 ***** NxtStp	52 *****	53 *****	54 *****	55 *****	57 *****		
58 Rest/Ctl Rest/Ctl ***** Quit Quit *****	60 *****	61 ***** RqdSpC *****	62 *****	64 Entr/Ctrl Entr/Ctrl *****									

APL Keyboard Layouts

This section shows the APL keyboard layouts for each country. Only APL characters are shown in each shift position (up/down/Alt). The character position is common to the 122-Key Keyboard and the IBM Enhanced Keyboard, except U.S. English, and is categorized into the types that appear on the following pages:

Language	Type
Austrian or German	1
Belgian AZERTY	2
Brazil (274)	3
Brazil (275)	2
Bosnia/Herzegovina	1
Bulgarian	1
Canadian (Bilingual)	1
Croatian	1
Czech	1
Denmark	1
Finnish or Swedish	1
French AZERTY	2
Greek	1
Hungarian	1
Italian	1
Japanese	4
Latin American Spanish	1
Norwegian	1

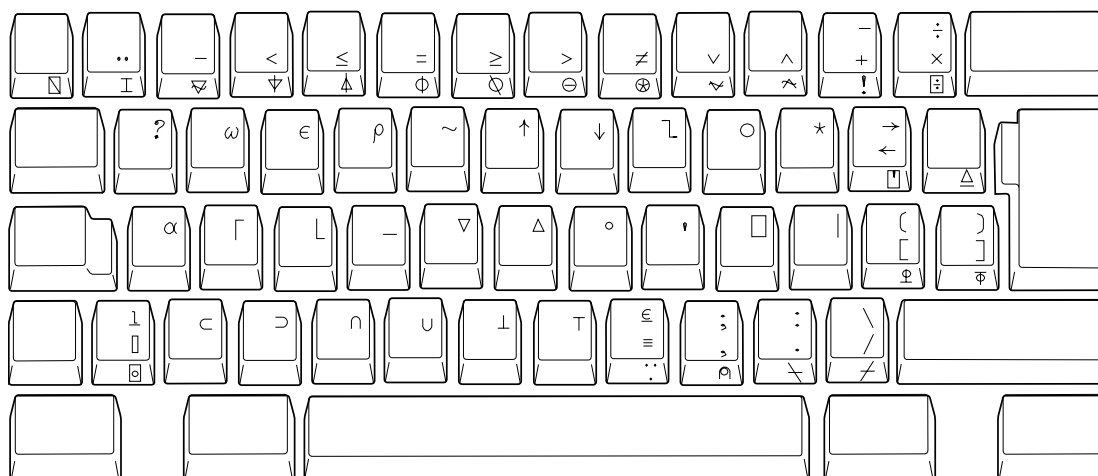


Figure 13. Type-2 APL Keyboard

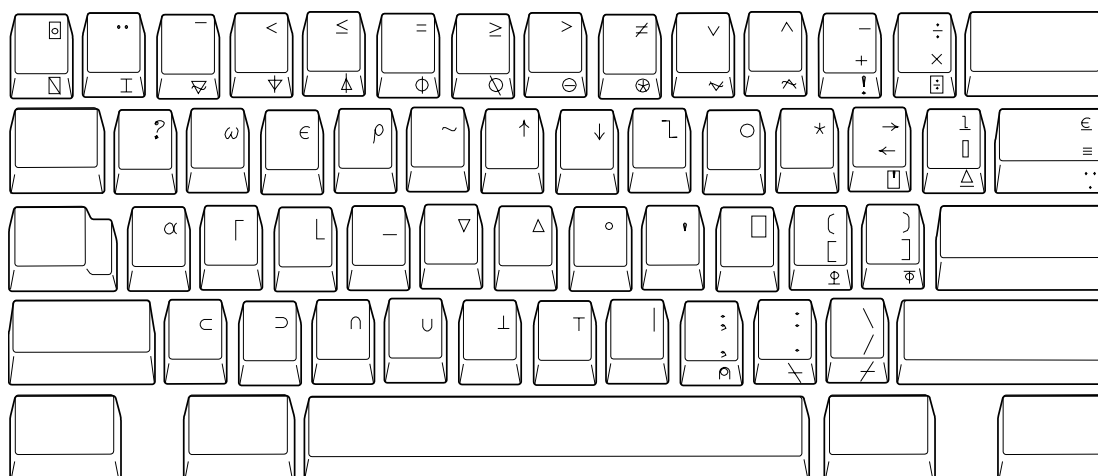


Figure 14. Type-3 APL Keyboard

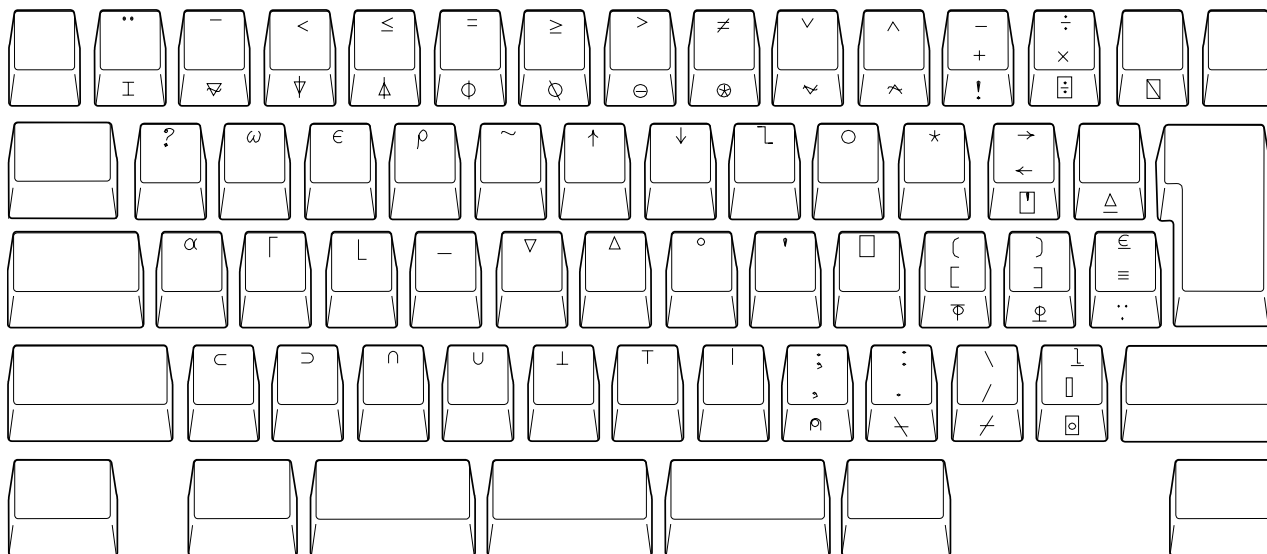


Figure 15. Type-4 APL Keyboard

Key Map for Home3270

This section shows the positions of the following control codes:

NUL (X'00')
 ESC (X'1B')
 FS (X'1C')
 GS (X'1D')
 RS (X'1E')
 US (X'1F')

The positions of these control codes are fixed and common for all language (including U.S. English), regardless of the characters assigned to BASE and UP SHIFT positions of the keys. These control codes are positioned to the CONTROL positions of the keys shown in Figure 16 through Figure 18 on page 177 .

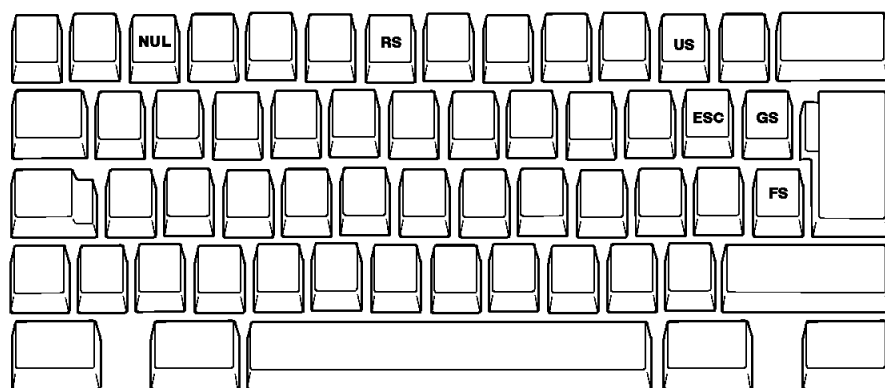


Figure 16. Common Control Code of the Keyboard Core Segment for the 122-Key Keyboard

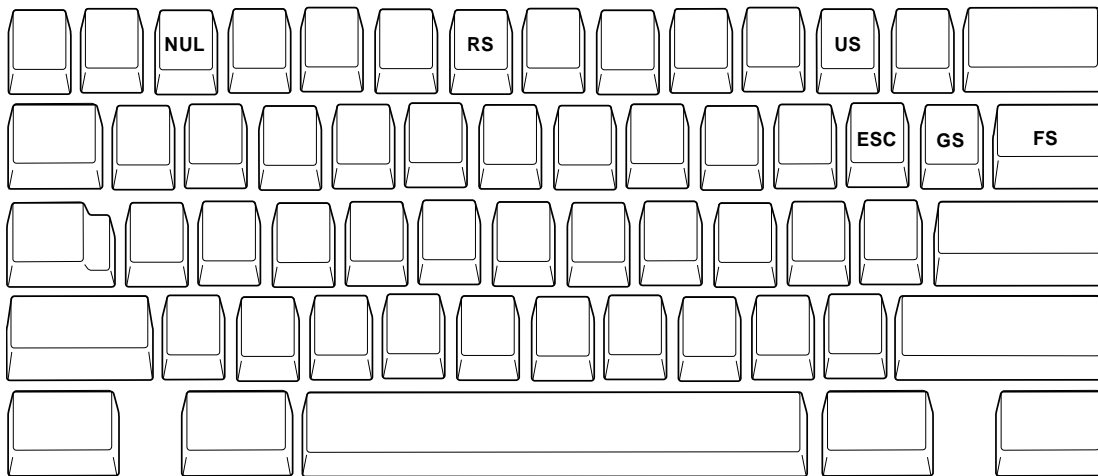


Figure 17. Common Control Code of the Keyboard Core Segment for the Enhanced Keyboard

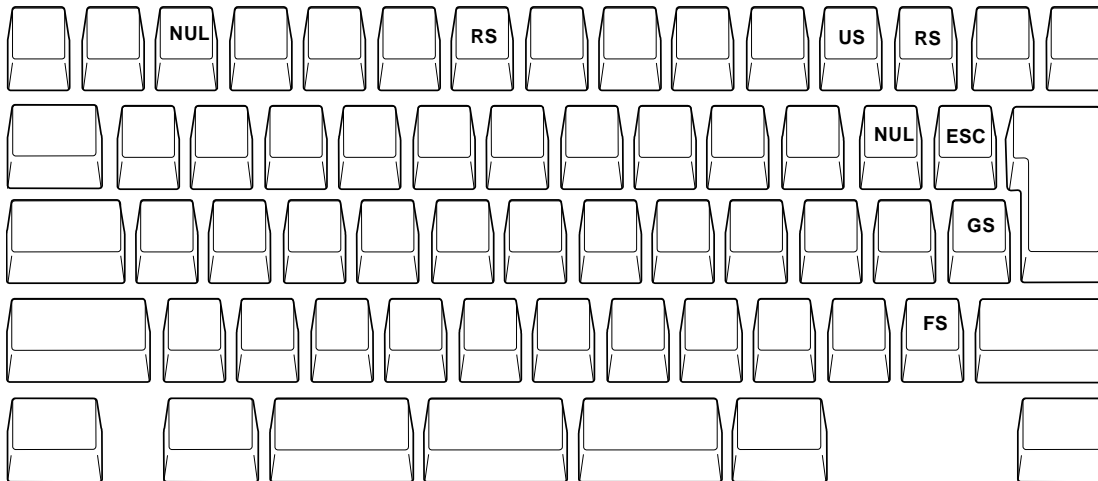


Figure 18. Common Control Code of the Keyboard Core Segment for the Japanese Keyboard

The positions of other control codes vary for each language. These control codes are positioned to the CONTROL position of the associated alphabetic key. Those control codes and the associated alphabetic characters are as follows:

Table 6. Other Control Code Map of Key Segment B

Control Code	Associated Letter
SOH (x01)	a
STX (x02)	b
ETX (x03)	c
EOT (x04)	d
ENQ (x05)	e
ACK (x06)	f
BEL (x07)	g
BS (x08)	h
HT (x09)	i

Table 6. Other Control Code Map of Key Segment B (continued)

LF (x0A)	j
VT (x0B)	k
FF (x0C)	l
CR (x0D)	m
SO (x0E)	n
SI (x0F)	o
DLE (x10)	p
DC1(XON) (x11)	q
DC2 (x12)	r
DC3(XOF) (x13)	s
DC4 (x14)	t
NAK (x15)	u
SYN (x16)	v
ETB (x17)	w
CAN (x18)	x
EM (x19)	y
SUB (x1A)	z

The following figure shows an example of control code mapping for the U.S. 122-Key and the U.S. Enhanced Keyboards:

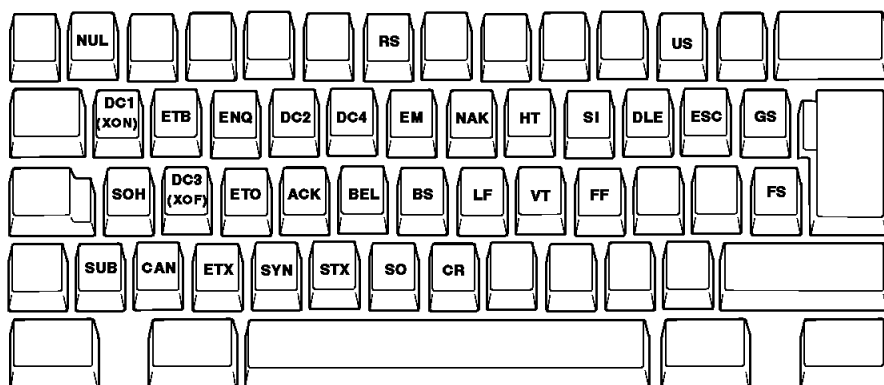


Figure 19. Control Code Map of the Keyboard Core Segment for the U.S. 122-Key Keyboard

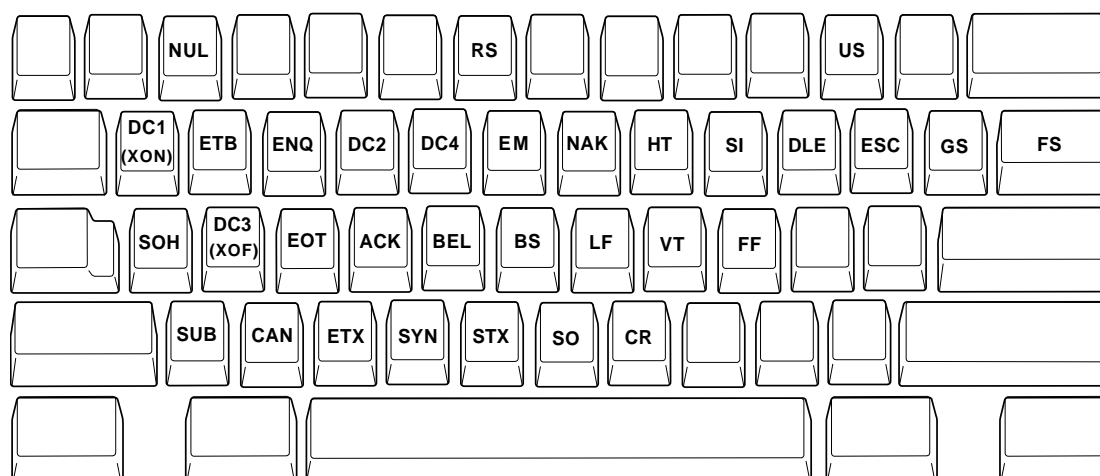


Figure 20. Control Code Map of the Keyboard Core Segment for the U.S. Enhanced Keyboard

Chapter 10. Migration

Migrating to Personal Communications Version 4.3

Personal Communications Version 4.3 requires the use of OS/2 Version 4.0 or higher. Earlier versions of the operating system must be migrated first.

After migrating the operating system, you can migrate the following to Personal Communications Version 4.3 and use your original configuration information:

- Personal Communications for OS/2 Version 4.1
- Configuration files of CM/2 Version 1.11

The new structure of Personal Communications utilizes the Access Feature for all connectivities that require SNA for emulation or other advanced functions such as X.25 or ISDN. This has eliminated the duplicate communication stacks seen in Personal Communications when the user wanted SNA API support along with emulation.

This Access Feature provides the same end node functionality as CM/2 1.11. In addition, the Access Feature provides enhanced end node function, such as Anynet and HPR, which provide multiprotocol support and advanced SNA routing.

With this change in system structure, the migration path has been modified. There are now two migration utilities. The CM/2 migration utility is automatically started if you are installing over CM/2. This is done to allow the install program to use the migrated config to install the necessary Access Feature files. The user can select to migrate at installation time or after the product is installed. The PCOMM 4.1 Migration Utility can only be used after installation.

At installation, Personal Communications 4.1 **.WS** files will be moved to the **PCOMOS2\OLD_WS** directory and CM/2 1.11 configuration files (**.CFG**, **.CF2**, **.NDF**, **.SEC**) will be moved to the **PCOMOS2\OLD_CFG** directory so the files will not be overwritten. All other existing files will be overwritten and new files will be installed in **PCOMOS2** and **CMLIB**.

The migration utilities can be accessed after installation from the appropriate ICON in the Personal Communications Administration Tools folder or the command line. See "CM/2 Migration Utility" and "PCOMM 4.1 Migration Utility" on page 185 for details. The migration utilities will automatically create the necessary Version 4.3 format **.WS** file and Access Feature configuration files (**.RSP**, **.CFG**, **.CF2**, **.NDF**, **.SEC**).

CM/2 Migration Utility

This utility migrates CM/2 **.CFG** configuration files to working Personal Communications Version 4.3 configurations. Each Personal Communications 4.2 configuration consists of multiple **.ws** files and an Access Feature **.CFG** file.

Since the Access Feature is a replacement for CM/2, the non-emulator information will be upgraded to an Access Feature configuration. The emulator information will be extracted out of the CM/2 configuration into an intermediate **.EMR** file and

then converted to the required Version 4.3 .WS file. The following information is migrated from CM/2 to a Version 4.3 .WS file:

- 3270 and 5250 session information, which includes:
 - Hotspot
 - Print information
 - 3270 Color
 - file transfer information
- Keyboard information, which includes:
 - Country keywords
 - Keyboard layout keywords

Note: The values stored under Keyboard Remap will not be migrated and must be reentered. A .KMP template can be created and distributed using the CID COPY keyword.

When migrating a configuration file named MYCONFIG.CFG, the following workstation profiles and Personal Communications batch file will be created: MYCONFIA.WS, MYCONFIB.WS, MYCONFIC.WS, etc., MYCONFIG.BCH.

An error log, named cmmigerr.log, and a history log, named cmmighst.log, are generated in the Personal Communications PRIVATE directory.

Instructions

Select one or more configuration (.CFG) files from a single directory for migration. (By default the current directory, the directory from which the .CFG files can be selected is the OLD_CFG subdirectory of the Personal Communications directory.)

There are two modes for the utility:

Quiet Mode

If the /q option is used, the quiet mode is invoked. The quiet mode returns a 0 value on success and a nonzero value on error. Two log files will be generated. No windows are displayed.

Windowed Mode

If the /q option is not used, the windowed version will be invoked.

The controls on the migration dialog include:

- A listbox containing all .CFG files in the currently selected directory. (By default C:\PCOMOS2\OLD_CFG is the current directory, where C:\PCOMOS2 is the Personal Communications directory.) Select the .CFG files in this listbox to migrate.
- A "Help" button which brings up the main help dialog.
- A "Migrate" button which begins the migration of the files selected in the listbox.
- A "Directory" button which brings up a dialog to change the current directory and drive. After changing the directory and/or drive the listbox will be updated with a list of any .CFG files in the new directory. Changing the directory and/or drive will cancel any previous selection of .CFG files.
- A "Close" button to close the migration tool. After the "Migration" button is selected and the migration has begun, a progress dialog will be displayed. This dialog has a "Cancel" button that if selected will terminate the current migration and bring back the first dialog. When the migration is complete, a dialog will be

displayed that tells the user whether the migration was successful. In the case of an error, this dialog will include error information. After the user closes the completion information dialog, the first dialog will once again be active and more selections and migrations can be done.

Note: The history log, `cmmighis.log`, and the error log, `cmmigerr.log`, will also be generated for the windowed migration utility.

Command Line Parameters

pcsmigcm.exe

Starts the windowed CM/2 .CFG configuration file migration utility.

pcsmigcm.exe /?

Shows usage information.

pcsmigcm.exe list_of_cfg_files

Starts the windowed CM/2 .CFG configuration file migration utility with the list of .CFG files already selected from the default directory (i.e. from `C:\PCOMOS2\OLD_CFG`).

Note: The list of .CFG files is a space separated list.

pcsmigcm.exe /d:DIRECTORY list_of_cfg_files

Starts the windowed CM/2 .CFG configuration file migration utility with the list of .CFG files already selected from the directory `DIRECTORY`.

Note: The list of .CFG files is a space separated list.

pcsmigcm.exe /q list_of_cfg_files

Starts the CM/2 .CFG configuration file migration utility in the quiet mode (no windows are created). The list of .CFG files in the default directory (i.e. `C:\PCOMOS2\OLD_CFG`) will be migrated.

Note: The list of .CFG files is a space separated list.

pcsmigcm.exe /d:DIRECTORY /q list_of_cfg_files

Starts the CM/2 .CFG configuration file migration utility in the quiet mode (no windows are created). The list of .CFG files in the directory `DIRECTORY` will be migrated.

Note: The list of .CFG files is a space separated list.

pcsmigcm.exe /q /noicons list_of_cfg_files

Starts the CM/2 .CFG configuration file migration utility in the quiet mode (no windows are created). The list of .CFG files in the default directory (i.e. `C:\PCOMOS2\OLD_CFG`) will be migrated. No icons are created.

Note: The list of .CFG files is a space separated list.

pcsmigcm.exe /d:DIRECTORY /q /noicons list_of_cfg_files

Starts the CM/2 .CFG configuration file migration utility in the quiet mode (no windows are created). The list of .CFG files in the directory `DIRECTORY` will be migrated. No icons are created.

Note: The list of .CFG files is a space separated list.

Context sensitive help

There are two forms of context sensitive help:

F1 help

A description of the control with the input focus is displayed when the <F1> key is pressed.

Status bar help

Each dialog has a status bar on the bottom edge. When the mouse cursor is placed over a control, the action of a control is displayed on the status bar.

Naming Conventions and Output from Migration

Personal Communications creates the following files from a CM/2 configuration and places them in the PRIVATE subdirectory in the directory where Personal Communications is installed:

- Workstation profiles (*.WS)
- Batch file (*.BCH)
- Response file (*.RSP)
- *.DAT (if necessary)
- PCSWIN.INI

Personal Communications also creates the icons for .WS and .BCH files. The .BCH and .RSP files that are created have the same name as the input file. However, if CMUserCFG is specified in the CM/2 response file, the specified name is used instead of the name of the input file. The .WS file has the same name as the .bch file, but a short session name specified for an emulator session in CM/2 configuration is appended to the name. If the length of the input file name or CMUserCFG name excluding the extension is 8 characters, the last character is replaced with the short session name.

Note: Note that these output files will replace existing files with the same names. Make backups of your existing files if you want to save them.

Considerations for CID

When a CM/2 response file is used for CID installation (not panel-driven installation), the keyword CMUpdateType needs to be specified. Personal Communications supports the values 0, 3, and 4 for this keyword, as does CID for CM/2. For other values, Personal Communications migrates the CM/2 configuration during Personal Communications installation.

CMUserCFG and CMMODECFG

Personal Communications supports the CMUserCFG and CMMODECFG keywords in a CM/2 response file, as does CM/2. If these keywords are not specified, Personal Communications merges the input configuration information with the CM/2 default configuration, and creates a .WS file.

Migrated Keywords

The following keywords will be migrated:

- 3270_SESSION
- 3270_CONNECT
- 3270_COLOR
- 5250_SESSION
- AT_KEYBOARD
- ENHANCED_KEYBOARD
- 106_ENHANCED_KEYBOARD
- FT_VM
- FT_TSO

- FT_CICS
- FT_MISC
- SRPI_SERVER
- WORKSTATION

PCOMM 4.1 Migration Utility

Overview

This utility migrates Personal Communications 4.1 for OS/2 workstation profile (.WS) files to a working Personal Communications Version 4.3 configuration. Each Personal Communication Version 4.3 configuration consists of multiple .WS files and Access Feature configuration files (.CFG, .CF2, .RSP, .NDF, .SEC).

The Twinax, LAN, SDLC, COM port (SNA over Async and Hayes Autosync) communication stacks will now use the Access Feature. This requires the .WS file to be migrated to a Version 4.3 format .WS file and Access Feature configuration files (.RSP, .CFG, .CF2, .NDF, .SEC)

For all other connectivities, the .WS files will be migrated to a Version 4.3 format.

Instructions

If your Personal Communications 4.1 .WS file contains any of the records listed in this chapter, it must be migrated to use Access Feature SNA support before using list records. Select one or more workstation profiles (.ws) files from a single directory for migration. (By default the current directory, the directory from which the .ws files can be selected is the OLD_WS subdirectory of the Personal Communications directory.)

An error log, named wsmigerr.log, and a history log, named wsmighst.log, will be generated in the Personal Communications PRIVATE directory.

There are two modes for the utility:

Quiet Mode.

If the /q option is used, the quiet mode is invoked. The quiet mode returns 0 on success and a nonzero value on error. Two log files will be generated. No windows are displayed. An error log, named wsmigerr.log, and a history log, named wsmighst.log, will be generated in the Personal Communications PRIVATE directory.

Windowed Mode.

If the /q option is not used, the windowed version will be invoked. The controls on the migration dialog are as follows:

- A listbox containing all .ws files in the currently selected directory. (By default C:\PCOMOS2\OLD_WS is the current directory, where C:\PCOMOS2 is the Personal Communications directory.) Select the .ws files in this listbox to migrate.
- A "Help" button which brings up the main help dialog.
- A "Migrate" button which begins the migration of the files selected in the listbox.
- A "Directory" button which brings up a dialog to change the current directory and drive. After changing the directory and/or drive the

listbox will be updated with a list of any .ws files in the new directory. Changing the directory and/or drive will cancel any selection of .ws files in the previous directory/drive.

- A "Close" button to close the migration tool.

After the "Migration" button is selected and the migration has begun, a progress dialog will be displayed. This dialog has a "Cancel" button that if selected will terminate the current migration and bring back the first dialog. When the migration is complete, a dialog will be displayed that tells the user whether the migration was successful. In the case of an error, this dialog will include display error information. After the user closes the completion information dialog, the first dialog will once again be active and more selections and migrations can be done.

Note: The history log, wsmighis.log, and the error log, wsmigerr.log, will also be generated for the windowed migration utility.

Command Line Parameters

pcsmigws.exe

Starts the windowed Personal Communications workstation profile migration utility

pcsmigws.exe /?

Shows usage information.

pcsmigws.exe list_of_ws_files

Starts the windowed Personal Communications workstation profile migration utility with the list of .ws files already selected from the default directory (i.e. from C:\PCOMOS2\OLD_WS).

Note: The list of .ws files is a space separated list.

pcsmigws.exe /d:DIRECTORY list_of_ws_files

Starts the windowed Personal Communications workstation profile migration utility with the list of .ws files already selected from the directory DIRECTORY.

Note: The list of .ws files is a space separated list.

pcsmigws.exe /q list_of_ws_files

Starts the Personal Communications workstation profile migration utility in the quiet mode (no windows are created). The list of .ws files in the default directory (i.e. C:\PCOMOS2\OLD_WS) will be migrated.

Note: The list of .ws files is a space separated list.

pcsmigws.exe /q /d:DIRECTORY list_of_ws_files

Starts the Personal Communications workstation profile migration utility in the quiet mode (no windows are created). The list of .ws files in the directory DIRECTORY will be migrated.

Note: The list of .ws files is a space separated list.

pcsmigws.exe /q /noicons list_of_ws_files

Starts the Personal Communications workstation profile migration utility in the quiet mode (no windows are created). The list of .ws files in the default directory (i.e. C:\PCOMOS2\OLD_WS) will be migrated. No icons are created.

Note: The list of .ws files is a space separated list.

pcsmigws.exe /q /d:DIRECTORY /noicons list_of_ws_files

Starts the Personal Communications workstation profile migration utility in the quiet mode (no windows are created). The list of .ws files in the directory DIRECTORY will be migrated. No icons are created.

Note: Note that the list of .ws files is a space separated list.

Context sensitive help

There are two forms of context sensitive help:

F1 help

A description of the control with the input focus is displayed when the <F1> key is pressed.

Status bar help

Each dialog has a status bar on the bottom edge. When the mouse cursor is placed over a control, the action of a control is displayed on the status bar.

Migrated Keywords

The following keywords will be migrated:

- ADLC
- ADLC5250
- HAM
- HAM5250
- SDLC
- SDLC5250
- SDLCAPPC
- SDLCPASS
- SLAN
- SLAN5250
- SLANAPPC
- SLANPASS
- TDLC5250
- TDLCPASS

Chapter 11. Where to Get More Information

This chapter discusses getting help when you are installing, configuring, or using Personal Communications.

Online Help

This help facility describes how to install, configure, and use Personal Communications. Online help is very extensive and includes information about every aspect of configuring and using Personal Communications.

Use help to obtain the following information:

- Menu choices
- Operation procedures
- Operations in windows
- Meanings of the terms displayed in windows
- Causes of errors and the corresponding actions to take
- Mouse-based operations
- Operation without a mouse
- Detailed explanations of specific terms
- Further technical information about Personal Communications
- Detailed explanations of operator information area (OIA) messages

How to Use Online Help

To display online help, select **Help** from the pull-down menu.

You can use Personal Communications online help in the same manner as you use the online help for OS/2. Refer to IBM OS/2 information for details.

Messages

This section describes the Personal Communications online messages. Online messages are displayed during Personal Communications sessions, but a message does not always mean an error occurred. For example, a message might tell you that an operation is in progress or has been completed. A message can also prompt you to wait for the completion of an operation.

Detailed descriptions of the Personal Communications messages are available in "Appendix A. Messages" on page 417.

OIA Messages

These messages are displayed in the operator information area (OIA) or in the OS/2 message window. Messages from Personal Communications are displayed in the message window; messages from the host system are displayed in the OIA of the session window.

The bottom line of the session window is the OIA. The OIA indicator indicates the status of Personal Communications as well as information about the workstation, host system, and attachment method.

All of the OIA indicators, reminders, and messages are described in the online help. To view this information:

- Select **Index** from the Help pull-down menu.
- Select **The operator information area messages**.

Personal Communications Library

The Personal Communications library includes the following publications:

- *IBM Personal Communications for OS/2 Version 4.3 Quick Beginnings*
- *IBM Personal Communications for OS/2 Version 4.3 Reference*
- *IBM Personal Communications for OS/2 Version 4.3 Programmer's Guide*

In addition to the printed books, there are HTML documents provided with Personal Communications:

Host Access Class Library

This HTML document describes how to write an ActiveX/OLE 2.0-compliant application to use Personal Communications as an embedded object.

Host Access Beans for Java

This HTML document describes Personal Communications emulator functions delivered as a set of Java™ Beans.

Note: The *Reference* and *Emulator Programming* are optionally installed.

Related Publications

For information about local area networks (LANs), refer to the following publications:

- *IBM Local Area Network Technical Reference*
- *AS/400 Communications: Local Area Network (LAN) Guide Version 2*
- Multiple Protocol Transport Services manuals

For information about TCP/IP, refer to the manual for *IBM TCP/IP Version 2.0 for OS/2 Base Kit*.

For more information about NetWare, refer to the publications for the following products:

For Client

NetWare Client for OS/2

For NetWare for SAA

NetWare for SAA

For more information about PC Support/400 refer to the following publications:

- *PC/Support/400: OS/2 Installation and Administration Guide*
- *PC/Support/400: OS/2 User's Guide*
- *PC/Support/400: Application Program Interface Reference*
- *PC/Support/400: DOS and OS/2 Technical Reference*

For more information about the AS/400 system, refer to:

- *AS/400 Distributed Data Management User's Guide*

- *AS/400 NLS Planning Guide*
- *AS/400 Programming: Control Language (CL) Reference Guide Version 2*
- *AS/400 Guide to Programming for Printing*

For more information about the mouse, refer to the *Mouse Driver User's Guide (OS/2)*.

For more information about OS/2, refer to:

- *The User's Guide to OS/2 Warp*
- *Using OS/2*, a tutorial
- Online books in the Information folder on your desktop.

For the operation of the workstation, refer to your workstation manuals.

For the workstation adapter settings, refer to your adapter manuals.

For printer operation information, refer to your printer manuals.

Problem Reporting (PR)

If you have a problem and you think that the source is in Personal Communications, report the problem to IBM.

Be prepared to provide IBM the information you obtained through the problem determination (PD) and problem-source identification (PSI) processes.

1. PD information includes:
 - Symptoms
 - Environment
 - Type of problem
 - Problem area
 - Problem re-creatability and re-creation procedure
2. PSI information includes:
3. OIA messages or error messages (if any)
4. Key factors related to the problem
5. Personal Communications dump information (PCSUSER.INF) (See the Administration Tools online help for more details.)
6. Communications trace. (See "Trace Services" on page 10 for more details.)
7. PDF file (for printer problems in PDT mode)
8. PCSDIAL.LOG if the problem occurred while dialing. (This log can be created by re-creating the problem after adding " -p" following parameter **Adffilename=** in the workstation profile.)
9. Spool file (for printer problems)
10. Use CMPD to automatically collect files required for problem determination (See "CMPD" on page 17)

Contacting IBM

This section lists a number of ways you can reach IBM for various reasons. Depending on the nature of your problem or concern, we will ask you to be prepared to provide the following information to allow us to serve you better. For information about the tools available to help with problem analysis, refer to the *Personal Communications Version 4.3 Reference*.

- The environment in which the problem occurs:
 - Personal Communications configuration
 - Personal Communications version and CSD level
 - The name of the workstation profile
 - The name of the Access Feature Configuration file (if required)
 - Workstation configuration
 - The machine type and model, the system memory, the video adapter
 - The communication adapter you are using
 - Other adapters (especially communication adapters) installed
 - The printer type and model
 - Other devices installed, such as sound cards, modems, or fax machines
 - Software configuration
 - Windows version and level
 - Communication and device-driver version and level
 - Other communication programs (such as NetWare, Microsoft SNA Server, or Microsoft Data Link Control) that are running and using resources
 - Printer driver version and level
 - Host configuration
 - The upstream host connection and configuration
- Problem analysis information
 - Symptoms
 - Type of problem
 - OIA messages or error messages (if any)
 - Key factors related to the problem

If you have a technical problem, take the time to review and carry out the actions suggested here. Use your local support personnel before contacting IBM. You can also check the Hints and Tips on the WWW for more information. Only persons with in-depth knowledge of the problem should contact IBM; therefore, support personnel should act as the interface with IBM.

Support Options

If you determine that you need to contact IBM, you can do any of the following:

- Access the Personal Communications Web page:
<http://www.ibm.com/software/network/pcomm>
- To find the phone number for IBM Software Support, U.S. customers can call 1-800-IBM-4YOU. International customers that have access to the U.S. "800" toll free numbers can reach the International Support Center by calling 1-800-IBM-4YOU and asking to speak with the International Support Center (ISC) in Atlanta. International customers without access to the U.S. toll free numbers can call the ISC directly at 770-863-1234. The ISC's FAX number is 770-863-3030 and is available 24 hours a day.

Part 2. Personal Communications/3270

Chapter 12. Building a Printer Definition Table (PDT) for PC/3270

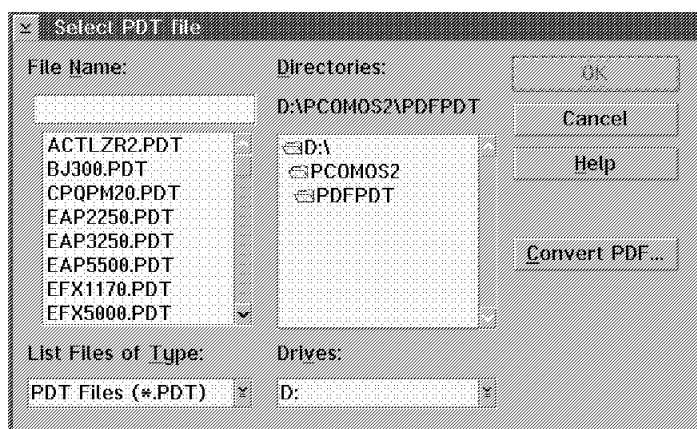
This chapter explains how to create and change the printer definition table (PDT) used for PC/3270.

The PDT is created by converting the printer definition file (PDF), which defines how characters and control codes are sent to the printer and how printer output is formatted. You can create a PDF by using a text editor that produces an ASCII file or by modifying one of the PDFs provided by PC/3270. All PDFs have the extension **.PDF**.

Customizing the PDT

To customize the PDT:

1. Select **File** from the menu bar of the workstation window.
2. Select **Printer Setup** from the File pull-down menu. The Printer Setup window appears.
3. Select the **Use PDT file** check box and click on **Select PDT**. The Select PDT File window appears:



4. Select **Convert PDF**.
5. Select the PDF to be converted from the list in the Convert PDF to PDT window; then select **Convert**. After the file has been converted, control is returned to the Convert PDF to PDT window.
6. Select **Close**. Control is returned to the Select PDT File window, and the converted PDT file is listed.
7. Select the PDT file; then select **OK**.
8. Select **OK** on the Printer Setup window.

After printer setup is complete, the Printer Setup window is closed.

PDF Format

A PDF consists of a *macro definitions section* and a *definitions section*.

In the *macro definitions section*, you can assign a name (macro name) to a sequence of hexadecimal numbers, decimal numbers, or ASCII characters. This name can be

referred to from within the definitions section, which follows the macro definitions section. The macro definitions section must start with a `BEGIN_MACROS` statement and end with an `END_MACROS` statement. The left part of the statement is the macro name assigned, and the right part of the statement is the value referred to by that macro name.

In the *definitions section*, the left side of each statement contains the name of a character or control command (field name). The right side of each statement contains hexadecimal numbers, decimal numbers, ASCII characters, or predefined macro names that define the character or the control codes sent to a printer.

Different printer manuals define printer control strings in different ways. Some printer manuals describe control sequences in hexadecimal, whereas others use such symbols as 'esc J1 K'. You can use either format and define macros to make the file more readable. In the macro definitions section and the definitions section of a PDF, the following things can be specified to the right of each statement:

- A single character, which is treated as an ASCII value
- Two digits, which are treated as a hexadecimal number
- Three or more digits, which are treated as a decimal number
- A predefined macro, which is expanded by the printer table compiler

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

After you have created your PDF, convert it to a PDT by using the printer table compiler. The resulting file has a **.PDT** extension.

The `/*` symbol indicates the beginning of a comment. The `*/` symbol indicates the end of a comment. A comment can be placed anywhere within a PDF. It is ignored by the printer table compiler.

A macro definition cannot contain another macro definition.

There is a sample file, **IBM4202.PDF**, on your PC/3270 CD-ROM. You can copy this file and modify the copy to customize your own PDT.

Standard PDT file names are of the form **IBMnnnnnn.PDT**. Tables containing code page fonts are of the form **PRNnnnnnn.PDT**, where nnnnn is a machine type.

Building PC/3270 PDTs

Example PDF

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 4202-1    */
/*
/*****
/*****
/*                                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 00 /* Nul character */
BEL EQU 07 /* Beeper */
BAK EQU 08 /* Back Space */
TAB EQU 09 /* Tab */
LFF EQU 0A /* Line Feed */
VTB EQU 0B /* Vertical Tab */
FFF EQU 0C /* Form Feed */
CRR EQU 0D /* Carriage Return */
P05 EQU 1B 57 01 /* 5 Pitch-Characters/inch */
/* Same as Double Wide */
SEL EQU 11 /* Select Printer */
P10 EQU 12 /* 10 Pitch-Characters/inch */
CDW EQU 1B 57 00 /* Cancel Double Wide contin. */
CDL EQU 14 /* Cancel Double Wide line */
ESC EQU 1B /* Escape */
CAN EQU 18 /* Cancel Data */
SPA EQU 20 /* Space */
P17 EQU 12 0F /* 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 Superscript */
SS0 EQU 1B 53 00 /* Set Superscript over */
SSU EQU 1B 53 01 /* Set Subscript under */
SUL EQU 1B 2D 01 /* Start Underline */
CUL EQU 1B 2D 00 /* Cancel Underline */
LL6 EQU 1B 41 0C 1B 32 /* Set line length 6 lines/inch */
LL8 EQU 1B 41 09 1B 32 /* Set line length 8 lines/inch */
LL0 EQU 1B 41 07 1B 32 /* Set line length 10 lines/inch */
/* actually 7/72 inch */
SDQ EQU 1B 49 00 /* Select Draft Printing Quality */
SLQ EQU 1B 49 02 /* 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=066 /* Printed lines per page */
MAXIMUM_PRINT_POSITION=132 /* Printed characters per line */
INTERV_REQ_TIMER=001
RESELECT_TIME_EXCPT_5204=001
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 */
/* 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 (0,..,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 may 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 3270 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 02 selects the NLQ (near letter quality) */
/*SET_CHARACTER_SET=ESC I 04 selects the normal downloaded font */
/*SET_CHARACTER_SET=ESC I 06 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 3270 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_10_LINES_PER_INCH=LL0             /* 7/72 inch or 9/96 inch */
SET_10_CHARACTERS_PER_INCH=P10
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=P05
END_DOUBLE_WIDTH_CHARACTERS=CDW

/* These control codes are used to select the source drawer number */
/* when your printer has the dual drawer sheet feed 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=0
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=40
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=60
 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=80
 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 08 00 06 6A AA AA 6A 1E 02 00
 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=90
AE_DIPHTHONG_SMALL=91
AE_DIPHTHONG_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 */
/* 08 00 is the count low and count high and defines eight bytes of */
/* APA data. The 00 44 28 10 28 44 00 00 are the eight bytes of data.*/
/* A bit set to 1 prints the dot and a bit set to 0 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 08 00 00 44 28 10 28 44 00 00
A_ACUTE_SMALL=A0
I_ACUTE_SMALL=A1
O_ACUTE_SMALL=ESC 4C 08 00 0C 12 12 52 92 12 0C 00
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 09 00 7E 81 BD A9 B9 A5 81 7E 00
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 08 00 06 0C 54 A4 14 0C 06 00
A_CIRCUMFLEX_CAPITAL=ESC 4C 08 00 06 4C 94 A4 94 4C 06 00
A_GRAVE_CAPITAL=ESC 4C 08 00 06 0C 14 A4 54 4C 06 00
COPYRIGHT_SYMBOL=ESC 4C 09 00 7E 81 99 A5 A5 A5 81 7E 00
CENT_SIGN=9B
YEN_SIGN= 9D
A_TILDE_SMALL=ESC 4C 09 00 06 2A 2A CA AA 5E 42 80 00
A_TILDE_CAPITAL=ESC 4C 08 00 06 4C 94 A4 54 4C 86 00
INTERNATIONAL_CURRENCY_SYMBOL=ESC 4C 09 00 82 54 28 44 44 28 54 82 00
ETH_ICELANDIC_SMALL=EB
ETH_ICELANDIC_CAPITAL=ESC 4C 08 00 92 FE 92 92 44 7C 38 00
E_CIRCUMFLEX_CAPITAL=ESC 4C 08 00 3E 6A AA AA 62 22 00
E_DIAERESIS_CAPITAL=ESC 4C 08 00 3E AA AA 2A 2A A2 A2 00
E_GRAVE_CAPITAL=ESC 4C 08 00 3E 2A 2A AA 6A 22 22 00
I_DOTLESS_SMALL=ESC 4C 08 00 00 00 12 1E 02 00 00 00
I_ACUTE_CAPITAL=ESC 4C 08 00 00 00 52 9E 12 00 00 00

```

```

I_CIRCUMFLEX_CAPITAL=ESC 4C 08 00 00 40 92 9E 92 40 00 00
I_DIAERESIS_CAPITAL=ESC 4C 08 00 00 40 52 1E 52 40 00 00
VERTICAL_LINE_BROKEN=ESC 4C 08 00 00 00 00 77 00 00 00 00
I_GRAVE_CAPITAL=ESC 4C 08 00 00 00 12 9E 52 00 00 00
O_ACUTE_CAPITAL=ESC 4C 08 00 0E 11 11 51 81 11 0E 00
SHARP_S_SMALL=ESC 4C 08 00 02 3E 40 52 52 2A 04 00
O_CIRCUMFLEX_CAPITAL=ESC 4C 08 00 1C 22 62 A2 A2 62 1C 00
O_GRAVE_CAPITAL=ESC 4C 08 00 1C 22 22 A2 62 22 1C 00
O_TILDE_SMALL=ESC 4C 08 00 0C 12 52 92 52 92 8C 00
O_TILDE_CAPITAL=ESC 4C 08 00 1C 22 62 A2 62 A2 9C 00
MICRO_SYMBOL=E6
THORN_ICELANDIC_SMALL=ESC 4C 08 00 02 FC 00 48 30 30 00 00
THORN_ICELANDIC_CAPITAL=ESC 4C 08 00 81 FF FF 42 24 3C 18 00
U_ACUTE_CAPITAL=ESC 4C 08 00 3C 02 42 82 02 02 3C 00
U_CIRCUMFLEX_CAPITAL=ESC 4C 08 00 3C 02 42 82 82 42 3C 00
U_GRAVE_CAPITAL=ESC 4C 08 00 3C 02 02 82 42 02 3C 00
Y_ACUTE_SMALL=ESC 4C 08 00 20 10 4A 84 08 10 20 00
Y_ACUTE_CAPITAL=ESC 4C 08 00 20 10 48 86 08 10 20 00
OVERLINE=ESC 4C 08 00 80 80 80 80 80 80 80 00
ACUTE_ACCENT=ESC 4C 08 00 00 00 40 80 00 00 00 00
SYLLABLE_HYPHEN=ESC 4C 08 00 10 10 10 00 00 00 00 00
PLUS_OR_MINUS_SIGN=F1
THREE_QUARTERS=ESC 4C 09 00 89 AA 74 08 16 2A 47 82 00
PARAGRAPH_SYMBOL=ESC 4C 08 00 60 F0 FE 00 00 FE 00 00
SECTION_SYMBOL=ESC 4C 08 00 30 4B A9 A5 95 D2 0C 00
DIVIDE_SIGN=F6
CEDILLA=ESC 4C 08 00 00 00 00 03 0C 0C 00 00
DEGREE_SYMBOL=F8
DIAERESIS=ESC 4C 08 00 00 80 80 00 00 80 80 00
MIDDLE_DOT_ACCENT=F9
ONE_SUPERSCRIPT=ESC 4C 08 00 00 00 48 F8 08 00 00 00
THREE_SUPERSCRIPT=ESC 4C 08 00 00 00 88 A8 A8 D8 00 00
TWO_SUPERSCRIPT=ESC 4C 08 00 00 48 98 A8 A8 48 00 00
REQUIRED_SPACE=FF
/*****
/*          PC/3270 Internal Data Area.          */
/* Do not change these statement.                  */
/*****
TOP_MARGIN=
LEFT_MARGIN=
DYNAMIC_START_JOB=00 00 00 00 00 00 00 00 00 00
DYNAMIC_END_JOB=00 00
DYNAMIC_SET_PAGE_LENGTH=00 00 00
PRINTER_ID=42 02
/*          End of Definition File          */

```

Supplemental Explanation of PDF Statements

The PDF statements have the following functions:

MAXIMUM_PAGE_LENGTH

Printed lines per page. If you change this value, you must also change the SET_PAGE_LENGTH statement.

MAXIMUM_PRINT_POSITION

Printed characters per line.

COMPRESS_LINE_SPACING?

(For LU 2 and LU 3 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 is valid only in the following positions:

- First print position of the buffer

- After a valid new line (NL) operation
- First print position of a line

VERRIDE_FORMATTED_PRINT?

Whether nulls are to be printed as blanks.

RESELECT_TIME_EXCPT_5204

This statement is ignored.

ESC/P_LINE_FEED?

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

IGNORE_FORM_FEED_AT_FIRST_POS?

If YES, the form feed (FF) function is ignored at the first position (for LU 2, LU 3, and non-SNA sessions) or at the beginning of the print job (for LU 1 sessions). Using this option eliminates extra blank pages at the beginning of each print job.

FORM_FEED_TAKES_POSITION?

If YES, the form feed (FF) function is effective if followed by data (LU 2, LU 3, and non-SNA sessions only).

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 personal computer 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 like what you expect. You can avoid this situation by modifying the PDF 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 and select the PDT file generated.

PDF Field Names and Symbols

Table 7 lists the symbols that are defined for a PDF:

Table 7. Printer Symbol Definitions

Field Name	Symbol
SPACE	
EXCLAMATION_POINT	!
QUOTATION_MARKS	"
NUMBER_SIGN	#
DOLLAR_SIGN	\$
PERCENT_SIGN	%
AMPERSAND	&

Table 7. Printer Symbol Definitions (continued)

Field Name	Symbol
APOSTROPHE	'
LEFT_PARENTHESIS	(
RIGHT_PARENTHESIS)
ASTERISK	*
PLUS_SIGN	+
COMMA	,
HYPHEN	-
PERIOD	.
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	=
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

Table 7. Printer Symbol Definitions (continued)

Field Name	Symbol
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
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

Table 7. Printer Symbol Definitions (continued)

Field Name	Symbol
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	â
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
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

Table 7. Printer Symbol Definitions (continued)

Field Name	Symbol
I_ACUTE_SMALL	í
O_ACUTE_SMALL	ó
U_ACUTE_SMALL	ú
N_TILDE_SMALL	ñ
N_TILDE_CAPITAL	Ñ
ORDINAL_INDICATOR_FEMININE	<u>a</u>
ORDINAL_INDICATOR_MASCULINE	<u>o</u>
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
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	Û
ACUTE_ACCENT	´

Table 7. Printer Symbol Definitions (continued)

Field Name	Symbol
SYLLABLE_HYPHEN	-
PLUS_OR_MINUS_SIGN	±
THREE_QUARTERS	$\frac{3}{4}$
PARAGRAPH_SYMBOL	¶
SECTION_SYMBOL	§
DIVIDE_SIGN	÷
DEGREE_SYMBOL	°
ONE_SUPERSCRIPT	¹
THREE_SUPERSCRIPT	³
TWO_SUPERSCRIPT	²
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 composes a color if the color is not defined in the PDT 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 PDF. Only the composite colors defined in Table 8 are created by double-printing the primary colors.

Table 8. Color Mixes

Composite Color	Primary Colors
Blue	Magenta, cyan
Green	Yellow, cyan
Red	Yellow, magenta

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

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. After the host system finishes 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 LU 3 session or a non-SNA DFT printer session.

Table 9 lists the commands that can be sent in the 3270 data stream:

Table 9. 3270 Data Stream Commands

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

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

Table 10 lists the orders that can be sent in the 3270 data stream:

Table 10. 3270 Data Stream Orders

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

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 11 lists the control codes that can be sent in the 3270 data stream:

Table 11. 3270 Data Stream Control Codes

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

Note: NL, CR, and EM are valid only if a line-length format specified by the WCC is not used.

PC/3270 printer support interprets each 3270 attribute and printer control code and translates them into a sequence of one or more personal computer printer control codes. For more information about the 3270 data stream, refer to the *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 LU 1 session only.

The valid SCS control codes supported by PC/3270 are listed in Table 12 .

Table 12. Supported SCS Control Codes

Code	Value	Command
BEL	X'2F'	Bell Function
BS	X'16'	Backspace
CR	X'0D'	Carriage Return
ENP	X'14'	Enable Presentation
FF	X'0C'	Form Feed
GE	X'08'	Graphic Escape
HT	X'05'	Horizontal Tab
INP	X'24'	Inhibit Presentation
IRS	X'1E'	Interchange-Record Separator
LF	X'25'	Line Feed (Index)
NL	X'15'	New Line
NUL	X'00'	Null
PPM	X'2BD2 xx48'	Page Presentation Media

Table 12. Supported SCS Control Codes (continued)

Code	Value	Command
SA	X'28'	Set Attribute
SHF	X'2B C1'	Set Horizontal Format
SLD	X'2B C6'	Set Line Density
SPD	X'2BD2 xx29'	Set Print Density
SVF	X'2B C2'	Set Vertical Format
TRN	X'35'	Transparent
VCS	X'04 xx'	Vertical Channel Select
VT	X'0B'	Vertical Tab

Note: The ENP and INP commands are accepted, but are ignored.

For more information about the SCS printer data stream, refer to *IBM Systems Network Architecture -- Sessions between Logical Units*, GC20-1868.

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 personal computer printer between jobs. 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 several 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.

Timeout interval

On non-SNA distributed function terminal (DFT) sessions, print jobs can be delimited by a user-specified timeout 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 LU 1 or LU 3 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 the 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 to perform host-directed printing. Structured fields are described in the next section.

Structured Fields (SFs)

The host uses Begin of File and End of File structured fields (SFs) 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 13 , to the host in response to a Read Partition General query.

Table 13. 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 SFs

Begin/End of File SFs are accepted on either LU 1 or LU 3 sessions. Table 14 shows the format of the Begin/End of File SFs.

Table 14. Begin/End of File SF 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	0-1 2-7	FLAG1* B'00' B'01' B'10' B'11'	Reserved End of File is being sent Begin of File is being sent Reserved 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 SFs: When the Begin/End of File SFs are used with brackets or non-SNA timeout intervals, the Begin/End of File SFs take precedence over the brackets or timeout intervals in determining when a print job begins or ends. Refer to the following examples:

- Begin/End of File SF overriding brackets:
Begin Bracket, Begin of File SF, ...Data...,
End Bracket

The device waits indefinitely until the End of File SF is received before ending the print job.

- Begin/End of File SF overriding non-SNA timeout intervals:
Begin of File SF, ...Data..., pause > timeout value

The device waits indefinitely until the End of File SF is received before ending the print job.

- Inconsistent use of Begin/End of File SFs and brackets:

```
Begin Bracket, ...Data1...,Begin of File SF,...Data2...,  
End of File SF, ...Data3..., End Bracket
```

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

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

```
Begin Bracket, Begin of File SF, ...Data1...,  
End of File SF,(job1)  
Begin of File SF, ...Data2..., End of File SF,(job2)  
Begin of File SF, ...Data3..., End of File SF,  
End Bracket(job3)
```

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

Begin/End of File SF 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 SFs must be the first SF of a chain, and End of File SFs must be the last SF of a chain.

PC/3270 rejects transmission in the following instances:

- The emulator receives an End of File SF without first receiving a Begin of File SF.
- The emulator receives a second Begin of File SF without receiving an intervening End of File SF.
- The emulator receives a Begin of File SF that is not the first structured field following a Write Structured Field command (LU 2, LU 3, and non-SNA sessions) or a function management header 1 (LU 1 sessions).
- The emulator receives an End of File SF that is not the last structured field following a Write Structured Field command (LU 2, LU 3, and non-SNA sessions) or a function management header 1 (LU 1 sessions).

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

- A Begin of File SF indicates that all SCS data in the same transmission is part of a new print job until an End of File SF is received.
- An End of File SF indicates that any SCS data received in the same chain as the End of File SF 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 SFs as follows:

- A Begin of File SF 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 SF 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 SF and an End of File SF without at least one presentation space separating them, it ignores the SFs.

Chapter 13. File Transfer Commands for PC/3270

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

CICS/MVS

Customer Information Control System running under MVS

CICS/VSE

CICS running under Virtual Storage Extended

MVS/TSO

Multiple Virtual Storage/Time Sharing Option

OV/MVS

OfficeVision/MVS

VM/CMS

Virtual Machine/Conversational Monitor System

For more information on using these commands, select **Help** from the Personal Communications menu bar, then select **Commands** and **Transfer** in the pop-up menus that follow.

File Transfer Methods

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

- By using the Transfer menu of the workstation window
- By using the **SEND** and **RECEIVE** commands at the OS/2 command prompt
- By using **ALMCOPY**

Requirements and Restrictions

Install the file transfer program, IND\$FILE, at your host system. Ask your system administrator for additional file transfer procedures and precautions.

You should not use the following words as a VM file name or file type, as an MVS data set name, or as a CICS file name, because they are reserved for use as option commands. However, if it you must use them for files, add a '\' (backslash), as a separate word, immediately after the file name and so on, even if you do not specify any options.

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

Sending and Receiving Files from the OS/2 Command Prompt

The workstation is the point of reference for the **SEND** and **RECEIVE** commands: You send from the workstation to the host and receive from the host to the workstation

To send or receive a file:

1. Make sure you are logged on to your host.

2. Make sure the **Ready** message of the host system is displayed, except if you are transferring files through the command option of the ISPF application.

Note: 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 not succeed. 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 OS/2 Window session or OS/2 full-screen 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 OS/2 command prompt.

Details on the SEND and RECEIVE commands and their options are explained in the following sections. File Transfer Commands

Using the VM/CMS SEND Command

VM/CMS SEND

Use the following information when sending a file to VM/CMS:

Figure 21 shows the command and information that you must provide. Enter it as shown (including parentheses). You can use either uppercase or lowercase letters.

Note: **b** means to insert a space. There must *not* be a space between **h:** and **fn**.

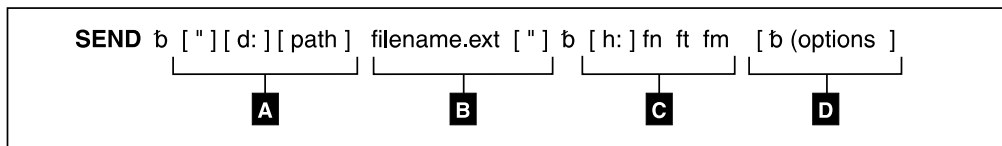


Figure 21. VM/CMS SEND Command Syntax

- A** The workstation drive and path of the file to send.
- B** The name of the workstation file to send.
- C** Host session specifications for the file to be sent to the host.
 - h:** The short name of the session (which 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

- CLEAR
- CRLF
- LRECL *n*
- NOCLEAR
- PROGRESS
- QUIET
- RECFM *x*
- TIME *n*

The parts of the VM/CMS SEND command 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 can 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 description of the APPEND option.)

(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 the APPEND option.

ASCII

Specifies ASCII-to-EBCDIC character translation.

CLEAR

Clears the workstation window at the beginning of the file transfer.

CRLF Specifies preserving of 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. **NOCLEAR** is the default.

PROGRESS

Shows a message indicating that the file transfer is in progress or has ended. Such messages do not show the current transferred bytes.

QUIET

Does not show any 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 has fixed-length records unless you specify the CRLF option; then the file has variable-length records unless you specify otherwise.

TIME n

Specifies the length of time n, in units of 30 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 1 through 2184. The default is 1. To avoid a premature error message, specify an adequate value. In cases of large packet sizes, of large block sizes, or for slow communication lines (such as SDLC and ASYNC), 3 units is recommended. At least one 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.

- To send a workstation file from your default drive and add 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 that line; continue typing your command.

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

- To send a workstation 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 workstation 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 workstation 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 are 80 characters long and have fixed length.

- To send a binary workstation file from a drive other than your default drive:

SEND a:pc.exe c:cmsfile exebin b

This command sends a workstation 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 are 80 characters long and have fixed length.

- To send a file from your hard disk and add 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 workstation 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.

- To send 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

VM/CMS RECEIVE

Use the following information when receiving a file from VM/CMS:

Figure 22 shows the command and information you must provide. Enter it as shown (including parentheses), except that you can use either uppercase or lowercase letters.

Note: **b** means to insert a space. There must *not* be a space between **h:** and **fn**.

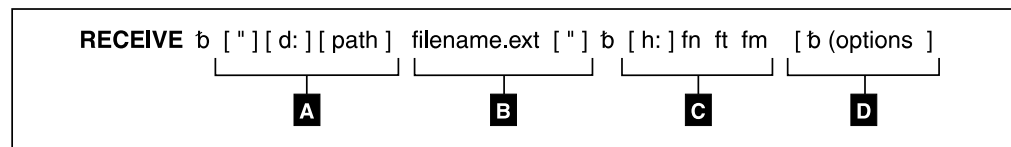


Figure 22. VM/CMS RECEIVE Command Syntax

- A** The workstation drive and path of the file to be received.
- B** The name of the workstation file to be received.
- C** Host session specifications for the file to be received from the host.
 - h:** The short name of the session (which 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
- CLEAR
- CRLF
- NOCLEAR
- PROGRESS
- QUIET
- TIME *n*

The parts of the VM/CMS RECEIVE command 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 workstation 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.

(options

These options can be specified:

APPEND

Specifies that the file being received is to be added to the end of an existing file. Omit this option if you want the VM/CMS file that is 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 as SCRIPT files. You do not need them for binary files, such as programs.

CLEAR

Clears the workstation window at the beginning of the file transfer.

NOCLEAR

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

PROGRESS

Shows a message indicating that the file transfer is in progress or has ended. Such messages do not show the current transferred bytes.

QUIET

Does not show any messages.

TIME n

Specifies the length of time *n*, in units of 30 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 1 through 2184. The default is 1. To avoid a premature error message, specify an adequate value. In cases of large packet sizes, of large block sizes, or for slow communication lines (such as SDLC and ASYNC), 3 units is recommended. At least one blank space is required between TIME and *n*.

Examples

The following examples show the command syntax 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.

- To receive a file from your VM/CMS A-disk to your default drive for a workstation 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 workstation session. It adds the file to your default drive (diskette or hard disk) with the name **PC.TXT**.

- To receive a file from your VM/CMS B-disk and replace 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 workstation session. It replaces a file named **PC.TXT** on a diskette in drive **A**.

- To receive a file from your VM/CMS A-disk and add 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 workstation session. It adds the contents of **CMSFILE** to the end of a file named **PC.TXT** on your hard disk.

- To receive a file from your VM/CMS A-disk and place 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

MVS/TSO SEND

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

Figure 23 shows the command and information you must provide. Enter it as shown (including parentheses), except that you can use either uppercase or lowercase letters.

Note: **b** means to insert a space. There must *not* be a space between **h:** and **data-set-name**.

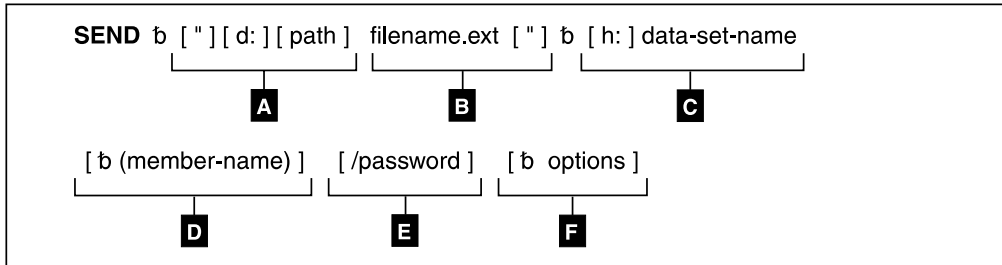


Figure 23. MVS/TSO SEND Command Syntax

- A** The workstation drive and path of the file to send.
- B** The name of the workstation file to send.
- C** The short name of the host session and the data set name of the file to send.
- D** The member name if the file is put in a partitioned data set.
- E** The 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)
 - CLEAR
 - CRLF
 - LRECL(n)
 - NOCLEAR⁷
 - PROGRESS
 - QUIET
 - RECFM(x)
 - 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.

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

7.

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

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.

This option 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 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 a 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)

Specifies the size of the blocks of data in a new data set on your MVS/TSO volume. 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 is 6233.
- If the record format is fixed, the block size is the largest multiple of the record length that is less than 6233:

$$\text{BLKSIZE} = \text{LRECL} * (6233/\text{LRECL})$$

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

CLEAR

Clears the workstation window at the beginning of the file transfer.

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.

PROGRESS

Shows a message indicating that the file transfer is in progress or has ended. Such messages do not show the current transferred bytes.

QUIET

Does not show any messages.

RECFM(x)

Specifies 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 CRLF parameter: if you specify CRLF, the data set has variable-length records; if you do not specify CRLF, it has fixed-length records. If you use the (member-name) or APPEND options, do not use this option.

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 n, in units of 30 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 1 through 2184. The default is 1. To avoid a premature error message, specify an adequate value. In cases of large packet sizes, of large block sizes, or for slow communication lines

(such as SDLC or ASYNC), 3 units is recommended. At least one blank space is required between TIME and n.

Examples

The following examples show the command syntax you can use to send files from your workstation to an MVS/TSO host:

- To send 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 workstation 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.

- To send 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 workstation 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.

- To send a file from your default drive to your MVS/TSO host and add it to the end of an MVS/TSO data set:

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

This command sends a workstation 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.

- To send a file to your MVS/TSO host and add it to the end of a data set that has a password:

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

This command sends a workstation 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**.

- To send 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 workstation 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.

- To send 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 workstation 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**.

- To send a file from your default drive and add it as a new data set on your MVS/TSO volume:

```
SEND pc.txt g:ds.script/aeneid20 ASCII CRLF LRECL(132)
      BLKSIZE(132) RECFM(V) SPACE(20,10) TRACKS
```

This command sends a workstation 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 **aeneid20** 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

MVS/TSO RECEIVE

Use the following information when receiving a file from MVS/TSO:

Figure 24 shows the command and information you must provide. Enter it as shown (including parentheses), except that you can use either uppercase or lowercase letters.

Note: **b** means to insert a space. There must *not* be a space between **h:** and **data-set-name**.

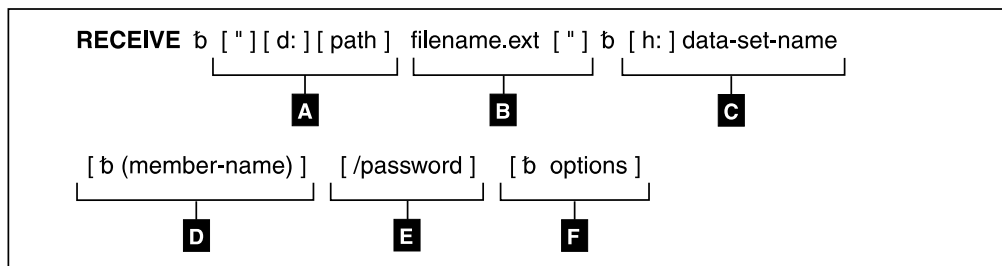


Figure 24. MVS/TSO RECEIVE Command Syntax

- A** The workstation drive and path to the directory where the file is to be stored.
- B** The name of the workstation file to receive.
- C** The short name of the host session, and the data set name of the file you are receiving.
- D** The member name if the file is put in a partitioned data set.
- E** The 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
 - PROGRESS
 - QUIET

- TIME(n)

The parts of the MVS/TSO RECEIVE commands are:

RECEIVE

The command.

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

path The subdirectory where you want the data set located. This part is optional.

filename.ext

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 229 .)

h: 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

The name of the data set or the partitioned data set that contains the member you want to send to your workstation 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)

The member name of a partitioned data set to send to your workstation session. This part is optional. Use it only if the data set is a member of a partitioned data set.

/password

The password of the data set. Use it 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 part if you want the MVS/TSO data set to replace an existing workstation 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.

PROGRESS

Shows a message indicating that the file transfer is in progress or has ended. Such messages do not show the current transferred bytes.

QUIET

Does not show any messages.

TIME(n)

Specifies the length of time *n*, in units of 30 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 1 through 2184. The default is 1. To avoid a premature error message, specify an adequate value. In cases of large packet sizes, of large block sizes, or for slow communication lines (such as SDLC and ASYNC), 3 units is recommended. At least one blank space is required between *TIME* and *n*.

Examples

The following examples show the command syntax you can use to receive files from your MVS/TSO host to your workstation:

- To receive a data set from an MVS/TSO host to the default drive for your workstation 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 OS/2 session. It creates or replaces the file on the default drive with the name **PC.TXT**.

- To receive 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**.

- To receive a data set from an MVS/TSO host and add it to a workstation 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**.

- To receive a data set from an MVS/TSO host and place 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.

- To receive 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**.

- To receive a member of a partitioned data set from an MVS/TSO host to your OS/2 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**.

- To receive a member of a partitioned data set that has a password to your OS/2 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

CICS SEND

Use the following information when sending a file to CICS:

Figure 25 shows the command and information you must provide. Enter it as shown (including parentheses), except that you can use either uppercase or lowercase letters.

Note: **b** means to insert a space. There must *not* be a space between **h:** and **fn**.

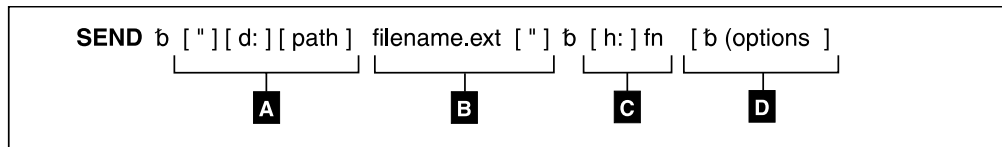


Figure 25. CICS SEND Command Syntax

- A** The workstation drive and path of the file to send.
- B** The name of the workstation file to send.
- C** The 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
 - CLEAR
 - CRLF
 - NOCLEAR
 - NOCRLF
 - PROGRESS
 - QUIET
 - TIME *n*

The parts of the CICS SEND command are:

SEND

The command.

d: The name of the diskette or hard disk drive where 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 where you want to send the file. If you have only one host, this part is optional. The default is session **A**.

fn 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 control terms 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:

- CRLF and NOCRLF are mutually exclusive options.
- BINARY and ASCII are mutually exclusive options.
- The assumed defaults, if the optional parameters are omitted, are CRLF ASCII.

BINARY

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

CLEAR

Clears the workstation window at the beginning of the file transfer.

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 workstation 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 a 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 32,767 characters.

PROGRESS

Shows a message indicating that the file transfer is in progress or has ended. Such messages do not show the current transferred bytes.

QUIET

Does not show any messages.

TIME n

Specifies the length of time *n*, in units of 30 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 1 through 2184. The default is 1. To avoid a premature error message, specify an adequate value. In cases of large packet sizes, large block sizes, or for slow communication lines (such as SDLC and ASYNC), 3 units 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 from your workstation to your CICS host:

- To send a workstation file from your default drive and add it as a new file on your CICS host:

SEND pc.txt a:cicsfile (ASCII CRLF)

Note: Enter the complete CICS SEND command on one line.

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

- To send a basic workstation file from a drive other than your default to replace a file on your CICS host:

SEND a:myprog.exe a:basprog

This command sends a workstation 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

CICS RECEIVE

Use the following information when receiving files from CICS:

Figure 26 shows the command and information you must provide. Enter it as shown (including parentheses), except that you can use either uppercase or lowercase.

Note: **b** means to insert a space. There must *not* be a space between **h:** and **fn**.

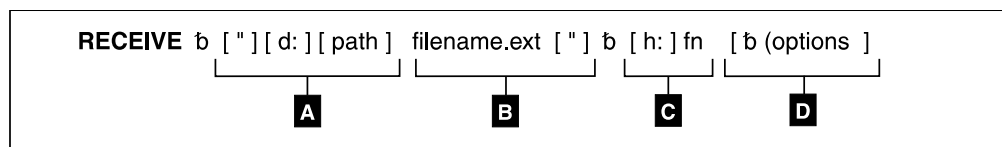


Figure 26. CICS RECEIVE Command Syntax

- A** The workstation drive and path where the file is to be received.
- B** The name of the workstation file.
- C** The 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
- CLEAR
- CRLF
- NOCLEAR
- NOCRLF
- PROGRESS
- QUIET
- TIME *n*

The parts of the CICS RECEIVE command are:

RECEIVE

The command.

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

path The path to the subdirectory where the file is to be located.

filename.ext

The name of the workstation PC file, including the extension. You can create a new name or use a name that is already on your workstation 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 part is optional. The default session is **A**.

fn 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 control terms 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:

- CRLF and NOCRLF are mutually exclusive options.
- BINARY and ASCII are mutually exclusive options.
- 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 workstation file.

CLEAR

Clears the workstation window at the beginning of the file transfer.

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

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

PROGRESS

Shows a message indicating that the file transfer is in progress or has ended. Such messages do not show the current transferred bytes.

QUIET

Does not show any messages.

TIME n

Specifies the length of time, in units of 30 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 1 through 2184. The default is 1. To avoid a premature error message, specify an adequate value. In cases of large packet sizes, of large block sizes, or for slow communication lines (such as SDLC and ASYNC), 3 units is recommended. A blank space is required between TIME and *n*.

Examples

The following examples show the command syntax you can use to receive files from your CICS host to your workstation:

- To receive a file from your CICS host to your default drive for a workstation session:

RECEIVE pc.txt A:cicsfile (ASCII CRLF)

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

- To receive a basic file from your CICS host and replace a file on a drive other than your default:

RECEIVE a:myprog.exe a:myprog

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

Configuring File-Transfer Code Translation

Configuring File-Transfer Code Translation

When you transfer a file between the host and the workstation using the ASCII option, the host-system file-transfer program performs translation from EBCDIC to ASCII or vice versa, according to the host and workstation code pages specified during PC/3270 configuration. However, you might want to use a different translation from that supplied by IBM. For the details, refer to “Chapter 5. Transferring Files” on page 33 .

Footnotes:

Chapter 14. Considerations for PC/3270 Installation and Use

This chapter provides technical information, considerations, and restrictions for installing and using PC/3270.

IEEE 802.2 Support

Customers who use LAN connectivity, such as

- 802.2
- IP
- LAN emulation (Frame Relay, 3174 Peer Communications)

or WAN connectivities that use SNA Phone Connect, such as

- MPA
- WAC
- ISDN
- ComPort (Async, AutoSync)

require LAN Adapter and Protocol Support (LAPS). LAPS is provided by Multiple Protocol Transport Services (MPTS).

If one of the following products has been installed on your workstation, an acceptable version of LAPS might already be available:

- Multiple Protocol Transport Services (MPTS), which is included in this package
- IBM TCP/IP for OS/2
- IBM LAN Server (or LAN Requester)
- IBM Communications Server for OS/2

Host Session Window Operations

This section provides information about host session window operations.

Cursor Color

PC/3270 assigns white as the cursor color by default and mixes the background color (if it exists) with an exclusively-ORed operation. If you want to change this default cursor color assignment, change the **PCSWIN.INI** file and insert the following line into the **[Session]** section:

```
[Session]
CursorColor=<red-value> <green-value> <blue-value>
```

where <red-value>, <green-value>, and <blue-value> are integers from 0 to 255 to specify the color intensity for each color primitive respectively; 0 0 0 for black color, and 255 255 255 for white.

IBM Custom Color (Display Setup - Palette)

Even if you set the IBM Custom Color setting to **Yes**, the color palette will be the same as the OS/2 system palette, regardless of which display adapter you have. If

you want to use the custom color palette, which provides better scaling of the color range, add the following lines in your \pcomos2\private\pcswin.ini file:

```
[Session]
TrueColor=Y
```

Note: The custom color palette has a better appearance than the system palette, but it might cause colors to flash when you start communications, and it might change the window focus to other Presentation Manager applications.

Releasing Insertion Mode with the Attention Key

To release insertion mode after execution of the Attention key, add the following parameter to the **[Keyboard]** section of the workstation profile (*.WS):

```
[Keyboard]
ResetInsertByAttn=Y          <- Added.
```

Scroll Bar

While you select **Font** from the Appearance pull-down menu in the session window and select **Fixed Size** from the Select Display Font dialog box, if you specify **With Scroll-Bar** in the Window Setup dialog box, the entire operator information area might not appear on the screen, because the session window size is not permitted to be larger than the screen size.

Scroll Lock Key

When the Scroll Lock keyboard indicator is turned on, the cursor movement keys, and **Page Up** and **Page Down** keys are used to scroll windows only when you specify **With Scroll-Bar** in the Window Setup dialog box. If you specify **Without Scroll-Bar**, you will not use the **Scroll Lock** key because the entire screen is displayed; for example, cursor movement keys in Scroll Lock mode do not do anything.

PC/3270 Screen Size Control

Although you can specify the screen size of the 3270 session in PC/3270 configuration, the final screen is determined by the host according to the SNA BIND negotiation, which is described below in detail.

Sometimes you want to use your configured screen size when it is difficult for you to ask the host VTAM table modification. This section gives you a hint for this purpose. (The following method will satisfy your requirement, but because it violates SNA rules, some applications referring to the VTAM table only might not work.)

You need to modify your workstation profile (*.WS) to insert the following line into the **[LU]** section:

```
[LU]
InfScreenSize=Y
```

Personal Communications processes byte 24 of the host BIND image correctly and according to the SNA rules. Byte 24 is the last 2 bytes of

```
PSERVIC=X'028000000000000000000000300' (03 in this case)
```

in the log mode.

If byte 24 is X'03', the default screen size is 24 x 80, and the alternate is what the USER configured with PC/3270.

If byte 24 is X'00' or X'02', the default and alternates screen sizes are 24 x 80.

If byte 24 is X'7E' or X'7F', bytes 20-23 in the BIND control the default and alternate screen sizes.

If you have X'03' in the BIND image, you can customize whatever screen size you want, and the host will query Personal Communications and use the alternate screen size.

The following table shows the details of the BIND image processing:

Byte in BIND by Host ==>						Result(Screen size)	
-----						Default	Alternate
24	20	21	22	23		=====	=====
==	==	==	==	==			
a) 00	--	--	--	--	==>	24 x 80	24 x 80
b) 02	--	--	--	--	==>	24 x 80	24 x 80
c) 03	--	--	--	--	==>	24 x 80	R x C
d) 7E	Rd	Cd	--	--	==>	Rd x Cd	Rd x Cd
e) 7F	Rd	Cd	Ra	Ca	==>	Rd x Cd	Ra x Ca

Legend: RxC: Screen Size defined by PC/3270 3.0 configuration
(R,C) = (24,80) , (32,80) , (43,80) or (27,132)

Rd: Rows in the default screen size mode
Cd: Columns in the default screen size mode
(Rd,Cd) = (24,80) , (32,80) , (43,80) or (27,132)
Rd*Cd <= R*C

Ra: Rows in the alternate screen size mode
Ca: Columns in the alternate screen size mode
(Ra,Ca) = (24,80) , (32,80) , (43,80) or (27,132)
Ra*Ca <= R*C

PC/3270 supports query replies. Make sure that the query reply of Implicit Partition returns the final screen size upon receipt of a BIND command.

Customizing a Display Translation Table

PC/3270 displays the host EBCDIC character by using a workstation (ASCII) graphic symbol so that the character defined by S/390 EBCDIC host code page is displayed correctly by using the same graphic symbol defined by ASCII. However, you might need your own original translation, because your host or workstation application is not designed to use the standard translation.

You can use your original translation table if you refer to the following procedure as an example. But you must keep in mind that the data integrity caused by the user-defined table is your responsibility.

The following example shows how to remap left and right brackets.

1. Stop all PC/3270 sessions that are running.
2. Modify the PC/3270 workstation profile (*.WS).

```
[Translation]
IBMDefaultView=N
DefaultView=C:\PCOMOS2\PRIVATE\BRACKET.XLT
```

3. Create the display translation table file (*.XLT). For this example, **C:\PCOMOS2\PRIVATE\BRACKET.XLT** should be created.

```
[Profile]
id=XLT
Description=User-defined Display Translation Table
```

```
[Option]
Replace=Y
```

```
[SB Xlate]
; EBCDIC=ASCII
; The next line displays EBCDIC X'AD' as
; an ASCII X'5B' (left bracket)
AD=5B
; The next line displays EBCDIC X'BD' as
; an ASCII X'5D' (right bracket)
BD=5D
```

4. Create your own keyboard layout (*.KMP) if you need to enter your new left and right brackets graphic symbols:

```
[KEYBOARD]
KEY27=ansi dd
KEY28=ansi a8
```

Where the right-hand side should be lowercase characters and ASCII X'dd' is translated into EBCDIC X'ad' by PC/3270, and then displayed as '[' by the table created in step 3, and so on.

5. Select the session icon corresponding to the modified workstation profile.

Edit Function

This section provides information about edit function restrictions for specific connectivity types.

Edit Function Restrictions at CUT Attachment

When you use the CUT attachment, you can use only the **Copy** and **CopyAppend** functions of the edit functions supplied by the menu bar in the display session window.

Edit Function Restrictions at Home3270 Attachment

When this system is connected to the host system by Home3270 attachment, the following edit functions supplied by the session window are restricted.

Undo function

You cannot execute the **Undo** function after using the **Cut**, **Paste**, **PasteNext**, or **Clear** functions, because these functions modify display areas in the protocol converter.

Cut and Clear functions

When an area to be cut or cleared contains a field attribute character or protected field, or each line in that area ends at the end of an unprotected field, the following things might happen:

- Characters in an unprotected field outside the area to be cut or cleared might also be cleared.
- An alarm might sound.

- The cursor might not appear at the initial position.

When you execute the Cut or Clear function, specify only the minimum area required (for example, some words or one field in one line); then confirm that the frame exists in an unprotected field.

Paste and PasteNext functions

When the area to be pasted contains a field attribute character or protected field, or the end of the paste area on each line is positioned at the end of an unprotected field, the following things might happen:

- The character to be pasted might not be written to the expected position.
- An alarm might sound.
- The cursor might not appear at the initial position.

When you use the paste function, paste the shortest character string possible (for example, a character string, but excluding CRLF); then confirm that the area to be pasted is in an unprotected field.

Pasting Data to Lotus 1-2-3 from the Clipboard

You can use the Clipboard to copy data from a Personal Communications session to Lotus 1-2-3 for OS/2, but it will not be divided into cells. If you want to paste the data into cells, add the following lines to the profile (*.WS) for the session:

```
[EDIT]
CelledText=Y
```

Note: If you paste data into another application later, it might appear in a different format.

File Transfer from the OS/2 Command Prompt

Note: For details, refer to the *Information Notebook* or “Chapter 13. File Transfer Commands for PC/3270” on page 217.

Host File Name and Reserved Words

You should not use the following words as a VM file name or file type, as an MVS data set name, or as a CICS file name, because they are reserved for use as command options. However, if you must use them for files, add a '\' (backslash), as a separate word, immediately after the file name and so on, even if you do not specify any options.

```
ASCII, APPEND, TIME, CLEAR, NOCLEAR, SILENT, QUIET,
PROGRESS, JISCII, SO, NOSO, BLANK, USER
```

Changing the Packet Size When Import/Export Is Idle

When Import/Export is idle, select **Setup** from the Transfer pull-down menu. When you change the packet size on the Miscellaneous Settings dialog box, end Import/Export; then rerun it.

WAIT Option for Multiple File Transfer

If multiple file transfers do not succeed, insert the following statement into the **[Transfer]** section of your *.WS file:

```
[Transfer]
WAIT=1000
```

This parameter causes a 1000-msec (1 sec) delay between file transfers. If this does not help, you might need to increase the value further.

NOTRUNC and BLANK Options for the Host File Transfer Program

If you want to add trailing blanks (spaces) to complete the logical record length for each record when downloading a text file, you can use the following options in **Additional Options** edit field of the Transfer-Type Definition dialog box.

- NOTRUNC for VM/CMS
- NOTRUNC for MVS/TSO
- BLANK for CICS

When you download a file from the host to the workstation using the CRLF option, trailing blanks are automatically deleted from the end of each record to save disk space and download time. If you do not want to have the trailing blanks deleted, you can specify the NOTRUNC option. The NOTRUNC option only takes effect when the CRLF option is also specified.

Note: The NOTRUNC option is available when you use the IND\$FILE program on VM/CMS or MVS/TSO to download the files if the appropriate PTF has been applied to the host program, as follows:

VM/CMS: UR34797 or UR07750
MVS/TSO: UR35492 or UR07751

To verify the current PTF level, enter the following line from a display session:

IND\$FILE ?

where: the character \$ might vary from country to country.

Graphic Functions

This section provides information, restrictions, and considerations for graphic functions.

Graphics Protocols

Personal Communications allows you to use host graphics applications, such as GDDM and others. Two types of graphics are supported:

- Vector
- Programmed symbols

Two protocols are supported for vector graphics:

- Advanced
- Native

See *Configuring Graphics* in the online helps for a description of these protocols and to learn how to configure your sessions for graphics.

The following functions are supported:

Multiple mixed alphanumeric and graphics host sessions
Use of the normal OS/2 printing and plotting facilities
Creation of PIF (Picture Interchange Format) files
Clipping graphics data into the clipboard

Vector Graphics: Vector graphics are computer graphics in which display images are generated from display commands and coordinate data. Personal

Communications provides vector graphics support for the OS/2-Link (advanced) or the 3179G or GOCA (native) protocols. Choose the protocol that is appropriate for your host applications.

Advanced Protocol: Use the advanced protocol when you have GDDM Version 2 Release 3 or later and are using any of the following operating system:

- MVS
- VSE
- VM/SP
- VM/XA SP

Note: The advanced protocol is not supported by the CICS pseudo-conversational mode with versions of GDDM earlier than Version 3, and not by IMS/VS at all. It is, however, supported by the CICS pseudo-conversational mode with GDDM Version 3 Release 1 or later.

The advanced protocol is equivalent to that used by OS/2-Link, so it supports the same subsystems. However, no download of code from the host system is required for Personal Communications because all the OS/2-Link graphics modules are integrated into the program.

Native Protocol: You should choose the native protocol when you intend to use older GDDM versions or non-GDDM host-graphics applications, such as those originally intended for use on 3270 nonprogrammable terminals as the 3179G, 3192G or 3472G. The native protocol also allows IMS/VS users to display GDDM graphics.

Note: A 3174 controller requires a terminal to respond within a certain time; if it does not, a machine check 207 message appears. If you are using a coaxial attachment for graphics in native mode, this can happen for various reasons, such as the complexity of the graphics drawing-orders or the speed of your workstation. In this case, you should change to advanced mode.

Programmed Symbols: Raster graphics are displayed with programmed symbols, which are downloaded to your workstation. Personal Communications support up to six sets (PSA through PSF) of triple-plane and multiple-color programmed symbols.

You should use programmed symbols as the graphics type when you intend to use host graphics applications originally written for the 3279G terminal.

Graphics applications use one or both of these methods to display graphical screens. Personal Communications allows you to enable or disable support for vector graphics and programmed symbols. Choose the type of support that our host applications require.

Note: If you use the OS2-Link (advanced) protocol under the GDDM program, do not choose programmed symbols. Also, do not choose programmed symbols when you use the OS2-Link protocol with other applications.

Enabling Programmed Symbol Sets: PC/3270 provides up to six sets of triple-plane programmed symbols, depending on the type of graphics support that you choose. By default:

- Two sets (PSA and PSB) of single-plane programmed symbols are usable if you choose both programmed symbols and vector graphics.

- Three sets (PSA, PSB, and PSE) of single-plane programmed symbols and three sets (PSC, PSD, and PSF) of triple-plane programmed symbols are usable if you choose programmed symbols, but not vector graphics.

You can change the number of programmed-symbol sets and triple or single planes available for each programmed-symbol set by editing the [3270] section of the workstation profile:

```
PSSPlanes=xxxxxx
```

Each *x* represents a number (0, 1, or 3) that indicates how many planes are to be available for each set; the first column indicates the number of planes for PSA, the second column for PSB, and so on. For example, to enable six triple-plane programmed symbol sets, enter the following:

```
PSSPlanes=333333
```

To enable two single-plane and two triple-plane sets, enter the following:

```
PSSPlanes=113300
```

How to Handle Errors Caused by Insufficient Memory: Graphic execution module PCSGRP.DLL uses a large amount of global memory for graphic drawing or printing. When the workstation has insufficient installed memory, results might not be obtained correctly. For example, an area might not be clearly shaded.

In this case, increase the amount of installed workstation memory by at least 1 MB. For host graphic printing, add 1 more megabyte.

Memory might have to be further extended depending on the host graphic application and printer driver used.

Drawing Buffer Size: The drawing buffer size varies depending on the contents set for **Redraw** of a graphic function.

To set **Redraw**, select **Display Setup** from the Appearance pull-down menu in the session window. On the continuously displayed Display Setup dialog box, select **Graphic** from **Category**.

Selecting **Host** from the optional items of **Redraw** requires no buffer, because the redraw is not executed.

If you select **Retained**, the graphic execution module stores all redrawing data into a buffer. Such a buffer is called a *retained buffer*. The buffer size varies depending on the complexity of the graphic data from an application program.

Example:

Simple table	10 KB to 20 KB
Complicated graphic image	200 KB to 300 KB

When you select **Bitmap** to set **Redraw**, the buffer size is the same as the sum of the retained buffer size and compatible bit-map size.

Following are examples for bit-map size:

(Height) x (Width) x (Number of planes) x (Bits/Pixel) / 8 bytes

Example:

When you select a 7x12 font for a VGA 16-Color Display Model 2 (24x80), the bit-map size is as follows:

$$\text{Bit-map size} = (7 \times 80) \times (12 \times 24) \times 1 \times 4 / 8 = 80 \text{ KB}$$

When you select a 12x20 font for an IBM PS/55 High-Resolution 256-Color Display Model 2, the bit-map size is as follows:

$$\text{Bit-map size} = (12 \times 80) \times (20 \times 24) \times 1 \times 8 / 8 = 460 \text{ KB}$$

Using Bit Maps for Drawing: The graphic execution module uses a bit map compatible with the display unit to draw an area instruction in overpaint mode. An image instruction requires one plane bit map.

$$(\text{Buffer for area}) = (\text{area width}) \times (\text{area height}) \times (\text{number of planes}) \times (\text{bits/pixel}) / 8$$

$$(\text{Image buffer}) = (\text{image width}) \times (\text{image height}) / 8$$

Printing Graphics: You can print or plot graphics by using the normal OS/2 print support. There are two ways to do this: .

- When using advanced protocol, by using the GDDM (or other host program) print capability.
- By using the Print Graphics menu-bar command (from the File menu).

If you have an existing host program that opens a printer, you can specify your workstation printer or plotter instead by putting a nickname statement in your GDDM nickname file (or the equivalent, if you are not using GDDM). For example, for a program that contains a DSOPEN for a printer with the name GRAPRINT specified in its name list, the nickname statement is:

```
ADMMNICK
FAM=0,NAME=GRAPRINT,TOFAM=1,TONAME=(*,PCSWGPRRT)
```

where *PCSWGPRRT* is the device name of the printer or plotter.

Another way is for your GDDM program to send graphics to a workstation printer or plotter. The program addresses the printer as a Family-1 auxiliary device with a device name of PCSWGPRRT:

```
DECLARE PROC_LIST(1) FIXED BINARY(31);
DECLARE N_LIST(2) CHARACTER(8);

N_LIST(1) = '*'
N_LIST(2) = 'PCSWGPRRT';

CALL DSOPEN(97,1,'*',0,PROC_LIST,2,N_LIST);

CALL DSUSE(1,97);
```

When you specify a device name as *PCSWGPRRT*, the printer select in the Printer Setup window is used.

You can also use other printers. To do this, you specify a printer object name (the eight-character physical name of the printer object).

GDDM alphanumerics (ASxxx and MSxxx calls) are supported by printers or plotters, with the following field and character attributes:

Color
Outlining
Reverse video
Transparency
Underscore

Note: The appearance of the output depends on the device driver for each printer or plotter.

Graphic Print Buffer: The retained buffer must be used for printing. The retained buffer is the same size as that used for redrawing. This is also applied when you specify **Bitmap** for **Redraw** on the Display Setup dialog box.

Editing Graphic Data: An editing operation causes the graphic execution module to copy the graphic data as a bit map and metafile to the clipboard. The graphic data can be executed only copying.

Printer Fonts: The printer driver can handle two font sets, the device font and system font. The device font is hardware fonts built into the printer.

The system fonts are System (without brackets) or other software fonts.

Plotter: Because a plotter does not support a raster, the following restrictions are imposed on drawing. A plotter should be used for figures and tables that use mainly lines.

- No shading is supported.
- Some shading patterns cannot be distinguished.
- Image order drawing requires much time and the final printout is of poor quality.
- The OR and exclusive OR are not correctly reflected.

Hole in the Screen Caused by Clearing a Graphic Character: When a character overlaps a graphic image, the graphic image is cleared at the position where the character is to be displayed. When you enter a null character or space having the transparent attribute at the position where a graphic image is displayed, the graphic image in that character cell is not cleared.

If you select **Host** or **Retained** to set **Redraw** on the Display Setup dialog box, when characters in a graphic image are cleared, a hole appears in the graphic area. This is because these two modes do not have a bit-map image, and partial redrawing cannot be performed on the screen.

If you select **Bitmap** mode as **Redraw Graphics**, you can find no hole on the graphic region by the application that overrides any alphanumeric characters (as well as NULL and SPACE) on the graphic image.

To restore the screen, perform either of the following actions:

- Press **PA3** to have the application program redraw the screen.
- Minimize and restore the graphic image retained in retained mode; then redraw it or select bit-map mode.

Note: When you change the setting of **Redraw** in the Display Setup dialog box, the set contents are valid from the next drawing.

Considerations for Configuring a Character Cell: If you use a host application that has a fixed font size, select **Fixed** for the **Cell Type** in the Configure Graphics dialog box and set the display space size of the session to that of the application. Otherwise, parts of the pictures might be missing or the characters might not fit with the graphics. In this case, unmatched font size of the actual window might make the figure appear warped because of the difference of horizontal-vertical ratio. Select the font in the **Font** of the Appearance pull-down menu to be the same size as the **Cell Size** selected in the Configure Graphics dialog box. If you cannot, select a font size with the same horizontal-vertical ratio.

Graphic Cursor: The graphic cursor is not supported in systems without a mouse.

API Considerations

This section describes factors you should consider if you plan to use PC/3270 application programming interfaces (APIs).

DOS Mode EHLLAPI

Use this function to call PC/3270 (for OS/2) EHLLAPI from EHLLAPI user applications that are created for PC/3270 (for DOS) on the OS/2 DOS box or created for PC/3270 (for Windows) on WIN-OS2. To use this function, specify the DOS mode EHLLAPI available in **API setting**. Then EHLLAPI Virtual Device Drive (VDD) will be added to **CONFIG.SYS**.

To use this function on WIN-OS2, copy the file **PCSHLL.DLL** in the directory, in which OS/2 and PC/3270 are installed, to the place that the environment variable **PATH=** of WIN-OS2 specified (in **AUTOEXEC.BAT**).

Note: **PCSHLL.DLL** is a Windows dynamic link library (DLL), which is a interface module between your EHLLAPI application for PC/3270 and the EHLLAPI VDD.

To use **SEND FILE (90)** or **RECEIVE FILE (91)**, you have to specify the workstation file name with drive and path name.

Home3270 and HLLAPI Applications

The HLLAPI functions for the Home3270 attachment are slightly different than those for the other attachments. As a result of these differences, you need to change the EHLLAPI code page.

To do this, complete these steps:

1. Select **File** from the menu bar and then select **API Settings**.
2. Select **819** from the Code Page list and then select **OK**.

For a description of the HLLAPI functions, refer to the *Personal Communications/3270 Programmer's Guide for Entry-Level DOS Mode*.

Print Processing

This section provides information, restrictions, and considerations for print processing.

Spooler

To use the OS/2 spooler, you must turn it on.

Using a Printer in a Non-SNA Coaxial Attachment

For the non-SNA coaxial attachment, PC/3270 regards the print job within 30 seconds after the previous one as a continuous job with the previous one. PC/3270

determines the job end artificially by the timeout value, because it is impossible to determine the job end automatically by the protocol of the non-SNA attachment.

You can change the standard timeout value for adapting to your environment. Specify the following parameter in the [CNDFT] section of the workstation profile (*.WS):

```
[CNDFT]
PrtTimeOut=nn
```

Note: nn is a decimal value of the timeout in seconds.

Print Job Control by Using SNA Timeout

PC/3270 treats the data packet, which begins with an SNA Begin Bracket (BB) and ends with an SNA End Bracket (EB), as one job, and spools to the print spooler. However, some applications might not use SNA BB and EB appropriately, and an unexpected page eject might sometimes occur. This section describes two timeout controls for you to customize your host print job to fit your environment.

Concatenation of Multiple Print Jobs to a Single Print Job: When a new print job comes from the host before expiring the timer specified by the workstation profile, the print job is concatenated to the previous one, and they are regarded as a single print job. You can change the timer value by specifying the following parameter in the [printers] section of the workstation profile (*.WS):

```
[printers]
ConcatinateTime=nn
```

Note: nn is as follows, and its unit is one second:

0: No concatenation of print jobs

1 - 32767:
Concatenation of print jobs by this timeout value

When the non-SNA attachment is used, the timer should not be specified on the workstation profile.

Termination of a Print Job: When an end of a print job (SNA End of Bracket) does not come from the host until the timer specified by the workstation profile is expired, the print job is automatically terminated. You can change the timer value by specifying the following parameter in the [printers] section of the workstation profile (*.WS):

```
[printers]
TerminateTime=nn
```

Note: nn is as follows, and its unit is one second:

0: No automatic termination of a print job

1 - 32767:
Automatic termination of a print job by this timeout value

When the non-SNA attachment is used, the timer should not be specified on the workstation profile.

SCS TRN Command (LU 1)

When you use printers with the OS/2 printer drivers, you can change the operation of the SCS TRN command by adding the following specification to the [printers] section of the workstation profile (*.WS):

ATRN=Y

Transfers data of the SCS TRN command to the printer driver without conversion.

ATRN=N

Converts data of the SCS TRN command and transfers the result to the printer device driver.

When ATRN=Y and ATRN=N are specified, host codes 00H to 3FH are converted to hyphens (-) or characters specified with the SCS SGEA command. The default value is as follows:

ATRN=Y

When you use PDT, you can change it to the similar setting. To change the PDT file, add one of the following lines to PDF.

TRANSPARENT_=Y (corresponds to ATRN=Y)
TRANSPARENT_=N (corresponds to ATRN=N)

Ignoring Blank Pages

When you cannot print a blank page correctly, check the following things:

- Some printers ignore a blank page if so specified with the **Printer Setup** option (or setting the printers DIP switches). Check whether the printer is set to enable this option.
- Some printer drivers ignore a blank page if it is set with the **Printer Driver Setup** option. Check whether this option is supported by the printer driver.
- Even if IGNORE_FORM_FEED_AT_FIRST_POS is set to NO, some printers ignore FF at the first position because of hardware specifications.

Extra Blank Page When Using a PDT

When you are printing in PDT mode and a host print job ends with a form feed (FF), an extra blank page is ejected; this is because PDT files are written to send an FF at the end of each job.

If your host print jobs always end with an FF, you can suppress the extra blank page by removing the FF from the END_JOB definition in the PDF. To do this, recompile the PDF to create a new PDT.

If you use HPLJII.PDT and you find an extra blank page at the end of each print job, change the PDT to HPLJII2.PDT, which is available on the Personal Communications CD-ROM.

CPI/LPI of Device Font

When the printer driver cannot print the device font for the specified CPI/LPI, data can be printed by another CPI/LPI.

Printing Reverse-Display Characters with a Device Font

Most printer drivers do not support reverse-display character printing with the device font.

Printable Area

Characters might not be printed over the entire paper depending on the printer driver used. When using a printer driver that allows you to set the margins, specify the minimum margins to maximize the printable area.

SVF Control Code

If the maximum print line (MPL) is shorter than the paper size in the SVF control code, when the printing position reaches MPL, a page feed is performed.

Printing Using PDT Mode

Printing using the PDT file is restricted as follows:

- A graphic image cannot be printed.
- No APL character can be printed.
- The PostScript** printer is not supported. (There is no PDF file for the PostScript printer.)

Miscellaneous Considerations

This section lists miscellaneous restrictions.

Ignoring Write Control Character (WCC) Start Print

Some TCP/IP gateways always send WCC with Start Print. This will cause PC/3270 to print the display session.

To avoid this, add the following lines to your workstation profile:

```
[LT]
IgnoreWCCStartPrint=Yes
```

FILE Parameter for TCP/IP Connections

Check your TCP/IP documentation to ensure that the value of the **FILES** parameter in your **CONFIG.SYS** file is sufficient. If this value is too low, AnyNet error message ANY0012E is issued. This message indicates that the local resource limit has been exceeded because no more sockets are available for creating connections or sending datagrams.

Considerations and restrictions on use of the PC/3270, and supplementary information other than the items described in this chapter are stored on the installation CD-ROM as a file. To access this information, refer to **README.INF**, which is saved in the directory where PC/3270 is installed, or double-click on the **Readme** icon.

Part 3. Personal Communications/400

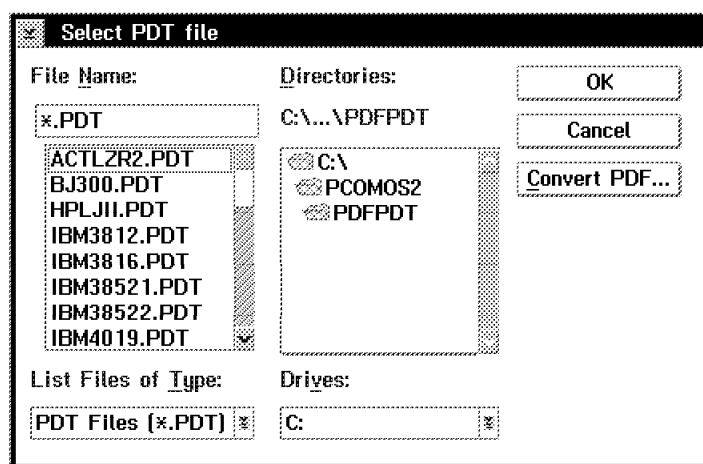
Chapter 15. Building PC400 Printer Definition Tables (PDTs)

This chapter explains how to create and change the printer definition table (PDT) used for PC400. The PDT is created by converting the printer definition file (PDF), which defines how characters and control codes are sent to the printer and how printer output is formatted. You can create a PDF by using a text editor that produces an ASCII file or by modifying one of the PDFs provided by PC400. All PDFs have the extension **.PDF**.

Customizing the PDT

To customize the PDT:

1. Select **File** from the menu bar of the workstation window.
2. Select **Printer Setup** from the File pull-down menu. The Printer Setup window appears.
3. Select the **Use PDT** check box and click on **Select PDT**. The Select PDT File window appears:



4. Select **Convert PDF**.
5. Select the PDF to be converted from the list in the Convert PDF to PDT window; then select **Convert**. After the file has been converted, control is returned to the Convert PDF to PDT window.
6. Select **Close**. Control is returned to the Select PDT File window and the converted PDT file is listed.
7. Select the PDT file; then select **OK**.
8. Select **OK** on the Printer Setup window.

After printer setup is complete, the Printer Setup window is closed.

PDF Format

A PDF consists of a *macro definitions section* and a *definitions section*.

In the *macro definitions section*, you can assign a name (macro name) to a sequence of hexadecimal numbers, decimal numbers, or ASCII characters. This name can be referred to from within the definitions section, which follows the macro definitions section. The macro definitions section must start with a BEGIN_MACRO\$ statement

and end with an `END_MACROS` statement. The left part of the statement is the macro name assigned, and the right part of the statement is the value referred to by that macro name.

In the *definitions section*, the left side of each statement contains the name of a character or control command (field name). The right side of each statement contains hexadecimal numbers, decimal numbers, ASCII characters, or predefined macro names that define the character or the control codes sent to a printer.

Different printer manuals define printer control strings in different ways. Some printer manuals describe control sequences in hexadecimal, whereas others use such symbols as 'esc J1 K'. You can use either format and define macros to make the file more readable. In the macro definitions section and the definitions section of a PDF, the following things can be specified to the right of each statement:

- A single character, which is treated as an ASCII value
- Two digits, which are treated as a hexadecimal number
- Three or more digits, which are treated as a decimal number
- A predefined macro, which is expanded by the printer table compiler

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

After you have created your PDF, convert it to a PDT by using the printer table compiler. The resulting file has a **.PDT** extension.

The `/*` symbol indicates the beginning of a comment. The `*/` symbol indicates the end of a comment. A comment can be placed anywhere within a PDF. It is ignored by the printer table compiler.

A macro definition cannot contain another macro definition. Building PC400 PDTs

Example of PDFs

The PC400 distribution CD-ROM contains the following PDFs:

ACTLZR2.PDF	HPLJII.PDF	IBM5182.PDF
BJ300.PDF	HPLJIII.PDF	IBM5201.PDF
CPQPM20.PDF	HPLJIIID.PDF	IBM5202.PDF
EAP2250.PDF	HPLJ4.PDF	IBM5216.PDF
EAP3250.PDF	IBM3812.PDF	IBM5223.PDF
EAP5500.PDF	IBM3816.PDF	LBP4.PDF
EFX850.PDF	IBM38521.PDF	LQ870.PDF
EFX1170.PDF	IBM38522.PDF	NEC6300.PDF
EFX5000.PDF	IBM4019.PDF	PANLBP4.PDF
ELQ860.PDF	IBM4070.PDF	PANLBP5.PDF
ELQ1070.PDF	IBM4070E.PDF	PAN1123.PDF
ELQ2550.PDF	IBM4072.PDF	PAN1124.PDF
ELQ510.PDF	IBM4201.PDF	PAN1180.PDF
ELX810.PDF	IBM4202.PDF	PAN1695.PDF
EPLPCL4.PDF	IBM4207.PDF	PAN2123.PDF
EPLPCL5.PDF	IBM4208.PDF	PAN2124.PDF
ESQ1170.PDF	IBM4212.PDF	PAN2180.PDF
HPDJ550C.PDF	IBM4226.PDF	PAN2624.PDF
HPDSKJT.PDF	IBM5152.PDF	

The PDFs contained in the PC400 installation CD-ROM can be used as is. However, you might want to change the definitions of some fields. To do so, copy an existing PDF, modify it, and then convert it to a new PDT file.

Do not attempt to change the statements in a field for which modification is specifically prohibited. If you use a PDT file created according to a changed PDF, the results of printing cannot be guaranteed.

Printer Control Codes

Table 14-1. Printer Control Codes

Control Code	Abbreviation	Hexadecimal Code	Function
<i>Character Set Control</i>			
Set CGCS(1) through Local ID	SCGL	2BD1nn81xx	Specifies the code page through a local ID.
Set Character Distance	SCD	2BD2nn29xxxx	Selects the pitch and font.
Set Font ID through GFID(2)	SFG	2BD1nn05xxxxyyyyzz	Selects the font.
Set GCSGID(3) through GCID(4)	SCG	2BD1nn01xxxxyyyy	Specifies the code page.
<i>Device Control</i>			
Bell	BEL	2F	Ignored.
Null	NUL	00	Ignored.
Repeat	RPT	0A	Ignored.
Set Exception Action	SEA	2BD2nn85p1-pn	Specifies the explicit action.
Set Initial Conditions	SIC	2BD2nn45xx	Sets the environment of the EBCDIC transform.
Set Print Setup	SPSU	2BD2nn4Cp1-pn	Ignored.
Switch	SW	2A	Ignored.
<i>Generation Control</i>			
Begin Emphasis	BES	2BD1nn8Axx	Begins emphasis.
Begin Overstrike	BOS	2BD4nn72wwwxyyyzzzz	Begins overstriking.
Begin Underscore	BUS	2BD4nn0Axyy	Begins underscoring.
Enable Presentation	ENP	14	Ignored.
End Emphasis	EES	2BD1nn8Exx	Ends emphasis.
End Overstrike	EOS	2BD4nn76	Ends overstriking.
End Underscore	EUS	2BD4nn0E	Ends underscoring.
Inhibit Presentation	INP	24	Ignored.
Justify Text Field	JTF	2BD2nn03xxxxyy	Justifies the following text.
Set Graphic Error Action	SGEA	2BC8nnxyy	Specifies how to process a received unprintable character font.
Set Justify Mode	SJM	2BD2nn0Dxyy	Justifies each line of text between the left and right margins.
Subscript	SBS	38	Subscript.

Control Code	Abbreviation	Hexadecimal Code	Function
Substitute	SUB	3F	Synonym for the graphic exception character.
Superscript	SPS	09	Superscript.
Word Underscore	WUS	23	Underscore the entire word immediately preceding the control.
<i>Print Format Control</i>			
Form Feed	FF	0C	Moves the printing position to the next page.
Page Presentation Media	PPM	2BD2nn48sssuuvv wwxyyzz	Specifies the forms setting, the source drawer, the quality, and the duplex function.
Required Form Feed	RFF	3A	Moves the printing position to the next page and restores the indent level to the left margin.
Set Horizontal Format	SHF	2BC1nnxyyzzt1-tn	Specifies the maximum print position, the left and right margins, and the horizontal tab stops in character units.
Set Horizontal Margins	SHM	2BD2nn11xxxxyyyy	Sets the left and right margins in units of 1/1440 inch.
Set Presentation Page Size	SPPS	2BD2nn40xxxxyyyy	Specifies the presentation surface width and depth.
Set Text Orientation	STO	2BD3nnF6xxxxyyyy	Specifies the page rotation.
Set Vertical Format	SVF	2BC2nnxyyzzt1-tn	Specifies the maximum print line, the top and bottom margins, and the vertical tab stops in character units.
Set Vertical Margins	SVM	2BD2nn49xxxxyyyy	Sets the top and bottom margins in units of 1/1440 inch.
<i>Printing Position Control</i>			
Backspace	BS	16	Moves the printing position to the left one font width.
Carriage Return	CR	0D	Moves the printing position to the left margin.
Horizontal Tab	HT	05	Moves the printing position right to the next tab stop.
Indent Tab	IT	39	Moves the printing position right to the next tab stop and sets the indent level one tab stop further to the right.
Index Return	IRT	33	Synonym for Required New Line.

Control Code	Abbreviation	Hexadecimal Code	Function
Interchange Record Separator	IRS	1E	Synonym for New Line.
Line Feed	LF	25	Moves the printing position one line vertically.
New Line	NL	15	Moves the printing position to the left margin of the next line.
Numeric Backspace	NBS	36	Synonym for Backspace.
Presentation Position	PP	34fpxx	Moves the printing position.
Release Left Margin	RLM	2BD2nn0B	Ignored.
Required New Line	RNL	06	Moves the printing position to the left margin of the next line and resets any pending indent level.
Set Horizontal Tab Stops	STAB	2BD2nn01xxt1-tn	Specifies the tab stops.
Set Indent Level	SIL	2BD2nn07xx	Sets the indent level to the specific tab stop.
Set Line Density	SLD	2BC6nnxx	Specifies the line pitch in units of 1/72 inch.
Set Line Spacing	SLS	2BD2nn09xx	Specifies the number of lines spaced by a new line control.
Set Single Line Distance	SSLD	2BD2nn15xxxx	Specifies the line pitch in units of 1/1440 inch.
Unit Backspace	UBS	1A	Moves the printing position 1/60 inch to the left.
Vertical Tab	VT	0B	Moves the printing position down to the next tab stop.
<i>Transparent Control</i>			
ASCII Transparent	ATRN	03	Enables the printing of an ASCII data stream.
Notes: 1 Coded Graphic Character Set 2 Global Font ID 3 Graphic Character Set Global Identifier 4 Graphic Character set ID			
Legend: nn: Count fp: Function parameter ee, gg, hh, il-ix, mm, nn, pl-pn, ss, tl-tn, uu, vv, ww, xx, yy, zz: Numeric parameter			

Programming Notes

If the transmission of a control code is interrupted, the printer waits for the remaining part of the code. If the data stream (the series of data units and control codes) sent after the interruption is consistent with the data stream sent before the interruption (that is, if one complete printer control code is restored by chaining), the control code is processed as is.

If the two parts of the data stream are inconsistent, an error occurs. A negative response to an "Invalid Printer Parameter" is sent to the host system, or treated as NO-OP (no-operation instruction, ignored because of a meaningless code).

The main point to note here is that detailed information is not sent to the host system if an error occurs in a control code. After programming, you need to check the data stream thoroughly by repeating the printing test.

Restrictions and Notes for Printer Codes and Printer Setup

This section provides supplementary notes and explains restrictions for printing.

Printer Control Codes

Printer Control Code	If Use PDT file Is Selected:	If an OS/2 Printer Driver Is Used:																		
Set the Character Density (SCD)	The GFID is selected for the valid Character Distance (CD) parameter as follows:																			
	<table><tr><th>CD Parameter</th><th>Character Pitch (Normal)</th><th>GFID Value (COR)</th></tr><tr><td>000A</td><td>10 CPI</td><td>13 CPI</td></tr><tr><td>000B</td><td>Proportional</td><td>13 CPI</td></tr><tr><td>000C</td><td>12 CPI</td><td>15 CPI</td></tr><tr><td>000F</td><td>15 CPI</td><td>20 CPI</td></tr><tr><td>00FF</td><td>10 CPI</td><td>13 CPI</td></tr></table>		CD Parameter	Character Pitch (Normal)	GFID Value (COR)	000A	10 CPI	13 CPI	000B	Proportional	13 CPI	000C	12 CPI	15 CPI	000F	15 CPI	20 CPI	00FF	10 CPI	13 CPI
	CD Parameter	Character Pitch (Normal)	GFID Value (COR)																	
000A	10 CPI	13 CPI																		
000B	Proportional	13 CPI																		
000C	12 CPI	15 CPI																		
000F	15 CPI	20 CPI																		
00FF	10 CPI	13 CPI																		
	If the specified font is not supported, a substitution is provided. For example, when 15 CPI font is specified but the font is not supported, the supported 17 CPI font is substituted.	See “How to Determine the Font” on page 259 .																		
Set Font ID through GFID (SFG)	Recognizable GFIDs are restricted. (See “PDF Field Names and Symbols” on page 204 .) If the specified GFID is not supported and it is out of the range from 154 through 200, the one with the closest font width of the following fonts is substituted:																			
	<table><tr><th>Font Name</th><th>GFID Value</th></tr><tr><td>Courier Bold 5</td><td>245</td></tr><tr><td>Courier 10</td><td>11</td></tr><tr><td>Prestige Elite 12</td><td>86</td></tr><tr><td>Gothic-text 13</td><td>204</td></tr><tr><td>Gothic-text 15</td><td>230</td></tr><tr><td>Courier 17</td><td>252</td></tr><tr><td>Gothic-text 20</td><td>281</td></tr><tr><td>Gothic-text 27</td><td>290</td></tr></table>		Font Name	GFID Value	Courier Bold 5	245	Courier 10	11	Prestige Elite 12	86	Gothic-text 13	204	Gothic-text 15	230	Courier 17	252	Gothic-text 20	281	Gothic-text 27	290
	Font Name	GFID Value																		
Courier Bold 5	245																			
Courier 10	11																			
Prestige Elite 12	86																			
Gothic-text 13	204																			
Gothic-text 15	230																			
Courier 17	252																			
Gothic-text 20	281																			
Gothic-text 27	290																			
	If the specified GFID is not supported and it is between 154 and 200, the following font is substituted:																			
	<table><tr><th>Font Name</th><th>GFID Value</th></tr><tr><td>Document</td><td>175</td></tr></table>		Font Name	GFID Value	Document	175														
Font Name	GFID Value																			
Document	175																			
		The selected font might be different. See “How to Determine the Font” on page 259 .																		

Printer Control Code	If Use PDT file Is Selected:	If an OS/2 Printer Driver Is Used:
Begin Underscore (BUS)		The selected font might not support the underscore.
Begin Emphasis (BES)		The selected font might not support the emphasis.
Set Text Orientation (STO)		When the page is rotated, only Outline Font is selected.
Page Presentation Media (PPM)	<p>The following parameters are supported:</p> <ul style="list-style-type: none"> • Forms Control (FC) • Source Drawer (SD) • Duplex (DX) <p>Other parameters are ignored.</p>	<p>The following parameters are supported:</p> <ul style="list-style-type: none"> • Forms Control (FC) • Source Drawer (SD) <p>Other parameters are ignored.</p>

Note: When you use the OS/2 printer driver, the spooler must be **on**.

How to Determine the Font

This section explains how PC400 determines a font when the OS/2 printer driver is used.

If the specified font is available on your printer, it is selected. However, if it is not available, PC400 selects a font from the available ones on your printer by checking the font attributes in the following order.

- Typeface name
- Character set
- Fixed-pitch font
- Character width. If the specified font is an Outline Font, the character width is not checked. If no available font has the same character width as the specified one, PC400 selects the font with the closest width.
- Font family
- Italic font
- Bold font

PFT Migration Utility

The PFT Migration Utility converts the printer function table (PFT) for the PC Support/400 Work Station function to a printer definition file (PDF) for PC400.

This section describes the operator interface of the PFT Migration Utility.

For details of PFT, see *PC Support/400: DOS and OS/2 Technical Reference*, SC41-8091.

How to Use the PFT Migration Utility

The file name of the PFT Migration Utility program is PCSPFC.EXE. You can execute it by:

- Making a program icon of the PFT Migration Utility and double-clicking on its icon.
- Specifying the program name (and parameters) at the command prompt as follows:

PCSPFC [[drive:] [path] PFT-file-name[.extension]]
--

If no parameter is specified, PCSPFC.EXE displays the Convert PFT to PDF window.

When you run the PFT Migration Utility, the Convert PFT to PDF window appears.

On the Convert PFT to PDF window, select a PFT file from the list box or type a specific PFT file name, and select **OK**. The PFT Migration Utility starts the conversion and displays the PFT File Converter window to show the conversion status.

After the conversion, if you select **Save List** on the PFT File Converter window, conversion messages in the dialog box are saved into a list file. The list file is created in the same directory and with the same name as the PFT file, except the extension. The extension of the list file is .LS2.

If the conversion was completed successfully, you can select **Convert PDF to PDT** on the PFT File Converter window to convert the PDF to a PDT file. You can also create a PDT file by selecting **Printer Setup** from the File pull-down menu as explained in "Customizing the PDT" on page 195 .

Considerations: When the base PDF already exists, the converted PDF fields are appended to the end of the base PDF. The name of the base PDF is decided as follows:

Table 14-2. PDF Name

PFT File Name	Base PDF Name
xxxxxxx.PFT	xxxxxxx.PDF
IBMxxxxx.MNL	MNLxxxxx.PDF
zzzxxxxx.MNL(1)	zzzxxxxx.PDF(1)
Note: 1 "zzz" is not "IBM."	

Even if the same fields are already defined in the PDF, the appended fields are effective because the last definition is always effective in a PDF.

If the base PDF does not exist in the directory, the PFT Migration Utility creates a new PDF that has only the converted fields from the PFT file. In this case, you should append this file to an appropriate base file manually, because the fields converted from the PFT file do not cover all of the necessary PDF fields.

Therefore, you should prepare both the PFT file and its base PDF in the same directory before the conversion.

Migration from the PFT to the PDF

This section describes how the PFT Migration Utility migrates the PFT to the PDF.

The following table shows the target fields of the PDF for the data in the PFT:

Table 15. Migration from the PFT to the PDF

PFT Field Name	PDF Field Name
	Description
Initialization and Reset	
<i>Initialization</i>	
Initialization	START_JOB=
	When the data is defined in the Initialization field of the PFT, the data is appended to the string START_JOB=.
<i>File Name</i>	
Filename	None.
	This field is ignored.
<i>Reset</i>	
Reset	END_JOB=
	When the data is defined in the Reset field of the PFT, the data is appended to the string END_JOB=.
Vertical Line Spacing	
<i>6 Lines per Inch</i>	
6 Lines per Inch	SET_6_LINES_PER_INCH=
	When the data is defined in the 6-lines-per-inch field of the PFT, the data is appended to the string SET_6_LINES_PER_INCH=.
<i>8 Lines per Inch</i>	
8 Lines per Inch	SET_8_LINES_PER_INCH=
	When the data is defined in the 8-lines-per-inch field of the PFT, the data is appended to the string SET_8_LINES_PER_INCH=.
<i>Variable Line Spacing</i>	
Control Sequence	SET_VARIABLE_DENSITY=
	When the data is defined in the control sequence field of the PFT for variable line spacing, the data is appended to the string SET_VARIABLE_DENSITY=. The parameter n in the control sequence is replaced with the PDF parameter type.
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
X/Y	LINE_SPACING_RATIO=
	When the data is defined in the X/Y field of the PFT for variable line spacing, the value Y/X is appended to the string LINE_SPACING_RATIO= as three-digit or four-digit numbers to indicate the decimal number. For example, when Y/X is 72, 072 is appended to the string LINE_SPACING_RATIO= and LINE_SPACING_RATIO=072 is written to the output file. When the value is greater than 255, the four-digit number is migrated. When the value is less than 255, the three-digit number is migrated.
<i>Indexing Functions</i>	
Begin Superscript	START_SUPERSCRIPT=
	When the data is defined in the Begin Superscript field and End Superscript field of the PFT for the indexing functions, the data is appended to the string START_SUPERSCRIPT=. If the data for End Superscript is not defined, the data for Begin Superscript is ignored.
End Superscript	END_SUPERSCRIPT=
	When the data is defined in the End Superscript field and Begin Superscript field of the PFT for the indexing functions, the data is appended to the string END_SUPERSCRIPT=. If the data for Begin Superscript is not defined, the data for End Superscript is ignored.
Begin Subscript	START_SUBSCRIPT=
	When the data is defined in the Begin Subscript field and End Subscript field of the PFT for the indexing functions, the data is appended to the string START_SUBSCRIPT=. If the data for End Subscript is not defined, the data for Begin Subscript is ignored.
End Subscript	END_SUBSCRIPT=
	When the data is defined in the End Subscript field and Begin Subscript field of the PFT for the indexing functions, the data is appended to the string END_SUBSCRIPT=. If the data for Begin Subscript is not defined, the data for End Subscript is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Reverse 1/2 index	START_SUPERSCRIPT= END_SUBSCRIPT=
	<p>The data is appended to the START_SUPERSCRIPT= for the following conditions:</p> <ul style="list-style-type: none"> • When the data is not defined in the Begin Superscript field in the PFT or when the data is not defined in the End Superscript field in the PFT. • When the data is defined in the Reverse 1/2 index and Forward 1/2 index field in the PFT. <p>The data is appended to the END_SUBSCRIPT= for the following conditions:</p> <ul style="list-style-type: none"> • When the data is not defined in the Begin Subscript field in the PFT or when the data is not defined in the End Subscript field in the PFT. • When the data is defined in the Reverse 1/2 index and Forward 1/2 index field in the PFT.
Forward 1/2 index	END_SUPERSCRIPT= START_SUBSCRIPT=
	<p>The data is appended to the END_SUPERSCRIPT= for the following conditions:</p> <ul style="list-style-type: none"> • When the data is not defined in the Begin Superscript field in the PFT or when the data is not defined in the End Superscript field in the PFT. • When the data is defined in the Reverse 1/2 index and Forward 1/2 index field in the PFT. <p>The data is appended to the START_SUBSCRIPT= for the following conditions:</p> <ul style="list-style-type: none"> • When the data is not defined in the Begin Subscript field in the PFT or when the data is not defined in the End Subscript field in the PFT. • When the data is defined in the Reverse 1/2 index and Forward 1/2 index field in the PFT.
Reverse Index	None.
	This field is ignored.
Horizontal Line Spacing	
<i>5 Pitch</i>	
5 pitch	None.
	This field is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
<i>8.55 Pitch</i>	
8.55 pitch	None.
	This field is ignored.
<i>10 Pitch</i>	
10 pitch	SET_10_CHARACTERS_PER_INCH=
	When the data is defined in the 10-pitch field of the PFT for horizontal character spacing, the data is appended to the string SET_10_CHARACTERS_PER_INCH=.
<i>12 Pitch</i>	
12 pitch	SET_12_CHARACTERS_PER_INCH=
	When the data is defined in the 12-pitch field of the PFT for horizontal character spacing, the data is appended to the string SET_12_CHARACTERS_PER_INCH=.
<i>15 Pitch</i>	
15 pitch	SET_15_CHARACTERS_PER_INCH=
	When the data is defined in the 15-pitch field of the PFT for horizontal character spacing, the data is appended to the string SET_15_CHARACTERS_PER_INCH=.
<i>17.1 Pitch</i>	
17.1 pitch	SET_17_CHARACTERS_PER_INCH=
	When the data is defined in the 17.1-pitch field of the PFT for horizontal character spacing, the data is appended to the string SET_17_CHARACTERS_PER_INCH=.
<i>Horizontal Motion Index</i>	
Control Sequence	None.
	This field is ignored.
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.
X/Y	None.
	This field is ignored.
Horizontal Relative Movement	
<i>Forward Relative Movement</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Control Sequence	FORWARD_HORIZONTAL_SKIP=
	When the data is defined in the Forward Relative Movement field of the PFT, the data is appended to the string FORWARD_HORIZONTAL_SKIP=. The parameter n in the control sequence is replaced with the PDF parameter type.
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.
X/Y	HORIZONTAL_PEL=
	When the data is defined in the X/Y field of the PFT for the forward relative movement, the value Y/X is appended to the string HORIZONTAL_PEL= as a three-digit or four-digit number to indicate the decimal number. For example, when Y/X is 120, 120 is appended to the string HORIZONTAL_PEL= and HORIZONTAL_PEL=120 is written to the output file. When the value is greater than 255, the four-digit number is migrated. When the value is less than 255, the three-digit number is migrated.
<i>Backward Relative Movement</i>	
Control Sequence	None.
	This field is ignored.
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.
X/Y	None.
	This field is ignored.
Highlighting	
<i>Begin Emphasis</i>	
Begin Emphasis	START_HIGHLIGHT_INTENSE=
	When the data is defined in the Begin Emphasis of the PFT, the data is appended to the string START_HIGHLIGHT_INTENSE=.
<i>End Emphasis</i>	
End Emphasis	END_HIGHLIGHT_INTENSE=
	When the data is defined in the End Emphasis of the PFT, the data is appended to the string END_HIGHLIGHT_INTENSE=.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
<i>Begin Underline</i>	
Begin Underline	START_HIGHLIGHT_UNDERLINE=
	When the data is defined in the Begin Underline of the PFT, the data is appended to the string START_HIGHLIGHT_UNDERLINE=.
<i>End Underline</i>	
End Underline	END_HIGHLIGHT_UNDERLINE=
	When the data is defined in the End Underline of the PFT, the data is appended to the string END_HIGHLIGHT_UNDERLINE=.
<i>Begin Quality Print</i>	
Begin Quality Print	None.
	This field is ignored.
<i>End Quality Print</i>	
End Quality Print	None.
	This field is ignored.
Paper-Handling	
<i>Bottom Tray Feed</i>	
Bottom Tray Feed	SELECT_DRAWER2=
	<p>If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control of the portrait orientation. For this, the PFT Migration Utility divides this control sequence into two parts and migrates the control sequence for the drawer select and paper feed. The control sequence of the portrait orientation is migrated to SET_PORTRAIT_ORIENT=.</p> <p>If no data is defined in any fields for the landscape paper handling, the PFT Migration Utility migrates this control sequence to the SELECT_DRAWER2=. (See “Definition of Paper-Handling Migration” on page 285 .)</p>
<i>Top Tray Feed</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Top Tray Feed	SELECT_DRAWER1=
	<p>If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control of the portrait orientation. For this, the PFT Migration Utility divides the control sequence into two parts and migrates it for the drawer select and paper feed. The control sequence of the portrait orientation is migrated to SET_PORTRAIT_ORIENT=.</p> <p>If no data is defined in any fields for landscape paper handling, the PFT Migration Utility migrates this control sequence to SELECT_DRAWER1=. (See “Definition of Paper-Handling Migration” on page 285 .)</p>
<i>Envelope Feed</i>	
Envelope Feed	SELECT_ENVELOPE=
	<p>If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control of the portrait orientation. For this, the PFT Migration Utility divides the control sequence into two parts and migrates it for the drawer select and paper feed. The control sequence of the portrait orientation is migrated to SET_PORTRAIT_ORIENT=.</p> <p>If no data is defined in any fields for landscape paper handling, the PFT Migration Utility migrates this control sequence to SELECT_ENVELOPE=. (See “Definition of Paper-Handling Migration” on page 285 .)</p>
<i>Manual Feed</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Manual Feed	SELECT_DRAWER3=
	<p>If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control of the portrait orientation. For this, the PFT Migration Utility divides the control sequence into two parts and migrates it for the drawer select and paper feed. The control sequence of the portrait orientation is migrated to SET_PORTRAIT_ORIENT=.</p> <p>If no data is defined in any fields for landscape paper handling, the PFT Migration Utility migrates this control sequence to SELECT_DRAWER3=. (See “Definition of Paper-Handling Migration” on page 285 .)</p>
<i>Continuous Feed</i>	
Continuous Feed	None.
	This field is ignored.
<i>Ignore Paper End Sensor</i>	
Ignore Paper End Sensor	None.
	This field is ignored.
<i>Enable Paper End Sensor</i>	
Enable Paper End Sensor	None.
	This field is ignored.
<i>Eject Automatic Cut Sheet</i>	
Eject Automatic Cut Sheet	None.
	This field is ignored.
<i>Eject Manual Cut Sheet</i>	
Eject Manual Cut Sheet	None.
	This field is ignored.
<i>Collate</i>	
Collate	None.
	This field is ignored.
Paper Positioning	
<i>Continuous Forms</i>	
Distance from Top Paper Edge	None.
	This field is ignored.
Distance from Left Paper Edge	None.
	This field is ignored.
Location of First Print Column	None.
	This field is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
<i>Manual Feed</i>	
Distance from Top Paper Edge	None.
	This field is ignored.
Distance from Left Paper Edge	None.
	This field is ignored.
Location of First Print Column	None.
	This field is ignored.
<i>Automatic Feed</i>	
Distance from Top Paper Edge	None.
	This field is ignored.
Distance from Left Paper Edge	None.
	This field is ignored.
Location of First Print Column	None.
	This field is ignored.
Set Page Length (Inches)	
Control Sequence	PAGE_LENGTH_TYPE?=INCH SET_PAGE_LENGTH=
	When the data is defined in the control sequence for SET PAGE LENGTH (INCHES) and any data is not defined in the control sequence for SET PAGE LENGTH (LINES), this field is migrated.
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.
X/Y	None.
	This field is ignored.
Top Margin Size	None.
	This field is ignored.
Bottom Margin Size	None.
	This field is ignored.
Set Page Length (Lines)	
Control Sequence	PAGE_LENGTH_TYPE?=LINE SET_PAGE_LENGTH=
	When the data is defined in the control sequence for the SET PAGE LENGTH (LINES), this field is migrated.
Maximum	None.
	This field is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PFT Field Name
	Description
Offset	None.
	This field is ignored.
X/Y	None.
	This field is ignored.
Top Margin Size	None.
	This field is ignored.
Bottom Margin Size	None.
	This field is ignored.
Set Left Margin (Inches)	
Control Sequence	None.
	This field is ignored.
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.
X/Y	None.
	This field is ignored.
Set Left Margin (Columns)	
Control Sequence	SET_HORIZONTAL_MARGIN=
	When the data is defined in the control sequence field for the SET LEFT MARGIN (COLUMNS), this field is migrated.
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.
Carrier Return/Line Feed	
<i>Continuous Forms</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Carrier Return (Continuous Forms)	<p>CARRIAGE_RETURN=</p> <p>This field is migrated for the following cases:</p> <ul style="list-style-type: none"> • Case 1 • When the data is defined in the Carrier Return field for the Continuous Forms and • Any data is not defined in the Carrier Return field for the Manual Feed and Automatic Feed • Case 2 • When the data is defined in the Carrier Return field for the Continuous Forms and • The same data is defined in the Carrier Return field for the Manual Feed and • Any data is not defined in the Carrier Return field for the Automatic Feed • Case 3 • When the data is defined in the Carrier Return field for the Continuous Forms and • The same data is defined in the Carrier Return field for the Automatic Feed and • Any data is not defined in the Carrier Return field for the Manual Feed • Case 4 • When the data is defined in the Carrier Return field for the Continuous Forms and • The same data is defined in the Carrier Return field for the Automatic Feed and Manual Feed

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Line Feed (Continuous Forms)	LINE_FEED=
	<p>This field is migrated for the following cases:</p> <ul style="list-style-type: none"> • Case 1 • When the data is defined in the Line Feed field for the Continuous Forms and • Any data is not defined in the Line Feed Line field for the Manual Feed and Automatic Feed • Case 2 • When the data is defined in the Line Feed field for the Continuous Forms and • The same data is defined in the Line Feed field for the Manual Feed and • Any data is not defined in the Line Feed field for the Automatic Feed • Case 3 • When the data is defined in the Line Feed field for the Continuous Forms and • The same data is defined in the Line Feed field for the Automatic Feed and • Any data is not defined in the Line Feed field for the Manual Feed • Case 4 • When the data is defined in the Line Feed field for the Continuous Forms and • The same data is defined in the Line Feed field for the Automatic Feed and Manual Feed
<i>Manual Feed</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Carrier Return (Manual Feed)	<p>CARRIAGE_RETURN=</p> <p>This field is migrated for the following cases:</p> <ul style="list-style-type: none"> • Case 1 • When the data is defined in the Carrier Return field for the Manual Feed and • Any data is not defined in the Carrier Return field for the Continuous Feed and Automatic Feed • Case 2 • When the data is defined in the Carrier Return field for the Manual Feed and • The same data is defined in the Carrier Return field for the Continuous Forms and • Any data is not defined in the Carrier Return field for the Automatic Feed • Case 3 • When the data is defined in the Carrier Return field for the Manual Feed and • The same data is defined in the Carrier Return field for the Automatic Feed and • Any data is not defined in the Carrier Return field for the Continuous Form • Case 4 • When the data is defined in the Carrier Return field for the Manual Feed and • The same data is defined in the Carrier Return field for the Automatic Feed and Continuous Form

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Line Feed (Manual Feed)	LINE_FEED=
	<p>This field is migrated for the following cases:</p> <ul style="list-style-type: none"> • Case 1 • When the data is defined in the Line Feed field for the Manual Feed and • Any data is not defined in the Line Feed Line field for the Continuous Forms and Automatic Feed • Case 2 • When the data is defined in the Line Feed field for the Manual Feed and • The same data is defined in the Line Feed field for the Continuous Forms and • Any data is not defined in the Line Feed field for the Automatic Feed • Case 3 • When the data is defined in the Line Feed field for the Manual Feed and • The same data is defined in the Line Feed field for the Automatic Feed and • Any data is not defined in the Line Feed field for the Continuous Form • Case 4 • When the data is defined in the Line Feed field for the Manual Feed and • The same data is defined in the Line Feed field for the Automatic Feed and Continuous Form
<i>Automatic Feed</i>	
	CARRIAGE_RETURN=

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
	<p>This field is migrated for the following cases:</p> <ul style="list-style-type: none"> • Case 1 • When the data is defined in the Carrier Return field for the Automatic Feed and • Any data is not defined in the Carrier Return field for the Continuous Feed and Manual Feed • Case 2 • When the data is defined in the Carrier Return field for the Automatic Feed and • The same data is defined in the Carrier Return field for the Continuous Forms and • Any data is not defined in the Carrier Return field for the Manual Feed • Case 3 • When the data is defined in the Carrier Return field for the Automatic Feed and • The same data is defined in the Carrier Return field for the Manual Feed and • Any data is not defined in the Carrier Return field for the Continuous Form • Case 4 • When the data is defined in the Carrier Return field for the Automatic Feed and • The same data is defined in the Carrier Return field for the Manual Feed and Continuous Form

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Line Feed (Automatic Feed)	LINE_FEED=
	<p>This field is migrated for the following cases:</p> <ul style="list-style-type: none"> • Case 1 • When the data is defined in the Line Feed field for the Automatic Feed and • Any data is not defined in the Line Feed Line field for the Continuous Forms and Manual Feed • Case 2 • When the data is defined in the Line Feed field for the Automatic Feed and • The same data is defined in the Line Feed field for the Continuous Forms and • Any data is not defined in the Line Feed field for the Manual Feed • Case 3 • When the data is defined in the Line Feed field for the Automatic Feed and • The same data is defined in the Line Feed field for the Manual Feed and • Any data is not defined in the Line Feed field for the Continuous Form • Case 4 • When the data is defined in the Line Feed field for the Automatic Feed and • The same data is defined in the Line Feed field for the Manual Feed and Continuous Form
Multiple Copies	
<i>Print without Clearing Page from:</i>	
Top Tray	None.
	This field is ignored.
Bottom Tray	None.
	This field is ignored.
Envelope Tray	None.
	This field is ignored.
Manual Tray	None.
	This field is ignored.
Clear Page Buffer	None.
	This field is ignored.
<i>Multiple Copies Variable Control</i>	
Control Sequence .	None.
	This field is ignored

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Maximum	None.
	This field is ignored.
Offset	None.
	This field is ignored.
Landscape Paper Handling	
<i>Bottom Tray Feed</i>	
Bottom Tray Feed	SET_LANDSCAPELEFT_ORIENT=
	If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control sequence for the landscape orientation. For this, the PFT Migration Utility divides the control sequence into two parts. The control sequence for the drawer select and paper feed is ignored, because this control sequence is migrated when the data for paper-handling is processed. The control sequence for the landscape orientation is migrated to SET_LANDSCAPE_ORIENT=. (See “Definition of Paper-Handling Migration” on page 285 .)
<i>Top Tray Feed</i>	
Top Tray Feed	SET_LANDSCAPELEFT_ORIENT=
	If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control sequence for the landscape orientation. For this, the PFT Migration Utility divides the control sequence into two parts. The control sequence for the drawer select and paper feed is ignored, because this control sequence is migrated when the data for paper-handling is processed. The control sequence for the landscape orientation is migrated to SET_LANDSCAPE_ORIENT=. (See “Definition of Paper-Handling Migration” on page 285 .)
<i>Envelope Feed</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Envelope Feed	SET_LANDSCAPELEFT_ORIENT=
	If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control sequence for the landscape orientation. For this, the PFT Migration Utility divides the control sequence into two parts. The control sequence for the drawer select and paper feed is ignored, because this control sequence is migrated when the data for paper-handling is processed. The control sequence for the landscape orientation is migrated to SET_LANDSCAPE_ORIENT=. (See "Definition of Paper-Handling Migration" on page 285 .)
<i>Manual Feed</i>	
Manual Feed	SET_LANDSCAPELEFT_ORIENT=
	If the data is defined in some fields for landscape paper handling, the PFT Migration Utility assumes that this control sequence includes the control sequence for the landscape orientation. For this, the PFT Migration Utility divides the control sequence into two parts. The control sequence for the drawer select and paper feed is ignored, because this control sequence is migrated when the data for paper-handling is processed. The control sequence for the landscape orientation is migrated to SET_LANDSCAPE_ORIENT=. (See "Definition of Paper-Handling Migration" on page 285 .)
Type Style Definition	
<i>Default Type Style Definition</i>	
PC Character Set	None.
	This field is ignored.
Initial Control Sequence	None.
	This field is ignored.
Ending Control Sequence	None.
	This field is ignored.
<i>Individual Type Style Definition</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Type Style Number	SET_GFID_ This number is appended as a four-digit number after the string SET_GFID_. For example, when the type style number 9 is defined, 0009 is appended after the string SET_GFID_ and SET_GFID_0009= is migrated. And the numbers that are supported by PC400 are migrated. The numbers that are not supported by PC400 are not ignored.
PC Character Set	None.
	This field is ignored.
Initial Control Sequence	SET_GFID_xxxx=
	This control sequence is appended after the string SET_GFID_xxxx=, xxxx is the four-digit number that is defined in the type style number field.
Ending Control Sequence	SET_GFID_xxxx=
	This control sequence is appended before Initial Control Sequence of all migrated SET_GFID_xxxx= fields as follows: SET_GFID_0011=1B 57 00,
Characters	None.
	This field is ignored.
Initial Control Sequence	None.
	This field is ignored.
Ending Control Sequence	None.
	This field is ignored.
Symbols	None.
	This field is ignored.
Initial Control Sequence	None.
	This field is ignored.
Ending Control Sequence	None.
	This field is ignored.
<i>Group Type Style Definition</i>	
Group Identifier	None.
	This field is ignored.
Group Identifier Comment	None.
	This field is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Type Style Number	SET_GFID_ This number is appended as a four-digit number after the string SET_GFID_. For example, when the type style numbers 1, 2, 3, and 4 are defined, 0001 , 0002 , 0003 , and 0004 are appended after the string SET_GFID_ and SET_GFID_0001=, SET_GFID_0002, SET_GFID_0003, and SET_GFID_0004= are migrated, because the PC400 does not have the group type style definition. The type style numbers that are not supported by PC400 are not migrated.
PC Character Set	None.
	This field is ignored.
Initial Control Sequence	SET_GFID_xxxx=
	This control sequence is appended after the string SET_GFID_xxxx=. xxxx is the four-digit number that is defined in the type style number field.
Ending Control Sequence	SET_GFID_xxxx=
	This control sequence is appended before Initial Control Sequence of all migrated SET_GFID_xxxx= fields as follows: SET_GFID_0011=1B 57 00,
Characters	None.
	This field is ignored.
Initial Control Sequence	None.
	This field is ignored.
Ending Control Sequence	None.
	This field is ignored.
Symbols	None.
	This field is ignored.
Initial Control Sequence	None.
	This field is ignored.
Ending Control Sequence	None.
	This field is ignored.
<i>Character Set Number</i>	
Character Set Number	None.
	This field is ignored.
Slot Selection	
<i>Slot 1 Sequence</i>	
Slot 1 Sequence	None.
	This field is ignored.
<i>Slot 2 Sequence</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Slot 2 Sequence	None.
	This field is ignored.
<i>Slot 3 Sequence</i>	
Slot 3 Sequence	None.
	This field is ignored.
<i>Stop Sequence</i>	
Stop Sequence	None.
	This field is ignored.
User-Defined Control	
<i>Parameters of the SET ENVELOPE SIZE Command</i>	
Control Number: 984	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
<i>ESC Sequence of the SET ENVELOPE SIZE Command</i>	
Control Number: 985	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
<i>Parameters of the SET PAGE SIZE Command</i>	
Control Number: 986	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
<i>ESC Sequence of the SET PAGE SIZE Command</i>	
Control Number: 987	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
<i>Printer Data Stream</i>	

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Control Number: 988	None.
	This field is ignored.
Control Sequence	SET_FONT_GLOBAL=1B 5B 49 word-value(LH) word-value(HL) word-value(HL) byte-value word-value(HL)
	When 04 is defined in this field, SET_FONT_GLOBAL=1B 5B 49 ... word-value(HL) is migrated. When the other value is defined, this field is ignored. 04 means IBM Personal Printer Data Stream Level 2 or higher. When the migration is done for paper-handling, use this information. (See "Definition of Paper-Handling Migration" on page 285 .)
Control Sequence Filename	None.
	This field is ignored.
<i>Duplex Long Edge</i>	
Control Number: 989	None.
	This field is ignored.
Control Sequence	SET_DUPLEX=
	When the data is defined in the control sequence for the duplex long edge, the data is appended to the string SET_DUPLEX=.
Control Sequence Filename	None.
	This field is ignored.
<i>Duplex Short Edge</i>	
Control Number: 990	None.
	This field is ignored.
Control Sequence	SET_DUPLEX_TUMBLE=
	When the data is defined in the control sequence for the duplex short edge, the data is appended to the string SET_DUPLEX_TUMBLE=.
Control Sequence Filename	None.
	This field is ignored.
<i>Simplex</i>	
Control Number: 991	None.
	This field is ignored.
Control Sequence	RESET_DUPLEX=
	When the data is defined in the control sequence for the simplex, the data is appended to the string RESET_DUPLEX=.
Control Sequence Filename	None.
	This field is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
<i>Jog the Output Tray</i>	
Control Number: 992	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
<i>Normal Portrait Orientation</i>	
Control Number: 993	None.
	This field is ignored.
Control Sequence	SET_PORTRAIT_ORIENT=
	When the data is defined in the control field for the normal portrait orientation, the data is appended to the string SET_PORTRAIT_ORIENT=.
Control Sequence Filename	None.
	This field is ignored.
<i>Landscape Left</i>	
Control Number: 994	None.
	This field is ignored.
Control Sequence	SET_LANDSCAPELEFT_ORIENT=
	When the data is defined in the control field for the landscape left, the data is appended to the string SET_LANDSCAPELEFT_ORIENT=.
Control Sequence Filename	None.
	This field is ignored.
<i>Portrait Upside-Down Orientation</i>	
Control Number: 995	None.
	This field is ignored.
Control Sequence	SET_PORTRAITUPDOWN_ORIENT=
	When the data is defined in the control field for the portrait upside-down orientation, the data is appended to the string SET_PORTRAITUPDOWN_ORIENT=.
Control Sequence Filename	None.
	This field is ignored.
<i>Landscape-Right</i>	
Control Number: 996	None.
	This field is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PDF Field Name
	Description
Control Sequence	SET_LANDSCAPERGHT_ORIENT=
	When the data is defined in the control field for the landscape right, the data is appended to the string SET_LANDSCAPERGHT_ORIENT=.
Control Sequence Filename	None.
	This field is ignored.
<i>COR in 10 Pitch</i>	
Control Number: 997	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
<i>COR in 12 Pitch</i>	
Control Number: 998	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
<i>COR in 15 Pitch</i>	
Control Number: 999	None.
	This field is ignored.
Control Sequence	None.
	This field is ignored.
Control Sequence Filename	None.
	This field is ignored.
Function Selection Test Responses	
Superscript /Subscript	None.
	This data is ignored.
Underline	None.
	This data is ignored.
Emphasis (Bold)	None.
	This data is ignored.
Form Feed	None.
	This data is ignored.

Table 15. Migration from the PFT to the PDF (continued)

PFT Field Name	PFT Field Name
	Description
Back Space	BACKSPACE=
	This field is migrated when you type YES or NO in response to the prompt during the Backspace Function Selection Test.
Midline Pitch Change	None.
	This data is ignored.
Horizontal Character Spacing	None.
	This data is ignored.
First Character Position	None.
	This data is ignored.
PSM	None.
	This data is ignored.
Cursor Draw	None.
	This data is ignored.

Note: When you migrate **IBM3812.PFT** and **IBM3812.MNL**, the following fields are added to **IBM3812.PDF**:

- FORWARD_VERTICAL_STEP_FEED=1B 5B 43 03 00 E3 word-value(LH)
- VERTICAL_PEL=240

Definition of Paper-Handling Migration: The PFT Migration Utility migrates the data for paper-handling and landscape paper handling as follows:

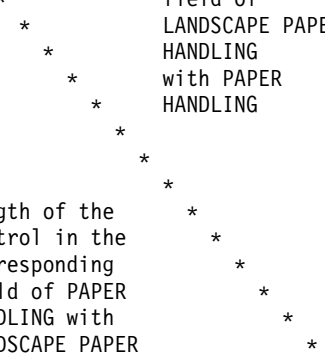
1. The PFT Migration Utility checks whether the landscape paper handling controls are defined.
2. If the landscape paper handling controls are defined, the PFT Migration Utility assumes that the paper-handling control sequences set the page orientation to portrait. The controls in each landscape paper handling control sequence set the tray select, the feed controls, and the page orientation to landscape.
3. If the landscape paper handling controls are not defined, the paper-handling controls do not set the page orientation to portrait. If a personal printer supports normal portrait, landscape-left, portrait-upside-down, and landscape-right orientation, the page-orientation controls are defined in the appropriate user-defined controls.

If the landscape paper handling controls are not defined: When the paper-handling controls are defined, the controls are migrated as follows:

PFT Fields		PDF Fields	
Bottom	Tray Select & Feed	-->	SELECT_DRAWER2=
Top	Tray Select & Feed	-->	SELECT_DRAWER1=
Envelope	Tray Select & Feed	-->	SELECT_ENVELOPE=
Manual	Select & Feed	-->	SELECT_DRAWER3=

If the landscape paper handling controls are defined: When the paper-handling controls are defined, they set the page orientation to portrait. The landscape paper handling controls set the page orientation to landscape.

The PFT Migration Utility migrates the controls as follows:

	$(Length1) == 0$	$(Length1) > 0$
$(Length2) == 0$	CASE 1	CASE 2
$(Length2) > 0$	CASE 3	$Length1 \neq Length2$ CASE 4 <hr/> $Length1 == Length2$ CASE 5

Note

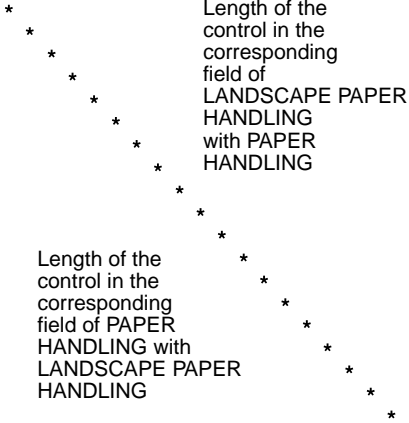
"==" means "equals to."

"!=" means "does not equal to."

Case 1 Since both of the fields are not defined, no data is migrated.

When the PAPER HANDLING controls are defined, these controls have the controls to set the page orientation to portrait. The LANDSCAPE PAPER HANDLING controls have the controls to set the page orientation to landscape.

The PFT Migration Utility migrates the controls as follows:

	(Length1) ==0	(Length1) > 0
(Length2) ==0	CASE 1	CASE 2
(Length2) > 0	CASE 3	<div>Length1 != Length2</div> <div>CASE 4</div> <hr/> <div>Length1 == Length2</div> <div>CASE 5</div>

- **CASE 1**

Since both of the fields are not defined, no data is migrated.

Example: No data is migrated to SELECT_DRAWER2= under the following conditions. For this, SELECT_DRAWER2= is not written in the output file.

- No data is defined in the bottom tray select and feed for PAPER HANDLING.
- No data is defined in the bottom tray select and feed for LANDSCAPE PAPER HANDLING.

- **CASE 2**

Since no data is defined in the field for PAPER HANDLING, the PFT Migration Utility cannot compare the data in the corresponding field with the data for LANDSCAPE PAPER HANDLING. The data for LANDSCAPE PAPER HANDLING is migrated to the drawer selection field of PDF regardless, including control of the landscape orientation.

Example: The control of the top tray select and feed for LANDSCAPE PAPER HANDLING is migrated to SELECT_DRAWER1= under the following conditions.

- No data is defined in the top tray select and feed for PAPER HANDLING.
- The control is defined in the top tray select and feed for LANDSCAPE PAPER HANDLING.

- **CASE 3**

Since no data is defined in the field for LANDSCAPE PAPER HANDLING, the PFT Migration Utility cannot compare the data in the corresponding field with

the data for PAPER HANDLING. The data for PAPER HANDLING is migrated to the drawer selection field of PDF regardless, including the control of the portrait orientation.

Example: The control of the manual select and feed for PAPER HANDLING is migrated to SELECT_DRAWER3= under the following conditions.

- The control is defined in the manual select and feed for PAPER HANDLING.
- No data is defined in the top tray select and feed for LANDSCAPE PAPER HANDLING.

- **CASE 4**

Since the length is different, no data is migrated.

Example: No data is migrated to SELECT_DRAWER2= under the following conditions. For this, SELECT_DRAWER2= is not written in the output file.

- The data is defined in the bottom tray select and feed for PAPER HANDLING and the length is 8.
- The data is defined in the bottom tray select and feed for LANDSCAPE PAPER HANDLING and the length is 10.

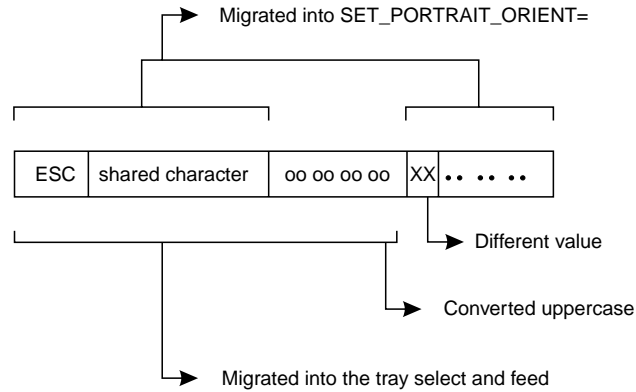
- **CASE 5**

The PFT Migration Utility compares the data for PAPER HANDLING with the data for LANDSCAPE PAPER HANDLING as follows:

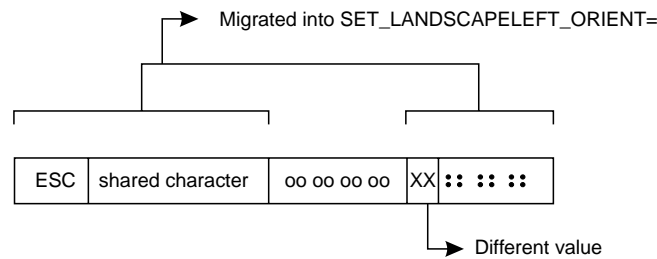
- If a different value is found in the data, search the control backward for the escape character X'1B'.
- If the escape character is found in the middle of the control, divide the control into two parts. The PFT Migration Utility assumes that the first part is the control for the tray select and feed, and the second part is the control for the page orientation. The PFT Migration Utility migrates the first part of the PAPER HANDLING control into the tray select and feed, the second part of the PAPER HANDLING control into the SET_PORTRAIT_ORIENT=, and the second part of the LANDSCAPE PAPER HANDLING control into SET_LANDSCAPELEFT_ORIENT=.
- If the escape character is found at the top of the control and 03 (= HP PCL) is defined in the user-defined control 988, the PFT Migration Utility assumes that the controls are combined. For this, the control begins with the escape character and the two shared characters. For this, the PFT Migration Utility assumes that the last character of the first part is a lowercase letter and converts it to an uppercase letter to indicate that it is a terminating character.

The PFT Migration Utility divides the controls into the two parts as follows:

< Control for the PAPER HANDLING >



< Control for LANDSCAPE PAPER HANDLING >



- If the escape character is found, but the data stream is not HP PCL, the PFT Migration Utility displays the error message to indicate that the PFT Migration Utility cannot migrate the data.
- If the escape character is not found, the PFT Migration Utility displays the error message to indicate that the PFT Migration Utility cannot migrate the data.
- If a different value is not found, the same control is defined for PAPER HANDLING and LANDSCAPE PAPER HANDLING.

The PFT Migration Utility migrates the data in the following order:

1. Top Tray Select and Feed
2. Bottom Tray Select and Feed
3. Manual Select and Feed
4. Envelope Tray Select and Feed

The migration stops for the page orientation, SET_PORTRAIT_ORIENT= and SET_LANDSCAPELEFT_ORIENT=, when the controls for the page orientation are found. For example, the controls for the page orientation are found when the data is migrated for the Bottom Tray Select and Feed. The PFT Migration Utility does not care about the page orientation when migrating the data Manual Select and Feed, and Envelope Tray Select and Feed.

Sample of the Character Definitions: If you want to change the character definitions in the distributed PDF and PDT by Personal Communications:

1. Copy the PDF for backup.
2. Change the character definitions in the PDF.
3. Convert the new PDF to a PDT file.

4. Test your printer by using the new PDT file.

Following is a sample of the character definitions. Refer to “Customizing the PDT” on page 195 for more information about the PDF and PDT file.

```

/*****
/* This is the sample of the Roman 8 character set for the Hewlett    */
/* Packard printers.                                                */
/*****
/*****
/*                               Character Definitions                */
/*****
SPACE = 20
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 = 0
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 = 40
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
 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 = 7C
 RIGHT_BRACE = 7D
 TILDE_ACCENT = 7E
 A_GRAVE_CAPITAL = A1
 A_CIRCUMFLEX_CAPITAL = A2
 E_GRAVE_CAPITAL = A3
 E_CIRCUMFLEX_CAPITAL = A4
 E_DIAERESIS_CAPITAL = A5
 I_CIRCUMFLEX_CAPITAL = A6
 I_DIAERESIS_CAPITAL = A7
 ACUTE_ACCENT = A8
 GRAVE_ACCENT = A9
 DIAERESIS = AB
 U_GRAVE_CAPITAL = AD
 U_CIRCUMFLEX_CAPITAL = AE
 OVERLINE = B0
 Y_ACUTE_CAPITAL = B1
 Y_ACUTE_SMALL = B2
 DEGREE_SYMBOL = B3
 C_CEDILLA_CAPITAL = B4
 C_CEDILLA_SMALL = B5
 N_TILDE_CAPITAL = B6
 N_TILDE_SMALL = B7
 EXCLAMATION_POINT_INVERTED = B8
 QUESTION_MARK_INVERTED = B9
 INTERNATIONAL_CURRENCY_SYMBOL = BA
 POUND_SIGN = BB
 YEN_SIGN = BC
 SECTION_SYMBOL = BD
 FLORIN_SIGN = BE
 CENT_SIGN = BF

```

A_CIRCUMFLEX_SMALL = C0
E_CIRCUMFLEX_SMALL = C1
O_CIRCUMFLEX_SMALL = C2
U_CIRCUMFLEX_SMALL = C3
A_ACUTE_SMALL = C4
E_ACUTE_SMALL = C5
O_ACUTE_SMALL = C6
U_ACUTE_SMALL = C7
A_GRAVE_SMALL = C8
E_GRAVE_SMALL = C9
O_GRAVE_SMALL = CA
U_GRAVE_SMALL = CB
A_DIAERESIS_SMALL = CC
E_DIAERESIS_SMALL = CD
O_DIAERESIS_SMALL = CE
U_DIAERESIS_SMALL = CF
A_OVERCIRCLE_CAPITAL = D0
I_CIRCUMFLEX_SMALL = D1
O_SLASH_CAPITAL = D2
AE_DIPTHONG_CAPITAL = D3
A_OVERCIRCLE_SMALL = D4
I_ACUTE_SMALL = D5
O_SLASH_SMALL = D6
AE_DIPTHONG_SMALL = D7
A_DIAERESIS_CAPITAL = D8
I_GRAVE_SMALL = D9
O_DIAERESIS_CAPITAL = DA
U_DIAERESIS_CAPITAL = DB
E_ACUTE_CAPITAL = DC
I_DIAERESIS_SMALL = DD
SHARP_S_SMALL = DE
O_CIRCUMFLEX_CAPITAL = DF
A_ACUTE_CAPITAL = E0
A_TILDE_CAPITAL = E1
A_TILDE_SMALL = E2
ETH_ICELANDIC_CAPITAL = E3
ETH_ICELANDIC_SMALL = E4
I_ACUTE_CAPITAL = E5
I_GRAVE_CAPITAL = E6
O_ACUTE_CAPITAL = E7
O_GRAVE_CAPITAL = E8
O_TILDE_CAPITAL = E9
O_TILDE_SMALL = EA
U_ACUTE_CAPITAL = ED
Y_DIAERESIS_SMALL = EF
THORN_ICELANDIC_CAPITAL = F0
THORN_ICELANDIC_SMALL = F1
MIDDLE_DOT_ACCENT = F2
MICRO_SYMBOL = F3
PARAGRAPH_SYMBOL = F4
THREE_QUARTERS = F5
ONE_QUARTER = F7
ONE_HALF = F8
ORDINAL_INDICATOR_FEMININE = F9
ORDINAL_INDICATOR_MASCULINE = FA
LEFT_ANGLE_QUOTES = FB
RIGHT_ANGLE_QUOTES = FD
PLUS_OR_MINUS_SIGN = FE

/*****
/*                               */
/*                               */
/*****

```

Chapter 16. Field Attribute Codes

The following table explains the field attribute codes used in PC400.

Table 16. Meanings of Field Attribute Codes

Hex Code	Meaning
20	Green
21	Green, reversed image
22	White
23	White, reversed image
24	Green, underlined
25	Green, underlined, reversed image
26	White, underlined
27	Nondisplay
28	Red
29	Red, reversed image
2A	Red
2B	Red, reversed image
2C	Red, underlined
2D	Red, underlined, reversed image
2E	Red, underlined
2F	Nondisplay
30	Sky blue with column delimiter
31	Sky blue, column delimiter, reversed image
32	Yellow with column delimiter
33	Yellow, column delimiter, reversed image
34	Sky blue, underlined, with column delimiter
35	Sky blue, underlined, reversed image, with column delimiter
36	Yellow, underlined, with column delimiter
37	Nondisplay with column delimiter
38	Purple
39	Purple, reversed image
3A	Blue
3B	Blue, reversed image
3C	Purple, underlined
3D	Purple, underlined, reversed image
3E	Blue, underlined
3F	Nondisplay with column delimiter

Chapter 17. Data Transfer for PC400

This chapter explains file-description files and data conversions for the data transfer function.

Data Transfer Function Overview

The PC400 data transfer function transfers data to or from the AS/400 system and a workstation.

PC400 can transfer data between the host and workstation. The data transfer function can be used by selecting the **Data Transfer** icon.

Transferring data, described in this chapter, is quite different from transferring files, which is described in “Chapter 18. File Transfer for PC400” on page 369. The main differences are listed below:

Type of Transfer	Products required on an AS/400 system	Access Method	Sending and receiving unit	Type of connection to an AS/400 system
File Transfer	Personal Communications Tools (APVAFILE)	Transfer menu in session window	Entire file	Display session
Data Transfer	PC Support/400 V2R2 or V2R3 or OS/400 V3R1 or later(1)	Data Transfer icon	Field, record, or file in a database	Router session

Note 1: OS/400 provides the host transaction program for Data Transfer.

Transferring Files from an AS/400 System to a Workstation

When using a workstation, you can retrieve and use data from the following file types on an AS/400 system:

- Physical database
- Logical database
- Distributed data management (DDM)

When retrieving files, you can:

- Control which records (and which fields within a record) are retrieved.
- Control the ordering of records and the ordering of fields within the record.
- Select a subset of the records.
- Group records into summary records.
- Join two or more files.
- Specify formats and separators of date and time fields.
- Specify the decimal separator character.

The following output destinations can be specified:

- Display

- Disk
- Printer

Transferring Files from a Workstation to an AS/400 System

The PC-to-AS/400 transfer function enables the transfer of data from a workstation to an AS/400 physical file. Data can be transferred to any of the following destinations:

- Existing members in an existing AS/400 physical file
- New members in an existing AS/400 physical file
- New members in a new AS/400 physical file

Note: Data cannot be transferred from a workstation file to an AS/400 logical file.

Note the following considerations when transferring data. PC400 Data Transfer

Transferring Data to Existing Members in an Existing File

Note the following considerations when transferring data from a workstation to an existing AS/400 member.

- When data is transferred to an existing member, data in that member is replaced with that transferred from a workstation.
- When AS/400 members already contain data, a message appears, indicating that the data in the existing members will be replaced with the data that is about to be transferred.
- Consider the effect of returning data that was previously transferred from the AS/400 system (such as when an AS/400 master file is updated on a workstation).

For example, you can transfer only the field subset of an AS/400 file by issuing a transfer request from the AS/400 system to a workstation. In this case, when returning data from the workstation to the AS/400 system, only the subset included in that AS/400 file can be transferred. Other fields that had been defined in the AS/400 file but not transferred are filled with blanks if they are character fields or, if they are numeric fields, with zeros or the values specified at file creation.

Therefore, the data must be transferred to another AS/400 file and the transferred data must be embedded in the AS/400 file by running the AS/400 application program. Follow this procedure to control the update processing for an AS/400 master file.

To prevent users from transferring data to a certain AS/400 file, check that the authority level for that file is defined correctly.

Transferring Data to New Members in an Existing File

You can transfer the data in a workstation file to new members in an existing AS/400 file. The transfer function automatically creates these members in the specified file in the specified library. New members are created according to the file description in the existing file.

Be particularly careful when only the field subset of the AS/400 file can be transferred from the AS/400 system to a workstation by the previous transfer request. When data is returned to the AS/400 system, new members can receive only the subset defined in that AS/400 file. Other character fields that are defined, but not transferred are filled with blanks. Numeric fields are filled with zeros or the valued specified at file creation. The date, time, and time-stamp fields use AS/400 default values.

Transferring Data to New Members in a New File

By using a transfer request from a workstation to the AS/400 system, you can transfer data to new members in a new AS/400 file. This is one of the safest transfer methods, because data already stored in the AS/400 file is not replaced with that transferred from the workstation.

There are two ways of transferring data to new members in a new AS/400 file. The method used depends on the data to be transferred.

- For data that is broken up into fields, correct conversion is achieved by transferring it in units of fields. Specify use of the workstation file-description file at file transfer. In addition, specify data as the type of the AS/400 file.

When an AS/400 file and its members are created, the transfer function must access the description of the format of each field to be transferred in the AS/400 file. You can get this description, called a field-reference file, from the AS/400 file. To create an AS/400 file and its members, specify the name of this AS/400 field reference file, as well as the parameters for the other files and members. Note that only the fields to be transferred are defined in a new file.

- For data consisting only of text or source statement records, it is not necessary to break up the records into fields. In addition, the workstation file-description file is not required to transfer data. In other words, an AS/400 physical source file is created.

Transferring Data to an AS/400 Data File and Source File

You can transfer data to the following two types of AS/400 physical files:

Physical data file

The members of a physical data file can contain numeric and character data of any AS/400 data type. To transfer data to a physical data file, use the workstation file-description file to define how data is stored in a workstation data file. Besides this definition, the file description of the AS/400 file is required to ensure correct conversion of the data.

When data is transferred to an existing AS/400 file, the file description becomes part of the AS/400 file. When data is transferred to a new AS/400 file, the file description is included in the AS/400 field-reference file.

Physical source file

Normally, a physical source file stores no data. It contains only text or source statements, as follows:

- The first part (field) of a source file always contains numbers indicating the order.
- The second part (field) of a source file always contains the date on which the file was created.
- The third part (field) of a source file contains the text of the file. This part can contain data fields of character type or zoned type only. Physical source files provide the optimum means of transferring text or source statements with a workstation.

Note the following considerations when transferring data to and from an AS/400 physical source file:

- To transfer text from the AS/400 system to a workstation, specify the name of the source file and members in **FROM**. Specify an asterisk (*) in **SELECT**. This informs the AS/400 system that only text is transferred from the source file, with the order number and date fields excluded.

- The AS/400 text must be stored in the workstation code text file. Normally, a workstation text editing program can be used to manipulate this workstation code text file.
- Specify that the file-description file is not to be stored for that workstation file. Because text is assumed to be a record consisting only of character data, it is not necessary to define fields.
- To return text from a workstation file to an AS/400 file, specify the type of the workstation file containing the text. This is almost always workstation code text. Specification of the file-description file is not required.
- To create a new AS/400 file and its members, specify a valid record length. This record length must be equal to the maximum record length of the workstation file, plus 12 bytes. This is because the transfer function automatically creates the order number and date fields when the file is transferred to the AS/400 members. The order number and date fields together occupy 12 bytes.

Preparing for Data Transfer

The following topics describe the software products required to transfer data and the points you must understand before transferring data with PC400.

Required Software Products

To use Data Transfer, IBM PC Support/400 (5738-PC1) must be installed on the AS/400 system. IBM PC Support/400 is not required with OS/400 Version 3 or later.

Before using the data transfer function, run the router of PC400 or PC Support/400.

Transfer Function

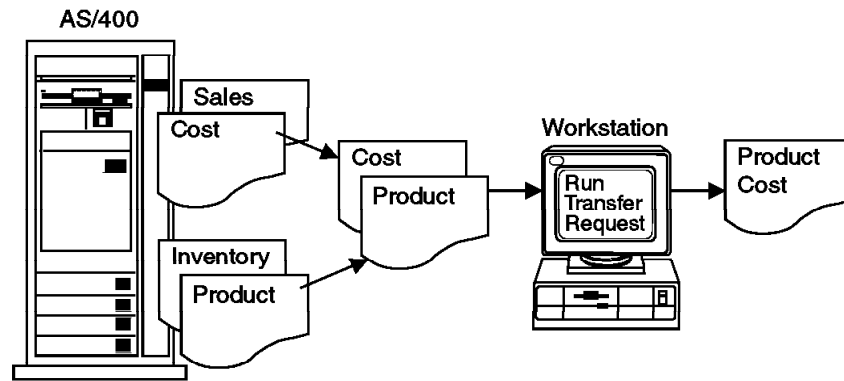
You can transfer only source programs, records, and the following information:

- Information organized for analysis
- Information used for decision making
- Information suited for computer processing

When using a spreadsheet, for example, you might want to use inventory data to create a cost analysis report. If there is no way to copy the data into the workstation, you must print the data from the AS/400 system and manually type it into a workstation file. With the transfer function, however, you can access the inventory database directly, select only the data needed for the report, process the data as required, then complete the report using that data.

Data can also be sent from the workstation to the host system for processing by AS/400 application. When a remote user is authorized to access the AS/400 system directly, he or she can access the created cost analysis report to compare with their results.

The following example outlines the joining of two files, transferring the information to the workstation, and creating a report.



To transfer data by using PC400, you must create a transfer request. A transfer request provides the necessary information about the data you want to transfer.

Before creating a transfer request, you must have the answers to the following questions:

- Where is the data located?
- How much of the data do you want to transfer?
- How should the data be sorted?
- Where do you want data to be transferred?

When transferring data from the AS/400 system to a workstation, PC400 allows you to specify which data is to be transferred and whether the data is to be displayed or written to a workstation file.

In addition, a transfer request can be saved to a workstation file, allowing you to easily perform the same transfer at a later date. After a transfer request is saved, you can call the request to make changes or to run it again.

Data Transfer Program

PC400 data transfer is classified into two types, depending on the direction of the transfer:

- Transferring data from the workstation to the AS/400 system is called data sending.
- Transferring data from the AS/400 system to the workstation is called data receiving.

Data transfer can also be classified according to how the program is started, as follows:

- Data is transferred by interactively entering information such as *what data is transferred from which file to which file* on the screen. In this case, the interactive screen for sending is called the PC>AS/400 Transfer window, and that for receiving is called the AS/400>PC Transfer window.
- Data is transferred according to the information that has already been registered. The interactive screen is not necessary. This is called the *automatic transfer* of data.

In both cases, data transfer is performed by **PCSFT5.EXE** on the workstation and by the *PC Support/400* transfer program on the AS/400 system.

The **Data Transfer** icon is registered in the PC400 folder by installing PC400. Double-clicking on this icon displays the AS/400>PC Transfer window (for receiving). This icon includes:

```
\PCOMOS2\PCSFT5.EXE -R
```

The PC>AS/400 Transfer window (for sending) appears when the registered contents are changed as follows:

```
\PCOMOS2\PCSFT5.EXE -S
```

The AS/400>PC Transfer and PC>AS/400 Transfer windows have a **Switch to SEND** button and **Switch to RECEIVE** button, respectively. By clicking either of these buttons, the window for sending can be switched to the window for receiving, and vice versa.

To perform *automatic transfer*, transfer information must be created, using the interactive screen window, and then saved. Data transfer can then be performed automatically by specifying the file name in which the data was saved.

For example, if transfer information is saved to file **TENSOU.TTO**, contained in directory **C:\PCOMOS2\PRIVATE**, run *automatic transfer* as follows:

```
C:\PCOMOS2\PCSFT5.EXE C:\PCOMOS2\PRIVATE\TENSOU.TTO
```

When you save the transfer information, register it as an icon in the PC400 folder. You can then transfer data automatically simply by double-clicking on this icon.

Data Concepts of the AS/400 System and Your Workstation

The basic components of data management are files, records, and fields. A *file* is an aggregate of records, referenced by a single name. Each record in a file contains one or more items of correlated information. Each item of information is called a *field*.

The AS/400 system and your workstation use different functions to store and group data, and to set the format.

Workstation Files

To transfer data from a workstation to the AS/400 system, the transfer function uses a special-format workstation file, called a *file-description file*. Using this file, data is stored in a valid format and converted into a valid type.

A file-description file identifies the format of a workstation data file and contains a description of the fields in the data file. The file-description file also contains a name list of all the fields in the data file. This list reflects the order, as well as the names, in which each field appears within the data file. In addition, this list includes a description of the data type, length, and decimal position of each field. Using this information, the transfer function can recognize not only how data has been modified but also where a certain field exists in a file record.

When data is transferred from the AS/400 system to a workstation, you can use the transfer function to automatically create the file-description file. In this case, the information in the file-description file depends on the file description in the AS/400 file.

You must create a file-description file with the same name as the workstation data file to transfer a workstation data file to the AS/400 system.

Distributed Data Management (DDM) Files

Distributed data management (DDM) is one of the functions supported by the AS/400 system. This function is used to access database files that are stored on remote AS/400 systems. To use the transfer function to access these database files, specify a DDM file name as the name of the AS/400 file to be transferred. Refer to the *DDM Guide* for details of how to use DDM files.

AS/400 Files

The following list provides a simple explanation of the requirements for transferring data between the AS/400 system and a workstation.

Library

The AS/400 library contains related objects that are used to generate significant groups. For example, the objects might be all the programs and files related to credit sales management. Using the library, you can group objects and find a desired file by name. The transfer function uses the library to locate an AS/400 file.

File AS/400 files that you can manipulate consist of a file description and data stored in the file. PC400 processes an AS/400 file, called a database file. The database file can be either a physical file or a logical file.

A *physical file* is a database file that contains data stored in records. It includes a description of the record format in addition to the data itself.

A *logical file* is a database file, which you can use to access data stored in one or more physical files. Logical files, like physical files, contain a file description. However, logical files do not contain any actual data. Instead, you can access fields in one or more physical files by using the record format included in the logical file description. When a logical file is transferred from the AS/400 system to a workstation, data is obtained from one or more physical files. You need only specify a logical file as the file to be transferred. The AS/400 system recognizes which physical file contains the actual data to be transferred.

Note: Data cannot be transferred from a workstation to logical files.

Member

Data records in a database file are grouped into several members. At least one member must be included in one file.

When data is transferred to and from the AS/400 system, actual data transfer is done between file members. For example, a certain workstation file can be transferred to the AS/400 system. In this case, the file members become new members of a new or existing AS/400 file, or substitute for existing members in an existing AS/400 file.

Record format

A record format describes the fields contained in a file record and the order in which these fields appear in the record. Record formats are stored in the file description. Both physical and logical database files can have one or more record formats.

Creating a Workstation-to-AS/400 Transfer Request

To create a request for data transfer from a workstation to the AS/400 system, do as follows.

- Using the router session, establish attachment to the AS/400 system to which data is to be transferred.
- Select the **Data Transfer** icon.
- When the AS/400>PC Transfer window has been displayed, select **Switch to SEND**. The display is switched to the PC>AS/400 Transfer window.
To choose additional settings, select **Advanced**.
- Specify each item. Refer to "Items to Be Specified" for details.

Items to Be Specified

The following section explains the items specified in the PC>AS/400 Transfer window. Those items that are specified by selecting **Advanced**, are indicated by the addition of "(Advanced)" at the end of the corresponding item name.

FROM:

PC file name: This item is always required. It specifies the name of the workstation file containing the data to be transferred to the AS/400 system. Specify this item using the following format. (Items inside brackets [] can be omitted.)

[d:][path-name]file-name[.ext]

A list of workstation files can be displayed by selecting **Browse**. You can limit the number of names listed. To limit the listing, specify a combination consisting of part of a file name and a global file name character (* or ?) in the input area of the workstation file list. For example:

- When you select **OK** with /A: specified, the displayed listing contains the names of all files in the current directory of the diskette inserted into drive A.
- When you select **OK** with A:\SUPPLY\ specified, the displayed listing contains the names of all files under the SUPPLY path of the diskette inserted into drive A.
- When you select **OK** after specifying B:*.XLS, the displayed listing contains the names of all files having extension XLS in the current directory of the diskette inserted into drive B.

TO:

System name: This item is always required. When the router program is active, this item specifies the default system name.

Library/File (Member): This item is always required. It specifies the name of the AS/400 physical file that will receive the data to be transferred from the workstation. Either an existing file name or new file name can be specified.

Specify this item using the following format. (Items inside brackets [] can be omitted.)

[library-name/]file-name[(member-name[,record-format-name])]

library-name

This is the name of the AS/400 library containing the AS/400 file to which data is to be transferred. If no library is specified, *LIBL is used. To create a new file to receive transferred data, specify the library name.

When the input field is null and **Browse** is selected, the AS/400 system displays a list of all libraries defined in *USRLIBL of the AS/400 job library list. This list can be modified by changing the job description. Run a change job description (**CHGJOB**) command on the AS/400 system.

file-name

This is the name of an AS/400 physical database file. When data is transferred to an existing file, the data in that file is replaced with the transferred data. To create a new file to receive transferred data, specify a new file name of 1 to 10 characters.

To list the available files, do one of the following things:

- To list all files within all libraries defined in *USRLIBL of the AS/400 job library list, specify *USRLIBL followed by a slash (/), then select **Browse**. If a slash (/) is not specified after the library name, the AS/400 system displays a list of library names rather than the file names.
- To list the names of the files in a certain library, specify the library name followed by a slash (/), then select **Browse**. You can also specify a part of a file name followed by an asterisk (*), then select **Browse**. The AS/400 system lists all the files whose names begin with the specified character string.

member-name

This is the name of a member in the specified AS/400 file to which data is to be transferred. If this member name is not specified, data is transferred to the first member, *FIRST, in the AS/400 file. When the specified member already exists, the data in that member is replaced with the transferred data.

To transfer data to an existing file, specify the member name. The data within that file member is replaced with the transferred data.

To create a new member in an existing file or in a new file, specify a new member name of 1 to 10 characters.

By selecting **Browse** with a file name specified, the names of the members in that file are listed. When a left parenthesis, part of a member name, an asterisk (*), and a right parenthesis are specified, in this order, and then **Browse** is selected, the AS/400 system can list all member names beginning with the specified character string.

record-format-name

This is the name of the record format in the specified AS/400 file. The record format name need not be specified except when a physical file contains more than one record format. Most physical files have only one record format. Before specifying a record format name, a member name or *FIRST must be specified as the member name.

When you transfer data to an existing file without specifying a record format name, it is assumed that the file has only one record format (*ONLY). Therefore, that record format is used.

When a new file is created with no record format name, QDFTFMT is used as the record format name.

Note: A library name, file name, member name, and record format name can be specified using up to 10 characters each. Each name must begin with one of characters A to Z, ¥, #, and @. For characters subsequent to the first, 0 to 9, underscores, and periods can also be used.

Use of File Description File (Advanced): This item is always required. It specifies whether a file-description file is used to transfer data to the AS/400 system. The file-description file is required to transfer a workstation file, containing the data to be transferred (and converted), in fields. Such a workstation file can have either several fields or numeric data fields. To transfer a workstation file containing text (character data) only, the file-description file is not required. For details on creating a file-description file, see “File-Description Files” on page 339.

Follow either of the two procedures below.

- Do not specify this item in the following case: a workstation file having only one field (for example, PC code character) is specified in **FROM**, while the AS/400 file is a physical source file having the following record format.

Field	Type	Length	" " Decimal Places
Order number	Zoned	6	2
Date	Zoned	6	0
Data	Character or Open	1 to 4096	

Note: When fields contain character data or zoned data only, the data portion can be broken down into several fields. The destination AS/400 file contains the fields for order number and date. The workstation file, however, does not. This method is recommended when transferring text only between the AS/400 system and the workstation.

- Specify this item in all cases other than that described above. Two examples are:
- Data is transferred from a workstation file having more than one field.
- The AS/400 file that receives the data is other than a physical source file having the record format described above.

File Description File Name (Advanced): This item appears only when item **Use of File Description File** is specified.

This item is always required. It specifies the name of the workstation file-description file that describes the data to be transferred.

Upon transferring data from the AS/400 system to a workstation, a file-description file might have been created.

A file-description file must be created when the data has not yet been transferred from the AS/400 system to a workstation or when no file-description file exists.

PC File Type (Advanced): This item appears only when **Use of File Description File** is not specified.

This item is always required. You must specify the type of the workstation file specified in the **FROM** field. The values provided by the AS/400 system are recognized as workstation code text. If the file type of a data file is not converted, the file can include nothing other than data that does not require conversion.

AS/400 Object (Advanced): This item is always required. It specifies whether the AS/400 member to which data is transferred is a new member or an existing member. When data is transferred to a new member, this item also specifies whether the file to contain the new member is an existing file.

Create New Member

This item specifies that a new member, to which data is transferred, is created in an existing AS/400 file.

Notes:

- To create a new member, you must have the following authorities:
- ***OBJOPR**, ***OBJMGT**, and ***ADD** for the file that will include the new member
- ***READ** and ***ADD** for a library that will contain the file

See *Security Descriptions* (SC41-8083) for details of object authorities.

- To create a member to add to a file, the transfer function uses the AS/400 default value for the add physical file member (**ADDPFM**) command.

When you specify this item, the following item must also be specified:

Member Text

This item is optional. It is used to add an explanation of a new AS/400 member. This explanation helps remind you of the contents of the member. This explanation appears, for example, when a list of all members in a file is requested (**Browse** is selected). If this item is left blank, no explanation is added to the new AS/400 member.

To specify an apostrophe (') in the explanation, enter two apostrophes (' ').

Create New Member in New File

This item specifies that a new member, to which data is to be transferred, is created in a new AS/400 file.

Notes:

1. To create a new member in a new file, ***READ** and ***ADD** authorities are required for the library that will contain that file. Authority to use the create physical file (**CRTPF**) command of the AS/400 system is also required.
2. To create a new member in a new file, the transfer function uses the default value for the create physical file (**CRTPF**) command of the AS/400 system. It does not, however, use the following values:
(**MAXMBRS[*NOMAX]**). This indicates that the file can contain up to 32,767 members.
(**SIZE[*NOMAX]**). This indicates that each member of the file can contain an unlimited number of records.

When this item is specified, also specify the following item:

Member Text

This item is optional. It is used to add an explanation of a new AS/400 member. This explanation helps remind you of the contents of the member. This explanation appears, for example, when a list of all the members in a file is requested (**Browse** is selected). If this item is left blank, no explanation is added to the new AS/400 member.

To specify an apostrophe (') in the explanation, enter two apostrophes (' ').

AS/400 File Type

This item is always required. It specifies the type of an AS/400 file and the members to be created (same type for both).

Specify one of the following things:

- To create an AS/400 physical source file and its members, specify **Source**. These members are created with two fields (order number and date) added to the beginning of the data transferred from the workstation file. A new AS/400 source file and its members have the following record format:

Field	Type	Length	Decimal Places
Order number	Zoned	6	2
Date	Zoned	6	0
Data	Character or Open	1 to 32755	

Note that in an AS/400 physical source file, each record can be up to 32,755 bytes in length. But, the maximum size of a source file created using the workstation-to-AS/400 transfer function is 4,107 bytes. Also, this file must include the order and date fields. Therefore, the maximum amount of data that can be transferred is 4,096 bytes per record.

The data portions of members inherit the workstation file characteristics. In other words, when a workstation file is a workstation code text file consisting of many records containing text, the created data fields will be the same.

- To create an AS/400 physical data file and its members, specify **Data**. The file and members will contain only the data fields described in the file-description file.

The value of the **AS/400 File Type** is assumed to be **Data** when a file-description file is used to transfer data. If a file-description file is not used for data transfer, the value of this item is assumed to be **Source**.

Field Reference File Name

This item appears only when **Use of File Description File** is specified for the creation of a new file.

When **Use of File Description File** is not specified, an AS/400 physical source file is created. **AS/400 File Type** and **Field Reference File Name** are not displayed. Instead, **Record Length** appears.

This item is always required. A new AS/400 file is created using the field name in a file-description file and the field definitions in an AS/400 field-reference file.

The format of a field-reference file name is as follows. (Items inside brackets [] can be omitted.)

[library-name/]file-name

library-name:

This is the name of an AS/400 library containing a field-reference file. If this library name is not specified, ***LIBL** is assumed. If you cannot find the desired library,

selecting **Browse** displays a list of all libraries in *USRLIBL of the AS/400 job library list. *USRLIBL of the library list can be changed by modifying the job description by executing a **CHGJOB** command on the AS/400 processor.

file-name:

This is the name of the AS/400 physical database file containing the field definitions. Always specify this file name. When a library name is specified concurrently, use a slash (/) to delimit the library name and file name. If the desired file cannot be found, enter the library name and a slash, then select **Browse**. The system displays a list of files in that library. To list all the files in the libraries defined in *USRLIBL of the AS/400 job library list, enter *USRLIBL/ then select **Browse**.

If you enter part of a file name followed by an asterisk (*) and then select **Browse**, the system displays a list of available file names, each beginning with the specified part of the name.

For example, enter **ARLIB/AR*** in the **Field Reference File Name** item, then select **Browse**. The system displays a list of all physical file names beginning with AR in library ARLIB.

Note: You must have *OBJOPR authority for the field-reference file to be specified. To list certain files, you must also have *OBJOPR authority for those files.

Record Length

This item is always required. It specifies the record length of an AS/400 physical source file. When the data receiver is an AS/400 physical source file, the specified value must include the length of the order number and date fields that are added to a workstation file at transfer (the total length of these two fields is 12 bytes).

Authority

This item is always required. It specifies the authority level of a new AS/400 file.

Specify one of the following things:

- **Read/Write.** This enables other users to read from and write to the AS/400 file and allows the file name to be displayed in lists. However, users cannot delete the file (*OBJOPR, *READ, *ADD, *OBJMGT, *UPD, and *DLT authorities). If other users might be transferring data from a workstation file to the AS/400 file, specify **Read/Write** or **All**.
- **Read.** This enables other users to read from the AS/400 file, and allows the file name to be displayed in lists. However, other users can neither write to the file nor delete it (*USE authority).
- **All.** This enables other users to read from and write to the AS/400 file as well as delete it. The file name is displayed in lists (*ALL authority).
- **None.** This prevents other users (except for the system administrator) from writing to or deleting the AS/400 file. The file name does not appear in lists (*EXCLUDE authority).

File Text

This item is optional. It is used to add an explanation of a new AS/400 file. This explanation helps remind the user of the contents of the file. This explanation appears, for example, when a list of all files in a library is requested (**Browse** is selected). If this item is left blank, no explanation is added to the new AS/400 file.

To specify an apostrophe (') in the explanation, enter two apostrophes (' ').

Replace Existing Member

This item transfers data to an existing AS/400 member, specified in the **Library/File (Member)** item. The existing data in that AS/400 member is replaced with the transferred data.

Saving, Opening, Changing, and Executing a Transfer Request

The following section explains how to save, open, change, and execute, as a file, information (transfer request) on data to be transferred.

Saving a Transfer Request: Save a transfer request when the request is likely to be executed repeatedly. This eliminates the need to create a transfer request every time data is to be transferred. To save a transfer request, do as follows:

1. Specify the information needed for transfer, using the PC>AS/400 Transfer window.
2. After specifying the necessary information, select **Save** or **Save As** from the File pull-down menu of the menu bar.
The Save Transfer Request File as window appears.
3. Specify each item, referring to the following explanation, then select **OK**.

File Name

Disk to which data is to be saved. Specify a file name or diskette file name. The default extension is **TFR**. Extension **TFR** identifies a file as a transfer request file.

Description

This item can be used to add an additional explanation of a transfer request, as required. The explanation can be up to 40 characters in length. This explanation is saved with the transfer request, and displayed in the list of transfer request names. It is, therefore, useful for identifying a transfer request.

- The system asks whether the saved transfer request is to be registered in the PC400 folder.

When **OK** is selected, the transfer request is registered as an icon. Subsequently selecting this icon transfers data according to the contents of the registered data transfer request.

Opening and Changing a Saved Transfer Request: To open and change a saved transfer request, do as follows:

1. Display the PC>AS/400 Transfer window.
2. Select **Open** from the File pull-down menu of the menu bar.
3. Specify the name of the file to be opened using the Open Transfer Request File window, then select **OK**.

The PC>AS/400 Transfer window reappears, and the transfer request information, saved to the specified file, appears for each item. This opens the saved transfer request.

4. Change the contents of the transfer request as necessary.

5. To save the changed contents, follow the procedure explained in “Saving a Transfer Request” on page 308.

Performing a Transfer Request: A transfer request can be performed in any of the following ways:

- By using the OS/2 command prompt
- By selecting the icon with which the transfer request has been registered
- By using the PC>AS/400 Transfer window of the Data Transfer icon

Using the OS/2 Command Prompt: By referring to “Data Transfer Program” on page 299, execute the program **PCSFT5.EXE**, specifying the saved transfer request file name as a parameter.

Selecting the Icon with Which the Transfer Request Has Been Registered: This method can be used only when a transfer request has been saved as an icon by using the PC>AS/400 Transfer window.

Selecting the corresponding icon starts data transfer.

Using the PC>AS/400 Transfer Window:

1. Before executing a transfer request, operations such as creating, opening, and changing a transfer request must be completed.

Note: When data is transferred from a workstation to an existing member in an AS/400 file, the transferred data replaces the existing data in that member.

2. Select **Send** from the PC>AS/400 Transfer window.
Data transfer starts.
3. After the transfer has been completed, select the **Cancel** push button or **Exit** from the menu bar File pull-down menu.

Conversion Errors That Can Occur during Transfer: Upon executing a transfer request, a file-description file (when specified) is read from the disk or diskette to be processed. The AS/400 system and workstation exchange information, if the data is transferable.

The workstation transfers records, one at a time, from the file specified in **FROM**. Transferred records are converted and stored in the AS/400 member specified in **TO**.

During this conversion process, conversion errors might occur. For example, the values in a workstation file might have to be rounded to fit the AS/400 fields. Another example is the case where the record length of a workstation file differs from that expected by the AS/400 system.

If such an error occurs, an error message is issued with the number of the workstation file record for which the error occurred and, sometimes, information about certain fields in that record.

If a severe error occurs, data transfer might stop. In such a case, stop the transfer request, correct the error, then rerun the transfer request.

When the error is not so severe, you can request that the system continue transferring data. By doing so, even if the same error occurs in another record, an error message does not appear and the transfer function automatically continues executing the transfer request.

Creating an AS/400-to-Workstation Transfer Request

To create a transfer request to receive data from the host, do as follows:

1. Select the **Data Transfer** icon.
2. When the PC>AS/400 Transfer window is displayed, select **Switch to RECEIVE** to switch the display to the AS/400>PC Transfer window.
For the additional settings, select the **Advanced** button.
3. Which items are to be specified by the user vary with the data type, as follows:
 - Entire AS/400 file
 - Part of an AS/400 file
 - Data combined from several AS/400 files
 - Summary of record groups

Before specifying each item, while referring to “Items to Be Specified” on page 312, note the following points regarding the data to be received.

Receiving an Entire AS/400 File

This is the simplest way of transferring data from the AS/400 system to a workstation. All records in a file and all the data in each record are transferred.

The **FROM** items that must be specified as follows:

System name:

This item specifies the name of the system.

Library/File (Member):

This item specifies the name of the AS/400 file.

SELECT:

Specifying an asterisk (*) for this item indicates that all fields are to be transferred, or lists all the fields in the AS/400 file.

ORDER BY:

This item is optional. It specifies how records will be grouped. When this item is left blank, records are not grouped (data is transferred in the same order it appears in the AS/400 file).

Receiving Part of an AS/400 File

Only part of an AS/400 file is transferred to the workstation.

The **FROM** items that must be specified as follows:

System name:

This item specifies the name of the system.

Library/File (Member):

This item specifies the name of the AS/400 file.

SELECT:

This item specifies a field to be transferred.

WHERE:

This item specifies the requirements that must be satisfied before records can be selected for transfer.

ORDER BY:

This item is optional. It specifies how records will be grouped. When this item is left blank, records are not grouped (data is transferred in the same order it appears in the AS/400 file).

Receiving Data Combined from Several AS/400 Files

The data to be transferred can be stored in two or more AS/400 files. These files are assumed to be related. Based on this relationship, they can be linked or *joined*, as if all the data existed in a single file. The files can be transferred to the workstation after they have been joined. By using the AS/400-to-PC transfer function, this "join and transfer" function can be performed in a single step.

The **FROM** items that must be specified as follows:

System name:

This item specifies the name of the system.

Library/File (Member):

This item specifies the names of all AS/400 files from which data is to be transferred.

JOIN BY:

This item specifies how to join or combine the data in each file.

SELECT:

This item specifies a field to be transferred.

WHERE:

This item specifies the requirements that must be satisfied before records can be selected for transfer.

ORDER BY:

This item is optional. It specifies how records will be grouped. When this item is left blank, records are not grouped (data is transferred in the same order as it appears in the AS/400 file).

Receiving a Summary of Record Groups

A summary record is a single record that includes information on each set of records grouped from one or more AS/400 files.

The **FROM** items that must be specified as follows:

System name:

This item specifies the name of the system.

Library/File (Member):

This item specifies the names of all files from which data is to be transferred.

JOIN BY:

This item is optional. It specifies the join conditions that must be satisfied before records can be joined.

GROUP BY:

This item is optional. It must be specified only when the records of AS/400 files are classified into several groups. To group all records into a single group, this item need not be specified.

SELECT:

Specifying this item causes a summary record to be created. The field names specified in **GROUP BY** can be specified.

WHERE:

This item is optional. It specifies the requirements that each record to be grouped must satisfy. To group all records, this item need not be specified.

HAVING:

This item is optional. It specifies the summary record to be transferred. To transfer all summary records, this item need not be specified.

ORDER BY:

This item is optional. It specifies how summary records will be grouped. When this item is left blank, records are not grouped (data is transferred in the same order as it appears in the AS/400 file).

Items to Be Specified

The following section explains the items to be specified using the AS/400>PC Transfer window. Those items that can be specified by selecting **Advanced**, are identified by adding "(Advanced)" to the end of those item names.

FROM

System name: This item specifies the name of the host system that contains the data to be received. When the router program is active, this item specifies the default system name.

Library/File (Member): This item is always required. It specifies the name or names of one or more files used to store data to be transferred. Up to 32 file names can be specified. To specify several files, delimit them with commas and use **JOIN BY**, displayed after all **FROM** items have been specified. Only the file name must be specified. Do not specify a comma as a part of a file name. When the other optional items are not specified, they are assumed automatically. For example, the library name, member name, and format name can be assumed to be ***LIBL**, ***FIRST**, and ***ONLY**, respectively. When the cursor is on the input field of **FROM**, selecting **Browse** lists libraries, files, members, and formats.

Note: To transfer data from an AS/400 physical file, you must have ***USE** authority for that file. To transfer data from an AS/400 logical file, you must have ***OBJOPR** authority for that file and ***READ** authority for each subordinate file.

Specify file names as follows. (Items inside brackets [] can be omitted.) To specify several file names, delimit the names with commas.

```
[library-name/]file-name[(member-name[,record-format-name])],
[library-name/]file-name[(member-name[,record-format-name]),...
```

library-name

This is the name of the AS/400 library that contains the AS/400 file to be transferred. This AS/400 file contains the data to be transferred from the AS/400 system to a workstation. If this library name is not specified, ***LIBL** is assumed. If you cannot find the desired library, selecting **Browse** displays a list of all libraries defined in ***USRLIBL** of the AS/400 job library list. ***USRLIBL** of the library list can be changed by modifying the job description by executing the **CHGJOB** command on the AS/400 system.

file-name

This is the name of the AS/400 physical file, logical file, or DDM file from which data is transferred. This file name must always be specified. To

specify a file name and library name concurrently, delimit them with a slash (/). If you cannot find the desired file name, enter the library name followed by a slash, then select **Browse**. The system then displays a list of files contained in that library. To display a list of all the files in the libraries defined in *USRLIBL of the AS/400 job library list, enter *USRLIBL/, then select **Browse**.

member-name

This is the name of the AS/400 member containing the data to be transferred, or *FIRST. If this member is not specified, the system assumes *FIRST, and the first member of that file is used.

record-format-name

This is the name of the record format contained in the specified AS/400 file, or *ONLY. Before specifying the record format name, specify the member name or *FIRST. If the record format name is not specified, the system assumes *ONLY, and the only record format for that file is used. To specify a record format name, delimit the record format name and member name with a comma.

When the specified AS/400 file has several record formats, a record format name must be specified. If the file member name is not specified, a record format name cannot be specified.

Notes:

1. A library name, file name, file member name, and record format name can be specified using up to 10 characters for each. Each name must begin with A to Z, ¥, #, or @. For characters subsequent to the first, 0 to 9, underscores, and periods can also be used.
2. When the **FROM** field remains blank or a comma is entered to specify the next file name, selecting **Browse** displays a list of libraries defined in *USRLIBL of the AS/400 job library list.
3. Enter part of the file name, member name, or record format name, followed by an asterisk (*), then select **Browse**. The system displays a list of names beginning with the specified characters.

Example: You might want to transfer data from file member **ITEMMBR1** (first member) of file **ITEMMAST** in library **ITEMLIB**. **ITEMFMT** is the only record format of this file. The specification will be as follows:

ITEMLIB/ITEMMAST(ITEMMBR1,ITEMFMT)

Alternatively, specify:

ITEMLIB/ITEMMAST

JOIN BY (Advanced): When several files have been specified in **FROM**, specify **JOIN BY**. When only one file has been specified in **FROM**, **JOIN BY** does not appear.

JOIN BY specifies how to link or join the records of the files specified in **FROM**. Each file specified in **FROM** must be joined with at least one other file that has been specified in **FROM**.

Use **JOIN BY** to specify one or more join conditions. The join conditions indicate the similarity of two files. Therefore, they indicate which records of one file are joined with those of another.

The join conditions are as follows:

field-name = field-name

Field name is the name of the field defined in the record format specified in **FROM**. The join conditions require two field names, one for each file to be joined.

Field names must be delimited by one these:

= Equal
or >< Not equal
> Greater than
>= Greater than or equal to
< Less than
<= Less than or equal to

When specifying fields in **JOIN BY**, observe the following rules.

- Join a numeric field to another numeric field. The field lengths and types do not have to be identical.
- Join a character field to another character field. The lengths do not have to be identical.

The field name to be specified might have been defined in the files specified in **FROM**. When such a field name is used in the following items, prefix the field name with the file qualifier:

- JOIN BY
- GROUP BY
- SELECT
- WHERE
- HAVING
- ORDER BY

The file qualifier is the character T (uppercase or lowercase) followed by a one- or two-digit number. Use T1 for fields defined with the first record format, T2 for fields defined with the second record format, and so on. Delimit the file qualifier and field name with a period (.). See “Receiving Records Using File Qualifiers” on page 332 for details of the file qualifiers.

If the field name of the file specified in **FROM** cannot be found, select **Browse** when the cursor is on the **JOIN BY** input area. Then, a list of file qualifiers and field names of the files appears.

To join three or more files, or to join two files based on two or more common fields, two or more link conditions must be used. To specify several join conditions, join the conditions with AND. For example:

T1.EMPNO = T2.EMPNO AND T2.EMPNO = T3.EMPNO

In this case, records having the same value as **EMPNO** are joined between the first and second files specified in **FROM**. Then, such records are joined between the second and third files specified in **FROM**.

Up to 32 join conditions can be specified.

After **JOIN BY** is specified, each of **SELECT**, **WHERE**, and **ORDER BY** can be completed, by following the procedure described earlier in this chapter. To browse a field name that has been defined in several files, prefix the field name with a file qualifier.

GROUP BY (Advanced): This item is required only to classify AS/400 file records into several groups. When no value is specified in **GROUP BY**, all the records are treated as a single group.

If **GROUP BY** is not displayed, select **Group functions** at the bottom right of the screen. Then, **GROUP BY** appears. **GROUP BY** and **HAVING** are displayed concurrently. You can specify either, both, or neither.

When **GROUP BY** and **HAVING** are displayed but you do not want to specify either, select **Remove Group functions**. The two items disappear.

To classify several records into groups, specify one or more fields to act as the base for grouping. Records are grouped according to the field specified first, then by the field specified second, and so on. For example, suppose that the following groupings are specified:

SHIFT, DEPTNO

In this example, the records are first grouped by **SHIFT**. Records belonging to a single group will subsequently have the same value as **SHIFT**. Then, the records in each group are grouped by **DEPTNO**. When there is only one record having a certain **SHIFT** value, the group has only one record.

Delimit field names with commas. Blanks can be specified to improve readability. Up to 50 field names can be specified. These fields must have been defined in the record format defined in **FROM**.

If a field cannot be found, selecting **Browse** displays a list of all the fields contained in the record.

With **GROUP BY** specified, specify **SELECT** to transfer the summary record of each group.

SELECT (Advanced): This item is always required. It specifies the field to be transferred or the function that indicates the type of summary information to be transferred.

The field to be specified must have been defined in the record format specified in **FROM**.

To transfer all the fields in the specified record, specify an asterisk (*) in this input field. (Specifying an asterisk causes all fields in the record to be transferred.)

Note: Up to 256 fields can be transferred. When more than 256 fields have been defined in a file, an asterisk cannot be used. In this case, specify the names by selecting the fields to be transferred.

To transfer fields by selecting from a record, enter the field names in the order in which the fields are arranged. One or more blanks can be placed between the field names to improve readability. However, the names must be delimited by commas, as follows:

ITEMNO, QONHAND, PRIC

You can also specify:

ITEMNO,QONHAND,PRICE

When records are transferred from an AS/400 source file, specifying an asterisk (*) causes all fields in the file to be transferred, with the exception of the order number field and date field. (To transfer all the fields, including the order number field and date field, specify all the field names, including each data field name.)

A field can be specified repeatedly as required. However, bear in mind that no more than 256 fields can be selected. A list of field names can be displayed by selecting **Browse**.

Receiving a Summary of Record Groups: The following information is necessary to receive summary records.

To transfer a summary record, do not leave this input area blank or specify an asterisk (*) (except when all the fields of the file specified at the prompt are specified in **GROUP BY**). The field names specified in **SELECT** (except for those specified in functions) must also have been specified in **GROUP BY**.

The functions and fields specified in **SELECT** return actual summary information for each group. Enter the field names and functions in **SELECT** in the order in which they are to be displayed.

Note: Null values are not included in the functions. When an entire value is null, the function output is set to null, except for **COUNT**. The **COUNT** output is 0.

The function format is as follows.

function (field-name)

This has the following meaning:

function:

This is one of the following functions:

- AVG** Transfers the average value of the specified fields for each record group. This function can be used only for numeric fields.
- MIN** Transfers the minimum or lowest value of the specified fields for each record group.
- MAX** Transfers the maximum or highest value of the specified fields for each record group.
- SUM** Transfers the total value of the specified fields for each record group. This function can be used only for numeric fields.

COUNT

Transfers the total number of records that satisfy the **WHERE** condition for each record group. Specify **COUNT(*)**.

field-name:

This is the field name defined with the record format specified in **FORM**.

Each function returns one value for each record group. In **SELECT**, several functions can be specified. To do so, delimit the functions by commas, as follows:

SUPPNO, AVG(PRICE), MIN(PRICE), MAX(PRICE)

This indicates that the average, minimum, and maximum values for **PRICE** are calculated for each supplier after **SUPPNO** has been selected. A summary record is transferred according to the function selection. Specify **SUPPNO** in **GROUP BY**, because **SUPPNO** has not been used for the functions.

WHERE (Advanced): This item is optional. It specifies one or more conditions that records to be transferred must satisfy.

To transfer summary records, use this item to specify which records are to be grouped, then group the records. Using this item, you can specify one or more conditions that the record must satisfy to belong to a certain group. When **WHERE** is not specified, all records are grouped.

As the *conditions*, specify the test to be applied to the records in the specified file member. All the records in the specified file member are tested for the conditions specified here. Only those records that pass this test are transferred.

When **WHERE** is not specified, all records in the specified file member are transferred.

The condition format is as follows:

field-name test value

field-name:

This must be a field substring or field name defined in the record format.

Fields or constants can be manipulated by specifying a supported function, with the results being used for comparison. The supported functions and usage are as follows:

SUBSTR

Returns the specified part of a character string. This function contains three parameters: the field name, starting position, and length of the returned substring. The following example returns the 20 characters starting from the 10th character of the **FULLNAME** field.

SUBSTR(FULLNAME 10 20)

VALUE

Returns the first non-null value in the parameter list. (If all parameters are null, null is returned.)

VALUE(DEPOSIT WITHDRAW BALANCE)

CURRENT

Returns **DATE**, **TIME**, **TIMEZONE**, or **TIMESTAMP** for the current system.

CURRENT(TIMEZONE)

DIGITS

Returns a character string representation of a numeric field.

DIGITS(EMPLOYEE#)

CHAR

Returns a character string representation of the date field, time field, or time-stamp field. The second parameter is used to specify the format of the Systems Application Architecture (SAA) of the string to be returned (supported values are **USA**, **EUR**, **ISO**, or **JIS**).

CHAR(DATEHIRE USA)

DATE

Returns the date of the time-stamp field.

DATE(TIMECRTD)

TIME Returns the time of the time-stamp field.

TIME(TIMECRTD)

TIMESTAMP

Returns the time-stamp, combining the date field and time field.

TIMESTAMP(DATESEND TIMESEND)

YEAR

Returns the year of the date field or time-stamp field.

YEAR(DATEHIRE)

MONTH

Returns the month of the date field or time-stamp field.

MONTH(DATEHIRE)

DAY Returns the date of the date field or time-stamp field.

DAY(DATEHIRE)

DAYS

Returns the day of the year, counted from January 1, of the date field or time-stamp field.

DAYS(DATEHIRE)

HOURL

Returns the time of the time field or time-stamp field.

HOURL(TIMESEND)

MINUTE

Returns the minute of the time field or time-stamp field.

MINUTE(TIMESEND)

SECOND

Returns the second of the time field or time-stamp field.

SECOND(TIMESEND)

MICROSECOND

Returns the microsecond of the time field or time-stamp field.

MICROSECOND(TIMECRTD)

test: This is the comparison type to be applied to fields or functions.

The following tests can be used. One or more blanks can be placed before and after these tests.

= Equal

> Greater than

or >< Not equal (See the note.)

>= Greater than or equal to

< Less than

<= Less than or equal to

LIKE The field is similar to the specified value.

BETWEEN

The field is equal to one of two constants, or to a value between them.

IN The field is the same as one of the values in the constant list.

IS The field contains null values.

ISNOT

The field contains no null values.

Using the LIKE Test

The **LIKE** test checks the field specified with the field name for a character pattern specified as a value. The field to be specified must be a character field.

The values to be tested must be character-string constants. This string can contain any characters. A percent (%) character (both SBCS% and DBCS%) indicates a character string consisting of zero or more characters. A 1-byte underscore (_) character indicates any single 1-byte character. A 2-byte underscore () character indicates any single 2-byte character.

The following example explains how to use the **LIKE** test:

NAME LIKE '%ANNE%'

The previous example searches for names containing character string **ANNE**, such as **ANNE**, **ANNETTE**, and **SUZANNE**.

The following example searches for names beginning with character string **ANNE**, such as **ANNE** and **ANNETTE**.

NAME LIKE 'ANNE%'

The following example searches for names ending with character string **ANNE**, such as **ANNE** and **SUZANNE**.

NAME LIKE '%ANNE'

The following example searches for all names whose second character is A.

```
NAME LIKE '_A%'
```

The following example searches for all last names beginning with character J.

```
LSTNAM LIKE 'J%'
```

This has the same effect as the following example:

```
SUBSTR (LSTNAM,1,1) = 'J'
```

When the pattern does not include a percent character (%), the length of the character string must be identical to that of the field.

Note: Values are searched according to the exact characters specified by the user. In other words, when the user's specification consists only of uppercase characters, only uppercase character strings are returned. Similarly, when the specification consists only of lowercase characters, only lowercase character strings are returned.

Using the BETWEEN Test

The **BETWEEN** test checks the fields specified in the field name for character strings or numeric values that are equal to or between the specified constants. The values to be tested must be two character-string constants or two numeric constants. The types of these constants must be identical to that of the field name specified by the user. Delimit the two constants with **AND**.

The following example searches for those records for which the price is between 50.35 and 75.3, inclusive:

```
PRICE BETWEEN 50.35 AND 75.3
```

The following example searches for those records for which the name begins with C:

```
NAME BETWEEN 'C' AND 'CZZZZZZZZZ'
```

The following example searches for those records for which the balance is between 0 and 5 000.

```
BALDUE BETWEEN 0 AND 5000
```

This has the same meaning as the following expression.

```
BALDUE >= 0 AND BALDUE <= 5000
```

Note: Specify the values to be tested in the form of **BETWEEN** (minimum) **AND** (maximum). For instance, **BETWEEN 1 AND 10** is a valid specification. However, **BETWEEN 10 AND 1** returns no records.

Using the IN Test

The **IN** test checks the fields specified in the field name for the character strings or numeric values in the list specified as the value. The value to be tested must be a list of character-string constants or numeric constants. In addition, the types of these constants must be identical to that of the specified field. Delimit the constants with blanks and enclose them in parentheses. Up to 100 constants can be specified. The following example shows how to use the **IN** test:

```
NAME IN ('SMITH' 'JONES' 'ANDERSON')
```

This example searches for those records for which the name is **SMITH**, **JONES**, or **ANDERSON**.

The following example searches for the values in the **STATE** field for which the value is *other than* **NY**, **MN**, or **TX**:

```
NOT STATE IN ('NY' 'MN' 'TX')
```

Note: Values are searched according to the exact characters specified by the user. In other words, when the user's specification consists of only uppercase characters, only uppercase character strings are returned. Similarly, when the specification consists of only lowercase characters, only lowercase character strings are returned.

Using the IS Test

The **IS** test checks the fields specified in the field name for null values.

The following example searches for those records for which the commission field contains null values:

```
COMMISSIONS IS NULL
```

Using the ISNOT Test

The **ISNOT** test checks the fields specified in the field name for non-null values.

The following example searches for those records for which the commission field does not contain null values:

```
COMMISSIONS ISNOT NULL
```

In the test, logical **AND** and logical **OR** can be combined. When both **AND** and **OR** are specified, **AND** comparison is performed first. Up to 50 conditions can be specified. For example:

```
MONTH=2 AND LOC='MIAMI' OR LOC='CHICAGO'
```

In this example, each record to be selected must satisfy the following condition:

```
MONTH=2 AND LOC='MIAMI'
```

or must satisfy the following condition:

LOC='CHICAGO'

This command can be modified by using parentheses. For example:

MONTH=2 AND (LOC='MIAMI' OR LOC='CHICAGO')

In this example, each record to be selected must satisfy the following condition:

MONTH=2

and it must satisfy the following condition:

LOC='MIAMI' OR LOC='CHICAGO'

NOT can also be used. The following example selects items where data is transferred not only from those records in which the **DEPT** field is not equal to 470, but also from those records for which the **DEPT** field is equal to 470 and, *additionally*, **STATE** is equal to NY.

NOT (DEPT = 470) OR (DEPT = 470 AND
STATE = 'NY')

Comparison can start from a certain line and end at the next line. However, a field name cannot start from a certain line and end at the next line. Field names must not exceed one line.

When a value to be tested is a character string enclosed in quotation marks, the value can start from a certain line and continue to the next line.

value Field names or constants can be specified as values. To use constants, enclose number or character strings in single quotation marks.

Note: Do not specify commas between numbers, because the system recognizes these as decimal points.

When a character field or substring is specified in the field name, the character field name or character-string constant must be specified as the value. If the field length differs from the value length, the shorter field is extended to the value length by adding blanks on the right.

When a numeric field is specified as the field name, a numeric field name, numeric constant, or expression must be specified as the value. The transfer function performs decimal alignment for numeric fields prior to comparison. Zeros are added wherever numeric values are missing.

When a date field is specified in the field name, the name of a date field, character field (when the **CHAR** function is used for date field conversion), or character-string constant must be specified as the value. To use a character-string constant, use a value in a form other than SAA (**USA**, **EUR**, **ISO**, or **JIS**).

Using Constants

A character string, numeric value, or keyword **NULL** can be specified as a constant.

Note: NULL can be used only when operators **IS** or **ISNOT** are used.

Using Character Strings

A character string must be enclosed in apostrophes, as follows:

'JOHN'

Use two apostrophes to represent one apostrophe in a character string, as follows:

'JOHN''S'

Note: The transfer function supports only right apostrophes (').

When a character string is shorter than the specified field, the string is extended to the value length by adding blanks on the right. When a character string is longer than the specified field, the string is truncated.

Values are searched according to the exact characters you specified. In other words, when your specification consists only of uppercase characters, only uppercase character strings are returned. Similarly, when the specification consists only of lowercase characters, only lowercase character strings are returned.

A character string can also be specified in hexadecimal format. In this case, enter X. Then, enter the character string, enclosed in apostrophes, using EBCDIC hexadecimal representation. For example:

X'D1D6C8D5'

If the character string contains any characters that cannot be represented, hexadecimal representation can be used. A character string can also be specified using DBCS representation, enclosed in apostrophes (DBCS mixed, DBCS exclusive, or DBCS alternative). In this case, first enter G. Then, enter the DBCS string, enclosed in apostrophes. For example:

G' D B C S'

A character string can also be specified using DBCS graphic representation. In this case, first enter N. Then, enter the DBCS string, enclosed in apostrophes. An example is given below.

N' D B C S'

Using Numeric Values

A numeric value can contain an optional sign (+ or -) and optional decimal point. Either a period (.) or comma (,) can be used to represent a decimal point. For example:

.5
-.05
1000.00
+5.00

Decimal alignment is performed prior to numeric field comparison. Zeros are added where numeric values are missing.

Using Expressions

An expression can contain numeric field names, numeric constants, parentheses, and the following arithmetic operators:

+	Plus sign (addition)
-	Minus sign (subtraction)
*	Multiplication
/	Division

For instance, the following expression searches for those records for which the number of products in stock (**ONHAND**) is at least 500 greater than the number of ordered products (**ONORDER**).

ONHAND > ONORDER + 500

The following expression searches for those records for which the price is 1 000.

PRICE = (10.00 * 100)

HAVING (Advanced): This item is optional. It specifies which summary record is transferred.

Pay particular attention to the difference between **HAVING** and **WHERE**. **WHERE** operates on each record within a certain group. **HAVING**, on the other hand, operates only on summary records (records that contain summary information for each group).

With this item, you can specify one or more conditions that a summary record must satisfy prior to being transferred.

As the conditions, specify the tests that should be applied to the summary records. The specified test conditions are applied to all summary records, only those summary records that pass the tests are transferred. To transfer all summary records, leave the **HAVING** item blank.

The format of the conditions is as follows:

function (field-name) test value

This indicates:

function

This is a function supported for **SELECT**. See the description of **SELECT** in this section for details of these functions.

field-name

This is the field defined by the record format specified in **FROM**. A field name is acceptable even when it has not been specified in **SELECT**.

Test This is the comparison type for functions. The types are listed below.

= Equal to
or >< Not equal
 > Greater than
 >= Greater than or equal to
 < Less than
 <= Less than or equal to

value This is a function operating on certain fields or a constant. See “WHERE (Advanced)” on page 317 for details of constants, expressions, and tests.

Note: A comma is treated as a decimal point. Therefore, do not separate numbers with commas.

Test conditions can be combined by using logical **AND** or logical **OR**. When both **AND** and **OR** are specified, **AND** comparison is performed first. Up to 50 tests can be specified. By using parentheses, the operation order can be modified, or a description can be added to an operation. For example, you can specify:

COUNT(*) >=2 AND MAX(PRICE) > 100

In this case, the following conditions are applied concurrently: groups to be transferred must contain more than one record, and the summary records in such groups are transferred only when the maximum price is greater than 100.

If the desired field cannot be found, selecting **Browse** displays a list of the names of all fields in the record.

The type, length, digit, and number of decimal places of the value returned for each function are:

	Type	Length	Digit	Decimal Places
SUM	Packed	16	31	(Same as tested field)
AVG	Packed	16	31	31 (Total of the digit and decimal places of the field)
COUNT	Binary	4	10	0
MAX		(Same as tested field)		
MIN		(Same as tested field)		

ORDER BY (Advanced): This item is optional. It specifies the order in which the requested records are grouped. When **ORDER BY** is not specified, record transfer is not done according to a certain order.

Records are grouped according to the field specified first. Those records having the same value in each field specified first are grouped by the field specified second, and so on. Records containing null values are grouped after all records without null values have been grouped.

For example, you can specify:

DEPT,NAME,PHONE

In this case, records are first grouped according to **DEPT**. Then, the records having the same value for **DEPT** are grouped by **NAME**. The records with the same **DEPT** and **NAME** values are finally grouped by **PHONE**.

When a field name is specified in **ORDER BY**, it must also have been specified in **SELECT**, or **SELECT*** must have been specified.

Fields can be grouped in ascending or descending order. To do this, specify one blank after a field name then enter **ASC** or **DESC**. The default value is **ASC**. For example, specify:

DEPT DESC, NAME ASC

This indicates that the **DEPT** fields are to be grouped in descending order, after which the **NAME** fields are to be grouped in ascending (alphabetic) order.

Absolute values (**ABS**) can be specified for numeric fields. To do this, add a blank after a field name then enter **ABS**. For those fields having negative values, the negative signs are ignored and the absolute values are used.

The total length of the fields to be specified must not exceed 120 digits.

Return Record at Missing Field Value (Advanced): When joining records from several files, joining might fail because a record is missing. This item specifies whether records with missing fields are transferred.

When you specify that records with missing fields are to be transferred, the alternative values for the missing fields are transferred. These values are normally blanks for character fields and zeros for numeric fields.

When you do not specify transfer of records with missing fields, those records are not transferred.

Specify this item to transfer data records that have alternative values for missing fields.

Do not specify this item if data records that have alternative values for missing fields are not to be specified. In this case, only those data records created from those records that exist in all files specified in **FROM** are transferred.

TO

Output device: This item specifies where received data is to be sent.

Display

The received data is displayed on the screen.

Disk The received data is written to a workstation diskette or hard disk file.

Printer

The received data is printed on the printer.

When **Disk** is selected as the output device, also specify the following items.

PC file

This item specifies the name of the workstation disk file or diskette file to which the data is to be written.

Replace old file

This item is always required. It specifies whether the records in the file specified by **PC File** are to be replaced with the transferred records.

The default value is **Replace old file**.

Workstation file type

This item is always required. It specifies the type of the workstation disk file or diskette file to which the transferred records are written.

The system default is PC code test.

Save transfer description

This item is always required. It specifies whether the workstation file description is written to a workstation file. This file description describes the transferred data and it is required to subsequently return data to the AS/400 system.

The system default is **Save**.

Description file name

This item is always required. It appears only when **Save Transfer Description** is selected. The **File Description File Name** specifies the name of the workstation disk file or diskette file to which the file description is written.

This item automatically sets the desired file name. This file name is the same as that specified by the user for **TO**, but to which extension **.FDF** has been added. Extension **.FDF** indicates that this file is a file-description file.

The use of extension **.FDF** is recommended when using a unique file name. To specify a file name in this item, use the same format as that in **TO**. (Items inside brackets [] can be omitted.)

[d:][path-name]file-name[.ext]

After **Save File Description File** is specified or a name is specified for **File Description File Name**, the AS/400>PC Transfer Request window reappears after the **Return** key is pressed. Using this screen, a transfer request can be changed, saved, or executed.

Saving, Opening, Changing, and Executing a Transfer Request

The following section explains how to save, open, change, and execute, as a file, the information (transfer request) on the data to be transferred.

Saving a Transfer Request

You should save a transfer request, especially when the request will be executed repeatedly. This eliminates the need to create a transfer request every time a request is executed. To save a transfer request, do as follows:

1. Specify the information needed for transfer, using the AS/400>PC Transfer window. See "Creating an AS/400-to-Workstation Transfer Request" on page 310 for an explanation of how to specify the required data.
2. After specifying the necessary data, select **Save** or **Save As** from the File pull-down menu of the menu bar.

The Save Transfer Request File As window appears.

3. Specify each item, referring to the following explanation, then select **OK**.

File Name

Disk to which data is to be saved. Specify a file name or diskette file name. The default extension is TTO. Extension TTO identifies a file as a transfer request file.

Description

This item can be used to add a short explanation of a transfer request, as required. The explanation can be up to 40 characters in length. This explanation is saved with the transfer request, and displayed in the list of transfer request names. It is useful, therefore, for identifying a transfer request.

- The system asks whether the saved transfer request is to be registered in the PC400 folder.

When **OK** is selected, the transfer request is registered as an icon. Subsequently selecting this icon transfers data according to the registered data transfer request.

Opening and Changing a Saved Transfer Request

To open and change a saved transfer request:

1. Display the AS/400>PC Transfer window.
2. Select **Open** from the File pull-down menu of the menu bar.
The Open Transfer Request File window appears.
3. Specify the name of the file to be opened using the Open Transfer Request File window. Then select **OK**.
The AS/400>PC Transfer window reappears, with the information specified for each item for the transfer request displayed. This completes opening of the saved transfer request.
4. Change the contents, as necessary.
5. To save the changed contents, follow the procedure given in "Saving a Transfer Request" on page 327.

Executing a Transfer Request

A transfer request can be executed in one of the following three ways:

- By using the OS/2 command prompt
- By selecting the icon with which the transfer request has been registered
- By using the AS/400>PC Transfer window of the Data Transfer icon

Using the OS/2 Command Prompt: By referring to "Data Transfer Program" on page 299, execute the program PCSFT5.EXE, specifying the saved transfer request file name as a parameter.

Selecting the Icon with Which the Transfer Request Has Been Registered: This method can be used only when a transfer request has been saved as an icon by using the AS/400>PC Transfer window.

Data transfer starts as soon as you select the icon with which a transfer request has been registered.

Using the AS/400>PC Transfer Window:

1. Before attempting to execute a transfer request, all operations such as creating, opening, and changing a transfer request must have been completed.

Note: When data is transferred from a workstation to an existing member in an AS/400 file, the transferred data replaces the existing data in the member.

2. Select **Receive** from the AS/400>PC Transfer window.
Data transfer starts.
3. After the transfer has been completed, select the **Cancel** push button, or select **Exit** from the menu bar File pull-down menu.

Status during Transfer

Display can be specified as the **output device**, when the current transfer request is created or changed. This sends the transferred record to the screen. On the screen, each record is displayed on one line.

Each field in a transferred record is converted from the AS/400 data type to workstation code.

Note: The workstation receives the AS/400 records in order and then writes them to a temporary file of the default directory in the default drive (usually, the directory in which PC400 is installed). The maximum number of records that can be transferred is 4096 records, limited by the amount of records that can be stored in free space of the default drive.

When **Disk** is selected as the **output device**, the following actions are performed:

1. The workstation file description is written to a workstation disk file or diskette file according to the **Save File Description File** specification. (If **Save File Description File** has not been specified, this procedure is not performed.)
2. The transferred records are written to a workstation disk file or diskette file.

Limited Usage of File Names and Field Names

For a transfer request from a workstation to the AS/400 system, none of the following reserved words can be specified as a file name or field name:

CRTFILE	MBRTEXT
CRTMBR	PUBAUT
FILETEXT	RCDLEN
FILETYPE	REFFILE
INTO	

For a transfer request from the AS/400 system to a workstation, none of the following reserved words can be used as a file name or field name:

ABS	IS
AND	ISNOT
ASC	LIKE
AVG	MAX
BETWEEN	MIN
BY	NOT
COLUMNS	OPTIONS
COUNT	OR
DESC	ORDER
EXTRACT	PARTOUT
FROM	REPLACE
GROUP	SELECT
HAVING	SUBSTR
IN	SUM
INNER	TABLES
	WHERE

To use one of these reserved words as a file name or field name, use the reserved word in uppercase, enclosed in quotation marks. Here is an example:

TO MYLIB/"INTO"

Examples of Transfer Requests for Receiving

This section provides examples of transfer requests for receiving. The contents of this section provide supplementary information to help you better understand transfer requests for receiving.

This section describes how to transfer data from the AS/400 system, based on the inventory control file **INVENTORY** and supplier file **SUPPLIERS**.

The **INVENTORY** file contains information about the various parts in stock. Each part has a three-digit identification number, **PARTNUM**. The **INVENTORY** file contains the names of parts (**DESCRIPTION**) and the quantity on hand (**QONHAND**) for each part.

```

File: INVENTORY
Field name: PARTNUM  DESCRIPTION  QONHAND
-----
Record 1:    209          CAM        50
            2:    221          BOLT       650
            3:    222          BOLT     1250
            4:    231          NUT        700
            5:    232          NUT     1100
            6:    207          GEAR         75
            7:    241        WASHER     6000
            8:    285          WHEEL       350
            9:    295          BELT         85

```

(Ref #5.)

The **SUPPLIERS** file contains information about the suppliers of each part. Each supplier is identified by a two-digit number, **SUPPNO**. The **SUPPLIERS** file contains the number of parts delivered (**PARTNO**), their prices (**PRICE**), times of delivery (**DELIVTIME**), and ordered quantities (**QONORDER**). The parts listed in the **SUPPLIERS** file are the same as those listed in the **INVENTORY** file.

```

File: SUPPLIERS
Field name: SUPPNO  PARTNO  PRICE  DELIVTIME  QONORDER
-----
Record 1:   51      221    .30      10         50
           2:   51      231    .10      10          0
           3:   53      222    .25      15          0
           4:   53      232    .10      15        200
           5:   53      241    .08      15          0
           6:   54      209   18.00     21          0
           7:   54      221    .10      30        150
           8:   54      231    .04      30        200
           9:   54      241    .02      30        200
          10:   57      285   21.00     14          0
          11:   57      295    8.50     21         24
          12:   61      221    .20      21          0
          13:   61      222    .20      21        200
          14:   61      241    .05      21          0
          15:   64      207   29.00     14         20
          16:   64      209   19.50      7          7

```

Receiving Part of an AS/400 File

Specify the following items:

Library/File (Member)
INVENTORY

SELECT
PARTNUM, QONHAND

WHERE
QONHAND < 100

ORDER BY
PARTNUM

In this case, only part of the **INVENTORY** file is to be transferred. Specifically, only the part number (**PARTNUM**) and quantity on hand (**QONHAND**) fields of the records for which the number of parts in stock is less than 100 (**QONHAND < 100**) are transferred. Records are transferred in ascending order of parts numbers (**PARTNUM**).

The following data is transferred:

```

Field:  PARTNUM  QONHAND
-----
Record 1:    207      75
           2:    209      50
           3:    295      85

```

Receiving Records Joined from Several AS/400 Files

Two AS/400 files, **INVENTORY** and **SUPPLIERS**, are assumed. Note that both files contain records including part number fields. The **INVENTORY** file contains inventory information about individual parts. The **SUPPLIERS** file contains information about purchasing and ordering.

The user might want to transfer information on part numbers, part names, and the prices of the parts to be ordered from supplier 51. The desired fields are **PARTNO** (**SUPPLIERS** file), **DESCRIPTION** (**INVENTORY** file), and **PRICE** (**SUPPLIERS** file).

By comparing the data in the **INVENTORY** file and the **SUPPLIERS** file, the user can determine that supplier 51 provides part numbers 221 and 231, called **BOLT**

and **NUT**, respectively, and that their prices are 30 cents and 10 cents, respectively. The following table summarizes this information:

Field:	PARTNO	DESCRIPTION	PRICE
	-----	-----	-----
Record 1:	221	BOLT	.30
2:	231	NUT	.10

The same results are available by joining the data in these two files by using the AS/400-to-PC transfer function. To do this, specify both files (**INVENTORY** and **SUPPLIERS**) in the **FROM** item. For **SELECT**, specify which fields are to be transferred (**PARTNO**, **DESCRIPTION**, and **PRICE**). For **WHERE**, specify which records are to be transferred (records for which **SUPPNO** = 51).

Respecify the relationship between the two files in **JOIN BY**. From these results, the user can determine, by checking the **SUPPLIERS** file, that part number 221 is delivered from supplier 51 at a cost of 30 cents. In addition, to determine the part name, the user must check the **INVENTORY** file for part number 221 and its product name. In other words, the user observes that data is joined from the records in both the **SUPPLIERS** file and the **INVENTORY** file and that those records have the same part number. Therefore, to link the two records in these files, the records must have the same part number.

In short, to obtain this information, specify:

```
Library/File (Member)
    SUPPLIERS, INVENTORY

JOIN BY
    PARTNO = PARTNUM

SELECT
    PARTNO, DESCRIPTION, PRICE

WHERE
    SUPPNO = 51

ORDER BY
    PARTNO
```

Receiving Records Using File Qualifiers

To join records from several AS/400 files, fields of the same type must be joined.

For example, the part number fields in the **INVENTORY** and **SUPPLIERS** files can have the same name **PARTNO**. To specify the desired **PARTNO** fields, the user must specify which file contains those fields. To do so, file qualifiers are used.

A file qualifier is the character **T** (uppercase or lowercase) followed by a one- or two-digit number. A comma is used to delimit the file qualifier and field name. In the previous example, prefix **T1.** and **T2.** to the **PARTNO** field names. **T1.** indicates the first file of **FROM**, while **T2.** indicates the second.

To obtain the same information as in the previous example, specify:

```
Library/File (Member)
    SUPPLIERS, INVENTORY

JOIN BY
    T1.PARTNO = T2.PARTNO
```

```

SELECT
    T1.PARTNO, DESCRIPTION, PRICE
WHERE
    SUPPNO = 51
ORDER BY
    T1.PARTNO

```

T1.PARTNO indicates the **PARTNO** fields in the **SUPPLIERS** file, while **T2.PARTNO** indicates the **PARTNO** fields in the **INVENTORY** file.

Qualifiers are not needed for the names of the **DESCRIPTION**, **PRICE**, and **SUPPNO** fields, because they exist in one file only. However, the user can specify the following qualifiers for clarity:

T2.DESCRPTION, T1.PRICE, T1.SUPPNO

The following examples of joining several AS/400 files describe more sophisticated techniques. You should now be familiar with the basics of how to join two files. For a more detailed explanation, refer to the following sections.

Receiving with Field Missing Records Joined

The joining of records from several files could fail because one or more records is missing. For example, the record containing part number 221 might not be found in the **INVENTORY** file. This means that the records that can be joined to the 1st, 7th, and 12th records in the **SUPPLIERS** file do not exist in the **INVENTORY** file. In this case, the **PARTNO** field and **PRICE** field for part number 221 can be determined, but the **DESCRIPTION** field cannot be determined. So, the **DESCRIPTION** field is missing.

To transfer field missing records, use **Return Record at Missing Field Value**.

When **Return Record at Missing Field Value** has been specified, the default AS/400 values are transferred instead of the missing field values. The default values for character fields are blanks, while those for numeric fields are zeros. For example, if the **INVENTORY** file does not contain the part number 221 record, the result of the previous example will be as follows:

Field:	PARTNO	DESCRIPTION	PRICE
	-----	-----	-----
Record 1:	221		.30
2:	231	NUT	.10

If **Return Record at Missing Field Value** has not been specified, the field missing records are not transferred. For example, if the **INVENTORY** file does not contain the part number 221 record, the result of the previous example will be as follows:

Field:	PARTNO	DESCRIPTION	PRICE
	-----	-----	-----
Record 1:	231	NUT	.10

Receiving with Records in a Same File Joined

Records in the same file can be joined. In other words, a file can be repeatedly specified in **FROM**. For instance, data in certain records can be compared using this function.

For example, the **SUPPLIERS** file shows that several suppliers provide the same part. The user might want to know which supplier sets a price that is double, or greater than double, that of another. To transfer the necessary information to a workstation, specify:

Library/File (Member)

SUPPLIERS, SUPPLIERS

JOIN BY

T1.PARTNO = T2.PARTNO

SELECT

T1.PARTNO, T1.SUPPNO, T1.PRICE, T2.SUPPNO, T2.PRICE

WHERE

T1.PRICE > 2 * T2.PRICE

ORDER BY

T1.PARTNO

The same file has been specified in **FROM** twice. **JOIN BY** specifies that records having the same part number are joined. This creates a joined record containing information about two suppliers of a single part. The user can spot those records for which the price is double, or greater than double, that of another supplier.

Records in the **SUPPLIERS** file are compared, one by one, with all the records (including itself) in the **SUPPLIERS** file. When the same part number is found, the two corresponding records are linked. This processing is performed for each record in the **SUPPLIERS** file.

For each record, the first supplier's price is compared with the second supplier's price. When the first supplier's price is double, or greater than double, that of the second, only the record containing the first supplier price is kept.

The final result is as follows:

Field:	T1.PARTNO	T1.SUPPNO	T1.PRICE	T2.SUPPNO	T2.PRICE
	-----	-----	-----	-----	-----
Record 1:	221	51	.30	54	.10
2:	231	51	.10	54	.04
3:	241	53	.08	54	.02
4:	241	61	.05	54	.02

Specifying Records to Be Included in a Group

You might want to limit which records will be included in a group. To do so, use **WHERE**. For example, the following example transfers the average and lowest prices of each part for those records for which the delivery time (**DELIVTIME**) is less than 30 days.

Library/File (Member)

SUPPLIERS

GROUP BY

PARTNO

SELECT

PARTNO, AVG(PRICE), MIN(PRICE)

WHERE

DELIVTIME < 30

The result is as follows:

	Field: PARTNO	AVG(PRICE)	MIN(PRICE)
	-----	-----	-----
Record 1:	221	.25	.20
2:	231	.10	.10
3:	222	.23	.20
4:	232	.10	.10
5:	241	.07	.05
6:	209	18.75	18.00
7:	285	21.00	21.00
8:	295	8.50	8.50
9:	207	29.00	29.00

Note that the conditions specified in **WHERE** are checked first, then the records that satisfy those conditions are included in the group.

Specifying Summary Records to Be Transferred

In some cases, you might want to transfer only summary records that satisfy certain conditions. The use of **HAVING** enables the selection of which summary records are to be transferred. **WHERE** is applied to certain records in a group, while **HAVING** is applied only to summary records.

The following example transfers the highest and lowest prices for each part. However, the summary records to be transferred are only those for which the highest price exceeds 10.00.

Library/File (Member)

SUPPLIERS

GROUP BY

PARTNO

SELECT

PARTNO, MAX(PRICE), MIN(PRICE)

HAVING

MAX(PRICE) > 10.00

The following table shows the result of removing unnecessary summary records by using **HAVING**.

	Field: PARTNO	MAX(PRICE)	MIN(PRICE)
	-----	-----	-----
Record 1:	209	19.50	18.00
2:	285	21.00	21.00
3:	207	29.00	29.00

One summary record for an entire file can be transferred. To do this, specify only the summary function in **SELECT** and nothing in **GROUP BY**. As a result, an entire file can be recognized as one group, while one summary record can be transferred for the group.

You can concurrently use the concept of summarizing groups and that of joining records from several files. To obtain the desired results, do as follows:

1. Specify a file in **FROM**, and specify the join conditions to join the records in **JOIN BY**.
2. Specify the conditions in **WHERE** to remove unnecessary records.
3. Specify the fields used for grouping the remaining records in **GROUP BY**.
4. Specify the function in **SELECT**, then create summary records.
5. Specify the conditions in **HAVING** to remove unnecessary records.

6. Specify the items for grouping the final summary records in **ORDER BY**.

Functions Available from Pull-Down Menu

The following section provides a simple explanation of the menu bar of the AS/400>PC Transfer window and PC>AS/400 Transfer window.

File

Transfer request files can be processed.

Create

This item creates a transfer request file.

Open This item displays the contents of an existing transfer request file.

Save, Save As

These items save the current settings to the transfer request file being used or to a new transfer request file, respectively.

Exit This item terminates the operation started by selecting the **Data Transfer** icon.

Setup (Only for AS/400>PC Transfer)

User options

Time, date, and numeric value format for receiving can be specified. The following paragraphs describe each item.

Ignore Decimal Data Error

This item specifies whether decimal data errors found in packed or zoned decimal fields upon executing requests are to be ignored. Selecting **Yes** to ignore decimal data errors and using existing indices can considerably reduce the time needed to execute a request. If this item is not specified, the transfer request creates indices again and modifies any detected decimal data errors. This requires extra processing time.

Time Format

This item specifies a desired time format for fields of AS/400 field type having a selected time. If no time format is specified, the default value in the workstation's national information file is assumed when the transfer request starts, and that in an existing transfer request is assumed when the request is called again.

Supported time formats are as follows:

HMS Hours, minutes, seconds (hh:mm:ss)

ISO International Standard Organization (hh.mm.ss)

USA USA Standard (hh:mm AM or PM)

EUR IBM European Standard (hh.mm.ss)

JIS Japanese Industrial Standard (hh:mm:ss)

DDS AS/400 DDS (Format given by AS/400 file attribute)

DFT AS/400 default format (Host job default is used)

Time separator

This item specifies enabled delimiters when fields of the AS/400 field type for the selected time are of the format type for which delimiters can be specified.

When no delimiters are specified, the default value in the workstation's national information file is assumed when the transfer request starts, and that in an existing transfer request is assumed when the request is called again.

Supported time delimiters are as follows:

Colon

(:)

Period

(.)

Comma

(,)

Blank

()

Null (NULL) No Separator

Default value

(DFT) AS/400 Default Separator

Date Format

Specifies the date format for fields of AS/400 field type for the selected date.

If this date format is not specified, the default value in the workstation's national information file is assumed.

Supported values are as follows:

MDY Month, day, year (mm/dd/yy)

DMY Day, month ,year (dd/mm/yy)

YMD Year, month, day (yy/mm/dd)

JUL Julian (yy/ddd)

ISO International Standard Organization (yyyy-mm-dd)

USA USA Standards (mm/dd/yyyy)

EUR IBM European Standard (dd.mm.yyyy)

JIS Japanese Industrial Standard (yyyy-mm-dd)

DDS AS/400 DDS (Format given by AS/400 file attribute)

DFT AS/400 default format (Host job default is used)

Date separator

This item specifies delimiters when fields of the AS/400 field type for the selected date are of the format type for which delimiters can be specified.

When no date delimiters are specified, the default value in the workstation's national information file is assumed when the transfer request starts, and that in an existing transfer request is assumed when the request is called again.

Supported date delimiters are as follows:

Slash (/)

Dash (-)

Period
(.)

Comma
(,)

Blank
()

Null (Null) Delimiters are not used.

DFT (DFT) AS/400 default separator

Decimal separator

This item specifies the decimal point character in an AS/400 field whose type is packed decimal or zoned decimal.

When decimal points are not specified, the default value in the workstation's national information file is assumed when the transfer request starts, and that in an existing transfer request is assumed when the request is called again.

Supported decimal point delimiters are as follows:

Period
(.)

Comma
(,)

DFT (DFT) - Default decimal separator

Sort Sequence

Specify which sort sequence should be used for this transfer request.

AS/400 job default

Sort by the table identified on the AS/400 system as the job sort table.

Hexadecimal

Sort by the internal hexadecimal representation.

User specified table

Sort by the table identified by the user in a subsequent prompt.

Shared Weight Table

Sort by the shared weight table associated with the language named in a subsequent prompt.

Unique Weight Table

Sort by the shared unique table associated with the language named in a subsequent prompt.

Changing the sort sequence affects the order in which records appear *only* if the **ORDER BY** clause is being used. The sort sequence affects all character comparisons that depend on the order of the alphabet. Such comparisons can occur in the **WHERE** clause, the **GROUP BY** clause, the **HAVING** clause, the **JOIN BY** clause, the **IN** predicate, the **LIKE** predicate, the **BETWEEN** predicate, the **MAX** function, and the **MIN** function. Comparison operations are =, , >, >=, and >=.

Sort Sequence Table Name

Type the name of the sort sequence table that you want to use for this transfer request. The format of the table name should be library/table. *LIBL and *CURLIB are allowed for the library name.

Language

AS/400 standard tables provide many languages. Select the user-specified languages to enter the desired language ID. Language IDs shipped with AS/400 are found in the *AS/400 NLS Guide*.

Language ID

Enter the language ID for the desired language.

AS/400 standard tables provide many languages. Language IDs shipped with AS/400 are found in the *AS/400 NLS Guide*.

Translation Table

Translation tables for ASCII-to-EBCDIC translation or for EBCDIC-to-ASCII translation can be specified, created, and customized. The following paragraphs describe each item.

Current Table

This item specifies whether the IBM default translation or the user-defined translation table is to be used.

Host Code Page

This item specifies the host code page to be used for translation.

Workstation Code Page

This item specifies the workstation code page to be used for translation.

File Name

This item specifies the file name of the user-defined table to be used for translation.

- To list all files in your workstation, select **Browse**.
- To customize the translation table, select **Customize**.

File-Description Files

A file-description file is a workstation file that contains all field descriptions of the data in the corresponding workstation data file. Each field descriptor contains the field name, data type, and field length. There is one field descriptor for each field in the workstation file.

A file-description file defines:

- File type of the workstation file to be transferred. For an explanation of each file type, see "File-Description Files".
- Field names and order of these fields in each data record.
- Data type of each field in the workstation file.
- Size and number of decimal places of each field.

The workstation files require field definitions when the files are transferred. The field definitions describe the file as it exists on the workstation. These definitions contain data that is similar to the field definitions (DDS) required by AS/400 system files. The data must be defined for both the AS/400 system and the workstation files, because the field names from each file are needed to send the data to the AS/400 system and the data in each file might be in different formats.

A file-description file is created on request during the transfer process of data from an AS/400 file to a workstation file. Therefore, you usually do not need to worry about the contents or the format of the file-description file. However, if you transfer data that has not been previously transferred to the system, you must create a file-description file.

Creating a File-Description File

You can create a file-description file using a workstation text editor. The file-description file must be an ASCII text file. Therefore, each record must end with a carriage return (CR) character (hex 0D) followed by a line feed (LF) character (hex 0A). All tab characters (hex 09) are treated as ASCII spaces. The last byte of the file must contain an end-of-file (EOF) character (hex 1A). Workstation editors that create ASCII text files usually use these special character designators, so normally you do not need to be concerned about them.

File-Description File Format

The format of the file-description file is as follows:

```
PCFDF [comment]
PCFT file-type-indicator [comment]
PCFO time-format,time-separator, date-format, date-separator, decimal-separator [comment]
PCFL field-name-1 data-type-1 length-1[/decimal-position-1] [comment]
.
.
.
PCFL field-name-n data-type-n length-n[/decimal-position-n] [comment]
[* comment]
```

Items within brackets are optional. Use either uppercase or lowercase characters anywhere in the file.

PCFDF Entries

PCFDF is a keyword that identifies this file as a workstation file-description file. It must appear in the first line of the file, starting in column 1. A comment is the only other entry allowed on the first line. If you type a comment, it must be separated from the PCFDF keyword by a space.

PCFT Entries

PCFT is a keyword that identifies this record as containing the file type indicator. It is followed by an indicator identifying the type of file in which the data is stored. It must appear only once, and must start in column 1, after the PCFDF record and before any PCFL records. An optional comment can follow this file-type indicator if separated from the indicator by at least one space.

Following is an example of a PCFT entry:

```
PCFT 4 BASIC RANDOM FILE
```

Table 17 shows the valid file-type indicators.

Table 17. File-Type Indicators

Indicator	File Type
1	ASCII text
2	DOS random
3	BASIC sequential
4	BASIC random

Table 17. File-Type Indicators (continued)

Indicator	File Type
5	Data interchange format (DIF**)
6	No-conversion file
7	Reserved
8	DOS random type 2
9	BIFF format

PCFO Entry

The PCFO entry is optional. PCFO is a keyword that identifies this record as containing information about the date and time formats, time stamp, and separator characters for applicable formats. It must appear only once and must start in column 1, after the PCFT record and before any PCFL records. If there is no PCFO entry, the information or characters assigned as defaults for the host system are used.

Table 18 shows the valid time formats.

Table 16-2.

Table 18. Time Formats

Indicator	Format Name	Time Format
1	HMS	hh:mm:ss
2	ISO - International Standards Organization	hh.mm.ss
3	USA - USA standard	hh:mm AM or PM
4	EUR - European	hh.mm.ss
5	JIS - Japanese Industrial Standard Christian Era	hh:mm:ss
6	DDS	Format given by AS/400 file attribute
7	DFT	Host job default is used
*	Unspecified	Host job default is used

Table 19 shows the valid time separators.

Table 19. Time Separators

Indicator	Separator
1	Colon (:))
2	Period (.))
3	Comma (,))
4	Blank ())
5	Null (N)
6	Default (D) (host job default)
*	Unspecified (host job default)

Table 20 shows the valid date formats.

Table 20. Date Formats

Indicator	Format Name	Date Format
1	MDY	mm/dd/yy
2	DMY	dd/mm/yy
3	YMD	yy/mm/dd
4	Julian	yy/ddd
5	ISO	yyyy-mm-dd
6	USA	mm/dd/yyyy
7	EUR	dd.mm.yyyy
8	JIS	yyyy-mm-dd
9	DDS	Format given by AS/400 file attribute
10	DFT	Host job default is used
*	Unspecified	Host job default is used

Table 21 shows the valid date separators.

Table 21. Date Separators

Indicator	Separator
1	Slash (/)
2	Dash (-)
3	Period (.)
4	Comma (,)
5	Blank ()
6	Null (N)
7	Default (D) (host job default)
*	Unspecified (host job default used)

Table 22 shows the valid decimal separators.

Table 22. Decimal Separators

Indicator	Separator
1	Period (.)
2	Comma (,)
*	Unspecified (workstation default used)

Following is an example of a PCFO entry:

PCFO 1,1,1,1,1 OPTIONS SETTINGS

PCFL Entries

PCFL identifies a definition for a field. Enter a PCFL entry in the file-description file for each field in the data file. The PCFL records must be in the same order as the fields they define in the data file.

Define as many as 256 PCFL records in the file-description file and start PCFL records in column 1. If you enter more than 256 PCFL records, you receive an error message. You cannot continue a record on one line, and only the first 80 characters of a record are used.

Following is an example of a PCFL entry:

```
PCFL CUSTNAME 1 20 CUSTOMER NAME
```

Each PCFL entry contains the following things:

- The keyword, PCFL, starting in column 1 and followed by a space. This identifies the record as a field description.
- The field name, followed by a space. This must match the name that exists in the field definitions on the AS/400 system and can be from 1 to 10 characters.
- The indicator for the data type. Table 23 shows the indicators that represent the data type of the data in the field. Follow the specified indicator with a space.
- The size of the field (in bytes) as it is stored in the workstation file. The length specification can be from 1 to 4 characters.

Table 23. Data Type Indicators

Indicator	Data Type
1	ASCII(1)
2	ASCII numeric
3	Hexadecimal
4	Binary
5	Zoned
6	Packed
7	BASIC integer
8	BASIC single-precision floating point
9	BASIC double-precision floating point
10	EBCDIC
11	EBCDIC zoned
12	EBCDIC packed
Note: (1) Includes date, time, and time stamp except for files that are not converted. The data type indicator you enter must be valid for the file type entered earlier. Any other data types are not valid and are diagnosed as errors during a data transfer to the AS/400 system.	

Table 24 shows the valid single-byte character set (SBCS) data types for each file.

Table 24. Valid SBCS Data Types for File Types

File Type	Valid Data Type
ASCII text	ASCII ASCII numeric
DOS random	ASCII Binary Hexadecimal Packed Zoned
BASIC sequential	ASCII ASCII numeric
BASIC random	ASCII BASIC double-precision floating point BASIC integer BASIC single-precision floating point Hexadecimal

Table 24. Valid SBCS Data Types for File Types (continued)

File Type	Valid Data Type
DIF	ASCII ASCII numeric
No-conversion	Binary EBCDIC EBCDIC packed EBCDIC zoned Hexadecimal
DOS random type 2	ASCII Binary Hexadecimal Packed Zoned
BIFF format	ASCII ASCII numeric
Note: ASCII (SBCS) includes date, time, and time stamp types if converted. EBCDIC includes date, time, and time stamp if not converted.	

For numeric fields in BASIC sequential and DIF files, a size specification must be present. However, because the data in these fields is of variable length, the data transfer function assumes a maximum length of 65 characters. This length more than covers the largest possible exponential ASCII numeric value. The size specifications for character fields must be the maximum size of any data item in that field.

Table 25 shows the allowed data length limits for each workstation data type. These are the maximum lengths you can specify for size in the PCFL entry.

Table 25. Allowable Data Length Limits for Personal Computer SBCS Data Types

Personal Computer Data Type	Data Length Limit (in Bytes)
ASCII	4093
ASCII numeric	33 (65 for DIF and BASIC sequential)
BASIC double-precision	8 (only allowed length)
BASIC integer	2 (only allowed length)
BASIC single-precision	4 (only allowed length)
Binary	4
EBCDIC	4093
Hexadecimal	2048
Packed decimal (ASCII and EBCDIC)	16
Zoned decimal (ASCII and EBCDIC)	31
Time	
HMS (see note 1)	8
USA	8
ISO, EUR, and JIS (see note 1)	8
DDS, DFT	8 or 10 (see note 2)
Date	
MDY, DMY, YMD	8
Julian	6 (only allowed length)
ISO, EUR, JIS, USA (see note 1)	10
DDS, DFT	6, 8, or 10 (see note 2)
Time stamp	26

Table 25. Allowable Data Length Limits for Personal Computer SBCS Data Types (continued)

Personal Computer Data Type	Data Length Limit (in Bytes)
Notes:	
1	These abbreviations appear in the time and date parameter sections.
Abbreviation Description	
HMS	Hours Minutes Seconds
EUR	IBM European Standard
JIS	Japanese Industrial Standard Christian Era
ISO	International Standards Organization
2	The length is determined by the format defined in the host file for DDS, or from the AS/400 job default (DFT keyword).

Table 26 shows the allowed data length limits for each AS/400 data type.

Table 26. Allowable Data Length Limits for AS/400 Data Types

AS/400 Data Type	Data Length Limit in Bytes (see note 1)
Binary	2 or 4 (only allowed lengths)
EBCDIC	4096
Hexadecimal	2048
Packed decimal (EBCDIC)	16
Zoned decimal (EBCDIC)	31
Time	
HMS	8
USA	8
ISO, EUR, and JIS	8
DDS, DFT	8 or 10 (see note 2)
Date	
MDY, DMY, YMD	8
Julian	6 (only allowed length)
ISO, EUR, JIS, USA	10
DDS, DFT	6, 8, or 10 (see note 2)
Time stamp	26
Notes:	
1	The data length limits for the workstation and the system data fields are different in some cases. For these cases, the transfer function attempts to fit the workstation data into the system field. If the data does not fit into the field, a message is displayed. Refer to “Data Conversions” on page 346 for more details.
2	The length is determined by the format defined in the host file for DDS, or from the AS/400 job default (DFT keyword).

If there is a decimal position associated with the data in that field, place a forward slash (/) and then the number of decimal positions after the length specification. There are no spaces between the length, slash, and decimal position specifications.

The decimal position specification refers to the number of positions from the right-hand byte of the resulting decimal number. Do not specify a decimal position for floating-point numbers unless the data type is one of the following types:

- ASCII numeric
- Binary
- Packed
- Zoned

Note: The number of decimal positions in a field ranges from 0 to 9 or the maximum number of decimal digits in this number, whichever is smaller. The data transfer function might round the number to fit it into the field. Refer to “Data Conversions” for more details.

Comment Entries

Enter comment lines anywhere in the file-description file, observing the following restrictions:

- The last element of the field-descriptor entry specification is a comment. This is an optional entry for your information only, and must be separated from the size entry by a space. PCFL entries created by the data transfer function (RTOPC) do not contain a comment field.
- Precede the comment with an asterisk (*) as the first nonspace character in the line.
- Do not exceed 80 characters in length.
- Do not make the comment the first record in the file-description file.

Following is an example of a comment:

* This is a comment

Example

Following is an example of a file-description file for an inventory file:

```
PCFDF
PCFT 3 BASIC SEQUENTIAL FILE
* ITEM INVENTORY FILE
PCFO 1,1,1,2,1 OPTIONS SETTINGS
PCFL ITEMNO 2 8 ITEM NUMBER
PCFL ITEMDESC 1 20 DESCRIPTION OF ITEM
PCFL COLOR 1 8 COLOR
PCFL WEIGHT 2 7/2 ITEM WEIGHT
PCFL PRICE 2 7/2 PRICE PER ITEM
PCFL INSTOCK 2 6 ITEMS IN STOCK
```

Data Conversions

The data transfer function needs data conversions for transferring data from the system to the workstation, and vice versa. For both types of transfers, the necessary conversion depends on the record size, the type of data being transferred, the type of workstation file being used, the system data type, and, in some cases, the data length.

Record Size

Each transferred record contains data indicating whether each field contains a null value. There is a restriction on the maximum data record that can be sent or received from the AS/400 system because of this data.

The following formula determines the maximum record length that can be transferred:

$$4096 - (\text{number of fields in the record} + 2) = (\text{maximum record length})$$

Data Types

The data transfer function supports the following system data types:

- Binary data
- Character data
- Date
- Hexadecimal data
- Packed decimal data
- Time
- Time stamp
- Zoned decimal data

The data transfer function supports the following workstation data types:

- ASCII numeric data
- BASIC numeric data, including:
 - Double-precision data
 - Integer data
 - Single-precision data
- Binary data
- Character data, including:
 - ASCII
 - EBCDIC
- Hexadecimal data
- Packed decimal data
- Zoned decimal data

ASCII Numeric Data

The data transfer function defines ASCII numeric data to represent any numeric value stored in ASCII format. This is not a valid AS/400 system data type. The number -123.45 in ASCII format is:

2D 31 32 33 2E 34 35

The decimal point and sign are stored explicitly for ASCII numeric data. The character on the left displays the sign (space or plus (+) for positive, minus (-) for negative). Leading zeros to the left of the decimal point change to spaces. The decimal point, if any, is added in the correct position.

BASIC sequential and DIF file types also support another form of ASCII numeric data called exponential numbers.

An exponential number is a decimal number followed by the letter E or D and a signed integer of two or three digits. E represents a single-precision number and D represents a double-precision number. The exponent portion (E or D and the integer) represents "times 10 to the power of the integer specified".

For example, the number -1.0E+03 (representing -1.0×10^3) in ASCII numeric format) is:

2D 31 2E 30 45 2B 30 33

For example, the number 9.5D-15 (representing 9.5×10^{-15}) in ASCII numeric format) is:

39 2E 35 44 2D 31 35

Binary Data

This data represents signed or unsigned numbers in twos complement form. Binary numbers of 1, 2, 3, or 4 bytes in length are allowed on the workstation, but the AS/400 system allows only numbers 2 or 4 bytes in length. The bit on the left side of the high-order bit determines the sign of the number (0 for positive, 1 for negative). The system stores the data with the high-order byte on the left side of the field, whereas the workstation stores the data with the high-order byte in the right-hand position of the field.

The decimal position, if specified by the file description, represents the number of decimal digits to the right of the decimal point. The file description specifies the presence of a decimal position.

For example, the binary number 3BF5 is equivalent to the decimal number 15349, and the binary number FFB4 is equivalent to the decimal number -76.

Character Data for SBCS

You can think of this data as a string of bits that represents particular characters and symbols.

The tables used to translate characters from ASCII to EBCDIC and from EBCDIC to ASCII contain the following kinds of values:

- Values where the workstation ASCII characters and AS/400 EBCDIC characters match exactly
- Values where a substitute character is chosen for a character that cannot be translated

The data transfer function uses tables to translate data from ASCII to EBCDIC and EBCDIC to ASCII. You can change these default tables using the translation table utility (TRTABLE).

Note: ASCII (SBCS) data includes date, time, and time stamp types if converted. EBCDIC data includes date, time, and time stamp if not converted.

Double-Precision Data

Double-precision data is defined only for the workstation. The AS/400 system does not support this data type. BASIC applications use double-precision data. This data type is a positive or negative number from $2.938735877055719 \times 10^{-39}$ to

$1.701411834604692 \times 10^{(38)}$. Double-precision numbers are stored in 8 bytes, with 7 bytes representing the mantissa and 1 byte representing the exponent.

Date, Time, and Time-Stamp Data Types

Date, time, and time-stamp values can be used in certain arithmetic and character operations and are compatible with certain character constants, but they are neither characters nor numbers.

A date is a three-part value (year, month, and day) designating a point in time on the calendar. The range of the year is 0001 to 9999. The range of the year for a non-SAA format is 1940 to 9999. The range of the month is 1 to 12. The range of the day is 1 to x , where x depends on the month.

A time is a three-part value (hour, minute, and second) designating a time of day under a 24-hour clock. The range of the hour is 0 to 24 and the range of the other values is 0 to 59.

A time stamp is a seven-part value (year, month, day, hour, minute, second, and microsecond) that designates a date and time including the specified microseconds. The maximum length of the time stamp is a character string of 26.

Dates, times, and time stamps can be assigned to result fields. A valid character-string representation of a date can be compared with a date field, or a valid character-string representation of a time can be compared with a time field.

Hexadecimal Data

You can think of this data as a string of bits representing base 16 numbers. For example, you can represent hex 3D with the following string of bits:

0011 1101

Integer Data

Integer data is defined only for the workstation. BASIC applications use integer data. Integer data is stored in 2 bytes and represents a whole number from -32768 to 32767.

Packed Decimal Data

For both the AS/400 system and the workstation, each half-byte represents a value from 0 through 9. The hexadecimal value in the half-byte on the right side of the right-hand byte specifies the sign.

For the AS/400 system, a value of hex B or hex D in this half-byte represents a negative number.

For DOS random files, only the last half-byte (the half-byte that contains the sign) is changed. For the sign half-byte, the workstation uses hex 3 to indicate a positive number or hex B to indicate a negative number.

For example, X'0865431F' appears as X'08654313'.

For DOS random type-2 files, the last half-byte (the half-byte that contains the sign) is not changed. The sign convention used on the workstation and on the host system is the same.

For example, X'0865431C' appears as X'0865431C'.

The decimal position, if specified, represents the number of decimal digits to the right of the decimal point. The presence of a decimal position is specified in the file description.

Single-Precision Data

Single-precision data is defined only for the workstation. The AS/400 system does not support this data type. BASIC applications use single-precision data. This data type is a positive or negative number from $2.938736 \times 10^{(-39)}$ to $1.701412 \times 10^{(38)}$. Single-precision numbers are stored in 4 bytes, with 3 bytes representing the mantissa and 1 byte representing the exponent and sign.

Zoned Decimal Data

This data is represented in a form in which each byte corresponds to one decimal digit. Each of these bytes is stored in character form. For example, the digit 7 is stored on the AS/400 system as F7, which is the EBCDIC representation, and is stored on the workstation as 37, which is the ASCII representation.

The size of each digit is determined by its half-byte on the right side. Valid values for the half-bytes are decimal 0 through 9.

The sign in both the AS/400 system and workstation zoned decimal fields is specified by the hexadecimal value in the left half-byte of the right byte of the field. For the AS/400 system, a hex B or hex D in this half-byte represents a negative number (for example, X'F6D2' represents -62).

For DOS random files, zoned decimal fields from the system change from EBCDIC to ASCII, as do character fields, except that the sign half-byte in the workstation field is changed to a hex 3 to indicate a positive number or a hex B to indicate a negative number.

For DOS random type-2 files, zoned decimal fields from the system change from EBCDIC to ASCII, as do character fields, except that the sign half-byte in the workstation field is changed to a hex 3 to indicate a positive number or a hex 7 to indicate a negative number.

The decimal position, if specified, represents the number of decimal digits to the right of the decimal point and is specified by the file description.

Personal Computer File Types

The following workstation file types are supported:

- ASCII text files
- BASIC random files
- BASIC sequential files
- DIF files
- BIFF files
- DOS random files
- DOS random type-2 files
- No-conversion files

ASCII Text Files

ASCII text files are normally used with programs that work with text (such as editors and print routines). The characteristics of an ASCII text file are as follows:

- Records consist of ASCII characters.
- A carriage return character (hex 0D) and a line feed character (hex 0A) delimit each record from the next. The character for end-of-file is hex 1A.
- Workstation records in an ASCII file can be variable in length due to truncation of trailing blanks at the end of an AS/400 record.

Transferring Data to ASCII Text Files: When you create an ASCII text file, the data coming from the AS/400 system changes as follows:

- Hexadecimal fields change to equivalent ASCII characters for each half-byte. For example, X'D3' expands to ASCII 4433 and is written to the file. When displayed by an editor or printed, the string appears as D3.
- EBCDIC character fields change byte by byte and are mapped into ASCII characters as defined by the translation tables.
- Date, time, and time-stamp data is mapped into ASCII characters as defined by the translation tables.
- Variable-length and null fields are converted to fixed lengths, and trailing blanks (for character, hexadecimal, date, time, and time-stamp data) or zeros (for binary, zoned, and packed,) are added to the maximum length of the field.

Note: Some nondisplayable EBCDIC characters are translated into ASCII control characters on the workstation. If EBCDIC character fields contain nondisplayable data, you might get unexpected results and your ASCII text file might appear to be corrupted.

For example, X'05' in an EBCDIC field is translated to an ASCII X'09', which is an ASCII control character for horizontal tab. Most workstation text editors process this tab character so that the data in your workstation text file appears to be shifted to the right when viewed.

One possible solution to this problem is to define these fields on the host system as hexadecimal fields instead of character fields.

- Binary fields change to ASCII numeric. For example, X'FFD3' with no decimal position expands to ASCII 2020202020202020D3435. When displayed by an editor or printed, the string appears as -45.

Note: The length of the ASCII field depends on the length of the binary field.

A binary field on the AS/400 system is either 2 or 4 bytes long. The resulting ASCII field length is from 6 to 11 bytes, including the sign. Another byte is added for a decimal point.

Table 27 shows the mapping between binary field lengths and their ASCII lengths.

Table 27. Binary-to-ASCII Field Length Mapping

Binary Length	ASCII Length	Value Range
2	6	-32768 to 32767
4	11	-2147483648 to 2147483647

- Zoned decimal fields are changed to ASCII numeric. For example, EBCDIC F0F0F9F5F2D6 with a field length that indicates two digits to the right of the decimal point expands to ASCII 20202D39352E3236. When displayed by an editor or printed, the string appears as -95.26. The resulting workstation field length is equal to the length of the system field plus 1 for the sign and 1 for the decimal point, if specified.
- Packed decimal fields change to ASCII numeric. For example, X'871D' (no decimal point) changes to ASCII 2D383731. When displayed by an editor or printed, the string appears as -871.
Since two decimal digits are packed into 1 byte, the length of the resulting workstation field is equal to two times the length of the AS/400 field, plus 1 for the decimal point (if specified). This length always includes the sign. A minus sign (-) indicates negative, and a space indicates positive.

Transferring Data from ASCII Text Files: When you transfer data from ASCII text files to system files, the data changes as follows:

- ASCII character data changes to EBCDIC character, date, time, or time-stamp data (based on the AS/400 field type) on a byte-to-byte basis, or to hexadecimal data by changing 2 ASCII bytes into 1 hexadecimal byte.
- ASCII numeric data changes to AS/400 binary, zoned decimal, or packed decimal data, depending on the specified data type.

The field lengths on the AS/400 system and the workstation are different because of the explicit way minus signs and decimal points are stored in ASCII numeric fields. Each field changes individually, to ensure that the resulting field length matches the specifications for that field. The data transfer function tries to fit the workstation data into the system field.

- For null-capable AS/400 fields, null values (except date, time, and time stamp) cannot be reliably detected and are not uploaded. For variable-length AS/400 fields, trailing blanks are removed and the field is converted to the variable-length format.

Errors When Transferring Data from ASCII Text Files: When you transfer data from a workstation ASCII text file to an AS/400 file, the following errors can occur:

- A data field in the ASCII text file is too long for a field in the AS/400-defined file. In this case, the data is truncated. This occurs when the description file defines the character data as longer than the field length specified for the system file.

If the data transfers to an EBCDIC field, this error occurs only if the extra bytes are not spaces.

If the data transfers to a hexadecimal field, this error occurs only if the extra bytes are not zeros. These extra bytes are truncated so the data fits into the specified field.

- The value of numeric data is too large for the system field. The maximum value is used. This error occurs when:
- Numeric data in the field does not fit into the specified number of bytes for the field.
- The decimal value of a numeric field contains more digits than were specified for the field.

The value of the field is set to the maximum value possible for the number of bytes and digits specified by the AS/400 system.

- Data in this field has too many decimal positions. The number is rounded. This error occurs when the number of decimal positions in the field is greater than

the number of decimal positions specified on the AS/400 system. These extra bytes are significant because the data rounds up if the first extraneous digit is 5 or greater, and rounds down if it is less than 5.

- Data in this field is incorrect or does not match the data type. This error occurs when:
- Nonnumeric data is found in a field that the file descriptions defined as numeric. The transfer request ends to prevent transferring incorrect data to the file.
- ASCII numeric data is found that does not match the format the file description specified. An incorrectly positioned decimal point within the field could cause this error.
- A value other than X'30' through X'39', minus, plus, or decimal point is found. A duplicated decimal point or minus is found. The transfer request ends to prevent transferring incorrect data to the file.
- Data for this field is missing. The default values are used. This error occurs when a data field is defined, but the data is not in the file. This means that the end of the record is reached before all of the defined data is found.

The field or fields for which data has been defined but not found then fill with default values and transfer to the file. The default values are EBCDIC spaces for character fields, or zeros for numeric and hexadecimal fields.

To supply your own default values, use the default (DFT) keyword in the data description specifications (DDS) for the file.

- Extra data is found at the end of this record. The extra data is not transferred. Data found at the end of this record and not defined by the system data definitions or workstation file-description file is not transferred to the system file, because no definitions exist to define the data and how it should change.

When you transfer data from an ASCII text file to an AS/400 file without using a file-description file, any extra data found past the record length specified for the file is not transferred.

BASIC Random Files

BASIC random files are the most general-purpose BASIC file type. They contain fixed-length records with:

- No delimiters between fields or records
- No end-of-file marks

Transferring Data to BASIC Random Files: When you create a BASIC random file, system data changes as follows:

- Hexadecimal fields do not change.
- Change from a system binary field depends on the field length:
- Fields of 2 bytes, with no decimal positions to the right of the decimal point, change to 2-byte BASIC integer values. The only change is that the order of the bytes reverses.
- Fields of 2 bytes, with decimal positions to the right of the decimal point, change to BASIC single-precision numbers.
- Fields of 4 bytes change to BASIC double-precision numbers.
- EBCDIC character, date, time, and time-stamp fields change byte by byte and are mapped into ASCII characters as defined by the translation tables.
- Variable-length and null fields are converted to fixed lengths, and trailing blanks (for character, hexadecimal, date, time, and time-stamp data) or zeros (for binary, zoned, and packed data) are added to the maximum length of the field.

- Zoned decimal fields change into one of the following BASIC variables depending on the field length and the number of decimal positions:
- Zoned decimal fields of 4 bytes or less with no positions to the right of the decimal point change to a BASIC integer of an equivalent value.
A zoned decimal field of 4 bytes or less, but with a decimal point, falls into the following category.
- Zoned decimal fields up to 7 bytes (including those that did not fall into the previous category) change to a BASIC single-precision number of an equivalent value.
- Zoned decimal fields greater than 7 bytes change to a BASIC double-precision number of an equivalent value.
- Packed decimal fields change into one of the following BASIC variables depending on the length of the field:
- Packed decimal fields of 2 bytes or less with no positions to the right of the decimal point change to a BASIC integer of an equivalent value.
A packed decimal field of 2 bytes or less, but with a decimal point, falls into the following category (up to 4 bytes).
- Packed decimal fields of up to 4 bytes (including those that did not fall into the previous category) change to a BASIC single-precision number of an equivalent value.
- Packed decimal fields greater than 4 bytes change to a BASIC double-precision number of an equivalent value.

Note: Changes between binary, packed decimal, and zoned decimal numbers with decimal points are not equivalent to their BASIC number counterparts, because BASIC uses a binary number format that does not always change into exact decimal fractions.

Transferring Data from BASIC Random Files: When you transfer data from BASIC random files to system files, the data changes as follows:

- Hexadecimal fields transfer to the system file as unchanged hexadecimal data. The field lengths as stored on the workstation should be the same as the field lengths as stored on the system.
- ASCII character, date, time, and time-stamp data changes to EBCDIC character data byte by byte.
- For null-capable AS/400 fields, null values (except date, time, and time stamp) cannot be reliably detected and are not uploaded. For variable-length AS/400 fields, trailing blanks are removed and the field is converted to the variable-length format.
- Numeric fields from BASIC random files (BASIC integers, single-precision floating-point numbers, and double-precision floating-point numbers) change to system binary data, zoned decimal data in EBCDIC format, or packed decimal data in EBCDIC format.

Note: Because the change of floating-point numbers into decimal fractions is not always exact, each number automatically changes into the most precise number possible with respect to the system field length. If you want more precision, specify a larger system field size.

Errors When Transferring Data from BASIC Random Files: When you transfer data from a workstation BASIC random file to a system file, the following errors can occur:

- Data in this field is too short for the system field. The data is padded. This error occurs when the file contains character or hexadecimal data shorter than the field length specified on the system. This error can occur if the workstation field is defined as shorter than the system, or if the data in the last record of the file is too short. Character fields are padded on the right with EBCDIC spaces, and hexadecimal fields are padded with zeros.
- Data in this field is too long for the system field. The data is truncated. This error occurs when the workstation file-description file defines character or hexadecimal data as longer than the field length specified on the system.
For character data, this error occurs only if the extra bytes are not spaces. For hexadecimal data, this error occurs only if the extra bytes are not zeros. These extra bytes are then truncated so that the data fits into the specified AS/400 field.
- The value of numeric data is too large for the system field. The maximum number is used. This error occurs when:
- Numeric data in the workstation field does not fit into the specified number of bytes for the system field.
- The decimal value of a numeric field contains more digits than are specified for the system field.
- Data in this field has too many decimal positions. The number is rounded down to zero. In BASIC random processing, this error occurs if the value of the number is too small to fit into the specified field.
For example, the number 0.00001 does not fit into a system zoned field specified as being 2 bytes in length and 2 decimal positions to the right of the decimal point. In this example, the resulting value is zero.
- Data for this field is missing. The default values are used. This error occurs when a data field is defined, but the data is not in the file. This means that the end of the file is reached before all of the defined data is found. For BASIC random files, this error occurs only on the last record in the file, since there are no explicit record delimiters.
When this error occurs, the field or fields for which data is defined, but not found, are filled with default values and are transferred to the AS/400 file. These default values are EBCDIC spaces for character fields and zeros for numeric fields.
To supply your own default values, use the Default (DFT) keyword in the DDS for the file.

When you transfer data from a BASIC random file to an AS/400 file, any data shorter than the record length defined for the system file is padded with EBCDIC spaces.

Because there are no record delimiters in BASIC random files, this error can occur only on the last record of the file. This probably indicates that the record length of the system file does not match the record length of the workstation file.

BASIC Sequential Files

BASIC uses BASIC sequential files for sequential processing (for example, INPUT and WRITE statements). The fields written are considered either character or numeric. Characteristics of BASIC sequential files are as follows:

- Both numeric and character fields are written as displayable characters. However, character strings are distinguished from numeric strings by the ASCII double quotation marks (X'22') that surround them.

Therefore, character data in BASIC sequential files cannot contain ASCII double quotation marks, because they are interpreted as the end of the character string.

- Fields are delimited by ASCII commas (X'2C'). Therefore, commas are not allowed as date, time, or decimal separators.
- Each record is delimited from the next by a carriage return character (X'0D') and a line feed character (X'0A'). The end-of-file character is X'1A'.
- Records and fields are variable in length.

Transferring Data to BASIC Sequential Files: The following list describes how AS/400 data created by a BASIC-sequential-file-defined data definition changes:

- Hexadecimal fields change to equivalent ASCII characters for each half-byte. Double quotation marks surround them.

For example, X'F3' expands to ASCII 22443322 and is written to the file.

- EBCDIC character, date, time, and time-stamp fields change byte by byte and are mapped into ASCII characters as defined by the translation tables. ASCII double quotation marks are added before and after the character string.
- Null fields are represented by the absence of the field (comma comma, or by a single comma if the null field is the last field of the record).
- For null fields, successive commas in the file will result in a null value being sent to the AS/400 system if the field is null-capable.
- In variable-length fields, if the AS/400 field is variable length, the field is converted to the AS/400 variable-length format.

- Binary fields change to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, X'FFD3' appears as ASCII 2D3435. When displayed on an ASCII device, the string appears as -45.

- Zoned decimal fields change to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, EBCDIC F0F0F9F5F2D6 with a field length that indicates two digits to the right of the decimal point expands to ASCII 2D39352E3236. The string appears as -95.26 when an editor displays it or it prints.

- Packed decimal fields change to ASCII numeric. Leading zeros to the left of the decimal point and trailing zeros to the right of the decimal point are removed.

For example, X'871F' (no decimal point) changes to ASCII 383731. The string appears as 871 when an editor displays it or it prints.

Transferring Data from BASIC Sequential Files: When you transfer data from BASIC sequential files to AS/400 files, the data changes as follows:

- ASCII character, date, time, and time-stamp data changes to EBCDIC character data on a byte by byte basis and to hexadecimal by changing 2 ASCII bytes into 1 hexadecimal byte.
- ASCII numeric data translates to system binary, zoned decimal, or packed decimal data, depending on the specified data type. The lengths of the system data and the workstation data might be different because the minus signs and decimal points are stored in ASCII numeric fields, and leading and trailing spaces are stripped away.

BASIC might create exponential numbers in these files. The data transfer function also changes these numbers.

Each translated field is individually verified to ensure that the resulting field length matches the specifications for that field. The data transfer function tries to fit the workstation data into the system field.

Errors When Transferring Data from BASIC Sequential Files: When you transfer data from a BASIC sequential file to a AS/400-defined file, the following errors can occur:

- Data in this field is too long for the AS/400 field. The data is truncated. The file-description file defines character data as longer than the field length specified for the file.
If the data transfers to an EBCDIC field, this error occurs only if the extra bytes are not spaces. If the data transfers to a hexadecimal field, this error occurs only if the extra bytes are not zeros. These extra bytes are truncated so that the data fits into the specified AS/400 field.
- The value of numeric data is too large for the system field. The maximum value is used. This error occurs when:
- Numeric data in the workstation field does not fit into the specified number of bytes for the system field.
- The decimal value of a numeric field contains more digits than were specified for the system field.

The value of the field is set to the maximum value possible for the number of bytes and digits specified by the AS/400 system.

- Data in this field has too many decimal positions. The number is rounded. This error occurs when the number of decimal positions in the workstation field is greater than the number of decimal positions specified on the system. The extra bytes are significant, because the data is rounded up if the first extraneous digit is 5 or greater, and is rounded down if it is less than 5.
- Data in this field is incorrect or does not match the workstation data type. This error occurs when a field defined as numeric by the file description contains nonnumeric data. This could also result if a character or hexadecimal field contains a numeric field, or if a numeric (zoned, packed, or binary) field contains a character field.

When this error occurs, the transfer request ends to prevent transferring incorrect data to the system file.

- Data for this field is missing. The default values are used. This error occurs when a data field is defined, but the data is not in the file. This means that the end of the record is reached before all of the defined data is found.

When this error occurs, the field or fields for which data has been defined, but not found, are filled with default values and transferred to the AS/400 file. These default values are EBCDIC spaces for character fields, or zeros for numeric fields.

To supply your own default values, use the default (DFT) keyword in the DDS for the file.

- Data in this field exceeds the workstation field size. The data is lost. This error occurs when extra data, not defined by the file-description file, is found at the end of a character field. The extra bytes are truncated and are not transferred to the system file.
- Extra data found at the end of the record. The extra data is not transferred. This error occurs when extra data is found at the end of the record, and has not been defined by the system data definitions or workstation file-description file. This extra data is not transferred to the system, because no definitions exist to define the data and describe how it should change.

Data Interchange Format Files

Data Interchange Format (DIF) files represent data in rows and columns. DIF files contain character and numeric data (positive and negative decimal numbers).

DIF is used for data interchange between spreadsheet programs and other application programs.

The data transfer function supports only the following two data types within DIF files:

- **Character data:** The data in a character cell (think of a *cell* as one field in one record) must be enclosed in double quotation marks if there is an embedded space in the string. However, if the string begins with a quotation mark, it must also end with a quotation mark.
- **Numeric data:** The numeric data supported by the data transfer function consists of a decimal number that can contain a minus sign or a decimal point or both. The data transfer function also supports exponential numeric data.

Transferring Data to DIF Files: When creating a DIF file, system data changes as follows:

- Hexadecimal fields change to equivalent ASCII characters for each half-byte. Double quotation marks surround them.
- EBCDIC character, date, time, and time-stamp data changes byte by byte and is mapped into ASCII characters as defined by the translation tables. ASCII double quotation marks are added before and after the character string.
- Binary fields change to ASCII numeric. Leading zeros to the left of the decimal point, and trailing zeros to the right of the decimal point, are removed.
- Zoned decimal fields change to ASCII numeric. Leading zeros to the left of the decimal point, and trailing zeros to the right of the decimal point, are removed. For example, EBCDIC F0F0F9F5F2D6 with a field length that indicates two digits to the right of the decimal point expands to ASCII 2D39352E3236. When displayed or printed, the string appears as -95.26.
- Packed decimal fields change to ASCII numeric. Leading zeros to the left of the decimal point, and trailing zeros to the right of the decimal point, are removed. For example, X'871D' (no decimal point) changes to ASCII 2D383731. When displayed or printed, the string appears as -871.
- If untranslatable data is found, the entire field becomes an error cell. An **error cell** results when untranslatable data is found when a DIF file is created or when a not valid calculation is done using the DIF file with a spreadsheet program.

Transferring Data from DIF Files: If an error cell is found when data is transferred from a DIF file to the AS/400 system, one of the following things can occur, depending on the type of data in the file:

- If the system field is a character (EBCDIC) field, it is filled with untranslatable characters (hexadecimal zeros) and is transferred to the system. A message appears, telling you how many bytes of untranslatable data have transferred.
- If the system field is a hexadecimal, zoned, packed, or binary field, you receive an error message telling you that the data in this cell is incorrect, and that the data was not transferred to the system.

When you transfer data from a system file to a DIF file, the field names are placed in the first record and you can consider them column headings. When you transfer DIF files back to the system, the first row must either be these field names (exactly as they are defined on the system) or data. If the first row does not consist of field names, the file is processed as if it contains only data.

No DIF header information is used when sending the file to the AS/400 system. To correctly transfer a DIF file to the system, ensure that the file is in the correct format (row and column). It is essential that the field names, if present, make up the first row of data. The subsequent records make up the remaining rows of data. Therefore, when you transfer the data to the AS/400 system, the file must be saved in the same format as originally created by the data transfer function.

When you transfer data from DIF files to AS/400 files, the data changes as follows:

- ASCII character, date, time, and time-stamp data is changed to EBCDIC character data or to hexadecimal data. ASCII-to-EBCDIC conversion is done byte by byte. ASCII-to-hexadecimal conversion is done by changing 2 ASCII bytes to 1 hexadecimal byte.
- ASCII numeric data changes to system binary, zoned decimal, or packed decimal data, depending on the data type the system specifies.

The lengths of the fields on the system and the workstation can be different, because of the explicit way minus signs and decimal points are stored in ASCII numeric fields. This means that each field changes individually, to ensure that the resulting field length matches the system specifications for that field. The data transfer function tries to fit the workstation data into the system field.

- In null fields, a NULL DIF character field results in a null value being sent to the AS/400 field if the field is null-capable.
- If the AS/400 field is variable-length, the field is converted to the AS/400 variable-length format.

Errors When Transferring Data from DIF Files: When you transfer data from a workstation DIF file to a system file with data definitions, the following errors can occur:

- Data in this workstation file is not valid, or the version of this workstation file is not supported. The DIF file does not follow the standard DIF format. Processing ends, and no more records are transferred.
- Data in this field is too long for the AS/400 field. The data is truncated. The workstation file-description file defines character or numeric data as longer than the field length specified for the system file.
For character data, this error occurs only if the extra bytes are not spaces. For hexadecimal data, this error occurs only if the extra bytes are not zeros. The extra bytes are truncated so that the data fits into the specified AS/400 field.
- The value of numeric data is too large for the system field. The maximum value is used. This error occurs when:
- Numeric data in the workstation field does not fit into the specified number of bytes for the AS/400 field.
- The decimal value of a numeric field contains more digits than are specified for the system field.

The value of the field is set to the maximum value possible for the number of bytes and digits the system specifies.

- Data in this field has too many decimal positions. The number is rounded. The number of decimal positions in the workstation field is greater than the number of decimal positions specified on the system. The data is rounded up if the first extraneous digit is 5 or greater, and is rounded down if it is less than 5.
- Data in this field is incorrect or does not match the workstation data type. One of the following things has occurred:
- A numeric field contains nonnumeric data.

- A character or hexadecimal field contains a numeric field or a numeric (zoned, packed, or binary) field contains a character field.
- An AS/400 hexadecimal or numeric (zoned, packed, or binary) field contains a DIF error cell.

When this error occurs, the transfer request ends to prevent the transfer of incorrect data to the system file.

- Data for this field is missing. This occurs when a data field is defined, but the data is not in the file. This means that the end of the record is reached before all of the defined data is found. If the host field is null-capable then a null is inserted; otherwise, the default values are used.

When this error occurs, the field or fields for which data is defined, but not found, are filled with default values and are transferred to the system file. These default values are EBCDIC spaces for character fields, or zeros for numeric fields.

To supply your own default values, use the Default (DFT) keyword in the DDS for the file.

- Data in this field exceeds the field size. The data is lost. This error occurs when extra data, not defined by the file-description file, is found at the end of a character field. The extra bytes are truncated and are not transferred to the system file.
- Extra data is found at the end of this record. The extra data is not transferred. This error occurs when there is extra data at the end of the record, and the AS/400 data definitions or file-description file have not defined it. This extra data is not transferred to the system, because no definitions exist to define the data and how it should change.

BIFF Files

In a BIFF file, data is expressed in lines and columns. A BIFF file contains character and numeric data (positive and negative decimal values).

The BIFF file format is used in EXCEL. The supported BIFF version is 4 (EXCEL 4.0).

The transfer facility supports only the following two data types for a BIFF file:

- Character data
- Numeric data

Transferring Data to BIFF Files: When a BIFF file is created, the system data is converted to equivalent EXCEL cell data.

If untranslatable data is found, the entire field is treated as an error cell.

Transferring Data from BIFF Files: If an error cell is found during data transfer from a BIFF file to the AS/400 system, either of the following things can occur depending on the data type of the file:

- If the system field is a character (EBCDIC) field, the error cell containing untranslatable characters (hexadecimal zeros) is transferred to the system. A message indicating how many bytes of untranslatable data were transferred is displayed.
- If the system field is a hexadecimal, zoned decimal, packed decimal, or binary field, an error message indicating that the data in this cell is not valid and thus has not been transferred to the system is displayed.

When data is transferred from a system file to a BIFF file, the first record contains field names, which can be treated as column headers.

To return a BIFF file to the system, the first line must contain these field names (as defined in the system) or data. If the first line does not contain field names, the file is regarded as containing data only.

When a file is sent to the AS/400 system, cell information (such as the character size and font information) is ignored. This means that cell information is lost, even if the contents of a BIFF file that have been sent to the AS/400 system are retransmitted to a workstation.

When data is transferred from a BIFF file to an AS/400 file, the data is converted as follows:

- ASCII character cell data is converted to EBCDIC character data or hexadecimal data; 1-byte ASCII data is converted to 1-byte EBCDIC data.
- ASCII numeric cell data is converted to a binary number, or a zoned or packed decimal number, depending on the data type specified in the system.

When data is transferred from a BIFF file to the AS/400 system, the following specific processing is performed:

- When data is transferred to a BIFF file, the first record contains the names of the fields to be transferred, which can be treated as column headers. To return a BIFF file to the AS/400 system, the first line must contain the same field names (as defined in the AS/400 system) or data. If the first line or the first set does not contain a character field that exactly matches the AS/400 field, the file is treated as being a file with no column headers, and only data is processed.
- When a BIFF file is transferred to the AS/400 system, header information is not used.
- To ensure correct transfer of a BIFF file to the AS/400 system, the file format must be valid (lines and columns). Data for each set or line must correspond to one record in the AS/400 file.

Errors When Transferring Data from BIFF Files: When data is transferred from a BIFF file on a workstation to the system file with the data definition, the following errors can occur:

- Data in this workstation file is not valid, or the version of this workstation file is not supported. The BIFF file does not conform to the standard BIFF format. Processing terminates, and no more records are transferred.
- Data in this field is too long for the corresponding AS/400 field. The data is truncated. A file-description file defines character or numeric data that is longer than the field specified in the system file.
- For conversion from ASCII to EBCDIC, this error occurs if a file-description file defines ASCII data that is longer than the field specified in AS/400 system. During conversion from ASCII to hexadecimal, this error will occur if a file-description file defines ASCII data that is twice as long as the field specified in AS/400 system. This is because 2-byte ASCII data is converted to one hexadecimal character.
- A truncation error only occurs if excess bytes are other than blanks (X'20') during conversion from ASCII to EBCDIC, or other than zeros (X'30') during conversion from ASCII to hexadecimal. Truncating these excess bytes enables data to fit into the specified AS/400 fields.

- Numeric data is too long to fit into the corresponding AS/400 field. The maximum value is assumed. This error occurs under either of the following conditions:
- Numeric data in a workstation field is too long to fit into the number of bytes specified for the AS/400 field.
- The number of decimal digits in a numeric field exceeds the number of digits specified for the AS/400 field.

The field value is set to the maximum value that can be specified for the number of bytes, and that for the number of digits, specified for the AS/400 system.

- Data in this field contains too many decimal places. The data is rounded off. The number of decimal places in a workstation field is greater than the number of decimal places specified for the system. If the first excess digit is 5 or more, the data is rounded up. Otherwise, it is rounded down.
- Data in this field is not correct, or its type does not match the type of workstation data. One of the following things has occurred:
- A numeric field contains other than numeric data.
- A character field or a hexadecimal field contains a number, or a numeric (zoned or packed decimal, or binary) field contains characters.
- A hexadecimal field or a numeric (zoned or packed decimal, or binary) field for the AS/400 contains a BIFF error cell.

If this error occurs, the transfer request terminates to avoid transferring incorrect data to the system file.

- Data for this field is missing. This error occurs if the data field is defined, but the file does not contain any data. This means that the end of the record is reached before all defined data has been found.

If this error occurs (that is, if data is defined for one or more fields, but it is not found there) the fields containing the default value are transferred to the system file. The default value is EBCDIC spaces for a character field and zeros for a numeric field.

To specify a user-specific default value, use the default value (DFT) keyword in DDS for the file.

- Data in this field exceeds the size of a workstation field. Data is lost. This error occurs if excess data, not defined in the workstation file-description file, is found at the end of the field. For character data, excess bytes are truncated, and not transferred to the system file. For numeric data, the entire field is converted to zeros and transferred to the system file.
- Excess data is found at the end of this record. The excess data is not transferred. This error occurs if such excess data is not defined in the AS/400 data definition or in the workstation file-description file. This excess data is not transferred to the system, because the data and the conversion method are not defined.

DOS Random Files

DOS random files are fixed-length files used by the DOS random read and write routines. The characteristics of DOS random files are as follows:

- There are no end-of-record or end-of-file markers.
- Records are delimited by their constant length, relative positions in the file, and the total length of the file.

Note: DOS random and DOS random type-2 files are identical, except for the way in which the signs are represented for packed decimal and zoned decimal numbers.

Transferring Data to DOS Random Files: When creating DOS random file data definitions, system data changes as follows:

- Binary fields on the AS/400 system and the workstation are represented as two-complement numbers, so it is unnecessary to change individual bytes. The workstation uses the convention of storing numeric values with the least significant byte in the left-hand byte position. The data transfer function then reverses the order of the bytes in the binary fields.
For example, X'CEF3', coming from the system as a 2-byte binary number (representing the value -12557), appears as X'F3CE'.
- EBCDIC character, date, time, and time-stamp data changes byte by byte and is mapped into ASCII characters as defined by the translation tables.
- Variable-length and null fields are converted to fixed length, and trailing blanks (for character, hex, date, time, and time stamp) or zeros (for binary, zoned, and packed) are added to the maximum length of the field.
- Hexadecimal fields do not change.
- Packed decimal fields do not change except for the last half-byte, which contains the sign. The workstation uses X'3' to indicate a positive number and X'B' to indicate a negative number in the sign half-byte.
For example, X'0865431F' appears as X'08654313'.
- Zoned decimal fields from the system change from EBCDIC to ASCII, as do character fields, except that the sign half-byte in the workstation changed field is X'3' to indicate a positive number and X'B' to indicate a negative number.
For example, EBCDIC X'F0F1F2F5F2D6' appears as ASCII X'3031323532B6'.

Transferring Data from DOS Random Files: When you transfer data from DOS random files to AS/400 files, the data changes as follows:

- ASCII character, date, time, and time-stamp data changes to EBCDIC character data on a byte by byte basis.
- Binary fields in the workstation file are stored in an order reversed from what the system file expects. These bytes reverse and transfer to the system file.
- Hexadecimal fields do not change. The field length on the system should be the same as the field length on the workstation.
- For packed decimal fields, only the last half-byte (the byte that contains the sign) is changed. The host system uses X'F' to indicate a positive number and X'D' to indicate a negative number for the sign half-byte.
For example, X'08654313' appears as X'0865431F'.
- Zoned decimal fields on the workstation change from ASCII to EBCDIC (ASCII to EBCDIC for DBCS), as do character fields. The last half-byte (the half-byte that contains the sign) in the workstation field is changed to X'F' to indicate a positive number and X'D' to indicate a negative number.
For example, ASCII X'3031323532B6' appears as EBCDIC X'F0F1F2F5F2D6'.
- For null-capable AS/400 fields, null values (except date, time, and time stamp) cannot be reliably detected and are not uploaded. For variable-length AS/400 fields, trailing blanks are removed, and the field is converted to the variable-length format.

Errors When Transferring Data from DOS Random Files: When you transfer data from a DOS random file to an AS/400 file, the following errors can occur:

- Data in this field is too short for the system field. The data is padded. This error occurs when the workstation file contains character or hexadecimal data shorter than the specified field length. It also occurs if the length of the workstation field is defined as less than the system field, or if the data in the last record of

the file is too short. Character fields are padded on the right with EBCDIC spaces. Hexadecimal fields are padded on the right with zeros.

- Data in this field is too long for the system field. The data is truncated. This error occurs when the workstation file-description file defines character or hexadecimal data as longer than the field length specified for the system file. For character data, this error occurs only if the extra bytes are not spaces. For hexadecimal data, this error occurs only if the extra bytes are not zeros. These extra bytes are truncated so that the data fits into the specified field.
- The value of numeric data is too large for the system field. The maximum value is used. This error occurs when:
- Numeric data in the workstation field does not fit into the specified number of bytes for the AS/400 field.
- The decimal value of a numeric field contains more digits than were specified for the AS/400 field.

The value of the field is set to the maximum value possible for the number of bytes and digits specified by the system.

- Data in this field has too many decimal positions. The number is rounded. This occurs when the number of decimal positions in the workstation field is greater than the number of decimal positions specified on the system. The extra bytes are significant, because the data rounds up if the first extraneous digit is 5 or greater, and rounds down if it is less than 5.
- Data in this field is incorrect or does not match the workstation data type. This error occurs when nonnumeric data appears in a field defined as numeric by the file descriptions. When this occurs, the transfer request ends to prevent transferring incorrect data to the system file.
- Data for this field is missing. The default values are used. This error occurs when a data field is defined, but the data is not in the file. This means that the end of the file is reached before all the defined data is found.

When this error occurs, the field or fields for which data has been defined, but not found, fill with default values and transfer to the system file. Default values are EBCDIC spaces for character fields, or zeros for numeric fields.

To supply your own default values, use the default (DFT) keyword in the DDS for the file.

When you transfer data from a DOS random file to a system file without data definitions, any data shorter than the record length defined for the system file is padded with EBCDIC spaces.

Because DOS random files have no record delimiters, this error occurs only on the last record and probably indicates that the record length of the system file does not match that of the workstation file.

DOS Random Type-2 Files

DOS random type-2 files are fixed-length files used by the DOS random read and write routines. The characteristics of DOS random type-2 files are as follows:

- There are no end-of-record or end-of-file markers.
- Records are delimited by their constant length, relative positions in the file, and the total length of the file.

Note: This workstation file type is identical to the DOS random file type, except that the internal sign representation for packed decimal and zoned decimal data types follow Systems Application Architecture (SAA) standards. Some

workstation applications, such as applications written in IBM COBOL/2 programming language, need to have the signs for packed decimal and zoned decimal data types represented this way. Use the DOS random type-2 file type for those workstation applications.

Transferring Data to DOS Random Type-2 Files: When you create DOS random type-2 file data definitions, system data changes as follows:

- Binary fields on the AS/400 system and the workstation are represented as twos complement numbers, so it is unnecessary to change individual bytes. The workstation uses the convention of storing numeric values with the least significant byte in the left-hand byte position. The data transfer function then reverses the order of the bytes in binary fields.
For example, X'CEF3', coming from the system as a 2-byte binary number (representing the value -12557), appears as X'F3CE'.
- EBCDIC character, date, time, and time-stamp fields change byte by byte and are mapped into ASCII characters as defined by the translation tables.
- Variable-length and null fields are converted to fixed length, and trailing blanks (for character, hex, date, time, and time stamp) or zeros (for binary, zoned, and packed) are added to the maximum length of the field.
- Hexadecimal fields do not change.
- Packed decimal fields do not change. The sign convention used on the workstation and on the host system is the same.
For example, X'0865431C' appears as X'0865431C'.
- Zoned decimal fields from the system change from EBCDIC to ASCII, as do character fields. However, the sign half-byte is changed to a 3 to indicate a positive number or a 7 to indicate a negative number when the data is sent to the workstation.
For example, EBCDIC X'F0F1F2F5F2D6' appears as ASCII X'303132353276'.

Transferring Data from DOS Random Type-2 Files: When you transfer data from DOS random type-2 files to AS/400 files, the data changes as follows:

- ASCII character data, date, time, and time stamp data change to EBCDIC character data on a byte by byte basis.
- Binary fields in the workstation file are stored in an order reversed from what the system file expects. These bytes reverse and transfer to the system file.
- Hexadecimal fields do not change. The field length on the system should be the same as the field length on the workstation.
- For packed decimal fields, the last half-byte (the half-byte that contains the sign) is not changed unless the sign half-byte is less than X'A' (represented by values 0 through 9). If the sign half-byte is less than X'A', it is changed to X'F' on the host system.
For example, X'865431D' appears as X'0865431D', but X'08654318' appears as X'0865431F'.
- Zoned decimal fields on the workstation change from ASCII to EBCDIC, as do character fields. However, the sign half-byte is changed to an F to indicate a positive number or a D to indicate a negative number when the data is sent to the host system.
For example, ASCII X'303132353276' appears as EBCDIC X'F0F1F2F5F2D6'.
- For null-capable AS/400 fields, null values (except date, time, and time stamp) cannot be reliably detected and are not uploaded. For variable-length AS/400 fields, trailing blanks are removed and the field is converted to the variable-length format.

Errors When Transferring Data from DOS Random Type-2 Files: When you transfer data from a DOS random type-2 file to an AS/400 file, the following errors can occur:

- Data in this field is too short for the system field. The data is padded. This error occurs when the workstation file contains character or hexadecimal data shorter than the specified field length. It also occurs if the length of the workstation field is defined as less than the system field, or if the data in the last record of the file is too short. Character fields are padded on the right with EBCDIC spaces. Hexadecimal fields are padded on the right with zeros.
- Data in this field is too long for the system field. The data is truncated. This error occurs when the workstation file-description file defines character or hexadecimal data as longer than the field length specified for the system file. For character data, this error occurs only if the extra bytes are not spaces. For hexadecimal data, this error occurs only if the extra bytes are not zeros. These extra bytes are truncated so that the data fits into the specified field.
- The value of numeric data is too large for the system field. The maximum value is used. This error occurs when:
- Numeric data in the workstation field does not fit into the specified number of bytes for the AS/400 field.
- The decimal value of a numeric field contains more digits than were specified for the AS/400 field.

The value of the field is set to the maximum value possible for the number of bytes and digits specified by the system.

- Data in this field has too many decimal positions. The number is rounded. This occurs when the number of decimal positions in the workstation field is greater than the number of decimal positions specified on the system. The extra bytes are significant, since the data rounds up if the first extraneous digit is 5 or greater, and rounds down if it is less than 5.
- Data in this field is incorrect or does not match the workstation data type. This error occurs when nonnumeric data appears in a field defined as numeric by the file descriptions. When this occurs, the transfer request ends to prevent transferring incorrect data to the system file.
- Data for this field is missing. The default values are used. This error occurs when a data field is defined, but the data is not in the file. This means that the end of the file is reached before all the defined data is found.

When this error occurs, the field or fields for which data has been defined, but not found, fill with default values and transfer to the system file. Default values are EBCDIC spaces for character fields, or zeros for numeric fields.

To supply your own default values, use the default (DFT) keyword in the DDS for the file.

When you transfer data from a DOS random type-2 file to a system file without data definitions, any data shorter than the record length defined for the system file is padded with EBCDIC spaces.

Because DOS random type-2 files have no record delimiters, this error occurs only on the last record and probably indicates that the record length of the system file does not match that of the workstation file.

No-Conversion Files

No-conversion files, defined by the data transfer function, consist of data that has not changed. For example, when data transfers from the system to a workstation

no-conversion file, the data transfers exactly as it is stored on the AS/400 system. Date, time, and time-stamp data transfers to EBCDIC character data on the workstation.

Transferring Data to No-Conversion Files: When you transfer data from the AS/400 system to a no-conversion file, the data transfers exactly as it is stored on the system.

Variable-length AS/400 fields are converted to fixed-length fields, and trailing EBCDIC blanks are added to the maximum length of the field.

Date, time, and time-stamp data is converted to EBCDIC character data.

Variable-length and null fields are converted to fixed length, and trailing EBCDIC blanks (for character, hex, date, time, and time stamp) or EBCDIC zeros (for binary, zoned, and packed) are added to the maximum length of the field.

Transferring Data from No-Conversion Files: The data types that exist in a no-conversion file are EBCDIC system data types only. When a no-conversion file transfers to the system, the data transfer function performs no data change or translation. Date, time, and time-stamp data transfers to EBCDIC character data on the workstation.

However, the data transfer function verifies that all numeric data is in the correct EBCDIC format. If any numeric data is found that is not in the correct EBCDIC format, that data and any remaining data does not transfer.

Errors When Transferring Data from No-Conversion Files: When you transfer data from a workstation no-conversion file to a system file, the following errors can occur:

- Data sizes are not equal. When you transfer no-conversion files, the length and decimal position specifications for the system and the workstation must match exactly. If not, no records transfer.
- Data in this field is too short for system field. The data is padded. This error occurs when the workstation file contains character or hexadecimal data shorter than the field length specified for the system file. This could occur if the data in the last record of the file is too short. Character fields are padded on the right with EBCDIC spaces. Hexadecimal fields are padded with zeros.
- Data in this field is incorrect or does not match the workstation data type. The transfer request ends to prevent transferring incorrect data to the system file. This error occurs when a field defined by the file descriptions as numeric contains nonnumeric data.

Note: The data is verified assuming that the data is in EBCDIC format. If you want to transfer data in another format, do not use data definitions or file descriptions, and specify the record lengths defined on the system and the workstation in the same way.

- Data for this field is missing. The default values are used. This error occurs when a data field has been defined, but the data is not in the file. This error can occur only in the last record of the file, since no-conversion files have no explicit record delimiters.

When this error occurs, the field or fields for which data has been defined but not found fill with default values and transfer to the system file. These default values are EBCDIC spaces for character fields, or zeros for numeric fields.

To supply your own default values, use the default (DFT) keyword in the DDS for the file.

AS/400 System-to-Personal Computer Performance Considerations

Transferring data from the AS/400 system to the workstation depends on the following performance considerations:

- The system workload.
- How many records have to be looked at to complete the transfer.
- If more than two files are joined. You need extra AS/400 resources to join records from more than one file.
- If GROUP BY fields are specified.
- If complicated WHERE or HAVING comparisons are specified.

These factors and others influence the time needed to determine which data should be transferred. For example, the time needed to receive the first record of a transfer in which all the records are chosen is less than the time needed to start transferring a smaller group of records based on complicated WHERE or HAVING values. However, transferring all the records in a large file is sometimes impractical or unnecessary.

The AS/400-to-workstation data transfer function uses many functions within the AS/400 system to determine the fastest method of selectively retrieving records. When it selects a smaller group of records to transfer, the AS/400-to-workstation data transfer function uses the existing access paths whenever possible to improve performance.

For the AS/400-to-workstation data transfer function to consider using an existing access path (logical file), the access path must meet the following conditions:

- It must be defined to the data that transfers.
- It must have either *DELAY or *IMMED maintenance.

When you meet these conditions, you must then match the transfer request to the access path. The following considerations might be helpful when you define your transfer request:

- The time it takes to select records based on WHERE clause values is less when the following things are true of the WHERE field:
 - It is compared with a constant.
 - It is the first key field in an existing access path defined to the data to be transferred.
- A transfer request containing a GROUP BY or ORDER BY clause or both can work better if the key fields in the access path are in the same order as specified on the GROUP BY or ORDER BY clauses.
- A transfer request containing a JOIN BY clause can work better when:
 - An access path exists over the file that you are joining to.
 - The field you are joining to is a primary key field in the access path.
 - You are not returning records with missing fields.

Chapter 18. File Transfer for PC400

File transfer is designed so that you can use it in the following cases:

- To store a workstation file on the AS/400 system for a backup
- To edit a source file of an AS/400 program with a workstation editor, and send the file edited on the workstation to the AS/400 system
- To distribute workstation documents and programs to the AS/400 users

You can easily transfer a file if you know the library name and file name.

File transfer is not suitable for complicated processing, such as the processing of an AS/400 database on a workstation and then returning the results to the AS/400. In that case, use the Data Transfer Function.

Before attempting to use file transfer, review this chapter.

Note: You need to have a program that supports the **APVAFILE** command installed on the host, such as Personal Communications Tools/400. If you do not, install one or ask IBM or your dealer how to obtain one.

PC File Transfer with the CRLF Option

If the CRLF option is specified, the transfer program checks for new-line characters. If the record length is reached before a new-line character is found, the record is divided at this point; one sentence of a workstation file will become two or more records. Particularly, specify a sufficiently long record length when retransmitting a workstation file containing 2-byte characters.

By default, the message records segmented. is not displayed. To display the message:

Look for the profile for the session you will use. Normally, this will be in the **\PCOMOS2\PRIVATE** directory under the name **filename.WS** (filename is a user-specified file name).

Use an editor to insert the following sentence into the [Transfer] section. If there is no [Transfer] section, first enter [Transfer]. Be careful to enter it correctly.

```
DisplayTruncateMessage=Y
```

or

```
[Transfer]  
DisplayTruncateMessage=Y
```

The next time the session is started, this specification becomes active.

Transfer to a Physical Source File

An AS/400 physical source file contains 12 bytes of information for each record as internal information: 6 bytes are for a record number, the other 6 bytes are for a date. When you transfer a file from a workstation using file transfer, the date field contains 000000. If the APPEND option is not specified, the record number is incremented by 1, up to a maximum of 9999. Otherwise, it is incremented from the

nearest integer, greater than the number of the last record in the original file (for example, 24 for 23.1). If the number of records exceeds 9999, the next and all subsequent record numbers are 9999.

Use the source specifications input utility (SIU) to renumber records when saving the file after editing. PC400 File Transfer

Transfer to a Physical File

A file, such as a PC program, that does not require the processing of the contents of an AS/400 file or the reading of data, should be transferred to a physical file with the BINARY transfer type. Because data is not converted, if the data is subsequently retransmitted from the AS/400 system to a workstation, the original workstation file can be re-created exactly. If the data is converted, however, data might not be restored to its original form, depending on the contents of the conversion table.

For the maximum number of members (MAXMBRS), a physical file attribute, the default value is 1. When a physical file is created during file transfer, MAXMBRS is 1.

When a file is transferred from a workstation to a physical file, the default file name **xxxBIN** is assumed (**xxx** is a workstation file extension.) If you transfer more than one file, an error occurs when the second and subsequent files are transferred: The TRANS58 file or member cannot be created. File transfer terminates. A file should be created with the expected file attribute before it is transferred from a workstation to the AS/400 system.

Use of the DSPMBRLST Command

For file transfer from the AS/400 system to a workstation, the Paste function can be used. If the name of the Library/File(Member) to be transferred is copied with the Copy function of the Edit menu, it can be displayed as the host file candidate to be transferred on the transfer request screen by clicking **Paste**. This is particularly convenient when transferring more than one file at a time.

Use the DSPMBRLST command to list AS/400 files or members. The command format is as follows:

DSPMBRLST LIB(lib-name) FILE(file-name)

LIB parameter

The LIB parameter contains the target library name. The default value is ***USRLIBL**. Extensive specification, such as ***ALL**, * for generic name, is possible, but is time consuming. AS/400 files or members are listed more efficiently if a specific name is specified.

FILE parameter

The FILE parameter contains the target file name. There is no default value. The parameter must be specified. ***ALL** and * for generic name can be specified.

Executing this command lists Library/File(Member) on the screen. If they cannot be listed on one screen, **MORE...** is displayed in the lower right corner of the screen. Use the next page or the preceding page key to scroll the screen. Create a list for Paste with the Copy or the CopyAppend function of the Edit menu, as required.

Restrictions for Transferred File Size

A file that is more than 1,040,000 bytes cannot be transferred correctly.

Chapter 19. Considerations for PC400 Installation and Use

This chapter provides technical information, considerations, and restrictions for installing and using PC400.

First-time users of PC400 or users who want only to perform simple operations using the supplied default values need not read this chapter.

Refer to this chapter if a problem occurs during operation, or when you want to obtain more detailed information about the system, or when you want to learn of the restrictions imposed on its use.

Note: Before proceeding with this chapter, double-click on the **Readme** icon or type **VIEW README** in the OS/2 command prompt to view the **README.INF** file, which is included on the PC400 installation CD-ROM.

IEEE 802.2 Support

Customers who use LAN connectivity, such as

- 802.2
- IP
- LAN emulation (Frame Relay, 3174 Peer Communications)

or WAN connectivities that use SNA Phone Connect, such as

- MPA
- WAC
- ISDN
- ComPort (Async, AutoSync)

require LAN Adapter and Protocol Support (LAPS). LAPS is provided by Multiple Protocol Transport Services (MPTS).

If one of the following products has been installed on your workstation, an acceptable version of LAPS might already be available:

- Multiple Protocol Transport Services (MPTS), which is included in this package
- IBM TCP/IP for OS/2
- IBM LAN Server (or LAN Requester)
- IBM Communications Server for OS/2

General PC400 Workstation Window Operations

Scroll-Bar

When you select **Font Size** from the Appearance pull-down menu, then select **Fixed Size** from the Select Display Font dialog box, the entire operator information area might not fit onto the screen if you have specified **With Scroll-Bar** in the Window Setup dialog box. Installation and Use Considerations

API Considerations

DOS Mode EHLLAPI

This function allows you to call PC400 (for OS/2) EHLLAPI from an EHLLAPI user application created for PC400 (for DOS) on OS/2 DOS Box or created for PC400 (for Windows) on WIN-OS2. To use this function, specify the DOS mode EHLLAPI available in **API setting**. Then EHLLAPI virtual device driver (VDD) will be added to **CONFIG.SYS**.

To use this function on WIN-OS2, copy the file **PCSHLL.DLL** in the directory, in which OS/2 and PC400 are installed, to the place that the environment variable **PATH=** of WIN-OS2 specified (in **AUTOEXEC.BAT**).

Note: **PCSHLL.DLL** is a Windows dynamic link library (DLL), which is a interface module between your EHLLAPI application for PC400 and the EHLLAPI VDD.

To use **SEND FILE (90)** or **RECEIVE FILE (91)**, you have to specify the workstation file name with drive and path name.

Print Processing

Font Pitch

When there is no font-specified pitch, vector font is selected in GPI mode. On the other hand, the maximum font size of all fonts under the pitch is selected in PDT mode. The pitch is set to that of the font selected.

Spool Function

The spooler must be on.

CPI/LPI of Device Fonts

If the printer driver cannot print device fonts associated with the user-specified CPI/LPI, the print output might be generated with incorrect CPI/LPI values.

Printable Area

Depending on the printer driver used, it might not be possible to use the entire surface of the paper for printing.

If the printing position is over the printable area, the page is automatically changed. When using a printer driver that allows you to set the margins, specify the minimum margins, thus maximizing the printable area.

Printing Using PDT Mode

Printing using the PDT file is restricted as follows:

- Only the fonts specific to the printer being used are supported.
- PostScript** printers are not supported.
- The following two conditions are required to print column separators in PDT mode:
 - The printer being used must support vertical 24 dots.

- **IMAGE_TRANSMISSION** must be defined in the *.PDF file, and the format must be Escape + Length + Data or Escape + Data.
- ASCII 850 must be used as default setting for the PC code page in PDT mode. If you want to use another PC code page, change the PDT file.

Unprintable Characters

Unprintable characters put the printer into deselect state.

Printing Using the OS/2 Printer Drivers

- Paper orientation depends on the settings in the Printer Setup dialog box for **Print Screen**.
- If you rotate the paper without selecting the PDT, the raster font cannot be selected. The outline font is the default.
- Duplex printing is available only if the PDT and the workstation printer support duplex printing.
- Setting up the configuration is required to change drawers.
- The SCS control codes might not always work correctly depending on the printer drivers and fonts being used.
- ASCII 850 is used for the PC code page in GPI mode. Therefore, the font whose code page is ASCII 437 is not selected though you select it from the font list on the printer control panel when the system code page is ASCII 437.

Setting the Code Page

The host code page, which is set in the Configuration dialog box, is used by default. The **Set Initial Condition (SIC)** command is used to set the host code page.

You can change the code page by using the **Set GCGID Through GCID (SCG)** command or the **Set CGCS Through Local ID (SCGL)** command. The same code pages for the display session are available.

Transferring Files

WAIT Option for Transferring Multiple Files

When you cannot successfully transfer multiple files, add the following parameters to the **[Transfer]** section in the workstation profile (*.WS):

```
[Transfer]
Wait=1000                < Added
```

This causes a 1000-msec to 1-second delay between transferring files. If it is not enough, increase the value.

Part 4. Personal Communications/SNA

Chapter 20. SNA Client/Server Concepts

SNA Client/Server Concepts

Terminology

Advanced Program-to-Program Communications (APPC)

An implementation of the SNA LU 6.2 protocol that allows interconnected systems to communicate and share the processing of programs.

Advanced Peer-to-Peer Networking (APPN)

An enhancement for Systems Network Architecture (SNA) networks featuring:

- Dynamic exchange of network topology information that simplifies connections, route selection, network definition, and reconfiguration
- Automated resource registration and directory lookup
- Greater distributed network control that helps to isolate the effects of single points of failure

Common Programming Interface for Communications (CPI-C)

Personal Communications provides support for the Common Programming Interface for Communications (CPI-C) 2.0 industry-standard interface from X/Open. The CPI-C interface enables greater application portability across different platforms. By using CPI-C 2.0, APPC programming is simplified, resulting in reduced cycle time, and enhanced client-server computing capability. This support provides the capability for distributed parts of an application to "converse" with one another. The implementation is consistent with the Conversational function described in IBM's Open Blueprint.

Logical Unit Address (LUA)

System software and interfaces that supply input/output (I/O) service routines to support communications that use LU types 0, 1, 2, and 3 SNA protocols. These protocols support user-defined data streams, SNA character streams, and SNA 3270 data streams. LUA services include only those services that support data communications. LUA does not supply any device emulation facilities.

Node An endpoint of a link, or a junction, common to two or more links in a network. Nodes can be linked to host processors, communication controllers, cluster controllers, terminals, or workstations.

End Node

Provides directory and routing services for a workstation on an APPN network.

If the workstation will not be connecting from an end node to a network node server, you need to define an SNA connection.

APPC Concepts

Personal Communications provides advanced peer-to-peer networking (APPN) end-node support for workstations, allowing them to communicate more flexibly with other systems in the network.

Personal Communications provides advanced program-to-program communications (APPC) to support communications between distributed processing programs, called *transaction programs* (TPs). APPN extends his capability to a networking environment. The TPs can be located at any node in the network that provides APPC.

Introducing APPC and CPI-C

Advanced Program-to-Program Communication (APPC), also known as LU 6.2, is software that enables high-speed communications between programs on different computers, from portables and workstations to midrange and host computers. APPC software is available for many different IBM and non-IBM operating systems, either as part of the operating system or as a separate software package.

APPC serves as an interface between application programs and the network. When the communications application on your workstation passes information to the APPC software, APPC takes the information and sends it on to a network interface, such as a token-ring adapter card. The information travels across the network to another computer, where the APPC software receives the information from the network interface. APPC puts the information back into its original format and passes it to the corresponding communications application.

APPC provides a consistent set of functions for program-to-program communications across different platforms. But, the architecture did not specify a common application programming interface (API) for implementing these functions. As a result, each operating system that supports APPC developed its own API, a set of verbs that closely resemble the operating system itself. These differences do not pose a problem if you are writing programs for two computers that use the same operating system. Most client/server applications run on different types of computers, however, to take advantage of the strengths of each computer. So, if you are designing programs for different operating systems, you must learn how to use two or more different sets of verbs.

The Common Programming Interface for Communications (CPI-C) eliminates this problem. CPI-C provides one standard set of verbs, known as CPI-C calls, for all systems that support CPI-C. As a result, you learn only one set of calls to write client/server applications for different systems.

What Is a Transaction Program?

The part of the communications application that initiates or responds to APPC communications is called a transaction program. A transaction program is not an entire, stand-alone program. Instead, it is the part of the program that handles transactions (exchanges of data) with another program.

When people talk with each other, we say that they are having a conversation. Likewise, the communication between two transaction programs is called a conversation.

A conversation between two programs is similar to a conversation between two people. When you have a conversation with another person, you follow unwritten rules that govern how you begin and end the conversation, take turns speaking, and exchange information. Similarly, APPC is called a protocol because it provides the rules that govern how conversations between transaction programs start and stop, which program "speaks" first, and how data is exchanged. Computers need

complete and rigid rules for conversations between programs. For that reason, APPC consists of a set of well-defined and thorough rules to cover all possible communications situations.

An APPC program may have several conversations active at one time, with the same transaction program or with different transaction programs.

Every transaction program needs a partner to communicate with. Thus, transaction programs are developed in pairs called partner transaction programs.

People use different parts of speech to communicate with each other. Transaction programs are more limited in their communications; they use only verbs to communicate with each other. The verbs are the programming language you use to start, stop, and control conversations.

A transaction program consists of APPC and CPI-C verbs such as:

ALLOCATE (CMALLC in CPI-C)

Starts a conversation with another transaction program

SEND_DATA (CMSSEND in CPI-C)

Sends data to the partner transaction program

RECEIVE (CMRCV in CPI-C)

Receives data from the partner transaction program

DEALLOCATE (CMDEAL in CPI-C)

Ends a conversation with another transaction program.

The APPC verbs make up the application programming interface (API) for APPC and CPI-C. In other words, these verbs represent the interface between the transaction program and the APPC software.

What Is the Difference between APPC and APPN?

APPC is a communications protocol that enables programs on different computers to "talk to" each other. APPC provides the interface between the programs and the networking hardware and software and defines the rules that programs use to exchange information.

Advanced Peer-to-Peer Networking (APPN) is the underlying networking protocol that routes APPC traffic through intermediate nodes in the network. For instance, when Program A uses APPC to talk to Program B, APPN finds the node where Program B is located and directs the APPC traffic through the network.

Note: Intermediate node requires Automatic Networking Routing (ANR) or intermediate session routing (ISR) provided by Communications Server. Access Feature provided by Personal Communications only supports EN (end node) functions and cannot be an intermediate node.

APPN includes several features that help reduce the amount of configuration required to set up and maintain a network. These features automate many tasks that are time-consuming, complicated, and error-prone. For example, if you're installing a new workstation that uses APPN, you don't have to set up configuration information for every workstation you want to communicate with. You simply provide the name of the computer and the address of the intermediate node that handles your traffic. APPN takes care of the rest of the information needed to route APPC traffic to and from your workstation.

If you connect to an APPN network, you simplify your own configuration and make it easier for other computers in the network to find you.

Side Information Definitions

Before starting a conversation with a partner program, a CPI-C program requires the following information:

- The name of the partner program
- The name of the LU on the remote computer
- The type of session used by the program
- Security information

If the CPI-C partner program uses a blank symbolic destination name, a side information definition is not necessary.

APPC Issues and Considerations

Why is APPC the protocol of choice for many client/server applications? Many users cite its openness, its advanced features, its common programming interface, and its exceptional performance. IBM and other vendors are constantly improving both the architecture and the products to ensure greater usability and performance in your network.

Improving Productivity Using APPC

The advanced features of APPC help speed the development of robust client/server applications and keep development costs low.

Client/server applications often prove to be especially challenging to the programmer. It's not enough to understand the details about the computer and operating system that your application uses. If you're designing client/server applications, you have to deal with computers used by both sides of the application, as well as the intervening network. For instance, implementing effective security measures is more important and more complicated, since you must ensure security throughout the network. In addition, synchronization and error reporting are often problematic in a distributed environment, because both sides of the application must coordinate their work.

One reason that APPC has become so widely used in client/server applications is that it furnishes a complete set of useful functions like security, synchronization, and error reporting. If you use other protocols, you must build these functions in every application you write. For example, if you use NetBIOS, you must design and implement a strategy for security for each application. Not only does this approach require additional work, it may result in a number of incompatible security systems in your network. By contrast, APPC includes a common set of security services that are consistent across all APPC platforms.

Similarly, most protocols do not include synchronization functions. Synchronization is required by any program that cannot continue processing data until the data sent to the partner program has been received and processed. Rather than writing your own synchronization routine, APPC provides a Confirm call that you can use to handle synchronization between two programs.

Improving Productivity Using CPI-C

Because many client/server applications are distributed between mainframe systems and workstations, host programmers and workstation programmers must

work together to develop partner applications. CPI-C bridges the gap between these programmers by providing a common "language" for designing the communications part of the applications. CPI-C also enables you to write the communications portion of an application without knowing the details of the operating system. After you write a CPI-C application, you can easily move the programs from one operating system to another with few changes. So, by using the CPI-C interface, you can port both your applications and your programming skills from one system to another, quickly and cost-effectively.

What Is a Logical Unit?

Every TP gains access to an SNA network through a *logical unit* (LU). An LU is SNA software that accepts verbs from your programs and acts on those verbs. A TP issues APPC verbs to its LU. These verbs cause commands and data to flow across the network to a partner LU. An LU also acts as an intermediary between the TPs and the network to manage the exchange of data between TPs. A single LU can provide services for multiple TPs. Multiple LUs can be active in the node simultaneously.

LU Types

Personal Communications supports LU types 0, 1, 2, 3, and 6.2. LU types 0, 1, 2, and 3 support communication between host application programs and different kinds of devices, such as terminals and printers.

LU 6.2 supports communications between two programs located at type 5 subarea nodes, type 2.1 peripheral nodes, or both, and between programs and devices. APPC is an implementation of the LU 6.2 architecture.

Communication occurs only between LUs of the same LU type. For example, an LU 2 communicates with another LU 2; it does not communicate with an LU 3.

When Personal Communications is configured, your local and partner LUs are defined once for each machine. When you design programs, you must understand the capabilities supported by the LU in the particular machines you plan to use.

Dependent and Independent LUs

A *dependent LU* depends on a system services control point (SSCP) to activate a session. A dependent LU needs an active SSCP-LU session, which the dependent LU uses to start an LU-LU session with an LU in a subarea node. A dependent LU can have only one session at a time with the subarea LU. For communications with a TP at a subarea node, each dependent LU can have only one conversation at a time, and each dependent LU can support communications for only one TP at a time.

An *independent LU* does not depend on an SSCP to activate a session. An independent LU supports multiple concurrent sessions with other LUs in a subarea node, so you can have multiple conversations and support multiple TPs for communications with subarea TPs. LUs between peripheral nodes also use this support.

The distinction between a dependent LU and an independent LU is meaningful only when discussing a session between an LU in a peripheral node and an LU in a subarea node. Otherwise, dependent and independent LUs both support multiple concurrent sessions and conversations when communicating between type 2.1

peripheral nodes. A Personal Communications LU can support a single session with a dependent LU or multiple sessions with an independent LU.

What Is a Session?

Before TPs can communicate with each other their LUs must be connected in a mutual relationship called a *session*. A session connects two LUs, so it is called an *LU-LU* session. Figure 27 illustrates this communication relationship. Multiple, concurrent sessions between the same two LUs are called *parallel* LU-LU sessions.

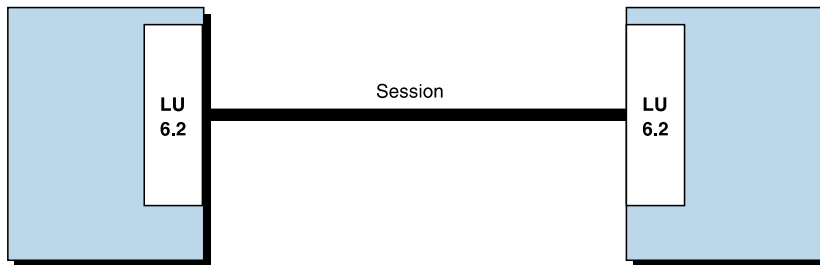


Figure 27. A Session between Two LUs

Sessions act as conduits that manage the movement of data between a pair of LUs in an SNA network. Specifically, sessions deal with things such as the quantity of data transmitted, data security, network routing, and traffic congestion.

Sessions are maintained by their LUs. Normally, your TPs do not deal with session characteristics. You define session characteristics when you:

- Configure your system
- Use the Session Services function in the Subsystem Management windows
- Use the management verbs

What Is a Conversation?

The communication between TPs is called a *conversation*. Conversations occur across LU-LU sessions. A conversation starts when a TP issues an APPC verb or CPI-C call that allocates a conversation. The conversation style associated with the conversation indicates the style of data transfer to be used, two-way alternate or two-way simultaneous. A conversation that specifies a two-way alternate style of data transfer is also known as a *half-duplex* conversation. A conversation that specifies a two-way simultaneous style of data transfer is referred to as a *full-duplex* conversation.

When a half-duplex conversation is allocated to a session, a send-receive relationship is established between the TPs connected to the conversation, and a two-way alternate data transfer occurs where information is transferred in both directions, one direction at a time. Like a telephone conversation, one TP calls the other, and they "converse", one TP talking at a time, until a TP ends the conversation. One TP issues verbs to send data, and the other TP issues verbs to receive data. When it finishes sending data, the sending TP can transfer send control of the conversation to the receiving TP. One TP decides when to end the conversation and informs the other when it has ended.

When a full-duplex conversation is allocated to a session, both TPs connected to the conversation are started in send-and-receive state, and a two-way simultaneous data transfer occurs where information is transferred in both directions at the same

time. Both TPs may issue verbs to send and receive data simultaneously with no transfer of send control required. The conversation ends when both TPs indicate they are ready to stop sending data, and each TP has received the data sent by the partner. If an error condition occurs, one TP may decide to end both sides of the conversation abruptly.

Conversations can exchange control information and data. The TP should select the conversation style best suited for its application.

A Conversation between Two TPs

Figure 28 shows a conversation between two TPs as it occurs over a session.

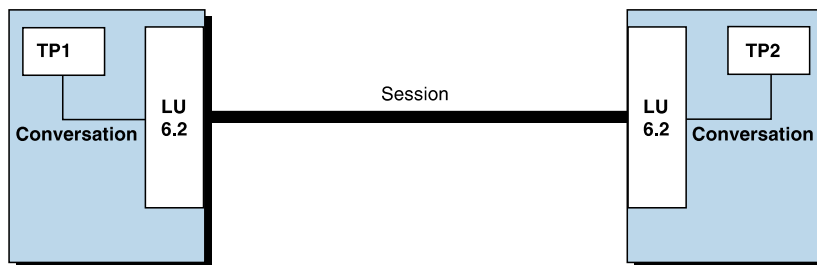


Figure 28. A Conversation between Two TPs

A session can support only one conversation at a time, but one session can support many conversations in sequence. Because multiple conversations can reuse sessions, a session is a long-lived connection compared to a conversation. When a program allocates a conversation and all applicable sessions are in use, the LU puts the incoming Attach (allocation request) on a queue. It completes the allocation when a session becomes available.

Two LUs can also establish parallel sessions with each other to support multiple concurrent conversations. A parallel session occurs when either TP allocates a conversation, and a session exists but is being used by a conversation. The LU can request a new session to satisfy the allocation.

Parallel Sessions between LUs

Figure 29 shows three parallel sessions between two LUs; each session carries a conversation.

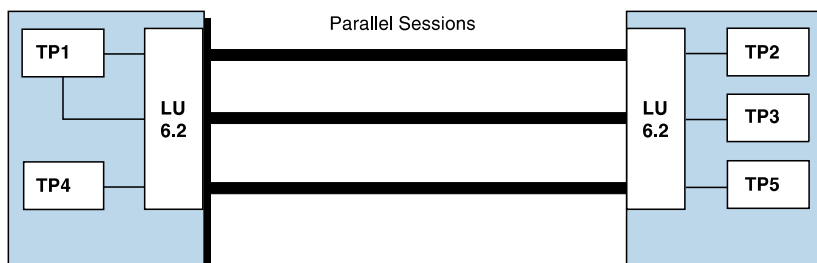


Figure 29. Parallel Sessions between LUs

SNA Communications

Personal Communications supports Systems Network Architecture (SNA) type 2.1 nodes (including SNA type 2.0 and SNA type 2.1 support for logical units "LUs" other than SNA LU 6.2). This support lets you write programs to communicate with many other IBM SNA products.

You can write programs without knowing the details of the underlying network. All you need to know is the name of the partner LU; you do not need to know its location. SNA determines the partner LU location and the best path for routing data. A change to the underlying network, such as a physical address change, the addition of a new adapter, or the relocation of a machine, does not affect APPC programs. A program might, however, need to establish link connections over switched SDLC connections.

When Personal Communications starts, it establishes local LU and logical link definitions, which are stored in a configuration file. The system management application programming interface (API) provides functions that control configuration definition and adapter and link activation.

Dependent Logical Unit Requester Support

Dependent Logical Unit Requester (DLUR) is an architecture intended to provide dependent LU support in an APPN network. Communications Server supports all base DLUR functions and the following optional functions:

- Self-defining dependent LU (SDDL) Support
By using SDDL support the DLUR-supported LUs can be dynamically defined to VTAM, thus eliminating the need to have these LUs predefined.
- TakeOver/GiveBack Support
This support allows LU-LU sessions to remain active even when the connection between the DLUR and DLUS nodes has failed. The connection can then be reestablished with the same or another DLUS, without the LU-LU sessions ever being disrupted.
- MultiSubnet Support
This support allows the DLUR node, DLUS node, and the node containing the application all to be in different subnetworks.
- DLUS-served LU registration
An end node DLUR registers its LUs so that the network node can locate these LUs without having to pass the locate requests to the DLUR.
- Backup DLUS Support
When the connection to the primary DLUS fails or does not become active, Communications Server will automatically try to establish a connection with the backup DLUS.

Using DLUR

To use the DLUR function, you configure a **Define_Dependent_LU_Server** definition and use the link name from that definition as the host link for your LUA, dependent LU 6.2, or gateway definitions. Communications Server sends the PUNAME, CPNAME, and NODEID to the DLUS. The PUNAME is sent as part of the signalling information (CV X'0E').

- If the DLUS is uplevel (supports checking of the CV X'0E' on REQACTPU) it uses the PUNAME in its search algorithm. This is available in VTAM 4.3 with PTF or higher.

- If the DLUS is downlevel, it ignores the CV X'0E'.
- If there is no match on PUNAME or the DLUS is downlevel, the DLUS then attempts to locate a PU with matching CP name or NODEID (IDBLK/IDNUM) either predefined in a VTAM switch major node or dynamically created using the ISTECCS exit.

Connections to the network using the connectivity of your choice (Token Ring, SDLC, AnyNet, and so on) must be configured and active before the DLUR-to-DLUS connection can be established. Once an APPN connection exists between the DLUR and DLUS, a pair of control sessions are established between the DLUR and DLUS using a special mode, CPSVRMGR. This pair of control sessions is also referred to as the CP-SVR pipe and appears as a link to Communications Server. It can therefore be activated, deactivated, and displayed using existing utilities such as SubSystem Management and sample programs, such as PMDdisplay and CMLinks.

Once the pipe is activated, SSCP-to-PU and SSCP-to-LU support can be provided to PUs and LUs that have defined the pipe as their host link. LU-to-LU sessions do not use the pipe, but as mentioned before, will use the best path available through the network.

In the DLUR environment, any number of dedicated PUs can be defined on the LU 6.2 sessions. This enables the gateway to provide network management access through the dedicated PU to downstream workstations without requiring numerous physical links to the hosts.

Figure 30 shows a Communications Server workstation acting as a DLUR gateway for both a workstation and a 4702 controller.

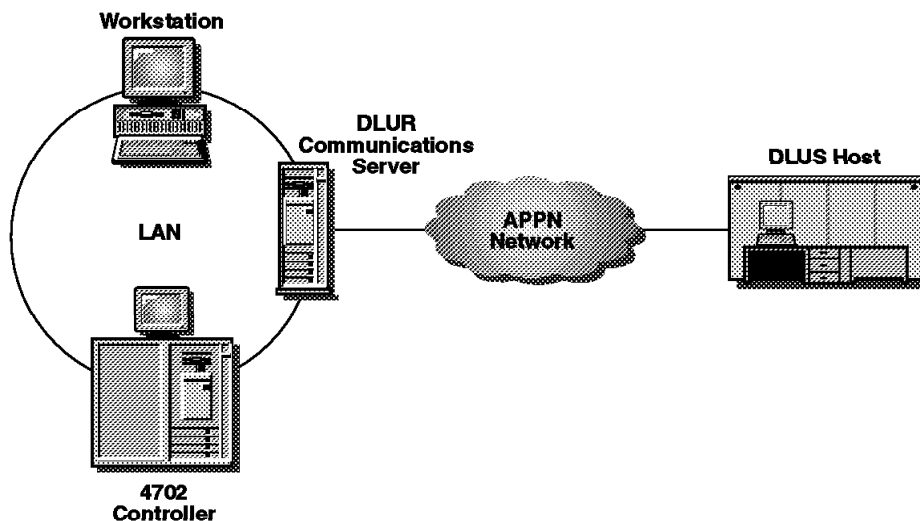


Figure 30. DLUR Connection to a Host through a Communications Server Gateway

Data Compression

Data compression is the process of compressing repeated bytes or repeated data strings to shorten the length of records or blocks. This reduces the transfer time needed for communications. By reducing the amount of data transferred between host and workstation sessions, you can increase the throughput on slow speed lines and lower the cost per bit on expensive lines.

The performance gain, as measured by the number of transferred bytes, that you can expect by using data compression is often a ratio of about 2:1. This means that, with data compression active, you save about every second byte in the buffers needed for lower level protocol conversion.

Data compression is beneficial to those who need:

- Improved response times, especially on low-speed lines
- Reduced costs on lines where tariffs are based on volume of data
- Fewer leased lines

However, data compression should not be applied to every session you are running as there are disadvantages you should consider:

- Compression and decompression need additional CPU cycles
- Increased data storage (32 bytes to 9.0 KB) will be needed
- Data compression requires a secure link as defined in your APPN class-of-service (COS) table.
- Tuning of the RU size might be required to obtain the best performance. Each RU is compressed and then sent. If packets are being sent, a larger RU size on the mode will enable more full packets to be sent.

Note: The amount of increased storage depends on the compression algorithm you use. This increase is in addition to the storage required for the message itself.

For detailed and technical descriptions of different compression algorithms see the following publications:

- *SNA Formats*
- *Better OPM/L Text Compression IEEE Transactions on Communications, vol COM-34*
- *IBM ITSC VTAM V3R4 and V3R4.1 Planning Guide*
- *A Technical Guide to ESA/390 Compression*

See *Communications Server for OS/2 Network Administration and Subsystem Management Guide* for a description of SNA session-level compression and Communications Server implementation.

Encryption

In Communications Server, LU 6.2 session level encryption is configured based on the mode description used for a given transaction program. There are two levels of encryption:

- APPC session level
Strictly between two LUs, no control points get involved in translating keys
- APPN session key translation

The control point of the originating LU (EN or NN) and possibly its NN server translate the keys in addition to the originating LU.

To configure a mode for encryption, bring up the SNA Features window and select **MODES**. Then inside the Mode Definition window, select **Setup....** The Compression and Session-level Encryption Support window appears. The parameters for the encryption configuration are in two parts:

- For session level encryption, you can specify whether encryption is optional (the LUs negotiate), selective (specified by the transaction program), or mandatory (encryption must be used).
- For APPN session key translation, you can specify that only the LU translates the key, that only the end node translates the session key, or that the end node and its network node translate the key.

Communications Server requires other products for key storage and translation. The Transaction Security System (TSS) product is required for key storage. Communications Server calls TSS, which interacts with the 4755 Cryptographic Adapter to get the keys and encrypt the data. Every workstation that will participate in session-level encryption requires a 4755 Cryptographic Adapter. For this reason, consider placing a 4755 Cryptographic Adapter in your SNA Gateway.

When the LANDP/2 product is installed, only one 4755 Cryptographic Adapter is required in the network. In this environment, each machine will have Communications Server, TSS, and LANDP/2 installed but all of them, except for one, will be configured as clients of the one workstation that has the 4755 adapter.

Note to VTAM Users: Communications Server does not encrypt the SNASVCMG session. You must specify ENCR=OPT in the APPL statement of your VTAM application definition. In working with VTAM, you must have encryption specified on the MODEENT statement. For example:

ENCR=B'0011' FOR MANDATORY ENCRYPTION

To use the VTAM encryption facility, the IBM Programmed Cryptographic Facility (PCF) must be initiated before starting VTAM.

Beginning with VTAM V3R4.1, VTAM uses a new interface to Integrated Cryptographic Service Facility/MVS (ICSF/MVS) for cryptographic services, such as providing session-level cryptography. This interface complies with the Common Cryptographic Architecture (CCA) as implemented by ICSF/MVS. With this support, you can start and stop the cryptographic service after VTAM has been started, and you can change the master key without disrupting VTAM or active LU-LU sessions.

For information on how to define data encryption, refer to the *VTAM Network Implementation Guide*.

Subsystem Management Services

Subsystem Management is an online facility that monitors and controls the communications resources of Access Feature. This allows you to adjust these resources to improve the efficiency of SNA communication services or to monitor and test these services during problem determination. The changes that you make while using Subsystem Management are not permanent and do not affect the configuration file.

Subsystem Management provides the following services:

- APPC attach manager
- Communications Server kernel
- SNA subsystem
- X.25

- ACDI

SNA services

This service allows you to display:

- Non-LU 6.2 sessions
- Gateway sessions
- Signed-on users
- Physical units
- Incoming call answer status

Also, this service allows you to display and:

- Deactivate APPC transaction programs (TPs)
- Change APPC session limits
- Activate and deactivate SNA logical links
- Activate and deactivate DLUS connections
- Deactivate LU 6.2 sessions
- Establish LU 6.2 sessions
- Activate and deactivate data link controls (DLCs)
- Change the answering mode for incoming calls
- Display and deactivate HPR connections

X.25 services

This service allows you to display and:

- Connect, autoconnect, or disconnect X.25 physical links

If the configuration for your workstation is locked by the Communications Server keylock function, only you can display the status of the subsystem components.

Through the launch capabilities, the user can directly access Trace, Message, System error log, Dump Formatter, and Configuration Services.

Chapter 21. Introducing SNA over TCP/IP

SNA over TCP/IP

This chapter introduces the SNA over TCP/IP function of Communications Server and contains the following sections:

- “What Does SNA over TCP/IP Do?”
- “How Does SNA over TCP/IP Work?” on page 401

For more detailed information on planning and configuring SNA over TCP/IP, see the *Guide to AnyNet SNA over TCP/IP*. For information about the TCP62 API which simplifies the configuration for applications of AnyNet LU6.2 over TCP/IP, see “Appendix C. TCP62 for IBM Access Feature for OS/2 Warp” on page 469.

What Does SNA over TCP/IP Do?

SNA over TCP/IP is one of IBM's AnyNet software offerings. AnyNet software enables application programs to communicate over different transport networks and across interconnected networks. Using AnyNet, you can reduce the number of transport networks and reduce operational complexity. These benefits are gained without modification to your existing application programs or hardware.

The SNA over TCP/IP access node function of Communications Server enables SNA applications to communicate over an IP network. Application programs, such as Customer Information Control System (CICS) and Information Management System (IMS), can access an IP network without modification.

The SNA over TCP/IP Gateway function enables SNA applications in SNA and IP networks to communicate. Using the SNA over TCP/IP Gateway function, SNA applications running nonnatively on an IP network can communicate, without change, with SNA applications on an SNA network. The SNA over TCP/IP Gateway supports 1500 LU-LU sessions.

For independent LU communication, two or more SNA over TCP/IP Gateway can be used to connect multiple IP networks and SNA networks, thereby allowing SNA applications to communicate with each other across multiple networks.

To enable dependent LU communication, you can use the AnyNet SNA over TCP/IP function with or without the SNA Gateway function of Communications Server.

The following network configurations illustrate how SNA over TCP/IP access nodes and gateways can be used:

- “Connecting SNA over TCP/IP Access Nodes over an IP Network” on page 392
- “Connecting an SNA over TCP/IP Access Node to a VTAM Host Processor over an IP Network” on page 392
- “Using a Single SNA over TCP/IP Gateway to Connect an IP Network to an SNA Network” on page 392
- “Using Parallel Gateways to Increase the Number of LU-LU Sessions” on page 393
- “Chaining Gateways to Connect Multiple SNA and IP Networks” on page 394

- “Using Gateways to Support Dependent LU Communication” on page 395

Connecting SNA over TCP/IP Access Nodes over an IP Network

Figure 31 illustrates how you can use the AnyNet SNA over TCP/IP function of the OS/2 Access Feature to enable communication between SNA applications over an IP network.

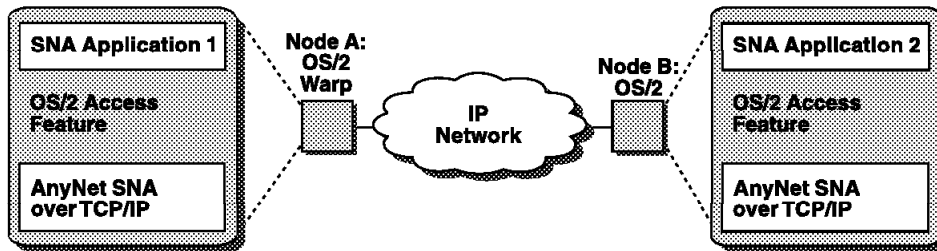


Figure 31. Using SNA over TCP/IP to Connect SNA Applications over an IP Network

Connecting an SNA over TCP/IP Access Node to a VTAM Host Processor over an IP Network

Figure 32 illustrates how you can use the AnyNet SNA over TCP/IP function of the OS/2 Access Feature to enable communication between a VTAM application and an OS/2 SNA application over an IP network. Node B, an access node, is defined as a dependent LU requester (DLUR).

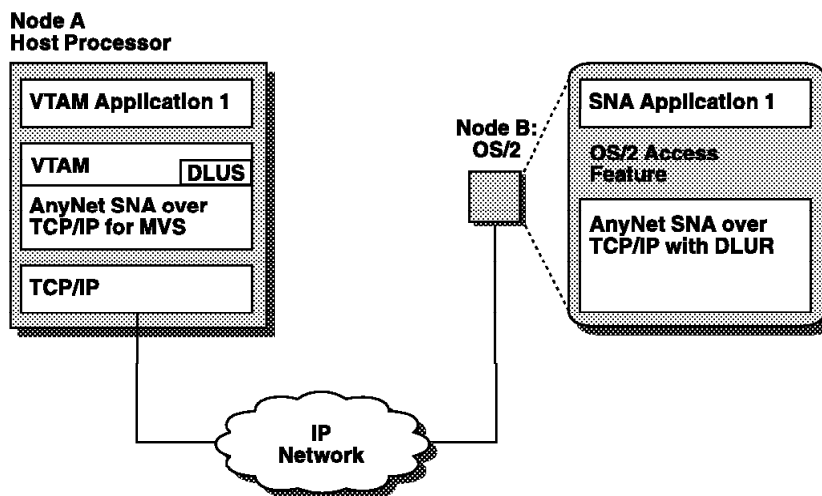


Figure 32. Using AnyNet SNA over TCP/IP to Connect a VTAM Application and an OS/2 SNA Application over an IP Network

Using a Single SNA over TCP/IP Gateway to Connect an IP Network to an SNA Network

Figure 33 on page 393 illustrates a configuration in which an IP network and an SNA network are connected by a single SNA over TCP/IP Gateway. In this example:

- Node A is running an independent LU 6.2 application on any operating system that supports SNA connectivity.
- Gateway Node B is running:
 - OS/2
 - Communications Server with the AnyNet SNA over TCP/IP Gateway function enabled
- Node C is running:
 - AnyNet APPC over TCP/IP or AnyNet SNA over TCP/IP function
 - An independent LU 6.2 application running on any operating system that supports AnyNet (for example, OS/2, OS/400, AIX, MVS, Windows, Windows/95, and Windows/NT)

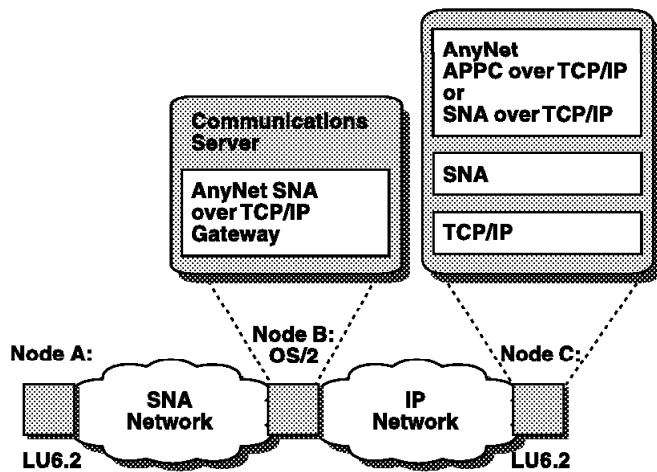


Figure 33. Using a Single Gateway to Connect an IP Network to an SNA Network

Using Parallel Gateways to Increase the Number of LU-LU Sessions

A SNA over TCP/IP Gateway can support up to 1500 LU-LU sessions. You can use parallel gateways to increase the total number of sessions that can be supported through the gateway.

Figure 34 on page 394 illustrates a configuration in which an IP network and an SNA network are connected by parallel gateways. In this example:

- Node A is running an independent LU 6.2 application on any operating system that supports SNA connectivity.
- Parallel gateways B and C are running:
 - OS/2
 - Communications Server with the AnyNet SNA over TCP/IP Gateway function enabled
- Node D is running:
 - AnyNet APPC over TCP/IP or AnyNet SNA over TCP/IP function
 - An independent LU 6.2 application running on any operating system that supports AnyNet (for example, OS/2, OS/400, AIX, MVS, Windows, Windows/95, and Windows/NT)

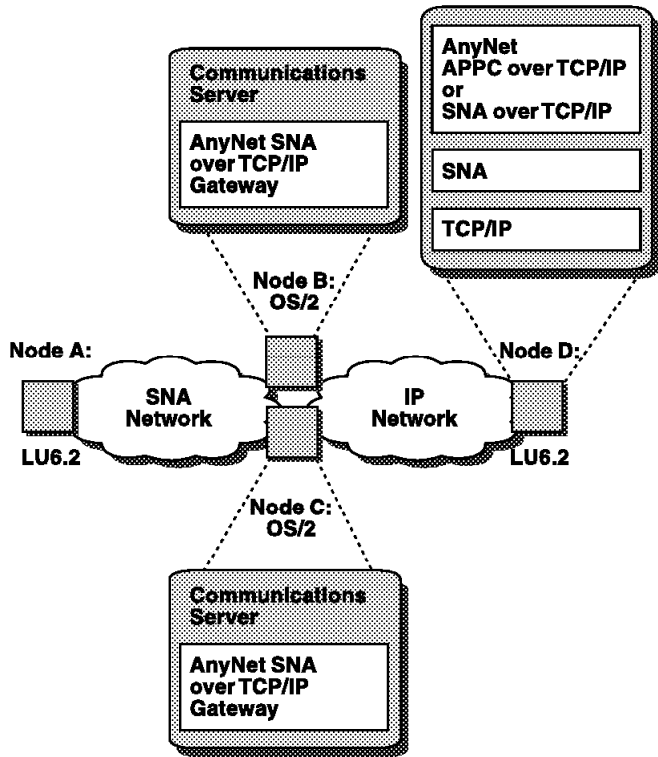


Figure 34. Using Parallel Gateways to Increase the Number of LU-LU Sessions

Chaining Gateways to Connect Multiple SNA and IP Networks

You can use chained gateways to connect multiple remote networks and support independent LU communication. Chained gateways enable either the IP network to connect multiple SNA networks (Figure 35 on page 395) or the SNA network to connect multiple IP networks (Figure 36 on page 395).

Note: While the sample configurations show three networks connected, the number of networks that can be concatenated is unlimited.

In Figure 35 on page 395 :

- Nodes A and D are running independent LU 6.2 applications on any operating system that supports SNA connectivity.
- Gateway nodes B and C are running:
- OS/2
 - Communications Server with the AnyNet SNA over TCP/IP Gateway function enabled

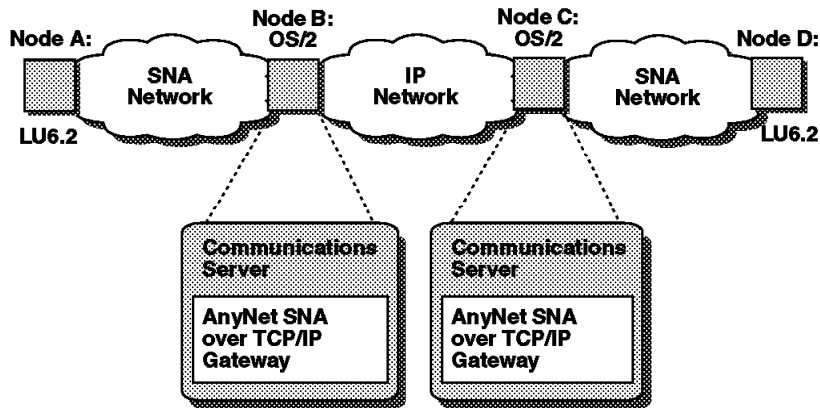


Figure 35. Chaining Gateways to Connect Multiple SNA Networks

In Figure 36 :

- Nodes A and D are running:
 - Anynet APPC over TCP/IP or Anynet SNA over TCP/IP function
 - An independent LU 6.2 application running on any operating system that supports Anynet (for example, OS/2, OS/400, AIX, MVS, Windows, Windows/95, and Windows/NT)
- Gateway nodes B and C are running:
 - OS/2
 - Communications Server with the Anynet SNA over TCP/IP Gateway function enabled

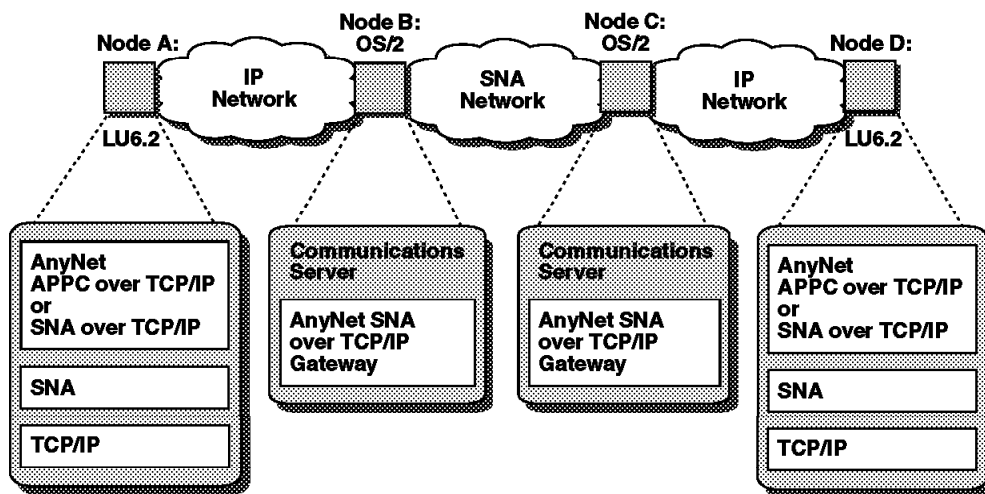


Figure 36. Chaining Multiple Gateways to Connect Multiple IP Networks

Using Gateways to Support Dependent LU Communication

To enable dependent LU communication, you can use the Anynet SNA over TCP/IP function with or without the SNA Gateway function of Communications Server.

The following network configurations illustrate how you can enable dependent LU communication using the Communications Server SNA Gateway with the Anynet SNA over TCP/IP function:

- “Support for Downstream Workstations over a Subarea Network”
- “Support for Downstream Workstations over an APPN Network”
- “Support for Downstream Workstations over an IP Network” on page 397
- “Support for Native Downstream SNA Nodes” on page 398
- “Chaining Gateways to Support Dependent LU Communication over an SNA Backbone” on page 399

For a network configuration that illustrates an Anynet SNA over TCP/IP Gateway without the Communications Server SNA Gateway function, see “Dependent LU Communication without the SNA Gateway Function” on page 400.

Support for Downstream Workstations over a Subarea Network

Figure 37 illustrates a configuration that supports dependent LU communication for downstream workstations using a subarea host. In this example:

- Node A is running VTAM.
- Gateway Node B is running:
 - OS/2
 - Communications Server with the following functions enabled:
 - SNA Gateway over the Anynet DLC
 - Anynet SNA over TCP/IP access node
- Node C, a downstream workstation, is running:
 - OS/2, Windows 3.1, Windows/NT, or Windows/95
 - AnyNet SNA/IP access node

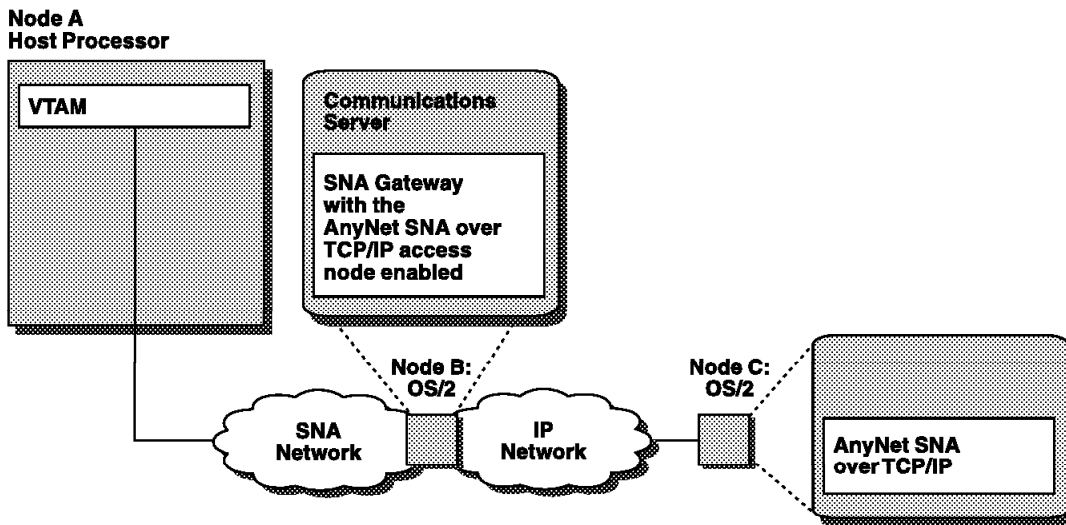


Figure 37. Dependent LU Communication Support for Downstream Workstations over a Subarea Network

Support for Downstream Workstations over an APPN Network

Figure 38 on page 397 illustrates a configuration that supports dependent LU communication for downstream workstations using an APPN host. In this example:

- Node A is running VTAM and is defined as a dependent LU server (DLUS).

- Gateway Node B is defined as a dependent LU requester (DLUR) and is running:
 - OS/2
 - Communications Server with the following functions enabled:
 - SNA Gateway over the Anynet DLC
 - Anynet SNA over TCP/IP access node

Node C, a downstream workstation, is running:

- OS/2, Windows 3.1, Windows/NT, or Windows/95
- AnyNet SNA/IP access node

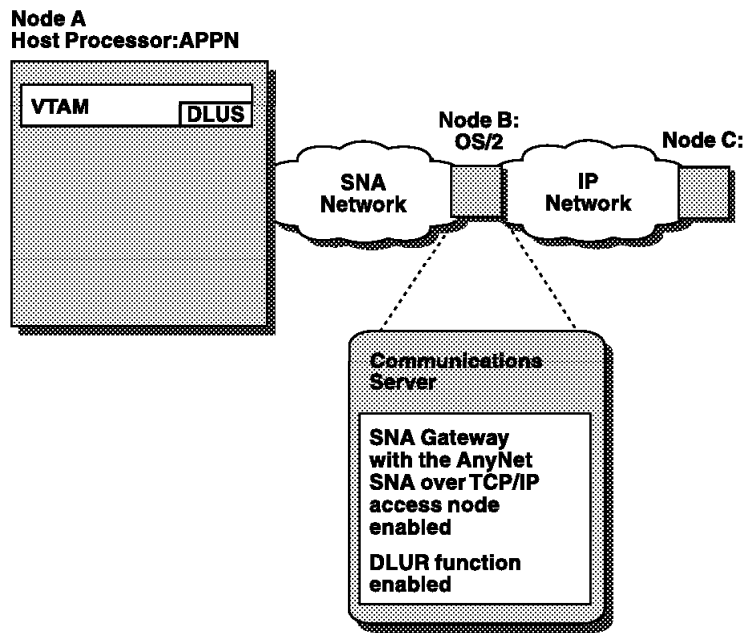


Figure 38. Dependent LU Communication Support for Downstream Workstations over an APPN Network

Support for Downstream Workstations over an IP Network

Figure 39 on page 398 illustrates a configuration that supports dependent LU communication for downstream workstations over an IP network. In this example:

- Node A is defined as a dependent LU server (DLUS) and is running:
 - VTAM
 - Anynet SNA over TCP/IP for MVS
 - TCP/IP for MVS
- Gateway Node B is defined as a dependent LU requester (DLUR) and is running:
 - OS/2
 - Communications Server with the following functions enabled:
 - SNA Gateway over the Anynet DLC
 - Anynet SNA over TCP/IP access node

Node C, a downstream workstation, is running:

- OS/2, Windows 3.1, Windows/NT, or Windows/95
- AnyNet SNA/IP access node

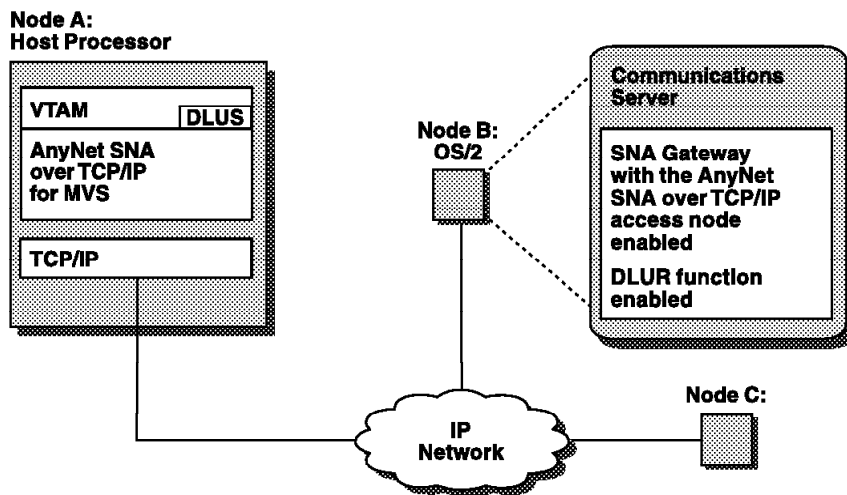


Figure 39. Dependent LU Communication Support for Downstream Workstations over an IP Network

Support for Native Downstream SNA Nodes

Figure 40 on page 399 illustrates a configuration that supports dependent LU communication for native SNA nodes. In this example:

- Node A is defined as a dependent LU server (DLUS) and is running:
 - VTAM
 - Anynet SNA over TCP/IP for MVS
 - TCP/IP for MVS
- Gateway Node B is defined as a dependent LU requester (DLUR) and is running:
- OS/2
- Communications Server with the following functions enabled:
 - SNA Gateway over an SNA DLL
 - Anynet SNA over TCP/IP access node
- Node C, a dependent LU, is running on any operating system that supports SNA connectivity.

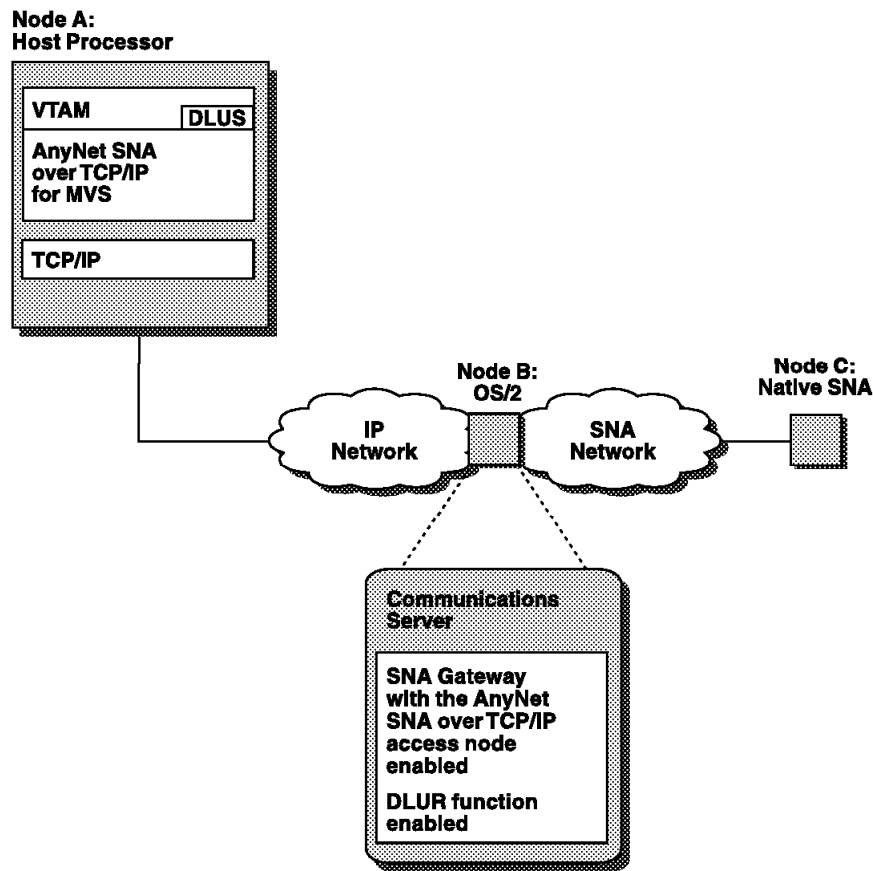


Figure 40. Dependent LU Communication Support for Native SNA Nodes

Chaining Gateways to Support Dependent LU Communication over an SNA Backbone

Figure 41 on page 400 illustrates a configuration that supports dependent LU communication for downstream workstations over an SNA backbone. In this example:

- Node A is defined as a dependent LU server (DLUS) and is running:
 - VTAM
 - Anynet SNA over TCP/IP for MVS
 - TCP/IP for MVS
- Gateway Node B is defined as a dependent LU requester (DLUR) and is running:
 - OS/2
 - Communications Server with the following functions enabled:
 - SNA Gateway over an SNA DLC
 - Anynet SNA over TCP/IP access node
- Gateway Node C is running:
 - OS/2
 - Communications Server with the following functions enabled:
 - SNA Gateway over the Anynet DLC
 - Anynet SNA over TCP/IP access node

Node D, a downstream workstation, is running:

- OS/2, Windows 3.1, Windows/NT, or Windows/95
- AnyNet SNA/IP access node

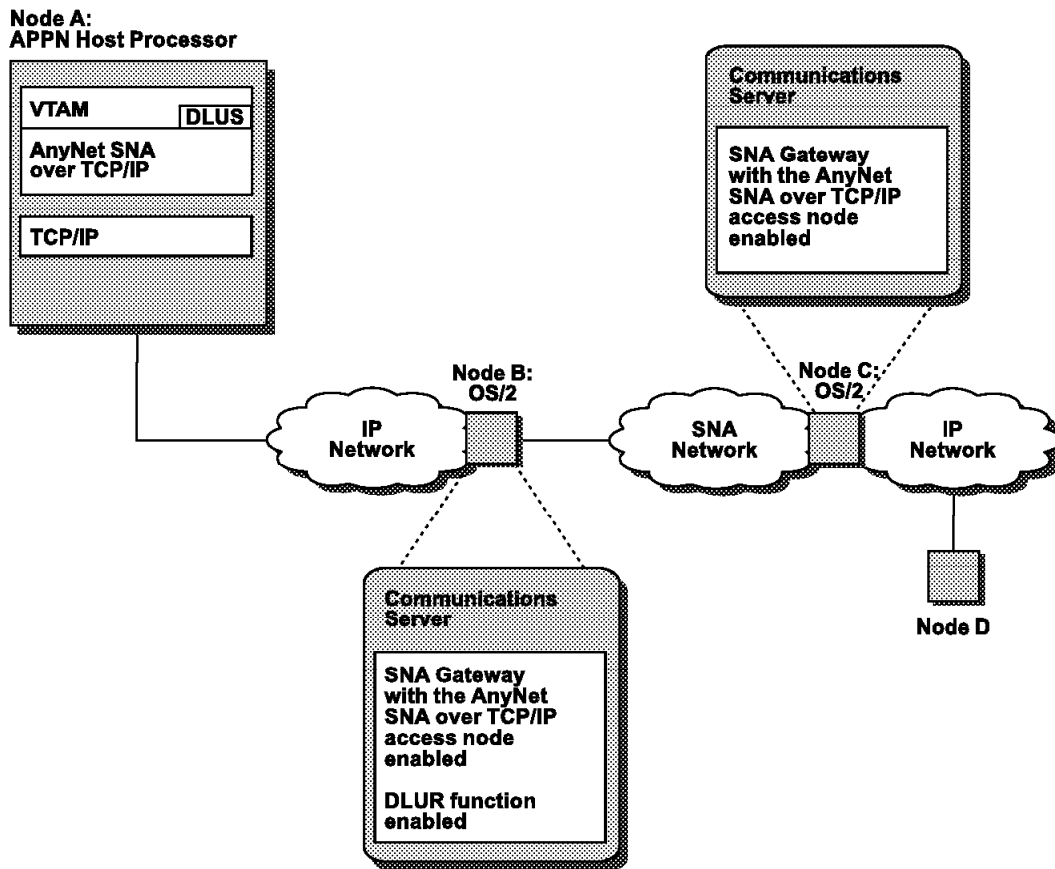


Figure 41. Chaining Gateways to Support Dependent LU Communication over an SNA Backbone

Dependent LU Communication without the SNA Gateway Function

Figure 42 on page 401 illustrates how dependent LU communication is supported through an AnyNet SNA over TCP/IP Gateway that is not defined as an SNA Gateway.

Configuration Restrictions:

- The dependent LU server (DLUS) is in the SNA network.
- The dependent LU requesters (DLURs) are in the IP network.
- Traffic between the DLUS and DLURs is routed through a single gateway or through parallel gateways.
- The SNA application (or primary LU) being accessed by the dependent LU is located in the SNA network.

In this example:

- Node A is running VTAM and is defined as a dependent LU server (DLUS).
- Gateway Node B is running:
- OS/2

- Communications Server with the AnyNet SNA over TCP/IP Gateway function enabled
- Node C is defined as a dependent LU requester (DLUR) with the AnyNet SNA over TCP/IP function enabled.

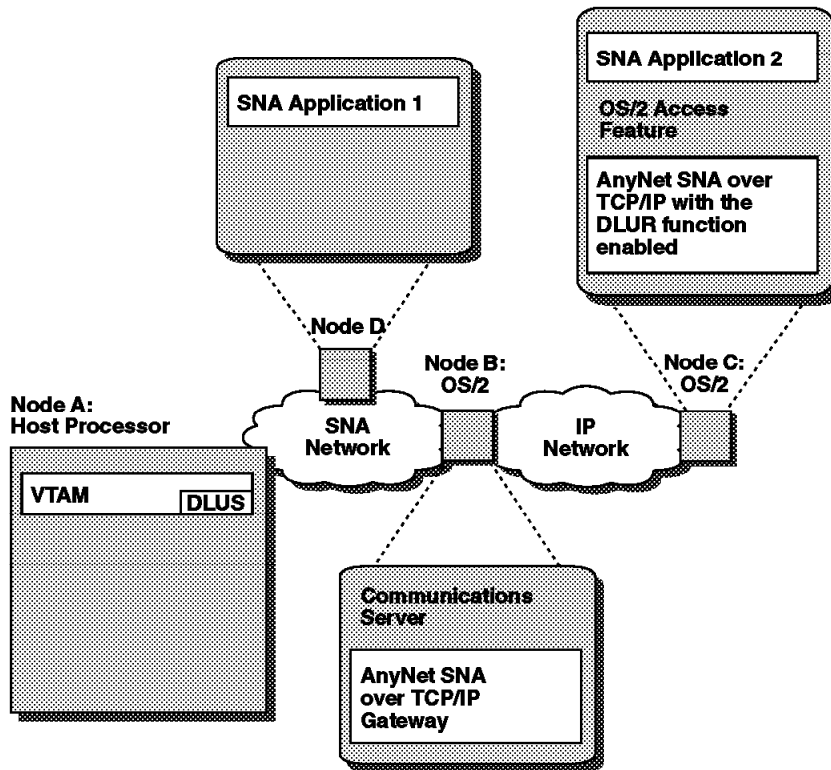


Figure 42. Using Gateways to Support Dependent LU Communications among Multiple Networks

How Does SNA over TCP/IP Work?

This section explains how data is transported and mapped by the SNA over TCP/IP access node and gateway. It includes the following information:

- “SNA over TCP/IP Access Node”
- “SNA over TCP/IP Gateway” on page 402
- “Protocol Flows for SNA over TCP/IP” on page 403
- “Application Program Interface Support” on page 405
- “Network Interface Protocol Support” on page 405
- “TCP/IP Support Services” on page 405

SNA over TCP/IP Access Node

Figure 43 on page 402 illustrates how an SNA over TCP/IP access node enables SNA application programs to communicate over IP networks.

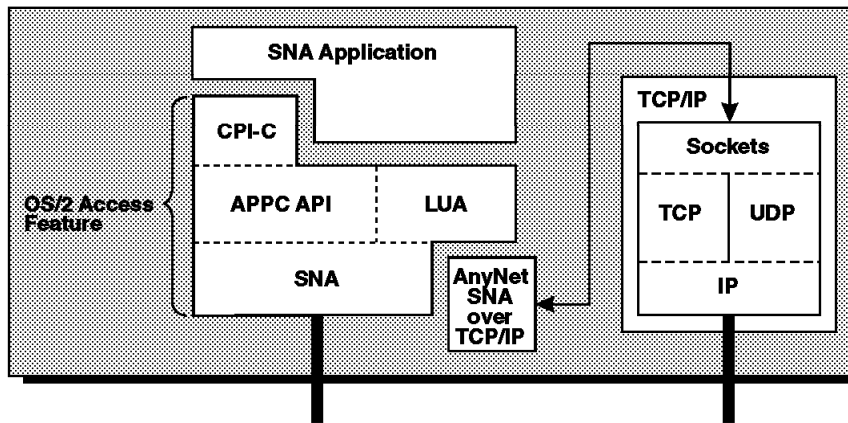


Figure 43. Structure of an SNA over TCP/IP for OS/2 Access Node

SNA over TCP/IP uses protocols that bypass the lower transport layers of the SNA architecture. Instead of encapsulating an entire SNA path information unit (PIU) within a TCP transmission frame, SNA over TCP/IP builds a basic information unit (BIU) that TCP can accept from SNA over TCP/IP when sending and receiving data.

The process of building the unique transmission frame is transparent to an SNA application program. Using a supported API, an application program passes data to the presentation services of the OS/2 Access Feature. The data, in turn, is passed through the SNA architectural layers and presented to SNA over TCP/IP instead of the usual SNA path control. When the OS/2 Access Feature initiates a session for an application program, SNA over TCP/IP translates the SNA routing information (network-qualified name) into IP routing information (IP address) and uses the IP address to create a TCP connection to the appropriate system.

The configuration information you define enables SNA over TCP/IP to determine:

- Whether to route the data using SNA transport or to route the data using IP transport
- The IP address associated with the SNA resource

SNA over TCP/IP uses both stream (TCP) and datagram (UDP) sockets that are bound to the well-known port (397). Any information received over this port is routed to Anynet.

SNA over TCP/IP Gateway

Figure 44 on page 403 illustrates how an SNA over TCP/IP Gateway node enables SNA application programs to communicate over SNA and IP networks.

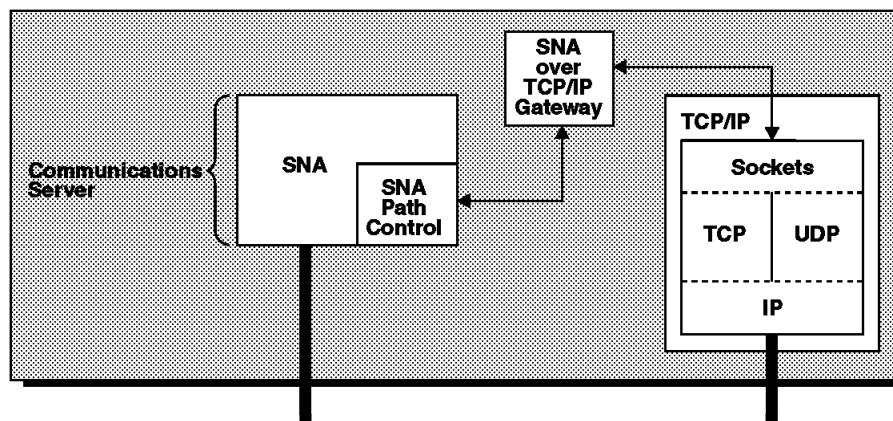


Figure 44. Structure of an SNA over TCP/IP for OS/2 Gateway Node

The SNA over TCP/IP Gateway sets up and takes down connections across the IP and SNA networks, transfers data between the two networks, and translates flows from one network to another. The nodes in the SNA network run applications natively and do not need to run SNA over TCP/IP software. The nodes in the IP network run applications nonnatively and must run either APPC over TCP/IP or SNA over TCP/IP.

SNA over TCP/IP sets up a logical connection across the SNA and IP networks. This connection is made up of two connection segments. One segment is across the IP network; one segment is across the SNA network. When an access node in the IP network issues a connection setup request, the request arrives at the well-known TCP port of the gateway as an MPTN connection setup request.

Protocol Flows for SNA over TCP/IP

The Anynet SNA over TCP/IP function can be used with or without the SNA Gateway function of Communications Server to enable dependent LU communication. For network configuration examples, see “Using Gateways to Support Dependent LU Communication” on page 395.

This section describes the connection setup protocol flows for Anynet SNA over TCP/IP.

Protocol Flow for SNA over TCP/IP without the SNA Gateway Function

If the SNA over TCP/IP Gateway is not defined as an SNA Gateway, the connection setup protocol flow between the access node and the gateway is the same as between two access nodes. If the partner LU does not reside in the gateway, the gateway uses SNA protocols to locate the partner LU in the SNA network. If the partner is found in the SNA network, the gateway acts as an endpoint for the TCP connection segment and sets up the SNA connection segment as a session across the SNA network.

Note: This explanation, and most configurations and scenarios in this book, assume an APPN environment where resources can be dynamically located. If the gateway is attached to an SNA network through a low-entry networking (LEN) node connection, the location of resources must be predefined.

When a native node in the SNA network issues a connection setup request, it generates an APPN Locate request to locate the partner LU. When the gateway, which is also an APPN network node, receives the Locate, it processes the request using standard APPN flows. It also queries the domain name server of the IP network or the local HOSTS file to determine whether the partner LU is located in the IP network.

If the LU is located in the IP network, the gateway creates a positive Locate response and sends the response to the source node. Using the information contained in the response, the source node sends an SNA session setup request to the gateway. The gateway forwards this request over the IP network as an MPTN_Connect packet to the access node containing the partner LU. The connection setup flows between the gateway and the access node are the same as between two access nodes.

Protocol Flow for SNA over TCP/IP with the SNA Gateway Function

If the SNA over TCP/IP Gateway is also defined as an SNA Gateway, it provides downstream workstation support over IP networks. Figure 45 shows an example. In this example:

- Node B, the SNA over TCP/IP Gateway, appears to be a type 2.0 PU supporting multiple logical units per workstation. All the LUs seem to belong to the gateway PU.
- To the downstream workstation, Node C, the gateway acts as a communications controller by forwarding host messages, such as ACTPU, ACTLU, BIND, and UNBIND.

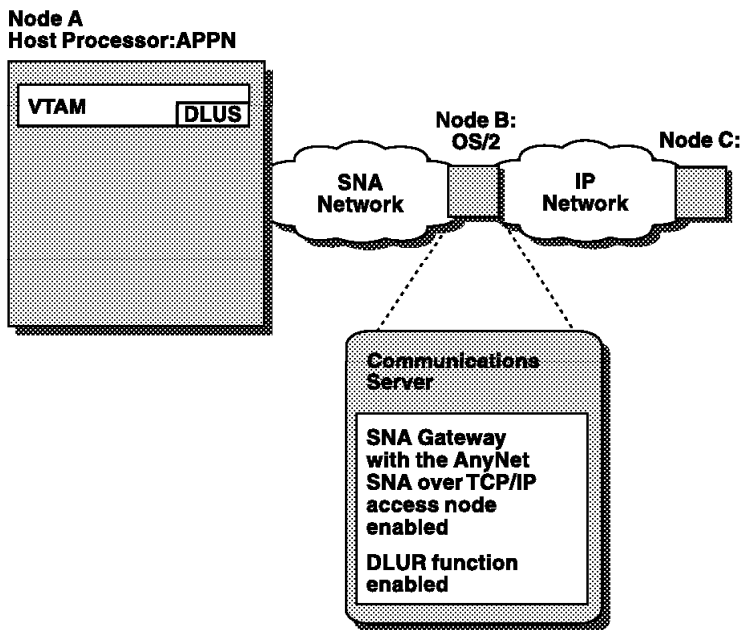


Figure 45. Dependent LU Communication Support for Downstream Workstations using a SNA Gateway and

When defined as an SNA Gateway, the SNA over TCP/IP Gateway initiates communication with a downstream node over an IP network by exchanging signal datagrams. The datagrams contain source and destination SNA names as well as sequencing information.

Link activation starts when the gateway sends a signal datagram request to the downstream workstation and creates a new path control for the link over TCP/IP. After receiving the datagram, the downstream node forwards the datagram to its MPTN component. The MPTN component indicates to the SNA component in the downstream node that a link has been activated by the gateway. The SNA component creates a new path control for the link. The node then sends a signal datagram response to the gateway. When the gateway receives the signal datagram response from the downstream workstation, link activation is complete.

Once the link is activated, flows between the gateway and the workstation, such as ACTPU, ACTLU, and BINDs, are forwarded to the path control associated with the link. All data flowing between the gateway and the downstream workstation is forwarded over the IP network.

Application Program Interface Support

SNA over TCP/IP supports application programs and subsystems that use the following application program interfaces (APIs):

- Communications Server APPC
- Communications Server CPI-C
- Communications Server LUA
- PC/3270

Network Interface Protocol Support

All network interface protocols supported by TCP/IP for OS/2, (IEEE 802.3 LAN, for example) can be used with SNA over TCP/IP. Refer to your TCP/IP documentation to determine which network interface protocols are supported.

Because the SNA over TCP/IP is attached to an SNA network, it also supports any network interface protocols that are supported by SNA.

TCP/IP Support Services

SNA over TCP/IP uses the following support services provided by IBM TCP/IP for OS/2.

- Socket API (for C language programs)
- TCP/IP protocol support
- Domain name system resolver function

Chapter 22. Introducing Sockets over SNA

This chapter introduces the Sockets over SNA function of Communications Server and contains the following sections:

- “What Does Sockets over SNA Do?”
- “How Does Sockets over SNA Work?” on page 411
- “Application Program Support Provided by Sockets over SNA” on page 412
- “Restrictions on Using Sockets over SNA” on page 413
- “Requirements for Full-Duplex Enablement” on page 413

For more detailed information on planning and configuring Sockets over SNA, see the *Guide to AnyNet Sockets over SNA*.

What Does Sockets over SNA Do?

Sockets over SNA is one of IBM's AnyNet software offerings. AnyNet software enables application programs to communicate over different transport networks and across interconnected networks. Using AnyNet, you can reduce the number of transport networks and reduce operational complexity. These benefits are gained without modification to your existing application programs or hardware.

The Sockets over SNA access node function of Communications Server enables C application programs using the IBM TCP/IP AF_INET socket interface to communicate over SNA networks. The Sockets over SNA Gateway function enables socket applications in SNA and IP networks to communicate.

The following network configurations illustrate how Sockets over SNA access nodes and gateways can be used:

- “Connecting Sockets over SNA Access Nodes on Different Operating Systems”
- “Connecting an SNA Network with an IP Network Using Sockets over SNA Gateway” on page 408
- “Connecting an SNA Network with IP Networks Using Sockets over SNA Gateway and a TCP/IP Router” on page 409
- “Connecting Remote IP Networks Using an SNA Backbone Network and Sockets over SNA Gateway” on page 410

Connecting Sockets over SNA Access Nodes on Different Operating Systems

Figure 46 on page 408 illustrates an SNA network in which socket applications on multiple operating systems are communicating over an SNA network. In this example:

- The MVS node is configured with Sockets over SNA for MVS which is provided with the VTAM Multiprotocol Transport Feature (MPTF) or the VTAM AnyNet feature.
- Node B is configured with Sockets over SNA for OS/2 which is provided with the OS/2 Access Feature.
- Node C is configured with Sockets over SNA for AIX which is provided as part of the AIX SNA Server/6000 AnyNet Feature.
- Node D is configured with Sockets over SNA and Communications Manager/2.

- Node E is configured with OS/400, which includes the Sockets over SNA function.

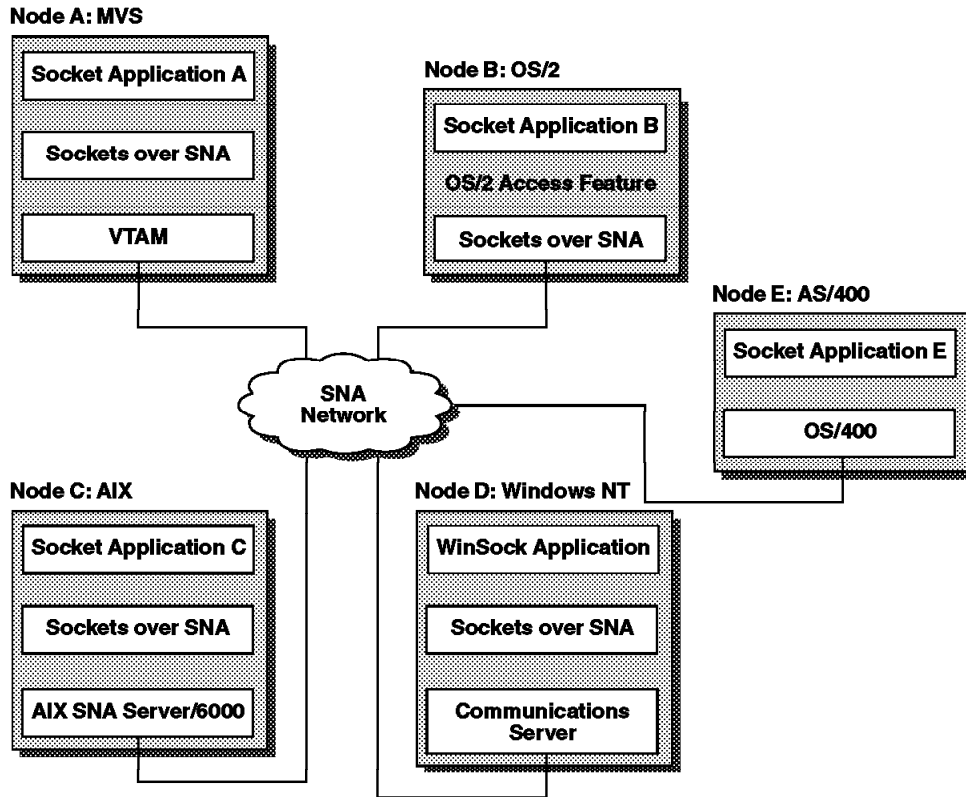


Figure 46. SNA Network with Multiple Operating Systems

Connecting an SNA Network with an IP Network Using Sockets over SNA Gateway

Sockets over SNA can be used to connect SNA and IP networks. In Figure 47 on page 409 :

- Node A is configured with Sockets over SNA for OS/2 which is provided with the OS/2 Access Feature.
- Node B is configured with TCP/IP and runs on a native IP network.
- Node C is configured with the Sockets over SNA Gateway feature of Communications Server.
- Socket applications on nodes A and B can communicate through Node C even though the applications are running on different types of networks.

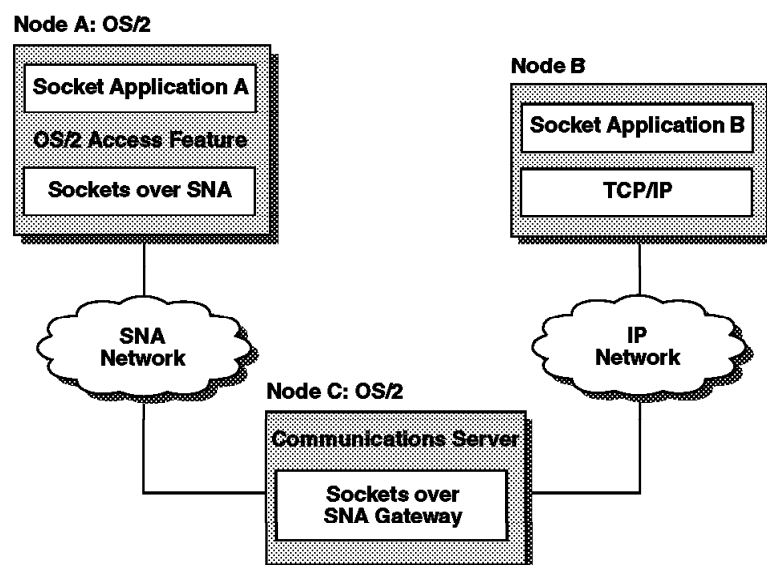


Figure 47. Socket Applications on IP and SNA Networks Communicating through a

Connecting an SNA Network with IP Networks Using Sockets over SNA Gateway and a TCP/IP Router

Sockets over SNA can be used to connect an SNA network to existing IP networks using Sockets over SNA and a TCP/IP router. In Figure 48 on page 410 :

- Nodes A and C are configured with TCP/IP and run on remote, native IP networks.
- Node B is configured as the TCP/IP default router in IP networks A and B.
- Node D is configured with Sockets over SNA Gateway and is added to interconnect IP networks A and B to the SNA network.
- Node E, on the SNA network, is configured with Sockets over SNA for OS/2 which is provided with the OS/2 Access Feature.
- Socket applications on nodes A and C can communicate with socket applications on node E even though all applications are not on the same type of network.

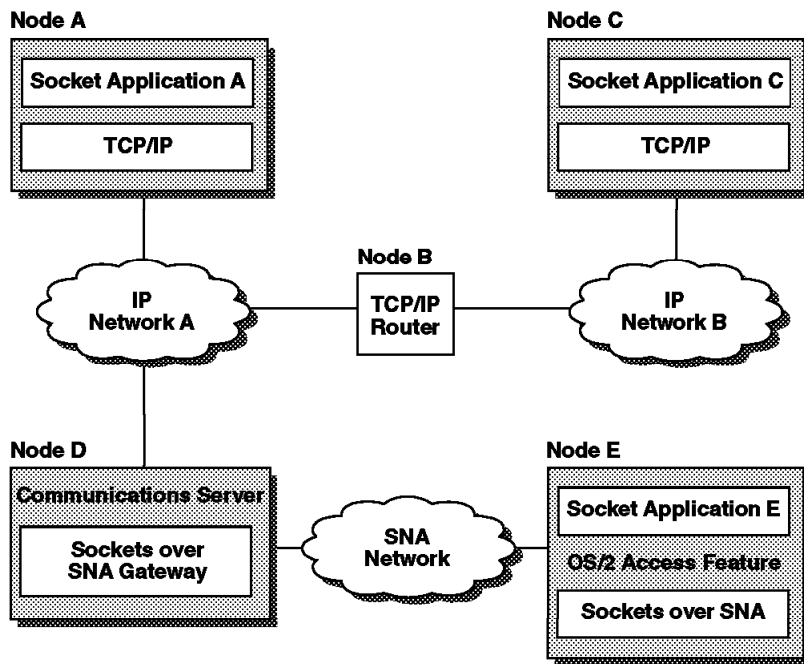


Figure 48. Socket Applications on IP and SNA Networks Communicating through a and a TCP/IP Router

Connecting Remote IP Networks Using an SNA Backbone Network and Sockets over SNA Gateway

Sockets over SNA can be used to connect remote, native IP networks across an SNA network. For example, two Sockets over SNA Gateway can be used to connect two IP networks to an SNA network. In this configuration, socket applications on either IP network can use the gateway to communicate with socket applications on the SNA network or with socket applications on the remote IP network.

In Figure 49 on page 411 :

- Nodes A and C are configured with TCP/IP and run on remote, native IP networks.
- Node B, on the SNA network, is configured with Sockets over SNA for OS/2 which is provided with the OS/2 Access Feature.
- Nodes D and E are configured as Sockets over SNA Gateway.

The two Sockets over SNA Gateway enable communication between socket applications on all nodes.

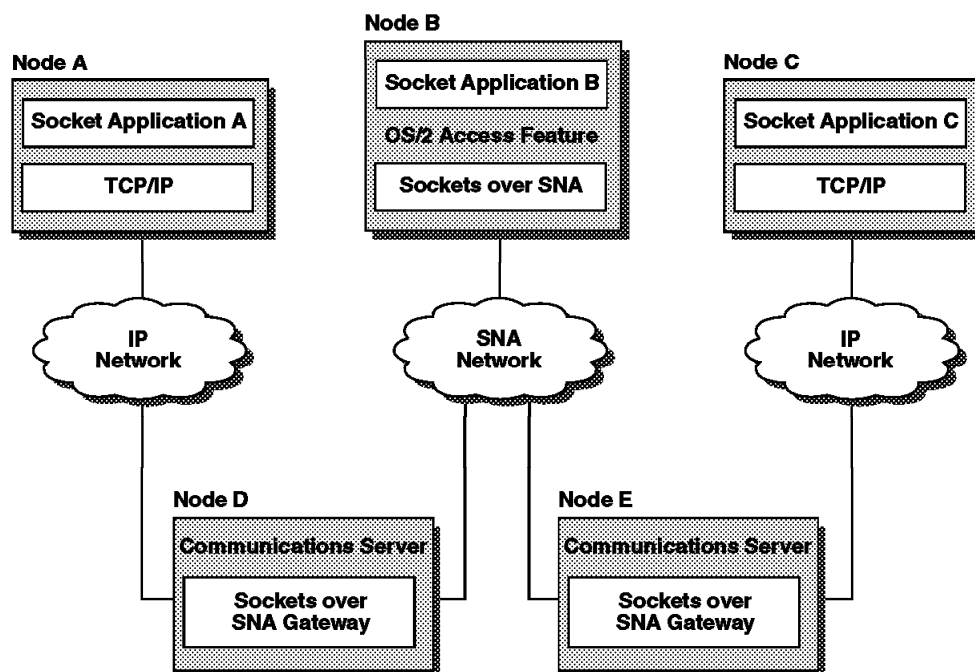


Figure 49. Socket Applications on IP and SNA Networks Communicating through Multiple Sockets over SNA Gateway

How Does Sockets over SNA Work?

Figure 50 shows the structure of an OS/2 node that is running Sockets over SNA and illustrates how socket application programs and Sockets over SNA operate on OS/2 node.

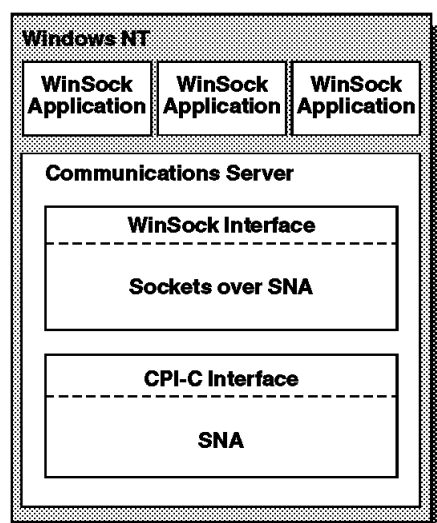


Figure 50. Structure of an OS/2 Node Running Sockets over SNA

Sockets over SNA uses the C socket interface that allows C socket applications to communicate with remote socket applications. When an application attempts to

open a stream or datagram connection to another application using Sockets over SNA, it supplies the same information to Sockets over SNA that it would supply to TCP/IP.

Operating as an LU 6.2 application, Sockets over SNA receives socket calls through its application program interface and generates LU 6.2 calls that correspond to the socket calls. Sockets over SNA issues these calls to the LU 6.2 interface of Communications Server.

Generating an LU 6.2 Call from a Socket Call

To enable TCP/IP-formatted information to route over SNA, Sockets over SNA maps IP addresses to SNA network-qualified LU names. When an application program invokes Sockets over SNA to establish a stream connection with another application program, Sockets over SNA establishes one or two LU 6.2 conversations for the stream connection. If the nodes on which the communicating applications reside are both full-duplex enabled, only one LU 6.2 conversation is established. If either of the communicating nodes is only half-duplex enabled, two LU 6.2 conversations are established. See “Requirements for Full-Duplex Enablement” on page 413 for full-duplex requirements.

Sockets over SNA establishes one LU 6.2 conversation for all datagrams sent to a single destination. Conversations dedicated to datagram traffic are deallocated if they are unused for some specified period of time.

Mapping an IP Address to an SNA Network-Qualified Name

When an application program invokes Sockets over SNA to communicate with another application program, it supplies the IP address of the destination node. Sockets over SNA must map the IP address to an SNA address to issue an appropriate LU 6.2 call. For every IP address that identifies a node, there will be a corresponding SNA network-qualified name.

Routing and Mapping Data over SNA and IP Networks

Sockets over SNA Gateway enables communication between socket application programs in IP and SNA networks by combining the routing function of TCP/IP with the protocol translation and address mapping capabilities of Sockets over SNA.

Protocol translation and address mapping are required when data is routed between nodes that use different transport protocols. The Sockets over SNA Gateway automatically performs protocol translation after determining the type of transport associated with the destination IP address.

Application Program Support Provided by Sockets over SNA

Any socket application that runs on OS/2 TCP/IP will run on Sockets over SNA. The socket applications listed in Figure 51 on page 413 have been tested and are compatible with Sockets over SNA. This list does not include all compatible socket application programs. You do not have to recompile or relink these applications to run them on Sockets over SNA.

Distributed computing environment (DCE)
Distributed system object model (DSOM)
File transfer protocol (FTP, FTPPM, and TFTP)
Interactive conversation (TALK)
IP name/number conversion using DNS (HOST, NAMED, NSLOOKUP)
Lotus Notes
Network File System (NFS)
Packet Internet groper (PING)
Remote execution protocol (REXEC)
Remote shell execution (RSH)
Systems, Applications, Products in Data Processing (SAP R/3)
Simple Network Management Protocol (SNMP)
Virtual terminal protocol (TELNET)
WebExplorer
X Window System (PMX)

Figure 51. Socket Applications Compatible with Sockets over SNA

Application programs written to non-IBM implementations of the Berkeley Software Distribution (BSD) AF_INET interface can use Sockets over SNA with few modifications. Refer to the *TCP/IP Programmer's Reference* to determine what changes might be required. If changes are required, you must have the software necessary to recompile and relink the application because Sockets over SNA does not provide this support on OS/2.

Requirements for Full-Duplex Enablement

For an OS/2 node to communicate in full-duplex mode, both communicating nodes have to support full-duplex LU 6.2 conversations. The following products support full-duplex communications:

- AnyNet Sockets over SNA for OS/2, Version 2.0 or later
- AnyNet Sockets over SNA Gateway for OS/2, Version 1.1.6 or later
- Communications Manager/2, Version 1.11 or later
- Communications Server for OS/2 Warp, Version 4.0 or later

Restrictions on Using Sockets over SNA

For Sockets over SNA support, you must use the level of Multiprotocol Transport Services (MPTS) shipped with Communications Server or a later version.

Sockets over SNA does not support applications that use broadcasting.

If you intend to use Sockets over SNA Gateway to route information to and from an MVS/ESA node configured with the VTAM V3R4.2 Sockets over SNA function, you must first install the route function on the MVS/ESA node. To install the route function on MVS/ESA, install the program temporary fix (PTF) UW03567. You can obtain PTFs through any of the following sources:

- Information Access
- SoftwareXcel Extended
- IBMLink (ServiceLink)

Part 5. Appendixes

Appendix A. Messages

Messages from the host are displayed in the operator information area (OIA) at the bottom line of the host screen. Messages from Personal Communications are displayed in a message window.

The messages are categorized as follows:

- Host messages in the OIA: Refer to the online help.
- Personal Communications messages in the message window.
- Host file-transfer messages.

Note: Error messages generated by one program might indicate a problem with another area of Personal Communications. For example, a message generated by PCSDIAL can indicate an asynchronous communication problem. That is, error messages do not necessarily reflect a problem source.

If your message is not listed in this chapter or in the online help, ask your system administrator for assistance.

Personal Communications Messages

COMDIA31 Dial now - press OK when you hear a ring. Hang up when you hear the remote modem answer.

Explanation: You are requested to dial a telephone number manually.

User Response: Dial a telephone number. Press **OK** when you hear a ring. Hang up when you hear the remote modem answer.

PCSADLC001 The communication port number in your WorkStation profile is invalid.

Explanation: You specified an incorrect port number for the Hayes AutoSync connection.

User Response: Change the port number to another that is available on your personal computer. If you are using a PCMCIA modem, it may be that it has not been enabled or that it has been assigned a different communication port.

PCSADLC002 The line speed in your WorkStation profile is invalid.

Explanation: The line speed entry in your workstation profile may have been altered manually.

User Response: Reconfigure the session through the panels so that a valid value will be entered in the profile.

PCSADLC003 The Bits-per-character and Parity value in your WorkStation profile is invalid.

Explanation: The line-speed entry in your workstation profile may have been altered manually.

User Response: Reconfigure the session through the panels so that a valid value will be entered in the profile.

PCSADLC004 The link-station address is invalid. Only values from 01 to FE are allowed.

Explanation: You selected **OK** in the SNA-over-Async Attachment window, but the value in the *link station address* entry field was not valid. Or, you attempted to start Personal Communications with a profile that specifies an invalid link-station address.

User Response: Change the link-station address to a valid one in the SNA-over-Async Attachment window.

PCSADLC005 The PU ID in your WorkStation profile is invalid.

Explanation: You selected **OK** in the SNA-over-Async Attachment window, but the value in the *link station address* entry field was not valid. Or, you attempted to start Personal Communications with a profile that specifies an invalid link station address.

User Response: Change the link station address to a valid one in the SNA-over-Async Attachment window.

PCSADLC006 The Block ID in your WorkStation profile is invalid.

Explanation: You selected **OK** in the SNA-over-Async Attachment window, but the value in the *link station address* entry field was not valid. Or, you attempted to start Personal Communications with a profile that specifies an invalid link station address.

User Response: Change the link station address to a valid one in the SNA-over-Async Attachment window.

PCSADLC008 The Bits-per-character and Parity value is invalid. For Basic or Flow transparency, you must use 8-bit mode; for Full transparency, you must use 7-bit mode.

Explanation: You specified incorrect *bits per character* and *parity* values.

User Response: Correct the *bits per character* and *parity* value in the SNA-over-Async Attachment window.

PCSADLC009 The Transparency Level is invalid. In 8-bit mode, you must use Basic or Flow transparency; in 7-bit mode, you must use Full transparency.

Explanation: You specified an incorrect value for *transparency level*.

User Response: Correct the *transparency level* value in the SNA-over-Async Attachment window.

PCSADLC011 The communication port selected is already being used by another application.

Explanation: None

User Response: Change the port number to one that is not currently being used.

PCSADLC012 No more ports can be opened.

Explanation: An additional port cannot be opened. The port assignment exceeds the maximum number allowed, which is 1. You may use only a single port at one time for the SNA-over-Async (SNA-A) attachment, so all SNA-A sessions must use the same port.

User Response: Change the port number to 1.

PCSADLC013 SNA-over-Async Attachment does not support multiple ports.

Explanation: You attempted to connect multiple SNA-over-Async attachments. Only one such connection can be used at a time.

User Response: Reconfigure the session to use the same port as the session that is already running.

PCSADU001 Dial configuration has been changed. Save the changes to the *file-name* file?

Explanation: One or more settings in the dial configuration have been changed and you attempted to exit the Configure Phone/Modem window.

User Response: Select **Yes** to save the new settings and exit the Configure Phone/Modem window. Select **No** if you do not want to save the changes.

PCSADU010 The Personal Communications v.25 bis Automatic-Dial Facility supports only the CRN, CRS, and CRI commands. *xx* is not supported.

Explanation: An incorrect Dial command was specified.

User Response: Use valid Dial commands: CRN, CRS, or CRI.

PCSADU011 The modem-information has been changed. Save the changes to the *file-name* file?

Explanation: One or more modem settings have been changed.

User Response: Select **Yes** to save the new settings. Select **No** if you do not want to save the changes.

PCSAEA001 The communication port selected is not available on this PC.

Explanation: You assigned a communication port that is not available on your personal computer.

User Response: Change the communication port to another that is available.

PCSAEA002 The communication port selected is already being used by another application.

Explanation: The selected port-number is already being used by another program.

User Response: Change the port-number to one that is not currently being used.

PCSAEA004 The line-speed defined in your workstation profile is invalid.

Explanation: The line-speed entry in your workstation profile may have been altered manually.

User Response: Reconfigure the session through the panels so that a valid value will be entered in the profile.

PCSAPI001 The combination of host code-page and PC code-page is invalid. The default PC code-page will be used.

Explanation: You selected DDE/EHLLAPI to be enabled, but the combination of host code-page and personal computer code-page is not valid.

User Response: Select the correct host code-page from the 3270 Host or 5250 Host window. Then select the correct PC code-page in the File-API Settings window.

If the problem persists, ask your system administrator for assistance.

PCSAPI002 The Virtual Device Driver that enables the DOS-mode EHLLAPI has not been loaded.

Explanation: The necessary virtual device driver (VHAPI.OS2) was not loaded, so you cannot use the DOS-mode EHLLAPI.

User Response: Select **DOS-mode EHLLAPI** in the API Settings window to install the required driver, then shut down and reboot your PC.

PCSAP32001 The Partner-LU Name is invalid.

Explanation: You specified an incorrect LU name.

User Response: The name can contain alphanumeric characters and the special characters \$, #, and @.

PCSAP32002 A Partner-LU Name has not been specified.

Explanation: You did not specify a partner-LU name, which is a required parameter.

User Response: Specify a partner-LU name. The name can contain alphanumeric characters and the special characters \$, #, and @.

PCSAP32005 The Mode Name is invalid.

Explanation: You specified an incorrect mode name.

User Response: The name can contain alphanumeric characters and the special characters \$, #, and @.

PCSAP32006 The Mode Name mode-name is not configured in the configuration. Do you want to change it?

Explanation: You are about to close the APPC3270 configuration panel having specified a mode-name that is not configured in Access Feature.

User Response: Change the specified mode-name after selecting **No**, or configure the specified mode-name in Access Feature after selecting **Yes**.

PCSAP32007 Communications did not start. The specified configuration is not valid or cannot be found.

Explanation: When you started to configure this attachment, Access Feature should have started automatically. It may be that the default configuration is not valid or cannot be found.

User Response: Verify that Access Feature is installed and configured correctly.

PCSAP32010 The Partner-LU Name specified in your WorkStation profile is invalid.

Explanation: The partner-LU name can be a fully qualified LU-name or a partner-LU alias configured in Access Feature.

A fully qualified LU-name contains both the network ID and the partner-LU name. They are connected by a dot character(.). The naming rules for both the network ID and the partner-LU name are as follows:

- Length must be 1-8 characters.
- The first character must be an uppercase alphabetic character (A-Z) or a special character (@, #, \$).
- The remaining positions can be alphanumeric (a-z, A-Z, -9) or special characters (@, #, \$).

The naming rules for the partner-LU alias are as follows:

- Length must be 1-8 characters.
- It can contain any combination of ASCII characters except a left parenthesis, a right parenthesis, a comma, a semicolon, and a blank space.
- It cannot start with the special character @.

User Response: Correct the partner-LU name in the workstation profile and start the session again.

PCSAP32011 The Mode Name specified in your WorkStation profile is invalid.

Explanation: The mode-name specified in your workstation profile is not valid. The mode is a set of session capabilities configured in Access Feature. The rules for mode-names are as follows:

- Length must be 1-8 characters.
- The first character must be an uppercase alphabetic character (A-Z) or a special character (@, #, \$).
- The remaining positions can be alphanumeric (a-z, A-Z, -9) or special characters (@, #, \$).

User Response: Correct the mode-name in the workstation profile and start the session again.

PCSAP32020 The necessary components for advanced connections have not been installed.

Explanation: This attachment requires Access Feature and its APPC API feature, but Personal Communications could not find the necessary modules.

User Response: Install Personal Communications. If it has already been installed, make sure that the APPC API feature is properly installed and configured.

PCSAP32021 The necessary components for advanced connections have not been installed. Do you want to continue? If you choose Yes, you can install the components later.

Explanation: You are attempting to configure APPC3270, but Access Feature is not installed or its APPC API feature is not properly configured. It is easier to configure APPC3270 after Access Feature is already installed and configured, but you can do this later if you wish.

User Response: If you choose **No**, you must install and configure Access Feature and its APPC API feature and then configure the session again. If you choose **Yes**, you can finish configuring this session and configure Access Feature later.

PCSASYNC001 Invalid Port-number!

Explanation: You specified an invalid port-number for Advantis (IIN) communication.

User Response: Change the port number to 1, 2, 3, or 4.

PCSASYNC002 The communication port selected is already being used by another application.

Explanation: None.

User Response: Change the port-number to one that is not currently being used.

PCSASYNC003 No more ports can be opened!

Explanation: An additional port cannot be opened. The port assignment exceeds the maximum number allowed, which is 1. You may only use a single port at one time for the SNA-over-Async (SNA-A) attachment, so all SNA-A sessions must use the same port.

User Response: Change the port number to 1.

PCSASYNC010 The Link Address specified in your WorkStation profile is invalid.

Explanation: The link-station address in the workstation profile may have been altered manually.

User Response: Make sure that a valid link-station address is specified in the configuration by reconfiguring the sessions through the panels.

PCSASYNC011 The PU ID specified in your WorkStation profile is invalid.

Explanation: The physical-unit ID in the workstation profile may have been altered manually.

User Response: Make sure that a valid PU ID is specified in the configuration by reconfiguring the session through the panels.

PCSASYNC012 The Block ID specified in your WorkStation profile is invalid.

Explanation: The block ID in the workstation profile may have been manually altered.

User Response: Make sure that a valid block ID is specified in the configuration by reconfiguring the session through the panels.

PCSASYNC020 PIU Size: Only values from 265 to 2057 are allowed.

Explanation: You specified an invalid PIU size.

User Response: Change the value to one within the allowed range.

PCSASYNC021 PAD Buffer Size: Only values from 272 to 2000 are allowed.

Explanation: You specified an invalid PAD buffer size.

User Response: Change the value to one within the allowed range.

PCSASYNC030 The auto-dial file is already being used for the first port.

Explanation: The specified auto-dial file was already used by another port that was already opened.

User Response: Specify another auto-dial file for this port.

PCSASYNC031 The line speed in your WorkStation profile is invalid.

Explanation: The line speed entry in your workstation profile may have been altered manually.

User Response: Reconfigure the session through the panels so that a valid value will be entered in the profile.

PCSBAT001 You have not specified a batch file.
PCSBAT.EXE will not execute any application.

Explanation: You attempted to execute PCSBAT.EXE with the /R parameter, but you did not specify the batch file to be executed.

User Response: Specify the batch file in the command line of PCSBAT.EXE and try the operation again.

PCSBAT002 parameter is an invalid parameter.

Explanation: You attempted to execute PCSBAT.EXE with an incorrect parameter.

User Response: Remove the incorrect parameter and try the operation again.

PCSBAT003 The file: file-name is not a Personal Communications batch file.

Explanation: The file file-name is not in the correct format for a Personal Communications batch file. This message sometimes appears if you have manually modified the batch file.

User Response: Make sure that the correct file name is specified and, if it is, re-create the Personal Communications batch file and try the operation again. If the problem persists, install Personal Communications again.

PCSBAT004 Not enough memory to load file-name, because it exceeds xxxx bytes.

Explanation: None.

User Response: Close other applications to free memory for Personal Communications.

PCSBAT010 file-name cannot be found.

Explanation: None.

User Response: Make sure that the correct path and file name are given.

PCSBAT011 file-name is not a valid file-name or the file is not in the path you specified.
Please check that you entered the correct name or path.

Explanation: None.

User Response: Make sure that a correct file-name and path are specified.

PCSBAT012 Error writing batch file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications attempted to save the file: file-name.

User Response: Determine the cause of the error condition and correct it.

PCSBAT020 file-name has been changed. Save changes?

Explanation: You attempted to exit the Personal Communications batch program without saving the changes made since the last time you selected **New** in the File pull-down menu, opened a batch file, or saved the changes.

User Response: Select **Yes** to exit after saving the changes. Select **No** to exit without saving the changes. Select **Cancel** to cancel the changes without exiting. The Personal Communications batch-program window remains open.

PCSBAT030 Add this new batch file to the Desktop?

Explanation: You have created and saved a new batch file and may want to add an icon for it to the Personal Communications folder, so that you can start the file easily.

User Response: Select **Yes** to add a new icon to the desktop.

If you select **No**, an icon will not be put on the desktop and you will have to start the batch program manually from an OS/2 command prompt.

PCSBAT040 The PCSBAT icon cannot be added to the desktop. You must start PCSBAT.EXE file-name /R manually.

Explanation: You chose not to add a batch-file icon to the desktop.

User Response: To run this batch-file, you must enter: PCSBAT batch-file-name IR from an OS/2 command prompt.

PCSBAT041 The 'file-name' icon has been added to the 'folder-name' folder. Double-click the icon to start the program.

Explanation: An icon for this batch-file has been added to the Personal Communications folder.

User Response: Double-click the icon to start the programs in this batch-file.

PCSBAT050 Add to desktop failed. You must start PCSBAT.EXE file-name /R manually.

Explanation: Something prevented the icon from being added to the folder.

User Response: To run this batch-file, you must enter: PCSBAT batch-file-name IR from an OS/2 command prompt.

PCSCC001 An invalid parameter was specified.

Explanation: You tried to start a session with a profile that contains an invalid parameter.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCC002 The link specified in your WorkStation profile is invalid.

Explanation: You tried to start a session with a profile that contains an unrecognized link selection. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCC003 The screen size specified in your WorkStation profile is invalid.

Explanation: You tried to start a session with a profile that specifies an unrecognized screen size. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCC004 The screen size specified in your WorkStation profile is not allowed for the current link connection.

Explanation: You tried to start a session with a profile that specifies a screen size that is not supported for this type of connection. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCC005 The session type specified in your WorkStation profile is invalid.

Explanation: You tried to start a session with a profile that specifies an unrecognized session type. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCC006 The host code-page specified in your WorkStation profile is invalid.

Explanation: You tried to start a session with a profile that specifies an unsupported host code-page. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCC007 The host code-page specified in your WorkStation profile is not compatible with your current PC code page.

Explanation: You tried to start a session with a profile that specifies a host code-page that is not compatible with the PC code-page. This message sometimes appears if you have manually modified the workstation profile.

User Response: Specify the correct host code-page or change the workstation code-page.

PCSCC008 The LT number specified in your WorkStation profile is invalid.

Explanation: You tried to start a session with a workstation profile that specifies an invalid logical terminal (LT) number. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCC009 The LU number specified in your WorkStation profile is invalid.

Explanation: You tried to start a session with a workstation profile that specifies an invalid LU number. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the

problem persists, install Personal Communications again.

PCSCC020 The Nth WorkStation Window is not allowed in the link-name connection.

Explanation: The maximum number of sessions allowed for this type of link are already running. The following list summarizes the maximum number of sessions allowed for each link-connection type:

- 20 for the SNA Distributed Function Terminal connection
- 20 for the non-SNA Distributed Function Terminal connection
- 5 for the Control Unit Terminal connection
- 5 for the Home3270 (3174) connection
- 5 for the Home3270 (others) connection
- 1 for TDLC (console) connection
- 1 for SNA-over-Async (console) connection
- 26 for other connections

User Response: Close one of the sessions that is already connected through the same link before attempting to connect this session.

PCSCC030 LT number xx has already been assigned to another session.

Explanation: You tried to start a session that specifies the same logical terminal number that is already in use by another. This message does not appear if you select **Default (Next Available)** in the **LT Number** combination box in the Customize Communication - 3270 Host window (the default setting), because Personal Communications then assigns an LT number automatically to each session.

User Response: Close the session that has the same LT number before attempting to connect this session or to change the definition for this session.

PCSCC031 LU number xx has already been assigned to another session.

Explanation: You tried to start a session that specifies the same logical terminal number that is already in use by another. This message does not appear if you select **Default (Next Available)** in the **LT Number** combination box in the Customize Communication - 3270 Host window (the default setting), because Personal Communications then assigns an LT number automatically to each session.

User Response: Close the session that has the same LT number before attempting to connect this session or to change the definition for this session.

PCSCC040 The Customize Communication dialog box is already open.

Explanation: You tried to select **Configure...** in the Communication pull-down menu while the Customize Communication dialog box was already displayed in another session window.

User Response: Close the Customize Communication dialog box in the other session window and try again.

PCSCC041 Because you have changed the configuration, communication will be terminated if you proceed. Are you sure?

Explanation: You chose **OK** in the Customize Communication dialog box while the session was connected.

User Response: To continue the operation, choose **OK**. The current connection will be terminated and, if **AutoConnect** is selected, will be reconnected.

To quit the operation, select **Cancel**. The Customize Communication dialog box remains open.

PCSCC050 PC Location name is invalid.

Explanation: The first half-field (local network ID) or the last half-field (local LU name) of the specified PC Location name is blank.

User Response: Enter a fully qualified local LU name (local network ID and local LU name).

PCSCC051 System Location name is invalid.

Explanation: The first half-field (remote network ID) or the last half-field (remote LU name) of the specified system location name is blank.

User Response: Enter a fully qualified partner LU name (remote network ID and remote LU name).

PCSCC053 Only the host code-page for Japan is valid for this session.

Explanation: You selected an incorrect host code page for a printer session.

User Response: Select Japanese alphanumeric katakana or Japanese alphanumeric lowercase as the host code-page.

PCSCC054 An invalid library name was specified.

Explanation: You selected an invalid name for the message library.

User Response: Specify *LIBL or *CURLIB if you specify * as the first character.

PCSCC055 An invalid object name was specified.

Explanation: You selected an invalid object name.

User Response: Specify *NONE if you specify * as the first character.

PCSCDLG001 Cannot create the Folder. Please change its name.

Explanation: You selected **OK** in the Add xxxx to Folder window, but an incorrect character was included in the specified folder name.

User Response: Change the folder name.

PCSCM001 PCSCM.EXE is already running.

Explanation: You attempted to run the Personal Communications program **PCSCM.EXE** when it was already running.

User Response: Stop **PCSCM.EXE** before trying to restart it.

PCSCOAX001 The number specified in your WorkStation profile for the 3270 coax adapter is invalid. It can be 0 to 3 only.

Explanation: You tried to start a session that specifies an invalid 3270-adapter number. This message sometimes appears if you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCOAX002 The memory test on the 3270 coax adapter failed.

Explanation: You tried to start a session with a profile that specifies an invalid buffer address for the 3270 adapter, the buffer does not exist at that address, or if you using a PCMCIA card, the card has been enabled at a different address. This message sometimes appears because you have manually modified the workstation profile.

User Response: Re-create the workstation profile by re-configuring the session through the panels. If the problem persists, install Personal Communications again.

PCSCOAX003 The keyboard-type specified in your WorkStation profile is invalid.

Explanation: The keyboard type specified in your workstation profile is not supported by PC/3270 in CUT mode. The only valid keyboard type is **Emulation**.

User Response: Re-configure the session through the panels.

PCSCOAX004 The controller-language specified in your WorkStation profile is invalid.

Explanation: The controller-language specified in your workstation profile is not supported by PC/3270.

User Response: The only valid languages for **CULanguage** are 0 for U.S. English or 1 for Austrian German.

PCSCOAX010 A 3270 coax adapter has not been installed.

Explanation: You tried to start a DFT or CUT-mode session, but PC/3270 could not find a 3270 coax adapter in your workstation. There are several possible reasons for this:

- There is no coax adapter in the workstation.
- You have specified the wrong adapter number.
- You have specified the wrong buffer address for the adapter.
- You are using a PCMCIA card and have not clicked the **PCMCIA Yes** button.
- You are using a type-B Micro Channel adapter and have set the wrong adapter number when configuring your workstation with the reference diskette or equivalent.
- You are using a type-B ISA-bus adapter and the switches are set incorrectly.
- You have both a PCMCIA card and an MCA or iSA bus adapter in the workstation. This is not allowed.
- The adapter is faulty.

User Response:

2, 3, 4: Reconfigure the session through the panels.

5: Check the system configuration.

6: Consult the documentation for the adapter to determine the correct switch setting.

Note: If you are using a type-B adapter, you can use up to four at once; they will be numbered from 0 to 3.

PCSCOAX012 The 3270 coax adapter is already being used by a session that has a different workstation profile.

Explanation: You tried to start a DFT or CUT-mode session, but the adapter was already being used for a different type of connection.

For example, this message appears when you try to start a SNA DFT session when a non-SNA DFT session is already running.

User Response: Close the other session that is using the adapter before attempting to connect this session.

PCSCOAX013 A PCMCIA card cannot coexist with a 3270 Connection or 3278/79 adapter, nor are multiple PCMCIA cards allowed. Please change the configuration.

Explanation: You tried to start a DFT or CUT-mode session when you had an unsupported hardware configuration.

User Response: Remove one of the adapters and re-configure the session.

PCSCOAX021 Your 3270 coax adapter does not support the Extended Attribute function, so your session will always be in 4-color mode.

Explanation: The 3270 adapter you are using does not support the Extended Attribute Buffer function, so the session will always be in 4-color mode.

User Response: If you want Extended Attribute support, change the adapter type.

PCSCOAX050 PCSCOAX.SYS has not been loaded. Please check your CONFIG.SYS; if there is no statement for this driver, you must install it from Administration Tools - Configuration and Program Options. Then shut down and reboot your PC.

Explanation: You tried to start a DFT or CUT-mode session, but it failed because the required device driver (PCSCOAX.SYS) had not been loaded.

User Response: Perform the steps described in the message. If the statement is already in CONFIG.SYS, shut down and re-start your PC.

PCSCOAX051 Card/Socket Services or the 3270 Credit Card Adapter could not be found. Please check that the PCMCIA device drivers are installed and that the Card is inserted in a slot.

Explanation: You tried to connect by using an IBM 3270 Emulation Credit Card adapter, but failed. The possible reasons are as follows:

- Card or Socket Service was not installed.
- The IBM 3270 Emulation Credit Card adapter was not installed in a slot.

User Response: Check that statements exist in the CONFIG.SYS to load PCMCIA.SYS and IBM2550n.SYS. If not, use the OS/2 utility to install them. Check that the card is correctly inserted in a slot.

PCSCOAX052 An error occurred in enabling the 3270 Card. Please check that the PCMCIA device drivers are installed correctly.

Explanation: None.

User Response: Check that statements exist in the CONFIG.SYS to load PCMCIA.SYS and IBM2550n.SYS. If not, use the OS/2 utility to install them. Check that the card is correctly inserted in a slot.

PCSCOAX053 The specified Buffer Address is already being used by another adapter. Please change it.

Explanation: You have specified a buffer address that is already being used by another 3270 adapter.

User Response: Change the **Buffer Address** in the SNA DFT, Non-SNA DFT, or CUT configuration panels.

PCSCOAX054 Adapter Open failed. Please customize the correct Adapter number.

Explanation: None.

User Response: Specify the correct **Adapter Number** in the SNA DFT, Non-SNA DFT, or CUT configuration panels. Restart the system, because the previous close of the adapter might have terminated abnormally.

PCSCOAX055 3270 coax adapter may be in use by another application.

Explanation: Your 3270 adapter might be in use by another application, such as LAN Adapter and Protocol Support (LAPS) for 3270 Peer Communications.

User Response: Terminate the other application, and try the connection again.

PCSCT001 file-name.DLL has not been installed.

Explanation: The specified Personal Communications dynamic link library was not found.

User Response: Make sure that the DLL is installed in the correct path.

PCSCT002 Because you must use some advanced connections parameters, you must install, configure and start SNA communications before configuring this attachment.

Explanation: Access Feature was not installed or could not start for some reason.

User Response: Install Access Feature or make sure that it will start correctly.

PCSCCT004 **Communications did not start. The specified configuration is not valid or cannot be found.**

Explanation: Access Feature did not start. The specified Access Feature configuration is not valid or cannot be found.

User Response: Verify that Access Feature is installed and configured correctly.

PCSCUT52001 **TDLC Attachment (Console) does not allow you to start another session with the same station address.**

Explanation: You attempted to open another session having the same address as an already open session of a twinaxial connection (Console).

User Response: Change the address. Or, use more than one session with a twinaxial connection (APPC).

PCSCUT52002 **Since both the allowed station addresses are already in use by other sessions, this session cannot be opened. Please try again after closing a session.**

Explanation: You attempted to open three sessions with different addresses at the same time.

User Response: Close the other sessions and restart the session.

PCSCW001 **You cannot start another session.**

Explanation: You attempted to start a session when the maximum allowed number of sessions is already running.

User Response: Close one of the sessions that is running.

PCSCW002 **Session ID xx has already been assigned to another session.**

Explanation: You attempted to start a session with an ID that is already in use by another session. Normally, session will take IDs, starting with a, in the sequence in which their connections become active. However, if you specify an ID for a session, using the /S=x option, it can happen that another session connects before the one for which you specified the ID, and takes the ID you specified. This is most likely to happen if you are using a batch file to start sessions and specify an ID for a session other than the first in the batch-file.

User Response: Close the session that is already using the ID you specified or change the ID that is specified for the session you want to start. If you are starting sessions from a batch file, add the /S=x option to the command line for every session.

PCSDIA010 **Host has not responded within the timeout period.**

Explanation: The Import or Export was cancelled because the host did not respond within the timeout period.

User Response: Increase the timeout value in the Miscellaneous Settings window; the default timeout value is 30 seconds. If the problem persists, ask your system administrator for assistance.

PCSDIA011 **Unrecoverable system error.**

Explanation: This message provides the following additional information:

Host connect return code - xxx
Write structured field return code - xxx
Read structured field return code - xxx
Data exception code sent to host - xxx
Data exception code sent from the host - xxx
Host disconnect return code - xxx

User Response: Make a note of the additional information, then restart Personal Communications and try again. If the problem persists, ask your system administrator for assistance.

PCSDIA012 **Program error at the host.**

Explanation: The transfer program has detected an error in the data from the host.

User Response: Ask your system administrator for assistance.

PCSDIA013 **Transfer program has stopped.**

Explanation: This message is displayed with message PCSDIA014 or any of several other messages.

User Response: None.

PCSDIA014 **Transfer program canceled by the user.**

Explanation: This message appears if you quit the transfer program.

User Response: None.

PCSDIA015 **Current file transfer canceled by the host program.**

Explanation: This message appears when the host application has signaled to the transfer program that it does not want to continue with the current transfer. This could be because of an input/output error at the host.

User Response: Record the messages in the host session and follow the instructions for the host application.

PCSDIA017 Program error detected by the host program.

Explanation: This message appears when the host has sensed an error in the data sent to it by the transfer program.

User Response: Ask your system administrator for assistance.

PCSDIA022 Host rejected your file-transfer attempt.

Explanation: This message appears when the host rejects a transmission that the transfer program assumed was successful. The transfer program is waiting for a new request from the host. This message will be followed by one of the PCSDIA011 messages.

User Response: Ask your system administrator for assistance.

PCSDIA036 Current file transfer canceled by the user.

Explanation: This message appears if you cancel the transfer. The transfer of the file stops, and the transfer program waits for more requests from the host.

User Response: Begin another transfer, or select **Exit** to quit.

PCSDLC001 At least one of the Link Parameters conflicts with that of another session. The parameters for the other session will be used to connect you now, but you should resolve the conflict as soon as possible.

Explanation: If LAN-via-802.2 sessions that have different workstation profiles are to coexist, at least one of the following parameters must be different between them:

- Adapter Number
- Destination Address
- Remote SAP
- Local SAP

If that is not the case, this message will appear. You will nevertheless get a session, but it will use the parameters defined for the first session.

User Response: Compare the workstation profiles for the sessions and change the value of one of these parameters so that it is different from the value in the other profile.

PCSDLC010 A device-driver statement for this attachment must be added to your CONFIG.SYS; do you want to add it now?

Explanation: When you click **OK** at the end of customization, the program checks to see whether the necessary device driver is already in memory. If not, it assumes that there is no statement for the driver in CONFIG.SYS and asks whether you want one to be added now. If you respond **Yes**, the program will insert the necessary statement in CONFIG.SYS and ask you to shut down and reboot. If you respond **No**, you will be asked to install the driver later and you will not be able to use the new configuration until you have done so.

User Response: Click **Yes** to have the device-driver installed. Before you can use the new configuration, you must shut down and reboot the personal computer but you might want to do other things first, some of which might also require a reboot. Or: Click **No**. In this case, you must at some time install the device-driver. To do this, click the Administration Tools icon, then the Configuration and Program Options icon; then choose **Add or Delete Communication Drivers** and click the box for the type of attachment that you have configured. The driver will be installed and you will be reminded to shut down and reboot.

PCSDLC011 When you want to add the device driver, click the Administration Tools icon, choose Configuration and Program Options, then Add or Delete Communication Drivers; then click the attachment that you have just configured.

Explanation: Execution of the setup program is required to change the system settings so that the session can connect to the host.

User Response: Run **Configuration and Program Options** in the **Administration Tools** to change the system settings. Then shut down and re-start.

PCSDLC020 The PIU size is invalid; only values from 265 to 2042 are allowed.

Explanation: You selected **OK** in the IEEE 802.2 window, but the value in the **PIU Size** entry field was not valid.

User Response: Correct the PIU size as instructed in the message, and try again.

PCSDLC021 The Fully-Qualified CP Name is invalid. Please correct it.

Explanation: You selected **OK** from the IEEE 802.2, SDLC Attachment, or Twinaxial Attachment (APPC) window, but had not entered a fully qualified control-point name was not entered.

User Response: Enter a fully qualified control-point name in the input field.

PCSDLC022 The PIU size is invalid; only values from 265 to 2057 are allowed.

Explanation: You selected **OK** in the **SDLC Attachment** window, but the value in the **PIU Size** entry field was not valid.

User Response: Correct the **PIU Size** value as instructed in the message, and try again.

PCSDLC030 Only hexadecimal numbers (0-9, A-F) are allowed.

Explanation: You attempted to type a character other than a hexadecimal number (0-9, A-F) in the entry field.

User Response: Type a valid number.

PCSDLC031 Only decimal numbers (0-9) are allowed.

Explanation: You attempted to type a character other than 0-9 in the entry field.

User Response: Type a valid number.

PCSDLC032 To be valid, a name must start with (A-Z, \$, @, #) followed by (0-9, A-Z, \$, @, #).

Explanation: As the first character in the input field, you tried to enter a character other than the foregoing.

User Response: Enter a valid character.

PCSDLC033 To be valid, a name must start with (A-Z, \$, @, #, *) followed by (0-9, A-Z, \$, @, #, ., _).

Explanation: As the first character in the input field, you tried to enter a character other than the foregoing.

User Response: Enter a valid character.

PCSDLC034 To be valid, a name must start with (A-Z, \$, @, #) followed by (0-9, A-Z, \$, @, #, ., _).

Explanation: As the first character in the input field, you tried to enter a character other than the foregoing.

User Response: Enter a valid character.

PCSERR001 Error opening file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to open the file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSERR002 Error reading file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to read the file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSERR003 Error writing file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to write the file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSERR004 Error in format of Personal Communications file: file-name.

Explanation: The format of the Personal Communications file file-name is incorrect.

User Response: If the file indicated by the message is a workstation profile, re-configure the session through the panels. Otherwise, re-install Personal Communications and try again. If the problem persists, ask your system administrator for assistance.

PCSERR005 Error writing file: file-name because disk is full.

Explanation: OS/2 returned an error condition when Personal Communications tried to write the file file-name, because there was insufficient space on the drive.

User Response: Clear some space on the drive and try again. If the problem persists, ask your system administrator for assistance.

PCSERR006 Error closing file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to close the file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSERR007 Error creating file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to create the file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSERR008 Error seeking file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to move the pointer in the file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSERR100 Error allocating xxxx bytes of memory from OS/2 system memory. Close one or more applications and try again.

Explanation: Your OS/2 system does not have enough memory available for Personal Communications to execute the function you selected.

User Response: Select **Retry** after closing one or more applications. Check the free space on the drive that contains **SWAPPER.DAT**.

Repeat the retry operation until this error message does not appear. If the problem persists, select **Cancel** and ask your system administrator for assistance.

PCSERR101 Error locking system memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to access system memory.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR102 Error unlocking system memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to release system memory.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR103 Error page-locking system memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to page-lock system memory.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR104 Error page-unlocking system memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to page-unlock system memory.

User Response: Try the operation again. If the

problem persists, ask your system administrator for assistance.

PCSERR105 Error freeing system memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to return memory to OS/2 system memory.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR106 Error reallocating xxxx bytes of memory from OS/2 system memory. Close one or more applications and try again.

Explanation: Your OS/2 system does not have enough memory available for Personal Communications to execute the function you selected.

User Response: Select **Retry** after closing one or more applications. Check the free space on the drive that contains **SWAPPER.DAT**.

Repeat the retry operation until this error message does not appear. If the problem persists, select **Cancel** and ask your system administrator for assistance.

PCSERR130 Error allocating xxxx bytes of memory for resources. Close one or more applications and try again.

Explanation: Your OS/2 system does not have enough memory available for Personal Communications to execute the function you selected.

User Response: Select **Retry** after closing one or more applications. Repeat the retry operation until this error message does not appear. If the problem persists, select **Cancel** and ask your system administrator for assistance.

PCSERR131 Error locking resource memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to access memory.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR132 Error unlocking resource memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to release memory.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR133 Error freeing resource memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to return memory to OS/2.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR134 Error loading resource memory.

Explanation: OS/2 returned an error condition when Personal Communications tried to load the data from the Personal Communications file.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR200 function-name failed : module-name

Explanation: OS/2 returned an error condition when Personal Communications executed or loaded the Personal Communications module module-name. The function-name is either DOS Load Module or WinStartApp.

For each *additional message*:

Out of memory or Out of system resources.

Close one or more applications and try again.

Explanation: Your OS/2 system does not have enough memory or system resources available to load the module module-name that is required for Personal Communications to execute the function you selected.

User Response: Select **Retry** after closing one or more applications. Repeat the retry operation until this error message does not appear. If the problem persists, select **Cancel** and ask your system administrator for assistance.

File not found.

Explanation: The module: module-name could not be found.

User Response: Unpack the module from the original diskette or CD-ROM. If that does not help, install Personal Communications again. If the problem persists, ask your system administrator for assistance.

Path not found.

Explanation: The path to a required program module could not be found. Some program modules must be in a specific path, for example, the directory that contains .dlls must be in the LIBPATH. It is also possible that the indicator for the current path is not in the PATH or LIBPATH. It may be that the PATH or LIBPATH statements in CONFIG.SYS have been altered or corrupted.

User Response: Check the PATH and LIBPATH

statements. If they seem to be correct, remove from them the references to the Personal Communications directory, then reinstall Personal Communications. If the problem persists, ask your system administrator for assistance.

(All other messages)

Explanation: Personal Communications encountered an internal problem.

User Response: Install Personal Communications again. If the problem persists, ask your system administrator for assistance.

PCSERR210 Error starting system timer. Close one or more applications that use the timer, then try again.

Explanation: So many other applications are using the system timer resource that no timer is available for Personal Communications to execute the function you selected.

User Response: Select **Retry** after closing one or more applications. Repeat the retry operation until this error message does not appear. If the problem persists, select **Cancel** and ask your system administrator for assistance.

PCSERR211 Error killing system timer.

Explanation: OS/2 returned an error condition when Personal Communications attempted to free the timer resource.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSERR900 Personal Communications cannot run on this version of OS/2.

Explanation: Personal Communications requires that workstations have IBM OS/2 Version 3.0 or later installed.

User Response: Upgrade OS/2 to Version 3.0 or later.

PCSERR999 Personal Communications internal error: module-name - xxxx.

Explanation: Personal Communications encountered an internal problem in the module module-name.

User Response: Try the operation again. If that does not help, unpack the module from the original diskette or CD-ROM and try again. If the problem persists, ask your system administrator for assistance and have the following information available:

- The module name and error number shown in the message
- The version of OS/2 and Personal Communications

- CONFIG.SYS file
- The workstation profile (filename.WS)

PCSFLR001 The shared Folders program cannot connect with the Host.

Explanation: A router session might not be connected correctly to the host.

User Response: Reconfigure the router session through the panels and make sure that it connects correctly.

PCSFLR005 At least one shared folder is still assigned. Please release the drive(s).

Explanation: You attempted to exit from a router session over which a shared folder has been allocated to a drive.

User Response: Select **Configure** from the Shared Folders menu and remove all drives to which a shared folder has been allocated.

PCSFLR007 The Shared Folders program is already running.

Explanation: You attempted to start the Shared Folders program when it was already running.

User Response: None.

PCSFLR010 Retrieving the folder name; please wait....

Explanation: The latest shared-folder list is being created.

User Response: None.

PCSFLR011 Assigning the drive; please wait....

Explanation: You have selected **Assign** in the shared folder program.

User Response: None.

PCSFLR012 Releasing the drive; please wait....

Explanation: You have selected **Release** in the Shared Folders window.

User Response: None.

PCSFLR013 The specified drive is already in use.

Explanation: A drive assigned for a shared folder is already assigned as a remote drive or another shared folder drive.

User Response: Select **Refresh** from the menu bar to refresh the list of the shared folder program, and specify a drive that is not in use.

PCSFLR014 There is no available shared folders drive. The shared folders function allows a maximum of 8 folders to be assigned at one time.

Explanation: You tried to assign more than 8 drives.

User Response: Delete unnecessary assignments and try again.

PCSFLR016 Changes have been made in the host connection(s). The status is being updated; please wait....

Explanation: The router session was reconfigured or ended.

User Response: None.

PCSFLR017 Conversation with the system ended unexpectedly.

Explanation: Communication errors occurred on a router session.

User Response: Check that there is an active connection to the AS/400 system, then restart the router session.

PCSFLR019 You cannot start Shared Folders until a or a link to an AS/400 is active, and PCSFLR0.IFS has been loaded. Click OK; if necessary, you will be asked whether you want PCSFLR0.IFS to be installed.

Explanation: To use shared folders, you must have an active connection to an AS/400 system. Also, the shared-folders driver PCSFLR0.IFS must have been installed and loaded (you must have rebooted the workstation after the driver was installed).

User Response: Click **OK**; if the device driver has not been installed, you are asked whether you want to install it now. If you do, you are asked to reboot the system. If not, you can install it later.

Try to start Shared Folders again. If it fails, check that the CONFIG.SYS file contains the statement IFS=[path]PCSFLR0.IFS. Check also that you have rebooted the workstation after you installed the driver, and that the link to the AS/400 system is active.

PCSFT052 System name has been defaulted.

Explanation: No system name was found in the specified transfer request file.

User Response: The default system name has been assumed for the system name in the transfer request. Correct this error, as follows:

- Enter in the **System Name** field, an AS/400 name that performs the transfer.

- Save the transfer request file.

PCSFT101 The AS/400 system detected a warning situation.

Explanation: A possible error condition was detected on the AS/400 system.

User Response: If you are performing interactive data transfer, the problem type is indicated in the text following the error code.

Do as follows:

- To continue this transfer (provided that the continuation option has been specified), select **Continue**. Execution of the transfer request continues, ignoring this possible problem.
- To discontinue this transfer request, select **Cancel**. Correct the error and reissue the transfer request.

PCSFT201 File is not a transfer request file.

Explanation: The specified file is not a transfer request file. Or, this error might have occurred because this transfer request is incomplete or is of an incorrect format.

User Response: If you are performing interactive data transfer, specify another transfer request file name. You can list transfer request files selecting **Open** from the File pull-down menu of the menu bar.

If you are performing automatic data transfer, specify a valid transfer request file name; then restart automatic data transfer.

PCSFT204 PC file description file is required to transfer data.

Explanation: To transfer data to an AS/400 data file, a file-description file is required. If a file-description file has not been specified, the format and proper ties of the personal computer file are not known, making the transfer of records from a personal computer to an AS/400 data file impossible.

User Response: If you are performing interactive data transfer:

- Ensure that the AS/400 file name is valid. Then check whether data is transferred to a data file or to a source file.
If you are transferring data to a data file, ensure that **Use PC file description** has been selected and that a valid file-description file name has been specified.
If you are transferring data to a source file, ensure that **Use PC file description** has not been selected and that a valid record length has been specified.
- Execute the data transfer request again.

If another message is displayed, indicating that no file-description file can be found, you will have to

create a file-description file to enable the transfer of data to a data file. This can be done in one of the following ways:

- If data from AS/400 was first transferred to the personal computer and data is currently being returned from the AS/400 system, a file-description file should have been created when the data was first transferred to the personal computer.

If a file-description file was not created, you can create it by changing the Create AS/400-PC Transfer Request and selecting **Save Transfer Description**. Then execute the Create AS/400-PC Transfer Request again. This creates a file-description file that can be used to transfer data to the AS/400 system.

To prevent overwriting of the data file, specify a temporary personal computer file name that differs from that of the data file being sent.

After data has been transferred and a file-description file has been created, delete this temporary data file. Change the name of the new file-description file to match the data file name and append extension **.FDF**.

After a file-description file has been created, start the Create PC-AS/400 Transfer Request, ensure that the file that has just been created has been specified, and complete the transfer request.

- If the data to be transferred is other than that received from the AS/400 system, create a file-description file.

After creating a file-description file and prior to executing it again, ensure that the name specified in the Create PC-AS/400 Transfer Request is valid.

If you are performing automatic data transfer, change the transfer request by specifying a file-description file, using the data transfer screen.

For more information, see the recovery action description for interactive data transfer, explained previously.

After making these corrections, retry the transfer request.

PCSFT205 Numeric data does not fit into range specified by digits.

Explanation: The data does not fit in the AS/400 field, because the value specified in the file-description file is too large. The number of columns for a decimal number (field size) has been specified in file description for this field on the AS/400 system.

User Response: To avoid this error, match the field definitions in the file-description file and in the AS/400 system.

PCSFT206 Total length of record exceeds 4096 bytes.

Explanation: The length of the record being transferred exceeds 4096 bytes. The record length includes data, 2 bytes for null map offset, 2 bytes for the length portion of each variable-length field, and 1 byte for each field in the record, used to determine whether the field contains a null value.

User Response: Reduce the number of fields such that the length of one record does not exceed 4096 bytes. Then execute the transfer request again.

PCSFT207 This system does not support the OPTIONS statement.

Explanation: The transfer facility attempted to send an OPTIONS statement to the requested AS/400 system, but an error was returned from the AS/400 system indicating that the AS/400 system did not recognize that statement.

User Response: To continue this transfer request, select **OK**. The resulting data is displayed as if the OPTIONS statement had not been sent.

PCSFT211 A value must be specified for field reference file name.

Explanation: The field reference file name has not been specified.

User Response: If you are performing interactive data transfer, specify the name of the AS/400 file containing the field description of the data to be transferred as the field reference file name. Then execute the transfer request again.

If you are performing automatic data transfer, specify a value for the field reference file name in the transfer request file, using the data transfer screen. Then restart automatic data transfer.

PCSFT212 A value must be specified for FROM.

Explanation: The transfer source file has not been specified.

User Response: If you are performing interactive data transfer, enter the name of the AS/400 file whose data is to be transferred. Then execute the transfer request again.

If you are performing automatic data transfer, specify a value for the file to be transferred in the transfer request file. Then restart automatic data transfer.

PCSFT213 A value must be specified for TO.

Explanation: The transfer destination file has not been specified.

User Response: If you are performing interactive data

transfer, enter the name of the AS/400 file to which data is to be transferred. Then execute the transfer request again.

If you are performing automatic data transfer, specify a value for the transfer destination file in the transfer request file, using the data transfer screen. Then restart automatic data transfer.

PCSFT215 A value must be specified for the 'JOIN BY'.

Explanation: Since two or more AS/400 file names have been specified as files to be transferred, specify the JOIN BY option.

User Response: If you are performing interactive data transfer, specify a condition for joining the files to be transferred, using the JOIN BY option. Then execute the transfer request again.

If you are performing automatic data transfer, change the transfer request file by specifying a value for the JOIN BY option using the data transfer screen. Then restart automatic data transfer.

PCSFT217 Data types are not compatible.

Explanation: All or part of the personal computer data of the data type specified in the AS/400 file description could not be converted.

User Response: If you are performing interactive data transfer:

- Ensure that the specified AS/400 system, personal computer data, and file-description file names are valid.
- If these file names are valid, the file-description file might not describe the personal computer file data correctly. In this case, change the file-description file. To change the file-description file:
- If a file-description file was not created at the previous transfer request from the AS/400 system to the personal computer, change this file-description file, using the personal computer edit program.
- If the file-description file was created at the previous transfer request from the AS/400 system to the personal computer, update that file-description file by executing that transfer request again.

When creating a file-description file, ensure that the data file being transferred to the AS/400 system is not overwritten. To prevent overwriting of this file, specify a temporary personal computer file name that differs from that of the data file, as the transfer destination file.

After data has been transferred and a file-description file has been created, delete the temporary file. Change the name of the new file-description file to match the data file name and append extension **.FDF**.

- Ensure that the AS/400 file description is valid. If it is not valid, modify it to match the data type prior to data transfer.

Be particularly careful when correcting this error. Incorrect data might result if an incorrect format is accidentally specified.

If you are performing automatic data transfer, follow the explanation just given for interactive data transfer. If one of the file names specified in the transfer request needs to be corrected, you must also change the transfer request file, using the Create Data Transfer Request screen.

PCSFT218 Data in this field has too many decimal positions. Number will be rounded.

Explanation: Either of the following things might have occurred:

- The number of decimal positions in a personal computer data field is greater than the number of columns specified for the AS/400 system, extra bytes being significant digits (other than zero).
- A number in a personal computer data field has too many decimal positions, such that if it is converted, it will be too large for the AS/400 field.

User Response: If you are performing interactive data transfer:

- If you continue this transfer request, data is rounded up if the first digit of the extra data value is equal to or greater than 5, or is truncated if it is equal to or less than 4. If this number is too small to fit in the corresponding AS/400 field, it is truncated to zero. No notification is posted if this field data is rounded.
- If you discontinue this transfer, the remaining records in the personal computer file are not sent to the AS/400 system. Previously transferred records remain in the AS/400 file, however.

PCSFT219 Data in this field is incorrect or does not match the PC data type.

Explanation: All or part of the personal computer data of the data type specified in the AS/400 file description could not be converted.

User Response: If you are performing interactive data transfer:

- Ensure that the specified AS/400 system, personal computer data, and file-description file names are valid.
- If these file names are valid, the file-description file might not describe the personal computer file data correctly. In this case, change the file-description file.
To change the file-description file:
- If a file-description file was not created at the previous transfer request from the AS/400 system to

the personal computer, change this file-description file, using the personal computer edit program.

- If the file-description file was created at the previous transfer request from the AS/400 system to the personal computer, update that file-description file by executing that transfer request again.

When creating a file-description file, ensure that the data file being transferred to the AS/400 system is not overwritten. To prevent overwriting of this file, specify a temporary personal computer file name that differs from that of the data file, as the transfer destination file.

After data has been transferred and a file-description file has been created, delete the temporary file.

Change the name of the new file-description file to match the data file name and append extension **.FDF**.

- Ensure that the AS/400 file description is valid. If it is not valid, modify it to match the data type prior to data transfer.

Be particularly careful when correcting this error. Incorrect data might result if an incorrect format is accidentally specified.

If you are performing automatic data transfer, follow the explanation just given for interactive data transfer. If one of the file names specified in the transfer request needs to be corrected, you must also change the transfer request file, using the Create Data Transfer Request screen.

PCSFT220 Data in this field is too short for AS/400 field. Data will be padded.

Explanation: During the transfer of character data from the personal computer to the AS/400 system, either of the following things occurred:

- The data length of this field, specified in the file-description file, is smaller than the specification made for this field for the AS/400 system.
- Data found in the personal computer file is shorter than the length defined for this fixed-length field for the AS/400 system.

User Response: If you are performing interactive data transfer:

- If you continue the transfer request, this field is embedded to match the specification made for this field for the AS/400 system. In the final character field, spaces are embedded to the right. This embedding must not affect the field value. The remaining fields of this record are automatically filled by the transfer program. No notification is posted.
- If you discontinue the transfer request, this record and subsequent data are not transferred to the AS/400 system. Previously transferred data remains in the AS/400 file, however.

If you do not want this embedding to be performed, ensure that the AS/400 system, personal computer, and file-description files have been specified correctly in the transfer request. If they have all been specified correctly, check the file-description file and AS/400 file to ensure that the error field descriptions are valid and match actual data for this record.

If either of those descriptions is incorrect, correct it to match the actual data. Then execute the transfer request again. Change the file-description file, using the personal computer editing program. Or, update it by executing the transfer request again (when the personal computer file-description file was created during data transfer from the AS/400 system to the personal computer).

To prevent overwriting of the data file being sent to the AS/400 system, specify a temporary personal computer file name that differs from that of the data file, as the transfer destination file.

After data has been transferred and a file-description file has been created, you can delete this temporary data file. Change the name of the new file-description file to match the data file name and append extension **.FDF**.

To avoid data embedding, the field length described in the file-description file must be equal to that defined for the AS/400 system.

PCSFT221 Data in this field is too long for AS/400 field. Data will be truncated.

Explanation: Character data longer than the specified transfer destination AS/400 field is defined in the file-description file, the extra characters being significant characters (characters other than spaces).

Or data, after conversion, might be longer than the specified AS/400 field due to the presence of shift characters (SO and SI).

User Response: If you are performing interactive data transfer:

- If you continue this transfer request, data in this field is truncated to fit the AS/400 field. This results in loss of the original data. The transfer facility automatically removes all data from this point to the end of this field. No notification is posted.
- If you discontinue this transfer request, the current and subsequent records are not transferred to the AS/400 file. Previously transferred records remain in the AS/400 file, however.

If data is not truncated, ensure that the AS/400 system, personal computer, and file-description files have been specified correctly in the transfer request. If they have been specified correctly, check the file-description file and AS/400 file to ensure that the field descriptions are valid and match the actual data

for this record. If any description is not valid, correct it to match the actual data. Then execute this transfer request again.

To change the file-description file, use the personal computer edit program. If the file-description file was created during data transfer from the AS/400 system to the personal computer, update the description file by executing that request again. To prevent overwriting of the data file being sent to the AS/400 system, if such updating is performed, specify a temporary personal computer file name that differs from that of the data file, as the transfer destination file name.

After data has been transferred and a file-description file has been created, delete this temporary data file. Change the name of the new file-description file to match the data file name and append extension **.FDF**.

Execute this personal computer-to-AS/400 transfer request again. Ensure that the file-description file is valid and that the AS/400 file description matches the final AS/400 field. If this description is not correct, it must be changed before you can complete this transfer request.

To avoid data truncation, the field length specified in the file-description file must be equal to that specified in the AS/400 file.

If this error is caused by the presence of shift characters, change the descriptions in the file-description file and AS/400 file such that all record data is transferred to the AS/400 fields without data truncation.

PCSFT222 Numeric data has too many digits for AS/400 field. Maximum value will be used.

Explanation: Numeric data will not fit in the AS/400 field, because it exceeds the specified number of columns. This error might also occur if a number has already reached the maximum value and it has more decimal positions than that defined for the AS/400 system. If this number is to be rounded up, it will become too large to fit in the AS/400 field.

User Response: To execute this transfer request, while ensuring that this error does not occur, ensure that the AS/400 file, personal computer file, and file-description file have been specified correctly in the transfer request. If they have been specified correctly, check the file-description file and AS/400 file, ensure that the field descriptions are correct, and match the actual data for the record. If those descriptions are not correct, correct them to match the actual data. Then execute the transfer request again.

Change the file-description file by using the personal computer edit program. Or, if the file-description file was created during data transfer from the AS/400 system to the personal computer, update that

file-description file by executing that transfer request again.

When executing a transfer request again, change that AS/400-to-personal computer transfer request, to prevent overwriting of the data file, by specifying a temporary personal computer file name that differs from that of the data file being sent to the AS/400 system, as the transfer destination file.

After data has been transferred and a file-description file has been created, delete this temporary file. Change the name of the new file-description file to match the data file name and append extension **.FDF**.

If the AS/400 system, personal computer, and file-description files are all correct, the amount of file data might be too large to fit in the AS/400 field. In this case, correct the data before transfer. Or, change the transfer facility to enable use of the maximum value.

PCSFT223 Data for this field is missing. Default values will be used.

Explanation: This field is defined in the file-description file and the AS/400 file, but it does not exist in the personal computer data file.

User Response: If you are performing interactive data transfer:

- If you continue the transfer request, this data-missing field is filled with an appropriate default character (spaces in character fields, zeros in numeric fields). If data is missing in this field of a subsequent record, no message is posted.
- If you discontinue the transfer request, the records remaining in the personal computer file are not sent to the AS/400 system. Previously transferred records remain in the AS/400 file, however.
- If a null value is missing from the field, the AS/400 file description must be corrected to specify that this field can contain a null value.

PCSFT224 Data in this field exceeds PC field size. Data will be lost.

Explanation: A personal computer field longer than the specification in the file-description file exists. This error occurs only during transfer of a BIFF file, DIF file, or a BASIC serial file.

User Response: To execute the transfer request, without this error occurring, ensure that the AS/400 system, personal computer, and file-description files have been specified correctly in the transfer request. If they have been specified correctly, check descriptions in the file-description file and AS/400 file. If either of these descriptions is not valid, correct it to match the actual data. Then execute the transfer request again.

PCSFT225 Data size in bytes and number of decimal positions must be equal for a no conversion file transfer.

Explanation: During record transfer without conversion to an AS/400 file, the size (in bytes) or the number of decimal positions specified for the field does not match the file data format. When you transfer data without conversion, the field descriptions must match exactly.

User Response: Field length definitions are not identical. The file-description file must be changed such that the two definitions match.

The definition in the file-description file must match the data format of the personal computer file without conversion. Correct the definition. Then execute the transfer request again.

If you are performing automatic data transfer, the transfer program terminates automatically. The field-length definitions are not identical. Change the length definition in either the file-description file or the AS/400 file, such that the two match. Ensure that the personal computer file definition matches the data format of the personal computer file without conversion. After correcting the field definition, execute the transfer request again.

PCSFT226 PC data file is incorrect or the version of the data format is not supported.

Explanation: While transferring data from a personal computer data file to an AS/400 file, the transfer program found the personal computer data file is incorrect or does not support the version of the data format.

User Response: Check and correct the format of the personal computer file, and then try the operation again. Or ask your system administrator the version of the personal computer data file format.

PCSFT230 File is not a PC file description file.

Explanation: The name of the file-description file is incorrect or the file contents are incorrect.

User Response: If you are performing interactive data transfer, correct the file-description file name. Then execute the transfer request again. (To display a list of existing file-description files when changing this prompt, click on **Browse**.)

If you are performing automatic data transfer, change the transfer request by correcting the file-description file name by using the data transfer screen. Then execute the transfer request again.

If you created this file-description file, use the personal computer edit program to correct it. If this file-description file was created during data transfer from the AS/400 system to the personal computer and

its file name has been specified correctly, it must be re-created.

PCSFT231 File type is incorrect or missing in PC file description file.

Explanation: A record having an incorrect file type (PCFT) specification was detected. A value other than 1-9 has been specified as the file type, or this PCFT record is not the second record in the file-description file (excluding comments).

User Response: Using the personal computer edit program, correct the file type specification or add a PCFT specification. Then execute the transfer request again.

PCSFT232 Field type is incorrect or missing in PC file description file.

Explanation: When retrieving information from the file-description file (PCFL), the transfer facility detected an incorrect field type specification for a PCFL item.

User Response: Correct the field type specification, using the personal computer edit program. Then execute the transfer request again.

PCSFT233 Field length is incorrect or missing in PC file description file.

Explanation: When retrieving information from the file-description file (PCFL), the transfer facility detected an incorrect field length specification for a PCFL item.

User Response: Correct the field length specification, using the personal computer edit program. Then execute the transfer request again.

PCSFT234 Field type not compatible with file type in PC file description file.

Explanation: The file-description file (PCFL) contains a field type that cannot be used with the specified file type.

User Response: Correct the field type or file type of the file-description file. Then execute the transfer request again.

PCSFT235 Field name is longer than 30 characters in PC file description file.

Explanation: The field name of a PCFL item in the file-description file (PCFL) is longer than the maximum number of characters (30 characters).

User Response: Correct the field name in the file-description file, using the personal computer edit program. This field name must exactly match the corresponding field name in the AS/400 file (name of the field to which this data is to be transferred).

PCSFT236 Incorrect record in PC file description file.

Explanation: The file-description file (PCFL) contains an incorrect record. The record type must begin with PCFT, PCFL, PCFO, or * (for a comment).

User Response: Correct or delete the record in the personal computer file-description file, using the personal computer edit program. Then execute this transfer request again.

PCSFT237 Incorrect decimal positions in PC file description file.

Explanation: The file-description file (PCFL) contains a record for which the number of decimal positions is incorrectly specified.

User Response: Correct the decimal position count field in the file-description file, using the personal computer edit program. Then execute the transfer request again.

PCSFT238 More than 256 fields in PC file description file.

Explanation: The file-description file (PCFL) contains too many field description records. A maximum of 256 field description records can be specified.

User Response: Using the personal computer edit program, reduce the number of field description records in the file-description file to reflect the first 256 fields only. This correction is needed only if the data file contains 256 fields. Otherwise, data cannot be transferred correctly.

PCSFT239 File type specified more than once in PC file description file.

Explanation: The file-description file (PCFL) contains more than one personal computer file type specification.

User Response: Using the personal computer edit program, correct the file-description file such that the personal computer file type is specified only once. Then execute the transfer request again.

PCSFT240 Extra data was found at the end of record; the extra data will not be transferred.

Explanation: The personal computer file contains an extra field that is not specified in the file-description file.

User Response: If you are performing interactive data transfer:

- If you select **OK**, extra data is not transferred to the AS/400 file. If the transfer program detects a second

undefined data item in the file-description file, no message is posted. All extra data in the personal computer file is ignored.

- If you select **Cancel**, the remaining records in the personal computer file are not sent to the AS/400 file. Previously transferred records remain in the AS/400 file, however.

To prevent the occurrence of this error when executing a transfer request, ensure that the AS/400 system, personal computer, and file-description files have been specified correctly in the transfer request. If they have been specified correctly, check the descriptions in the file-description file and AS/400 file and ensure that any extra data in the personal computer data file has been defined.

PCSFT241 Field name is missing in PC file description file.

Explanation: The field name of a PCFL item is missing from the file-description file.

User Response: Correct the PCFL item in the file-description file, using the personal computer edit program. Then execute the transfer request again.

PCSFT242 No PCFL records were found in PC file description file.

Explanation: No PCFL record was found in the file-description file. At least one PCFL record must be defined in a file-description file.

User Response: Add a valid PCFL item corresponding to the personal computer data file, using the personal computer edit program. Then execute the transfer request again.

PCSFT243 PC file description file is empty.

Explanation: No data was found in the file-description file.

User Response: Transfer data from the AS/400 system to the personal computer. Or create a file-description file, using the personal computer edit program. Then execute the transfer request again.

PCSFT244 PC file contains no data records to transfer.

Explanation: No data was found in the specified personal computer file. A personal computer data record cannot be transferred to the AS/400 system.

User Response: The personal computer file must contain data to be transferred.

PCSFT245 PC transfer request file is empty.

Explanation: An attempt was made to open the transfer request file, but the specified file contained no data.

User Response: If you are performing interactive data transfer, specify a valid transfer request file name.

PCSFT246 No data was matched to the specified options.

Explanation: Your request has been completed, but there was no data matched to the specified options.

User Response: None.

PCSFT251 Invalid option in PC file description file.

Explanation: In a PCFO item in the field-description file, a number that does not correspond to a valid format or delimiter has been specified.

User Response: Specify a valid format and delimiter corresponding to the personal computer file. Correct the field description in the PCFO item. Then execute the request again.

PCSFT252 Record length is incorrect.

Explanation: This transfer request is either too short (equal to or shorter than 13 bytes) or too long (equal to or longer than 4097 bytes).

User Response: Specify a valid value. Then execute the request again.

PCSFT253 Transfer request character cannot be translated.

Explanation: The data transfer was terminated because a character could not be translated.

User Response: Check the file to be transferred and the specified translation table, and then execute the translation request again.

PCSFT254 Untranslatable numeric data was found.

Explanation: While transferring data, untranslatable numeric data was found.

User Response: Make sure the personal computer field type matches the AS/400 field type.

PCSFT255 Not connected to the system.

Explanation: Connection to an AS/400 system has not yet been established.

User Response: Establish a connection with the AS/400 system with which you want to perform data transfer.

PCSFT301 Error detected by AS/400. Statement offset provided.

Explanation: The AS/400 system detected an error.

User Response: If you are performing interactive data transfer, the error type is indicated in the text output.

To correct this error, change the transfer request using the data transfer screen or correct it with the AS/400 system.

The IWSxxxx message, written during AS/400 job logging, provides detailed information.

PCSFT302 Error detected by AS/400. No statement offset provided.

Explanation: AS/400 detected an error.

User Response: The IWSXXXX message, written during AS/400 job logging, provides detailed information.

PCSFT305 Number of records exceeds limit of the PC data file.

Explanation: The number of the received records exceeded the limit of the personal computer data file. The records under the limit were received normally.

User Response: None.

PCSFT306 Maximum number of transfer requests already active.

Explanation: The maximum number of transfer requests is currently active. You cannot start another transfer request.

User Response: Close one of the active transfer requests before starting another transfer request.

PCSFT313 Can not find necessary programs on the system.

Explanation: A PC Support/400 program tried to communicate with a host system program, but the host system program was not found.

User Response: Make sure that the host system programs are installed correctly on the host system, and that you are using the latest release of the program.

PCSFT314 Programs on the system terminated unexpectedly.

Explanation: The program was trying to communicate with a host system program, but the host system program ended unexpectedly. If you need more information, ask your administrator for the job log.

User Response: Make sure that the host system

programs are installed correctly on the host system and that you are using the latest release of the program.

PCSFT315 Security error is occurred on the system.

Explanation: An incorrect user ID or password was detected when you tried to begin a session on the host system. The cause might be one of the following things:

- User ID or password was not entered correctly.
- User profile does not exist on the AS/400 system.
- User profile has the incorrect authority.

User Response: Specify the correct user ID and password. If the problem persists, check the error messages on the AS/400 QSYSOPR message queue.

PCSFT316 The system is not a supported system.

Explanation: Your specified system is not supported.

User Response: Specify the name of the supported system. Ask your system administrator for the name of the supported system.

PCSFT318 Contact with the system ended.

Explanation: The personal computer program is no longer communicating with the system for one of the following reasons:

- The connection with the system was stopped.
- A permanent error occurred, and the personal computer program could not recover.

User Response: Correct the problem and establish a connection with the system again. Try your request again.

PCSFT319 Contact with the system temporarily interrupted.

Explanation: The personal computer is no longer communicating with the system for one of the following reasons:

- The connection with the system was stopped.
- The cable connection to the system is defective or was disconnected.
- The QBASE and QCMN subsystems are not started.

User Response: Correct the problem and establish a connection with the system again. Try your request again.

PCSFT320 Resource failure on the system.

Explanation: There are not enough resources available on the system to start the requested operation. This message is displayed in the following cases:

- The maximum number of sessions are already communicating with the system. No more session conversations are allowed.

- There is not enough memory or disk space available on the AS/400 system to start the requested operation.
- A system name was not found.
- If you are using PC Support/400 pass-through, a connection to the requested system cannot be established.
- The line controller or device is varied off on the AS/400 system.
- The subsystem the device is attached to was not started or is ending.
- There is a problem accessing objects associated with the user profile for the user ID that was used to sign on to the router.

User Response: Try your request again when the system resources are available. If possible, release one of the active sessions.

If there is a problem with the user profile information, the system operator message queue on the AS/400 system contains CPF1269, which indicates the reason for the failure. You can use this message information to determine the cause of the problem. You might have to start the router again to make the change of the user profile effective.

PCSFT321 Conversation with the system ended unexpectedly.

Explanation: The previous active conversation with the system was ended unexpectedly. The conversation was ended for one of the following reasons:

- A connection with the system was stopped.
- A communication failure occurred.

User Response: Correct the problem and establish a connection with the system again. Try your request again.

PCSFT323 Options not fully supported on this host system.

Explanation: The OPTIONS statement sent to the AS/400 system had keywords that are supported on the personal computer but are not supported on the AS/400 system. An earlier release of PC Support/400 is installed on your AS/400 system.

User Response: Your request is continued, but the keyword not supported on the host system and other keywords following the unsupported one are ignored. To avoid this error, check the release level of your AS/400 system to identify the supported keywords, and change your transfer request using only valid keywords.

PCSFT401 Transfer request has been changed. Save changes?

Explanation: Selecting **Yes** causes the transfer request save screen to appear.

User Response: Select **Yes** to save changes.

PCSFT402 Add this icon to the desktop ?

Explanation: Selecting **Yes** causes an icon to be registered with the contents of the current transfer request file. You can subsequently execute automatic data transfer simply by clicking on this icon.

User Response: Select **Yes** to add the icon.

PCSFT403 To start this transfer function with the modified definition, enter 'command' in OS/2 command prompt.

Explanation: You saved the transfer request without adding the icon to the desktop.

User Response: Select **OK**.

PCSFT404 To start the transfer function that you have just saved, choose the 'icon' icon in the 'folder-name' folder.

Explanation: You saved the transfer request and added the icon to the specified folder.

User Response: Select **OK**.

PCSFT405 An icon was not added to the desktop.

Explanation: You attempted to add a data transfer icon to the desktop, but it failed.

User Response: None.

PCSFT406 Error saving the transfer description : file-name.

Explanation: An attempt was made to save the transfer request file, but it was not successful.

User Response: Ensure that the drive, directory, and file names are correct.

PCSFT410 The system name is incorrect or the system that you specified is inactive.

Explanation: Connection to the specified AS/400 system has not yet been established.

User Response: Establish a connection with the AS/400 system with which you want to perform data transfer.

PCSFT412 **A value must be specified for system name.**

Explanation: The system name has not been specified.

User Response: If you are performing interactive data transfer, enter the system name. Then execute the transfer request again.

If you are performing automatic data transfer, specify the system name in the transfer request file, using the data transfer screen. Then restart the automatic data transfer.

PCSFT420 **PC file to receive data records already exists. Do you want to overwrite it ?**

Explanation: The specified file already exists. This message requests confirmation of whether the file can be overwritten.

User Response: Selecting **Yes** causes the file to be overwritten.

PCSFT421 **Specified PC file was not found. Specify the correct PC file name.**

Explanation: The specified file does not exist.

User Response: Specify a valid file. Then execute the transfer request again.

PCSFT422 **PC file name is incorrect. Specify the correct PC file name.**

Explanation: An incorrect file name has been specified.

User Response: The cursor is positioned to the field for which the incorrect file name was specified. Specify a valid file name. Then execute the transfer request again.

PCSFT423 **Invalid syntax for the file name.**

Explanation: The syntax of the specified file name is not valid.

User Response: If you are performing interactive data transfer, enter the correct file name. Then execute the transfer request again.

If you are performing automatic data transfer, specify the correct file name in the transfer request file, using the data transfer screen. Then restart the automatic data transfer.

PCSFT424 **Sort sequence table name cannot be blank. The Sort sequence choice has been reset to 'AS/400 job default'.**

Explanation: The sort sequence table name stored in the transfer request file is blank.

User Response: Specify the correct sort sequence table name. After changing the table name, save the transfer request file and try the transfer request again.

PCSFT425 **Language ID cannot be blank. The language choice has been reset to the AS/400 Job Default.**

Explanation: The language ID stored in the transfer request file is blank.

User Response: Specify the correct language ID. After changing the language ID, save the transfer request file, and try the transfer request again.

PCSFT999 **An unexpected error has been detected while processing transfer request.**

User Response: Report the problem to your system administrator.

PCSGRP001 **Too little space for the Retain buffer.**

Explanation: There is not enough space for the retain buffer used for graphic redrawing.

User Response: Terminate the application program, and select **Bitmap** in the **Redraw** field.

PCSHPO001 **The communication-port number in your WorkStation profile is invalid.**

Explanation: You specified an incorrect port number for the IBM Global Network Connection.

User Response: Change the port number to another that is available on your personal computer. If you are using a PCMCIA modem, it may be that it has not been enabled or that it has been assigned to a different COM port.

PCSHPO002 **The line speed in your WorkStation profile is invalid.**

Explanation: The line-speed entry in your workstation profile may have been altered manually.

User Response: Reconfigure the session through the panels so that a valid value will be entered in the profile.

PCSHPO011 **The communication port selected is already being used by another application.**

Explanation: None.

User Response: Change the port number to one that is not currently being used.

PCSHPO013 IBM Global Network Connection does not support multiple ports.

Explanation: You attempted to connect multiple IBM Global Network attachments. Only one such connection can be used at a time.

User Response: Reconfigure the session to use the same port as the session that is already running.

PCSINST002 The Personal Communications installation program is already running. You can run it only once at a time.

Explanation: You tried to start the installation program when it was already running.

User Response: If you really want to start the program again, close the current instance of it.

PCSINST003 Personal Communications installation has been cancelled.

Explanation: You selected **Cancel** during the installation operation. The installation process did not complete.

User Response: Restart the installation process from the beginning.

PCSINST010 The Personal Communications installation program does not recognize the specified file: file-name.

Explanation: You attempted to start the Personal Communications installation program with the file file-name as a parameter.

User Response: The **install** command does not allow file names as parameters. Remove the file name and try again.

PCSINST011 The Personal Communications installation program does not allow the parameter: parameter.

Explanation: You attempted to start the installation program with an incorrect parameter.

User Response: Remove the incorrect parameter and try again.

PCSINST012 The Personal Communications files have not been correctly installed on the server, so you cannot use them.

Explanation: You attempted to start the installation program with the option **/N**, but the program files have not been correctly installed on the server.

User Response: Contact your system administrator. It is likely that the files will have to be re-installed on the server with the **Install /A** command.

PCSINST019 Files cannot be backed up to the source sub-directory. Please change the target drive or directory.

Explanation: For the backup directory, you specified the same path as that from which you are trying to install Personal Communications.

User Response: Change the backup drive or directory.

PCSINST020 Do you want to overwrite the previous version of Personal Communications that is in the specified directory?

Explanation: As the target directory, you specified the directory in which the previous version of Personal Communications was installed.

User Response: Select **Yes** if you do not care if the installation program destroys the previous version. Otherwise, select **No**, and specify another drive and directory.

PCSINST021 Files cannot be copied into the source sub-directory. Please change the target drive or directory.

Explanation: As the target directory, you specified the source directory.

User Response: Change the target drive or directory and try again.

PCSINST022 Error creating the sub-directory. Please change the target drive or directory.

Explanation: You specified a subdirectory that does not exist, and the installation program could not create that subdirectory.

User Response: Change the target drive or directory and try again.

PCSINST030 Personal Communications requires xxxx bytes of disk space on drive disk-drive: to complete the installation.

Explanation: There is not enough space for Personal Communications on the target disk.

User Response: Make space on the disk or make another disk the target, and try again.

PCSINST031 The files required to install Personal Communications cannot be found on the source diskette or in the fixed-disk subdirectory.

Explanation: The files required to install Personal Communications were not found in the source path. The source diskette may have been corrupted.

User Response: Try again, using the correct

installation diskettes, or check that you specified the correct drive and path.

PCSINST040 Error opening the Personal Communications file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to open the file: file-name in either the installation source diskette or directory or the target directory. The source diskette may have been corrupted.

User Response: Check the status of the target directory, and try again, using the correct installation diskettes.

PCSINST041 Error reading the Personal Communications file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to read the file: file-name from the source diskette or disk. The source diskette may have been corrupted.

User Response: Try again, using the correct installation diskettes.

PCSINST042 Error writing the Personal Communications file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications tried to write the file: file-name to the target directory.

User Response: Check the status of the target directory and try again.

PCSINST050 You are installing Personal Communications from a server. Do you want to share the program files with other users? If so, INSTALL will copy only your private files to a directory on your own PC or to a private drive on a server.

Explanation: None.

User Response: To share the Personal Communications files, except some private files, with other users on the network, select **Yes**.

To copy all the Personal Communications files to your own PC or server directory, select **No**.

PCSINST100 A Personal Communications folder has been created. To start the first session, double-click the Start/Configure session icon.

Explanation: The installation program has created a folder called Personal Communications and has put the standard icons into it. If you have migrated from a previous release, or from Communications Manager/2,

you will also find icons for migrated sessions.

User Response: If this is a first-time installation, double-click the Start/Configure Session icon; this will allow you to configure your session parameters.

PCSINST101 Icons for Personal Communications have not been added to the desktop. You must start the programs manually.

Explanation: You chose not to add the Personal Communications icons to the folder.

User Response: You have to start Personal Communications manually from the OS/2 command prompt.

To start a single session, you must enter:
d:\path\pcsws.exe d:\path\private\xxx.ws

To start a Personal Communications batch file, you must enter: d:\path\pcsbat.exe
d:\path\private\xxx.bch /R

PCSKBD001 file-name cannot be found.

Explanation: The file file-name could not be found in the specified path.

User Response: Make sure that the correct path and file name are given.

PCSKBD002 file-name is not a valid filename.

Explanation: None.

User Response: Make sure that the correct name is specified.

PCSKBD100 The file: file-name is not a Personal Communications keyboard file.

Explanation: The file file-name does not have a valid format as a Personal Communications keyboard file. This message may appear if you have manually modified the file.

User Response: Make sure that the file name is correct, and, if it is, re-create the file in the Customize Keyboard window, then try the operation again. If the problem persists, install Personal Communications again.

PCSKBD101 Unrecognized expression in keyboard-file: file-name. Expression: key-name=value

Explanation: There is an incorrect expression (key-name=value) in the Personal Communications keyboard file file-name. This message may appear if you have manually modified the file.

User Response: Re-create the file, using the Customize Keyboard window, and try again. If the problem

persists, install Personal Communications again.

PCSKBD110 keyboard-name is not supported.

Explanation: The keyboard-name keyboard configured for your personal computer is not supported.

User Response: Change the keyboard to one supported by Personal Communications using the OS/2 Selective Install program, stop and restart OS/2, then try the operation again. If the problem persists, ask your system administrator for assistance.

PCSKBD150 The Customize Keyboard dialog box is already open.

Explanation: You selected **Customize** in the Keyboard Setup window while the Customize Keyboard window was already open.

User Response: Close the Customize Keyboard window in the other session before attempting to open it in this one.

PCSKBD151 file-name has been changed. Save the changes?

Explanation: You attempted to exit the Customize Keyboard window without saving the changes,

User Response: To exit after saving the changes, select **Yes**. To exit without saving the changes, select **No**. To do neither, select **Cancel**; the Customize Keyboard window remains open.

PCSKBD152 Error writing keyboard file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications attempted to write the file file-name to disk.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSKBD160 Unrecognized key-action: key-action. This key-action is not currently assigned to any key.

Explanation: You clicked **Change Key** in the Customize Keyboard window, but an unrecognized key action was found in the highlighted edit field.

User Response: Correct the key action manually or select a key action from the Function list, and click select the appropriate arrow, then try the operation again. If the problem persists, ask your system administrator for assistance.

PCSKBD200 The file: file-name is not a Personal Communications popup-keypad file.

Explanation: The file file-name does not have a valid format as a Personal Communications pop-up keypad file. This message may appear if you have manually modified the file.

User Response: Make sure that the file name is correct, and, if it is, re-create the file in the Customize Pop-up Keypad window, then try again. If the problem persists, install Personal Communications again.

PCSKBD201 Error in the dimensions of the popup keypad defined in popup-keypad file: file-name. Dimension: Pad=xx, Column=yy, Row=zz.

Explanation: The dimension (Pad=xx, column=yy, Row=zz) defined in the Personal Communications pop-up keypad file file-name is not within the supported range. This message may appear if you have manually modified the file.

User Response: Re-create the pop-up keypad file, using the Customize Popup Keypad window, and try again. If the problem persists, install Personal Communications again.

PCSKBD203 Unrecognized expression in popup-keypad file: file-name. Expression: key-name=value.

Explanation: An incorrect expression (key-name=value) was found in the Personal Communications pop-up keypad file file-name. This message may appear if you have manually modified the file.

User Response: Re-create the file, using the Customize Popup Keypad window, and try again. If the problem persists, install Personal Communications again.

PCSKBD210 Error in the dimension of the popup keypad. dimension: Pad=xx, Column=yy, Row=zz.

Explanation: A Personal Communications internal error was detected in the pop-up keypad operation.

User Response: Ask your system administrator for assistance.

PCSKBD250 Customize Popup Keypad window is already open.

Explanation: You attempted to select **Customize** in the Popup Keypad Setup window while the Customize Popup Keypad window was already open.

User Response: Close the Customize Popup Keypad window before attempting to select it.

PCSKBD251 file-name has been changed. Save the changes?

Explanation: You attempted to exit the Customize Popup Keypad window without saving the changes,

User Response: To exit after saving the changes, select **Yes**. To exit without saving the changes, select **No**. To cancel without exiting, select **Cancel**; the Customize Popup Keyboard window remains open.

PCSKBD252 Error writing popup-keypad file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications attempted to write the Personal Communications pop-up keypad file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSKBD300 The file: file-name is not a Personal Communications mouse file.

Explanation: The file file-name did not have a valid format for a Personal Communications mouse file. This message sometimes appears if you have manually modified the mouse file.

User Response: Make sure that the correct file name is given, and if it is, re-create the Personal Communications mouse file in the Customize Mouse window, and try the operation again. If the problem persists, install Personal Communications again.

PCSKBD301 Unrecognized key expression in mouse file: file-name. Key expression: key-name.

Explanation: The key name (key-name) was not found in the Personal Communications mouse file file-name. This message sometimes appears if you have manually modified the mouse file.

User Response: Re-create the Personal Communications mouse file using the Customize Mouse window, and try the operation again. If the problem persists, install Personal Communications again.

PCSKBD302 Unrecognized expression in mouse file: file-name. Expression: key-name=value.

Explanation: An incorrect expression (key-name=value) was found in the Personal Communications mouse file file-name. This message sometimes appears if you have manually modified the mouse file.

User Response: Re-create the Personal Communications mouse file using the Customize

Mouse window, and try the operation again. If the problem persists, install Personal Communications again.

PCSKBD350 Customize Mouse window is already open.

Explanation: You attempted to select **Customize** in the Mouse Setup window while the Customize Mouse window was already open.

User Response: Close the Customize Mouse window before attempting to select it.

PCSKBD351 file-name has been changed. Save the changes?

Explanation: You attempted to exit the Customize Mouse window without saving the changes,

User Response: To exit after saving the changes, select **Yes**. To exit without saving the changes, select **No**. To cancel without exiting, select **Cancel**; the Customize Mouse window remains open.

PCSKBD352 Error writing mouse file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications attempted to write the Personal Communications mouse file file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSKBD400 The file: file-name is not a Personal Communications macro file.

Explanation: The file file-name did not have a valid format for a Personal Communications macro file. This message sometimes appears if you have manually modified the macro file.

User Response: Make sure that the correct file name is given, and if it is, re-create the Personal Communications macro file in the Customize Macro window, and try the operation again. If the problem persists, install Personal Communications again.

PCSKBD401 No macro file can be found in the directory: directory-name.

Explanation: No Personal Communications macro file was found in the directory directory-name.

User Response: Make sure that the Personal Communications macro file exists in the directory, and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSKBD402 Unrecognized expression in macro file:
file-name. expression: value.

Explanation: An incorrect expression (value) was found in the Personal Communications macro file file-name. This message sometimes appears if you have manually modified the macro file.

User Response: Re-create the Personal Communications macro file using the Customize Macro window, and try the operation again. If the problem persists, install Personal Communications again.

PCSKBD410 Macro: macro-name cannot be found.

Explanation: The macro macro-name was not found in the macro table currently loaded.

User Response: Close the Personal Communications workstation program, restart it, and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSKBD450 Customize Macro window is already open.

Explanation: You attempted to select **Customize** in the Macro Setup window while the Customize Macro window was already open.

User Response: Close the Customize Macro window before attempting to select it.

PCSKBD451 file-name has been changed. Save the changes?

Explanation: You attempted to exit the Customize Macro window without saving the changes,

User Response: To exit after saving the changes, select **Yes**. To exit without saving the changes, select **No**. To cancel without exiting, select **Cancel**; The Customize Macro window remains open.

PCSKBD452 The file: file-name is not a Personal Communications macro file. The file extension must be "MAC."

Explanation: The file file-name was not a Personal Communications macro file.

User Response: Make sure that the correct file name and file extension are given, and then try the operation again. If the problem persists, install Personal Communications again.

PCSKBD453 Macro file: file-name is too large.

Explanation: You attempted to open the file file-name in the Customize Macro window, but it was too large.

User Response: Make sure that the given file is the Personal Communications macro file, and try the

operation again. If the problem persists, install Personal Communications again.

PCSKBD460 Unrecognized key action in the highlighted line.

Explanation: You attempted to save the macro into the macro file in the Customize Macro window, but an unrecognized key action was found in the macro statements.

User Response: Select a key action from the List of Key Actions or type any interspersed text strings necessary to complete the macro; then try the operation again. If the problem persists, ask your system administrator for assistance.

PCSKBD461 Macro: macro-name cannot be found. Please create it, otherwise this macro will not work correctly.

Explanation: You attempted to save the macro into the macro file in the Customize Macro window, but the macro used in the current macro does not exist.

User Response: Follow the instruction in the message and create the macro referred to by the current macro. Otherwise, when you invoke the current macro, you will get an error message.

PCSKBD462 String in the highlighted line is too long.

Explanation: You attempted to save the macro into the macro file in the Customize Macro window, but the macro in the highlighted line was too long.

User Response: Change the macro expression so that it does not exceed 253 characters, and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSKBD500 The label name 'label-name' was not found in 'macro-name.'

Explanation: Although you specified the target label 'label-name' followed by the GOTO statement, it was not found in the macro.

User Response: Check if the label name exists in the macro, and then add or correct the required label in the macro.

PCSKBD501 An invalid label name was found in 'macro-name.'

Explanation: An incorrect label name was found in the macro. The possible reasons for the error are as follows:

- A character other than alphabetic characters (A-Z) and numeric characters (0-9) is used.
- The length of the label name exceeds 32 characters.

- The label name is defined as a case-sensitive character string.

User Response: Identify the cause of the error, and then remove or correct the label name in the macro.

PCSKBD502 The label name 'label-name' already exists in 'macro-name.'

Explanation: A duplicate label name was found in the macro.

User Response: Change one of these label names to an appropriate one.

PCSKBD601 The current host code page conflicts with the selected PC keyboard-file code page.

Explanation: The code page in the keyboard file does not match the current host code page. Some characters may not be displayed correctly.

User Response: Open the Keyboard Setup window and either define a new keyboard file or redefine the current keyboard file.

PCSKBD602 The current host code page conflicts with the selected PC popup-keypad file code page.

Explanation: The code page in the popup-keypad file does not match the current host code page. Some characters may not be displayed correctly.

User Response: Open the Popup Keyboard Setup window and either define a new popup-keypad file or redefine the current popup-keypad file.

PCSKBD603 The current host code page conflicts with the selected mouse-file PC code page.

Explanation: The code page in the mouse file does not match the current host code page. Some characters may not be displayed correctly.

User Response: Open the Mouse Setup window and either define a new mouse file or redefine the current mouse file.

PCSKBD604 The current host code page conflicts with the loaded macro %s code page.

Explanation: The code page in the loaded macro macro-name does not match the current host code page. Some characters included in the macro macro-name may not be displayed correctly.

User Response: Open the Macro Setup window and either define a new macro or redefine the current macro.

PCSKBD610 Selected keyboard layout conflicts with PC code page of file-name. Do you want to customize this?

Explanation: You attempted to choose **Customize** while the selected keyboard layout conflicted with the personal computer code page of the file *file-name*.

User Response: Select **Yes** to accept that the customized file name is specified as the code page for the selected keyboard layout. Select **No** to cancel **Customize**.

PCSKBD611 The current host code page conflicts with the PC code page. Do you want to customize this?

Explanation: You attempted to choose **Customize** while the current host code page conflicted with the personal computer code page of the file *file-name*.

User Response: Select **Yes** to accept that the customized file name is specified as the code page according to the current host code page. Select **No** to cancel **Customize**.

PCSMT001 The file : file-name cannot be found in the source drive and directory. Please insert another diskette or name a different drive and directory.

Explanation: You attempted to install a CSD or apply a PTF, but there is no required component. This operation has been canceled.

User Response: Insert a correct CSD diskette (diskette-1), or specify the correct drive and directory for the CSD diskette. Then try the operation again.

PCSMT002 The file: file-name cannot be found in the target drive and directory. This fix has not been applied.

Explanation: You attempted to apply a PTF, but there is no required component. This operation has been canceled.

User Response: Specify the correct target drive and directory to install the CSD diskette, or apply your APAR fix diskette.

PCSMT003 The file : file-name cannot be found in the source drive and directory. Please check your APAR Fix diskette.

Explanation: You attempted to apply a PTF, but there are no fixed modules, which are listed in *PTF.TXT* in your APAR fix diskette.

User Response: Check if there are necessary files to apply a PTF in your APAR fix diskette. If you cannot find them, contact an IBM representative to get a correct APAR fix diskette.

PCSMT004 This fix is not applicable to the release of Personal Communications that is installed; it can be applied only to Version/CSD-level.

Explanation: You attempted to apply a PTF, but the base level of Personal Communications did not match your APAR fix diskette.

User Response: Contact an IBM representative to get a correct APAR fix diskette.

PCSMT005 File : file-name cannot be found.

Explanation: You attempted to view the CSD information, but there was no **APARLIST.TXT** found in your CSD diskette. The display CSD information operation has been canceled.

User Response: Contact an IBM representative to get the correct Personal Communications CSD diskettes.

PCSMT006 PCSMAINT.EXE failed: file-name file not found.

Explanation: You attempted to apply a PTF by executing **PCSMAINT.EXE**, but there was no **PCSPROD.INF** or **PCSMAINT.TXT** in the current drive and directory, which is required to apply a PTF.

User Response: Check if there is **PCSPROD.INF** or **PCSMAINT.TXT** in the current drive and directory. If it is not found, install Personal Communications, a CSD, or APAR fix again.

PCSMT007 Personal Communications is active. You must terminate it before you apply a fix.

Explanation: You attempted to apply a PTF, but Personal Communications was running.

User Response: Terminate Personal Communications before applying a PTF.

PCSMT011 Error happened while opening the Personal Communications file: file-name. Please try again.

Explanation: You attempted to apply a PTF, but a critical error occurred in opening a file.

User Response: Check that your APAR fix diskette is not damaged.

PCSMT012 Error happened while reading the Personal Communications file: file-name. Please try again.

Explanation: You attempted to apply a PTF, but a critical error occurred in reading a file.

User Response: Check that your APAR fix diskette is not damaged.

PCSMT013 Error happened while writing the Personal Communications file: file-name. Please try again.

Explanation: You attempted to apply a PTF, but a critical error occurred in writing a file.

User Response: Check that the target disk is not damaged.

PCSMT015 Error happened while writing the Personal Communications file: file-name because the disk is full. Please clear some disk space and try again.

Explanation: You attempted to apply a PTF, but there was no space to save the PTF modules on the disk.

User Response: Erase unnecessary files to make free space on the disk, and then try the operation again.

PCSMT016 A file could not be copied. Perhaps the disk is full or you are not authorized to write.

Explanation: You attempted to apply a PTF, but the target drive has a problem as follows:

- There is no space to save the fix modules on the disk.
- When the target drive is a network drive, it is a read-only drive.

User Response: If the target disk is full, erase unnecessary files to make free space on the disk. When the target drive is a network drive and you do not have authorization to write, contact your system administrator.

PCSNWCS001 The Server Name specified in your WorkStation profile is invalid.

Explanation: You attempted to start the Personal Communications workstation program with a profile, or you attempted to open a profile, specifying an incorrect server name for the LAN via NetWare for SAA attachment. This message might appear if you have manually modified the workstation profile.

User Response: Re-create the Personal Communications workstation profile after specifying the correct server name in the **Server Name** entry field in the LAN via NetWare for SAA window; then try the operation again. If the problem persists, install Personal Communications again.

PCSNWCS002 The User Name specified in your WorkStation profile is invalid.

Explanation: You attempted to start the Personal Communications workstation program with the profile, or you attempted to open the profile, specifying an incorrect user name for the LAN via NetWare for SAA

attachment. This message might appear if you have manually modified the workstation profile.

User Response: Re-create the Personal Communications workstation profile after specifying the correct user name in the **User Name** entry field in the LAN via NetWare for SAA window; then try the operation again. If the problem persists, install Personal Communications again.

PCSNWCS003 The Service Name specified in your WorkStation profile is invalid.

Explanation: You attempted to start the Personal Communications workstation program with a profile, or you attempted to open a profile, specifying an incorrect service name for the LAN via NetWare for SAA attachment. This message might appear if you have manually modified the workstation profile.

User Response: Re-create the Personal Communications workstation profile after specifying the correct service name in the **Service Name** entry field in the LAN via NetWare for SAA window; then try the operation again. If the problem persists, install Personal Communications again.

PCSNWCS004 The LU Category specified in your WorkStation profile is invalid.

Explanation: You attempted to start the Personal Communications workstation program with a profile, or you attempted to open a profile, specifying an incorrect LU category for the LAN via NetWare for SAA attachment. This message might appear only if you have manually modified the workstation profile.

User Response: Re-create the Personal Communications workstation profile after specifying the correct LU category in the LU Category entry field in the LAN via NetWare for SAA window; then try the operation again. If the problem persists, install Personal Communications again.

PCSNWCS005 The LU Name (or LU Pool Name) specified in your WorkStation profile is not valid.

Explanation: You attempted to start the Personal Communications workstation program with a profile, or you attempted to open a profile, specifying an incorrect LU name (or LU pool name) for the LAN via NetWare for SAA attachment. This message might appear if you have manually modified the workstation profile.

User Response: Re-create the Personal Communications workstation profile after specifying the correct LU name (or LU pool name) in the **LU Name** (or **LU Pool Name**) entry field in the LAN via NetWare for SAA window; then try the operation again. If the problem persists, install Personal Communications again.

PCSNWCS007 The trace entry size specified in your WorkStation profile is invalid. Default value (576 bytes) will be used instead.

Explanation: You attempted to start the Personal Communications workstation program with a profile, or you attempted to open a profile, specifying an incorrect trace entry size for the LAN via NetWare for SAA attachment. Only values from 576 to 16384 are allowed.

User Response: You can continue your operation, but you should modify the trace entry of your workstation profile.

PCSNWCS101 Invalid character is specified.

Explanation: You selected **OK** in the LAN via NetWare for SAA window, but you specified an incorrect character in the entry field.

User Response: Type correct characters in the entry field.

PCSNWCS102 Required parameter is not specified.

Explanation: You selected **OK** in the LAN via NetWare for SAA window, but you specified nothing in the entry field.

User Response: Fill in the entry field and try again.

PCSNWCS103 You entered an invalid character in your password.

Explanation: You selected **OK** in the LAN via NetWare for SAA Password window, but you specified an incorrect character in the entry field.

User Response: Type a correct character in the entry field.

PCSNWCS301 The connection request has been canceled.

Explanation: The connection request was canceled. You might have selected **Cancel** in the LAN via NetWare for SAA Password window, or some network error occurred when the window was displayed.

User Response: Disconnect and reconnect to establish the communication.

PCSNWCS401 The NetWare Client for OS/2 is not installed.

Explanation: The NetWare Client for OS/2 was not available in your workstation.

User Response: Make sure the correct version of NetWare Client for OS/2 is installed before using LAN via NetWare for SAA attachment. For more information, refer to online help.

PCSNWCS403 Socket Open Failure: return code - xx.

Explanation: NetWare IPX/SPX driver failed to open a socket.

User Response: Ask your system administrator for assistance.

PCSNWCS404 IPX.SYS is not installed.

Explanation: NetWare IPX** driver (**IPX.SYS**) is not configured in **CONFIG.SYS**.

User Response: Install and configure NetWare Requester for OS/2. For more information, refer to the *NetWare Requester for OS/2* manual.

PCSNWCS405 SPX.SYS is not installed.

Explanation: NetWare SPX driver (**SPX.SYS**) is not configured in the **CONFIG.SYS** file.

User Response: Install and configure SPX Support. For more information, refer to the *NetWare Requester for OS/2* manual.

PCSPCO001 DisplayWrite is not supported.

Explanation: You cannot use DisplayWrite from DBCS devices.

User Response: Change to the OfficeVision/400 editing program.

PCSPCO002 PCO command processor (PCSPCOC.EXE) failed: DosStartSession return code - xx.

Explanation: When PC400 attempted to execute the PCO command processing program, OS/2 returned an error status.

User Response: Install Personal Communications again, and then retry the operation. If this error persists, contact your system administrator.

PCSPCO003 Application program-name is already running.

Explanation: The program program-name specified has already been running in OS/2.

User Response: Stop the active application program; then run the program again.

PCSPCO004 You asked for more than one DisplayWrite 5/2 (DW 5/2) editing session. Only one is allowed.

Explanation: You asked for more than one DisplayWrite 5/2 (DW 5/2) editing session.

User Response: If you already canceled a DW 5/2 editing request from the host, close the DW 5/2 editing

session associated with it. Then try the operation again.

If not, return to the editing session. You cannot start a new editing session until the first editing session is closed.

PCSPCO005 PC Organizer could not assign a system drive.

Explanation: PC Organizer requires a shared folders system drive to be assigned before using the word processing function.

User Response: Use the Shared Folders Assign command to explicitly assign a system drive.

PCSPCO006 Path path-name could not be accessed.

Explanation: The access was denied for one of the following reasons:

- The specified path is a secured path. You do not have authority to access the folder.
- Your user ID is not in the system directory.

User Response: Do one of the following things:

- Submit the request again using a different folder.
- Have the security officer give you authority to access the folders in the path specified.
- Add your user ID in the system directory.

PCSPCO007 PC Organizer cannot run on the version of DisplayWrite 5/2 being used. Version 1.1.2 or higher is needed.

Explanation: PC Organizer cannot run on the version of DisplayWrite 5/2 being used.

User Response: Install DisplayWrite 5/2 Version 1.1.2 or later.

PCSPCO008 PC Organizer detected a system error.

Explanation: PC Organizer detected a system error.

User Response: Restart your computer and retry the operation you were attempting when the problem occurred.

If the problem persists, follow your local network operating procedures. If this does not resolve the problem, contact your service representative.

PCSPCO009 Program program-name was not found.

Explanation: Program program-name was not found.

User Response: Check that you entered the program name correctly. If you did, make sure the specified program is installed and try the operation again.

PCSPCO010 DisplayWrite 5/2 (DW 5/2) was not loaded.

Explanation: DW 5/2 was not loaded correctly with the information provided in the editor-of-choice fields.

User Response: Correct the editor-of-choice fields to reflect the correct location of DW 5/2 and the appropriate startup sequence.

PCSPCO011 The editor could not interpret the request it received from PC Organizer.

Explanation: The editor could not interpret the request from PC Organizer.

User Response: Close the PC Organizer session. Restart it, and try the operation again.

If the problem persists, follow your local network operating procedures. If this does not resolve the problem, contact your service representative.

PCSPCO012 DisplayWrite 5/2 could not process an edit request.

Explanation: DisplayWrite 5/2 could not process an edit request.

User Response: Try the operation again.

If the problem persists, follow your local network operating procedures. If this does not resolve the problem, contact your service representative.

PCSPCO013 PC Organizer timed out while waiting for a response from the host.

Explanation: PC Organizer timed out while waiting for a response from the host.

User Response: If you want to try the operation again, select **Retry**. If you want to cancel the operation, select **Cancel**.

PCSPCO014 The request to edit a document failed.

Explanation: The failure occurred for one of the following reasons:

- The file extension specified is either **.RFT** or **.FFT**; both are reserved.
- The fully qualified file name is longer than 44 characters.

User Response: Correct the file name.

PCSPD010 You have not set up a printer for this session, so the OS/2 default printer will be used instead.

Explanation: A printer was not selected for this workstation.

User Response: Select a printer using **Printer Setup...**

in the File menu. The OS/2 default printer is selected if a printer is not selected.

PCSPD020 printer-name cannot be found. The OS/2 default printer will be used instead.

Explanation: The specified printer was not found.

User Response: Create the specified printer object, or select another printer using **Printer Setup...** in the File menu.

PCSPD050 You have not chosen an OS/2 default printer. Print canceled.

Explanation: The print function was canceled, because the OS/2 default printer was not selected.

User Response: Select the printer using **Printer Setup...** in the File menu, or select a default printer from a printer object pop-up menu.

PCSPD070 You have not chosen a OS/2 default printer. The font list is empty.

Explanation: The font list for the printer was empty, because the printer was not selected.

User Response: Select the printer using **Printer Setup...** in the File menu.

PCSPD090 Not enough disk space for spooling.

Explanation: There was not enough disk space available in your personal computer for printing.

User Response: Delete unnecessary files from your disk, and try the operation again.

PCSPD091 Not enough memory space for spooling.

Explanation: There was not enough memory available in your personal computer for printing.

User Response: Close one or more applications and try the operation again.

PCSPD092 General print error. Command: xxxx.

Explanation: A printer error was reported from the printer driver.

User Response: If this error message is displayed before the previous print job is finished, try the operation again after it is finished. Ask your system administrator for assistance if you continue to get this message.

PCSPFC000 Converting file-name1 to file-name2.

Explanation: PFT Migration Utility (PCSPFC.EXE) is converting the printer function table (PFT) to the printer definition file (PDF).

User Response: None.

PCSPFC001 PFT conversion completed successfully.

Explanation: The conversion from the PFT to the PDF was completed successfully.

User Response: None.

PCSPFC002 PFT conversion completed with xx errors.

Explanation: The conversion from the PFT to the PDF was completed, but errors occurred.

User Response: Correct the errors, and execute the conversion again if necessary.

PCSPFC003 PFT conversion failed with xx errors.

Explanation: The conversion from the PFT to the PDF failed because errors occurred.

User Response: Correct the errors and execute the conversion again.

PCSPFC004 Fatal error: Cannot open file: file-name.

Explanation: The conversion from the PFT to the PDF failed, because the PFT Migration Utility could not open the file.

User Response: Check the file, and try the operation again.

PCSPFC005 Cannot close file: file-name.

Explanation: The conversion from the PFT to the PDF failed, because the PFT Migration Utility could not close the file.

User Response: Check the file, and try the operation again.

PCSPFC006 Cannot delete file: file-name.

Explanation: The conversion from the PFT to the PDF failed, because the PFT Migration Utility could not delete the file.

User Response: Check the file, and try the operation again.

PCSPFC007 Cannot read file: file-name.

Explanation: The conversion from the PFT to the PDF failed, because the PFT Migration Utility could not read the file.

User Response: Check the file, and try the operation again.

PCSPFC008 Cannot write file: file-name.

Explanation: The conversion from the PFT to the PDF failed, because the PFT Migration Utility could not write the file.

User Response: Check the file, and try the operation again.

PCSPFC009 File file-name is not a PFT file.

Explanation: The conversion from the PFT to the PDF failed, because the specified file was not a PFT file.

User Response: Check the file, and try the operation again.

PCSPFC010 Cannot migrate PDF-field-name.

Explanation: No data was converted into the PDF-field-name.

User Response: Check the file, and try the operation again. Or specify the data at the field in the PDF file.

PCSRBW001 The system settings will not allow you to use the PCS/400 functions. Do you want to change the system settings now?

Explanation: A module required to use PC Support/400 has not yet been loaded.

User Response: To change the system settings and load the required module, select **Yes**.

PCSRTR001 The PC Support/400 Router has not been started.

Explanation: The PC Support/400 Router has not been started or it has terminated abnormally.

User Response: Exit the Windows operating system, and then start the router program.

PCSRTR002 The PC Support/400 Windows Compatibility Module has not been installed.

Explanation: The PC Support/400 Windows Compatibility Module (PCSWIN.EXE) has not been installed.

User Response: Exit the Windows operating system, and then install the PC Support/400 Windows Compatibility Module. Ensure that the Microsoft

Windows option is specified in the PC Support/400 configuration.

PCSRTR003 The communication buffer for the PC Support/400 Windows Compatibility Module is too small.

Explanation: The communication buffer for the PC Support/400 Windows Compatibility Module (PCSWIN.EXE) is too small.

User Response: Specify a larger value for the /B= parameter for the PC Support/400 Windows Compatibility Module in the PC Support/400 startup program STARTPCS.BAT file. With PC/3270, each session requires 6 KB.

PCSRTR004 The AS/400 system is not active.

Explanation: Communication has not been established with the specified host.

User Response: Ensure that a valid host system is specified in the PC Support/400 configuration.

PCSRTR010 The PC Support/400 Router can not allocate the memory. Please terminate application programs that you are not using.

Explanation: The PC Support/400 Router cannot allocate the conventional memory that is required to perform the request.

User Response: Terminate the application programs that are not used or remove the unnecessary Terminate and Stay Resident (TSR) program and start the Windows operating system again.

PCSRTR021 The Network Services has not been started.

Explanation: Network Services has not been started or it has terminated abnormally.

User Response: Start the Network Services program.

PCSRUI001 The LU Name is invalid.

Explanation: The specified LU name is not valid. The LU name must be 1 to 8 characters, and the first character must be an alphabetic (A-Z) or a special character (@, #, \$). The remaining characters can be alphanumeric (a-z, A-Z, 0-9) or special characters (@, #, \$).

User Response: Type the correct LU name.

PCSRUI002 The LU Name was not specified.

Explanation: The LU name must be specified for this connectivity.

User Response: Type the correct LU name.

PCSRUI005 The LU Name lu-name is not defined in configuration: file-name. Do you want to change it?

Explanation: You are attempting to exit the LUA 3270 configuration panel with an LU name that is not configured in Access Feature.

User Response: Change the specified LU after selecting **No**, or configure the specified LU in Access Feature after selecting **Yes**.

PCSRUI006 Communications did not start. The specified configuration is not valid or cannot be found.

Explanation: Access Feature did not start. The specified configuration is not valid or cannot be found.

User Response: Verify that the configuration is valid.

PCSRUI010 The LU Name specified in your workstation profile is invalid.

Explanation: You specified an incorrect LU name in your workstation profile.

User Response: The name can contain alphanumeric characters and the special characters \$, #, and @.

PCSRUI011 The LU Name specified in your WorkStation profile exceeds 8 characters.

Explanation: The LU name length must be eight characters or shorter.

User Response: Specify a name from one to eight characters long.

PCSRUI020 The necessary components for advanced connections have not been installed.

Explanation: This connectivity requires Access Feature and its LUA API feature.

User Response: Install Personal Communications.

PCSRUI022 The specified LU name is being used by another session.

Explanation: Each LUA 3270 session requires a unique LU. The LU must be configured in Access Feature LUA configuration. The other Personal Communications session has already used the LU specified in this session configuration.

User Response: Change the LU specified in this

session configuration, or stop the session that is using the LU.

PCSRUI023 The necessary components for advanced connections have not been installed. Do you want to continue? If you choose Yes, you can install the components later.

Explanation: You are attempting to configure LUA3270, but Access Feature is not installed or its LUA API feature is not properly installed.

User Response: Install Personal Communications before starting communication.

PCSSETUP001 The Personal Communications files that are needed to perform the function you selected have not been installed. Do you want to install them now?

Explanation: You attempted to perform some functions of Personal Communications, but the required modules or files did not exist in the directory where Personal Communications is installed.

User Response: Select **Yes** to install the required modules or files to perform that function. You are prompted to insert the *Personal Communications* diskette into drive A. An error message is displayed if you select **No**.

PCSTBAR001 File is not a tool bar file, or is corrupted.

Explanation: The selected file is not recognized as a tool bar file. This is because the file was not created with the tool bar **Save** option, or the file contents have been corrupted.

User Response: Verify the file name and try again. If the file contents have been corrupted, delete the file and save the tool bar again using the tool bar **Save** option.

PCSTDLC001 The TDLC configuration data has been saved. You must reboot the PC so that the changes you made can take effect.

Explanation: The configuration information for the adapter is saved.

User Response: Restart OS/2.

PCSTDLC002 Since the twinaxial station address is already being used by another session, this session cannot be opened. Please try again after closing a session.

Explanation: You attempted to connect a workstation window application by the twinaxial station address. But it failed, because the address was used by another

session configured for other attachments.

User Response: Close another session using the same address, and then try to open the session again.

PCSTDLC003 The Twinax Adapter failed to open.

Explanation: An error occurred when opening the twinaxial adapter.

User Response: Check that the twinaxial adapter is installed correctly. Restart the system.

PCSTD012 System environment is not correct. Please check your environment.

Explanation: The basic input/output system (BIOS) returned an error during 5250 adapter card initialization.

User Response: Make sure that the personal computer on which this error occurred is supported by Personal Communications. If so, make sure that you do not specify the same address for another adapter card.

PCSTD014 Twinaxial adapter card RAM Error. Please check Twinaxial card.

Explanation: The 5250 adapter card was found to have a problem.

User Response: Install the 5250 adapter card again, and test it as specified in the 5250 adapter installation procedures.

PCSTD015 PCSTDBOT.LEX is not found.

Explanation: PCSTDBOT.LEX could not be found in the directory where Personal Communications is installed.

User Response: Make sure that PCSTDBOT.LEX is in the directory where Personal Communications is installed. If you have accidentally erased it, install Personal Communications again.

PCSTD016 PCSTD0CM.LEX is not found.

Explanation: PCSTD0CM.LEX could not be found in the directory where Personal Communications is installed.

User Response: Make sure that PCSTD0CM.LEX is in the directory where Personal Communications is installed. If you have accidentally erased it, install Personal Communications again.

PCSTD017 Error occurs while loading 5250 adapter micro code.

Explanation: An error occurred while loading the adapter microcode for the 5250 adapter card. This error can occur if the adapter card is defective or an address

used by another device driver duplicates that used by the 5250 adapter card.

User Response: Set a memory address for the 5250 adapter card that does not duplicate that of another card or device driver.

PCSTD018 Since another twinaxial adapter handler is already loaded, twinaxial device driver for Personal Communications is not loaded.

Explanation: Another twinaxial adapter handler, such as Access Feature, and the twinaxial device driver for Personal Communications cannot be loaded together.

User Response: Remove the other twinaxial adapter handler from CONFIG.SYS and restart OS/2.

PCSTLNET001 SO32DLL.DLL could not be loaded.

Explanation: An attempt to load SO32DLL.DLL failed. SO32DLL.DLL does not exist on the LIBPATH.

User Response: Make sure that SO32DLL.DLL exists on the LIBPATH. If not, install TCP/IP for OS/2.

PCSUPM001 You did not enter a user ID.

Explanation: A user ID must be specified as part of a user profile at automatic logon.

User Response: Specify a user ID.

PCSUPM002 You did not enter a password.

Explanation: A password must be specified as part of a user profile at automatic logon.

User Response: Specify a password.

PCSUPM003 Please enter your password again to confirm it.

Explanation: To confirm that the password has been entered as desired, the system requests that it be entered a second time.

User Response: Enter the desired password again.

PCSUPM004 The new and confirmation passwords are not the same.

Explanation: The first and second password entries are different.

User Response: Reenter the password, taking care to specify it exactly as desired.

PCSUPM005 You did not specify a user profile.

Explanation: A user profile name must be specified.

User Response: Specify a user profile name or select a user profile name by using the Windows Browse function.

PCSUPM006 The file you chose does not contain any user-profile information.

Explanation: The specified user profile does not contain the required user ID or password information.

User Response: Specify a user ID and password.

PCSVPD001 Invalid character in Device Type field. Valid input characters are: A-Z a-z 0-9 space.

Explanation: You attempted to select OK in the Vital Product data window while incorrect characters were in the **Device Type** entry field. Characters a-z, A-Z, 0-9, and space are valid characters in this field.

User Response: Remove the incorrect characters from the **Device Type** entry field, and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSVPD002 Invalid character in Model field. Valid input characters are: A-Z a-z 0-9 space.

Explanation: You attempted to select OK in the Vital Product data window while incorrect characters were in the **Model** entry field. Characters a-z, A-Z, 0-9, and space are valid characters in this field.

User Response: Remove the incorrect characters from the **Model** entry field, and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSVPD003 Invalid character in Machine Serial field. Valid input characters are: A-Z a-z 0-9 space.

Explanation: You attempted to select OK in the Vital Product data window while incorrect characters were in the **Machine Serial** entry field. Characters a-z, A-Z, 0-9, and space are valid characters in this field.

User Response: Remove the incorrect characters from the **Machine Serial** entry field, and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSVPD010 Invalid character is in No.xx Data field. Valid input characters are: A-Z a-z 0-9 space + < = > % & * " ' () . , _ - / : ; ?

Explanation: You attempted to select OK in the Extended Vital Product data window while incorrect

characters were in the **Data** entry field. Characters a-z, A-Z, 0-9, space, + < = > % & * " ' () . , _ - : ; ? are valid characters in these field.

User Response: Remove the incorrect characters from the **Data** entry field, and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSWKBD001 file-name cannot be found.

Explanation: The file file-name was not found.

User Response: Make sure that the correct path and file name are given.

**PCSWKBD002 file-name is not a valid file name.
Please make sure that you specified the correct file name.**

Explanation: The file file-name did not form a valid file name.

User Response: Make sure that the correct file name is given.

**PCSWKBD003 file-name is not a valid filename;
wild-card characters are not supported.**

Explanation: A wildcard character was found in the file name.

User Response: Remove the wildcard character from the file name.

PCSWKBD004 Path: path-name does not exist. Please verify that you specified the correct path.

Explanation: The path path-name did not exist.

User Response: Make sure that the correct path name is given.

PCSWKBD100 Macro does not exist. Please select a function.

Explanation: You attempted to select **OK** in the Keyboard/Macro window after selecting a no-macro in the Macro combination box. (You did not create the macro, so nothing was in the Macro combination box.)

User Response: Select a function from the Function combination box, and try the operation again.

PCSWKBD200 Please specify a keyboard-file name.

Explanation: You attempted to select **OK** in the Keyboard Setup window after selecting **User defined** keyboard, but the keyboard file name was not specified.

User Response: Type a file name of the keyboard file

in the **Keyboard File Name** entry field, and try the operation again.

PCSWKBD201 Please select a keyboard layout.

Explanation: You attempted to select **OK** in the Keyboard Setup window without selecting a keyboard language from the Keyboard Layout combination box.

User Response: Select a keyboard language from the Keyboard Layout combination box, and try the operation again.

PCSWKBD300 Please specify a popup-keypad-file name.

Explanation: You attempted to select **OK** in the Popup Keypad Setup window after selecting **User defined** pop-up keypad, but the **Popup Keypad File Name** was not specified.

User Response: Type a file name of the pop-up keypad file in the **Popup Keypad File Name** entry field, and try the operation again.

PCSWKBD400 Please specify a mouse-file name.

Explanation: You attempted to select **OK** in the Mouse Setup window after selecting **User defined** mouse, but the **Mouse File Name** was not specified.

User Response: Type a file name of the keyboard file in the **Mouse File Name** entry field, and try the operation again.

PCSWKBD500 Macro does not exist.

Explanation: You attempted to select **OK** in the Play Macro window, but there was no macro file to play.

User Response: Select **Cancel** to close the Play Macro window.

PCSW001 An error has occurred. One possibility is that you are extremely low on memory, in which case you should close one or more applications and start again.

Explanation: Your OS/2 system does not have enough available memory to start the Personal Communications workstation program.

User Response: Close one or more OS/2 saveapplications and start the Personal Communications workstation program again.

PCSW010 WorkStation profile: file-name cannot be found. Do you want to select another?

Explanation: The profile file-name defining the characteristics of the Personal Communications workstation window was not found. A possible reason is that the path does not exist, the path is not correct,

or the file name is not correct.

User Response: Select **Yes** to select another profile and continue the operation. The Open Workstation Profile window will appear and allow you to select another profile. Select **No** to quit the operation.

PCSWS011 The file: file-name is not a Personal Communications WorkStation Profile.

Explanation: The file file-name does not have a valid format as a profile for the Personal Communications workstation window. This message might appear if you have manually modified the workstation profile.

User Response: Make sure that the correct file name is given, and if it is, re-create the Personal Communications workstation profile and try the operation again. If the problem persists, install PC/3270 again.

PCSWS020 You have asked to close this session. It may be a new session or you may have changed one or more of its settings; do you want to save the current definitions?

Explanation: You attempted to exit the Personal Communications workstation window without saving the settings changed since the last time you selected **New** in the File pull-down menu, opened the profile, or saved the settings into the profile.

User Response: To exit after saving the changes, select **Yes**. To exit without saving the changes, select **No**. To cancel without exiting, select **Cancel**; the Personal Communications workstation window remains open.

PCSWS021 Because you have changed the profile for this session, communication will be terminated if you proceed. Are you sure?

Explanation: You attempted to change the profile of the Personal Communications workstation window without disconnecting the communication.

User Response: Select **OK** to continue the operation. The communication is automatically disconnected before the settings are loaded from the new profile and reconnected if **AutoConnect** is selected in the new profile.

Select **Cancel** to quit the operation. The settings of the Personal Communications workstation window remains unchanged.

PCSWS022 Do you want to add an icon for this session to the desktop?

Explanation: You created a new profile for the Personal Communications workstation.

User Response: Select **Yes** to add the icon of the Personal Communications workstation program with the current settings. The Add Workstation Program-to-Program Group window prompts you to specify the folder name to which the icon is added. To not add the icon of the Personal Communications workstation program with the current settings, select **No**.

PCSWS023 To start this session with the modified definitions, enter '(drive:path)PCSWS (drive:path)file-name' from the OS/2 command prompt.

Explanation: You did not add the icon of the Personal Communications workstation program when you created the new profile.

User Response: Follow the instruction in the message the next time you start the Personal Communications workstation program.

PCSWS024 To start the WorkStation (session) that you have just saved, choose the 'icon-name' icon in the 'folder-name' folder.

Explanation: You added the icon of the Personal Communications workstation program when you created the new profile.

User Response: Follow the instruction in the message the next time you start the Personal Communications workstation program.

PCSWS025 An icon was not added to the desktop.

Explanation: OS/2 returned an error condition when Personal Communications attempted to add the icon of the Personal Communications workstation program to the desktop.

User Response: Try the operation again. If the problem persists, ask your system administrator for assistance.

PCSWS026 Error saving the WorkStation profile: file-name.

Explanation: OS/2 returned an error condition when Personal Communications attempted to write the Personal Communications workstation profile file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSXFER001 Insufficient system memory available.
Close one or more unnecessary application program, and try again.

Explanation: Your OS/2 system does not have enough available memory to transfer the files you selected.

User Response: If you were sending or receiving more than one file, try sending or receiving one file at a time. If the problem persists, close one or more OS/2 applications and try again. If the problem persists, ask your system administrator for assistance.

PCSXFER010 PC file: file-name cannot be found in the path specified.

Explanation: The file file-name was not found.

User Response: Make sure that the correct path and file name are given.

PCSXFER011 Error reading file: file-name from the PC disk.

Explanation: The file might have write-only access, or the disk or the diskette might be damaged. Or you might have specified an incorrect subdirectory or file name.

User Response: Make sure that the correct path name and file name are given. If they are correct, make sure that the file can be read by checking that the file is not a write-only file. If the problem persists, ask your system administrator for assistance.

PCSXFER012 Error creating file: file-name on the PC disk.

Explanation: The disk or diskette was either damaged, full, or unformatted. Or you might have specified an incorrect subdirectory or file name.

User Response: Make sure that the correct path name and file name are given. If they are correct, make sure that the file can be written by checking that the diskette is not write-protected, and ensure that there is adequate space available. If the problem persists, ask your system administrator for assistance.

PCSXFER013 Error writing file: file-name to the PC disk.

Explanation: The disk or diskette was either damaged, full, or unformatted. Or you might have specified an incorrect subdirectory or file name.

User Response: Make sure that the correct path name and file name are given. If they are correct, make sure that the file can be written by checking that the diskette is not write-protected or that the file is not a read-only file. Also ensure that there is adequate space available. If the problem persists, ask your system administrator for assistance.

PCSXFER014 Error writing file: file-name to the PC disk because the disk is full.

Explanation: The disk or diskette is full.

User Response: Erase unnecessary files from the target disk and try the operation again. If the problem persists, ask your system administrator for assistance.

PCSXFER015 PC file: file-name which was to be appended to, could not be found in the path specified. It has been created as a new file.

Explanation: There was no file-name file to append.

User Response: Make sure the correct path and file name are given.

PCSXFER020 Error opening send/receive-list file: file-name.

Explanation: OS/2 returned an error condition when Personal Communications attempted to open the send/receive file: file-name.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSXFER030 Cannot send zero-length file: file-name.

Explanation: You attempted to send an empty file file-name to the host.

User Response: Erase the file.

PCSXFER040 Lost contact with the host.

Explanation: The host was inactive, or the communication link with the host was lost. Or the transfer was executed when a cursor was not in the command line.

User Response: If you have received an error code in the operator information area, copy it down and refer to the OIA messages in the online help. Or make sure that a cursor is at the command line, and then try to request the transfer again.

PCSXFER041 Host has not responded within timeout period. You may have to disconnect from IND\$FILE by pressing the PF2 key once or twice.

Explanation: IND\$FILE is the host application program that manages file transfers. The Personal Communications workstation window canceled the file transfer, because IND\$FILE did not respond within the timeout period. The workstation window screen might look incorrect because of the IND\$FILE process.

User Response: Exit IND\$FILE by pressing F2 once or

twice and restart the file transfer. Make sure that the ready prompt appears on the screen before transferring the files.

If the problem persists, you might need to increase the timeout value in the Miscellaneous Settings-Session X window. The default timeout value is 30 seconds.

PCSXFER042 Transfer has been canceled. You may have to disconnect from IND\$FILE by pressing the PF2 key once or twice.

Explanation: IND\$FILE is the host application program that manages file transfers. You canceled the file transfer, and the workstation window screen might look incorrect because of the IND\$FILE process.

User Response: Exit IND\$FILE by pressing F2 once or twice to terminate IND\$FILE completely and restore the screen.

PCSXFER045 File transfer has been canceled because the host is busy.

Explanation: The host session is busy. The file transfer command has been canceled.

User Response: The specified host session is performing another file transfer operation. Try the operation again, when the specified host session is ready.

PCSXFER046 The specified terminal session is not available.

Explanation: The specified terminal session is not started or is disconnected. The file transfer command cannot start.

User Response: Try the operation again, after the specified terminal session is ready.

PCSXFER050 The combination of host code page and PC code page is not valid. The default PC code page will be used.

Explanation: You attempted to start file transfer, but the combination of the host code page and personal computer code page was not valid.

User Response: Reconnect the communication after selecting the proper host code page from the Host Code Page combination box in the Customize Communication-3270 or 5250 Host window. Then select the proper personal computer code page from the PC code page combination box in the Miscellaneous Settings-Session X window and try the operation again.

If the problem persists, ask your system administrator for assistance.

PCSXFER060 Transfer had finished successfully before your pause request was accepted.

Explanation: You selected **Pause** in the Send Files Status or the Receive Files status window while transferring multiple files. But the file transfer completed successfully before your request was accepted.

User Response: None.

PCSXFER070 file-name is not a valid file-name. Please make sure that you specified the correct file-name.

Explanation: The file file-name does not form a valid file name.

User Response: Make sure you have specified the correct file name.

PCSXFER071 file-name cannot be found.

Explanation: The file file-name could not be found.

User Response: Make sure you have specified the correct path and file name.

PCSXFER072 Path: path-name does not exist. Please make sure that you specified the correct path.

Explanation: The path path-name does not exist.

User Response: Make sure that correct path name is given.

PCSXFER073 Please specify a translation-file name.

Explanation: A translation file name has not been specified in the **File Name** field of the Translation-Table Setup window.

User Response: Select **OK** and specify a translation file name.

PCSXLT001 The file: file-name is not a Personal Communications code-page-translation file.

Explanation: The file file-name was not a Personal Communications code-page translation file.

User Response: Make sure that the correct file name is given, and then try the operation again. If the problem persists, install Personal Communications again.

PCSXLT002 A character outside the revisable range was found and ignored.

Explanation: A character outside the revisable range was found and ignored.

User Response: Re-create the Personal

Communications code-page translation file and try the operation again. If the problem persists, install Personal Communications again.

PCSXLT350 **Customize Translation Table window is already open.**

Explanation: You attempted to open the Translation Table window while it was already open.

User Response: Close the Translation Table window.

PCSXLT351 **file-name has been changed. Save the changes?**

Explanation: You attempted to exit the Translation Table window, but the translation table has been changed.

User Response: Select **OK** to save the changes, or select **NO** to cancel the changes.

PCSXLT352 **Error writing translation file: file-name**

Explanation: OS/2 returned an error condition when Personal Communications attempted to save the translation table.

User Response: Determine the cause of the error condition and correct it, or ask your system administrator for assistance.

PCSXLT353 **hex-code1 has been translated from hex-code2. Replace hex-code2 by undefined code?**

Explanation: You attempted to specify the code: hex-code1, which has been already translated from hex-code2. Therefore, change the code hex-code2 to the undefined code.

User Response: Select **OK** to replace hex-code2 to the undefined code. Select **NO** to cancel the change.

PCSXLT354 **file-name is not a valid file-name. Please make sure that you specified the correct file-name.**

Explanation: The extension of the file: file-name is not XLT.

User Response: Select **OK** and specify the correct file name.

PCSXLT355 **file-name cannot be found.**

Explanation: The file: file-name cannot be found.

User Response: Select **OK** and specify the correct file name.

PCSXLT356 **Path: path-name does not exist. Please make sure that you specified the correct path.**

Explanation: The path: path-name does not exist.

User Response: Select **OK** and specify the correct path.

PCSXLT357 **Please specify a translation-file name.**

Explanation: A translation file name has not been specified in the **File Name** field of the Translation-Table Setup window.

User Response: Select **OK** and specify a translation file name.

File Transfer Messages

TRANS03 and TRANS04 are not error messages and are usually not displayed. When file transfer terminates with no messages having been displayed, it indicates that file transfer was successful. More than one file can be transferred by a single file-transfer request. If the operation is normal, the system does not display messages during the transfer. This avoids interrupting the transfer operation.

TRANS03 **File transfer complete.**

Explanation: The file transfer operation was completed normally. There is now a file either in the host or in the personal computer with the name and characteristics you specified in the **SEND** or **RECEIVE** command.

User Response: None.

TRANS04 **File transfer complete, with records segmented.**

Explanation: The file transfer operation was completed. But there were some records that were longer than the logical record length. These records have been segmented.

User Response: Increase the record length, and try the file transfer again.

Messages TRANS12 - TRANS99 are error messages. File transfer is abnormally ended. Error information might also be output from the host system or from the

AS/400 system. You can view this information using the DSPJOBLOGT command.

TRANS12 Write error, insufficient PC disk space, or defective disk: File transfer aborted.

Explanation: None.

User Response: Ensure that there is sufficient free space available on the personal computer. Then request the transfer again. If the same message is displayed, check whether the personal computer disk is defective, as described in the manual for your personal computer.

TRANS13 Error writing file to host: File transfer canceled.

Explanation: The host program has detected an error in the file data being sent to it by the SEND command.

User Response: Try the file transfer again. If the message recurs, ask your system administrator for assistance.

TRANS14 Error reading file from host: File transfer canceled.

Explanation: The host program has detected an error in the file data during a receive operation.

User Response: Try the file transfer again. If the message recurs, ask your system administrator for assistance.

TRANS15 Required host storage unavailable: File transfer canceled.

Explanation: You need 30 KB of main storage for file transfer in addition to that required by your host. This should not be confused with disk space.

User Response: Ask your local host system support representative for assistance.

TRANS16 Incorrect request code: File transfer canceled.

Explanation: An incorrect parameter was sent by the SEND or RECEIVE application.

User Response: Verify that the current version of SEND, RECEIVE, and IND\$FILE MODULE are correctly installed. If they are, follow local procedures and have available:

- The sequence of events, including keys pressed and in what order
- The system level
- The message number

TRANS17 Missing or Incorrect TSO data set name: File transfer canceled.

Explanation: The TSO data set name was is missing or not a sequential or partitioned data set.

User Response: Correct the TSO data set name in the command, and try the operation again.

TRANS17 Missing or Incorrect CMS file name: File transfer canceled.

Explanation: The CMS file name was missing or incorrectly specified.

User Response: Correct the CMS file name in the command, and try the operation again.

TRANS17 Missing or incorrect library/file/member name File Transfer Canceled.

Explanation: To execute a RECEIVE command, the specified library or file or member must exist. When a SEND command is executed, a file or member is automatically created if it does not already exist. The library, however, must already exist.

User Response: Specify a valid library or file or member. Then request file transfer again.

TRANS18 Incorrect option specified: File transfer canceled.

Explanation: You specified an option that is not acceptable.

User Response: Correct the command to specify an acceptable option, and try the operation again.

TRANS19 Error reading or writing to host disk: File transfer canceled.

Explanation: There was not enough space available for data on the host.

User Response: Look at the host session message for indications and correct the problem.

TRANS28 Invalid option xxxxxxxx: File transfer canceled.

Explanation: xxxxxxxx was not recognized, was specified as a positional keyword, or has an associated value that is incorrect.

User Response: Correct the option in the command, and try the operation again.

TRANS29 Invalid option xxxxxxxx with RECEIVE:
File transfer canceled.

Explanation: xxxxxxxx is not valid with RECEIVE, but it can be used with SEND.

User Response: Remove the option from the command, and try the operation again.

TRANS30 Invalid option xxxxxxxx with APPEND:
File transfer canceled.

Explanation: xxxxxxxx is not valid with the APPEND command.

User Response: Remove the option from the command, and try the operation again.

TRANS31 Invalid option xxxxxxxx without SPACE:
File transfer canceled.

Explanation: xxxxxxxx can be used only if space is also specified.

User Response: Remove the option from the command, and try the operation again.

TRANS32 Invalid options xxxxxxxx with PDS: File transfer canceled.

Explanation: xxxxxxxx is not valid with a host-partitioned data set.

User Response: Remove the option from the command, and try the operation again.

TRANS33 Only one of TRACKS, CYLINDERS, AVBLOCK allowed: File transfer canceled.

Explanation: Space can be specified in units of TRACKS, CYLINDERS, or AVBLOCK. Only one can be specified.

User Response: Remove the unwanted option from the command, and try the operation again.

TRANS34 CMS file not found: File transfer canceled.

Explanation: An existing CMS file must be specified for RECEIVE.

User Response: Correct the CMS file specification in the command, and try the operation again.

TRANS35 CMS disk is Read-Only: File transfer canceled.

Explanation: The CMS file mode specified for SEND must allow write access.

User Response: Correct the CMS file specification in the command, and try the operation again.

TRANS36 CMS disk is not accessed: File transfer canceled.

Explanation: The CMS file mode was not in the CMS disk search order.

User Response: Access the required disk in CMS or correct the CMS file specification in the command. Try the command again.

TRANS37 CMS disk is full: File transfer canceled.

Explanation: The CMS disk was full, the maximum number of files (3400) on the minidisk has been reached, or the maximum number of data blocks per file (16,060) has been reached.

User Response: Use another disk with enough space, or remove unwanted files from the specified disk. If the personal computer file is very large (over 1 MB), consider dividing it into several pieces. When one of these actions has been taken, try the command again.

TRANS51 File type option is not proper. File Transfer Canceled.

Explanation: Only physical files and source physical files can be sent or received to and from the personal computer by using the PCT/400 file transfer facility. The issued command is identified as a source physical file if specified with the SCR option, or as a physical file if specified without the SCR option. An option specified in the command, however, is not compatible with the type of the existing file.

User Response: Check the type of the file. Then request transfer again.

TRANS53 Library not found. File Transfer Canceled.

Explanation: None.

User Response: Check the library name. Then request file transfer again.

TRANS54 Member not found. File Transfer Canceled.

Explanation: None.

User Response: Check the member name. Then request file transfer again.

TRANS55 Cannot access the file. File Transfer Canceled.

Explanation: The target file cannot be opened due to a problem with the AS/400 system.

User Response: Execute the AS/400 command DSPJOBLOG to view detailed error information.

Remove the cause of the error. Then request file transfer again.

TRANS56 No authorization to library. File Transfer Canceled.

Explanation: None.

User Response: Obtain the required authority from the system administrator or the library owner. Then request file transfer again.

TRANS57 No authorization to file. File Transfer Canceled.

Explanation: None.

User Response: Obtain the required authority from the system administrator or the file owner. Then request file transfer again.

TRANS58 Can not create file/member. File Transfer Canceled.

Explanation: A file or member cannot be created when using the SEND command. The reason could be one of the following things:

- "Maximum Member Count" is included as an AS/400 file attribute. The member count has already reached the maximum, thus a new member cannot be created.
- An incorrect AS/400 file or member name has been specified. For example, a name beginning with a number cannot be specified as an AS/400 file name.

Other error messages might also be displayed on the AS/400 screen. Determine and remove the cause of these errors by checking the job log. Typical error messages are as follows.

Command APVAFILE not found in Library *LIBL.

Explanation: For you to use the file transfer facility, the system administrator must install PCT/400, and set up the AS/400 system as its destination.

User Response: Contact your system administrator and confirm that Personal Communications Tool/400 has been installed and set up.

Cursor is positioned to a protected area of the screen. Only a number from 0 to 9 can be specified. Unable to use the specified option number. and others.

Explanation: When you run the file transfer facility, the cursor must be on the command line (a field

The PCSXFERxx error messages might also be displayed during file transfer. These messages are listed under "Personal Communications Messages" on page 417 .

- Two requests were simultaneously issued for a single file or member. You can determine the cause by viewing the AS/400 job log. To view the detailed error information, execute the DSPJOBLOG command.

User Response:

- To include two or more members in one file, create a file for which MAXMBRS(*NOMAX) is specified.
- Check the file name or member name. Then request file transfer again.
- Wait a short while. Then request file transfer again.

TRANS60 Error on AS/400 program - APVAFILE File Transfer Canceled.

Explanation: None.

User Response: Contact your system administrator.

TRANS99 Host program error. xx xxxxxxxx: File transfer canceled.

Explanation: This message indicates a program error.

User Response: Follow your local procedures and have available:

- The sequence of events
- The variable data, xx xxxxxxxx, from this message
- The system level

available for input and execution of a command) of the AS/400 screen.

User Response: Ensure that the cursor is on the command line. Then request file transfer again.

Appendix B. Deleting Unnecessary Files

If you do not have enough disk space and you want to allocate minimum disk space for Personal Communications, you can delete unneeded Personal Communications files from the directory where you installed them. Before deleting any of the listed files, make sure that you don't intend to use that particular Personal Communications function.

Attention

Do not delete any Personal Communications files other than the ones listed below. Otherwise, you will have unpredictable results.

Notes:

1. The number of bytes freed might be slightly different from the actual size of the files.
2. You will be able to restore any files from the diskettes when you need to use any functions associated with the files. Use **DECOMP.EXE** (OS/2 program) for compressed files and the OS/2 Copy command for noncompressed files. You will find the **DECOMP.EXE** in the directory where Personal Communications is installed. Type **DECOMP.EXE SourceFile TargetFile** and press **Enter**. The SourceFile and TargetFile should specify drive, path and file name.
3. You can also delete unnecessary PDT and PDF files in the subdirectory **PDFPDT**.

Productivity Tools

		KB
		--
- Almcop PM interface	ACPM.EXE	84
	ACPM.HLP	22
	ACPMDLG.DLL	19
	ACPM.DOC	4
- VM File Transfer	ALMCOPY.DOC	179
	ALMCOPY.EXE	37
	ALMCOPY5.EXC	5
	ALMCOPY5.REX	1
	ACXFR56B.MOD	176
	ALMCOPYX.NAM	8
	ALMBEL.MOD	1
	ALMDEN.MOD	1
	ALMFRA.MOD	1
	ALMGER.MOD	1
	ALMITA.MOD	1
	ALMSPA.MOD	1
	ALMSWE.MOD	1
	ALMUK.MOD	1
	ALMUSA.MOD	1
	PCSCOPY.DLL	113
- Profs/Xedit/CMS print utility	ZIPPRINT.EXE	140
- EasyRexx HLL	PCSRXHLL.DOC	1
	PCSRXHLL.EXE	206
	PCSRXHLL.HLP	46

Deleting Unnecessary Files

Administration Tools

- Adapter Status	TOKSTAT.EXE	40
- Trace	PCSMON.EXE	56
- Maintenance Aid	PCSMINT.EXE	90
	PCSMTCPY.EXE	38
- Menu-Bar Customizing Utility	PCSCMENU.EXE	47
- Trace Setup	PCSTRSET.EXE	

Other Tools

- Multiple Session	PCSBAT.EXE	58
- SEND/RECEIVE	SEND.EXE	31
	RECEIVE.EXE	31
- Shared Folder	PCSFLR.EXE	69
	PCSFLR0.IFS	33
	PCSFLR3.EXE	101
	PCSFLRC.DLL	9
- Data Transfer	PCSFT5.EXE	296
- PC Organizer	PCSPCO.DLL	45
	PCSPCOC.EXE	18
- Printer Function Table migration Aid	PCSPFC.EXE	58

Fonts

- APL2 Outline Font	APL2.AFM	9
	APL2.PFB	40
- ENPTUI Font	PCSENP.FON	382

Links

- COAX	PCSCSDFT.DLL	36
	PCSCNDFT.DLL	40
	PCSCOAX.DLL	24
	PCSCOAX.SYS	3
	PCSVPD.DLL	27
- ASYNC	PCSASCON.DLL	14
	PCSASYNC.DLL	56
- TCP/IP	PCSTLNET.DLL	58
	PCSTN52.DLL	2
- ADLC	PCSADLC.DLL	60
	PCSADLCC.DLL	2
- AEA		

- SPX/IPX	PCSAEA.DLL	51
	PCSNWCS.DLL	61
	PCSNWSAA.DLL	18
- APPC	PCSAP32.DLL	43
	PCSAP3S.DLL	42
	PCSAPPC.DLL	65
- RUI	PCSRUI.DLL	33
- TDLC	PCSCUT52.DLL	34
	PCSTDLC.DLL	42
	PCSTDLC5.DLL	1
	PCSTDLC.P.DLL	1
	PCSTDLC.SYS	74
	PCSTDLC.DAT	3
	PCSTDBOT.LEX	9
	PCSTDPCM.LEX	15

Link Utility

- Auto Dial	PCSADU.DLL	89
	PCSDIAL.DLL	51
	PCSMODEM.DAT	12

Helps/README

- Help	PCSHHELP.HLP	643
	PCSINST.HLP	25
- ReadMe	README.ICO	1
	README.INF	47
	PCOM.INF	15

Appendix C. TCP62 for IBM Access Feature for OS/2 Warp

Introduction to TCP62

IBM TCP62 is an Application Programming Interface (API) that simplifies configuration of AnyNet LU6.2 support over TCP/IP.

The TCP62 configuration can be thought of as a filter on top of the existing Access Feature configuration API. It adds function by adding new and extended verbs that are useful in meeting TCP62 requirements. In particular, since many configuration files are identical except for the local LU names, unique local LU names can be defined dynamically based on the local IP address. Since TCP62 always implies LU 6.2 over IP, SNA and AnyNet configurations can be simplified to one or two parameters.

TCP62 consists of the following four verbs:

START_TN62

Builds a Access Feature configuration file based on the parameters passed in the START_TN62 verb and starts Access Feature using that configuration file.

DEFINE_PARTNER_LU_TN62

Generates a partner LU name and passes the define verb to the Access Feature node.

DEFINE_LOCAL_LU_TN62

Generates a local LU name and passes the define verb to the Access Feature node.

STOP_TN62

Stops Access Feature and immediately ends any communication in progress.

The **START_TN62** verb can be used when another subsystem (for example, a CICS client) wants to enable LU6.2 over IP communication. Since **START_TN62** may involve starting the underlying communications node, it should be used infrequently due to the potentially long processing time. For example, **START_TN62** can be used when the subsystem is initialized and should not be used on a per transaction basis. Similarly, it is expected that both the **DEFINE_LOCAL_LU_TN62** and **DEFINE_PARTNER_LU_TN62** verbs would only be used during subsystem initialization. However, the processing time for these two verbs is much less than for the **START_TN62** verb.

Writing TCP62 Programs

The Access Feature TCP62 provides a dynamic link library (DLL) file that handles TCP62 verbs.

TCP62 verbs have a straight forward language interface. Your program fills in fields in a block of memory called a verb control block (VCB). Then it calls the TCP62 DLL and passes a pointer to the VCB. When the program is complete, TCP62 returns, having used and then modified the fields in the VCB. Your program can then read the returned parameters from the VCB.

The following table shows source module usage of supplied header files and libraries needed to compile and link TCP62 programs. Some of the header files may include other required header files.

Table C-1. Table 1.Header File and Library for TCP62

Operating System	Header File	Library	DLL Name
OS/2	TN62API.H	ACS32.LIB	TN62API.DLL

TN62API() Entry Point

This provides a synchronous entry point for issuing the following TCP62 API verbs:

- **START_TN62**
- **STOP_TN62**
- **DEFINE_LOCAL_LU_TN62**
- **DEFINE_PARTNER_LU_TN62**

Syntax void APIENTRY TN62API(PVOID vcb);

Parameter

Description

vcb Pointer to verb control block

Returns

No return value. The **primary_rc** and **secondary_rc** fields in the verb control block indicate any error.

Remarks

This is the main synchronous entry point for the TCP62 services API. This call blocks until the verb completes.

Migration Considerations

One common migration scenario involves the Access Feature node communicating outside the scope of TCP62. For example, a user may have previously installed Access Feature and used it for emulator or native SNA communication. In this case, the user will have a default Access Feature response file and Access Feature may be running when START_TN62 is invoked. This section discusses the design and use of the TCP62 API using this scenario.

When START_TN62 creates its response file, it takes as its starting point the active or default response file. Therefore, any Access Feature configuration, such as links, modes, or LUs performed outside of TCP62 is not lost.

AnyNet support, (that is, whether or not a node can use AnyNet IP transport), cannot be dynamically changed in a running node. For example, if a node is running that is not configured to support AnyNet, the **START_TN62** verb cannot dynamically update the running node to support AnyNet and START_TN62 will fail. In this case, Access Feature must be stopped before START_TN62 can complete successfully.

The following node parameters cannot or should not be changed in a running node:

- CP name

- CP alias
- SNA domain name suffix
- AnyNet timer values

If the node is running and **START_TN62** is issued with parameters from the above list that are different from those in the running node, the **START_TN62** completes successfully. However, the values from the running node will be unchanged and these values will be returned in the **START_TN62** VCB. The **START_TN62** tells the caller that some values were not used by setting **primary_rc** to 0 and **secondary_rc** to **TN62_PARAMETERS_NOT_USED**.

Dynamic Name Generation

TCP62 dynamically generates local LU or partner LU names if the input name parameter is a template. That is, if it contains one or more replacement characters ("*"). The name generation algorithm is also used by the SXMMap program in Access Feature.

The following example shows how this algorithm is implemented.

```
static void
SxMap(unsigned char *generatedName,
      unsigned char *nameTemplate,
      unsigned int  templateLength,
      unsigned long addr,
      unsigned long mask)
{
    int I;
    unsigned long host_bits;
    unsigned long bit_pos;
    char chars[] = "0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZEIOU@#$. ";

    addr = ntohl(addr);
    mask = ntohl(~ mask);
    host_bits = 0L;
    bit_pos = 0x00000001;
    for (i = 0; i < 32; i++)
    {
        if (mask & bit_pos)
        {
            host_bits |= (addr & bit_pos);
            bit_pos <<= 1;
        }
        else
        {
            addr >>= 1;
            mask >>= 1;
        }
    }
    for (i = templateLength; i >= 0; i--)
    {
        if (nameTemplate[i] == REPLACEMENT_CHAR)
        {
            generatedName[i] = chars[host_bits & 0x1F];
            host_bits >>= 5;
        }
    }
}
```

```

        else
            generatedName[i] = nameTemplate[i];
        }
    return;
}

```

The algorithm selects bits from *addr* which is a local or remote IP address. The selected bits are those where the corresponding bit in **mask** is 0. The selected bits are then taken in groups of 5, right to left, to generate a character for each replacement character in **nameTemplate**.

For example, if **nameTemplate** =

"A*NAME*"

addr =

0x13.0x8f.0x22.0xa3

and **mask** =

0xff.0xff.0xff.0x00

The bits selected by mask are

0x00.0x00.0x00.0xa3

Since there are two replacement characters in **nameTemplate**, the two groups of five bits are

0x05

0x03

Using these as indices in chars yields a **generatedName** of

"A2NAME4"

TCP62 API Support

Access Feature supports the following verbs using the TCP62 API:

START_TN62

The **START_TN62** verb starts the Access Feature node.

VCB Structure

```

typedef struct start_tn62
{
    unsigned short opcode; /* verb operation code */
    unsigned char reserv1 [6] ; /* reserved */
    unsigned short primary_rc; /* primary return code */
    unsigned char reserv2 [2] ; /* reserved */
    unsigned long secondary_rc; /* secondary return code */
    unsigned char reserv3 [4] ; /* reserved */
    unsigned char key [8] ; /* key (ASCII) */
}

```

```

unsigned char fqcp_name [17] ;/* real fully-qualified*/
/* name or a template */
/* for a fully-qualified*/
/* name*/
unsigned char cp_alias [8] ;/* ASCII CP alias*/
unsigned char   reserv4 [3] ;/* reserved*/
unsigned long ip_address_mask;/* mask used in dynamic*/
/* CP name generation*/
unsigned short connection_retry_secs;
/*connection retry count*/
unsigned short unacked_dg_retry_secs;
/* unacknowledged data-*/
/* gram retry interval*/
unsigned short unsent_dg_retry_secs;
/* unsent datagram*/
/* retry interval*/
unsigned short inactivity_timer_secs;
/* remote node inactiv-*/
/*ity poll interval*/
unsigned short connwait_secs;/* connection wait time*/
/* limit*/
unsigned char domain_name_suffix[220];
/* domain name suffix*/
} START_TN62;

```

Supplied Parameters

The application supplies the following parameters:

opcode

AP_START_TN62.

key Specifies either the master or service key if the keylock feature has been activated.

This is an 8-byte ASCII character string. If the name is less than 8 bytes, it must be padded on the right with ASCII blanks.

fqcp_name

This is either a real fully-qualified CP name or a template for a fully-qualified CP name. If there are no template replacement characters (`|*|`), it is a real name, otherwise it is a template. The net ID must not contain any template replacement characters and the CP name must not begin with a replacement character. Except for the replacement character, this must be a valid EBCDIC fully-qualified CP name.

cp_alias

The ASCII CP alias for the TCP62 node. If the node is running when the START_TN62 is issued, this will contain the CP alias of the running node on return. If this field is all blanks or nulls, and the node is not running when the START_TN62 is issued, the CP alias is set to the (unqualified) CP name on return.

ip_address_mask

This is the mask to be used in dynamic CP name generation. It is ignored if fqcp_name is not a template. The mask is encoded as a big-endian long; i.e., high-order byte first to low-order byte last.

connection_retry_secs

The connection retry count is the maximum time, in seconds, for LU6.2

over TCP/IP to set up a multiprotocol transport network (MPTN) connection over TCP/IP. When an MPTN connection setup fails, Access Feature tries every IP address associated with an LU name in the domain name server or HOSTS file until all the addresses are exhausted or until the time specified is reached.

Specify a value between 1 and 65535 seconds.

Default: 300

If you are unsure about what value to enter, use the default.

unacked_dg_retry_secs

The unacknowledged datagram retry interval is the maximum time, in seconds, that LU6.2 over TCP/IP waits to resend an unacknowledged out-of-band (OOB) or MPTN keep alive datagram.

When expedited data is sent over TCP/IP, this interval is used to help control the delivery of expedited data in congested situations. In SNA, some control messages are sent over TCP/IP, this interval is used to help control the delivery of expedited data in congested situations. In SNA, some control messages are sent as expedited data (for example, messages requesting the right to send data or messages taking down a session). Expedited data is not subject to congestion control and can move ahead of normal, non-expedited data. To assure delivery, AnyNet SNA over TCP/IP might send expedited data as normal data and as an OOB datagram.

Specify a value between 1 and 65535 seconds.

Default: 10

If you are unsure about what value to enter, use the default.

unsent_dg_retry_secs

The unsent data gram retry interval is the maximum time, in seconds, that Access Feature waits for an acknowledgement after sending expedited data on a TCP connection, before sending the data as an out-of- band (OOB) datagram.

When expedited data is sent over TCP/IP, this interval is used to help improve the delivery of expedited data in congested situations. In SNA, some control messages are sent as expedited data (for example, messages requesting the right to send data or messages taking down a session). Expedited data is not subject to congestion control and can move ahead of normal, non-expedited data. To assure delivery, AnyNet SNA over TCP/IP might send expedited data as normal data and as an OOB datagram.

Specify a value between 1 and 65535 seconds.

Default: 3

If you are unsure about what value to enter, use the default.

inactivity_timer_secs

The remote node inactivity poll interval is the number of seconds of inactivity allowed between two partner nodes before LU6.2 over TCP/IP tries to determine whether the partner node is still active.

Type a value between 1 and 65535 seconds.

Default: 30

Setting the interval below 10 seconds might seriously affect system performance.

To calculate how long it takes before an inactive partner is detected:

- Multiply the value of the unsent datagram retry interval by 5.
- Add the remote node inactivity poll interval value.

The resulting value is the number of seconds it takes to detect an inactive partner.

If you are unsure about what value to enter, use the default.

connwait_secs

The connection waittime limit is the maximum time, in seconds, that LU6.2 over TCP/IP waits to receive a multiprotocol transport network (MPTN) connection or connection response packet after the TCP connection is established. This limit prevents the connecting node from waiting too long for a session partner to send a packet.

Specify a value between 1 and 65535 seconds.

Default: 30

If you are unsure about what value to enter, use the default.

domain_name_suffix

The SNA domain name suffix is used when a domain name is created from the fully-qualified partner LU name.

The SNA domain name suffix is a user-defined domain name suffix created using the hierarchical-naming format recognized by TCP/IP. For example, SNA.IBM.COM is an SNA domain name suffix.

Consult your network administrator to obtain an SNA domain name suffix. The suffix consists of strings concatenated with periods. Each string must be less than or equal to 63 characters, with the total length of less than or equal to 237 characters.

Valid characters for each string are:

The first character must be an alphabetic character (A- Z, a-z).

The last character must be an alphanumeric character (A-Z, a-z, 0-9).

The remaining characters can be alphanumeric characters (A-Z, a-z, 0-9) or the special character (-).

Default: SNA.IBM.COM

Returned Parameters

primary_rc

secondary_rc

fqcp_name

See TCP62 Return Codes for details on **primary_rc** and **secondary_rc** verbs. The real fully-qualified CP name. If the supplied fqcp_name was a template, it is replaced with the generated name.

STOP_TN62

The **STOP_N62** verb stops the Access Feature node. Any communications that are in progress will end.

VCB Structure

The VCB structure is as follows:

```
typedef struct stop_tn62
{
    unsigned short opcode;/* verb operation code*/
    unsigned char reserv1[6];/* reserved*/
    unsigned short primary_rc;/* primary return code*/
    unsigned char reserv2[2];/* reserved*/
    unsigned long secondary_rc;/* secondary return code*/
    unsigned char reserv3[4];/* reserved*/
    unsigned char key[8];/* key (ASCII)*/
} STOP_TN62;
```

Supplied Parameters

The application supplies the following parameters:

opcode AP_STOP_TN62 key

Specifies either the master or service key if the keylock feature has been activated.

This is an 8-byte ASCII character string. If the name is less than 8 bytes, it must be padded on the right with ASCII blanks.

Returned Parameters

The returned parameters are as follows:

primary_rc

Success or failure of the verb. The primary and secondary_rc secondary return codes are always zero on return.

DEFINE_LOCAL_LU_TN62

TCP62 extends the **DEFINE_LOCAL_LU** verb to allow definitions of LU names that are generated dynamically, based on a supplied template, mask, and the local IP address.

VCB Structure

The VCB structure is as follows:

```
typedef struct define_local_lu_tn62
{
    unsigned short opcode;/* verb operation code*/
    unsigned char reserv1[6];/* reserved*/
    unsigned short primary_rc;/* primary return code*/
    unsigned char reserv2[2];/* reserved*/
    unsigned long secondary_rc;/* secondary return code*/
    unsigned char reserv3[4];/* reserved*/
    unsigned char key[8];/* key (ASCII)*/
    unsigned char lu_name[8];/* local Lu name*/
    unsigned char lu_alias[8];/* Lu alias (ASCII)*/
    unsigned char nau_address;/* network addressable*/
    /* unit address*/
    unsigned char external_support;/*
    /*external support for sync point*/
```

```

/*AP_NONE x"00"*/
/*AP_SYNCPT_PROVIDER x"80"*/
/*AP_REMOTE_TP_PROVIDER x"40"*/
/*AP_SYNCPT_AND_REMOTE_TP x"C0"*/
unsigned char host_link_name[8];/* host link name*/
/* 0 or 1-8 bytes*/
/* (EBCDIC type A)*/
unsigned char lu_model_name[7];/* self-defining dep LU*/
/* model name*/
unsigned char reserv4[35];/* reserved*/
unsigned long ip_address_mask;/* mask used in CP name/
unsigned char reserv5;/* reserved*/
} DEFINE_LOCAL_LU_TN62;

```

Supplied Parameters

The application supplies the following parameters:

opcode

AP_DEFINE_LOCAL_LU_TN62.

key

Specifies either the master or service key if the keylock feature has been activated.

This is an 8-byte ASCII character string. If the name is less than 8 bytes, it must be padded on the right with ASCII blanks.

lu_name

This is either a real LU name or an LU name template. If there are no template replacement characters ("*"), it is a real name, otherwise it is a template. Except for replacement characters, lu_name must be a valid, EBCDIC LU name. The first character must not be the replacement character.

lu_alias

The 8-byte ASCII name used locally for the LU. The name is not sent outside the local node.

nau_address

Specifies the network addressable unit (NAU) address of the LU.

You can specify a value from 0 to 254, where:

- 0** Specifies that the NAU address is not used, and the LU is an independent LU. Sessions among APPN end nodes and network nodes must use independent LUs. An LU type 6.2 is the only type of SNA LU that supports independent sessions. An independent session does not depend on an SSCP (that is, the LU can send a BIND directly without the help of an SSCP).
- 1-254** Specifies the NAU address of the LU, and that the LU is a dependent LU for sessions to a subarea node. If your network contains a subarea that does not support an independent session from a peripheral node, you will be restricted to a single dependent session between your APPC LU and that subarea. In this case, the LU will need to be assigned a unique NAU address.

An LU's NAU address is the address used by a subarea node for an LU dependent session. A dependent session is a session that depends on an

SSCP to initiate it (that is, an optional INIT_SELF request that flows on the LU to SSCP session, the SSCP sends a CINIT request to a subarea LU, and the subarea LU sends the BIND).

On a given link, every LU that uses a dependent session must be assigned a unique NAU address. Every LU defined for an LUA session, every LU defined for a 3270 session, and every LU defined for a 3270 gateway session, uses a dependent session and must be assigned a unique NAU address.

host_link_name

The 8-byte EBCDIC name of the local link station. This logical link can be activated by specifying this name on the ACTIVATE_LOGICAL_LINKS verb.

Note: The host link name is ignored if nau_address equals 0 is specified. Otherwise, this parameter is optional. If a NAU address is specified, the LU definition is assigned to the CP-PU. Special characters include \$, #, and @.

This is a Type A EBCDIC character string. If the name is less than 8 bytes, it must be padded on the right with EBCDIC blanks. In addition, the string cannot begin with an EBCDIC T@ (X"7C").

LU_model_name

The 7-byte EBCDIC model name of the dependent LU 6.2 local LU. This is a 7-byte EBCDIC character string consisting of uppercase A-Z and 0-9 only. If the lu_model_name is not used, it must be filled with EBCDIC blanks. It should match a model name on a Host Model definition.

ip_address_mask

This is the mask to be used in dynamic LU name generation. It is ignored if lu_name is not a template. The mask is encoded as a big-endian long; i.e., high-order byte first to low-order byte last.

Returned Parameters

primary_rc

secondary_rc

See TCP62 Return Codes for details on **primary_rc** and **secondary_rc** verbs.

lu_name

The real name of the defined LU. If the supplied **lu_name** was a template, it is replaced with the generated name.

lu_alias

If all blank or nulls on input, this will contain the LU name (in ASCII) on output.

DEFINE_PARTNER_LU_TN62

TCP62 extends the **DEFINE_PARTNER_LU** verb to allow the definition of LU names that are generated dynamically, based on a supplied template, mask, and IP address. The verb is extended by using a new overlay structure. The **DEFINE_PARTNER_LU_TN62_OVERLAY** is specified after all the **alt_alias_overlay** structures (if any) in the **DEFINE_PARTNER_LU VCB**.

The opcode field in the **DEFINE_PARTNER_LU VCB** must be set to **AP_DEFINE_PARTNER-LU_TN62** before invoking the TCP62 API. For a

description of a **DEFINE_PARTNER_LU** verb, see Access Feature for OS/2 Warp:
System Management Programming Reference.

OVERLAY Structure

The overlay structure is as follows:

```
typedef struct define_partner_lu_tn62_overlay
{
    unsigned long ip_address_mask; /* mask used in dynamic */
    /* name generation */
    unsigned long partner_ip_addr; /* IP address of the */
    /* partner LU */
    unsigned char partner_hostname[220];
    /* host name of the */
    /* partner LU */
} DEFINE_PARTNER_LU_TN62_OVERLAY;
```

Supplied Parameters

The application supplies the following parameters:

opcode

AP_DEFINE_PARTNER_LU_TN62

fq_partner_lu_name

This is either a real fully-qualified partner LU name or a template for a fully-qualified partner LU name. If there are no template replacement characters ("*"), it is a real name, otherwise it is a template. The net ID must not contain any template replacement characters. Note that the replacement character is "*" instead of "." to avoid confusion with the "." separating the net ID and partner LU name.

ip_address_mask

This is the mask to be used in dynamic partner LU name generation. It is ignored if fqplu_name is not a template. The mask is encoded as a big-endian long, that is, high-order byte first to low-order byte last.

If the fqplu_name is a template, one of the following two parameters must be specified. If both are specified, partner_ip_addr takes precedence.

partner_ip_addr

This is the IP address of the partner LU. It is ignored if fqplu_name is not a template. All zeros indicate "unspecified". The IP address is encoded as a big-endian long; that is, high-order byte first to low-order byte last.

partner_hostname

This is the host name of the partner LU. It is ignored if the fqplu_name is not a template. All blanks indicate "unspecified".

Returned Parameters

The returned parameters are as follows:

primary_rc

secondary_rc

See TCP62 Return Codes for details on **primary_rc** and **secondary_rc** verbs.

fq_partner_lu_name

The real fully-qualified LU name. If the supplied fq_partner_lu_name was a template, it is replaced with the generated name.

TCP62 Return Codes

The following section summarizes the unique TCP62 return codes.

Note: **DEFINE_LOCAL_LU_TN62** and **DEFINE_PARTNER_LU_TN62** may also have return codes that are described in the *Access Feature for OS/2 Warp System Management Programming Reference*. Each subsection heading lists both the primary and secondary return codes in parenthesis (primary_rc, secondary_rc), using defined symbols located in **tn62api.h** or **appcdef.h**.

(TN62_ERROR, TN62_NODE_RUNNING_NO_ANYNET)

returned by

START_TN62

cause The Access Feature node is running and the running configuration does not support AnyNet. START_TN62 did not complete successfully.

corrective action

Stop the node and reissue the START_TN62.

(TN62_ERROR, TN62_CONFIGURATION_FILE_ERROR)

returned by

START_TN62

cause A TCP62 call to the Access Feature configuration API failed. The most likely cause is a TCP62 or Access Feature program defect. START_TN62 did not complete successfully.

corrective action

None. Collect problem determination data by turning on all tracing and recreating the problem. Also, capture any log data.

(TN62_ERROR, TN62_NODE_NOT_STARTED)

returned by

START_TN62

cause The node failed to start. The most likely cause is a TCP62 program defect. START_TN62 did not complete successfully.

corrective action

None. Collect problem determination data by turning on all tracing and recreating the problem. Also, capture any log data.

TN62_ERROR, TN62_NODE_START_INCOMPLETE)

returned by

START_TN62

cause The node started, but the configuration was not successful. The most likely cause is the AnyNet program is not installed. The node is running.

corrective action

Ensure the AnyNet component is installed. If the problem persists, collect problem determination data by turning on all tracing and recreating the problem. Also, capture any log data.

(AP_OK, TN62_PARAMETERS_NOT_USED)**returned by**

START_TN62

cause The AnyNet parameters (timers and domain_name_suffix) or both the CP name and CP alias from START_TN62 were not used. The node was already running using different parameters. The parameter values used by the running node are returned in the START_TN62 VCB. START_TN62 completes successfully.

corrective action

None.

(TN62_ERROR, TN62_NAME_GENERATION_ERROR)**returned by**

START_TN62, DEFINE_LOCAL_LU_TN62, DEFINE_PARTNER_LU_TN62

cause Dynamic name generation failed due to gethostname (for START_TN62 and DEFINE_LOCAL_LU_TN62) or gethostbyname (for DEFINE_PARTNER_LU_TN62). The most likely causes are TCP/IP was not installed, configured and active, or an incorrect partner_hostname passed on DEFINE_PARTNER_LU_TN62. The verb does not complete successfully.

corrective action

Ensure that TCP/IP is configured and active, and that the partner_hostname on DEFINE_PARTNER_LU_TN62 is correct.

(AP_PARAMETER_CHECK, INVALID_CP_NAME)**returned by**

START_TN62

cause The **fqcp_name** is not valid. The net ID must not contain any template replacement characters and the CP name must not begin with a replacement character. Except for the replacement character, this must be a valid EBCDIC fully-qualified CP name. START_TN62 does not complete successfully.

corrective action

Correct the fqcp_name parameter.

(AP_PARAMETER_CHECK, INVALID_LU_NAME)**returned by**

DEFINE_LOCAL_LU_TN62

cause The **lu_name** is not valid. The LU name must not begin with a replacement character. Except for the replacement character, this must be a valid EBCDIC LU name. DEFINE_LOCAL_LU_TN62 does not complete successfully.

corrective action

Correct the lu_name parameter.

(AP_PARAMETER_CHECK, INVALID_FQ_LU_NAME)

returned by

DEFINE_PARTNER_LU_TN62

cause The **fqplu_name** is not valid. The net ID must not contain any template replacement characters and the partner LU name must not begin with a replacement character. Except for the replacement character, this must be a valid EBCDIC fully-qualified LU name. This return code will also occur if the **fqplu_name** is a valid template, but both **partner_ip_addr** and **partner_hostname** are unspecified. DEFINE_PARTNER_LU_TN62 fails.

corrective action

Correct the **fqplu_name** parameter or the (**partner_ip_addr**, **partner_hostname**) combination.

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Glossary

access control . In computer security, ensuring that the resources of a computer system can be accessed only by authorized users in authorized ways.

access control profile . A list of the access privileges assigned to users and groups for a particular network resource in a domain.

access priority . In the IBM Token-Ring Network, the maximum priority a token can be given by the adapter for transmission.

ACF/NCP . Advanced Communication Function for the Network Control Program.

ACF/TCAM . Advanced Communication Function for the Telecommunications Access Method.

ACF/VTAM . Advanced Communication Function for the Virtual Telecommunications Access Method.

adapter . A part that electrically or physically connects a device to a computer or to another device.

Advanced Communications Function (ACF) . A group of IBM licensed programs, principally VTAM, TCAM, NCP, and SSP, that use the concepts of Systems Network Architecture (SNA), including distribution of function and resource sharing.

Advanced Communication Function for the Telecommunications Access Method (ACF/TCAM) . A network host communication program.

Advanced Communication Function for the Network Control Program (ACF/NCP) . A network host communication program.

Advanced Communication Function for the Virtual Telecommunications Access Method (ACF/VTAM) . A network host communication program.

advanced program-to-program communication (APPC) . The general facility characterizing the LU 6.2 architecture and its various implementations in products.

Sometimes used to refer to the LU 6.2 architecture and its product implementations as a whole, or to an LU 6.2 product feature in particular, such as an APPC application programming interface.

AID key . A control key that generates a host attention interrupt.

alert . A message sent to a management services focal point in a network to identify a problem or an impending problem.

In SNA management services (SNA/MS), a high priority event that warrants immediate attention.

alias name . A name that is defined in one network to represent a logical unit name in another interconnected network. The alias name does not have to be the same as the real name; if these names are not the same, translation is required.

American National Standard Code for Information Interchange (ASCII) . A character set standard established by the American National Standards Institute, using a set of 7-bit binary-coded characters (8 bits including parity check). ASCII is used for information interchange among data processing systems, data communication systems, and associated equipment. An extended, 8-bit version of this code is used in the personal computer. It consists of control characters and graphic characters in addition to the 7-bit ASCII characters. See also *extended binary-coded decimal interchange code*.

American National Standards Institute (ANSI) . An organization consisting of producers, consumers, and general interest groups, that establishes the procedures by which accredited organizations create and maintain voluntary industry standards in the United States. (A)

ANSI . American National Standards Institute.

AnyNet product family . A group of IBM products that implement the multiprotocol transport networking (MPTN) architecture, thus enabling application programs to communicate independently of the underlying network transport protocol.

API . Application programming interface.

APL . A programming language requiring the use of a special keyboard to represent various operator symbols.

APPC . Advanced program-to-program communications.

application . A collection of software components used to perform specific types of user-oriented work on a computer.

application program . A program written for or by a user that applies to the user's work, such as a program that does inventory control or payroll.

A program used to connect and communicate with stations in a network, enabling users to perform application-oriented activities.

application programming interface (API) . The set of programming language constructs or statements that can be coded in an application program to obtain the specific functions and services provided by an underlying operating system or service program.

In VTAM, the language structure used in control blocks so that application programs can reference them and be identified to VTAM.

application transaction program . A program written for or by a user to process the user's application; in an SNA network, a user of a type 6.2 logical unit. Contrast with *service transaction program*.

APPN . Advanced Peer-to-Peer Networking.

APPN end node . See *Advanced Peer-to-Peer Networking (APPN) end node*.

APPN network node . See *Advanced Peer-to-Peer Networking (APPN) network node*.

ASCII (American National Standard Code for Information Interchange) . The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), that is used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters. (A)

ASYNCR . Asynchronous.

asynchronous (ASYNCR) . Pertaining to two or more processes that do not depend upon the occurrence of specific events such as common timing signals. (T)

Without regular time relationship; unexpected or unpredictable with respect to the execution of program instructions.

Asynchronous Data Link Control (ASYNCR) . A discipline for managing asynchronous, serial-by-bit information transfer over a line connection.

asynchronous transmission . A data communication method wherein character strings of variable length are transmitted serially at a variable transmission rate. Each character or defined block of characters has a constant transmission duration.

atom . Represents a character string that has been reduced to a unique integer value.

attention identifier . See *AID key*.

attachment . A communication link used by Personal Communications to connect a personal computer to a host system, consisting of an adapter and controlling software.

audit trail . A history of network activity on a server.

AUTOEXEC.BAT file . In the DOS operating system, a batch file that resides in the root directory of the boot drive. AUTOEXEC.BAT contains commands that DOS executes every time the PC is booted.

automatic access utility . A utility that allows you to create and edit the files that control the automatic-dial, automatic-logon, and modem control programs.

autoskip . A field defined as protected and numeric. Causes the cursor to skip to the next unprotected field.

backup diskette . A diskette that contains information copied from a Personal Communications diskette.

base-color mode . The mode in which a terminal operates if the host system does not supply color information.

Basic Input/Output System (BIOS) . Code that controls basic hardware operations, such as interactions with diskette drives, hard disk drives, and the keyboard.

batch file . In IBM DOS, a file containing commands to be processed sequentially. A DOS batch file must have a .BAT extension in order to be executable.

binary . Pertaining to the base two system of numbers. The binary digits are 0 and 1. Executable files are generally in binary format rather than the character string format that text files are composed of.

BIOS . Basic Input/Output System.
See also *NetBIOS*.

bis . German (Federal Republic) preliminary standard.

bit map . A representation of an image by an array of bits.

Caps Lock . The personal computer keyboard mode entered after the **Caps Lock** key is pressed. This mode is indicated by a capital A in the operator information area (OIA). When the **Shift key** is pressed while in this mode, **Caps Lock** is temporarily discontinued and the OIA indicator changes. Pressing the **Shift** key again returns the Caps Lock mode.

character cell . The maximum physical boundary of a character on a display screen.

character set . A finite group of characters defined for a keyboard or output device.

CICS/VS . Customer Information Control System for Virtual Storage.

code page . An assignment of graphic characters and control function meanings to all code points; for example, assignment of characters and meanings to 256 code points for an 8-bit code, assignment of characters and meanings to 128 code points for a 7-bit code.

A particular assignment of hexadecimal identifiers to graphic characters.

Common Programming Interface for Communications (CPI-C) . An evolving application programming interface (API), embracing functions to meet the growing demands from different application environments and to achieve openness as an industry standard for communications programming. CPI-C provides access to interprogram services such as (a) sending and receiving data, (b) synchronizing processing between programs, and (c) notifying a partner of errors in the communication.

configuration . The manner in which the hardware and software of an information processing system are organized

In Personal Communications, the arrangement of personal computers connected to one or more host systems by one or more attachment types.

configuration file . A file that specifies the characteristics of a system device or network.

continuous carrier . A characteristic of the modem used in an SglC type of attachment; frequency capable of being modulated or impressed with a second (informative carrier) signal.

control unit . A device that manages the flow of data between personal computers used with Personal Communications and a host system.

conversation . A logical connection between two transaction programs using an LU 6.2 session. Conversations are delimited by brackets to gain exclusive use of a session.

CP . Control point.

CPI-C . Common Programming Interface for Communications.

CP name . A network-qualified name of a control point (CP), consisting of a network ID qualifier identifying the network (or name space) to which the CP's node belongs, and a unique name within the scope of that network ID identifying the CP. Each APPN or LEN node has one CP name, assigned to it at system-definition time.

CSD . Corrective service diskette.

Customer Information Control System for Virtual Storage (CICS/VS) . An IBM licensed program that can be used in a communications network.

customization . The process of configuring one or more personal computers connected to a host system by the SglC, LAN, ASYNCH, X.25, DFT, or other attachment. Customization precedes Personal

Communications installation and includes the definition of the sessions to be carried out by Personal Communications.

default . A value, attribute, or option that is assumed when no differing selection is made.

definition file . A file loaded by default that contains keyboard and screen color characteristics that can be adapted for a particular session. The lines of a definition file must be coded according to a strict layout.

delimiter . In the IBM Token-Ring Network, a bit pattern that defines the limits of a frame or token.

dependent LU . See *SSCP-dependent LU*.

dependent LU requester (glUR) . An APPN end node or an APPN network node that owns dependent LUs, but requests that a dependent LU server provide the SSCP services for those dependent LUs.

dependent LU server (glUS) . An APPN network node that provides SSCP services for a dependent LU in its own or another APPN network. Contrast with *dependent LU requester*.

DFT . See *distributed function terminal*.

diacritic key . A key that allows a character to be entered without the cursor position being changed. When you enter an accent mark or a tilde, for example, the cursor does not advance to the next position until you enter the corresponding alphabetic character.

dial-up line . See *switched line*.

direct memory access (DMA) . The system facility that allows a device on the Micro Channel bus to get direct access to the system or bus memory without the intervention of the system processor.

distributed function terminal (DFT) . A terminal that supports multiple concurrent logical terminal sessions.

distributed function terminal attachment . The connection of a personal computer with an IBM 3174 or 3274 Control Unit using a coaxial cable and software that provides DFT capabilities.

directory . A named hierarchical grouping of files in a file system.

glUR . Dependent LU requester.

glUS . Dependent LU server.

DMA . See *direct memory access*.

domain . A set of servers that allocate shared network resources within a single logical system.

DOS session . A session in which a personal computer operates as a stand-alone computer, running under Disk Operating System (DOS). See *host session*.

download . The transfer of a file from a host system to a personal computer.

dynamic data exchange (DDE) . A protocol that allows applications to exchange data.

EBCDIC . See *extended binary-coded decimal interchange code*.

ECF . See *Enhanced Connectivity Facilities*.

EGA . See *enhanced graphics adapter*.

EHLAPI . See *Emulator High-Level Language Application Programming Interface*.

EMM . See *Expanded Memory Manager*.

EMS . See *Expanded Memory Specification*.

emulator . A program that allows a device to operate as if it were a different type of device. Personal Communications, for example, allows supported personal computers and printers to operate as if they were 3270-series or 5250-series workstations.

Emulator High-Level Language Application Programming Interface (EHLAPI) . A programming interface that permits workstation-based programs to access host computer presentation space.

Enhanced Connectivity Facilities (ECF) . An IBM communication utility that provides the ability to share resources between workstations and host systems.

enhanced graphics adapter (EGA) . An adapter, such as the IBM Enhanced Graphics Adapter, that provides high-resolution graphics, allowing the use of a color display for text processing as well as graphics applications.

EOF . End of Field

EOT . End of Text

error log . A file that stores error information for later access.

Ethernet . A 10-Mbps baseband local area network that allows multiple stations to access the transmission medium at will without prior coordination, avoids contention by using carrier sense and deference, and resolves contention by using collision detection and delayed retransmission. Ethernet uses carrier sense multiple access with collision detection (CSMA/CD).

exit function . A function that allows the user to switch from a host session to a DOS session. The key sequence for exit is **Ctrl+End**.

Expanded Memory Manager (EMM) . A standard device driver that manages expanded memory in 16-KB logical pages. The EMM maps a set of logical pages into a page frame using the physical address space that is available in memory above 640 KB, storing the map into conventional memory. The application then accesses the expanded memory thus created as though it were conventional memory.

Expanded Memory Specification (EMS) . A specification for accessing memory above the conventional DOS memory address space, 0-640 KB. See *Expanded Memory Manager*, *LIM EMS 3.2*, and *LIM EMS 4.0*.

extended binary-coded decimal interchange code (EBCDIC) . The standard code, using a character set consisting of 8-bit coded characters, used by Personal Communications for information interchange between personal computers and a host system. See also *American National Standard Code for Information Interchange*.

extended-color mode . The mode in which a terminal operates if the host system supplies color information.

extended error code . An 8-byte data string returned by **Query System** generated by an internal system error that is used by service personnel for diagnosis.

extended memory . Memory above 1 MB that can be accessed and used by 80286 and 80386** (or greater) CPUs to run applications in protected mode. PC DOS does not normally access memory above 640 KB. This memory is useful only for applications that are written specifically to use extended memory. Successful use of extended memory by an application usually requires the use of an 80386 or greater CPU, which provides machine instructions to handle the use of extended memory.

external resource . A file, directory, or device supplied by a server outside the current domain.

field . (1) An area in a record or panel used to contain data. (2) In the IBM 3270 data stream, a group of consecutive positions on a presentation space having similar characteristics that are defined by a field attribute byte at the beginning of the field.

field delimiters . Symbols (often brackets) that indicate the limits of a data entry field.

file mode . In VM/CMS, the third field of the file identifier, which indicates the assigned virtual disk wherein the file resides.

file type . In VM/CMS, the second field of the file identifier. The file type can be arbitrary, or of significance to the system (for example, SCRIPT, LIST3270, and NOTEBOOK file types).

fixed disk . See *hard disk*.

flag . A character or bit sequence that marks an occurrence or boundary, such as the end of a word or the beginning or end of a data transmission block.

frame . A data structure (data frame) composed of fields meeting the field specifications of a type of communication protocol. Frames are used to control data transfer across a data link.

In SglC, a frame is a sequence of bits delimited by an opening and closing flag. In X.25 packet switching data networks, frames are composed of 8-bit byte sequences delimited by beginning and ending flags; the frames in X.25 control various functions, data transfer, and transmission checking.

gateway . A station in a local area network through which a connection to a host system or a separate network is established.

gateway status utility . A utility that allows a user to check the status of sessions in a gateway network.

GDDM . See *Graphical Data Display Manager*.

GDDM-PCLK . A personal computer application program that supports host GDDM graphics applications. This application requires an LLAPI interface for PC/3270.

Graphical Data Display Manager (GDDM) . An IBM host function that processes text and graphics for output to a display, printer, or graphic output device.

hard disk . A rigid-magnetic disk such as the internal disks used in the system units of personal computers and in external hard disk drives (also known as fixed disks).

High-Level Language Application Programming Interface (HLLAPI) . A software product that supports interaction between a host program and an application program running on a personal computer in terminal emulation (usually 3270 terminal emulation).

High-Performance Routing (HPR) . An addition to APPN that enhances data-routing performance and session reliability.

HLLAPI . See *High-Level Language Application Programming Interface*.

host address . A LAN address used by the host controller.

host code page . The character code page used by the host system to which a gateway connects.

host print . A printer session on a local personal computer directed by the host system.

host profile . A configuration profile that identifies a gateway by name, and establishes LU addresses and types for connected logical units.

host session . A logical connection that enables a personal computer to communicate with a host system. A session can be identified by LU address, LT number, or session ID. See *DOS session*. See also *logical terminal*.

host short name . See *short name*.

host system . In Personal Communications, the computer linked to one or more personal computers by the SglC, LAN, ASYNCH, X.25, or DFT attachment.

hot key . A keystroke or keystroke combination that initiates the hotkey function. See *hotkey function*.

hotkey function . A function that allows you to switch to the next logical terminal or DOS, on whichever screen it last appeared, without exiting the current application.

HPR . High-Performance Routing.

IBM NCP Packet Switching Interface (NPSI) . A host program used for interconnecting systems using switched lines. See also *switched line*.

IBM PC Network . A local area network providing peer-to-peer communication among IBM personal computers, allowing them to share resources. It utilizes carrier sense multiple access/collision detect (CSMA/CD) protocol and supports a data transmission rate of 2 million bits per second. Broadband and baseband versions are available.

IBM Token-Ring Network . A general-purpose baseband token-ring local area network for interconnecting information processing equipment at a local site. It uses a token-ring access protocol and supports a data rate of either 4 or 16 million bits per second. It conforms to the IEEE 802.5 (token-ring) and IEEE 802.2 (logical link control) standards.

IBM X.25 NCP Packet Switching Interface Program . A network host communication product that allows workstations using an IBM 3725 or IBM 3720 communication controller to connect to a ITU-TS X.25 recommendation packet-switching data network.

igles . In a token-ring network, the signals sent when neither frames nor tokens are being transmitted.

IEEE . See *Institute of Electrical and Electronics Engineers*.

IEEE 802.2 . An IEEE standard for logical link control in local area networks.

initial program load (IPL) . The initialization procedure that starts an operating system, or the process of loading programs and preparing a system to run jobs.

installation . In Personal Communications, the process of loading microcode from the Personal Communications diskettes.

Institute of Electrical and Electronics Engineers (IEEE) . An organization that establishes and promotes standards in related industries.

integrated services digital network . A digital end-to-end telecommunication network that supports multiple services including, but not limited to, voice and data.

interleave . In Personal Communications, to arrange parts of a transmission sequence so that they are interspersed with parts of one or more other transmission sequences of the same nature, with each sequence retaining distinct meaning and identity. See also *packet-switching data network* and *X.25 Recommendation*.

International Telecommunication Union (ITU) . The specialized telecommunication agency of the United Nations, established to provide standardized communication procedures and practices, including frequency allocation and radio regulations worldwide.

interrupt level . A number assigned to an interrupt to indicate priority. The interrupt with the lowest number has the highest priority.

IPL . See *initial program load*.

ISDN . Integrated services digital network.

ITU-T . See *ITU-TS*.

ITU-TS . International Telecommunication Union - Telecommunication Standardization Sector. The part of the International Telecommunication Union (ITU) that is responsible for developing recommendations for telecommunications.

jump . To start the jump function.

jump function . A switch to the logical terminal session specified.

key assignment . The character, numeral, symbol, or function generated when a keyboard key is pressed. All keys have default assignments that can be customized.

keyboard definition . Definitions of keyboard keys as stored on one of the Personal Communications diskettes.

keyboard template . An overlay placed on a keyboard to explain the function of each key.

LAN . See *local area network*.

leased line . See *nonswitched line*.

LIM EMS 3.2 . An expanded memory specification agreed to in 1984 by the computer software manufacturers Lotus**, Intel**, and Microsoft** to access memory above the DOS conventional memory area, 0-640 KB, using an EMM device driver. LIM EMS 3.2

allows an application to store up to 8 MB of data in expanded memory, in 512 logical pages of 16 KB. The EMS 3.2 expanded memory manager maps up to 64 KB of expanded memory in the PC BIOS memory area. See also *LIM EMS 4.0* and *Expanded Memory Manager*.

LIM EMS 4.0 . An extended expanded memory specification (EEMS) pioneered by AST** Research Corporation as an extension to LIM EMS 3.2 to permit expanded memory to be used for directly executing programs through multitasking, and to expand the areas accessible for mapping expanded memory beyond the conventional memory barrier, up to 1024 KB. The EEMS was further improved and defined by agreement of Lotus, Intel, and Microsoft corporations to better support windowing and multitasking operating environments. With appropriate hardware support, LIM EMS 4.0 supports up to 32 MB of expanded memory. Its EMM can create page frames up to 896 KB, and up to 2048 logical pages of 16-KB memory.

line speed . The speed at which data is transferred over an analog (telephone) line. Line speeds depend on the quality of the line.

local area network (LAN) . A computer network located on a user's premises within a limited geographical area. Communication within a local area network is not subject to external regulations; however, communication across the LAN boundary may be subject to some form of regulation. (T)

A network in which a set of devices are connected to one another for communication and that can be connected to a larger network.

See also *Ethernet* and *token ring*.

local copy . A printer session initiated by a personal computer user or host that reproduces a presentation space with all supported graphics.

local LU . A logical unit not distributed over the LAN, but controlled by a gateway personal computer. This is normally a physical device such as a workstation, printer, or terminal.

logical terminal (LT) . (1) A terminal with a name related to one or more physical terminals. (2) The definition of a specific 3270 terminal emulation session. See also *host session*.

logical terminal ID . See *logical terminal identifier*.

logical terminal identifier (LT ID) . An identifier for the LU type specified in the gateway host profile. In Personal Communications, up to 8 (unchangeable) IDs can be displayed. See *session ID*.

logical terminal number . A number used to identify DFT host sessions. A 3270 control unit controls some number of sessions with the host. The control unit then

assigns from 1 to 5 of these sessions to a particular coaxial connection and assigns each session an LT number from 1 to 5.

logical unit (LU) . A type of network accessible unit that enables users to gain access to network resources and communicate with each other.

logon . The process of accessing a domain and assuming a user ID.

LT . See *logical terminal*.

LU . Logical unit.

LU 2 . A type of LU for an application program that communicates with a single display workstation in an interactive environment, using the SNA 3270 data stream.

LU 3 . A type of LU for an application program that communicates with a single printer, using the SNA 3270 data stream.

LU 6.2 . A type of LU that supports sessions between two applications in a distributed data processing environment using the SNA general data stream, which is a structured-field data stream, or a user-defined data stream.

LU address . In Personal Communications, a number from 02 to 254 assigned by the host to represent the remote partner in an SNA session.

MAN . Metropolitan area network.

mantissa . The decimal part of a common logarithm.

mark . A symbol or sequence of symbols that indicate the beginning or end of a field, word, data item, or data set.

menu . A list of available operations. You select which operation you want from the list.

messaging name . A name under which messages can be received.

metropolitan area network (MAN) . A network formed by the interconnection of two or more networks which may operate at higher speed than those networks, may cross administrative boundaries, and may use multiple access methods. (T) Contrast with *local area network (LAN)* and *wide area network (WAN)*.

modem . A serial data translator that converts digital signals into analog signals at transmission, and on reception, converts analog signals back into digital signals. Modems are used primarily for telephonic computer communication. Synonymous with *modulator/demodulator*.

multiplexer (mux) . A device capable of interleaving events of two or more activities, or of spreading the events of an interleaved sequence of the multiple activities.

mux . See *multiplexer*.

MVS . See *Operating System/Virtual Storage Version 2*.

NA . Not applicable. When this appears in a calling parameter position, it means that PC400 EHLLAPI does not require this parameter to perform the specific function.

NCB . See *network control block*.

NetBIOS . Network Basic Input/Output System. In Personal Communications, an interface for application programs (API) between a LAN adapter and a token-ring network.

netname . The name used to identify a shared resource on the network.

network . An arrangement of nodes and connecting branches. (T)

A configuration of data processing devices and software connected for information interchange.

A group of nodes and the links interconnecting them.

network accessible unit (NAU) . A logical unit (LU), physical unit (PU), control point (CP), or system services control point (SSCP). It is the origin or the destination of information transmitted by the path control network. Synonymous with *network addressable unit*.

network address . According to ISO 7498-3, a name, unambiguous within the OSI environment, that identifies a set of network service access points.

In a subarea network, an address, consisting of subarea and element fields, that identifies a link, link station, physical unit, logical unit, or system services control point. Subarea nodes use network addresses; peripheral nodes use local addresses or local-form session identifiers (LFSIDs). The boundary function in the subarea node to which a peripheral node is attached transforms local addresses or LFSIDs to network addresses and vice versa. Contrast with *network name*.

network addressable unit (NAU) . Synonym for *network accessible unit*.

network administrator . A person who manages the use and maintenance of a network.

network application program . In the IBM Token-Ring Network, a program used to connect and communicate with adapters on a network, enabling users to perform application-oriented activities and to run other application programs.

network control block (NCB) . A part of the network control program that controls the resources used by the communication network in a LAN attachment.

network name . The symbolic identifier by which users refer to a network accessible unit, a link, or a link station within a given subnetwork. In APPN networks, network names are also used for routing purposes. Contrast with *network address*.

network node (NN) . See *Advanced Peer-to-Peer Networking (APPN) network node*.

network node server . An APPN network node that provides network services for its local LUs and client end nodes.

non-return-to-zero inverted encoding (NRZI) . A data encoding method that ensures correct synchronization of information in an analog data stream transmission.

nonswitched line . A communication line (such as is used in the SglC attachment) that is permanently connected and does not require dialing to establish communication. Contrast with *switched line*.

NPSI . See *IBM NCP Packet Switching Interface Program*.

NRZI . See *non-return-to-zero inverted encoding*.

NUL . A transmission control character used as a filler or for sequence control in network communication.

Num Lock . The keyboard mode entered after the **Num Lock** key is pressed. When the **Shift** key is pressed while in this mode, Num Lock is temporarily discontinued.

OIA . See *operator information area*.

OIA indicator . Characters or symbols in the operator information area providing information about network, workstation, gateway, or interface status. See also *operator information area*.

operator information area (OIA) . The bottom line of a session window that shows information on status and Personal Communications connections.

Operating System/Virtual Storage Version 2 (OS/VS2) . A set of commands, subcommands, and operands recognized by the host computer. Synonymous with MVS.

packet . A discrete unit of information including addressing and sequence information that can be sent interleaved with other packets of the same and other transmission sequences. Data sent by packet switching protocols, such as the X.25 protocol, do not always arrive in the order sent or even by the same routing on a PSDN.

packet assembler/disassembler (PAD) . A program that codes data into packets for transmission and reassembles received packets into the original data format. See also *packet*, *packet-switching data network*.

packet-switching data network (PSDN) . A data transmission system consisting of one or more host systems and one or more network stations that communicates using packets of information. The data is sent in interleaved packets to distribute the flow of information and maximize the data transmission capabilities of the network. X.25 is a packet-switching data network communication protocol. See *X.25 network*.

PAD . See *packet assembler/disassembler*.

parity bit . A binary digit appended to a group of binary digits as needed to make the sum of all the digits either odd (odd parity) or even (even parity).

PC Network . See *IBM PC network*.

PCSDIAL . A program that automatically dials a host number, permitting a fast connection.

permanent virtual circuit (PVC) . A session assigned to a dedicated line telephonic link. See *switched virtual circuit*.

physical unit (PU) . The component that manages and monitors the resources (such as attached links and adjacent link stations) associated with a node, as requested by an SSCP via an SSCP-PU session. An SSCP activates a session with the physical unit in order to indirectly manage, through the PU, resources of the node such as attached links. This term applies to type 2.0, type 4, and type 5 nodes only.

physical unit identifier (PUID) . In the gateway status utility, five hexadecimal digits used to identify the network station to the gateway.

PIU . Path information unit.

pooled LUs . Logical units that share host sessions in a common pool to save system resources.

POR . See *power-on reset function*.

port number . In DFT attachment, the logical ports assigned to a terminal by a control unit.

power-on reset (POR) function . A function that allows the user to reset all logical terminals. The key sequence for POR is **Ctrl+Pause** using the Enhanced or Space Saving keyboards. Otherwise, the sequence is **Ctrl+F2**.

preallocated LUs . Logical units only available to a specified network station.

presentation space . The host display space for the window.

presentation space position parameter . One of the four parameters that you must specify for some EHLLAPI functions. A position in the presentation space from 1 to 3564.

printer utility . A utility that allows users to check the status of the printers in their network.

private application . An application maintained for use only on one computer or user, that is not available on the network for other users.

program operator . The EHLLAPI program that performs and monitors activities in a workstation presentation space.

programmed symbol set (PS) . A set of fonts that can be system-defined or defined by the user and to which a code can be assigned.

protected field . A field that holds data for viewing; the data cannot be changed (at the current screen) by the user.

protocol . A specification for the format and timing of data exchanged between communicating systems. Also, the set of rules governing the operation of units of the communication system to facilitate communication.

PSDN . See *packet-switching data network*.

PSID . Presentation Space Identifier; a short one-character or one-letter name of the presentation space.

PU . Physical unit. See also *physical unit identifier*.

public application . An application shared among users on a network.

PUID . See *physical unit identifier*.

PVC . See *permanent virtual circuit*.

queue . A list of pending tasks for a computer or server to execute in order.

redefinition file . See *definition file*.

request . A message unit that signals initiation of a particular action or protocol. For example, Initiate-Self is a request for activation of an LU-LU session.

requester . A computer that accesses shared network resources through a server.

resource . A directory (files resource) or device used by computers on a network.

response time monitor . A function that measures and displays the host response time

RS-232C . A standard established by the Electronic Industries Association for direct linkage for serial data

transfer between a computer and peripheral equipment, such as a modem or printer.

RSAP . Remote service access point. See *service access point*.

run book . A supplemental guide, controlled by a system administrator, that describes the implementation and usage of a specific system configuration.

SAP . See *service access point*.

SAS . See *session active screen*.

SglC . See *Synchronous Data Link Control*.

SglC command . The control information in the C-field of the link header, sent from a primary station to a secondary station.

Server-Requester Programming Interface (SRPI) . An IBM application programming interface (API) used by requester and server programs to communicate with the personal computer or host routers.

service access point (SAP) . The gateway address of the controller. An SAP provides a point to link the controller to the host system.

service coordinator . The person in your organization responsible for answering hardware and software computing questions.

service transaction program . Any IBM-supplied transaction program running in a network accessible unit. Contrast with *application transaction program*.

session . (1) A logical connection between a server and a requester that was initiated by a successful request for a shared resource. See also *host session* and *DOS session*. (2) A logical connection between two network addressable units that can be activated, tailored to provide various protocols, and deactivated, as requested.

session active screen (SAS) . The display that is active for the current communication session. See also *next-session-active-screen function*.

session ID . An alphabetic ID (*a* through *h*) assigned by Personal Communications to each session or screen. This applies to all types of host sessions and is used in file transfers. See also *short name*.

shared resource . A directory or device made available to users on a network. A shared resource is attached to a server, but it is not attached to the requesters that use them.

Shift Lock . The personal computer keyboard mode entered after the **Shift Lock** key is pressed. In this mode, the keyboard performs the function printed on the upper half of the keytop. Press the **Shift** key to cancel the Shift Lock mode.

short name . In Personal Communications, a character displayed in column 7 of the operator information area that shows the session ID. See also *session ID* and *operator information area*.

SNA . See *Systems Network Architecture*.

SNA network . The part of a user-application network that conforms to the formats and protocols of Systems Network Architecture. It enables reliable transfer of data among users and provides protocols for controlling the resources of various network configurations. The SNA network consists of network accessible units (NAUs), boundary function, gateway function, and intermediate session routing function components; and the transport network.

source diskette . In a diskette copying procedure, the diskette from which information is read.

SRPI . Server-Requester Programming Interface.

SSCP . System services control point.

SSCP-dependent LU . An LU that requires assistance from a system services control point (SSCP) in order to initiate an LU-LU session. It requires an SSCP-LU session.

suspend-DOS function . The function that stops the running of the DOS session. The key sequence for suspend-DOS is **Alt+S**. (In the Netherlands, the sequence is **Ctrl+S**.)

SVC . See *switched virtual circuit*.

switched line . A telephonic communication line on which connections are established by dialing. See also *switched virtual circuit*. Contrast with *nonswitched line*.

switched virtual circuit (SVC) . (1) An X.25 circuit that is dynamically established when needed. The X.25 equivalent of a switched line. (2) A virtual circuit that is requested by a virtual call. It is released when the virtual circuit is cleared. Contrast with *permanent virtual circuit (PVC)*.

switch-screen function . A function that switches keyboard control to the other screen, if two screens are used. The key sequence for switch-screen is **Alt+Tab**.

Synchronous Data Link Control (SglC) . A discipline for managing synchronous, code-transparent, serial-by-bit information transfer over a line connection. Transmission exchanges can be duplex (in both directions at the same time) or half-duplex (in either direction, one direction at a time) over switched lines or direct lines.

system services control point (SSCP) . A component within a subarea network for managing the configuration, coordinating network operator and problem determination requests, and providing

directory services and other session services for users of the network. Multiple SSCPs, cooperating as peers with one another, can divide the network into domains of control, with each SSCP having a hierarchical control relationship to the physical units and logical units within its own domain.

Systems Network Architecture (SNA) . The description of the logical structure, formats, protocols, and

target diskette . In a diskette or storage copying procedure, the diskette onto which information is written.

template . See *keyboard template*.

terminal emulator . See *emulator*.

terminal operator . The human user of a EHLLAPI application program. Contrast with *program operator*.

Time Sharing Option (TSO) . A set of commands, subcommands, and operands recognized by the host computer.

token ring . According to IEEE 802.5, network technology that controls media access by passing a token (special packet or frame) between media-attached stations.

A FDDI or IEEE 802.5 network with a ring topology that passes tokens from one attaching ring station (node) to another.

See also *local area network (LAN)*.

token-ring network . A ring network that allows unidirectional data transmission between data stations, by a token passing procedure, such that the transmitted data return to the transmitting station. (T)

A network that uses a ring topology, in which tokens are passed in a circuit from node to node. A node that is ready to send can capture the token and insert data for transmission.

TOKREUI . A low-level personal computer extended user interface program to access the token-ring adapter. TOKREUI is an acronym that stands for *token-ring extended user interface*.

TQDOS . A multitasking DOS interface that is called automatically by Personal Communications to handle service tasks.

trace size . See *trace table*.

trace table . A storage area that contains the records of all Personal Communications operations. The trace information can either be directed to the standard output destination, or it can be redirected to a file.

transaction program (TP) . A program that processes transactions in an SNA network. There are two kinds of

transaction programs: application transaction programs and service transaction programs. See also *conversation*.

transferring files . Sending files from a personal computer to a host system or vice versa. See *download* and *upload*.

TSO . See *Time Sharing Option*.

UID . See *user identifier*.

unprotected field . A field that is available for the user to enter or modify data.

upload . The transfer of a file from a personal computer to a host system.

user ID . See *user identifier*.

user identifier (UID) . A name that uniquely identifies a user on a network or system.

user profile . A file containing values for setting up the user environment, and that can be automatically accessed when a user logs on.

utility programs . Programs that support operations of Personal Communications, such as file transfer and keyboard redefinitions.

V.24 . A 2400 bps ITU-TS communication protocol.

V.35 . A 64 Kbps ITU-TS communication protocol.

valid key . A key that is recognized by the host session.

VGA . See *video graphics adapter*.

video graphics adapter (VGA) . A computer adapter that provides high-resolution graphics and a total of 256 colors. See also *enhanced graphics adapter (EGA)*.

virtual machine (VM) . A time sharing control program.

VM . See *virtual machine*.

VM/CMS . See *Virtual Machine/Conversational Monitoring System*.

Virtual Machine/Conversational Monitoring System (VM/CMS) . A time sharing system control program that manages the resources of an IBM System/370 such that multiple remote terminal users have a functioning simulation of a computing system at their disposal. The Conversational Monitoring System provides general time sharing, development, and problem-solving facilities.

Virtual Telecommunications Access Method (VTAM) . A host program for communication using switched lines. See also *switched line*.

virtual route (VR) . (1) A path between a data source and a data sink that can be created in various circuit configurations during the transmission of packets or messages. (2) In SNA, a logical connection between two subarea nodes that is physically an explicit route, or a logical connection that is contained entirely within a subarea node. See also *Systems Network Architecture* and *packet-switching data network*.

VR . See *virtual route*.

VS . Virtual storage.

VTAM . See *Virtual Telecommunications Access Method*.

WAN . See *wide area network*.

wide area network (WAN) . A network that provides communication services to a geographic area larger than that served by a local area network or a metropolitan area network, and that may use or provide public communication facilities. (T)

A data communication network designed to serve an area of hundreds or thousands of miles; for example, public and private packet-switching networks, and national telephone networks.

Contrast with *local area network (LAN)* and *metropolitan area network (MAN)*.

X.21 bis . A preliminary German (Federal Republic) modem communication specification.

X.25 network . A packet-switching data network linked in accordance with ITU-TS recommendation X.25.

X.25 Recommendation . An ITU-TS recommendation for the interface between data terminal equipment using packet switching data networks.

X.400 . An electronic mail addressing and address directory control system established by the IEEE, designed to facilitate electronic mailing between otherwise independent data networks.

XID . SNA exchange identifier command. See also *Systems Network Architecture*.

3270 numeric field . A display field that accepts only numerics (0-9), a minus sign, a period, a comma, and DUP keyboard entries.

Index

Numerics

3270 data stream (printing) 210

A

abbreviations for PC/3270 key functions 162
abbreviations for PC400 key functions 162
adding a file to the list 37
adding or changing transfer types 43
adding templates 38
additional options 43
APPC
 attach manager
 controlling 19
APVAFILE 44
AS/400 301
 file 301
AS/400 files 301
ASCII text files 351

B

BASIC random files 353
BASIC sequential files 355
BETWEEN test 320
BIFF files 360
bitmaps for drawing 245

C

changing contents of a list 37
changing miscellaneous items 45
changing packet size 241
changing translation tables 46
character sets 122
clearing sessions before transfer 45
CM/2 migration 181
CMPD 17
code pages xv, 122
color mixing, printer 209
command syntax symbols xv
commands
 CMPD 17
 EPW 9
 MSGLOGF 10
 MVS/TSO send 223
commands, VM/CMS
 VM/CMS RECEIVE 221
 VM/CMS SEND 218
compiler, printer table
 explanation 195, 253
 printer color mixing 209
compiler (printer table)
 PDF format 195, 253
conditions, specifying WHERE 317
configuring, SSL support 108

Configuring SSL
 using self-signed certificate 114
 using unknown CA 111
 using well-known CA 110
contacting IBM 192
controlling LU 6.2 sessions 20
conversion errors that can occur during transfer 309
country 119
CPI/LPI of device font 249
creating a template 37
creating a transfer request 302, 310
 receiving data from the host 310
 transferring data to the host 302
creating IDP Files 40
creating list files 36
cursor color 237
customizing a display translation table 239
customizing translation window 47

D

data compression 387
data conversions
 data types
 ASCII numeric 347
 binary 348
 character 348
 double-precision 348
 hexadecimal 349
 integer 349
 packed decimal 349
 single-precision 350
 zoned decimal 350
 host file types
 ASCII text 351
 BASIC random 353
 BASIC sequential 355
 BIFF 360
 data interchange format (DIF) 357
 DOS random 362
 DOS random type-2 364
 no-conversion 366
 record size 347
 workstation file types
 ASCII text 351
 BASIC random 353
 BASIC sequential 355
 BIFF 360
 data interchange format (DIF) 357
 DOS random 362
 DOS random type-2 364
 no-conversion 366
data description specifications (DDS) 340, 355
data interchange format files (DIF) 357
data link controls 23
data stream support, printer
 3270 210
 SCS 211

data transfer function 295
data types
 ASCII numeric 347
 binary 348
 character 348
 double-precision 348
 hexadecimal 349
 integer 349
 packed decimal 349
 single-precision 350
 zoned decimal 350
database file 301
DDM 295, 301
 transfer function 301
DDS (data description specifications) 340, 355
deactivating transaction programs 20
default (DFT) keyword 355
default key function (keyboard layout) 162
deleting a file from the list 37
delimiting print jobs 212
Dependent Logical Unit Requester 386
Dependent LU Requester (DLUR) 386
DFT (default) keyword 355
directories created by the installation program 52
displaying
 logical links 21
 non-LU 6.2 session 21
 signed-on users for an LU 23
 transaction programs 20
distributed data management 295, 301
 file concept 301
DLUR 386
DOS mode EHLLAPI 247, 374
DOS random files 362
DOS random type-2 files 364
drawing buffer size 244

E

easy mouse operation 34
edit function restrictions at CUT attachment 240
edit function restrictions at Home3270 attachment 240
editing graphic data 246
editing lists 36
encryption 388
enhanced 119
error messages 417
errors caused by insufficient memory 244
Euro Sign xv
explaining a file-description file 339
extension for list files 44, 45

F

- field attribute code 293
- file 301
 - AS/400 301
 - database 301
 - joining 301
 - logical 301
 - physical 301
- file-description file 300, 339
- file-description file entries
 - comment lines 346
 - example 346
 - format 340
 - PCFDF 340
 - PCFL 342
 - PCFO 341
 - PCFT 340
- file option
 - APPEND 41
 - ASCII 41
 - BLANK 41
 - CRLF 41
 - SRC 41
- file transfer 33, 369
 - CICS receive 233
 - CICS send 231
 - host 217
 - MVS/TSO receive 228
 - MVS/TSO send 223
 - VM/CMS receive 221
 - VM/CMS send 218
- file-transfer code translation 235
- file transfer directory 45
- file transfer timeout 44
- First Failure Support Technology/2 (FFST/2) 9
 - description 8
 - message log 10
 - starting and stopping 9

G

- graphic print buffer 246
- graphic protocol
 - advanced protocol 243
 - native protocol 243
- graphics, printing 245
- graphics protocols 242

H

- highlighting conventions xiv
- hole in the screen caused by clearing a graphic character 246
- host code page 119, 124
- host command 44, 45
- Host Connected 119
- host-directed print 210
- host file transfer
 - IND\$FILE 217
- HPR connections 22

I

- IDP file 40
- ignoring blank pages 249
- import/export 39
- Import/Export 241
- IN test 320
- IND\$FILE 217
- information, where to get more 189
- installation (consideration) 237
- IS test 321
- ISNOT test 321
- ISPF 224

K

- keyboard country ID 121
- keyboard layout 162
- keyboards 161

L

- library 301
- LIKE test 319
- list file extension 36
- logical database file 301
- logical links
 - displaying or deactivating 21
- logical record length (LRECL) 42
- LU 6.2 20

M

- member 301
- message log
 - reading 10
 - using 10
- migrating
 - from CM/2. 181
 - from Personal Communications V4.1 185
- migration from CM/2 181
- migration from the PFT to the PDF 260
- MSGLOGF 10
- MVS/TSO
 - ISPF 224

N

- no-conversion files 366
- non-LU 6.2 session, displaying 21
- numeric values, specifying WHERE 323

O

- online help 189
- OS/2 commands
 - RECEIVE.EXE 217
 - SEND.EXE 217
- OS/2 printer drivers 375

P

- packet size 45
- paper-handling migration 285

- PC code page 44, 45, 119
- PC400 key functions, abbreviations 162
- PCFDF entries 340
- PCFL entries 342
- PCFO entry 341
- PCFT entries 340
- PCSPTC program 195, 253
- PDF
 - customizing 195, 253
- PDF examples 254
- PDF format 195, 253
- PDFPDT subdirectory 53
- PDT file
 - customizing 195, 253
- PDT files 28
- PDT mode 250, 374
- Personal Communications key functions, abbreviations 162
- Personal Communications library 190
- PFT 259
- PFT Migration Utility 259, 260
 - considerations 260
 - how to use 259
- physical database file 301
- plotter 246
- print job control by using SNA
 - timeout 248
- print jobs, delimiting 212
- print screen 26
- printable area 249, 374
- printer 25
- printer color mixing 209
- printer control codes
 - list 255
 - restrictions 258
- printer data stream support
 - 3270 210
 - SCS 211
- printer definition file 28
- printer definition table 28, 195, 253
 - explanation 195, 253
- printer function table (PFT) 259
- printer in non-SNA coaxial
 - attachment 247
- printer session 25
- printer table compiler
 - PDF format 195, 253
 - printer color mixing 209
- printing 25
- printing reverse-display characters with device font 249
- PRIVATE subdirectory 52
- problem determination (PD)
 - environment 7
 - problem area 8
 - problem re-creation 8
 - problem reporting (PR) 18
 - problem source identification (PSI) 8
 - problem type 7
 - symptom 7
- problem determination tools 10
 - CMPD 17
 - FFST/2 8
- program, host
 - IND\$FILE 217
- programmed symbol sets, enabling 243
- programmed symbols 243

R

README.INF 373
RECEIVE command 217
receiving files from a host 217
receiving files from the host system 35
record format 42, 301, 347
 record length limit 347
record size 347
 record length limit 347
related publications 190
releasing insertion mode 238
replacing and deleting templates 38
request, transfer 300
reserved word 329

S

saving a transfer request 308
screen size control 238
scroll bar 238
scroll-bar 373
scroll lock key 238
SCS 210
SCS TRN command (LU 1) 248
SDK subdirectory 53
security
 configuring SSL 105
 using SSL 105
SEND command 217
sending files to a host 217
sending files to the host system 33
setting transfer options 44
setting transfer type 40
setting up the printer 28
SF 213
shift support 121
SNA
 subsystem management, using 19
SNA character string 210
SNA Client/Server 379
SNA over TCP/IP 391
SNA subsystem management, using 19
Sockets over SNA 407
source file 297
 transferring data to 297
space saving 119
spool function 374
SSL Security
 configuring 105
 limitations 117
 Password
 changing 110
 problem determination 118
 using 105
SSL support
 configuring 108
starting or stopping the Communications Manager kernel 19
starting subsystem management 19
status window 44, 45
structured fields 213
subdirectory 52
subsystem management
 managing HPR connections 22
 online facility 389

subsystem management (*continued*)
 windows, automatic refresh
 controlling the attach manager 19
 SNA 19
 the Communications Manager
 kernel 19
 X.25 services 24
SVF control code 249

T

technical assistance 192
template 37
test 321
 combination 321
 logical AND and logical OR 321
testing templates
 source file 39
 templates 39
 test mode 39
the APPC attach manager 19
trace, performing a 11
Trace services 10
trademarks 484
transfer function 298
transfer request 300
 definition 300
transfer requests for receiving
 (example) 330
transfer type 40
transferring data to AS/400 296
transferring data to the host 296
transferring files 33, 217
transferring files using
 import/export 39
transferring files using list file 34
transferring files using list files 35, 36
transferring files using Load button 35
transferring files using Paste button 35
translation table 46
translation tables customization 46
transparent (SCS control code) 211
trim print 26
TSO allocation parameter
 (MVS/TSO) 43
 allocation amounts 43
 allocation units 43
 AVBLOCK 43
 CYLINDERS 43
 TRACKS 43
 block size 43

U

UPGRADE.LOG 10
use (consideration) 237
users, displaying signed-on 23
using constants 322
using expressions 324

V

vector graphics 242
VERIFY.LOG 10
VM/CMS command
 SEND 218

X

X.25 services
 controlling physical links 24

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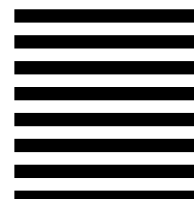


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