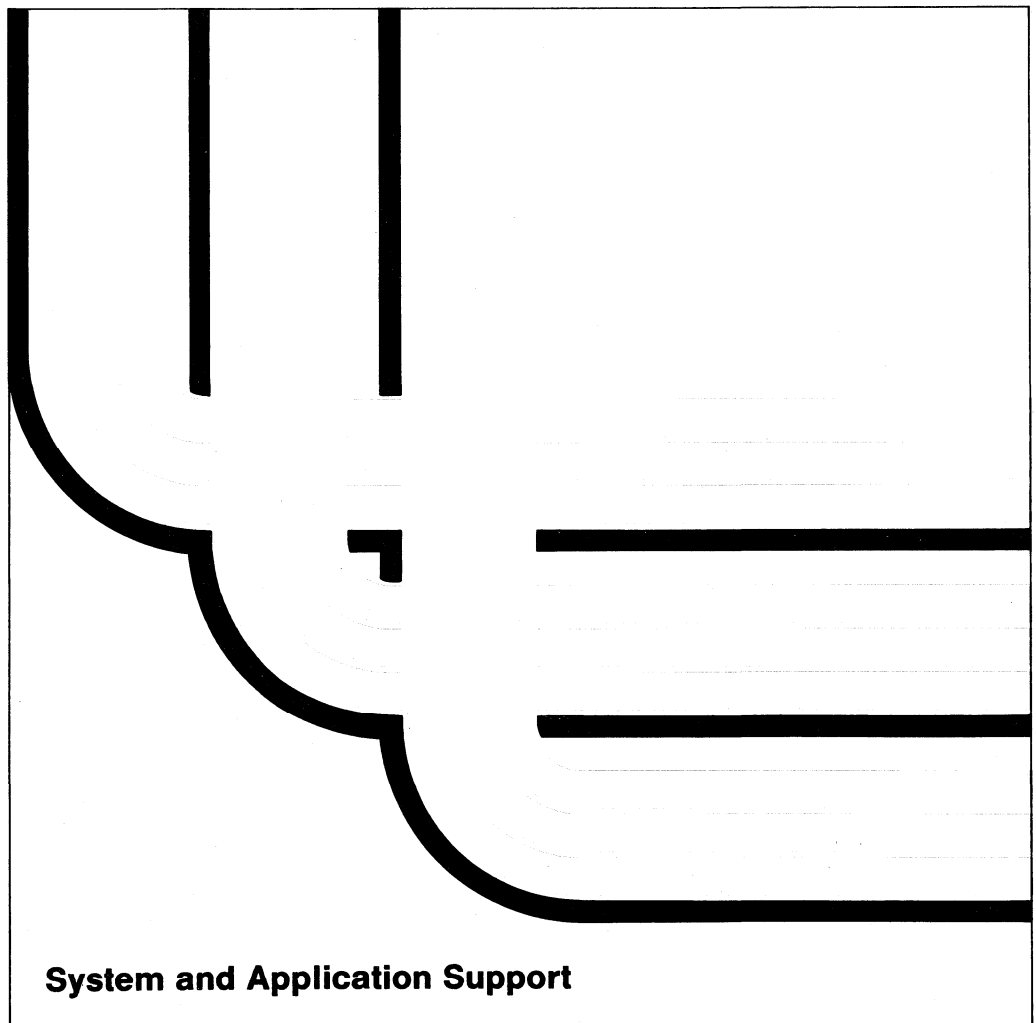


**National Language Support
Planning Guide**

Version 2





Application System/400

GC41-9877-03

**National Language Support
Planning Guide**

Version 2

Take Note!

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

Fourth Edition (November 1993)

This edition applies to the licensed program IBM Operating System/400, (Program 5738-SS1), Version 2 Release 3 Modification 0, and to all subsequent releases and modifications until otherwise indicated in new editions. This major revision makes obsolete GC41-9877-02. Make sure you are using the proper edition for the level of the product.

Order publications through your IBM representative or the IBM branch serving your locality. Publications are not stocked at the address given below.

A Customer Satisfaction Feedback form for readers' comments is provided at the back of this publication. If the form has been removed, you can mail your comments to:

Attn Department 245
IBM Corporation
3605 Highway 52 N
Rochester, MN 55901-7899 USA

or you can fax your comments to:

United States and Canada: 800+937-3430
Other countries: (+1)+507+253-5192

When you send information to IBM, you grant IBM a non-exclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you or restricting your use of it.

© **Copyright International Business Machines Corporation 1991, 1993. All rights reserved.**

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Contents

Notices	xvii
Trademarks and Service Marks	xvii
About This Guide	xix
Who Should Use This Guide	xx
Summary of Changes	xxi
Sort Sequence Support	xxi
Language Identifiers and Country Identifiers	xxi
Coded Character Set Identifiers	xxi
REXX/400 and Coded Character Set Identifiers	xxi
Miscellaneous Changes	xxi
Chapter 1. What is National Language Support	1-1
National Language Version	1-1
Setting Up the National Language Version	1-2
Character Information (Data)	1-3
Graphic Character Sets	1-3
Groups and Subgroups	1-3
Code Points	1-5
Code Page	1-5
Character Identifier	1-5
Encoding Scheme	1-5
Additional Coding-Related Required Information	1-6
Character Data Representation Architecture	1-6
Coded Character Set Identifier	1-6
Character Data Integrity	1-8
Related Architectures	1-9
Distributed Relational Database Architecture	1-9
Distributed Data Management (DDM)	1-9
National Language Sequence Support	1-10
Language-Dependent or Culture-Dependent System Values	1-12
National-Language-Dependent Functions	1-13
Changing National-Language-Dependent System Values	1-15
Changing National-Language-Dependent Functions in User Profiles	1-15
Changing National-Language-Dependent Job Attributes	1-16
Other Language-Dependent or Culture-Dependent System Functions	1-16
Display and Printer Devices	1-16
Display and Printer Files	1-17
Database Files	1-18
Menus and Panel Groups	1-18
Example of Single System with a Single Language	1-18
Planning Checklist for National Language Support	1-20
Chapter 2. What is Multilingual Support	2-1
Working in a Multilingual Environment	2-1
Using and Changing the Primary Language	2-1
Service	2-2
System and User Interfaces	2-2
Secondary Language Requirements	2-3

Using and Changing the Secondary Language	2-4
System CCSID Implementation	2-6
Work Management Support for Coded Character Set Identifiers	2-6
Database Management Support for Coded Character Set Identifiers	2-7
Workstation Function Management Support for Coded Character Set Identifiers	2-8
Display Files	2-8
Printer Files	2-11
User Interface Manager Menus and Panel Groups	2-13
Changing Physical Files Assigned a CCSID	2-14
Migration	2-14
CCSID Support in Other System Components	2-14
General Recommendations	2-16
Major Limitations	2-16
System Sort Sequence Support	2-17
Work Management for Sort Sequence Support	2-18
Database Management for Sort Sequence Support	2-18
Using System-Supplied Sort Sequence Tables	2-19
Sort Sequence Support in Other System Components	2-20
Implementation Notes	2-21
Storage Requirements	2-21
Considerations for Using Multilingual Support	2-21
Ordering Equipment and Software	2-22
Workstation Controllers	2-22
Workstation Customization	2-23
Display Stations	2-24
Printers	2-28
Intelligent Printer Data Stream (IPDS) Printers	2-28
Working with the PTF Process	2-29
Installing the Hardware and the Software	2-30
Hardware	2-30
Software	2-32
Using Multilingual Support in Multilingual Environments	2-32
Single System with Multiple Languages	2-32
Single System Supporting DBCS and SBCS	2-35
Multilingual Network	2-37
Planning Checklist for Multilingual Support	2-39
Chapter 3. Developing an Internationalized Application	3-1
Defining the Application Marketplace	3-1
Planning for Internationalized Applications	3-2
Development Process for Creating Internationalized Applications	3-2
Education for Developing Internationalized Applications	3-3
Application Design	3-3
Implementing Internationalized Applications	3-3
Documentation for Internationalized Applications	3-4
Translation Process	3-4
Physical Equipment	3-4
Translation Tools	3-4
Translation Education	3-4
Translation Guidelines and Instructions	3-5
Glossary for Translation	3-5
Testing	3-5
Packaging and Installation	3-5

Application Maintenance	3-6
User Interface for Internationalized Applications	3-6
Making Textual Data Translatable	3-6
Techniques for Coding Textual Data	3-8
Direct Coding as an Unnamed Output Field	3-8
Early Binding of Messages	3-9
Late Binding of Messages	3-10
Storing Text in Database Files	3-11
Respecting Cultural Conventions	3-12
Date Formats	3-14
Date Separators	3-15
Date Presentation (Editing)	3-15
Time Formats	3-16
Time Separators	3-17
Time Presentation (Editing)	3-17
Sort Sequence for National Languages	3-18
Designing and Coding Guidelines for Internationalized Applications	3-20
Organization of Application Parts	3-20
Separating Program Modules at Appropriate Places	3-20
Compatibility of NLS Components	3-21
Naming the Application Parts	3-23
Referring to Specifications	3-24
Working with Database Definitions	3-25
Display Files	3-25
Constant Text Strings	3-26
Input and Output Fields	3-26
Field Editing Specifications	3-26
Cursor Positioning Specifications	3-26
Default Values for Input Fields	3-27
Field Validation Specifications	3-27
Error Messages	3-28
Defining Online Help Information	3-29
Choosing the Online Help Method	3-29
Help Design Guidelines	3-30
Translation Guidelines	3-30
Printer Files	3-30
Program Messages	3-32
Defining Menus for Internationalized Applications	3-33
Defining Commands	3-35
CDRA Implementation for NLS Enabling	3-37
Source Files	3-39
High-Level Languages (Literals and Encoding)	3-39
Using High-Level Language Programs	3-42
Sort Sequence with the RPG/400 Licensed Program	3-43
Sort Sequence with the COBOL/400 Licensed Program	3-45
Sort Sequence with the SQL/400 Licensed Program	3-46
Sort Sequence with the PC Support/400 Licensed Program	3-47
Enabling for DBCS	3-48
DBCS Designing and Coding Guidelines	3-49
Enabling for Bidirectional Languages	3-52
Designing and Coding Guidelines for Bidirectional Languages	3-53
Chapter 4. National Language Support in AS/400 Licensed Programs	4-1
OS/400 Functions and National Language Support	4-1

Distributed Database	4-1
Library List	4-1
Graphical Data Display Manager (GDDM)	4-2
Interactive Data Definition Utility (IDDU)	4-2
Question-and-Answer Function (Q & A)	4-3
REXX/400	4-3
SNA Distribution Services (SNADS)	4-4
Sort Utility	4-4
Spellchecking	4-5
System/36 Environment	4-5
User Data	4-5
Double-Byte Character Set Support	4-6
IGC Parameter	4-6
Advanced DBCS Printer Support/400 Licensed Program	4-6
Advanced Function Printing DBCS Fonts/400 Licensed Program	4-6
Advanced Function Printing Utilities/400 Licensed Program	4-7
Application Dictionary Services/400 Licensed Program	4-7
AS/400 SAA AD/Cycle Application Development Manager/400	4-7
AS/400 Application Development Tools Licensed Program	4-7
AS/400 BASIC Licensed Program	4-8
AS/400 Business Graphics Utility Licensed Program	4-8
Application Program Driver/400	4-8
SAA C/400 Licensed Program	4-9
CallPath/400 Licensed Program	4-9
CICS/400 Licensed Program	4-9
SAA COBOL/400 Licensed Program	4-10
SAA AD/Cycle CoOperative Development Environment/400	4-10
Cryptographic Support/400 Licensed Program	4-10
SAA FORTRAN/400 Licensed Program	4-11
Integrated Language Environment C/400* (ILE C/400)	4-11
Language Dictionaries/400 Licensed Program	4-11
SAA OfficeVision/400 Licensed Program	4-12
Changing the System Primary Language	4-12
Before Changing Your Primary Language:	4-12
After Changing Your Primary Language:	4-13
Using Double-Byte Character Set Data	4-14
Using Text Search Services	4-14
OSI Communications Subsystems/400 Licensed Program	4-15
OSI File Services/400 Licensed Program	4-15
OSI Message Services/400 Licensed Program	4-15
AS/400 Pascal Licensed Program	4-16
PC Support/400 Licensed Program	4-16
RUMBA*/400	4-17
Performance Tools/400 Licensed Program	4-17
Point-of-Sale Communications Utility/400 Licensed Program	4-17
AS/400 PL/I Licensed Program	4-17
Query/400 Licensed Program	4-17
RM/COBOL-85 for the AS/400 Licensed Program	4-19
SAA RPG/400 Licensed Program	4-19
SAA Structured Query Language/400 Licensed Program	4-19
SQL/400 Query Manager	4-20
SAA SystemView System Manager/400 Licensed Program	4-21
SAA SystemView Managed System Services/400 Licensed Program	4-21
SystemView Information Warehouse* DataHub* Support/400	4-21

IBM SAA SystemView OMEGAMON** Services/400	4-21
AS/400 System/38 Utilities Licensed Program	4-21
TCP/IP Connectivity Utilities/400 Licensed Program	4-22
Appendix A. National Language Version Feature Codes	A-1
Licensed Programs for National Language Versions	A-2
Appendix B. National Language Version Default System Values	B-1
Belgium Dutch MNCS (Feature 2963)	B-2
Belgium French MNCS (Feature 2966)	B-2
Brazilian Portuguese (Feature 2980)	B-2
Canadian French MNCS (Feature 2981)	B-2
Danish (Feature 2926)	B-3
Dutch Netherlands (Feature 2923)	B-3
English Uppercase (Feature 2950)	B-3
English Uppercase and Lowercase (Feature 2924)	B-3
English Uppercase DBCS (Feature 2938)	B-4
English Uppercase and Lowercase DBCS (Feature 2984)	B-4
Finnish (Feature 2925)	B-5
French (Feature 2928)	B-5
French MNCS (Feature 2940)	B-5
German (Feature 2929)	B-5
German MNCS (Feature 2939)	B-6
Greek (Feature 2957)	B-6
Icelandic (Feature 2958)	B-6
Italian (Feature 2932)	B-6
Italian MNCS (Feature 2942)	B-7
Japanese (Katakana) DBCS (Feature 2962)	B-7
Korean DBCS (Feature 2986)	B-7
Norwegian (Feature 2933)	B-7
Portuguese (Feature 2922)	B-8
Portuguese MNCS (Feature 2996)	B-8
Spanish (Feature 2931)	B-8
Swedish (Feature 2937)	B-9
Simplified Chinese DBCS (PRC) (Feature 2989)	B-9
Traditional Chinese DBCS (ROC) (Feature 2987)	B-9
Turkish (Feature 2956)	B-10
System Values for Other Languages	B-10
Albanian (Albania)	B-10
Arabic (Bahrain)	B-10
Arabic (Egypt)	B-11
Arabic (Iraq)	B-11
Arabic (Jordan)	B-11
Arabic (Kuwait)	B-11
Arabic (Lebanon)	B-12
Arabic (Libyan Arab Jamahiriya)	B-12
Arabic (Oman)	B-12
Arabic (Qatar)	B-13
Arabic (Saudi Arabia)	B-13
Arabic (Sudan)	B-13
Arabic (Syrian Arab Republic)	B-13
Arabic (United Arab Emirates)	B-14
Arabic (Yemen)	B-14
Afrikaans (South Africa)	B-14

Australian English (Australia)	B-15
Byelorussia (Belarus)	B-15
Bulgarian (Bulgaria)	B-15
Croatian (Croatia)	B-15
Czech (Czech Republic)	B-16
Hebrew (Israel)	B-16
Hungarian (Hungary)	B-16
Irish Gaelic (Ireland)	B-17
Macedonian (Macedonia)	B-17
Polish (Poland)	B-17
Rhaetic-Romantic (Switzerland)	B-17
Romanian (Romania)	B-18
Russian (Russia)	B-18
Serbian Cyrillic (Serbia)	B-18
Serbian Latin (Serbia)	B-19
Slovakian (Slovakia)	B-19
Slovenian (Slovenia)	B-19
Thai (Thailand)	B-19
UK English (United Kingdom)	B-20
Appendix C. National Language Keyboard Types and SBCS Code Pages	C-1
SBCS Keyboard and Display Part Numbers by Language	C-3
3477 and 3476 Keyboard and Display Part Numbers	C-3
3486 and 3487 Keyboard and Display Part Numbers by Language	C-8
Keyboard Support for Other Devices	C-12
Appendix D. Multilingual Support for the AS/400 Workstation Controller	D-1
Determining Number of Keyboard Types	D-1
Keyboard Types on the Twinaxial Workstation Controller	D-2
Keyboard Types on an ASCII Workstation Controller	D-4
Countries or Languages Supported without Workstation Customization	D-4
Countries or Languages Supported Using Workstation Customization	D-4
Appendix E. Planning Checklist	E-1
Appendix F. Coded Character Set Identifiers (CCSIDs)	F-1
Encoding Schemes for the Coded Character Set Identifiers	F-1
Code Pages and Character Sets for the Coded Character Set Identifiers	F-1
Substitution Characters	F-5
Associated CCSIDs	F-6
Appendix G. Language and Country Identifiers	G-1
Language Identifiers	G-1
Country Identifiers	G-3
Appendix H. Sort Sequence Tables	H-1
Sort Sequence for Arabic	H-3
Sort Sequence for Cyrillic	H-6
Sort Sequence for Danish	H-8
Sort Sequence for Greek	H-11
Sort Sequence for Hebrew	H-14
Sort Sequence for Icelandic	H-17
Sort Sequence for Japanese	H-20
Sort Sequence for Korean	H-22

|	Sort Sequence for Latin-1	H-25
|	Sort Sequence for Latin-2	H-28
|	Sort Sequence for Norwegian	H-30
|	Sort Sequence for Russian	H-33
|	Sort Sequence for Spanish Speaking	H-35
|	Sort Sequence for Swedish and Finnish	H-37
|	Sort Sequence for Thai	H-39
|	Sort Sequence for Turkish	H-42

Appendix I. Graphic Character Conversion Tables	I-1
CCITT T.61 Graphic Character Conversions	I-12
Monocase Tables	I-14

Appendix J. PC Support National Language Information	J-1
---	-----

|	Appendix K. REXX/400 Extension Characters	K-1
|	REXX/400 Extension Characters-Axxxxxxx GCGIDs	K-1
|	REXX/400 Extension Characters-Bxxxxxxx GCGIDs	K-3
|	REXX/400 Extension Characters-Gxxxxxxx GCGIDs	K-3
|	REXX/400 Extension Characters-Hxxxxxxx GCGIDs	K-4
|	REXX/400 Extension Characters-Jxxxxxxx GCGIDs	K-4
|	REXX/400 Extension Characters-Kxxxxxxx GCGIDs	K-5
|	REXX/400 Extension Characters-Lxxxxxxx GCGIDs	K-6
|	REXX/400 Extension Characters-Nxxxxxxx GCGIDs	K-8
|	REXX/400 Extension Characters-Oxxxxxxx GCGIDs	K-8
|	REXX/400 Extension Characters-Sxxxxxxx GCGIDs	K-9

Appendix L. Changing the Primary Language	L-1
Disabling and Enabling the High-Speed Feature on the 2440 Tape Unit	L-2
Changing the Primary Language from DBCS to SBCS	L-3
Save the Entire System	L-3
Install SBCS Version 2, Release 3 Modification 0	L-8
Install the Operating System	L-11
Restoring User Profiles, Device Configurations, User Libraries, and Authorities	L-16
Using Option 21 (The system) on the Restore Menu	L-16
Installing Licensed Programs	L-19
Completing the Installation Process	L-24
Setting Up Configuration Lists and Relational Database Directory Entries	L-25
Changing the Primary Language from SBCS to DBCS	L-26
Save the Entire System	L-28
Install DBCS Version 2, Release 3 Modification 0	L-33
Install the Operating System	L-36
Restoring User Profiles, Device Configurations, User Libraries, and Authorities	L-42
Using Option 21 (The system) on the Restore Menu	L-42
Installing Licensed Programs	L-45
Completing the Installation Process	L-50
Changing Authority and Ownership for Each SQL Collection	L-51
Setting Up Configuration Lists and Relational Database Directory Entries	L-52

Appendix M. Keyboard Layouts	M-1
Enhanced Keyboard	M-1
Special-Character Keyboard Set	M-5

Creating a Special Character	M-5
Special Character Example	M-7
122-Key and 124-Key Typewriter Keyboards	M-7

Appendix N. Code Pages	N-1
Code Page 037 (EBCDIC) USA/Canada	N-2
Code Page 256 (EBCDIC) International #1	N-3
Code Page 260 (EBCDIC) Canadian French	N-4
Code Page 273 (EBCDIC) Germany F.R./Austria	N-5
Code Page 277 (EBCDIC) Denmark, Norway	N-6
Code Page 278 (EBCDIC) Finland, Sweden	N-7
Code Page 280 (EBCDIC) Italy	N-8
Code Page 281 (EBCDIC) Japan (Latin)	N-9
Code Page 284 (EBCDIC) Spain/Latin America	N-10
Code Page 285 (EBCDIC) United Kingdom	N-11
Code Page 290 (EBCDIC) Japanese (Katakana) Non-extended	N-12
Code Page 290 (EBCDIC) Japanese (Katakana) Extended	N-13
Code Page 297 (EBCDIC) France	N-14
Code Page 420 (EBCDIC) Arabic Bilingual	N-15
Code Page 423 (EBCDIC) Greece	N-16
Code Page 424 (EBCDIC) Israel (Hebrew)	N-17
Code Page 435 (EBCDIC) Teletext Isomorphic	N-18
Code Page 437 (IBM Personal Computer) USA	N-19
Code Page 500 (EBCDIC) Multilingual #5	N-20
Code Page 813 (ISO 8859, Part 7) Greece	N-21
Code Page 819 (ISO 8859, Part 1) Latin Alphabet No. 1	N-22
Code Page 833 (EBCDIC) Korea Extended	N-23
Code Page 836 (EBCDIC) Simplified Chinese Extended	N-24
Code Page 838 (EBCDIC) Thai Extended	N-25
Code Page 850 (IBM Personal Computer) Multilingual	N-26
Code Page 851 (IBM Personal Computer) Greece	N-27
Code Page 852 (ISO 8859-2) Personal Computer	N-28
Code Page 857 (ISO 8859-5) Turkey	N-29
Code Page 860 (IBM Personal Computer) Portugal	N-30
Code Page 861 (IBM Personal Computer) Iceland	N-31
Code Page 862 (IBM Personal Computer) Israel	N-32
Code Page 863 (IBM Personal Computer) Canadian French	N-33
Code Page 864 (IBM Personal Computer) Arabic	N-34
Code Page 865 (IBM Personal Computer) Nordic	N-35
Code Page 869 (IBM Personal Computer) Greece	N-36
Code Page 870 (ISO 8859-2) Multilingual	N-37
Code Page 871 (EBCDIC) Iceland	N-38
Code Page 874 (IBM Personal Computer) Thai Extended	N-39
Code Page 875 (EBCDIC) Greece	N-40
Code Page 880 (EBCDIC) Cyrillic, Multilingual	N-41
Code Page 891 (IBM Personal Computer) Korea	N-42
Code Page 897 (IBM Personal Computer) Japan PC #1	N-43
Code Page 903 (IBM Personal Computer) People's Republic of China (PRC)	N-44
Code Page 904 (IBM Personal Computer) Republic of China (ROC)	N-45
Code Page 905 (ISO 8859-9) PC-Turkey	N-46
Code Page 916 (ISO 8859-8) Hebrew	N-47
Code Page 920 (ISO 8859-9) Turkey	N-48
Code Page 1009 (7-Bit ISO) International Alphabet 5 (IA5)	N-49

|	Code Page 1024 (EBCDIC) Encoding of T.61 BTTX Characters	N-50
|	Code Page 1025 (EBCDIC) Cyrillic, Multilingual	N-51
|	Code Page 1026 (ISO 8859-9) Turkey	N-52
|	Code Page 1027 (EBCDIC) Japanese (Latin) Extended	N-53
|	Code Page 1036 (8-Bit ISO/ASCII) CCITT T.61 (BTTX)	N-54
|	Code Page 1040 (IBM Personal Computer) Korean Extended	N-55
|	Code Page 1041 (IBM Personal Computer) Japanese Extended	N-56
|	Code Page 1042 (IBM Personal Computer) Simplified Chinese Extended	N-57
|	Code Page 1043 (IBM Personal Computer) Traditional Chinese	N-58
|	Code Page 1046 (Not ISO 1089) Arabic	N-59
|	Code Page 1051 (8-Bit) H-P Emulation, Roman 8	N-60
|	Code Page 1088 (IBM Personal Computer) Korean	N-61
	Appendix O. Graphic Character Set	O-1
	Syntactic/Invariant Character Set 640	O-1
	Country Extended Character Set 697	O-2
	T.61 Character Set 1252	O-3
	T.61 Character Repertoire 1253 (1 of 2)	O-4
	T.61 Character Repertoire 1253 (2 of 2)	O-5
	Bibliography	P-1
	Index	X-1

Figures

1-1.	Coded Character Set Identifier (CCSID)	1-7
1-2.	National-Language-Dependent Functions	1-14
1-3.	Single AS/400 System with a Single (Primary) National Language (Spanish)	1-19
2-1.	A System with Three Secondary Languages	2-5
2-2.	CCSID Support of Display Files When the CHRID Value Is *JOBCCSID	2-10
2-3.	CCSID Support of Printer Files When *JOBCCSID Is Specified for the CHRID Parameter	2-12
2-4.	Sort Sequence Normal View	2-20
2-5.	Changes for Display Station Not Set for Code Page 500	2-26
2-6.	Changes for Display Station Set for Code Page 500	2-27
2-7.	Single AS/400 System with Primary Language and Two Secondary Languages	2-34
2-8.	Single System with AS/400 DBCS Primary and Secondary Languages and an SBCS Secondary Language	2-36
2-9.	Network of Three AS/400 Systems with Different Primary Languages	2-38
3-1.	Direct Coding on an Unnamed Output Field (Literal)	3-9
3-2.	Early Binding of Messages	3-10
3-3.	Late Binding of Messages	3-11
3-4.	Storing Text in Database Files	3-12
3-5.	Example of English Uppercase and Lowercase NLV (2924) Display	3-14
3-6.	Using Different Sort Sequences	3-19
3-7.	General-Purpose National Language Exit	3-20
3-8.	Organization of Application Parts	3-22
3-9.	Application in Two Different Language Versions	3-24
3-10.	Creating Different NLV Reports from Printer Files	3-31
3-11.	Creating Different NLV Messages from Message Files	3-33
3-12.	Display File Menu for National Language Version	3-34
3-13.	Program Menu for National Language Version	3-35
3-14.	Command Prompt Display in English	3-36
3-15.	DSPEMPRCD Command Prompt Display Translated into German	3-37
3-16.	Considerations in a Multilingual System	3-38
3-17.	A Multilingual Network Example	3-39
3-18.	RPG Program Example Using Variant Characters	3-40
3-19.	RPG Program Example Using Different Sort Sequences	3-41
3-20.	PC Transfer Request Display	3-48
3-21.	Layout of a Display for Bidirectional Languages	3-54
L-1.	2440 Tape Unit	L-2
M-1.	Arabic Speaking IBM Enhanced Keyboard	M-1
M-2.	Austrian/German IBM Enhanced Keyboard	M-1
M-3.	Belgian IBM Enhanced Keyboard	M-1
M-4.	Brazilian IBM Enhanced Keyboard	M-2
M-5.	Canadian French IBM Enhanced Keyboard	M-2
M-6.	Danish IBM Enhanced Keyboard	M-2
M-7.	Dutch IBM Enhanced Keyboard	M-2
M-8.	Finnish/Swedish IBM Enhanced Keyboard	M-2
M-9.	French (AZERTY) IBM Enhanced Keyboard	M-2
M-10.	Greek IBM Enhanced Keyboard	M-2
M-11.	Italian IBM Enhanced Keyboard	M-2

M-12.	Japanese IBM Enhanced Keyboard	M-2
M-13.	Korean IBM Enhanced Keyboard	M-2
M-14.	Latin/Hebrew IBM Enhanced Keyboard	M-2
M-15.	Norwegian IBM Enhanced Keyboard	M-2
M-16.	Portuguese IBM Enhanced Keyboard	M-3
M-17.	Spanish IBM Enhanced Keyboard	M-3
M-18.	Spanish-Speaking IBM Enhanced Keyboard	M-3
M-19.	Swiss-Bilingual-French IBM Enhanced Keyboard	M-3
M-20.	Swiss-Bilingual-German IBM Enhanced Keyboard	M-3
M-21.	Simplified Chinese IBM Enhanced Keyboard	M-3
M-22.	Traditional Chinese IBM Enhanced Keyboard	M-3
M-23.	Turkey IBM Enhanced Keyboard	M-3
M-24.	U.K. English IBM Enhanced Keyboard	M-3
M-25.	U.S. English IBM Enhanced Keyboard	M-4
M-26.	Special-Character Keyboard Set	M-5
M-27.	Special-Character Keyboard Set Lowercase Position	M-6
M-28.	Special-Character Keyboard Set Uppercase Position	M-6
M-29.	Special-Character Keyboard Set with ALT Key Position	M-7
M-30.	Austrian/German 122-Key Typewriter Keyboard	M-7
M-31.	Belgian 122-Key Typewriter Keyboard	M-7
M-32.	Canadian French 122-Key Typewriter Keyboard	M-7
M-33.	Danish 122-Key Typewriter Keyboard	M-7
M-34.	Finnish/Swedish 122-Key Typewriter Keyboard	M-7
M-35.	French (AZERTY) 122-Key Typewriter Keyboard	M-7
M-36.	Italian 122-Key Typewriter Keyboard	M-7
M-37.	Japanese Katakana 124-Key Typewriter Keyboard	M-7
M-38.	Norwegian 122-Key Typewriter Keyboard	M-7
M-39.	Portuguese 122-Key Typewriter Keyboard	M-7
M-40.	Spanish 122-Key Typewriter Keyboard	M-8
M-41.	Spanish-Speaking 122-Key Typewriter Keyboard	M-8
M-42.	Swiss-Bilingual-French 122-Key Typewriter Keyboard	M-8
M-43.	Swiss-Bilingual-German 122-Key Typewriter Keyboard	M-8
M-44.	U.K. English 122-Key Typewriter Keyboard	M-8
M-45.	U.S. English 122-Key Typewriter Keyboard	M-8

Tables

0-1.	CDRA APIs Provided	xx
1-1.	Data Integrity Is Not Maintained without CCSID Tags	1-8
1-2.	Data Integrity Is Maintained by Using CCSID Tags	1-8
1-3.	Using the Danish Language Sort Sequence Tables	1-10
1-4.	Using the English Language Sort Sequence Table	1-11
1-5.	Checklist for National Language and Multilingual Support	1-20
2-1.	Job Attributes	2-5
2-2.	Checklist for National Language and Multilingual Support	2-39
3-1.	Translation Expansion Table	3-7
3-2.	DBCS File Data Types	3-52
4-1.	OfficeVision/400 Language Dictionaries	4-12
4-2.	OfficeVision/400 Language Identifiers for Text Search Services	4-15
4-3.	Language Collating Sequence Support by Query/400	4-19
A-1.	National Language Version Feature Codes	A-1
A-2.	Translated National Language Versions (Part 1 of 2)	A-2
A-3.	Translated National Language Versions (Part 2 of 2)	A-4
C-1.	National Language Keyboard Types and SBCS Code Pages	C-1
C-2.	3477 and 3476 Keyboard and Display Part Numbers by Language	C-3
C-3.	3486 and 3487 Keyboard and Display Part Numbers by Language	C-8
D-1.	Language/Keyboard Computational Factor Table	D-2
E-1.	Checklist for National Language and Multilingual Support	E-1
F-1.	Encoding Scheme ID Values in CDRA Level 1	F-1
F-2.	Coded Character Set Identifiers (CCSID)	F-1
F-3.	Conversions Where Substitution Can Occur	F-5
F-4.	Associated CCSIDs and Encoding Schemes	F-6
G-1.	National Language Identifiers	G-1
G-2.	Country Identifiers	G-3
H-1.	Tables Shipped with System	H-2
H-2.	Arabic Sort Sequence	H-3
H-3.	Cyrillic Sort Sequence	H-6
H-4.	Danish Sort Sequence	H-8
H-5.	Greek Sort Sequence	H-11
H-6.	Hebrew Sort Sequence	H-14
H-7.	Icelandic Sort Sequence	H-17
H-8.	Japanese Sort Sequence	H-20
H-9.	Korean Sort Sequence	H-22
H-10.	Latin 1 Common Sort Sequence	H-25
H-11.	Latin-2 Sort Sequence	H-28
H-12.	Norwegian Sort Sequence	H-30
H-13.	Russian Sort Sequence Table	H-33
H-14.	Spanish Speaking Sort Sequence	H-35
H-15.	Swedish and Finnish Sort Sequence	H-37
H-16.	Thai Sort Sequence	H-39
H-17.	Turkish Sort Sequence	H-42
I-1.	Conversion Tables on the AS/400 System	I-1
I-2.	T.61 Conversions on the AS/400 System	I-12
I-3.	Monocase Tables	I-14
J-1.	PC Support National Language Information	J-1
L-1.	SRC Codes for Installing the SBCS Version 2 Release 3.0	L-10
L-2.	SRC Codes for Installing the DBCS Version 2 Release 2.0	L-35

I

N-1.	ISO Standards and IBM Code Pages	N-1
P-1.	AS/400 Manuals	P-1
P-2.	Related Information	P-4

Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of the intellectual property rights of IBM may be used instead of the IBM product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the responsibility of the user.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Commercial Relations, IBM Corporation, Purchase, NY 10577, U.S.A.

This publication could contain technical inaccuracies or typographical errors.

This publication may refer to products that are announced but not currently available in your country. This publication may also refer to products that have not been announced in your country. IBM makes no commitment to make available any unannounced products referred to herein. The final decision to announce any product is based on IBM's business and technical judgment.

Changes or additions to the text are indicated by a vertical line (|) to the left of the change or addition. Refer to the "Summary of Changes" on page xxi for a summary of changes made to the AS/400 program and how they are described in this publication.

This publication is for planning purposes only. The information herein is subject to change before the products described become available.

This publication contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

This publication contains small programs that are furnished by IBM as simple examples to provide an illustration. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. All programs contained herein are provided to you "AS IS". THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED.

Trademarks and Service Marks

The following terms, denoted by an asterisk (*) in this publication, are trademarks of the IBM Corporation in the United States or other countries or both:

| Advanced Function Printing	Integrated Language Environment
| AD/Cycle	MVS/ESA
| AFP	MVS/XA
| Application System/400	OfficeVision
| AS/400	OfficeVision/400
| AT	Operating System/2
| C/400	Operating System/400
| CallPath/400	OS/2
| CICS/400	OS/400
| COBOL/400	Personal System/2
| DATABASE 2	Personal System/55
| DataHub	PS/2
| DB2	PS/55
| Display Manager	RPG/400
| Distributed Relational Database Architecture	SAA
| DRDA	SQL/400
| ES/9000	SQL/DS
| FORTRAN/400	Systems Application Architecture
| GDDM	SystemView
| IBM	System/370
| ILE	System/390
| Information Warehouse	400
| InfoWindow	

| The following terms, denoted by a double asterisk (**) in this publication, are trademarks of other companies as follows:

Century Schoolbook	American Type Foundry
ITC Avant Garde Gothic	International Typeface Corporation
ITC Souvenir	International Typeface Corporation
| Microsoft Windows	Microsoft Corp.
Monotype Arial	The Monotype Corporation plc.
Monotype Garamond	The Monotype Corporation plc.
Monotype Times New Roman	The Monotype Corporation plc.
RM/COBOL-85	Ryan McFarland Corporation
| RUMBA	Wall Data Incorporated

About This Guide

This guide contains information on:

- Understanding national language support concepts for the system.
- Using national language support in a multilingual environment.
- Writing internationalized applications in a multilingual environment.
- Describing how the licensed programs are affected by national language support in a multilingual environment.
- Finding where to go for more information about national language support and the multilingual environment on the system.
- Using reference information for keyboard types, code pages, coded character set identifiers (CCSIDs), language identifiers (LANGIDs), and country identifiers (CNTRYIDs).

Use this guide to plan for and use the national language support (NLS) function on the AS/400 system.

You may need to refer to other IBM manuals for more specific information about a particular topic. The *Publications Guide*, GC41-9678, provides information on all the manuals in the AS/400 library.

This guide does not contain information on how to use application program interfaces (APIs) for national language support. For more information on the following APIs, go to the *System Programmer's Interface Reference*.

- QLGRTVSS (Retrieve Sort Sequence Table)
- QLGCNVSS (Convert Sort Sequence Table)
- QLGRTVLID (Retrieve Language Identifier)
- QLGVLI (Validate Language Identifier)
- QLGSORT (Sort)
- QLGSRTIO (Sort I/O)
- QLGSCMNX (Scan String for Mixed Data)
- QLGTRDTA (Truncate Character Data)
- QECEDT (Edit)

The Character Data Representation Architecture (CDRA) APIs are located in the QSYS2 library. You should ensure that this library has been installed on your system if you want to use the APIs by the CDRxxxx name.

For users who do not have QSYS2 installed on their system, equivalent APIs with a QTQ prefix and the same interface are provided in the QSYS library.

<i>Table 0-1. CDRA APIs Provided</i>		
Name in QSYS2 Library	Name in QSYS Library	Description
QDRGESP	QTQGESP	Get Encoding Scheme
CDRSCSP	QTQSCSP	Get Short Form CCSID
CDRCVRT	QTQCVRT	Converet a Graphic Character String
CDRGRDC	QTQGRDC	Get Related Default CCSID
CDRGCCN	QTQGCCN	Get CCSID for Normalization)

For more information on the CDRA APIs, go to the *Character Data Representation Architecture, Level 2 Reference*, SC09-1390.

For a list of related publications, see the *Bibliography* in this guide.

Who Should Use This Guide

The information in this guide is intended for executives, data processing managers, system operators, application programmers, system programmers, and administrators/supervisors.

You should be familiar with basic computer concepts, computer systems, and with the general programming concepts and terminology as they apply to national languages. This guide discusses these topics as they relate to the AS/400 system functions and utilities.

Whenever display station is referred to in the guide, it includes the personal computer, except where stated otherwise.

Whenever the term **conversion** is used in the guide, it pertains to converting a code point assigned to a character in one code page to its corresponding code point assigned in another code page. The term conversion does not include translation from one national language to another.

Summary of Changes

The following major changes were made since the previous edition of the manual.

Sort Sequence Support

Sort sequence tables have been added to the system as an easier way to sort character data. A sort sequence system value is discussed in Chapter 1, "What is National Language Support." The system implementation of sort sequence is discussed in Chapter 2, "What is Multilingual Support." Chapter 3, "Developing an Internationalized Application" contains sort sequence information for the application developer. Appendix H, "Sort Sequence Tables" contains copies of the sort sequence tables.

Language Identifiers and Country Identifiers

Language identifiers are used with the sort sequence support and are discussed in Chapter 1, "What is National Language Support." Appendix G, "Language and Country Identifiers" contains a copy of the language identifiers and country identifiers supported by the AS/400 system.

Coded Character Set Identifiers

Additional support for coded character set identifiers (CCSID) values is possible through a new value, *JOBCCSID, on the CHRID parameter for display files, printer files, UIM menus, and UIM panel groups. The *JOBCCSID value is discussed under the topics "Other Language-Dependent or Culture-Dependent System Functions" on page 1-16 and "Workstation Function Management Support for Coded Character Set Identifiers" on page 2-8.

Character integrity is ensured for all characters when conversion takes place between CCSIDs. Appendix F, "Coded Character Set Identifiers (CCSIDs)" has been updated to include all CCSIDs supported on the AS/400 system.

REXX/400 and Coded Character Set Identifiers

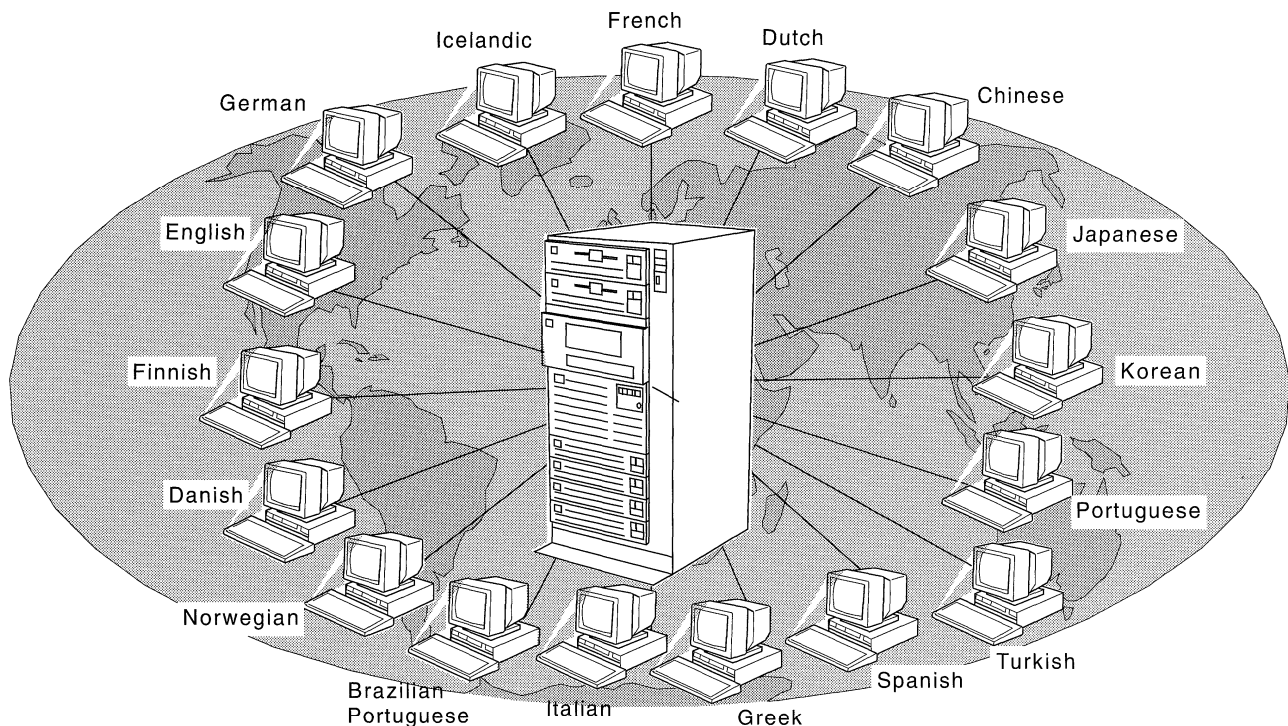
REXX/400 now supports CCSID values and is discussed under "REXX/400" on page 4-3. Appendix K, "REXX/400 Extension Characters" is a new appendix.

Miscellaneous Changes

- The 3486, 3487, and 3488 display stations are added to "Display Stations" on page 2-24 and Appendix D, "Multilingual Support for the AS/400 Workstation Controller"
- A cross-reference between ISO standards and AS/400 code pages is added to Appendix N, "Code Pages." Some code pages are renamed for the ISO standard they represent.
- The appendixes are rearranged to include the new appendixes and how the user might use them.
- Short titles have been added to the *Bibliography* for AS/400 manuals.

Chapter 1. What is National Language Support

National language support (NLS) is the ability for a user to communicate with hardware and software products in a language of choice to obtain results that are culturally acceptable. The AS/400* system supports many national languages in the form of national language versions. Each national language version uses character information (such as character sets, code pages or coded character set identifiers) for its language. The character information can be changed through the use of language-dependent or culture-dependent system values and national language dependent functions or job attributes.



RV2C058-2

National Language Version

For the primary language, the **national language version** consists of the running (program) code and textual data for each licensed program ordered along with the national language cultural values. The cultural values are explained in “Language-Dependent or Culture-Dependent System Values” on page 1-12. **Textual data** is a collective term for menus, displays, lists, prompts, options, online help information, and messages.

All AS/400 systems worldwide use a common set of program code, with different textual data for each language used by a customer. On a system that supports more than one language, there is one set of program code and multiple versions of textual data to support the additional languages.

For each licensed program installed on the system, the national language version for the primary language is in the product library. For example, the Operating System/400* program ordered in Spanish (whose national language version feature code is 2931 for a primary language) is installed in library QSYS as a primary language.

Setting Up the National Language Version

For each AS/400 licensed program ordered, you specify a language feature code to identify a national language version (NLV). It is *required* that all licensed programs ordered for your system have the same language feature code as the primary language of the system. The national language versions available for AS/400 licensed programs are listed in Appendix A, “National Language Version Feature Codes” on page A-1.

If you want to use the AS/400 licensed programs in a language in addition to the primary national language, you can order additional languages from the program library or contact your marketing support representative in your country. For example, a customer in Germany may need support for both German and French on one AS/400 system.

The feature code identified when you ordered the Operating System/400* (OS/400*) program is the language of your textual data and is called the **primary language** of the system. Any other language versions ordered are called **secondary languages**. For secondary languages, the **national language version** consists of only the textual data for all licensed programs ordered. The program code is not contained in the secondary language version. Working with secondary languages is discussed in more detail in Chapter 2, “What is Multilingual Support.”

The primary language is the language in which the system is serviced and from which all language-dependent or culture-dependent system values are initialized. In addition, other system objects and functions assume attributes based on the primary language. For example, messages appearing in the history log always appear in the primary language.

To correctly process and display information in the language chosen, you must use language-dependent system values. The system provides default system values for each of the primary languages.

Refer to “Licensed Programs for National Language Versions” on page A-2 to see which licensed programs are translated into a secondary language.

The *Licensed Programs and New Release Installation Guide*, SC41-9878, contains all the information you need to install your primary language and licensed programs.

Character Information (Data)

This section describes character sets, code pages, encoding schemes, and Character Data Representation Architecture (CDRA).

I Graphic Character Sets

Graphic characters are symbols, such as letters, numbers, and punctuation marks, that can be entered on a keyboard, printed, or displayed. A collection of graphic characters is called a **character set**, or sometimes a **graphic character set**. A character set is a group of characters used for a specific reason. For example, the set of characters the display station can display, the set of characters a printer can print, or a particular set of graphic characters in a code page are all character sets. (Note, however, that a character set is not the same as a display or printer font.)

With only a few exceptions, each character set contains the following common set of graphic characters: the uppercase English letters A to Z, the lowercase English letters a to z, the numerals 0 to 9, and 19 miscellaneous symbols. This set is called the syntactic/invariant character set and has been assigned character set identifier 640 by IBM. See “Syntactic/Invariant Character Set 640” on page O-1.

Groups and Subgroups

Groups and subgroups are logical classifications of the character sets used within different countries to support different languages, grouping into sets with common properties.

Group 1: Latin Alphabet Number 1 character set; uses single-byte codes

- Americas
 - Canada
 - Latin America: Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, El Salvador, Surinam, Uruguay, and Venezuela
 - United States of America
- Western Europe: Austria, Belgium, Denmark, Faroe Islands, Finland, France, Germany, Iceland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.
- Other parts of the world
 - Australia
 - Hong Kong (Latin)
 - New Zealand

Group 1a: Consists of several different character sets that can be represented using single-byte codes. These character sets include non-Latin characters and some Latin ones that could not be accommodated in the Latin Alphabet Number 1 character set.

- Arabic Scripts subgroup
 - Arabic: Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates, and Yemen
 - Urdu: Pakistan
 - Farsi: Iran

- Arabic-French: Algeria, Morocco, and Tunisia
- Latin Alphabet Number 2 subgroup
 - Albania
 - Bosnia
 - Croatia
 - Czech Republic
 - Hungary
 - Poland
 - Romania
 - Slovenia
 - Some countries of the former Yugoslavia
- Cyrillic subgroup
 - Byelorussia
 - Bulgaria
 - Russian Federation
 - The Ukraine
 - Some countries of the former Yugoslavia
- Greek (Greece)
- Turkish (Turkey)
- Hebrew (Israel)

Group 2: Character sets for countries in the Far East. These character sets are represented using double-byte code pages. They are often used along with single-byte code pages.

- Double-byte subgroups
 - Japanese
 - Korean
 - Simplified Chinese (People's Republic of China)
 - Traditional Chinese (Republic of China)
 - Thai (Thailand, device character sets)
- Single-byte character sets often used with the double-byte subgroups
 - Katakana (Japan)
 - Korean (Korea, small set)
 - Simplified Chinese (People's Republic of China, small set)
 - Traditional Chinese (Republic of China, small set)
 - Thai (Thailand, processing and interchange set)

Some languages are different from Latin-based languages in more than character sets alone. For example, the general direction of Hebrew and Arabic text is from right to left across the page in successive lines, from top to bottom down the page. However, numbers and Latin character phrases are written from left to right. Because text and numbers are often intermixed, these languages are **bidirectional** in nature.

Code Points

Character information can be represented in computers by one or more bytes of information known as code points. **Code points** are hexadecimal values assigned to each graphic character, to be used by the computer for entering, storing, changing, viewing, printing, or exchanging information.

Code Page

A **code page** is a collection of graphic characters assigned to code points.

Each graphic character of a graphic character set is represented by a unique value on a specific code page. Along with the graphic characters, a code page also contains control characters used by the system, or by applications. The code page may vary from country to country. Characters outside of the syntactic or invariant character set may have different code points, depending on the code page in use. For example, in the United Kingdom (using code page 285) the pound sterling sign is represented internally as an EBCDIC X'5B'; in the United States (U.S. English code page 037) an EBCDIC X'5B' is a dollar sign. See Appendix N, "Code Pages" for illustrations of actual code pages supported on the AS/400 system.

Character Identifier

The AS/400 system has a character identifier (CHRID) value. A CHRID is a 4-byte value, which is a concatenation of the character-set ID followed by the code-page ID. The **character-set ID** is a 5-digit registered identifier used to specify a graphic character set. The character-set ID is the first part of the QCHRID system value or the CHRID parameter value. The **code-page ID** is a 5-digit registered identifier used to specify a particular assignment of code points to graphic characters. The code-page ID is the second part of the QCHRID system value or the CHRID parameter value.

Encoding Scheme

Underlying each code page is an **encoding scheme**. Encoding scheme definitions specify the coding space (number and allowable value of code points in a code page), rules for sharing the coding space between control and graphic characters and rules related to specific options (such as the number of bits in a byte, single-byte, double-byte, or mixed byte) permitted in that scheme. The rules for encoding schemes are followed when code points are assigned to graphic characters in a particular code page. For example, graphic characters can be encoded in the following encoding schemes: Extended Binary Coded Decimal Interchange Code (EBCDIC), American Standard Code for Information Interchange (ASCII), or IBM Personal Computer. See Table F-1 on page F-1.

For languages that are not alphabet-based, a double-byte character set (DBCS) encoding is used. For example, DBCS is used for the Japanese, Chinese, and Korean languages, because they are ideographic in nature, with very large numbers of characters. DBCS is an extension of existing encoding schemes.

- A **single-byte character set (SBCS)** is a character set in which each character is represented by a one-byte code.
- A **double-byte character set (DBCS)** is a set of characters in which each character is represented by 2 bytes. Languages such as Japanese, Chinese, and Korean, which contain more symbols than can be represented by 256 code points, require double-byte character sets. Because each character requires 2

bytes, the typing, displaying, and printing of DBCS characters requires hardware and programs that support DBCS. Four double-byte character sets are supported by the system: Japanese, Korean, Simplified Chinese, and Traditional Chinese.

Additional Coding-Related Required Information

Some encoding schemes require specifications beyond the character set and code page elements to complete their definitions. Such specifications are called **additional coding-related required information**.

Character Data Representation Architecture

The SAA* **Character Data Representation Architecture (CDRA)** provides cross-system support for the management of character information. CDRA defines the coded character set identifier (CCSID) values to identify the code points used to represent characters, and to convert these codes (character data), as needed to preserve their meanings.

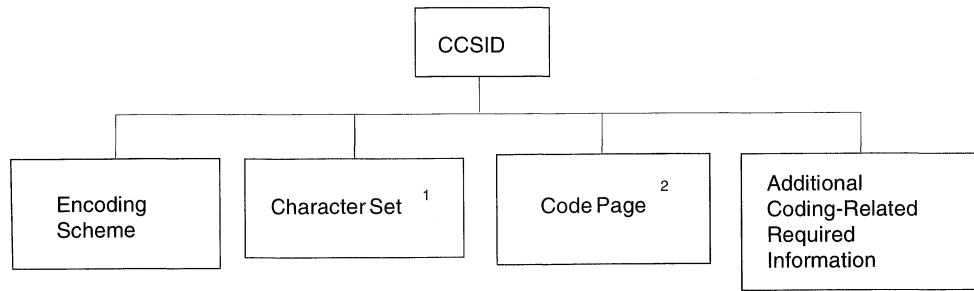
The overall objective of CDRA is to define a method of assigning and preserving the meaning of coded graphic characters through various stages of processing and interchanging.

Coded Character Set Identifier

To achieve character data integrity, CDRA tags all character data. Tagging is a process used to identify and to associate certain attributes with character data. Tagging can be either the long-form identification or the short-form identification. **Long-form identification** consists of the encoding scheme, the character set, the code page, and additional coding-related required information. The **short-form identification** uses a 2-byte tag or value called a **coded character set identifier (CCSID)** that indicates the encoding structure of the data. The CCSID is used as an index into a resource table to obtain the associated resources. A CCSID consists of a specific set of an encoding scheme identifier, character set identifiers, code page identifiers, and additional coding-related required information that uniquely identifies the coded graphic character representation used. A CCSID tag is an alternative to the variable-length long form.

A **mixed CCSID** supports a mixed-byte encoding scheme (single-byte and double-byte). CCSID 05026 is an example of a mixed CCSID. CCSID 05026 contains SBCS code page 290 and DBCS code page 300.

The following illustration shows the parts of a CCSID:



¹ Can be more than one character set for a mixed CCSID.

² Can be more than one code page for a mixed CCSID.

RV2C075-1

Figure 1-1. Coded Character Set Identifier (CCSID)

For a list of supported CCSIDs, refer to Appendix F, “Coded Character Set Identifiers (CCSIDs).”

Conversion: Conversion pertains to converting a code point assigned to a character in one code page to its corresponding code point in another code page. Conversion should not be equated to translating from one language to another.

The following two methods are used for conversion.

1. Round-trip conversion. The integrity of all character data is maintained from the source CCSID to the target CCSID and back to the source. The graphic characters that are in both the target CCSID and source CCSID are preserved. Any characters outside of the target CCSID are arbitrarily assigned unique code points in the target CCSID.

When performing a round-trip conversion, you may see incorrect representation of the characters displayed in the target CCSID. The integrity is preserved, however. When the characters are converted back to the source CCSID, they regain their original hexadecimal values.

2. Enforced subset match conversion (substitution). Characters that exist in both the source and target CCSID have their integrity maintained. Characters in the source CCSID but not in the target CCSID are replaced:

- In EBCDIC encoding with X'3F'
- In ASCII encoding with X'7F'

Replaced values are also referred to as substitution characters. For EBCDIC encoding, these appear on most display stations as a solid block (■). For ASCII encoding, these substitution characters appear differently.

Note: After the conversion, characters that are not included in the target CCSID are represented to the user as substitute characters. This substitution is permanent when converting back to the source CCSID because it is not possible to retrieve their original hexadecimal values. The replacement values may become permanent values if the data is updated.

For a list of CCSID conversions that result in substitution characters, see Table F-3 on page F-5.

One of the ways a CCSID value can be assigned is through a system value. CDRA defines the following range of values for CCSIDs:

CCSID Value	Purpose/Meaning
00000	Use next higher hierarchical CCSID
00001 through 28671	IBM-registered CCSIDs
28672 through 65533	Reserved
65534	Refer to lower hierarchical CCSID
65535	No automatic conversion of data between this CCSID and any other CCSID. This is the default setting of the QCCSID system value.

CDRA uses a tag field to hold a CCSID value to identify the meaning of coded graphic characters. The tag field may be in a data structure that is logically associated with the data object (explicit tagging), or it may be inherited from the tag field associated with the other objects within the operating system (implicit tagging).

Character Data Integrity

Maintaining data integrity when character data is passed from system to system or user to user is critical to customers. Coded character set identifier (CCSID) support changes how character information (data) is stored and accessed on the system by assigning a value that uniquely identifies the coded graphic character representation used.

The following shows the meaning of maintaining data integrity. A file created by a U.S. user contains a dollar sign and is read by a user in the United Kingdom and in Denmark. If the application does not use CCSID tags, the users will see different characters.

Table 1-1. Data Integrity Is Not Maintained without CCSID Tags

Country	Keyboard Type	Code Page	CCSID	Code Point	Character
U.S.	USB	037	65535	X'5B'	\$
U.K.	UKB	285	65535	X'5B'	£
Denmark	DMB	277	65535	X'5B'	Å

With AS/400 CCSID support, the integrity of the character is maintained. When the file is created with CCSID 037, the user in the United Kingdom (job CCSID 285) and the user in Denmark (job CCSID 277) see the same character. Database management takes care of the mapping.

Table 1-2. Data Integrity Is Maintained by Using CCSID Tags

Country	Keyboard Type	Code Page	CCSID	Code Point	Character
U.S.	USB	037	00037	X'5B'	\$
U.K.	UKB	285	00285	X'4A'	\$
Denmark	DMB	277	00277	X'67'	\$

CCSID support is particularly important when:

- More than one national language version, keyboard, and display station is installed on the AS/400 system.

- Multiple AS/400 systems are sharing data between systems with different national language versions.
- The correct keyboard support for a language is not available when you want to encode data in another language.

Refer to “System CCSID Implementation” on page 2-6 for more information on how to use CCSIDs.

For a list of the OS/400 CCSIDs, refer to Appendix F, “Coded Character Set Identifiers (CCSIDs)” and for a complete list of the CDRA CCSIDs, the *Character Data Representation Architecture - Level 1, Registry*, SC09-1391.

For an overview of the architecture, refer to *Character Data Representation Architecture Executive Overview*, GC09-1392.

For a complete discussion of the architecture, refer to the *Character Data Representation Architecture - Level 1 Reference*, SC09-1390.

Related Architectures

The Distributed Relational Database Architecture* and the Distributed Data Management are dependent on the Character Data Representation Architecture (CDRA).

Distributed Relational Database Architecture

Distributed Relational Database Architecture (DRDA*) protocol is a connection protocol for distributed relational database processing that is used by the IBM relational database products. The DRDA protocol comprises protocols for communication between an application and a remote relational database, and communication between relational databases. The DRDA protocol provides the connections for remote and distributed processing. It allows an application to be created at one location and run against a relational database at a different location. In this regard, DRDA protocol is dependent on CDRA and cannot function without it.

Distributed relational database support is available on the following IBM SAA database managers:

- OS/400 program
- SQL/DS* on IBM System/370* VM
- DB2* on IBM System/370 MVS
- OS/2* Extended Edition Database Manager

DRDA protocol is built on the Distributed Data Management (DDM) Architecture. For more information on Distributed Relational Database on the AS/400 system, refer to the *Database Guide*.

Distributed Data Management (DDM)

If Distributed Data Management (DDM) or Distributed Relational Database Architecture (DRDA) support is used to access and interchange database data, conversions between CCSIDs on the system are automatic. **Distributed Data Management** is a function of the OS/400 program that allows an application program or user on one system to use database files on remote systems. The systems must be connected by a communications network, and the remote systems must also be using DDM. **Distributed Data Management (DDM) Architecture** is an architecture that

defines the protocol used for communicating between two systems using distributed file management and the distributed relational database.

For DDM, the conversions are automatic only if all the systems are AS/400 systems running Version 2 Release 1.1 or later. For more information on DDM, refer to the *DDM Guide*.

National Language Sequence Support

National language sequence support provides the capability to easily write applications to correctly sequence character data.

A **sort sequence** is the order in which characters are arranged within the computer for sorting, combining, or comparing data. A set of shared-weight and unique-weight sort sequence tables for the SBCS languages is provided on the AS/400 system.

A **shared-weight sequence** is a sort sequence in which some graphic characters may have the same weight as some other characters in the sequence. Those with the same weight sort together as if they were the same character. For example, the letters *a* and *A* might both have the same value 24. This would ensure that words such as *able* and *Able* would be kept together in a list. In a simple sort table, *a* and *A* might share the value 24, and *b* and *B* might share the value 25 and so on.

A **unique-weight sequence** is a sort sequence in which each graphic character has a weight different from the weight of every other graphic character in the sequence.

These tables are shown in Appendix H, "Sort Sequence Tables."

Before national language sequence support was available, the AS/400 system used only the internal representation of a character (binary representation) as a default for sorting data. Sorting by binary representation can produce results that are not in the culturally expected order for all languages. Regardless of the country or language in use, with sort sequence support you can sort lists that match the order consistent with the usage of the language and the alphabet. Table 1-3 shows an example using a binary sort sequence, a shared-weight and a unique-weight sort sequence for the Danish code page 277.

Binary Sort Sequence		Shared-Weight Sort Sequence Using LANGID(DAN) and SRTSEQ(*LANGIDSHR)		Unique-Weight Sort Sequence Using LANGID(DAN) and SRTSEQ(*LANGIDUNQ)	
Ågård	Maria	Andersen	Jens	Andersen	Jens
Ægidius	Poul	Nielsen	Lars	Nielsen	Lars
Ørsted	Hans	Zeuthen	Hans	Zeuthen	Hans
Andersen	Jens	Nielsen	Lars	Ægidius	Poul
Nielsen	Lars	Órsted	Hans	Ørsted	Hans
Zeuthen	Hans	Ørsted	Hans	Órsted	Hans
Órsted	Hans	Ågård	Maria	Ågård	Maria

Table 1-4 on page 1-11 shows an example of a shared-weight sort sequence and the binary sorted sequence for English code page 037.

Table 1-4. Using the English Language Sort Sequence Table

Binary Sort Sequence		Shared-Weight Sort Sequence Using LANGID(ENU) and SRTSEQ(*LANGIDSHR)		Unique-Weight Sort Sequence using LANGID(ENU) and SRTSEQ(*LANGIDUNQ)	
Jones	Mary	JOHNSON	JOHN	JOHNSON	JOHN
JOHNSON	JOHN	JONES	MARTIN	Jones	Mary
JONES	MARTIN	Jones	Mary	JONES	MARTIN
Smith	Ron	SMITH	ROBERT	Smith	Ron
SMITH	ROBERT	Smith	Ron	SMITH	ROBERT

Applications can refer to the sort sequence tables to correctly sequence the data in an order that is culturally acceptable using the following:

- OS/400 database
- Query Manager functions
- Query/400 licensed program
- RPG/400, C/400, SQL/400, and COBOL/400 compilers

Many commands and system functions also allow a single sort sequence table to be referred to in all parts of an application. For more information on the sort sequence support, see "System Sort Sequence Support" on page 2-17.

Language-Dependent or Culture-Dependent System Values

The national language environment of a job (along with the overall processing environment) is determined by the job attributes and the object attributes that work with the job. To achieve a consistent national language environment, the AS/400 system provides several alternatives to assist system administrators in setting these attributes.

The national language implementation on the AS/400 system starts with defining the national-language-dependent values. These values correspond to values of the primary language on the system, considered as system-wide defaults, and are stored as system values. For individual users, different values can be stored in the user profiles and then can be used as defaults when setting job attributes and object attributes. Job attributes can also be used as defaults for setting object attributes created or changed under the control of that job.

If you are using more than one language, you may need different copies of some objects with different attributes. Those objects can be stored in different libraries under the same name. The library list has to be set for you to access the proper object required for the language you are using.

The language-dependent default system values (with the exception of QDATE, QYEAR, QMONTH, QDAY, QUTCOFFSET, QSYSLIBL, QSRTSEQ, QIGC, and QLEAPADJ) for each of the supported languages can be found in Appendix B, "National Language Version Default System Values." The language-dependent system value keywords include the following:

- QCCSID (coded character set identifier)
- QCHRID (default character set and code page)
- QCNTYID (country identifier)
- QCURSYM (currency symbol)
- QDATE (system date)
- QDATFMT (date format)
- QDATSEP (date separator)
- QDAY (day of the month)
- QDECFMT (decimal format)
- QIGC (DBCS system indicator)
- QKBDTYPE (specifies the language character for the keyboard)
- QLANGID (language identifier)
- QLEAPADJ (leap-year adjustment)
- QMONTH (month of the year)
- QSYSLIBL (system part of library list)
- QSRTSEQ (sort sequence)
- QTIMSEP (time separator)
- QUTCOFFSET (coordinated universal time offset)
- QYEAR (year)

The Work with System Value (WRKSYSVAL) command provides an interface to display or change these values.

Note: When changing the primary language, each system value is reset to the default value for the new primary language.

In addition, the *Work Management Guide* contains detailed information for all the system values.

National-Language-Dependent Functions

Any function of a product that must be altered to suit a new country or language is defined as a **national-language-dependent function**. Examples include date formats, monetary values, and measurement systems. Also, the sorting, merging, and comparing functions may vary depending on the national language. Functions may also vary by language within a country, such as French and English in Canada.

Some ways you can change the national-language-dependent functions are:

- | With system and subsystem values
- | In the user profile
- | With job attributes
- | With specified data types

Figure 1-2 on page 1-14 shows the relationship between the system values and the national-language-dependent functions.

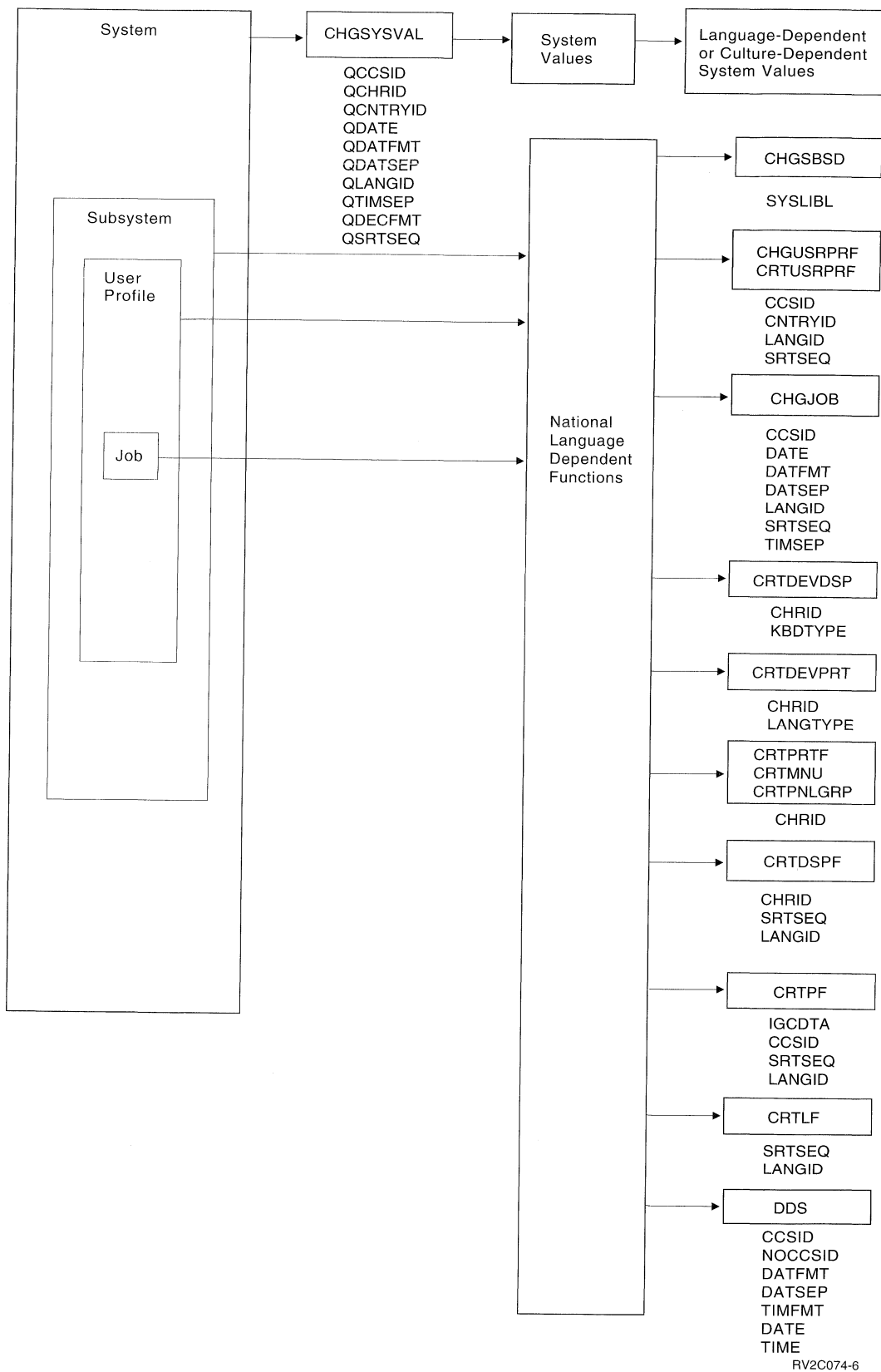


Figure 1-2. National-Language-Dependent Functions

Changing National-Language-Dependent System Values

The culture-dependent system values are used to set the values for the national-language-dependent system functions of the primary language user.

QCHRID is one national-language-dependent system value that is based on the primary language of the shipped system. The Change System Value (CHGSYSVAL) command or the Work with System Value (WRKSYSVAL) command can be used to change this value. The QCHRID system value cannot be changed unless the QCCSID system value is 65535 or the code page of the QCHRID is the same as the code page of the QCCSID system value. When the QCCSID system value changes, the QCHRID system value is changed accordingly. If the QIGC system value is set on, the QCCSID system value must be set to a mixed CCSID (for example, 05026) or to CCSID 65535.

QDECFMT is another system value that is based on the primary language of the shipped system.

QSRTSEQ is a system value that can be changed to support a specific sort sequence. Use the CHGSYSVAL (Change System Value) command or the WRKSYSVAL (Work with System Value) command to specify either of the following:

- A shared-weight table or a unique-weight table for the language specified by the language identifier in effect.
- A sort sequence table.

QLANGID is a system value that is used to specify a language identifier. Along with the QSRTSEQ system value, the QLANGID system value determines the sort sequence table to be used. QCNTYID is a system value that is used to specify a country identifier. The CHGSYSVAL or WRKSYSVAL commands allow you to change the QLANGID and QCNTYID system values. You can then choose the correct language dictionary, encoding of data, and advanced linguistics for successful document indexing.

Changing National-Language-Dependent Functions in User Profiles

When having a single system supporting multiple languages, the user profile should be used for initial settings of national-language-dependent functions. The coded character set identifier (CCSID) parameter in the user profile:

- Must be set to a SBCS (single-byte character set) CCSID or to CCSID 65535 for SBCS users.
- Must be set to a mixed CCSID or to CCSID 65535 for DBCS (double-byte character set) users.
- Can be set to SBCS CCSID on a DBCS system for single-byte users.
- Can reflect the CHRID value of the input and output device.

Use the Create User Profile (CRTUSRPRF) and the Change User Profile (CHGUSRPRF) commands to specify the default values for the user or language of choice.

The language identifier (LANGID) and country identifier (CNTYID) parameters allow you to pick the correct language dictionary and advanced linguistics for successful document indexing.

Note: There is no validity checking between the QCNTYID system value and QLANGID system value with the QCCSID system value.

Changing National-Language-Dependent Job Attributes

Some job attributes can be changed at the time a job runs. The Change Job (CHGJOB) command allows you to specify the values for the following parameters:

- job date
- date format
- date separator
- time separator
- coded character set identifier (CCSID)
- sort sequence,
- language identifier
- country identifier

For the CCSID value:

- If the job CCSID is mixed, it is a DBCS-capable job.
- If the job CCSID is SBCS, it is not a DBCS-capable job.

Note: The job CCSID cannot be mixed if the DBCS system value (QIGC) indicates a DBCS national language version is not installed on the system.

When a job is started, the job CCSID value is taken from the user profile under which the job is running. For every mixed or DBCS CCSID, there is a corresponding SBCS CCSID that is valid. If a mixed DBCS CCSID was specified for a SBCS system, the job CCSID is changed to the corresponding SBCS CCSID. If a valid CCSID cannot be found, then the job CCSID is changed to 65535.

Other Language-Dependent or Culture-Dependent System Functions

Other language-dependent functions affect display or printer devices, display files, printer files, database files, menus, and panel groups.

Display and Printer Devices

Following are the CL command parameters that can be used to change other language-dependent or culture-dependent system functions.

- Character Identifier (CHRID) parameter

The CHRID parameter can be specified when creating device descriptions using the following commands:

- The Create Device Description (Display) (CRTDEV DSP)
- The Change Device Description (Display) (CRTDEV DSP)
- The Create Device Description (Printer) (CRTDEV PRT)
- The Change Device Description (Printer)

- Keyboard Type (KBdtype) parameter

The KBdtype parameter can be specified when creating device descriptions using the CRTDEV DSP command to specify a keyboard language type.

- Workstation Customization (WSCST) parameter

The WSCST parameter can be specified when creating device descriptions using the CRTDEV DSP command to specify the usage of a customized national language keyboard layout. For more information on using the WSCST parameter, see “Workstation Customization” on page 2-23.

- Language Type (LNGTYPE) parameter

When an ASCII printer is created using the CRTDEVPRT command, the LNGTYPE parameter describes the default country keyboard language identifier for the printer. When the *SYSVAL value is specified, the QKBDTYPE system value is used. For a list of valid language identifiers when the *SYSVAL value is not specified, refer to the *CL Reference*.

Display and Printer Files

Following are the keywords and command parameters that can be used to change other display and printer files related to language-dependent or culture-dependent system functions.

- Character Identifier (CHRID) keyword in DDS

This field-level keyword identifies fields to be converted to the character identifier (CHRID) of the device. This keyword is used in conjunction with the CHRID parameter on the CRTDSPF, CHGDSPF, CRTPRTF, CHGPRTF, and OVRPRTF commands, but is ignored when the CHRID parameter is set to *JOBCCSID.

- The Create Display File (CRTDSPF), Change Display File (CHGDSPF), Create Printer File (CRTPRTF), Change Printer file (CHGPRTF), and Override Printer File (OVRPRTF) commands

You can specify a character identifier explicitly:

- As the QCHRID system value (*SYSVAL).
- As a device description of the output device (*DEV).
- With the *JOBCCSID value. If *JOBCCSID is specified:

- For displays, conversion of constant data is automatically done from the character identifier, taken from the CCSID of the display file to the character identifier of the display device. Character data in input and output fields is converted between the character identifier (CHRID) of the device and the character identifier (CHRID) taken from the CCSID of the job.
- For printers, automatic conversion of the constant data in externally described printer files is done from the CCSID of the printer file to the CCSID of the job. CHRID values taken from the CCSID of the job are sent to the printer to tell how to interpret the data to be printed. If the CCSID of the job is 65535, no conversion is done and the device default setting is used.

- The SRTSEQ parameter and LANGID parameter on the CRTDSPF command can be used to specify a sort sequence and a language identifier for a display file.

Note: If *JOBCCSID is not specified for the CHRID parameter of a display file, the CHRID parameter of the display file must be compatible with the job CCSID. Otherwise unpredictable results might occur when data is displayed or when data is stored in a database file.

Database Files

Following are the keywords that can be used to change language-dependent values for database files.

- The CCSID keyword in DDS can be used to tag character data stored in a database. By default, the CCSID value is taken from the job creating the database file.
- The SRTSEQ parameter and LANGID parameter on the Create Physical File (CRTPF) and the Create Logical File (CRTLFL) commands can be used to specify a sort sequence and language for a file.
- TIMFMT, DATFMT, TIMSEP, and DATSEP keywords in DDS

The format of the data type Time (T) field is described by DDS with the TIMFMT keyword that can have *JOB specified for a value. Similarly, the format of the data type Date (L) is described by DDS with the DATFMT and can have *JOB specified for a value.

TIMSEP and DATSEP keywords allow you to specify date and time separators.

Menus and Panel Groups

The CHRID parameter on the Create Menu (CRTMNU) command for creating menus can be used to specify a *JOBCCSID value for a menu. The CHRID parameter on the Create Panel Group (CRTPNLGRP) command for creating panel groups can be used to specify a *JOBCCSID value for panel groups. If *JOBCCSID is specified for the CHRID parameter on the CRTMNU command, conversion is automatically done between the CHRID parameter of the device and the CCSID value of the menu. If *JOBCCSID is specified for the CHRID parameter on the CRTPNLGRP command, conversion is automatically done between the CHRID parameter of the device and the CCSID value of the panel group.

Example of Single System with a Single Language

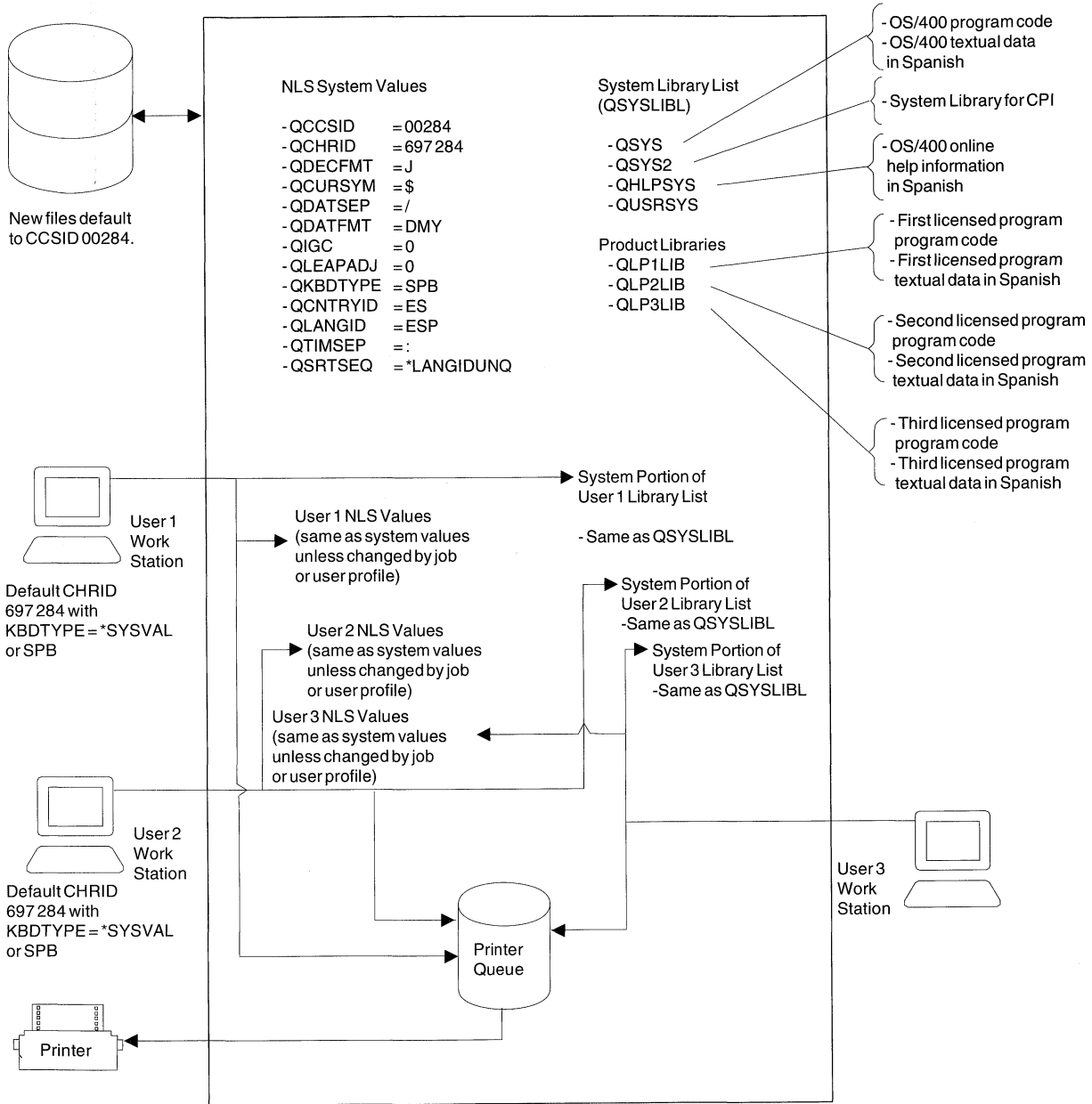
Figure 1-3 on page 1-19 shows a single system with a single primary language (Spanish). In this environment:

- Allow enough time for ordering and receiving the hardware.
- The keyboards and printers must be configured to support the Spanish language (code page 284).
- Make sure all licensed programs are installed with the Spanish primary national language version (NLV) feature code.

Licensed programs that are not in the same NLV feature code (in this case, 2931) and are added to the system will appear on the install licensed program display (LICPGM menu) in error. The Save Licensed Program (SAVLICPGM) command will fail with an exception when trying to save the program.

- The recommended QCCSID for Spanish is 00284, which must be manually changed from the shipped value of 65535 to correctly tag your character data.
- The default country identifier is ES for Spanish.
- The default language identifier is ESP for Spanish.
- One example of a sort sequence value is *LANGIDUNQ.

AS/400 System
- Primary Language of Spanish (#2931)
- With QCCSID manually changed to CCSID 00284



RV2C070-9

Figure 1-3. Single AS/400 System with a Single (Primary) National Language (Spanish)

Planning Checklist for National Language Support

Prior to working with national language support, answer the following questions on the *Planning Checklist*. A copy is found in Appendix E, "Planning Checklist."

Table 1-5. Checklist for National Language and Multilingual Support

Check Off	Question	Response
	What national language version for the primary language are you going to install? (Refer to "Setting Up the National Language Version" on page 1-2.)	
	What program library can it be ordered from? (Refer to Appendix A, "National Language Version Feature Codes" on page A-1.)	
	Are you going to use a DBCS national language version as a secondary language? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	
	Are you aware that the latest 5250 PC emulation is necessary to support graphic data type? (Refer to the marketing support representative in your country.)	
	What national language version for the secondary language are you going to install, if any? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	
	Do you want to change your subsystem to change the language of your initial sign-on display? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	
	What release level of the national language version for the primary language are you ordering? (Refer to "Using and Changing the Primary Language" on page 2-1.)	
	Are the release levels of the national language version for the secondary language the same as the primary language you ordering? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	

Chapter 2. What is Multilingual Support

This chapter contains an overview of multilingual support and procedures that must be followed to use the AS/400 system in a multilingual environment.

The AS/400 system supports either a single language (for example, German) or multiple languages (for example, Italian and French), depending on the needs of the user and the configuration of the system. **Multilingual support** on the AS/400 system is support that includes more than one national language on the system. In those configurations where more than one language is used, all other languages are referred to as secondary languages.

Working in a Multilingual Environment

A multilingual environment is one or more systems that have more than one national language versions (NLVs) installed and where applications are used by more than one national language.

The languages currently supported on the AS/400 system as either primary or secondary languages can be found in Appendix A, "National Language Version Feature Codes." Listed are the national language versions, their feature codes, and the program libraries from which they are available. Appendix A also shows the secondary national language versions the various AS/400 licensed programs are translated into.

Secondary languages enable a single AS/400 system to operate in multilingual mode. To have a single AS/400 system support multiple languages, consideration must be given to having sufficient disk storage space available to contain all of the system and application textual data for the secondary languages and having the associated hardware installed. For more information on disk storage space considerations, see "Storage Requirements" on page 2-21.

Using and Changing the Primary Language

The choice of the primary language is very important. The AS/400 system allows you to change your primary language to accommodate your business needs based on the country in which you are operating. However, careful consideration and planning needs to be done to accomplish the task.

To change a primary language on your system, you can order a different primary language from IBM, order a different secondary language to be installed as your primary language, or use the secondary language that you might already possess.

- The instructions to change the primary language on your system from DBCS to SBCS or from SBCS to DBCS are in Appendix L, "Changing the Primary Language" on page L-1.
- The instructions to change the primary language on your system are in the *Licensed Programs and New Release Installation Guide*.

When you are changing a primary or secondary language, and want to continue receiving software and documentation updates for future releases of licensed programs that you are currently using, contact your IBM representative.

Selecting and changing a primary language affects the operational characteristics of your system:

- Culture values of the user
- Language used to communicate with the system through the system and user interfaces presented through a display station, personal computer, or printer (see “System and User Interfaces”),
- Implied character set and code page (CHRID) of the character data stored in objects other than database files on the system

By default, the database files are assigned CCSID 65535 as the delivered system value for QCCSID is 65535. If the CCSID value is set to a different value in the user profile, job or system value, then all database files are tagged with that CCSID when they are created.

- If you change the primary language and the CCSID for the data remains the same, there is no effect on your system. An example would be to change the primary language from the German Multinational Character Set (MNCS) to the Italian MNCS, which both use CCSID 00500. The **multinational character set** refers to character set 697 and code page 500.
- If changing the primary language includes changing the CCSID value, the character data in objects other than database files may not be presented properly through the system and user interfaces. The database manager automatically converts character data unless conversion is suppressed by the application that processes the file. For example, REXX/400 interprets procedures in the CCSID of the source file. No conversion of the character data is performed. Data in objects other than database files are displayed correctly if the CHRID value of the display file, panel group, or menu is *JOBCCSID.

Service

Panels, messages, and online help information for service tools are usually shown in the primary language of the system. Therefore, the display station from which the system is being serviced must be configured to support the primary language, and the keyboard for the primary language must be attached to that display station.

System and User Interfaces

The system and user interfaces are presented through a display station, personal computer, or printer. The work station controller interprets keystrokes on keyboards according to the mapping determined by the KBDTYPE parameter in the device description. The display station presents the data to the user, depending on the code page mapping located in the work station controller. This code page mapping in the work station controller is determined by the CHRID parameter in the device description. Each supported keyboard type has a character identifier assigned to it, and the default setting of CHRID in the device description (*KBDTYPE) refers to that character identifier. For information about setting code page and national language support on a personal computer, refer to the *PC Support/400 User's Guide for DOS* and *PC Support/400 User's Guide for OS/2*.

Automatic configuration defines the local devices to the system for you. This means that the devices attached to your system are available for use as soon as you power on the system. You do not have to use **manual configuration** to create configuration descriptions for the devices before you can use them. For devices that are able to send configuration information to the work station controller, the

KBDTYPE parameter is set according to the keyboard attached. Otherwise the QKBDTYPE system value is used. For more information about automatic configuration, refer to *Device Configuration Guide*.

Note: If you use manual configuration to set up a device with a different keyboard type than the hardware reports, automatic configuration changes the device description to match the keyboard attached. To avoid this, each time the device is powered on, you can switch automatic configuration off by setting QAUTOCFG system value to 0 (Off).

The system provides automatic conversion between character set and code pages if so designated by the user's application. This automatic conversion can be started through the use of the display file, and data description specifications (DDS) field descriptions, and panel groups, or through the use of CCSIDs (see explanation in "System CCSID Implementation" on page 2-6). The character set and code page of the device used by the end user is determined by the CHRID parameter in the device description. The CHRID value is normally set to *KBDTYPE. The KBDTYPE parameter always determines the character identifier used by the device.

When the data to be presented is in a character set and code page different from the language of the end user, automatic data conversion may occur. For detailed information on data conversions, refer to "System CCSID Implementation" on page 2-6. For display and printer files, see "Workstation Function Management Support for Coded Character Set Identifiers" on page 2-8. For a list of character conversion tables, see Appendix I, "Graphic Character Conversion Tables."

The printer provides printed output to the user. OS/400 printer support does not do any conversion between the different character sets. For the data to be printed, the user must make sure that the proper character set and code page are specified in the printer and the fonts are in the printer.

If the CHRID value of the printer file is set to *JOBCCSID, the printer joins the CHRID value of the job CCSID to the data to be printed. The printer file headers are converted from DDS (data description specification) source file CCSIDs to the character identifier of the job CCSID value.

Secondary Language Requirements

Important requirements for the installation and use of secondary languages are:

- A double-byte character set (DBCS) secondary language (for example, 2986 for Korean DBCS) may be installed only on a system with a primary DBCS language (for example, 2984 for English uppercase and lowercase DBCS, or 2962 for Japanese DBCS).

Notes:

1. If you install Japanese DBCS (2962) as a secondary language, it is recommended that you install English uppercase DBCS (2938) as the primary language because of the potential loss of lowercase English letters in textual data.
2. When using Japanese DBCS (5962) as a secondary language with English Uppercase and Lowercase Support for DBCS (2984) as the primary language, it is recommended that you use JUB (Japanese English) as the key-

board type. This allows entering English characters, but not Katakana characters.

3. If Simplified Chinese, Traditional Chinese, or Korean is used as a secondary language and English is required as the primary language, English Uppercase and Lowercase (2984) is recommended to be used as a primary language.
 4. The English uppercase DBCS NLV (2938) and the English Uppercase and Lowercase DBCS NLV (2984) are available in the United States.
- A single-byte character set (SBCS) secondary language may be installed on a system with a primary DBCS language or with a primary SBCS language.

Using and Changing the Secondary Language

To ensure that secondary languages can be used after they have been installed on an AS/400 system, you must do the following:

- Change the user's system library list to add the secondary language library to the beginning of the list. You can accomplish this in either of two ways:
 - Use the Change System Library List (CHGSYSLIBL) command to add the desired national language library to the top of the library list. The command can be in an initial program specified in the user profile so the user does not have to enter the command at every sign-on.

The authority shipped with the CHGSYSLIBL command does not allow all users to run the command. To enable a user to run the CHGSYSLIBL command without granting the user rights to the command, you can write a CL program containing the command. The program is owned by the security officer and adopts the security officer's authority when created. Any user with authority to run the program may use it to change the system part of the library list in the user's job.

- Use a separate subsystem for a secondary language. To do this:
 1. Create a subsystem description to be used for secondary language users (QGPL/DANISH, for example).
 2. Specify the secondary language library for SYSLIBLE (QSYS2926, for example).
 3. Specify the sign-on display file from the secondary language library for SGNDSPF (QSYS2926/QDSIGNON, for example).
 4. Remove the appropriate display devices (Remove Work Station Entry (RMVWSE) command) from the interactive subsystem and add them (Add Work Station Entry (ADDWSE) command) to the secondary language subsystem.
 5. If you want to use separate job queues (JOBQ) and output queues (QUTQ) for a secondary language, you can create these in the secondary language library (for example, QSYS2926). Attach the job queue to the secondary language subsystem (for example, QGPL/DANISH).

Internationalized Code Spanish Text QSYS, QSYS2	Spanish Help Text QHLPSYS	User Data QUSRSYS
English Text QSYS2924	German Text QSYS2929	Danish Text QSYS2926

RV2C327-0

Figure 2-1. A System with Three Secondary Languages

6. To see Danish text, a Danish secondary language user must have library QSYS2926 before library QSYS in the system library list.

- If you have licensed programs which have secondary language libraries and which are not on the OS/400 secondary language tape, you should also add those secondary language libraries to the library list before the primary language product libraries.

- Specify the keyboard ID for the secondary language in the device description for the display station. This can be accomplished through the use of the Change Device Description (Display) (CHGDEV DSP) command. You need to vary off your device, use the CHGDEV DSP command, and then use the Vary Configuration (VRYCFG) command to vary the device back on.
- Change the date format to reflect the date format of your language. The date format, date separator, and time separator can only be changed using the CHGJOB command. Table 2-1 illustrates this and shows the ways the date and other NLS-related job attributes can be specified.

	CHGJOB	CRTJOB	CHGJOB	CRTUSRPRF	CHGUSRPRF
Date	X	X	X		
Date Format	X				
Date Separator	X				
Time Separator	X				
Coded Character Set Identifier	X			X	X
Language Identifier	X			X	X
Sort Sequence	X			X	X

- Change the CCSID value to reflect the code page and character set of the secondary language you want to use. You can set the CCSID value for all jobs run under your user profile by using the Change User Profile (CHGUSRPRF) or Create User Profile (CRTUSRPRF) command. You must sign off and sign on

again for this to take effect. You can set the CCSID value for the job to be run by using the Change Job (CHGJOB) command. For more information on CCSID values, see “System CCSID Implementation.”

- Ensure that your data, in objects other than database files, prints correctly. To do this, you may want to direct all of your printed output to a print queue that contains printer output for only the character identifier of your language. If the printer support changing the code page, you can use the *JOBCCSID value in the printer file.
- Change other language-dependent and cultural-dependent values to the secondary language you wish to use if you don't want to use primary language-dependent and cultural-dependent values (denoted by the system values). See “Language-Dependent or Culture-Dependent System Values” on page 1-12.

Additional details on changing the subsystem description can be found in the *Work Management Guide*.

System CCSID Implementation

The CCSID support is provided through the following system components:

- Work management support
- Database management support
- Workstation function management support
 - Printer files
 - Display files
 - User interface management menus and panel groups

Work Management Support for Coded Character Set Identifiers

Work management support provides the function to assign or change CCSID values at three different levels. All jobs run with a CCSID value established at one of these levels:

- Job level

A CCSID is assigned to a job. It can be set or changed using the CHGJOB command.

- User level

A CCSID is assigned to a user (through the user profile) and thus to all jobs run under that user profile. The CCSID can be set or changed with the CRTUSRPRF and CHGUSRPRF commands.

- System level

A CCSID is assigned to all jobs running on the system. It is assigned through a system value, QCCSID, which is shipped with the system. It can be set or changed with the CHGSYSVAL and WRKSYSVAL commands.

Work management support initializes the job CCSID to the CCSID on the user profile. If a CCSID does not exist on the user profile, work management support gets the CCSID (QCCSID) from the system value. The system value QCCSID is initially set to CCSID 65535.

The job CCSID can be changed by using the CHGJOB command. Make a note of the current job CCSID so you can use it to reset the job CCSID to its original value,

if necessary. The CHGJOB CCSID value is reflected in the job immediately. In a CL program, use the Retrieve Job Attributes (RTVJOB) command to get the current job CCSID. Interactively, use the Work with Job (WRKJOB) command and select option 2, Display Job Definition Attributes on the Work with Job display.

Database Management Support for Coded Character Set Identifiers

Database management support provides default CCSID values for character data on the system. All database files are assigned a CCSID. The CCSID is either explicitly assigned through DDS, SQL, or IDDU at file creation, or it is implicitly assigned the job CCSID by the database at file creation.

- IBM system files and licensed program database files are created with the CCSID of choice for each of the national language versions. Only the customer files are automatically assigned the CCSID of the job creating the file.
- All customer and AS/400 database files created prior to Version 2 Release 1.1 are assigned CCSID 65535.
- Program-described files are assigned CCSID 65535.
- Hexadecimal database fields are assigned CCSID 65535.
- Numeric fields are not assigned a CCSID value.
- Date, time, and timestamp fields are implicitly assigned the job CCSID.
- Database physical-file character, DBCS-open, DBCS-only, DBCS-either, and graphic fields are implicitly assigned a CCSID value, if a CCSID was not explicitly assigned through DDS, SQL, or IDDU at file creation.
- Database logical-file fields are assigned a CCSID value based on their data type and the data type of the underlying physical field. If a logical file is defined over several physical files, it is assigned a CCSID at the field level and assumes the CCSID value of the physical file. Logical files cannot be explicitly assigned a CCSID value.
- Database source files default to the job CCSID at file creation if a CCSID is not explicitly specified on the CRTPF or CRTSRCPF command.
- All IBM-supplied database files are assigned a CCSID value. You can use the Display File Description (DSPFD) command to view the CCSID of a file or the Display File Field Description (DSPFFD) command to view the CCSID of the fields in a file.

Database management support converts the data read from or written to database files. The job CCSID determines the code page and character set to use for this conversion. The value of the job CCSID is the same as the system value (QCCSID), unless it is changed through the user's profile or the Change Job (CHGJOB) command.

- If data is being read from a database file and the CCSID of the file is the same as the job CCSID, no conversion is done.
- If data is being read from a database file and the CCSID of the file and the job CCSID are different, the data is converted to the CCSID of the job.
- If data is being written to a database file and the CCSID of the file is the same as the job CCSID, no conversion is done.
- If data is being written to a database file and the CCSID of the file and the job CCSID are different, the data is converted to match the CCSID of the file.

No conversion is performed if one of the CCSID tags is equal to 65535.

Workstation Function Management Support for Coded Character Set Identifiers

Workstation function management involves working with display files, printer files, panel groups, and UIM menus. All source files on the system are tagged with a CCSID.

Display Files

When the display file object is created from these files, the object is tagged with the CCSID of the source file. Character data contained in the same source files (field reference file) are converted to the CCSID of the primary source file.

During the creation of the display file, the compiler does not refer to the job CCSID. All character data is read from the primary source file without any character conversion being performed. User message text fetched at compile time (identified by the MSGCON keyword in DDS) remains the same, assuming that it is already in the same CCSID as the primary source file.

As the display file objects are tagged with the CCSID of the primary source file, it is possible during run time to convert all the constant character data. This conversion is from the display file CCSID to the character identifier (CHRID) of the device. The field-level keyword NOCCSID (no coded character set identifier) allows the user to specify fields within the DDS that are never to be converted.

Notes:

1. Source physical files tagged with CCSID 65535 have to be changed to support the proper CCSIDs. This can be done using the Change Source File (CHGSRCPF) command.
2. Display files created prior to Version 2 Release 3 Modification 0 must be recompiled to get the new CCSID support. By recompiling, the display file object is tagged and all necessary conversions take place when needed.

CHRID Parameter on the Create Display File Command: When specifying the value for the CHRID parameter on the Create Display File (CRTDSPF) command, consider the following:

- The *JOBCCSID value is specified on the CHRID parameter of the CRTDSPF command.
 - Input characters are converted from the device CCSID to the job CCSID.
 - Character data is sent to output fields and converted from the job CCSID to the device CCSID.
 - Constant text from the display file is converted from the CCSID of the display file to the character identifier of the device.
 - User message text not appearing on the message line or message subfile (identified by MSGID keyword in DDS) is converted from the job CCSID to the device CCSID. Because the message file is not tagged, it is assumed that the contents of the message file are already in the CCSID of the job.
 - Message text for messages on a message line or in a message subfile (identified by the ERRMSG or ERRMSGID keyword in DDS), are sent to the device without any conversion. Figure 2-2 on page 2-10 shows con-

| versions done during display file processing when the CHRID value of the
| display file is set to *JOBCCSID.

- A specific value is specified for the CHRID parameter on the CRTDSPF
| command.

| Conversion is done between the CHRID specified on the CRTDSPF command
| and the CHRID of the device. This conversion affects only fields defined with
| the CHRID DDS keyword.

- The *DEVN value is specified on the CHRID parameter of the CRTDSPF
| command.

| No conversion performed. This is the default setting.

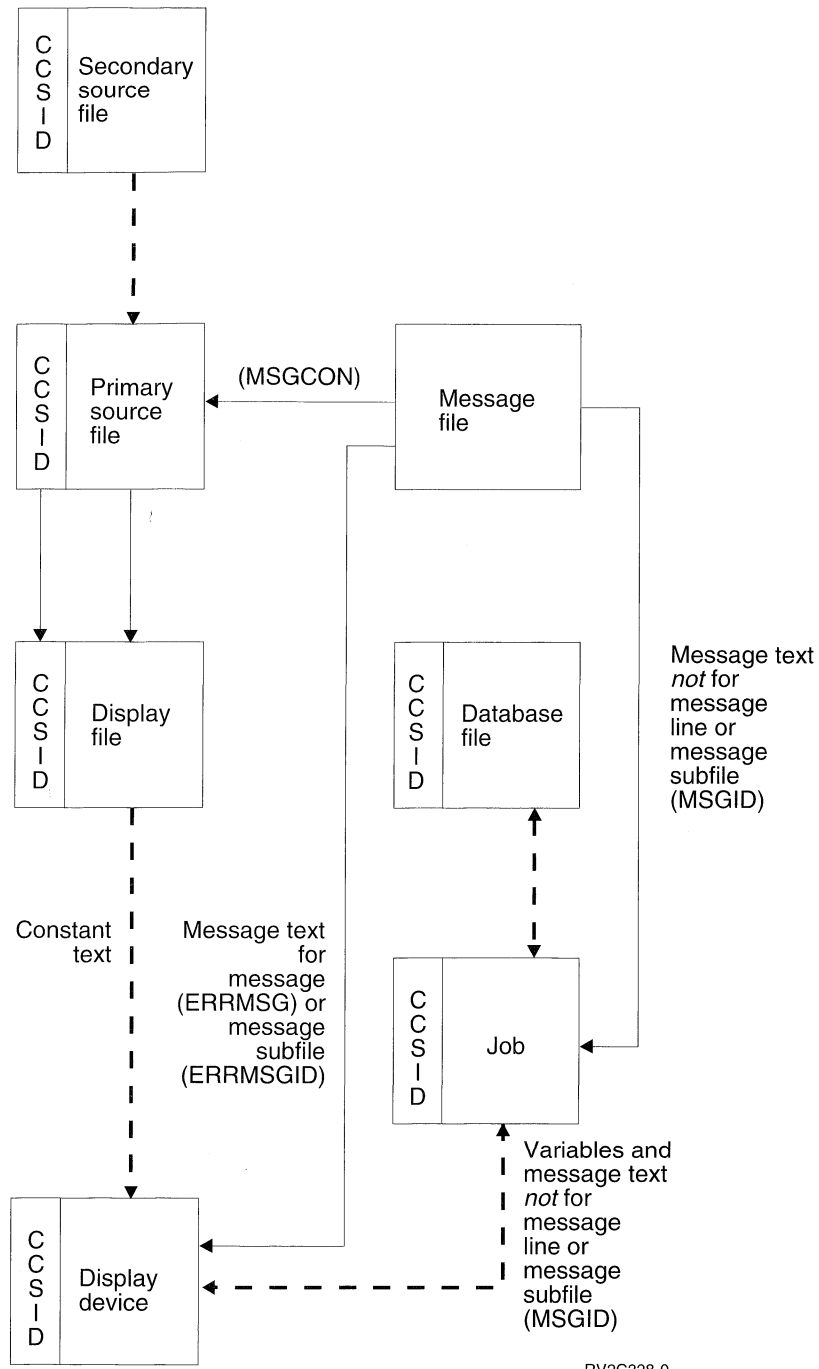


Figure 2-2. CCSID Support of Display Files When the CHRID Value Is *JOBCCSID

Notes:

1. The figure applies only to display files created when *JOBCCSID is specified for the CHRID parameter and the CCSID of the display file is not 65535. If the display file is not tagged or the CCSID of the display file is 65535, processing is the same as when *DEVD is specified for the CHRID parameter.
2. The broken lines mean:
 - a. Conversion between the CCSIDs of the source object and the CCSIDs of the target objects takes place if they are different and neither of them is CCSID 65535.

- b. For the device, conversion takes place from the CHRID derived from the CCSID of the display file or job to the CHRID of the device description.
- 3. The solid line means that data is transferred without conversion taking place.
- 4. In all cases, the field-level keyword, NOCCSID, prevents data conversion from being performed on the fields for which it is specified.
- 5. Character data contained in COMP, RANGE, and VALUE definitions within the DDS are converted.
- 6. The field-level DDS keyword, CHRID, is ignored.

Printer Files

Processing of the source code for printer files is the same as for display files. When printing to the device, considered the following:

- The *JOBCCSID value is specified on the CHRID parameter of the CRTPRTF command.
 - Constant text from an externally described printer file is converted from the CCSID of the printer file to the CCSID of the job.
 - Character data sent to output fields is assumed to be already converted to the job CCSID.

The printer data stream is tagged with the character identifier derived from the CCSID of the job. This CHRID is used by the printer to interpret the data. The CHRID value is ignored for printers not supporting this function. Figure 2-3 on page 2-12 shows conversions done during printer file processing when the CHRID of the printer file is set to *JOBCCSID.

- A specific value is set for the CHRID parameter on the CRTPRTF command.

For externally described printer files, fields that specify the CHRID DDS keyword are tagged with the CHRID value specified on the printer file. The remainder of the file is printed as if *DEV D was specified for the CHRID parameter on the CRTPRTF command.

For program-described printer files, the printer data stream is tagged with the CHRID value specified on the job.
- The *DEV D parameter is specified on the CHRID parameter of the CRTPRTF command.

No conversion is performed and the character identifier information is not sent to the printer. The printer hardware determines the character identifier to be used. This is the default setting.

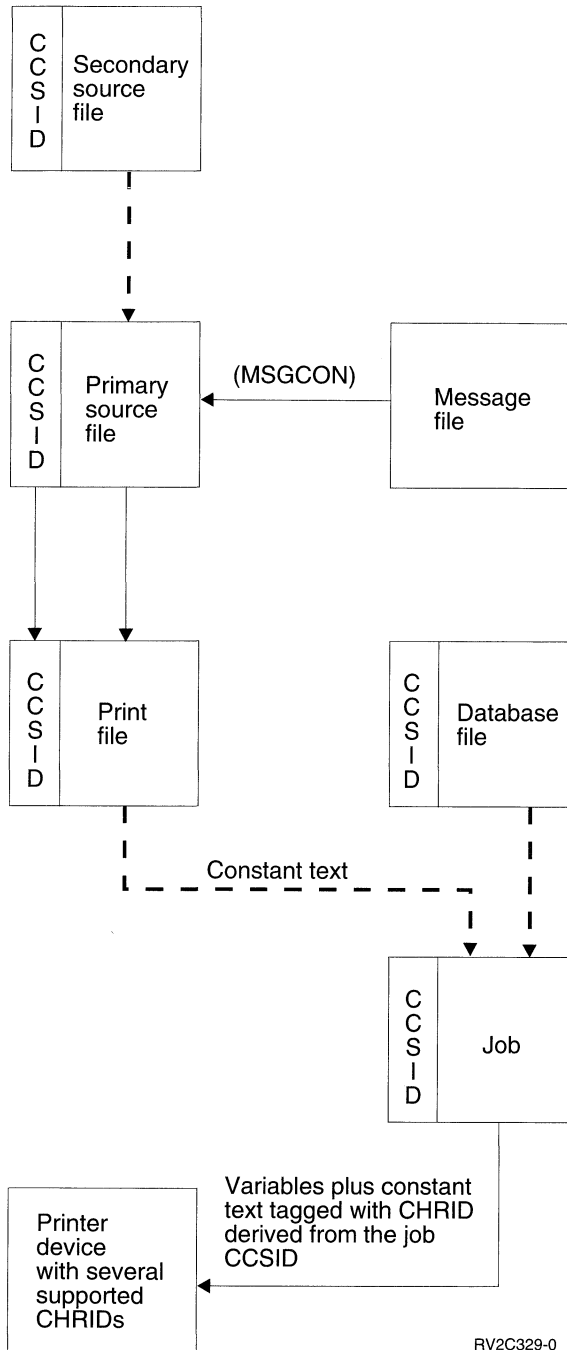


Figure 2-3. CCSID Support of Printer Files When *JOBCCSID Is Specified for the CHRID Parameter

Notes:

1. The figure applies only to externally described printer files created with *JOBCCSID specified for the CHRID parameter, and the CCSID of the printer file is not 65535. If the printer file is not tagged or the CCSID of the printer file is 65535, processing is the same as when *DEVDD is specified for the CHRID parameter.
2. The broken lines show that the conversion between the CCSIDs of the source objects and the CCSIDs of the target objects is different and neither of them are 65535.

3. The solid lines show the transfer of data without conversion.
4. The field-level DDS keyword, CHRID, is ignored.

User Interface Manager Menus and Panel Groups

Like display files and printer files, panel group objects and user interface manager (UIM) menus are tagged with the CCSID of the primary source file. The contents of embedded source members is converted to this CCSID. At run time conversion is performed among the CCSIDs of the panel group, user job, and the CHRID of the display or the CHRID of the printer when the panel group was created with *JOBCCSID specified for the CHRID parameter. The following describes what happens to the devices during the conversion:

- Displays
 - Text in the panel group is converted from the panel group CCSID value to the device CCSID value derived from the CHRID value of the device.
 - Text in the UIM menu is converted from the UIM menu CCSID value to the device CCSID value derived from the CHRID value of the device.
 - Variables from the user job are converted from the job CCSID value to the device CCSID value derived from the CHRID of the device.
 - Variables to the user job are converted from the device CCSID derived from the CHRID of the device to the job CCSID.
 - Online help information imported from a different panel group is converted from the imported panel group CCSID to the device CCSID.
- Printers
 - If the printer file is created with a value specified for the CHRID parameter and the panel group is created with CHRID specified for the class definition, only variables are converted. No text is converted and the job CCSID is ignored.
 - If the printer file is created with a value specified for the CHRID parameter and the panel group is created with *JOBCCSID specified for the CHRID parameter, only variables are converted. The class definition is ignored.
 - If the printer file is not created with *DEV D specified for the CHRID parameter and the panel group is created with *JOBCCSID specified for the CHRID parameter, then the conversion is performed in the same way as for the display.
 - If the printer file is created with *DEV D specified for the CHRID parameter and the panel group is created with *JOBCCSID specified for the CHRID parameter, the text is converted from the panel group CCSID to the job CCSID. No conversion is done on variables.
 - If the printer file is created with *JOBCCSID specified for the CHRID parameter and the panel group is created with the *DEV D or *JOBCCSID specified for the CHRID parameter, the text is converted from the panel group CCSID to the job CCSID. No conversion is done on variables.
 - If the printer file is created with *JOBCCSID specified for the CHRID parameter and the panel group is not created with the *DEV D or *JOBCCSID specified for the CHRID parameter, the variables with CHRID specified for the class definition on the panel group are converted from the panel group CHRID to the job CCSID. No conversion is done on text.

- No conversion is done on printed online help information.

Changing Physical Files Assigned a CCSID

Use the Change Physical File (CHGPF) command to change the CCSID of a physical file. A physical file cannot be changed if one or more of the following conditions exists:

- Logical files have been defined over the physical file. In this case you must
 - Save the logical and physical files along with their access paths.
 - Print a list of authorities for the logical files (DSPOBJAUT).
 - Delete the logical files.
 - Change the physical files.
 - Restore the physical and logical files and their access paths over the changed physical files.
 - Grant private authority to the logical files (see list that you printed).
- The file has a sort sequence table.
- Files or fields have been explicitly assigned a CCSID value. To change a physical file with the CCSID assigned at the field level, the physical file must be re-created and the data copied to the new file using the FMTOPT(*MAP) parameter on the Copy File (CPYF) command.
- Record formats are being shared. The file was created using the Create Duplicate Object (CRTDUPOBJ) command.

Migration

Files migrated to the AS/400 system that were created prior to Version 2 Release 1.1 (this includes files on the system when you perform a release upgrade or those that are not assigned a CCSID and are restored onto the system), are assigned CCSID 65535.

CCSID Support in Other System Components

CCSID support is also built into the following components of the system:

- Copy function
 - The CPYF and Copy from Query File (CPYFRMQRYF) commands support CCSIDs. To use the CPYF command to change a physical file, see “Changing Physical Files Assigned a CCSID.”
 - The Copy Source File (CPYSRCF) command supports CCSID conversion.
- Distributed Data Management (DDM)

DDM provides support to pass CCSID tags in homogeneous environments.

- Passes CCSID parameter when sending files.
- Can specify CCSID when creating files on a remote system.

Special CCSID considerations for DDM:

- Data is converted to the job CCSID of the source system if the source and target systems are both AS/400 systems at a release level of Version 2 Release 1.1 or later. Data is not converted if either system is not an AS/400 system or is an AS/400 system at a release level prior to Version 2 Release 1.1.

- An externally described file or program-described file created on a target AS/400 system at a release level of Version 2 Release 1.1 or later by a source system that is not an AS/400 system or is an AS/400 system at a release level prior to Version 2 Release 1.1 is always created with a file CCSID of 65535.
- The SBMRMTCMD (Submit Remote Command) command can be used on a source AS/400 system to change the file CCSID (externally described files only) by specifying the CHGPF command and the CCSID parameter.
- Data description specification (DDS)

File- and field-level CCSID keywords are supported for all character fields and DBCS fields in physical files.
- Control language (CL)

The CRTPF, CRTSRCPF, DSPFD, and DSPFFD commands support CCSIDs.
- Interactive data definition utility (IDDU)

IDDU provides support to specify a CCSID for a character field or DBCS field.
- OS/400 Query support
 - The OPNQRYF command allows a CCSID on the MAPFLD parameter.
 - Conversion is performed on CHAR, OPEN, and EITHER field operators for join, record selection, group-by, and minimum or maximum values functions. Conversion is performed whenever fields do not have the same CCSID value. No conversion is performed if at least one of the fields is assigned a CCSID of 65535.
 - The output of fields is converted to the job CCSID.
- Query management support
 - Assigns a CCSID to queries and forms.
 - Performs conversions of queries to the user's CCSID.
 - Presents data to the display using the job CCSID.
 - Assigns a CCSID to the files it creates.
- Distributed relational database support
 - Passes the CCSID of an application requester (AR) job to an application server (AS) job and vice versa during connect processing.
 - Uses CCSID information to:
 - Determine how to build data exchanged between application requester jobs and application server jobs.
 - Describe data exchanged between application requester jobs and application server jobs (for example, a format description).
 - Performs conversion of error information and text-describing fields according to the job CCSID.
- SNA Distributed Services (SNADS)

CCSIDs are supported by any user ID, system name, or destination queue name.

General Recommendations

- Because the system is shipped with a default of 65535, applications will not see any difference. You should look over the CCSID information in this manual, however, because the system may need to participate in a network or exchange data at a later time.
- Applications implementing their own mapping scheme must use CCSID 65535 for the jobs. Consider changing the applications to use the new support.
- Correctly define fields based on their usage. If fields contain application-dependent values (for example, control characters or fields that are not used as real character fields), define the fields as hexadecimal data.
- Avoid using characters that are not in the invariant character set for naming and for hard code in programs.
- If you are running S/36 environment, the CCSID of the procedures source file (QS36PRC) must match the CCSID of the job, or either CCSID can be set to 65535.
- If you expect to have the same character appear, do not alter any code points between X'40' and X'FF' on any code page.

Major Limitations

- Some high-level languages support a CCSID value on source files. You may want to leave the default CCSID of 65535 or change the job CCSID to 00037 by using the CHGJOB (Change Job) command (see “High-Level Languages (Literals and Encoding)” on page 3-39).
- If the QIGC system value is set on, QCCSID must be a mixed CCSID or 65535.
- If you are a double-byte user, the job CCSID must be a mixed CCSID or 65535.
- The QCHRID code page must be compatible with the character set and code page of the QCCSID value, unless the QCCSID value is 65535. If the QCCSID value is changed to a value that is incompatible with the current QCHRID value, the QCHRID value is changed to a compatible value by the system.
- If you are using a user-defined data stream (UDDS), you must ensure that your data does not contain a hexadecimal 3F value (X'3F' blanks out the screen). The X'3F' character is the recommended substitution character when performing character data conversions.
- If you are using any AS/400 Application Development Tools utilities, ensure that the code page of the job CCSID matches the code page of the keyboard type. If these CCSID values do not match or the job CCSID is 65535, unpredictable results could occur. (See Appendix C, “National Language Keyboard Types and SBCS Code Pages” on page C-1 and “AS/400 Application Development Tools Licensed Program” on page 4-7 for more information.)
- The *JOBCCSID value for the CHRID parameter is not supported by the Source Entry Utility (SEU) Edit or Browse display (in display file QDSUDSPF) or the Screen Design Aid (SDA) Work display (in display file QDSDPSF).
- If database files are distributed in a network of multiple AS/400 systems having different primary national language versions, you must be aware of character data that has been defined or specified as control information. If this situation

exists, you must specify the job CCSID as 65535, or use the CHGPF (Change Physical File) command to change the CCSID of the physical file to 65535. You do not want conversion to be performed on control information.

For new database files, fields that contain control information must use hexadecimal fields instead of character fields.

- Because of your work station hardware restrictions, you may not see all of the characters on your display when CCSID conversion occurs. However, the character data is retained in the system. It is recommended that you use a 3486, 3487, 3488, or PS/2* display station if you want to see all of the character data when converting between languages using the same character set.
- When a CCSID conversion is performed, substitution characters may cause a loss of data. The situation occurs if enforced subset match conversion is performed (see “Conversion” on page 1-7).
- If you copy to a target file and it was originally created using the Create Duplicate Object (CRTDUPOBJ) command, you cannot change the CCSID of the target file. This is because you are sharing the record format of the file being copied.

System Sort Sequence Support

The sort sequence support provides the possibility for the programmer or user to determine the sequence of the graphic characters processed by the system through the use of sort sequence tables.

A sort sequence table is an object that contains the weight of each character within a specified CCSID. The system-recognized identifier for the object type is *TBL. The table can contain unique weights for each character within the character set (unique-weight table). Some graphic characters may share the same weight (shared-weight table) according to the user requirements. There are sequence tables shipped with the system, defining both unique- and shared-weight sort sequence for all single-byte supported languages.

The sort sequence support is provided through:

- Work management
- Database management
- A user interface for creating new tables based on system-supplied sort sequence tables
- CL, RPG/400, C/400, and COBOL/400 compilers

Sort sequence tables can be assigned to programs used for ordering and comparing data. The sort sequence table to be used is specified at compile time with the sort sequence (SRTSEQ) parameter and language identifier (LANGID) parameters of the create program commands. The SRTSEQ parameter values follow:

- SRTSEQ(*HEX) means that no sequence table should be used (hexadecimal sorting).
- SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) means that the unique- or shared-weight table, determined by the LANGID parameter, should be used.
- A name for the system-supplied or user-supplied sort sequence table name can be specified explicitly on the SRTSEQ parameter.

- SRTSEQ(*JOB RUN) or LANGID(*JOB RUN) means that the sort sequence table to be used is determined at run time.

The first three options assign the sort sequence to the program object at creation time. This sequence is always used when the program is run. Using the *JOB RUN value on the SRTSEQ or LANGID parameters, however, provides the possibility for dynamically assigning sort sequence tables to the program.

Work Management for Sort Sequence Support

Work management involves the assigning of the SRTSEQ value at the following levels:

- Job level

A SRTSEQ value is assigned to a job. It is valid on the Submit Job (SBMJOB), Batch Job (BCHJOB) and the Change Job (CHGJOB) commands. At program creation time the SRTSEQ value determines the sort sequence to be assigned to the program (if SRTSEQ(*JOB) has been specified). At run time the SRTSEQ value determines the sequence table to be used (if the program is created with SRTSEQ(*JOB RUN)).

- User level

The user profile assigns a SRTSEQ value to a user and by default to all jobs running under this user profile.

- System level

The QSRTSEQ system value defines a sort sequence that can be referred to by other objects. The QSRTSEQ system value should be set according to the requirements of the primary language used on the system.

Database Management for Sort Sequence Support

Database management supports the SRTSEQ and LANGID parameters on the Create Physical File (CRTPF) and Create Logical File (CRTL F) commands.

The LANGID and SRTSEQ parameters determine a sort sequence table. The sort sequence table is captured at file creation time, stored as an attribute of the file, and does not change whatever job SRTSEQ attribute is in effect at the time the file is accessed. The sort sequence table associated with the file is used for key sequencing, select logic fields and omit logic fields, and for join field functions.

The ALTSEQ keyword in DDS can also be used to specify a sequence table. The ALTSEQ keyword applies only to the key fields, not to the select logic and omit logic. If the SRTSEQ parameter is specified on the CRTPF command, or the CRTL F commands and the ALTSEQ keyword in the DDS source file specify a sort sequence table, an error message is sent and the file is not created.

The default SRTSEQ parameter on CRTPF and CRTL F commands is *SRC, which indicates that the sort sequence table on the ALTSEQ keyword should be used. If ALTSEQ is not used in DDS, the SRTSEQ attribute of the job determines the file attributes when creating or changing the file.

Sort sequence tables can be specified in the following areas:

- Query/400 Support

External sort sequence tables (including those shipped with the system) and user-defined tables can be specified.

- SQL/400 Support

The Create Structured Query Language xxx (CRTSQLxxx) commands and the Start Structured Query Language (STRSQL) command support the SRTSEQ and LANGID parameters.

- Query management

The Create Query Management Query (CRTQMQRy) command supports the SRTSEQ and LANGID parameters.

- SQL/400 Query Manager

A sort sequence table can be specified when a query object is being defined with the Work with Queries display. The sort sequence (SRTSEQ) value and language identifier (LANGID) value are specified on the Specify Sort Sequence display.

For more information on sort sequence support, see the *Database Guide*.

Using System-Supplied Sort Sequence Tables

Sort sequence tables and conversion tables are built using the Create Table (CRTTBL) command and the system-supplied sort sequence tables. Table functions include:

- Using a definition stored in a source member.
- Creating a table based on a system-supplied sort sequence table using an interactive interface.
- Creating a table interactively to change the sequence numbers to define the positions of the characters.

Figure 2-4 on page 2-20 shows the result after using the following CRTTBL command:

```
CRTTBL TBL(MYTEST) SRCFILE(*PROMPT) TBLTYPE(*SRTSEQ)
      BASESRTSEQ(LSM/QLA10025S) CCSID(037)
```

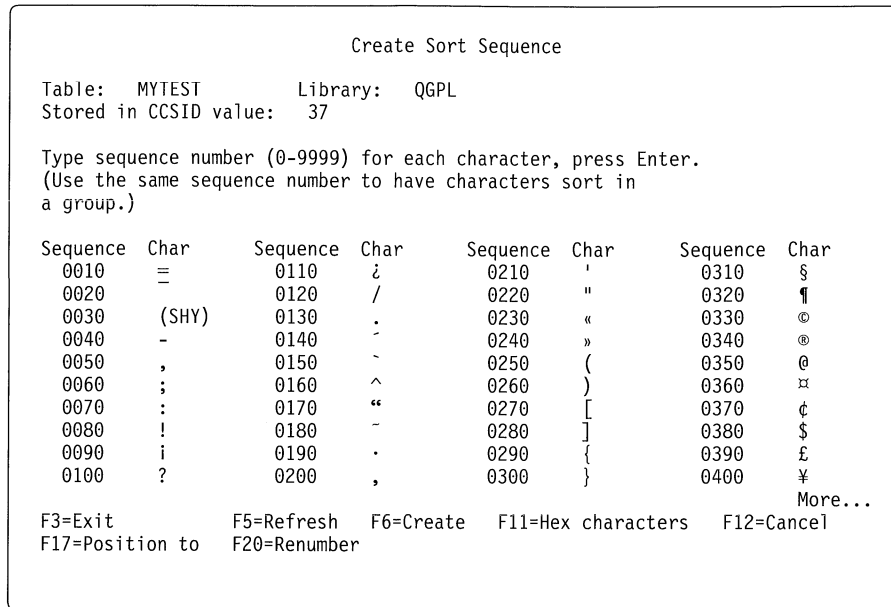


Figure 2-4. Sort Sequence Normal View

Changes can be made to the tables to move characters in each code page to the preferred position for the national language sort sequence table. The ordering is done by increments of 10. Therefore, the first value is 10, then 20, and so on. If some characters have a shared weight, these groups of characters have the same resequenced weight.

A set of sort sequence tables are provided for the Coded Character Set Identifiers (CCSIDs) of the AS/400 national languages. For a list of these tables, see Appendix H, "Sort Sequence Tables."

Sort Sequence Support in Other System Components

Sort sequence support is found in the following components of the system:

- CRTCLPGM (Create Control Language Program) command
 The LANGID and SRTSEQ parameters are supported.
- DSPPGM (Display Program) command
 The LANGID and SRTSEQ values that were specified when the program was created are displayed.
- CRTDSPF (Create Display File) command
 The LANGID and SRTSEQ parameters are supported. The values of the RANGE, VALUES, and COMP keywords are validated when the program is compiled.
- High-level languages
 The SAA COBOL/400, C/400, and RPG/400 languages allow the specification of the SRTSEQ and LANGID values to be associated with the programs.
- AS/400 PC Support
 The transfer function allows a sort sequence table to be specified when performing queries on database files and SQL tables.

Implementation Notes

Sort sequence support does not take into consideration the following:

- Special cases of single characters that should be handled as multiple characters (such as the German ß).
- Sequences of characters that should be treated as a single character (such as the Danish aa, Hungarian ly, Serbian lj, Spanish ll).
- Nonalphanumeric characters that should be ignored (such as coop and co-op because they are embedded in alphanumeric strings).
- Prefixes that should be ignored (such as Van der Pool).
- Program-described files.
- Double-byte character set code pages.

If a sort sequence table has a weight other than hexadecimal 40 assigned to the blank character, unpredictable results can occur when strings of unequal lengths are compared.

Storage Requirements

Licensed programs and applications for your system in any national language may require additional disk space.

The licensed programs are made up of two parts: the program code needed to make the programs work, and the textual data needed for users to communicate with the system using a display station and keyboard in the national language version.

For a primary SBCS language, 150 megabytes of storage is required.

When any primary DBCS language is used, an additional 25 megabytes of storage is required for a total of 175 megabytes.

For secondary languages, only the textual data is needed. Each secondary national language version requires up to 175 megabytes of additional storage for DBCS languages, and up to 160 megabytes of storage for SBCS languages.

Note: If you do not use all the licensed programs, the amount of additional storage may be smaller.

For actual sizes of the licensed programs, see *New Products Planning Information for Release 3*.

Considerations for Using Multilingual Support

Each of the national language versions available from the program library (primary or secondary) include default system values for that particular language. Date format, date and time separators, CCSIDs, code page and character set, and keyboard types are examples. However, only the default system values for the primary language are initialized. The secondary default system values are used only when the primary language of the system is changed using the secondary language. In selected situations, applications can use the secondary language values which are available in message CPX8416 in the secondary library.

When you use the AS/400 system in a multilingual environment, the primary language version and any secondary languages must be at the same release level. You must also order and install the correct devices (workstation controllers, display stations, and printers) to support your languages.

Ordering Equipment and Software

To properly support a language or multiple languages on a single system, the appropriate hardware and software must be ordered and configured. Consider the following when ordering your hardware and software:

Workstation Controllers

Workstation controllers that attach to the AS/400 system can support a number of different languages simultaneously. The characteristics of multilingual support depend on the type of workstation controller. The type of workstation controllers that can be attached to the AS/400 system are:

- Twinaxial workstation controller

The local twinaxial workstation controller maps keyboard data received from a display station into EBCDIC values corresponding to the keyboard ID configured for that display station on the system. Multiple languages are supported by using a separate keyboard mapping table to handle each unique combination of national language versions and keyboard for each display station attached to the system.

The amount of storage available within the twinaxial workstation controller for mapping tables is limited and restricts the total number of national language versions that the workstation controller can simultaneously support. Depending on the mix of languages and types of keyboards, the twinaxial workstation controller can support several different national language versions simultaneously (in addition to U.S. English, which is always available). This number is based on a computational factor described in Appendix D, "Multilingual Support for the AS/400 Workstation Controller."

The list of languages supported by the local twinaxial workstation controller is found in Appendix C, "National Language Keyboard Types and SBCS Code Pages."

- ASCII workstation controller

Like twinaxial devices, ASCII devices for different national language versions support different code pages. The ASCII workstation controller handles conversion of data back and forth between a particular EBCDIC code page for a language and an ASCII code page for that same language by using a set of mapping tables.

The ASCII workstation controller can simultaneously support 14 national language versions (in addition to U.S. English, which is always available).

The set of languages that may be selected for the ASCII workstation controller is a subset of the language types that may be selected for the twinaxial workstation controller. For the list of languages support by the ASCII workstation controller, see Appendix D, "Multilingual Support for the AS/400 Workstation Controller."

- Remote workstation controller

- The 5394 remote workstation controller is a twinaxial workstation controller and uses conversion tables to map the data between the devices.

The 5394 remote workstation controller can support up to 4 multinational character set (MNCS) languages at a time and only one language that is not a MNCS language. When changing languages, you must change the keyboard type code. Changing the keyboard type code is explained further in the *5394 Remote Control Unit Setup Guide*, GA27-3804, and *5394 Remote Control Unit Introduction and Installation Planning*, SK2T-0316.

- The 5494 remote workstation controller has 4 ports for twinaxial workstations, a port for communication networks, and on the Model 002, a port for attaching to a token-ring network.

The 5494 remote workstation controller can support up to 4 multinational (MNCS) languages at a time. When changing languages, you must change the keyboard language code. Changing the keyboard language codes is discussed further in the *5494 Remote Control Unit Planning Guide*, GA27-3936, and the *5494 Remote Control Unit User's Guide*, GA27-3960.

Workstation Customization

Workstation customization is a function of the OS/400 program that allows users to tailor twinaxial display stations, ASCII work stations, and ASCII printers for use with the AS/400 system and SBCS languages. It also allows users to tailor the way the host print transform function supports ASCII printers. The **host print transform** function converts an SNA character string (SCS) data stream into an ASCII data stream. The ASCII data stream is then formatted and sent to an ASCII printer through one or more hardware connections, such as PC Support/400, 3477, or 3487 work stations. This single location of the transform allows for consistent ASCII printing through any of the hardware connections.

Character presentation, font specifications, and control key sequences are examples of characteristics that can be customized. To change the characteristics of work stations and printers, you can retrieve a copy of the system mapping table or tables used for mapping data and function translation. You can then change this copy and create a customization object.

The workstation customization functions allow you to change the hexadecimal values that control the displaying and printing attributes for these types of devices.

Twinaxial keyboards attached to 3179, 3180, 3196, 3197, 3476, 3477, 3846, 3487, 3488, 5251, 5291 and 5292 display stations
ASCII printers attached to 3477 Model H twinaxial work stations
ASCII display stations and keyboards
ASCII printers directly attached to the AS/400 system

The following mapping tables can be customized:

- Twinaxial keyboards (for any 5250-attached display station)
- ASCII-to-EBCDIC character mapping tables (for ASCII printers attached to 3477, 3486, 3487, or 3488 display stations and keyboards)
- EBCDIC-to-ASCII character mapping tables (for ASCII printers attached to 3477, 3486, 3487, or 3488 display stations and keyboards)
- ASCII-to-keyboard function mapping tables (for ASCII printers attached to 3477, 3486, 3487, and 3488 display stations and keyboards)
- Update screen tables (for ASCII printers attached to 3477, 3486, 3487, or 3488 display stations and keyboards)

- Default EBCDIC-to-ASCII mapping tables (for printers directly attached to the system)
- Multilingual EBCDIC-to-ASCII mapping tables (for ASCII printers directly attached to the system)
- Printer function tables (for ASCII printers directly attached to the system)
- Printer definition tables (for printers attached to a twinaxial workstation)
- Host print transform function tables (for ASCII printers)

Note: Be sure the characters or functions that you customize are supported by the device. The OS/400 workstation customization function cannot make the device provide that support.

For more information about creating customizing objects, refer to the *Workstation Customization Function Programmer's Guide*.

Display Stations

If display station pass-through is being used, the target system must be able to recognize the display station used on the source system. For example, a user in Japan operating from a PS/55* workstation, passing through to a system in the United States, will be able to access the data on the U.S. system (using pass-through) only if the U.S. system has a DBCS version of the operating system (for example, 2938 for English uppercase DBCS).

To operate in a multilingual environment, you must consider the different printers and workstation keyboards needed for support of national languages. In addition to being aware of ordering printers and workstation keyboards, you may have to configure your workstation device description using the Create or Change Display Description (CRTDEV DSP or CHGDEV DSP) commands to reflect the appropriate keyboard type (KBDDTYPE parameter) for the secondary language you are using. The users of the primary language can use the system value defaults and are not required to provide any special configurations.

Changing Your Standard Display Station to MNCS: Some display stations make it possible to enter characters from the multinational character set (MNCS) by configuring the hardware only and without having the specific national language installed on the system. The display stations having the 5250 (122-key typewriter) keyboard or the IBM-enhanced keyboard attached with the multinational character setting are:

- 3196 (see note)
- 3197 (see note)
- 3180 (cannot have the IBM-enhanced keyboard attached) (see note)
- 3476
- 3477
- 3486
- 3487
- 3488

Notes:

1. The 3196, 3197, 3180, 3486, and 3487 display stations automatically configure for the following countries or languages when the appropriate keyboard is attached.

Austria/Germany	Austria/Germany Multinational
Belgium	Canadian French
Canadian French Multinational	Cyrillic
Danish (except for the 3180 display station)	France (Azerty) Multinational
France (Azerty)	France (Qwerty) Multinational
France (Qwerty)	Iceland
Hebrew	Japanese-Katakana
Iceland Multinational	Norway
Latin 2	Portugal
Norway Multinational	Former countries or languages of Yugoslavia
Portugal Multinational	

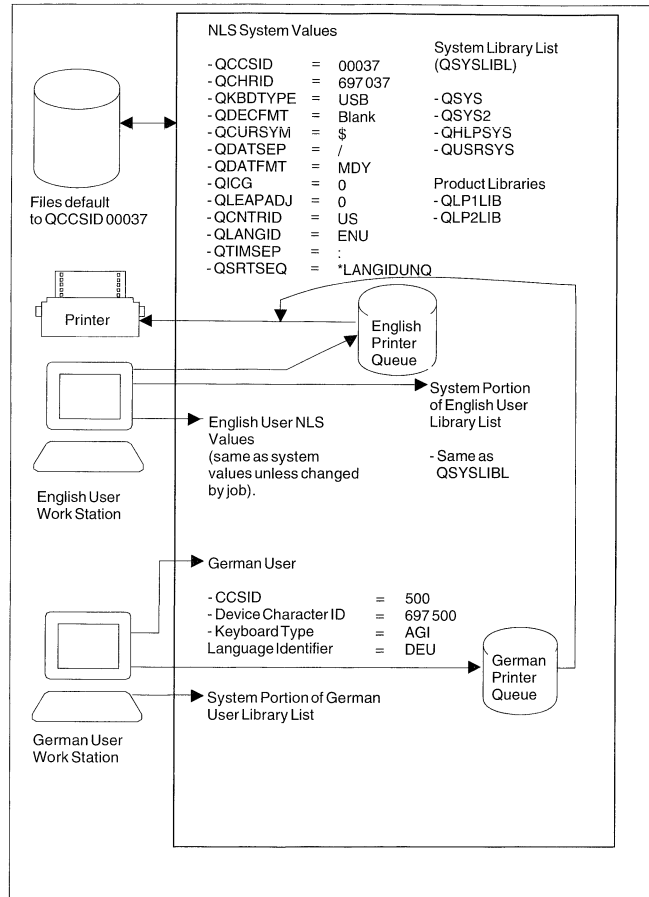
- The 3486, and 3487 display stations support all the languages listed under “3486 and 3487 Keyboard and Display Part Numbers by Language” on page C-8 on all levels of hardware except for Thai. No checking of the part numbers for the display stations is necessary. All keyboards are listed in Table C-3 on page C-8.
- The 3488 display stations support all the languages and keyboards listed on on page C-12.
- The 3486, 3487 and 3488 display stations do not need the correct language keyboard to show the code page for a language. The code page used by the display station matches what is specified in the configuration record.

As an example, to use an English display station to enter German characters:

- Vary off the display station.
- Configure the display station for the multinational character setting. Refer to the display station manuals for this procedure.
- Use the CHGDEVDS (Change Device Display) command to change the keyboard type (KBDTYPE parameter) to the language you want to enter. Refer to Appendix C, “National Language Keyboard Types and SBCS Code Pages” for the KBDTYPE value for the multinational language version. For example, AGI is for Austria/Germany Multinational. Most keyboard type values that end in I use EBCDIC code page 500.
- Vary on the display station.
- You can now enter data from the keyboard in code page 500 and the logical view of the character keys on the keyboard is in German.
- Change the job CCSID to 00500.
- If you want your database file to contain the German country-extended code page (CECP) data, explicitly specify a CCSID of 00273 for all created source and externally described database files.

Figure 2-5 on page 2-26 shows a system with a primary national language version of English (2924) and the KBDTYPE parameter value of USB. One of the display stations has been configured to use the KBDTYPE parameter of AGI, which allows entering Austria/Germany MNCS.

AS/400 System
- Primary Language of English (#2924)



RV2C078-3

Figure 2-5. Changes for Display Station Not Set for Code Page 500

For examples of the 5250 (122-key typewriter) and the IBM-enhanced keyboards, refer to Appendix M, "Keyboard Layouts."

To use an Italian display station to enter German characters:

1. Vary off the display station.
2. Use the CHGDEVDS (Change Device Display) command to change the keyboard type (KBDBTYPE parameter) from ITI for Italian to AGI for Austria/Germany Multinational.
3. Vary on the display station.
4. The logical view of the character keys on the keyboard is in German. See Figure 2-6 on page 2-27.
5. It is assumed that the code page of the user's job CCSID is 00500, which is equal to the code page of the keyboard ID (ITI).
6. If you want your database file to contain the German country-extended code page (CECP) data, explicitly specify a CCSID of 00273 for all created source and externally described database files.

AS/400 System
- Primary Language of Italian (#2942)

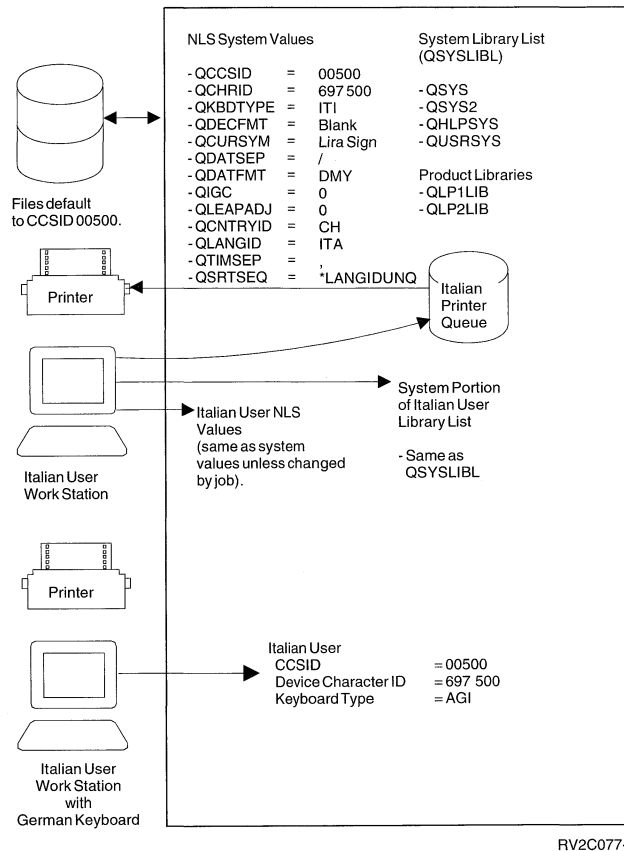


Figure 2-6. Changes for Display Station Set for Code Page 500

Notes:

1. The multinational character setting is available for Latin-based languages that support code page 500 and character set 697.
2. Keyboard types (xxl) are found in Appendix C, "National Language Keyboard Types and SBCS Code Pages," where the xx represents the country or language and l represents the multinational version.
3. The CHRID parameter on the display file must be changed to the CHRID of the language you have configured on your display station and the CHRID value on the device data specifications must be changed to the correct value of the data, or unpredictable results could occur. These changes allow you to enter data from a display station in code page 500 and store the data in the database with a CCSID of 00273. Refer to Figure 2-5 on page 2-26.
4. If the primary language is already in code page 500, the display stations may already be set up correctly. Refer to Figure 2-6.
5. If you wanted to add a display station to this system to enter the German characters, there is no database concern, because the primary language is in code page 500 and the CCSID is 00500.
6. Anytime you want to change the national language of a keyboard, you must plan to do the necessary configuration of the keyboard again.

Printers

The CHRID parameter on the Create, Override, or Change Printer File (CRTPRTF/OVRPRTF/CHGPRTF) commands allow the user to select which character set and code page will be used by the printer to interpret the code points in the data stream. One of the allowable values for CHRID is *DEV D. When the CHRID(*DEV D) parameter is selected, the AS/400 system puts a command in the data stream that instructs the printer to use the character set and code page that has been physically set on the hardware.

Another value on the CHRID parameter is *JOBCCSID. When the *JOBCCSID value is specified for the CHRID parameter and the CCSID of an externally-described printer file or job is not 65535, the AS/400 system converts the constant text stored in the printer file. The constant text is converted from the CCSID of the printer file to the CCSID of the job. If the job value is a mixed CCSID, the corresponding SBCS (single-byte) value is used. The printer data stream is built to allow the printer to generate the output using the CHRID value taken from the CCSID of the job. To get the proper printout, one of the following should occur:

- The printer should be set to the appropriate CHRID.
- The printer should have the appropriate CHRID value among the selectable ones.

If the CCSID value of the job is 65535, the value of the CHRID parameter is set to *DEV D.

The method of setting the character set and code page on the hardware differs from printer to printer. Consult the operator's guide for your printer to determine proper printer settings. The CHRID parameter does not affect the following printer devices:

3287
5256
5262
5553
5583
6252
6262
3900

Intelligent Printer Data Stream (IPDS) Printers

Intelligent printer data stream (IPDS) is an all-points addressable data stream that allows users to position text, images, and graphics at any defined point on a printed page.

The following IPDS printer models do not support the printer resident code pages normally specified in the CHRID parameter of the CRTPRTF, CHGPRTF, or OVRPRTF commands.

3820
3825
3827
3831
3835

Because these printers do not support the resident code pages, host resident code pages must be downloaded to the printer before printing can occur. When the printer writer program sends a spooled file to one of these printers, a substitution takes place from the printer resident code page specified in the CHRID parameter of the printer file to a host resident code page. The host resident code page matches the printer resident code page as closely as possible. For a table that shows which host resident code page is substituted for each printer resident code page, see the *Guide to Programming for Printing*.

Using the CRTDEVPRT (Create Device Description (Printer) command)) for these printers, you may specify the default character set and code page to be used when *DEVN is specified on the printer file for the CHRID parameter. An example is code page 500 and character set 697.

For a further explanation on the CRTDEVPRT command for IPDS printers, refer to *CL Reference*.

ASCII Printers: Using the workstation customization function, some ASCII printers not in the current list of support devices can now attach to the AS/400 system. For more information on workstation customization, see “Workstation Customization” on page 2-23.

PC Printers: Refer to the *PC Support/400 DOS Installation and Administration Guide* and *PC Support/400 OS/2 Installation and Administration Guide* for configuring attached PC printers.

Working with the PTF Process

IBM periodically creates **program temporary fixes (PTF)** to correct existing problems or potential problems within a particular IBM licensed program. PTFs are designed to fully replace one or more objects in the licensed program. Primary and secondary languages may have language-sensitive online information PTFs.

You can get a package of the PTFs available from the start of the current release. This is called a **cumulative PTF package**. The preferred way to use the PTF process is to work with cumulative PTF packages. Cumulative PTF packages contain an accumulation of PTFs that apply to your system since the start of the current release. They are regularly provided by your service support system to help you avoid problems that already have fixes available and to correct program problems that may appear to be hardware failures.

The application of the correct level of PTFs is particularly important when:

- Changing your current primary language to be your secondary national language
- Changing your current secondary language to be your primary language

PTFs that were associated with each of these languages must be applied again.

If the primary language of your system is changed at any time for reasons other than a new release update, the cumulative PTF package of the new primary language should be at the same level as the previous primary national language.

Primary language and secondary language PTFs for the online information need to be ordered by the customer.

PTFs are distributed by your service support system, either electronically by using your communications connection to service support or by magnetic tape. Generally, problems that require PTFs are permanently corrected in the next system upgrade.

For detailed instructions on how to install PTFs on your system, see the *AS/400 System PTF Shipping Information Letter*.

Installing the Hardware and the Software

After making sure you have the correct PTF level, you can install the hardware and software.

Hardware

When installing or changing a device on your system, you must make sure that the device is configured correctly to reflect the keyboard ID that matches the character set and code page of the job CCSID. Changing the configuration of a device is the same as adding a new display station, keyboard, or printer to the system.

Workstation Controllers: When changing workstation controllers, the same considerations apply as when adding the following:

- Local twinaxial workstation controllers
- ASCII workstation controllers
- Remote workstation controllers
- Languages supported by the workstation controller

Display Stations: In a multilingual environment, where different display stations are supporting different languages on the same AS/400 system, the entered data that is not database data should be stored in separate objects, unless the CCSID for each language is the same. To correctly retrieve, process, and display data that is not database data, the application being used needs to be aware of the language differences, and how they relate to the following:

- Programmable workstations through PC Support/400 program
 - Nonprogrammable workstations
- Note:** The 3486, 3487, and 3488 display stations support all SBCS languages.

- Keyboards

Appendix M, “Keyboard Layouts” contains examples of the IBM-enhanced keyboard for the languages supported by the AS/400 system.

- Pass-through implications

The characters shown on your workstation depend on the keyboard type defined on your source system. If you pass through to the target system and use a virtual device with a different keyboard type, you may not see the same characters as if you were directly attached to the target system, because the target system uses another language.

To use the TC/IP Telnet Utilities in a multilingual environment, see “TCP/IP Connectivity Utilities/400 Licensed Program” on page 4-22.

Printers: When changing printers, consider the areas of data interchange, data stream, fonts, and host printer emulation.

- Interchange (a System/370 system or a System/390* system sending Advanced Function Printing* (AFP*) data for DBCS to an AS/400 system)

AFP data containing DBCS data can be generated on the AS/400 system. In addition, the AS/400 system can receive AFP-generated data from the System/370 system containing DBCS data and print it on IPDS printers attached to the AS/400 system. The IPDS printers must be configured with *YES specified for the AFP parameter.

- Data Stream

Printers consist of SNA character string (SCS) and intelligent printer data stream (IPDS) printers.

SNA character string (SCS) is a data stream composed of EBCDIC controls, optionally intermixed with end-user data, which is carried within a request/response unit. Host-attached SCS printers can be configured by the systems engineer or by the customer, using a diskette or selection of keys on the printer. The appropriate printer operator's guide should be used to determine how to configure the SCS printer for the language you are using.

One of the strengths of IPDS is that independent applications can create source data. The source data from independent applications is merged at the printer to create an integrated mixed data page. For example, text data could be produced on an editor like the OfficeVision/400 editor, image data could be the output of a scanner stored in a folder, and graphics data could be produced by the Business Graphics Utility program. IPDS makes it possible to integrate application output rather than requiring the use of integrated applications.

- Fonts

Font types for IPDS printers can be configured through the use of the Create Device Description (Printer) or Change Device Description (Printer) (CRTDEVPRT or CHGDEVPRT) commands. Fonts may be downloaded from the host or may be saved in printer storage.

For a list of the character identifier (CHRID values) supported by the various printers and languages, see the *Guide to Programming for Printing*.

- PC Support/400 printer to emulate host printer

The PC Support/400 program supports multiple languages on a single AS/400 system. A PC Support/400 user (except for host emulation) can use any single language of choice that is installed on the attached AS/400 system. If a PC Support/400 user has a host emulation session with five different AS/400 systems, the user can potentially view a different language on each session. However, the same personal computer ASCII code page must be on all the systems.

The installation and configuration of PC Support/400 to obtain this capability is discussed in the *PC Support/400 DOS Installation and Administration Guide* and *PC Support/400 OS/2 Installation and Administration Guide*.

For information about a specific device, see the *Device Configuration Guide* and the appropriate device manuals.

Software

See the *Licensed Programs and New Release Installation Guide* and the appropriate software product manuals.

If your system will be communicating with systems using different languages, use care when specifying configuration names that will be exchanged with the remote system. Avoid using characters that may not be available on the keyboard used by the remote system; for example, characters such as \$, #, and @. The use of these characters should be limited to migration and support of existing systems that already use them.

Configuration names that may be exchanged with remote systems include:

- Network identifiers
- Location names
- Control point names
- Mode description names
- Class-of-service description names
- User ID (from the directory entry)

For more information on configuration names, refer to *OS/400* Communications Configuration Reference*.

Using Multilingual Support in Multilingual Environments

Once the hardware and software is installed, you can begin using the multilingual support. The following are examples of systems in a multilingual environment.

Single System with Multiple Languages

Figure 2-7 on page 2-34 shows a single system with Spanish as the primary language and Italian and German as secondary languages. For Spanish language users, the system defaults are activated and no special configuration is necessary. However, users of secondary languages must ensure that the device descriptions for the display stations, the system library lists, and the CCSIDs of the user profile reflect the secondary language used. For example, this requires the Italian user to create or change the following parameters in the display station description (if using automatic configuration) and to change the system library list by the CHGSBSD or CHGSYSLIBL commands as discussed under “Using and Changing the Secondary Language” on page 2-4:

- Create or change the user profile to CCSID 00280 and the language identifier to ITA.
- Set keyboard type ID to ITB, which specifies the type of keyboard attached to the Italian display station. This also implies that the code page for the device is 280 (see keyboard to code mapping in Appendix C, “National Language Keyboard Types and SBCS Code Pages” on page C-1).
- Change the system library list to include QSYS2932 before the QSYS system library.
- Use the Change Job (CHGJOB) command to change the date value, date format, date separator, and time separator. All other language-dependent functions except CCSID must use the system defaults for the primary language.

- Direct Italian printed output to the printer queue that contains the printed output for Italian data.

A German user would accomplish the same changes as the Italian user:

- Create or change the user profile to CCSID 00273 and the language identifier to DEU.
- Use character set 697 and code page 273 for the CHRID value.
- Use AGB for the workstation keyboard ID in the device description for their display station.
- Change the system library list to include QSYS2929 before the QSYS system library.
- Use the CHGJOB command to change the date value, date format, date separator, and time separator. All other language-dependent functions except CCSID must use the system defaults for the primary language.
- Direct German printed output to the print queue that contains the printed output for German data.

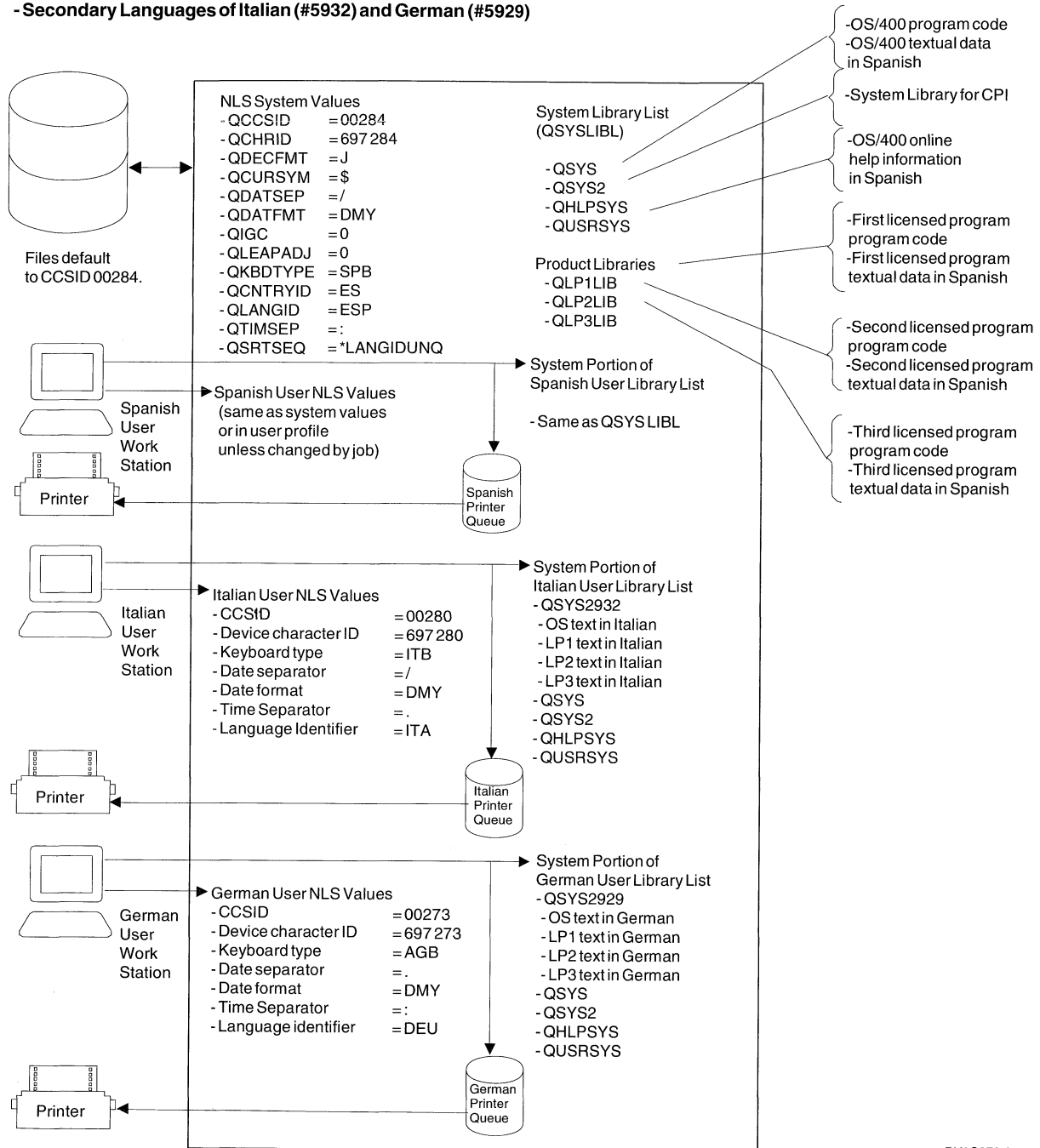
The CCSID for the character fields in the database for this system is the Spanish CCSID 00284, which is based on the job CCSID when the file is created. Assuming the Spanish user did not specify a different CCSID for the database files created, the files are assigned CCSID 00284 and contain code points from character set 697 and the Spanish code page 284. The Italian and German users can still use these files.

Database support automatically converts character data between the default Spanish CCSID 00284 and the Italian user's job CCSID 00280 or the German user's job CCSID 00273.

The example in Figure 2-7 on page 2-34 shows a SRTSEQ value of *LANGIDUNQ.

AS/400 System

- Primary Language of Spanish (#2931)
- Secondary Languages of Italian (#5932) and German (#5929)



RV2C072-9

Figure 2-7. Single AS/400 System with Primary Language and Two Secondary Languages

Single System Supporting DBCS and SBCS

Figure 2-8 on page 2-36 is a single system containing English Uppercase DBCS as the primary language and Japanese DBCS and English SBCS as secondary languages.

In this example, English uppercase is viewed on English users' display stations because English uppercase is the primary language version installed. It contains all the textual data and is restricted to the English uppercase alphabet. However, if the English data is to be displayed correctly, you must change the keyboard type parameter in the device description to USB for the English display stations and set the CCSID parameter in the user profile to 00037. If the device configuration is not changed, all lowercase characters and some special characters may not be viewed by the English user.

Note: For a Japanese display station, if you specify JKB on the keyboard parameter, you can use double-byte Japanese characters, single-byte English uppercase characters, and single-byte Katakana characters concurrently. If you specify JUB on the keyboard parameter, you can use double-byte Japanese characters and single-byte English uppercase and lowercase characters.

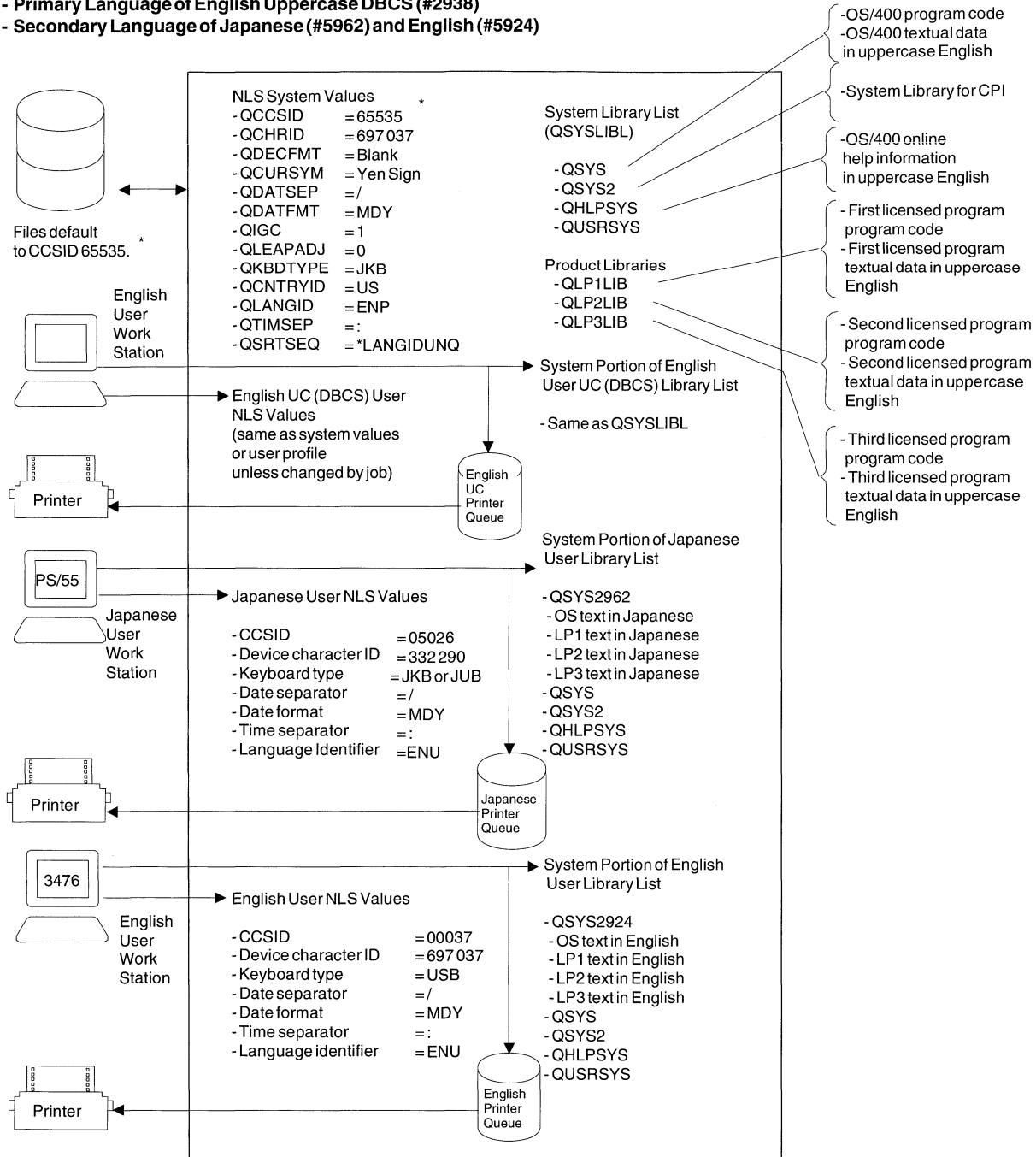
The AS/400 system requires a DBCS primary language to support a DBCS secondary language. If you have a DBCS primary language and a DBCS secondary language, you may want also to provide an SBCS language for the majority of users. You can do this by changing the system library list and adding QSYS2924 to the system library list. A better way is to use a subsystem description for the secondary language users. Then all secondary language users use the same subsystem. In some cases you may want to change the CCSID in the user profile to indicate the CCSID for the language of choice (05026 in this example). For more information on using the subsystem description, see "Using and Changing the Secondary Language" on page 2-4.

If you make these changes for an SBCS language of choice, such as NLV 2924, users of NLV 2938 will not have the correct characters in displays and messages. To correct this situation, these users must change their system library list, or all such users must be assigned to a special subsystem where QSYS would once again be the first library in QSYSLIBL where their display stations are automatically configured. If automatic configuration is not supported by the device, do a manual configuration and have the applications of the users of NLV 2938 use the text message CPX8416 for the system values.

Users of double-byte and single-byte languages may not want to store their data in the same database. You can create a separate DBCS-capable physical file and a separate SBCS-capable physical file. The CCSID parameter can be used to specify the CCSID that data is stored in. For more information about creating DBCS-capable files, refer to the *DDS Reference*.

AS/400 System

- Primary Language of English Uppercase DBCS (#2938)
- Secondary Language of Japanese (#5962) and English (#5924)



* Because this national language version is not specific to any country, 65535 is used. You may want to change this system value to an appropriate CCSID after installing your system, or change the job or user profile CCSID. System and product files not explicitly assigned a CCSID value will be assigned CCSID 65535.

RV2C071-10

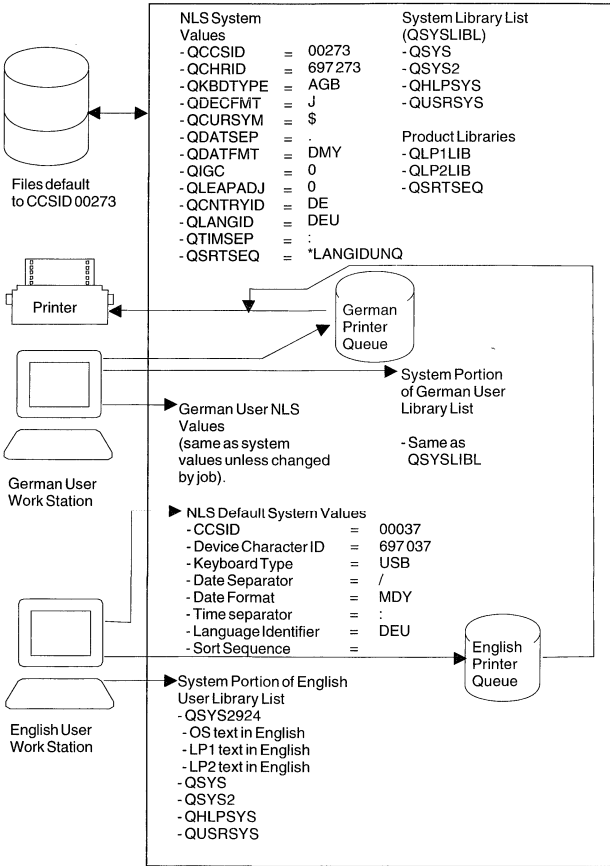
Figure 2-8. Single System with AS/400 DBCS Primary and Secondary Languages and an SBCS Secondary Language

Multilingual Network

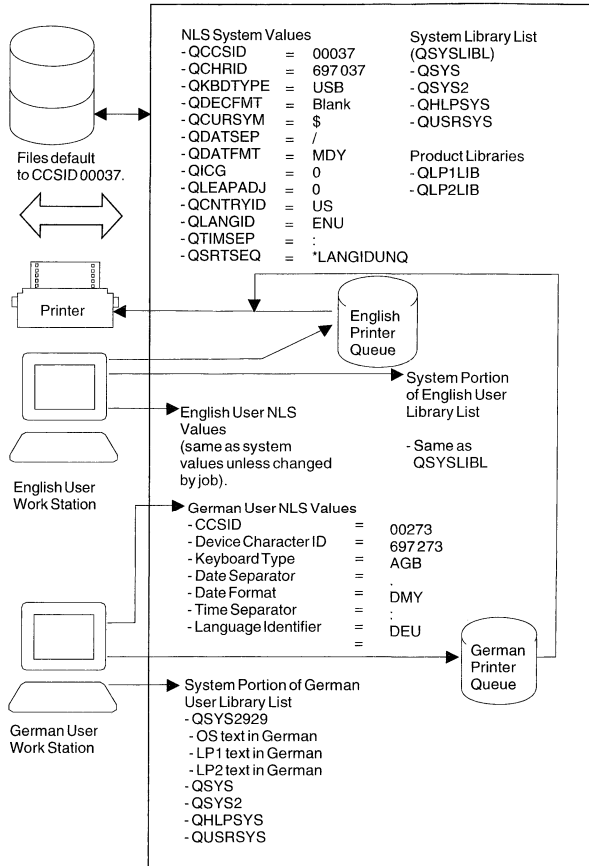
Figure 2-9 on page 2-38 illustrates three AS/400 systems interchanging data, and each system uses a different primary language. Because data is flowing between systems with different primary languages, the data must have a CCSID assigned if data integrity is to be maintained, and thus allow character data to be correctly displayed by the receiving user.

The data is assigned the coded character set identifier (CCSID) found in the national-language dependent system value (QCCSID) for the primary language, found in the CCSID parameter of the user profile, or found in the job attribute. Character data in database files is automatically assigned a CCSID by the Operating System/400 database manager. Character data not distributed in database files (for example, through the Send Network File (SNDNETF) command) must be handled by the application.

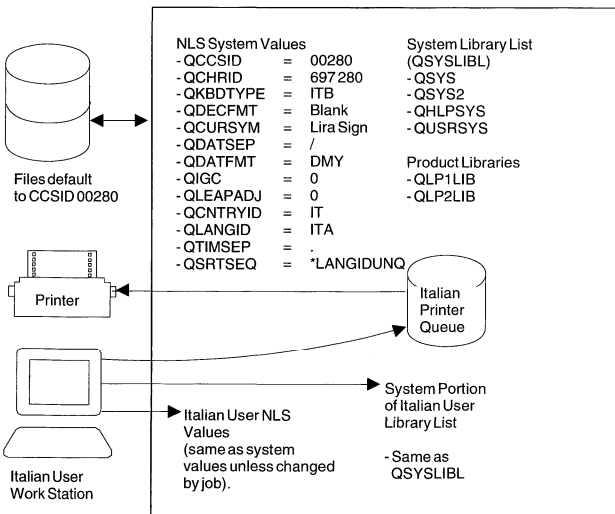
AS/400 System
- Primary Language of German (#2929)
- Secondary Language of English (#5924)



AS/400 System
- Primary Language of English (#2924)
- Secondary Language of German (#5929)



AS/400 System
- Primary Language of Italian (#2932)



RV2C076-6

Figure 2-9. Network of Three AS/400 Systems with Different Primary Languages

Planning Checklist for Multilingual Support

You should answer the following questions and fill out the Planning Checklist you started in chapter 1.

Table 2-2 (Page 1 of 2). Checklist for National Language and Multilingual Support

Check Off	Question	Response
	What local work station controllers support your language? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What display stations and keyboards are required to support your language? (To determine the display stations and keyboards, refer to "Ordering Equipment and Software" on page 2-22 and Appendix D, "Multilingual Support for the AS/400 Workstation Controller" on page D-1.)	
	What printers support your language? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What keyboard ID are you using for your local devices? (Refer to Appendix B, "National Language Version Default System Values" on page B-1.)	
	What remote work station controllers support your language? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What display stations and keyboards support your language from a remote location? (Refer to "Ordering Equipment and Software" on page 2-22 and Appendix D, "Multilingual Support for the AS/400 Workstation Controller" on page D-1.)	
	What printers support your language from a remote location? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What keyboard ID are you using for your remote devices? (Refer to Appendix B, "National Language Version Default System Values" on page B-1.)	
	Are you considering the workstation customization function for work stations? (Refer to <i>Workstation Customization Function Programmer's Guide</i> .)	
	What applications support your languages on the local system? (Contact your marketing support representative in your country.)	
	What applications support your languages on the remote system? (Contact your marketing support representative in your country.)	

Table 2-2 (Page 2 of 2). Checklist for National Language and Multilingual Support

Check Off	Question	Response
	Do you want all your database files with the CCSID of the primary language? (Refer to “Database Management Support for Coded Character Set Identifiers” on page 2-7.)	
	Are you aware of the limitations in multilingual and multiple system settings for CCSIDs? (Refer to “Major Limitations” on page 2-16.)	
	Do you want the language ID and country ID different from the primary language? (Refer to “Changing National-Language-Dependent Functions in User Profiles” on page 1-15.)	
	Do you want to work with sort sequence tables in your applications? (Refer to “National Language Sequence Support” on page 1-10.)	

Chapter 3. Developing an Internationalized Application

This chapter contains guidelines for designing and writing internationalized applications based on the existing national language support in the OS/400 program.

Internationalized applications are those that can operate in all language environments without any change to the application. Any support that is based on a user's language, country, culture, and character encoding is **localized** support.

A software product that is internationalized and localized is an **NLS-enabled** product. You should not have to recompile or repackage data objects, but your product may be required to use a different data object based on the language version you are using. You should have one set of program code and different sets of textual data (messages, displays, online help information) and culture-dependent code.

Defining the Application Marketplace

The most important factor for every decision is that you know for whom you are designing and developing your applications. To find out this answer, ask yourself the following questions:

- What are my target markets for today and tomorrow?

The answer to this question makes a big difference if you define your marketplace in different countries or only in the area of your own language, or if you decide to include countries speaking other languages. It makes a bigger difference if you decide to include countries using non-Latin languages such as Hebrew, Chinese, or Japanese.

Along with the language problem, there are other areas to consider. You need to understand the culture, habits, ways of doing business, and laws of the target markets. You need to understand the customers' ways of life for you to be accepted as a business partner, to be able to get into the market, and to support them in their countries.

These factors may all affect:

- The skills you need (technical, cultural, language, laws)
- The environments to consider
- Your company structure and support organization
- Your relationship to other companies
- Resources you need (people, time, and money)

- Who are the users of the application?

You must understand the requirements that future users of your application will have. For example, do they want to:

- Work with separate databases for different languages?
- Work with a shared database for all languages?
- Exchange or consolidate data?
- Work with different languages dependent on the end user, the company branch, or their customers?

- Use end user database tools to do their own inquiries on the application database?

All these factors may affect the design you choose, the way your application is able to switch from one language environment to another, and how data presentation and conversion take place.

- How much national language support is needed?

After you understand the requirements for your customers and their end users, you can decide what kind of culture-sensitive information you need to store and maintain, the type of data presentation, which parts you have to translate, and how your application must be able to be integrated in the different environments.

- What is the cost of the effort?

To estimate the expected revenue, analyze the places you have chosen as your target market. After you know the requirements, you should be able to determine the effort and costs. This amount allows you to compare the costs against the expected revenue.

- What is the initial cost of enabling the application compared to retrofitting an existing application?

The initial cost of enabling an application for national language support might be higher. But consider that the enabling steps are based more on normal modular and data-driven design techniques, which improve the quality of your application even without NLS enabling. Because a good design helps people to understand and describe the application system, you will receive a certain return on the investment. A good design helps to improve productivity of development and maintenance. You have the additional effort of designing and implementing the application only once, even for many different language versions. Compared to retrofitting an existing application, it is much cheaper to plan and design it from the very beginning.

Planning for Internationalized Applications

An NLS-enabled application should be well planned at every stage in order to save time, effort, and money.

Consider the following steps when planning for an internationalized application.

- Development process
- Translation process
- Testing
- Packaging and installation
- Application maintenance

Development Process for Creating Internationalized Applications

Before you are ready to develop NLS-enabled applications, consider the following for a successful development process.

Education for Developing Internationalized Applications

When you intend to develop NLS-enabled applications, you need to consider additional initial education. This does not mean you have to learn all the languages you want to work with on your own. The following are important topics to learn about:

- General NLS concepts
- Available NLS support on the AS/400 system
- Isolation of different parts of an application
- Data presentation corresponding to cultural conventions
- Design and coding for textual data parts
- Translation process
- Product and system integration
- Packaging, installation, and setup
- Product support and maintenance

Based on the NLS enabling guidelines, first prepare a prototype application and test the chosen way of implementing the application for your specific environment. Afterward include the NLS enabling guidelines into your general application development processes, guidelines, and standards.

Application Design

Consider NLS-enabling aspects at the beginning of your design. For example, your database design in terms of database content and relations, the field sizes, key sequences, and storage formats may change when supporting a non-English speaking country.

NLS-enabling affects the process design in terms of isolation, control of the NLS-dependent functions, and modular program design. Many functions can be a general design and driven by an external program. Such a program could be NLS-specific editing information or any calculation factors for a flexible calculation routine.

NLS-specific information either can be retrieved directly from a database file or can be passed to programs as parameter lists. You will have a more flexible application when you achieve a table-driven design rather than a process-driven design.

NLS-enabling affects the display and report design in terms of layout, presentation, validation, and control. You need to design displays and reports in a flexible way that makes them translatable and adaptable to the needs of different languages and cultural conventions.

Implementing Internationalized Applications

When implementing an internationalized application, the most important objective is to produce only one set of running code. You must differentiate consistently between running code and textual data. It is essential that you standardize the chosen approach throughout the whole application. Work with unique and clearly defined naming conventions. To understand and to maintain this information in the application, handle parameters called from a program in a consistent way.

Documentation for Internationalized Applications

Documentation should provide information for the end users of the application system in their own language. The documentation should also include installation, setup, and customization information for the end user, the system operator, and the application system manager.

The user documentation should be textual data that can be easily translated. Whenever possible, combine the online help information and user documentation to reduce the volume of text to translate. Any example displays or print layouts should be produced by the application and included in the documentation.

Translation Process

Translating the textual data is a very time-consuming process. The textual data should be available to translators very early in the development stage, even before the code is stable. Consider the following areas when planning for translation:

Physical Equipment

Each translator should have equipment compatible with the language being translated. The display stations and keyboards should have all the characters needed to translate, and the printers should be able to print the translated text.

Translation Tools

Provide the translators with tools to increase productivity and avoid translating parts of the application that are textual data. When purchasing or developing a translation tool, the following features should be included.

- An editor that provides the ability to show displays that would be seen by the end user, and the ability to translate the textual data on the system but still protect the parts of the application that are not textual data.
- A dictionary function to provide consistency of words and phrases throughout the product.
- A validation process to check translation errors that might cause the application to malfunction.
- A merge function that provides the ability to merge the translated text into a new version of the original text. This merge function allows for translating only new text, and saves time and effort.
- A print function for validation purposes.
- Enhanced editing functions such as scan and replace, find, copy, move, and delete.

Translation Education

It is important that translators are familiar with the product they are translating and also with the tools they are using. The translation process is not the replacement of one word with another, but the formation of concepts in another language. Knowledge of the product being translated provides more understandable products to the end user. Time and resources for educating translators should be planned well in advance.

Translation Guidelines and Instructions

Guidelines and translation instructions should be provided to ensure correct translation. For example, to translate an error message properly, it is important to know in what context this message is displayed. A note to translators telling them what error caused the message to be displayed also helps.

Glossary for Translation

It is important that the developers provide a glossary of terms and abbreviations to all translators.

Testing

The testing of an NLS-enabled product is more complex than an ordinary application.

The testing of the application should be done in three phases:

1. Testing the running code

The running code should be tested in a national language support environment in order to check all the possible language-dependent combinations. Translators should not test the product.

2. Checking the textual data

The textual data should be tested to check correct translation and consistency throughout the product.

3. Integrating the running code and textual data

After the textual data and the code have been tested separately, an integration test should be performed to test if the application has taken into account all the NLS-related processing, and that the translation of the textual data has not caused a malfunction in the product.

If your application will also run on a multinational or multilingual system a separate test that includes more than one set of textual data should be planned.

Packaging and Installation

Running code, translated textual data, and installation documents are three considerations when packaging applications:

- The running code should be placed apart from the textual data in separate objects and in a separate library.
- Place the translated textual data for each language apart from the running code in separate files and in separate libraries. The customer should receive the textual data only in the languages that were ordered. Do not send the textual data to all customers. If the textual data is sent to all customers, they could become confused.
- Installation documentation

It is important to provide comprehensive installation documents (translated into the language of the person installing the product) to avoid unnecessary operator-related problems and also to avoid the wrong impression right at the beginning that the application is not reliable.

Installation documentation should cover the following topics:

- What is needed to install and run the application, such as hardware and software requirements.
- How to install the application, and how to recover when things go wrong.
- What changes need to be made regarding:
 - Subsystem definitions
 - Device descriptions
 - User profiles
 - System values
 - Library lists
 - Output queues
- What are the application limitations?

Application Maintenance

Consider the following points when planning for maintenance of a multilingual application:

- The running code must be maintained separately from the textual data, but these separate components must be fully synchronized. A redesign in one component may cause a redesign to be made in the other.
- Whenever textual data is changed, be sure that it is incorporated into all the languages your textual data was translated. In this way, you can ensure full agreement and maintain a single level for the complete product.
- Be sure to test the running code for each textual data change you distribute.

User Interface for Internationalized Applications

The system provides specific software functions (such as displays, menus, online help information, command prompts, and externally described messages that are part of the user interface) to help you organize your data and store it in a library for easy translation.

This section provides guidelines for the application developer in designing the user interface for an NLS-enabled application. These guidelines should be applied early in the design to be effective:

- Making textual data translatable
- Techniques for coding textual data
- Respect cultural conventions
- Enabling for CDRA

Making Textual Data Translatable

To make the translation process as easy as possible:

- Isolate textual data from the running code.

To allow easier translating into multiple languages and to avoid translating the running code, all textual data should be separated from the running code. Only one set of running code is needed, but many translations of the textual data can be done.

- Provide for expansion space during translation.

The space needed to translate text from one language to another varies by language. To ensure that the translated version preserves the concept and keeps usability, sufficient presentation space must be allowed for the textual data expansion.

Table 3-1. Translation Expansion Table

Number of Characters in Text	Additional Space Required
Up to 10	100 to 200%
11 to 20	80 to 100%
21 to 30	60 to 80%
31 to 50	40 to 60%
51 to 70	31 to 40%
Over 70	30%

- Provide for different display locations.

Because the position of one display element often is influenced by the position and size of others, the translated version of a display may have to relocate some elements. The program must continue to respond properly, despite this relocation.

- Allow for flexible order of variables.

In order to contain dynamic information, messages usually employ substitution variables. However, each spoken language has its own syntax (order of arrangement of parts of speech). When a message is translated into another language, the position and order of substitution variables may have to change to meet the syntax requirements in the translated language.

- Make textual data complete entities.

If the final form of the constant text relies on the composition of various parts, it may be untranslatable. This is because the translator might not know which form of the word to use.

- Treat commands, responses, and keywords like textual data.

Commands, responses, and keywords should be translated into the language normally spoken by the user. For example, an English application has been translated into German. If the response is still in English as Yes and No, the German users would feel unfamiliar and uncomfortable in using the program because the responses they are familiar with are Ja and Nein.

- Make terminology consistent throughout the product.

If consistent terminology is not being adopted throughout the product, translators will waste time trying to determine the appropriate word to be used in translation.

- Include notes in your information for correct word use to prevent any misunderstandings.

- Express all text as simply as possible.

Use simple phrases and sentences and avoid compound phrases. Simple words allow easy translation.

- Avoid abbreviations.

Rules for abbreviations vary from language to language. Abbreviations of words can lead to misunderstandings by the translator and by the end user.

- Avoid slang, jargon, and humor.

Slang, jargon, and humor are specific for a particular language and cannot be easily translated into another language.

- Avoid negative questions.

Negative questions are often misunderstood by the user. When asking questions, ask them in a positive way.

A more detailed description of these rules can be found in the *National Language Design Guide, Designing Enabled Products, Volume 1*, SE09-8001.

Techniques for Coding Textual Data

Application displays, printer file specifications, and user-created commands usually contain a large amount of constant text along with the input and output fields, such as headings, field prompts, instruction lines, and function key descriptions.

Four different techniques can be used to specify, store, and use constant text. Each technique can be used for specific types of textual data components and has its advantages and disadvantages. The following explanations show you how each works and what component it is for.

Direct Coding as an Unnamed Output Field

The most common way to define constant text is to specify the text directly in the source code as a literal. This technique can be used for:

- | | |
|----------------------|--|
| Display files | Constants such as titles, instruction lines, option definitions, headings, field prompts, command key descriptions
Default values on input fields (DFT keyword)
Error messages (ERRMSG/SFLMSG keyword) |
| Printer files | Constants such as titles, headings, total line descriptions |
| User commands | Prompt descriptions on the command definition statements. |

For device files, specify the text as an unnamed field, indicating the starting line and column and the constant text itself.

For example:

```
A          line pos          'Text . . . . . : '
```

A similar rule applies to user-created commands. Define the text directly on the keywords of your command source statements.

For example:

```
CMD          PROMPT('      Command description      ')
```

When defining the text directly on the keywords, standardize the sizes of the different elements in a large literal, rather than specifying many small single one as single words. This makes the source code more readable and more flexible for translation. Consider that the space needed for explanation text can vary from language to language. To have enough room after translation, remember to reserve

The message has to be entered into the specified message file using the ADDMSGD (Add Message Description) command before the object can be created.

For example:

```
ADDMSGD   MSGID(xxxxxxx) MSGF(library-name/message-file-name) +
          MSG('Text')
```

This technique allows you to create any number of objects in different languages and to put them into different libraries using the same source code by just assigning another message file at object creation time. The message file is only needed during the creation of the object. Consider specifying the appropriate length for different languages on the MSGCON keyword and making that information available to the translator. Figure 3-2 is an example.

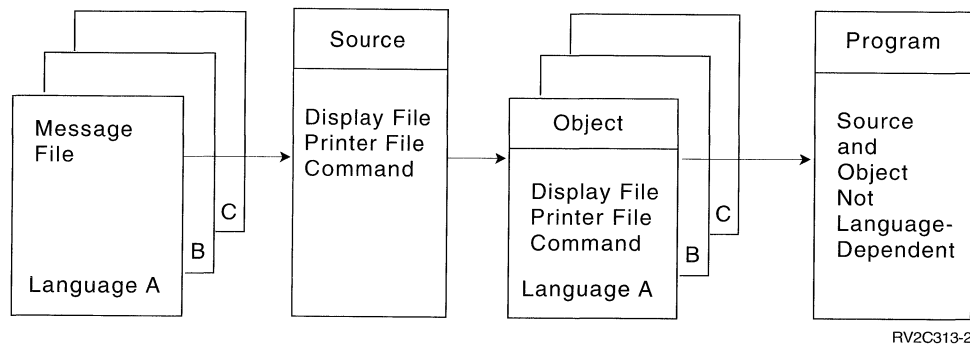


Figure 3-2. Early Binding of Messages

At file creation time, you can choose the appropriate textual data of the language version you want to work with by setting up the library list with the specific library containing the textual data and the program library.

Note: If the display file or printer file source contains the EDTCDE keyword, the decimal delimiters are based up the QDECFMT system value when the object is created. You may need to change the QDECFMT system value before creating the objects for a specific language.

Late Binding of Messages

Text can be stored externally from the DDS source code in a message and is bound only to the display format at run time.

This technique can be used for:

- Display files only**
 - Constants such as titles, instruction lines, option definitions, headings, field prompts, command key descriptions (MSGID keyword)
 - Default values on input fields (MSGID keyword)
 - Field validation specifications (CHKMSGID keyword)
 - Error messages (ERRMSGID and SFLMSGID keywords)

In the DDS for the display file, the message is specified through the MSGID (Message Identifier) keyword. The message has to be entered into the specified message file using the ADDMSGD (Add Message Description) command.

For example:

```

A   FLD-name length line pos   MSGID(message-ID [*lib1/]message-filename)
      ▲
      includes expansion space

```

```

ADDMSGD  MSGID(xxxxnnn) MSGF(library-name/message-file-name) +
          MSG('Text

```

This technique allows you to create any number of message files in different languages and different libraries, with one DDS source code and display file object. During run time, you assign another message file by setting the library list accordingly. Figure 3-3 is an example.

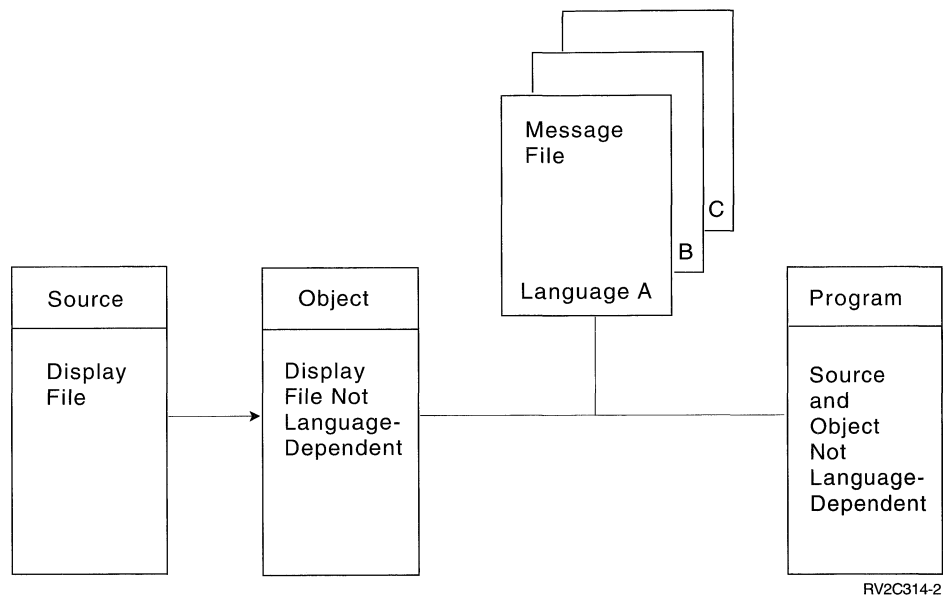


Figure 3-3. Late Binding of Messages

Note: This technique requires that the application performs all editing based on the cultural convention.

Storing Text in Database Files

Text can be stored externally from the source code in a database file and retrieved by the application program, and then moved to the display or print format at run time. Instead of coding constants on the DDS, you can specify output fields that can be filled by the program. Consider specifying the appropriate length for different languages on the output fields and making that available to the translator.

This technique can be used for:

- | | |
|----------------------|---|
| Display files | All constant text
Default values on input fields
Error messages |
| Printer files | All constant text |
| Programs | All constants like compare values, scan characters, and tables. |

As shown in Figure 3-4 on page 3-12, this technique allows you to create any number of database files in different languages and different libraries, with only one

DDS source code and display file object. During run time, you assign the corresponding database file by setting the library list accordingly.

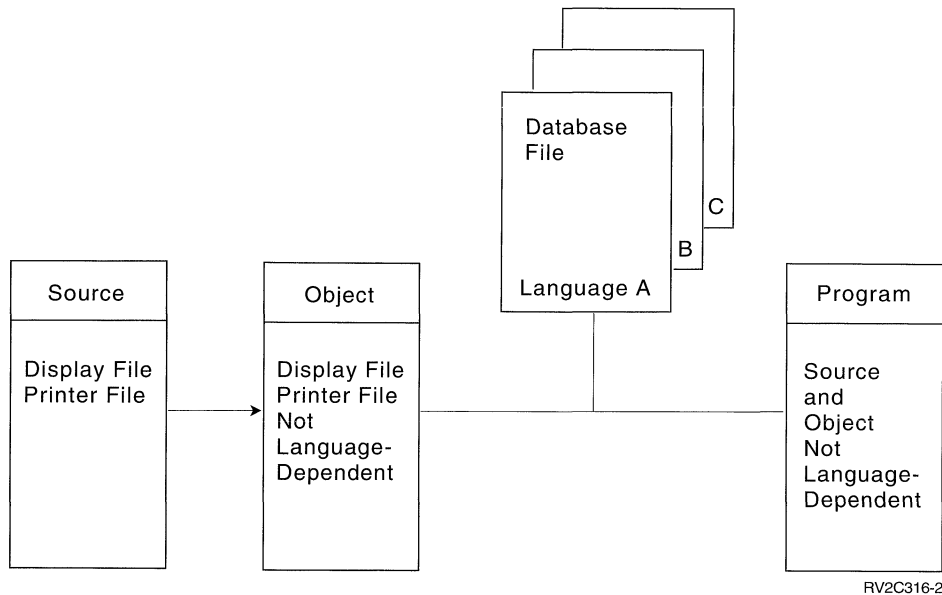


Figure 3-4. Storing Text in Database Files

Note: This technique requires that the application perform all editing based on the cultural convention.

Respecting Cultural Conventions

Different countries have different standards that must be taken into account when developing an NLS-enabled application. For transformation to take place, the culturally sensitive information must be placed outside the program the same way as the textual data is handled.

Many languages have characters (such as common-usage vowels essential to the correct spelling of a word) outside of the A–Z alphabet that must be considered for collating purposes. For example, a simple list of documents displayed from the system will appear sorted in ascending order according to the hexadecimal values of the code points.

The language or cultural considerations provided by the system are the formatting of language or culture-dependent data and the ordering of data, which may vary by language or culture (country). Appendix B, “National Language Version Default System Values” lists the default system values for each national language version.

Cultural conventions must be reflected in the data stored on the system (database attributes) and in the processes manipulating that data (program attributes, job attributes, or both).

Culture-dependent database attributes are the following:

- Coded character set identifier (CCSID)
- Sort sequence (SRTSEQ)
- Language identifier (LANGID)

The CCSID attribute applies only to physical files while the other two can be used with both physical files and logical files. A logical file can have a CCSID value only if it has taken the logical file from the physical file. The database attributes are stored with the data. They are static in the sense that they cannot be dynamically altered by the process of accessing the data. For other attributes defined with DDS, see “Other Language-Dependent or Culture-Dependent System Functions” on page 1-16.

Culture-dependent job attributes are the following:

- Coded Character Set Identifier (CCSID)
- Sort Sequence (SRTSEQ)
- Language Identifier (LANGID)
- Country Identifier (CNTRYID)
- Date Format (DATFMT)
- Date Separator (DATSEP)
- Time Separator (TIMSEP)

The default values for CCSID, SRTSEQ, LANGID, and CNTRYID attributes are set according to the user profile running the job. The default values for other keywords are taken from the corresponding system value. Using the Change Job (CHGJOB) command, you can override the values specified for any of the listed job attributes.

Using the Create User Profile (CRTUSRPRF), Change User Profile (CHGUSRPRF), Batch Job (BCHJOB), and Submit Job (SBMJOB) commands, you can affect only the values specified for the CCSID, SRTSEQ, LANGID, and CNTRYID attributes.

The SRTSEQ and LANGID parameters can also be specified as a program attribute belonging to a *PGM object type. If a program explicitly refers to a sort sequence or a language identifier, then those attributes stored in the program object take effect. The *JOB RUN value for these parameters is used to refer to the attributes of the job running the program. *JOB RUN makes it possible to use a single set of programs processing data according to different sort sequences. The *JOB RUN value affects only the processing of data, however, not the retrieval sequence of data. The retrieval sequence is determined by the database attributes. To retrieve data in a sort sequence different than what is defined in the database, use logical files that are built separately.

Do not use system values such as QDECFMT or QDATFMT unless you are running your application on a single language system.

If the translated languages for your application have a national language version, then use message CPX8416 from the QCPFMSG message file to get cultural values. The message exists for your primary language and all installed secondary language libraries. The system message contains these values:

- Code page and character set
- Currency symbol
- Date format
- Date separator
- Decimal format
- Leap year adjustment
- Coded character set identifier
- Time separator

Language identifier
Country identifier

Culture-dependent fields in the panel or display should not contain coded values. These fields should be defined with the maximum length permitted for the field on the display. A callable routine uses the cultural values for the primary language to determine the contents of the field (for example, date format) and places these values on the display. NLS system values maintained in message CPX8416 determine the format of the cultural values appearing in the culture-dependent fields. If the application is to support users in languages other than the primary language, the callable routines should use the CPX8416 message values.

Your application can use the details from the system message. Figure 3-5 is an example of the contents of the message for English uppercase and lowercase NLV (2924).

```
Display Formatted Message Text
System: RCHAS149
Message ID . . . . . : CPX8416
Message file . . . . . : QCPFMSG
Library . . . . . : QSYS
Message . . . . . :
QCHRID 697 37          QCURSYM $ QDATFMT MDY QDATSEP /
QDECfmt QLEAPADJ 0 QCCSID 37 QTIMSEP : QLANGID ENU
QCNTYID US

Press Enter to continue. Bottom
F3=Exit F11=Display unformatted message text F12=Cancel
```

Figure 3-5. Example of English Uppercase and Lowercase NLV (2924) Display

Date Formats

There is no worldwide standard for the presentation of dates. Therefore the date format should always be stored externally as part of the textual data. The valid date formats on the AS/400 system are:

- *MDY (Month, day, year)
- *DMY (Day, month, year)
- *YMD (Year, Month, Day)
- *JUL (yy/ddd)
- *ISO (YYYY-MM-DD)
- *USA (MM/DD/YYYY)
- *EUR (DD.MM.YYYY)
- *JIS (YYYY-MM-DD)

In database files, dates can be stored as:

Normal numeric data fields

SAA date data-types

When you store dates as numeric data, your application needs to specify the format in which it is stored and presented.

When you store dates as data type DATE (L), you can specify the format with the DDS keyword DATFMT on the database file. The date is shown in this predefined format as character data, including the date separators.

If date sorting and other processing is needed, the date should be stored in *ISO format and converted during the input and output operations. Use the Convert Date (CVTDAT) command to convert dates or write a high-level language routine to do the conversion.

Date Separators

The valid date separators are:

- / (slash)
- (dash)
- . (period)
- , (comma)
- (blank)

The date separator for presentation should always be stored externally as part of the textual data.

When you use decimal fields for dates, not only does your application have to specify the format, but it also must handle the date separators during the input operation and presentation.

When you use date-type fields, the date separators are always included in the date. To exchange the date separator, you can use the CVTDAT (Convert Date) command to convert dates or write a high-level language routine to do the conversion.

Date Presentation (Editing)

You need to handle the presentation of dates on display and printer files differently, depending on how they are stored:

- As a normal decimal data field

Your application program has responsibility for the way the date is entered, stored, and presented. The application must check to see that the date is entered in the right format, remove any date separators, convert the date to another format when necessary, and edit it on the display file or printer file.

The editing can be done using the edit code keyword, EDTCDE, for 6-digit date fields. For the DDS keyword DATE, which is an output-only field for the actual job date, the date is shown using the date format and separator of the job attributes.

For all other types of fields using the edit code Y keyword, the program has to specify the format, and the system uses the date separator of the job that created the device file. The date separator is integrated in the object, and you are not able to change it dynamically at run time.

- As an SAA data type DATE (L) field

The DDS date format (DATFMT) keyword allows you to specify different date formats, including default date separators, at the database field level. For the *MDY, *DMY, *YMD, and *JUL parameters, the default date separator can be changed with the date separator (DATSEP) keyword. The *ISO, *USA, *EUR, and *JIS values have a fixed separator, and the DATSEP keyword is not allowed with these values. The DATFMT and DATSEP keywords allow you to specify the format and editing characters for storing date fields. The date is shown as a character string, including the separators.

The DATFMT keyword allows you to specify such date fields as normal character fields on the display file or printer file. On an input operation, your program has to check entered data for the correct format and separators and move the data over to the database field. On an output operation, you can just move the character string from the database file field (including the separators) to the device file field. Any format conversion between the input and output format and the format the database asks for can be done by:

- Using the CVTDAT (Convert Data) command
- Application program routines
- Field mapping through logical files that define different date formats and separators

For example, you can provide a date conversion that is dependent on the actual job attributes by using the following CL program:

```

PGM      PARM(&fromfmt &fromfld &tofld)
DCL      VAR(&fromfmt) TYPE(*CHAR) LEN(4)
DCL      VAR(&fromfld) TYPE(*CHAR) LEN(10)
DCL      VAR(&tofld) TYPE(*CHAR) LEN(10)
CVTDAT   DATE(&fromfld) TOVAR(&tofld)
          FROMFMT(&fromfmt) TOFMT(*JOB) TOSEP(*JOB)
ENDPGM

```

Your application program has to pass the format of the date you want to convert and the date itself to the CL program. The CL program assumes that the job values represent the way the user expects to see date fields edited. It retrieves these values and does the conversion, conforming to these values, and passes back the date in that way. The *ISO, *USA, *EUR, and *JIS values have a fixed separator that cannot be changed. If the TOFMT parameter contains one of these values, the TOSEP value is ignored.

Time Formats

The valid time formats on the AS/400 system are:

- *HMS (hh:mm:ss)
- *ISO (hh.mm.ss)
- *USA (hh:mm AM or hh:mm PM)
- *EUR (hh.mm.ss)
- *JIS (hh:mm:ss)

The time format for presentation should always be stored externally as part of the textual data.

In database files, times can be stored as:

- Normal numeric data fields
- SAA time data-types

When you store the time as numeric data, your application needs to specify the format in which it is stored and presented.

When you store the time as data type TIME (T), you can specify the format with the DDS keyword TIMFMT on the database file. The time is sorted in this predefined format as character data, including the time separators. To convert time fields from one format to another, write a CL program or high-level language routine to do the conversion.

Time Separators

The valid time separator characters on the AS/400 system are:

- : (colon)
- . (period)
- (blank)

The time separator for presentation should always be stored externally as part of the textual data.

When you use decimal-data fields for time fields, your application needs to specify the format and time separators on the input and presentation operations.

When you use time-type fields, the time separators are always included in the time field. To exchange the time separators, write a CL program or high-level language routine to do the conversion.

Time Presentation (Editing)

You need to handle the presentation of times on display files and printer files differently, depending on the way they are stored:

- As a normal decimal data field

Your application program has responsibility for the way the value is entered, stored, and presented. The program must check for the correct format, eliminate the time separators, convert the time to another format when necessary, and edit it on the display file or printer file.

The editing can be done by specifying the edit word (EDTWRD) for the field. The TIME keyword is an output-only field for the actual job time. Both the edit word and TIME keyword use the information available at creation time. The date separators are integrated in the device file object, and you are not able to change them dynamically at run time.

Both ways force you to have different copies of the source and objects for different editing requirements.

- As an SAA data type TIME (T) field

The OS/400 program allows you to specify different time formats and time separators on the database file level. The TIME keywords allow you to specify the format and editing characters for storing time fields. The time type field is shown as a character string that includes the separators.

As an SAA data type, you can specify such time fields as normal character fields on the display file or printer file. On an input operation, your program has to check entered values for the correct format and separators and move them over to the database field. On an output operation, you just move the character string from the database file field to the device file field, including the sep-

arators. Any format conversion between the input and output format and the format that the database asks for can be done either by:

- Application program routines
- Field mapping through logical files that define different time format and separators

Sort Sequence for National Languages

Sort Sequence is supported on the AS/400 system beginning with Version 2 Release 3. The ordering of data, according to culture-dependant requirements for specific applications, can be achieved by using one of the following options:

- Hexadecimal sorting (sort sequence tables not used). This is the default.
- A user-supplied or system-supplied shared-weight sort sequence table or unique-weight sort sequence table, determined by the SRTSEQ parameter.

The following example shows how to use one set of DDS source to create database files with different sort sequences. The following steps can be performed:

For language A:

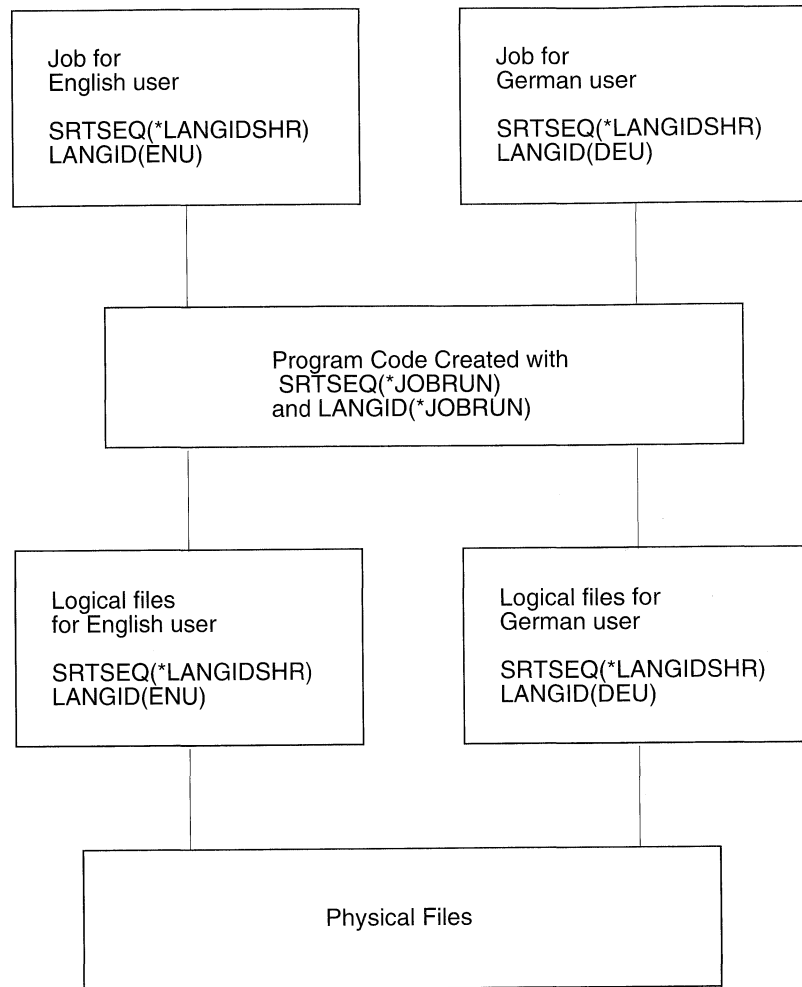
```
CRTXF      FILE(*CURLIB/NAME)
           SRTSEQ(*JOB)
           LANGID(*JOB)
```

You can then use different user profiles to create different sort sequences for each language you want.

The CL program and high-level language programs can be created by specifying either of the following:

- A sort sequence table to be used (early binding)
Bind, in SQL, is a process by which the output from the SQL precompiler is converted to a usable structure called an access plan. This process is the one during which access paths to the data are selected and some authorization checking is performed.
- A sort sequence to be used as the SRTSEQ associated with the job at the time the program is run (late binding)

Late binding makes it possible to use one set of programs in different national language environments. Figure 3-6 on page 3-19 illustrates using different sort sequences for different jobs with one set of physical files and program code. The sort sequence table defined for the job and used by the program should be the same as (or compatible with) the sort sequence table assigned to the logical files accessed through the library list.



RV2C330-1

Figure 3-6. Using Different Sort Sequences

If your program is expected to run with different sort sequences, consider the following:

- Presenting the data in different order.
- Processing different records.

Specifying selection criteria such as *less than* or *greater than* can result in selecting different records. The selection criteria *equal to* can result in selecting a different number of records when the shared-weight sort sequence table is used.

- Processing of a conditional branch may be different.

Note: System lists (such as the output from the WRKOBJ command) are not affected by sort sequence support.

You can also use the DDS file-level keyword alternate sequence (ALTSEQ) to specify the sequencing table and the library in which it is contained. The system-supplied sort sequence tables with shared and unique weight can be used for defining the alternative collating sequence.

The alternative collating sequence table is inserted into the file at compile time and is not needed at run time. You can have different files containing different collating sequences using one set of DDS.

Note: The alternative collating sequence defined in your database files must also be defined in your application programs; otherwise, you may get unpredictable results.

The DDS keyword ALTSEQ, provides limited support for sequencing, it has no effect on select/omit logic. The ALTSEQ keyword can only be used with the SRTSEQ(*SRC) parameter on the CRTPF and CRTLF commands.

Designing and Coding Guidelines for Internationalized Applications

It is difficult to write a single set of code and use it in both the single-byte character set (SBCS) encoding and double-byte character set (DBCS) encoding environments. Clarification on what is meant by an encoding environment is discussed under “Encoding Scheme” on page 1-5.

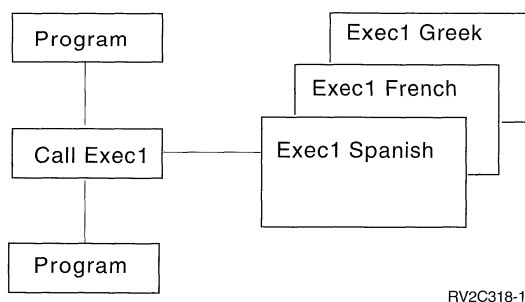
Organization of Application Parts

Consider the following relating to the general arrangement and architecture of your application.

Separating Program Modules at Appropriate Places

The AS/400 system makes it possible to separate culture-dependent parts from the running code and set up culture-dependent environments. This is done using system values, user profile attributes, job attributes, and object attributes.

When it is impossible to separate national language and culture-dependent parts from the running code, national language exits or calls must be provided at all points where functions dependent on national language support are required. Figure 3-7 shows a national-language-exit:



RV2C318-1

Figure 3-7. General-Purpose National Language Exit

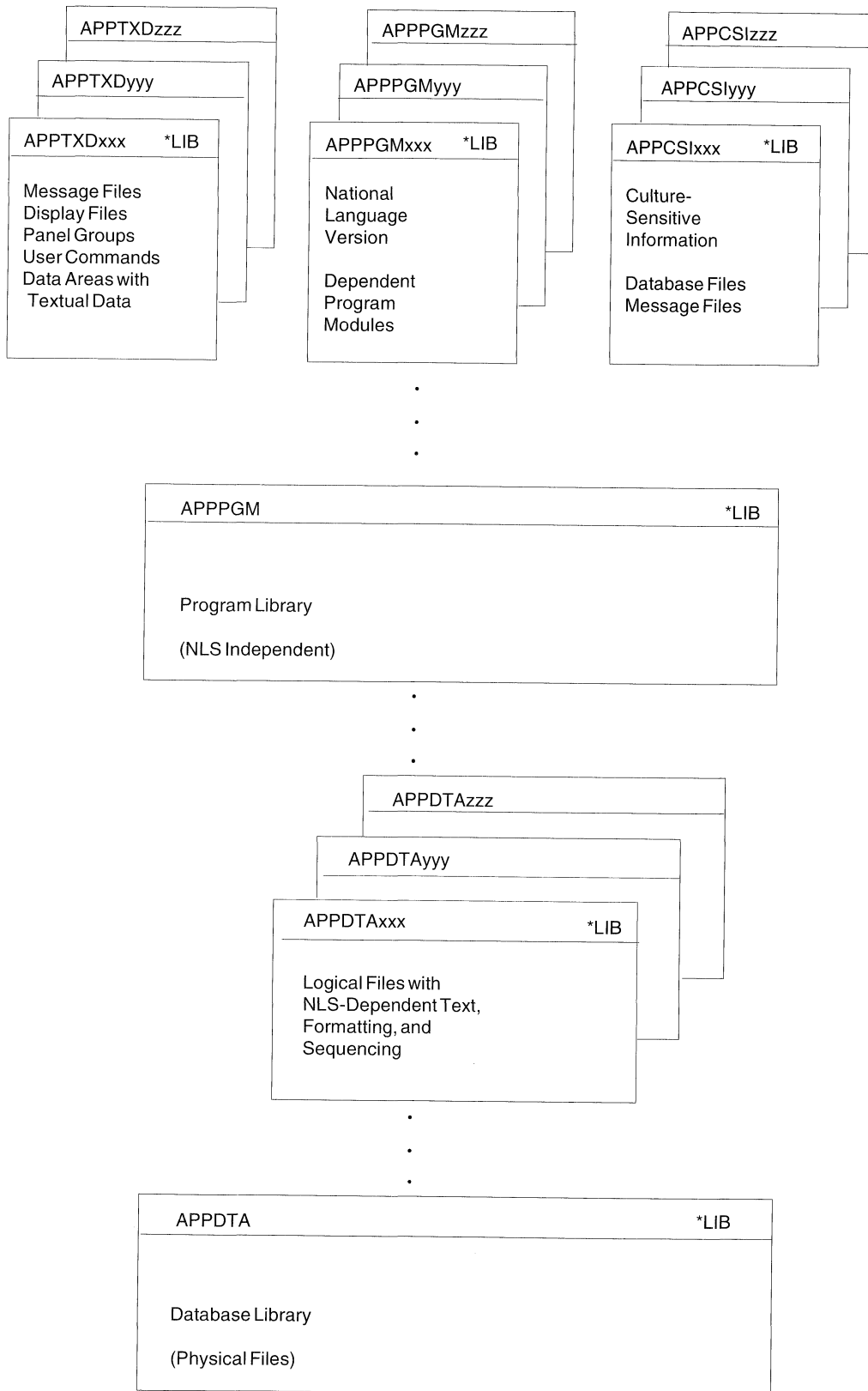
Figure 3-9 on page 3-24 shows how national language dependent exit routines can be integrated in a multilingual environment.

Compatibility of NLS Components

The design of a product must allow for the national language support of its components to be independent of each other. The support of one language should not interfere with the support of another and should not force any reduction in function of the product. The application should be able to support multiple languages simultaneously.

For example, support for a DBCS language should not exclude support for SBCS languages. When you set up your libraries, consider using multiple textual data libraries, which can be dynamically allocated for testing, packaging, and delivery.

Figure 3-8 on page 3-22 shows you how to organize the parts of an application. An explanation follows the example.



RV2C310-1

Figure 3-8. Organization of Application Parts

Naming the Application Parts

When you want to enable your application for different languages and countries, consider the environments of the target systems in your naming conventions. Use characters that are available, can be displayed, and can be printed in all the target environments. Whenever you specify names for:

- Libraries
- Database files
- Device files (display or printer)
- Help panels
- Message files
- User commands
- Programs
- Record formats
- Fields

use only characters of the invariant character set. For a list of these characters, see Appendix O, "Graphic Character Set." All other characters either vary their meaning or may not be on the keyboard.

To become NLS-enabled, you need to divide your application objects into related parts that are textual data and nontextual data. Your naming conventions should be able to distinguish between these parts. You should also be able to distinguish between the textual data of different languages. You can do this by separating the objects into different libraries.

For example, your library naming convention could look like the following:

AAATTTLLL

where:

AAA is the application identification
TTT is the type of objects
LLL is the language code

This naming convention allows you to have all libraries that belong to an application grouped together because you have a unique identifier (AAA) at the beginning.

The second part (TTT) allows you to distinguish between different types of objects:

Textual data	Display files Printer files Message files Help panels User command Cultural values Database files with NLS-sensitive information and specifications NLS-dependent program modules
Nontextual data	Programs
Data	Database files

The third part (LLL) allows you to specify the national language version for all the textual data parts. This allows you to use the same names for objects of the dif-

ferent NLVs within the different libraries. Your program is able to use different objects by just rearranging the library list accordingly when the job is run.

The initial library list can be taken from the job description. You can build a new library list by specifying the library list in the INLLIBL parameter of the Create Job Description (CRTJOB) command for a new job description, or the Change Job Description (CHGJOB) command for an existing job description. Figure 3-9 shows an example of this.

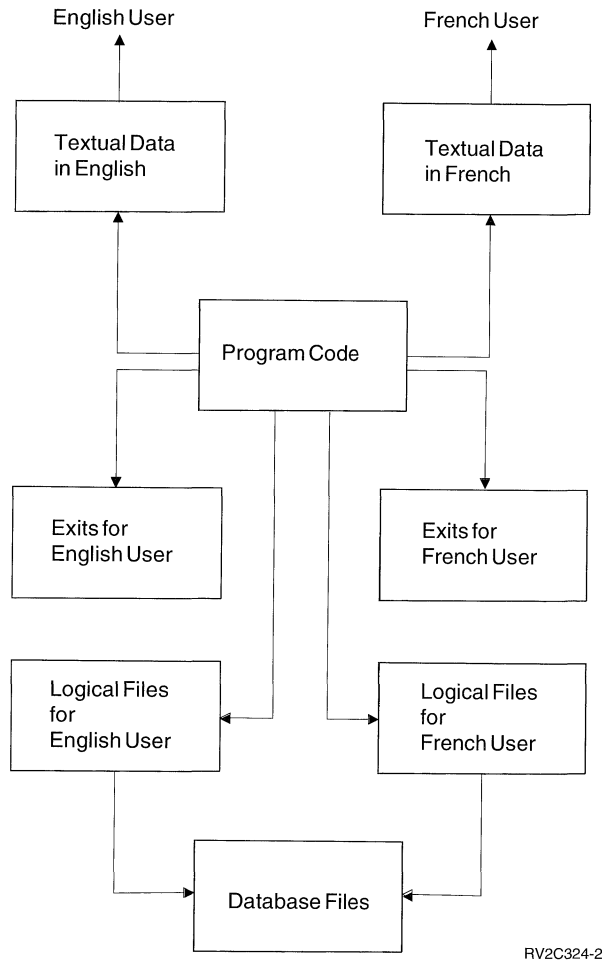


Figure 3-9. Application in Two Different Language Versions

Referring to Specifications

Define all your fields first in the field reference file of your application and refer to them whenever you can: in the database specifications, in device file specifications, and in the high-level language programs. This technique helps you to define the field specifications once and use them again. If you need to distinguish between the same field of different sources, you can rename or qualify them. Whenever you need to change the definition of a specific field, you just need to change the attributes of that field in the field reference file and create the objects again. Then the changes take place automatically in all the different places where the field is used.

For example:

```

A                                REF(field-ref-file-name)
A      R record
A      field      R line  pos
or
A      field      R line  pos REFFLD(ref-field-name)

```

Working with Database Definitions

You define a file to specify certain facts, the specifications are then used on database files. The following are some examples of such specifications:

- The object description text of the file
- The explanation text (TEXT keyword) on record formats and field descriptions
- The column headings (COLHDG keyword) on field descriptions
- Date and time formats and separators
- Sort sequence
- Language identifier

The object description text is shown by all database tools such as Query/400, SQL/400, Query Management/400, PC Support/400, and data file utility (DFU) on the file selection display.

The column headings are shown by the database tools on the output field definition display. Column headings are also used on screen design aid (SDA) and report layout utility (RLU) as the proposed field-prompting text or heading.

Data management handles date- and time-type fields in the format specified at file-creation time, unless your application or database tool does a conversion to present it according to your request or job demand.

When you want to present all this information according to the language and culture of the user, you need to provide multiple sets of logical files in separate libraries. Along with the translated text, you can specify different date and time formats or different sort sequence and let data management perform the conversion. A similar technique can also be used for numeric-type date fields (unless they are packed), using the substring (SST) function. The user can assess the data only through the designated logical views. When you are defining logical files with different sort sequences, avoid using a unique index with a shared-weight table. Although this is possible, a unique index prevents using keys that differ only in characters with the same weight.

Figure 3-9 on page 3-24 shows an example of using different sets of logical files for different users.

Display Files

Application panels usually consist of the following major elements:

- Constant text strings (literals)
- Input and output fields
- Field editing specifications
- Cursor positioning specifications
- Default values for input fields
- Field validation specifications
- Error messages

These can be handled either as a program-described or an externally described file using DDS. The following information is based on the externally described technique using DDS.

Constant Text Strings

Because different languages have different space needs for the same expression, design your panels with this in mind. Do not place many fields on the same line, except for a list panel that has column headings instead of field prompts. Do not overload the panels with information. Choose one of the techniques described under “Techniques for Coding Textual Data” on page 3-8 to make your panels.

Input and Output Fields

Consider defining your fields according to the needs of the different languages, countries, cultures, currencies, and laws you want to address with your application. For example, when you want to store Italian lira or Japanese yen in the same field as United States dollars, you must size it according to the number of digits needed for lira or yen.

Field Editing Specifications

For the edit specification of your numeric, date, and time fields, consider the different cultural conventions of the users you want to address. Do not code the format and editing instructions in your application program in a way that requires program modification when another convention is needed. Refer to “Respecting Cultural Conventions” on page 3-12 for more information.

Cursor Positioning Specifications

Do not specify cursor positioning values to fixed locations on the screen, because different languages have different space requirements. When you work with different display files, you can adjust them with the translation process. When you need to work with field-independent cursor locations, store the positional information outside of your code and retrieve the variable values for the keyword within your program.

For example:

```
A    record-name      CSRLOC(field-name-1 field-name-2)
```

Cursor positioning on the field level is more useful in an NLS environment. For normal records, this is done by specifying the DSPATR(PC) keyword on a specific field. For subfiles, the cursor can be positioned using SFLRCDNBR(CURSORS) keyword on a special positioning field. In addition, the subfile record number must be stored in that field before the format is written.

For example:

```
A    field-name      4S 0B line pos SFLRCDNBR(CURSORS)
```

Note: The name of the record and field where the cursor is positioned, the subfile relative record number, and subfile fold/truncate indicator can be returned to your application program. This function is provided by hidden fields on the DDS keywords RTNCSRLOC, SFLCSRRRN, and SFLMODE.

Default Values for Input Fields

There are three different ways to put default values into the input fields of your display, which the user can override with his own data:

- Getting information from program

Never hard code the values as a literal if they are language or culture-dependent values. Use values you can get from the system-provided information, such as system or job date, or get the values from a data object, such as a database file or data area from outside of the program.

- Using DDS keywords DFT (Default) or DFTVAL (Default Value)

Specify the default input value directly on the DDS after the keyword. The DDS keyword DFT is for input-only (I) fields. For output-only (O) or input-output (B) fields, use the keyword DFTVAL.

For example:

```
A   field-name  length type I   line pos  DFT('default  ')
or
A   field-name  length type O/B line pos  DFTVAL('default value  ')
```

- Using DDS keyword MSGID (Message Identification)

Using the Message Identification (MSGID) keyword allows you to retrieve the content of a specified message description when the program is run and to put that value as a default in your display file field. The field must be input-output capable (B) for you to use this technique.

For example:

```
A   field-name  length type usage line pos  MSGID(message-id [*lib/message-file])
```

This allows you to use different message files for each national language version by setting the library list accordingly when the program is run.

Field Validation Specifications

The following DDS keywords provide validation checks on input-capable fields on your display:

```
RANGE (Range checking)
VALUES (Values checking)
CMP and COMP (Comparison)
CHECK (Check validity, keyboard control and cursor control)
```

Using the DDS keywords with any hard-coded values that are language, country, or culture-dependent makes duplication and modification of the DDS and the application program necessary.

For example:

```
A   field-name  length type usage line pos  VALUES('Y' 'N')
or
A   field-name  length type usage line pos  COMP(EQ 'US$')
or
A   field-name  length type usage line pos  CHECK(M10 or M11)
                                         (Modulus checking)
or
A   field-name  length type usage line pos  CHECK(RL)
                                         (Right-to-left support)
```

Validation checks are provided according to the sort sequence defined for the display file at creation time. You can use the same DDS source file to create objects for different languages. For example, the following command creates a display object tagged with the Latin 1 sort sequence table:

```
CRTDSPF FILE(name) SRTSEQ(*LANGIDSHR) LANGID(DEU)
```

The following specification:

```
A field-name length type usage line pos COMP(EQ 'a')
```

accepts all the following characters, lowercase, uppercase, and accented as defined by the shared-weight in the Latin 1 sort sequence. For a list of these characters with 73 for the shared weight, refer to “Sort Sequence for Latin-1” on page H-25.

In addition, note that all the checks specified using those DDS keywords are done by the data management function of the OS/400 program. Any error message caused by wrong input or handling by the user appears in the language of the OS/400 program. This could be the primary language or a secondary language, depending how the library list of the job is set up.

You can override this when you use the additional DDS keyword `CHKMSGID` (Check Message Identifier). This keyword allows you to specify your own customized messages and message file to be used by the checking routines of the OS/400 program.

For example:

```
A field-name length type usage RANGE(1 999)
A CHKMSGID(USR1234 [*lib/]APPMSGF [&MSGFLD1])
A MSGFLD1 length type P TEXT('Message data field')
```

and `ADDMSGD MSGID(USR1234) MSGF(APPTXDENU/APPMSGF)`
`MSG('Value &1 is out of range 1 to 999')`

and `ADDMSGD MSGID(USR1234) MSGF(APPTXDDEU/APPMSGF)`
`MSG('Wert &1 ist ausserhalb des gültigen Bereichs 1 bis 999')`

To use different message files of different library names, do not specify a fixed library name. You can use a message file for different languages by setting the library list when you run the program.

Error Messages

There are two ways to provide error messages on a display file:

- Specifying text as constant on `ERRMSG` or `SLFMSG` keywords

Specify the text directly as a constant on the DDS keyword. When you want to have more than one language, you have to duplicate the DDS source code and translate constants within the DDS specifications. You can then create a separate display file object for each language.

- Using predefined messages on `ERRMSGID` or `SFLMSGID` keyword

When using predefined messages instead of constants, you need to have multiple display files.

Instead of using different display files, exchange only the used message file by setting the library according to the language that you want to use.

For example:

```
A    field-name  length type usage EDTCDE(x)
A 61                                ERRMSGID(USR3456 [*lib1/]APPMSGF [&MSGFLD2])
A    MSGFLD2    length type  P   TEXT('Message data field')

and  ADDMSGD   MSGID(USR3456) MSGF(APPTXDENU/APPMSGF)
      MSG('Delivery date &1 is earlier than production end date &2')

and  ADDMSGD   MSGID(USR3456) MSGF(APPTXDDEU/APPMSGF)
      MSG('Lieferdatum &1 ist . . .')

.
.
.
```

Defining Online Help Information

You can define online help information by using one of the following:

- Panel groups** Objects into which user interface manager (UIM) source is entered.
- Documents** Objects created using the OfficeVision/400 licensed program.
- Records** A set of DDS keywords contained in a source file member.

The **user interface manager** is a function of the operating system that provides a consistent user interface by providing comprehensive support for defining and running panels (displays and help information). If the user interface manager is used for defining online help information, the panel groups are defined in place of DDS or the display file. In either case, the encoding of the data to be displayed must be indicated by the CHRID value in the display file or the panel group. A **panel group** is an object that contains a collection of help information. The system's recognized identifier for the object type is *PNLGRP. In addition, the fields for which data is to be converted must have the CHRID parameter specified in DDS or the panel group.

Choosing the Online Help Method

When defining online help information to be translated into national language versions, keep in mind the following about panel groups, documents, and records:

- Records do not have word processing functions available such as spell check and the word wrap functions.
- Help documents created using the OfficeVision/400 program must be stored in folders. The user application recognizes help documents by the DDS keywords that define the name of the help document and the name of the folder in which the document is stored. These names cannot be overridden when the application is run. For example,

```
Language #1   HLPDOC(START DOC1 FLD1)
Language #2   HLPDOC(START DOC1 FLD2)
```

The help document DOC1 is stored in FLD1 for one language, and stored in FLD2 for another language.

When multiple languages are installed on one system, the help documents are stored in different folders. The DDS source file needs to be copied, changed, and compiled again for each language on the system.

- Various OS/400 messages and panel groups determine the national language conventions and translations. Not all countries have a national language version available for the OS/400 program. Not all national language versions are completely translated, with many parts still in English. The messages and panel groups that are not translated do not reflect their national language cultural conventions. See Figure 3-15 on page 3-37 for an example of a translated panel in which part of the panel has remained in English because not all parts of the NLV were translated.

Help Design Guidelines

When designing help displays, keep in mind the following:

- Allow for translation expansion.
- UIM help module tags for width and depth should not have absolute values in order to allow for translation expansion.
- The help area defined in the DDS keyword, HLPARA, must allow for translation expansion.

Translation Guidelines

When using UIM to define only help information, the panel control tags that may be changed during the translation process are:

- **TEXTMODE=SBCS/DBCS**
This attribute specifies whether a single-byte or double-byte character set is used in the panel group tag. Note that only tag text is translatable (not tag attributes).
- **TXTCHRID=Querycharacter set code page=**
This attribute specifies the character set and code page for text data in the panel group source. If the attribute is omitted, all text is assumed to be in the QCHRID system value at the time the panel group was created.
- **BIDI=None | LDT | RTL**
This attribute controls the directional orientation of the help modules in the panel group. BIDI=NONE is required when TEXTMODE=DBCS is specified.

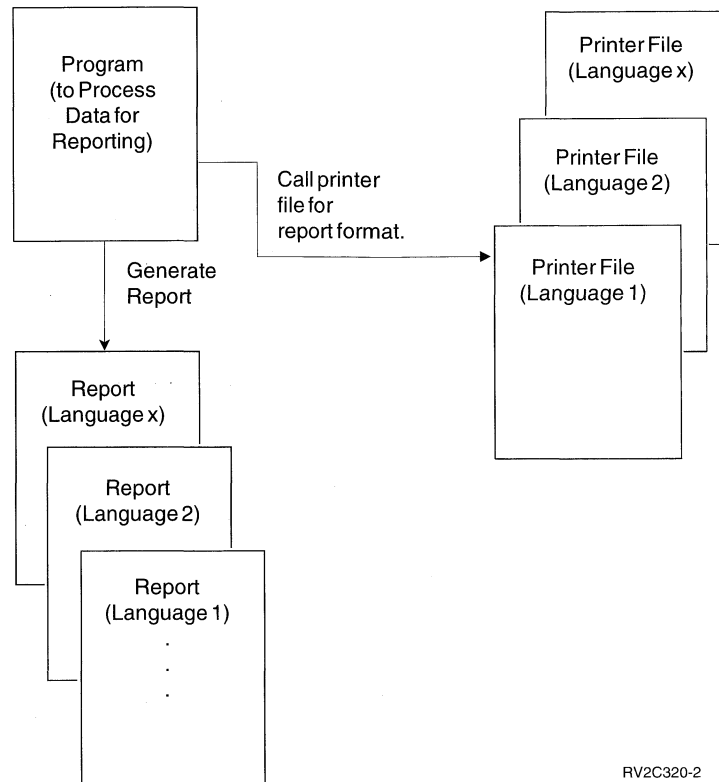
For a list of all the valid tags, see the *Guide to Programming Displays*.

Printer Files

The types of printer files are:

- **Program-described printer files**
Program-described files rely on the high-level language program to define records and fields to be printed.
- **Externally described printer files**
Externally described printer files use DDS rather than the high-level language to define records and fields to be printed.

Figure 3-10 on page 3-31 shows how externally described printer files are used in creating reports for a different national language version.



RV2C320-2

Figure 3-10. Creating Different NLV Reports from Printer Files

When designing printer files to be translated into a national language version:

- Use externally described printer files to define records and fields to be printed. Program-described printer files are described inside the high-level language program, and prevent easy translation of literals.
- Print data in one national graphic character set on devices that support the corresponding character sets and code pages. Not all printers support all CHRID parameters.
- Use the MSGCON keyword to access the constant text described in the message file. A printer file does not have the MSGID keyword. However, the techniques of direct coding as unnamed output field (literal) and storing text in a database file can be used to specify the constant text in a printer file. See “Techniques for Coding Textual Data” on page 3-8.
- Take culture conventions into consideration when bar codes are being described in the printer file. Different countries have different standards for bar codes.
- When entering data, consider these parameters on the Create Printer File (CRTPRTF) command.
 - PAGESIZE (page size)
Different countries have different page-size standards.
 - OVRFLW (overflow line number)
The overflow line number must be less than or equal to the page size.

- CHRID (character set and code page)

If the CHRID parameter of the printer file is set to *DEV D, the printer uses the character identifier that was set on the control panel or specified in the device description.

If the CHRID parameter of the printer file is set to a specific value, this value determines the code page and character set used to print the data. For externally described printer files, the CHRID parameter is used only for fields that also have the CHRID DDS keyword specified. For all other fields, the code page and character set used is the same as if *DEV D was specified.

If the CHRID parameter of the printer file is set to *JOBCCSID, constant text from an externally described printer file is converted to the CCSID of the job. The printer data stream is tagged with the CHRID taken from the job CCSID, using this CHRID value to print the data. When using the *JOBCCSID value on the CHRID parameter, the CHRID DDS keyword is ignored.

Note: All code pages and character sets cannot be handled by all printers. For a list of these values, see Appendix B, “National Language Version Default System Values.”

Program Messages

On the AS/400 system, a message can be predefined or immediate. Consider the following when designing and coding your messages:

- Do not use immediate messages. They are created by the sender or program at the time they are sent and are not stored in a message file. Therefore, they cannot be translated by the translator.
- Use predefined messages that exist outside of the program that uses them and can be stored in a message file.
- Do not specify the maximum size for a message file. When the message file becomes full, you cannot change the size of the message file. You need to create another message file and create the message again in the new file.

Use the Create Message File (CRTMSGF) command to create a message file to hold the predefined message. The contents of the predefined message can then be described and put into a message file by the Add Message Description (ADDMSGD) command. For details, refer to *CL Programmer's Guide*.

- Use substitution variables with care. Different languages have different orders for substitution variables. For example, in the English message:

File &1 in Library &2 not found.

&1 and &2 are the substitution variables. Those substitution variables may appear in different positions for different languages.

Your program must have the ability to understand different orders of substitution variables after the translation is done.

- Make your design and coding able to understand a reply code for different languages. For example,

English	Y = Yes
Danish	J = Ja (means Yes)

Figure 3-11 on page 3-33 shows the creation of different NLV messages from message files.

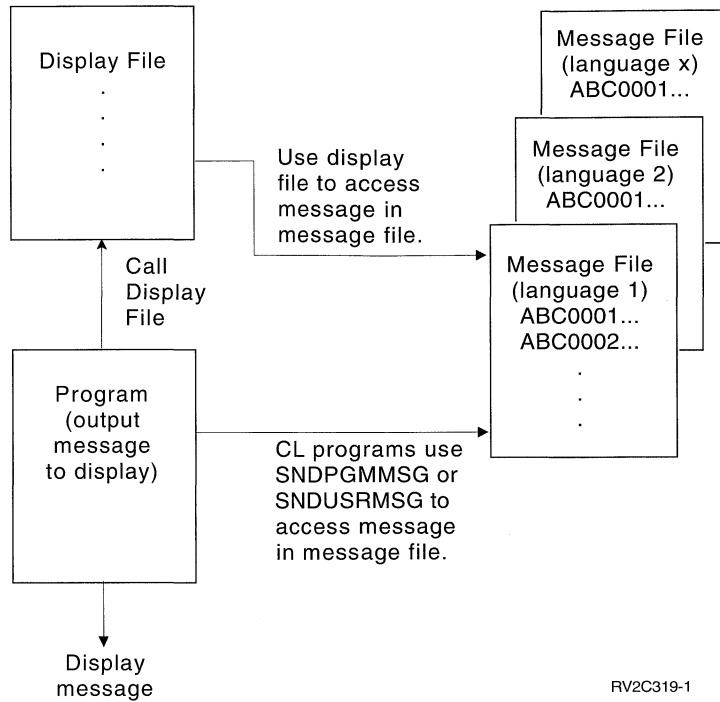


Figure 3-11. Creating Different NLV Messages from Message Files

A program can directly access the message file for program messages, or it can indirectly access the message file through display files for program messages.

Defining Menus for Internationalized Applications

You can define your own menus on the AS/400 system. There are two types of user-defined menus:

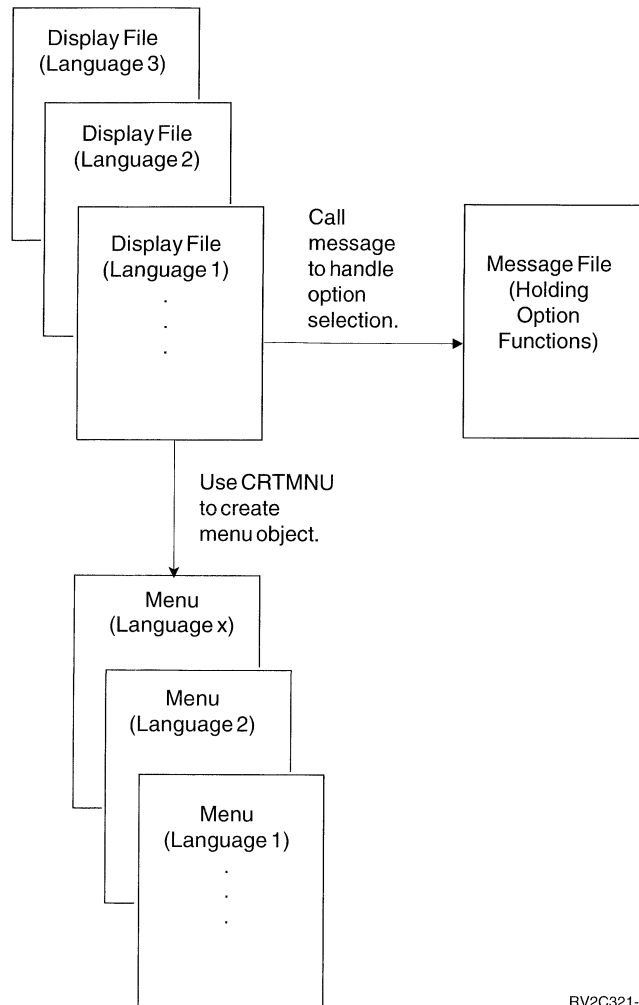
- Display file menu

A display file menu uses a display defined by DDS to present a menu format. The menu functions are controlled by a menu object containing the commands used to run each of the menu options. Figure 3-12 on page 3-34 shows how display file menus are created for different national language versions.

- Program menu

A program menu uses programs to present the menu format, defined by DDS, and provide functions necessary to run the menu options. Figure 3-13 on page 3-35 shows how program menus are created in different national language versions.

To use an application system, users have to deal with a lot of menus and displays. When an application is being translated from one language to another, a large portion of the literal text to be translated comes from menus.



RV2C321-2

Figure 3-12. Display File Menu for National Language Version

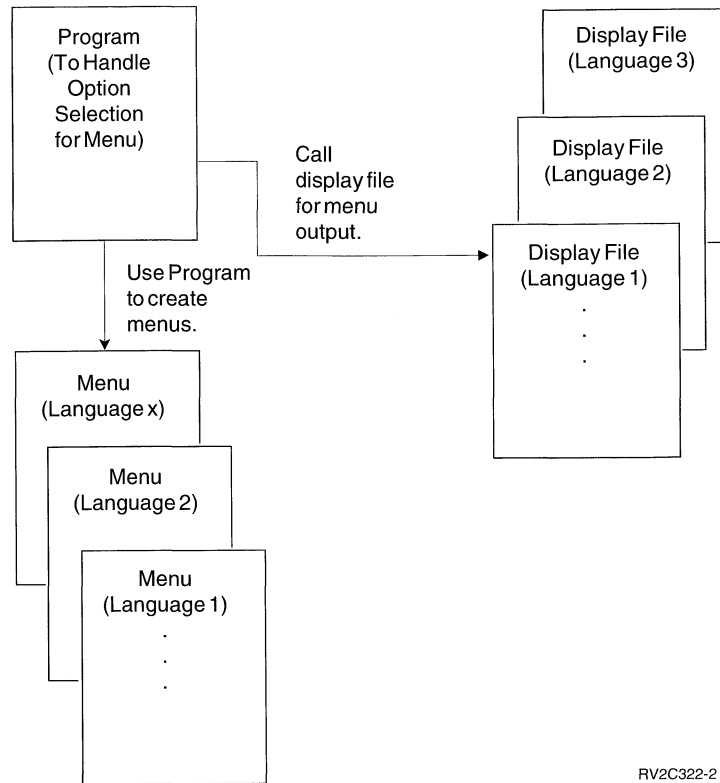


Figure 3-13. Program Menu for National Language Version

To allow for easy translation into national language versions of your menus:

- Keep the literal text of menus external by holding the constant text as externally defined messages in a message file and incorporate the text into a menu file when the program is run.
- Be aware of the expansion space needed when a menu is translated from one language to the next. Leave space for translation expansion when you design your menus.
- Be aware of cultural conventions when date, time, or edited fields are displayed on the menu.
- Use numerals 0 through 9, instead of uppercase and lowercase English letters (A through Z), as the option fields for selection. Numeric characters are more standard among different languages.

The *Guide to Programming Displays* provides a detailed description on how to create and access menus.

Defining Commands

The OS/400 program allows users to define and create their own commands. To create a command, you must first define the command through command definition statements. Then use the CRTCMD (Create Command) command to process the command definition statements to create the command definition object.

When defining and creating a command, take into consideration the following:

- Use help panel groups to provide online help information for the command. See “User Interface for Internationalized Applications” on page 3-6 for information on national language version help panels.
- Use message identifiers instead of literal text for the PROMPT keyword on the CL CMD, PARM, ELEM, and QUAL command definition statements.
- Translate the text that is displayed to the right of the prompt line of each parameter on the prompt display. This text is specified by the CHOICE parameter of the PARM command definition statements, so the appearance of the command prompt display will maintain its coherency.
- Avoid using the CHOICEPGM parameter, which specifies the qualified name of the program that is called during the prompting, to fill in the possible text choices and the permissible values during prompting.
- Compile command-prompt text into separate command definition object versions for each national language.
- Because English-language CL commands closely follow English verb-object syntax (for example, CRTLIB for Create Library), it makes the CL command easy to use and remember. When defining commands for each national language version, follow similar rules according to the particular language's syntax.

Note: The function keys of the command prompt display are provided by the OS/400 program. If the NLV of the OS/400 program is different from the NLV of the command, two different languages would appear on the command prompt display. For example, when the DSPEMPRCD command prompt display in English (Figure 3-14) is being translated into German, a command prompt display in both English and German as shown in Figure 3-15 on page 3-37 is created.

```

                                Display Employee Record (DSPEMPRCD)

Type choices, press Enter.

Employee code . . . . . _____ Code, *ALL
              + for more values

Field Name   . . . . . _____ Name, *ALL
              + for more values

File Name    . . . . . _____ Name

Library Name . . . . . _____ Name, *LIBL

Output to    . . . . . _____ *CONS, *PRINT

F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys

```

Figure 3-14. Command Prompt Display in English


```

Anzeige Angestellten Information (DSPEMPRCD)

Type choices, press Enter.

Angestellten Nummer . . . . . _____ Nummer, *ALL
      + for more values

Feldname. . . . . _____ Nummer, *ALL
      + for more values

Dateiname . . . . . _____ Name

Bibliotheksname . . . . . _____ Name, *LIBL

Ausgabe auf . . . . . _____ *CONS, *PRINT

F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys

```

Figure 3-15. DSPEMPRCD Command Prompt Display Translated into German

For additional information on creating and defining commands, see the *CL Reference*.

CDRA Implementation for NLS Enabling

To enable your application for a multilingual environment, consider the following:

- Avoid coding CCSID values directly in your DDS for physical files. When creating different physical files for different languages, change the CCSID for your job (using the CHGJOB command). Only one set of DDS source code needs to be maintained.

You cannot convert data between different CCSID values in all cases. For example, if you access a Greek database with a CCSID of 00875 from a German display station with a job CCSID of 00273, you get Greek characters converted to X'3F'. X'3F' has no meaning on your display station. Countries outside the Latin-1 character set use character sets that include non-Latin characters. No meaningful conversion is possible between the non-Latin code points and the Latin code points. Arabic, Greek, Hebrew, and Turkish are SBCS languages with non-Latin characters.

- When database sharing takes place, define your files with the CCSID of the primary language being used. Make sure all users have the CCSID of the language they use defined in their user profile.

Figure 3-16 on page 3-38 describes a multilingual single system with German as the primary language and English and French as secondary languages. All users enter data into the same database file.

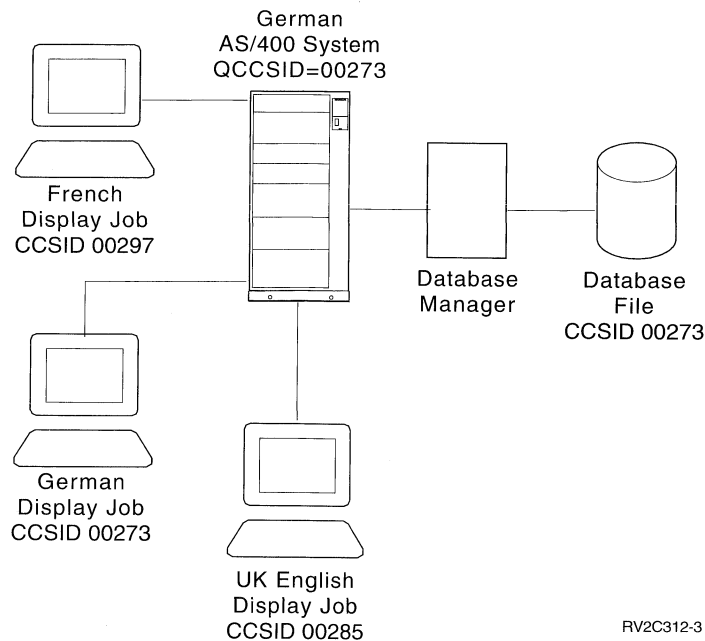


Figure 3-16. Considerations in a Multilingual System

On this multilingual system, all users are entering character data into a single file with CCSID 00273 (German), and character data entered from the English and French display stations is being mapped into the German file.

- Fields defined as character fields should be actual character fields in order to preserve correct mapping. If the fields contain application development values (for example, control characters or fields not used as real character fields), the fields should be specified as hexadecimal fields or assigned a CCSID value of 65535.
- Using CCSIDs, all characters that cannot be converted between different code pages are replaced with X'3F'. If you are using a user-defined data stream (UDDS) to format and lay out your display (instead of using DDS), you may get X'3F' returned after the system reads and inserts that data in your user-defined data stream. X'3F' is an incorrect value in the 5250 data stream, and you may get unpredictable results on the display.
- When the SNDNETF command is used, the data (if sending a member only) is assumed to be in the CCSID of the job running the command; therefore, no conversion takes place. When the data is received, care must be taken to store the member in a file with the same CCSID as the originating file, otherwise unexpected mapping can occur. If the receiver does not know the CCSID of the incoming file member, it can be received into a field with a CCSID of 65535, which indicates that no conversion takes place.

Figure 3-17 on page 3-39 shows an example of a multilingual network with three AS/400 systems located in three different countries, each with a different language. The application on the Danish system is using distributed relational database. All national characters (regardless of the language the data is stored in) are displayed correctly at the Danish display. When the CCSID of the language is used by the database, the integrity of the database is preserved. The conversion of data between the different code pages is completely automatic and part of the OS/400 database management.

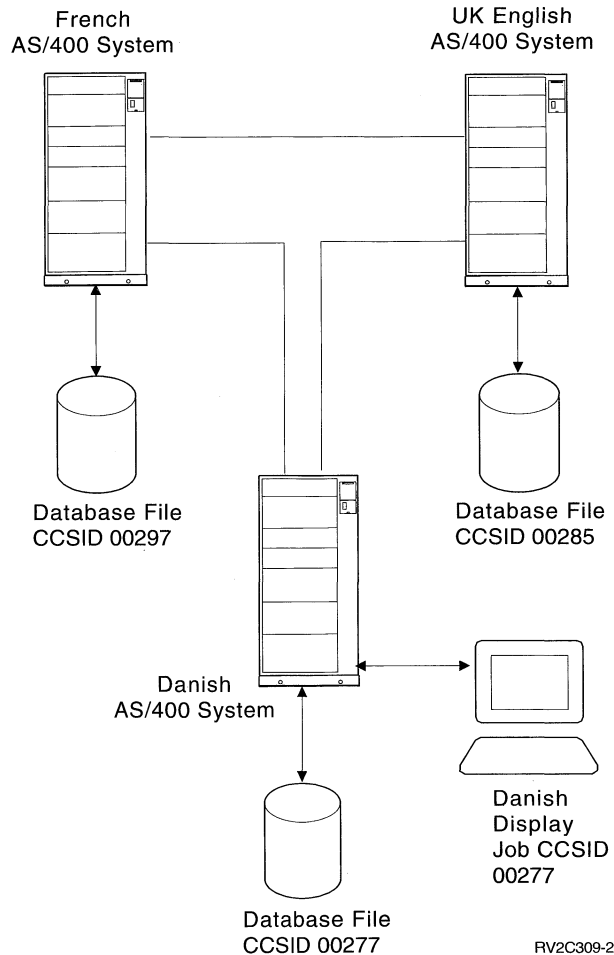


Figure 3-17. A Multilingual Network Example

Source Files

Database source files are implicitly assigned the CCSID of the job when they are created, unless they have been explicitly assigned a CCSID value using the CCSID parameter on the Create Physical File (CRTPF) or Create Source Physical File (CRTSRCPF) command.

Database source files created prior to Version 2 Release 1.1 are implicitly assigned CCSID 65535. Inline and device source files assume a CCSID of 65535.

High-Level Languages (Literals and Encoding)

The high-level languages (SAA C/400, SAA RPG/400, SAA COBOL/400, SAA FORTRAN/400, AS/400 PL/I, AS/400 BASIC, AS/400 Pascal, RM/COBOL-85 for the AS/400, and SAA Structured Query Language/400) have the following considerations when writing applications:

When compiling a program, source from database source files is converted to the CCSID of the job.

Use only characters from the invariant character set for naming, literals, and constants in your source code. See Appendix O, "Graphic Character Set" for a list of these characters. Most compilers expect syntactical operators and the naming con-

vention for the source code to be in code page 037; therefore, undesired mapping will occur if the source is compiled with a CCSID other than 00037 or 65535.

Figure 3-18 shows an example RPG program **1**. Compiling the source using a different job CCSID will produce running code, but the dollar sign may represent a different code point. The field name FLD\$ **2** would not be accepted by the compiler if compiled with a CCSID other than 00037 or 65535.

```
* RPG Source (Source file created with CCSID 00037)
*
FFILE1 IF E          DISK          80
C          READ FILE1
C* Test char 1
C*
C          FLD1      IFEQ '$'
C          ...
C* Move char 2
C*
C          MOVE FLD1      FLD$
C          ...
C*
C          SETON          LR
```

Figure 3-18. RPG Program Example Using Variant Characters

You must be careful when using variant characters in high-level language (HLL) syntax. The HLL compilers require such characters to be represented as they are in CCSID 00037. Pascal and C/400 will also accept variant characters in their syntax as they are represented in code page 00293. If variant characters in syntax are used, you can change the job CCSID to 00037 to cause database support to convert the characters to CCSID 00037. Note, however, that any names, constants, or literals are also converted to CCSID 00037. For example, in C/400, the right brace is expected to be at code point X'DO' in CCSID 00037. If the CCSID of your source is CCSID 00273 and you compile with a job CCSID of 00037, you can enter the right-brace character at code point X'DC' in CCSID 00273. Database support then automatically converts code point X'DC' to code point X'DO', which is what the compiler expects.

If you do not want your names, constants, or literals to be converted to the CCSID of the job, you may change your job CCSID to 65535. Your constants, literals and names then remain intact. However, you must still ensure that the compiler receives variant characters used in language syntax in CCSID 00037. For example, in C/400, the right brace is expected to be at code point X'DO' in CCSID 00037. If the CCSID of your source is CCSID 00273 and you compile with a job CCSID of 65535, you need to enter the u Umlaut Small, which is the character at code point X'DO' in CCSID 00273.

For all applications that use a session manager, you must ensure that the output datastream has no X'3F' values in it.

The sort sequence used by a program may influence the program logic.

Figure 3-19 on page 3-41 shows an example of this.

```

* RPG Source (Program created with Latin 1 sort sequence)
*
C* Test char 3
C*
C          FLD1      IFEQ 'a'
C          ...
C* Test char 4
C*
C          FLD1      IFEQ 'a'
C          FLD1      OREQ 'A'
C          FLD1      OREQ 'ã'
C          FLD1      OREQ 'Ã'
C          ...
C*
C          SETON                                LR

```

Figure 3-19. RPG Program Example Using Different Sort Sequences

Using the Latin 1 shared-weight sort sequence, character test **3** is equivalent to character test **4** (not all characters are shown). When using hexadecimal or unique sorting, they are completely different. If you compile the program with *JOB RUN specified for the SRTSEQ parameter and *JOB RUN specified for the LANGID parameter, the sort sequence table used at run time is not known at compile time.

REXX/400 procedures and the literal data coded within them are not converted to the job CCSID.

SAA C/400, Integrated Language Environment* C/400, and SAA Structured Query Language/400 licensed programs have additional special considerations:

- SAA C/400 Language

If a C program is compiled with a CCSID other than 00037, unpredictable results may occur because variant characters such as the left and right square brackets, [], the left and right braces, {}, and the back slash, \, are converted to the CCSID of the job when the source file is read by the compiler. In order to write C/400 programs using CCSIDs other than 00037, you should use trigraph support (three-character representation) that is available for the SAA C/400 language. Trigraph support uses valid invariant characters to represent variant characters. For example, the left square bracket is a valid syntactic character but also a variant character. The compiler accepts another form as ??((three-character representation). The ? and (are in the invariant character set and cannot change. Use the trigraph support for the following characters: right brace (}), left brace ({), right bracket (]), left bracket ([), number (#), caret (^), back slash (\), vertical bar (|), exclamation point (!), and similar (~).

Note: The only exception to this is the bitwise OR operator, where both the C character | and the trigraph ??| contain variant characters.

- The ILE* C/400 licensed program

Using the ILE C/400 program:

- You can compile a source file in any EBCDIC code page except code page 290.
- If the CCSID of the primary source file is 65535, code page 037 is assumed.

- | – All secondary source files are converted to the CCSID of the primary source file.
- | – If the CCSID of the secondary source files is 65535, no conversion takes place.
- | – Any modules are created in the code page of the primary source file. A **module** is an OS/400 object that can be a collection of one or more procedures and, one or more definitions for external or internal variables that is compiled from source code.
- | – When binding modules of different CCSIDs, no conversion takes place and unpredictable results may occur.
- | – You can use the trigraph support for the C characters that are not available on all keyboards. For example, the left bracket (:[]) is represented by ??{.

| The ILE C/400 runtime library functions that parse strings containing variant characters use the variant character code point value associated with the CCSID of the job.

| The ILE C/400 licensed program uses the Convert a Character String (CDRCVRT) API for CCSID support in both the compiler and run time. The CDRCVRT API is found in the QSYS2 library. For more information about the CDRVRT API, see the *Character Data Representation Architecture, Level 2 Reference*.

- SAA Structured Query Language/400

SQL/400 does not assume a particular CCSID when precompiling source. Any variant characters in the language syntax (such as the ~ symbol) are assumed to be encoded in the CCSID of the source file. For example, if the source file has a CCSID of 00037, the ~ symbol is correctly interpreted to be at code point X'5F'. If the source file has a CCSID of 00500, however, the ~ symbol is correctly interpreted to be at code point X'BA'. If a literal is a variant character, the literal is stored but not converted in the CCSID of the source file. Because SQL/400 calls the appropriate language compiler to create an SQL program, the considerations given here for the appropriate high-level language must also be taken into account.

For additional information on the SQL/400 program, see *SQL/400* Query Manager User's Guide*.

Using High-Level Language Programs

Your major goal must be to have only one general set of running code that is common for all language versions and to make your programs table-driven as much as possible. You should:

- Base validity checks on database accesses rather than on hard-coded literals or tables.
- Base calculations on variable factors retrieved from a file rather than coding them inline.
- Place culture-dependent functions into separate modules of the application and call them when you cannot code them flexibly.

Do not use hard-coded values unless they are fully language and culture independent on comparison, scan, replace, or call operations. In addition, do not use uppercase or lowercase-sensitive values. For example, never hard code Yes and

No (Y or N) responses in your program, because these values are different for every language, and should be part of the textual data.

For literals and constants in source code, use characters only from the invariant character set. If input data is checked for validity in the program, make sure that the characters checked belong to the invariant character set; otherwise you may get a situation where the user is requested to enter a character that is not even on his keyboard. For example, { and } do not appear on Arabic keyboards. See Appendix O, “Graphic Character Set” for a listing of the invariant character set.

Do not use compile-time arrays to hold messages or any other language or culture-sensitive data.

For better performance, when you need to call external NLS-dependent modules, call them by a fixed name as a literal (but based on the library list) rather than by a variable field containing the program name. This allows your application to call the modules of different libraries based on the associated library list.

To allow users to work with an application in the language and habits of their culture, specify the editing values (for example, date, time, and date separators) as dependent on the language and country. You can then retrieve them according to the information in the user profile. The parameters are LANGID (language identifier) and CNTRYID (country identifier). You need to retrieve the culture-sensitive information only once at program initiation. You can do this by an initial CL program or by the high-level language program and prepare them as:

- Parameters on the call operation
- Parameters on the local data area (LDA)
- Program load tables

Using an initial CL program allows you to set the user's job attributes to present a consistent application, such as the OS/400 program and other licensed programs.

Sort Sequence with the RPG/400 Licensed Program

The RPG/400 licensed program provides the possibility for a user to specify a sort sequence table and use it in comparison operations performed with non-numeric data. For each of the supported languages, two tables (a shared-weight and unique-weight) are shipped with the system. With sort sequence support you can create sort sequence tables based on the existing ones.

The **control specifications** are specifications that provide the RPG/400 compiler with information about your program and your system. The control specifications, and the SRTSEQ (sort sequence table) and LANGID (language identifier) parameters on the Create RPG Program command control the sort sequence used in RPG/400 programs.

The alternative collating sequence field in the control specifications (column 26), allows the following entries:

blank No alternative collating sequence is used in the RPG program. Binary representation of a character is used to order, sort, compare, or match field processing.

The compile options SRTSEQ and LANGID are ignored.

S Alternative collating sequence is used in the RPG program, according to the tables entered at the end of the RPG program. The alternative collating sequence table is loaded at compile time, and ordering, sorting, comparing, and match field processing is done according to that table.

The SORTA and LOKUP operation codes do not use specified alternative collating sequence tables.

The SRTSEQ and LANGID parameters on the Create RPG Program command are ignored.

D This entry activates the sort sequence support. The RPG compiler imports an external sort sequence table, based on the SRTSEQ and LANGID parameters on the Create RPG Program command.

The sort sequence table to be used by the program can be determined at compile time or when the job is run. If the SRTSEQ parameter of the Create RPG Program command:

- Is set to *HEX, no sort sequence table is used.
- Specifies a table name, then that table is stored with the program object to be used when the job is run. For system-supplied default sort sequence tables for the supported languages, refer to Appendix H, "Sort Sequence Tables" on page H-1.
- Is set to *LANGIDSHR or *LANGIDUNQ, the shared-weight or unique-weight table for the language determined by the LANGID parameter is stored with the program object. For a list of valid language identifiers, refer to Appendix G, "Language and Country Identifiers" on page G-1.
- Is set to *JOB, the SRTSEQ parameter of the compile time job is used to determine the sort sequence. The table is stored with the program object.
- Is set to *JOB RUN, the attributes of the job running the compiled program determine the sort sequence to be used. If the SRTSEQ attribute of the job refers to the LANGID, the LANGID stored with the program object is used. If the LANGID stored with the program is also *JOB RUN, the LANGID of the run-time job is used.

Notes:

1. If the table to be stored with the program object at compile time does not exist, a table defining hexadecimal sort sequence and tagged with a CCSID value of 65535 is used.
2. If the sort sequence table and the CCSID of the job running the program differ, the table is converted to the CCSID of the job.

SORTA and LOKUP Operation Codes: The implementation of compare operation codes, match field and control field processing with the sort sequence tables is the same for the alternative collating sequence and for the sort sequence support. Compare operation codes are ANDxx, COMP, CABxx, CASxx, DOUxx, DOWxx, IFxx, ORxx, and WHxx. Additional functions provided with the SORTA and LOKUP operation codes follow:

SORTA The data in the array is sorted according to the sort sequence table.
The array elements are translated using the external sort sequence table.

LOKUP To provide proper table searching, the sort sequence table is used with the search arguments in the arrays and tables.

The search argument and the table or array element are translated using the sort sequence table.

The SORTA and LOKUP function with the arrays and tables at compile time and processing time take effect only when you specify D in the control specifications.

The array and table data are checked using the sort sequence table, whenever ascending or descending sequence is specified. If the SRTSEQ and LANGID parameter values resolve to retrieve the sort sequence table again at run-time, then the array and table elements are loaded without a sequence check at the compile time. The sequence checks are performed at run time, according to the sort sequence table.

Sort Sequence with the COBOL/400 Licensed Program

The COBOL/400 licensed program uses the sort sequence support in the following ways:

- Create COBOL Program (CRTCLPGM) command
- PROCESS clause
- ALPHABET clause

The COBOL/400 licensed program uses sort sequence tables that are system supplied or user supplied.

CRTCLPGM Command: This CL command has two compiler options relating to sort sequence support: the SRTSEQ parameter and LANGID parameter. The SRTSEQ parameter allows the user to specify any of the system-supplied or user-supplied sort sequence tables residing in a specified library. You can specify whether the sort sequence table should be taken at compile time or run time. Also, you can choose between the shared-weight and unique-weight tables.

With the LANGID parameter, you can specify one of the system-defined language identifiers, or leave that parameter to be defined at the run time.

The meanings of the SRTSEQ and LANGID parameters on the CRTCLPGM command are the same as on the Create RPG Program command as described in “Sort Sequence with the RPG/400 Licensed Program” on page 3-43.

COBOL PROCESS Statement: Sort sequence support options can be supplied in the PROCESS statement. The syntax for that command is like that for the CRTCLPGM command. The only exception to this is that the values for the parameters in the PROCESS statement are entered without an asterisk (*) for the predefined values. When the options in the CRTCLPGM command and PROCESS statement conflict, the options specified in the PROCESS statement are given the most weight.

ALPHABET Clause: The alphabet-name in the ALPHABET clause of the SPECIAL-NAMES paragraph may use the NLSSORT option. Use the SRTSEQ and LANGID parameters of the compiler for alternative collating sequence options. Otherwise, it means the same as the NATIVE option.

The following COBOL lines are affected by the NLSSORT option:

- PROGRAM COLLATING SEQUENCE phrase of OBJECT-COMPUTER paragraph

When evaluating the result of nonnumeric comparisons, the alphabet name has to be referenced in this phrase to enable the program to use the specified sort sequence options. This option also applies to the nonnumeric sort or merge operation. Otherwise, the hexadecimal collating sequence is used.

- ALPHABET CLAUSE in the SPECIAL-NAMES paragraph

This clause should specify the NLSSORT option.

- COLLATING SEQUENCE in the MERGE (or SORT) statement

This phrase is used to specify the collating sequence to be used for nonnumeric comparisons for the KEY data name in the MERGE or SORT operation. If omitted, the PROGRAM COLLATING SEQUENCE clause in the OBJECT-COMPUTER paragraph defines the collating sequence to be used. If neither is specified, hexadecimal collating sequence is used.

- Nonnumeric relation names and condition names

The selected sort sequence table affects the result of certain statements, using nonnumeric relation names and condition names: EVALUATE, IF, PERFORM...UNTIL, SEARCH and START. The truth values of the nonnumeric comparisons depend on the corresponding weights of the characters in the selected sort sequence table. For example, if you specify unique-weight table (LANGIDUNQ) for French (Latin 1), the following statement is true for the single value of the variable ITEM-1,e.

```
IF ITEM-1 = "e"
```

If you specify a shared-weight table (LANGIDSHR) for French (Latin 1), the same statement is true for several values of the variable ITEM-1. All have the same shared weight of 77:

```
e, E, é, É, è, È, ê, Ê, ë, Ë
```

Sort Sequence with the SQL/400 Licensed Program

For interactive SQL, the SRTSEQ and LANGID parameters can be specified on the STRSQL command. Later these parameters can be changed using the session services for interactive displays.

Sort sequence tables are used for all string comparisons. String comparisons are performed in the following SQL statements:

- ORDER BY clause
- WHERE clause
- GROUP clause
- HAVING clause
- UNION and UNION ALL clauses
- DISTINCT clause
- BETWEEN predicate
- IN predicate
- LIKE predicate
- MIN and MAX scalar functions
- MIN and MAX column functions

In addition, any indexes or views that are created using the CREATE INDEX or the CREATE VIEW statements are created with the specified sort sequence table.

Sort Sequence with the PC Support/400 Licensed Program

You can specify the sort sequence in the PC Support/400 functions, remote SQL, and transfer function. When performing queries on the AS/400 databases and SQL tables, you can specify the system-supplied or user-supplied sort sequence tables.

Remote SQL Support: You can specify the way the selected data has to be sorted when performing the query. For that purpose, sort fields have to be specified in the ORDER BY clause. The following clauses also use the specified sort sequence:

- WHERE clause
- GROUP BY clause
- HAVING clause
- JOIN BY clause
- UNION clause
- DISTINCT clause
- IN predicate
- LIKE predicate
- BETWEEN predicate
- RANGE predicate
- MAX function
- MIN function

The actual sort sequence table is retrieved from the job attributes of the user. The SRTSEQ and LANGID parameters can be affected through changing the user profile or changing the job attributes.

Transfer Function Support: When transferring data from the AS/400 system to the work station, you can specify the sort sequence to be applied on selected data. The sort sequence table is also used in the following string comparison operations:

- WHERE clause
- GROUP BY clause
- HAVING clause
- JOIN BY clause
- IN predicate
- LIKE predicate
- BETWEEN predicate
- MAX function
- MIN function

You can specify in the OPTION statement the following parameters related to sort sequence:

- SRTSEQ (sort sequence table)
 - *JOB
 - *HEX
 - *LANGIDSHR
 - *LANGIDUNQ
 - *LIBL/sort-seq-table-name
 - *CURLIB/sort-seq-table-name
 - library-name/sort-seq-table-name
- LANGID (language identifier)
 - *JOB

language-identifier

When transferring data between a personal computer with the PC Support/400 Version 2 Release 3 installed and an AS/400 system with a previous release installed, you can specify the value of *HEX for the SRTSEQ parameter.

On the personal computer side, you can choose the appropriate sort sequence through the options on the following PC Support/400 display:

```
Select options for an AS/400 System-to-PC Transfer Request

Select options and then press Enter
Ignore decimal data
errors if encountered. . . . . 1. Yes
                                >2. No
Time format. . . . . [HMS]
Time separator. . . . . [:]
Date format. . . . . [MDY]
Date separator. . . . . [-]
Decimal separator. . . . . [.]
Sort sequence
                                >1. AS/400 job default
                                2. EBCDIC hex
                                3. User-specified table name
                                4. Shared weight table
                                5. Unique weight table
Sort sequence table name . . . . . [ ]

Language . . . . . >1. AS/400 job default
                                2. User-specified language ID
Language ID. . . . . [ ]

-----
Enter  Esc=Cancel  F1=Help  F3=Exit  F8=Reset  Spacebar
```

Figure 3-20. PC Transfer Request Display

For information on how to use this display, go to the *PC Support/400 User's Guide for DOS* and the *PC Support/400 User's Guide for OS/2*.

Enabling for DBCS

The AS/400 system supports the following double-byte character sets:

- Japanese
- Korean
- Simplified Chinese
- Traditional Chinese

Usually, both single-byte characters and double-byte characters are used in a DBCS environment. For example, an accounting firm in Japan uses both English and Japanese for the spreadsheet. If both English and Japanese are being encoded as mixed SBCS and DBCS, the product must be able to understand a mixed character set that contains both single-byte coded characters and double-byte coded characters.

In IBM systems that use EBCDIC, a DBCS string is bracketed in a mixed data stream by a shift-out (SO) control character and a shift-in (SI) control character:

Mixed (SBCS + DBCS) string ssssss(SO)D1D2D3D4D5(SI)sssssss

Like SBCS (single-byte character set), DBCS can be used in different user-related areas on the AS/400 system. These include:

- User data (database)
- Literals or constants in control language and programming languages
- Print data
- System or program messages
- Text on menus and displays
- User input values from displays

However, DBCS should not be used to describe:

- Object names
- Labels
- Parameters or keywords in control languages and programming languages

Consider the characteristics of DBCS data when defining a DBCS field:

- Each DBCS character is 2 bytes long.
- The length of a DBCS character string is always even.
- Shift-out (SO) and shift-in (SI) control characters are required at the beginning and end of the DBCS character string, except for graphic-data type fields. Together, these characters are 2 bytes long.
- The system treats DBCS data the same as character data, and therefore cannot perform arithmetic operations on it.
- The following DBCS data types can be used to identify DBCS fields:
 - J (DBCS-only) for fields that can contain only bracketed DBCS data.
 - E (DBCS-either) for fields that can contain bracketed DBCS or SBCS data, but not both.
 - O (DBCS-open) for fields that can contain both SBCS and bracketed DBCS data.
 - G (DBCS-graphic) for fields that can contain graphic data without the SO and SI control characters.

Note: Data type O is allowed in all types of files. Data types J and E are allowed only in database and display files. Data type G is allowed in database, display, and printer files. The AS/400 system automatically inserts shift-out and shift-in characters.

More information on the DBCS data types can be found in the *DDS Reference*.

DBCS Designing and Coding Guidelines

If you plan to have your application used in a DBCS environment, you should ensure that it is DBCS enabled. The following are product design suggestions:

- Reserve more expansion space for DBCS textual data translation, although it is possible that the number of bytes used may be reduced when a SBCS sentence is being translated into DBCS.
- Programs must be able to understand shift-out and shift-in delimiters. Otherwise, mixed-byte character strings cannot be handled.
- Short responses should not be DBCS enabled. It is difficult to shift in and out of DBCS for short responses. The yes and no are examples of short responses.

- Remember to use the graphic data type G that does not need the control characters. Data type G can be created either on an SBCS system or a DBCS system, but only processed on a DBCS system.
- The 5494 remote controller supports the graphic data type.
- When converting mixed data between DBCS-host code and DBCS-PC code, the transition may change the data length. Losing and gaining SO and SI character pairs can upset field-length calculations.
- When creating a physical file, display file, and printer file for a DBCS environment, consider the IGCDTA parameter present in the following commands:

- Create Physical File (CRTPF) command

If DBCS fields are described in DDS, the system treats the file as a DBCS file. Otherwise, specify *YES for the parameter of the CRTPF command so that the file can contain double-byte character set data. However, the system ignores the IGCDTA parameter value when a value for the RCDLEN parameter is not specified.

- Create Display File (CRTDSPF) and Create Printer file (CRTPRTF) commands

Specify *YES for the parameter when using the CRTDSPF or CRTPRTF commands to create the externally described files. Then DBCS attributes, in addition to those defined in the DDS, can be specified.

For details on creating commands, refer to the *CL Reference*.

- When the CPYSPLF, DSPSPLF, or WRKSPLF commands with OUTPUT(*OUTFILE) option are used under the DBCS version of the OS/400 program, the target physical file must be DBCS enabled.

Note: The primary language of the system must support the double-byte character set to allow DBCS-enabled applications. If you need to change the primary language from a SBCS language to a DBCS language, see Appendix L, “Changing the Primary Language” on page L-1.

Use the QIGC system value to check if a DBCS version of the system is installed. Because it is set by the system, it cannot be changed. These system values can be referred to in an application program. QIGC can be:

0 (DBCS version is not installed)

1 (DBCS version is installed)

Note: A DBCS system allows for concurrent use of SBCS and DBCS data. When the QIGC system value is 1, you should not assume all jobs are DBCS.

- Use DBCS CCSIDs for DBCS languages. For example, 00933 is the CCSID for the Korean DBCS, including 1880 UDC. UDC is an acronym for user-defined character that is created through the Character Generator Utility (CGU). CGU is an extension of the code page with special user-defined ideographic characters, symbols, or logos. UDC may be present in some of the Japanese, Chinese, and Korean code pages. When designing an application to be used in the DBCS environment, consider the following CCSID information:
 - If the QIGC system value is set on (a DBCS language is installed) and you want to install an SBCS language as a secondary language, your system value QCCSID must have the value of a mixed CCSID. The CCSID must

support mixed-byte (DBCS and SBCS) encoding, but the CCSID of the job can be an SBCS CCSID or a mixed CCSID.

- If the DBCS and SBCS language users are sharing the same system, they may want to store their data in different databases. It is possible to create DBCS-capable and SBCS-capable physical files in the same system. The CCSID parameter on the CRTPF command or the CCSID keyword on the physical file DDS definition can be used to specify the CCSID value that the data is stored in.
- If a CCSID was not explicitly assigned through DDS at file creation time, the database physical file character J (DBCS-only), E (DBCS-either), O (DBCS-open) or G (DBCS-graphic) fields are implicitly assigned a CCSID value.

For an example of a system having a DBCS national language version installed, refer to Figure 2-8 on page 2-36.

For more information on CCSIDs, refer to “System CCSID Implementation” on page 2-6.

- Make sure the double-byte data is always processed in a double-byte unit. Do not split a double-byte character.
- Design the display as well as the print format to avoid the problem of truncation of a double-byte character into two single-byte units.
- Consider the following DDS keywords so that you can specify alternative ways to enter data through display files, change input- and output-capable alphanumeric data fields to DBCS data fields, or to specify the special features of the DBCS printer output:
 - CHRSIZ (Character Size)
This printer file keyword can expand the printer characters to twice the normal size (width and height)
 - CONCAT (Concatenate)
This keyword does not support concatenation of a character field and a data type O field.
 - DFLIN (Define Line)
The printer file keyword draws horizontal and vertical lines.
 - IGCALTTYP (DBCS Alternative Data Type)
This display and printer keyword is used to change input- and output-capable character fields to DBCS fields with data type O.
 - IGCANKCNV (Alphanumeric-to-DBCS Conversion)
This printer file keyword converts alphanumeric characters to equivalent DBCS characters. Printed alphanumeric characters have the same appearance as printed DBCS characters.
 - IGCCNV (DBCS Conversion)
This is a display file keyword that enables DBCS conversion.
 - IGCCHRRTT (DBCS Character Rotation).

This printer file keyword rotates each DBCS character 90 degrees counter-clockwise before printing. By rotating characters, the system prints them in reading sequence.

For more information on the DDS keywords for DBCS, see the *DDS Reference*.

The data type of a field in a physical file may be changed, as shown in Table 3-2, when it is being referred to in a logical file:

Table 3-2. DBCS File Data Types

Physical File Data Types	Logical File Data Types
J	J, O, E, H
O	O, H
E	E, O, H
A	A, O, E, H
H	J, O, E, A, H
G	G

- The Katakana code page (code page 290) of Japan supports uppercase English and single-byte Katakana (phonetics) characters. The lowercase English characters are located at code points different from other code pages and the hardware may not be able to display English uppercase, lowercase, and Katakana characters concurrently. Therefore, special considerations should be taken if the application is going to support this code page:
 - Avoid using the lowercase alphabet for syntactic characters.
 - Avoid automatic monocasing.
 - Avoid using the SBCS lowercase alphabet with Japanese DBCS messages.
- The order of substitution variables may change when an SBCS message is translated into a DBCS language.
- Avoid using abbreviations, because it may not be possible to translate abbreviations into a DBCS language.

Enabling for Bidirectional Languages

Arabic script and Hebrew languages use an alphabet written and read from right to left. Numerics and Latin text imbedded in the right-to-left text are written and read from left to right; therefore, these languages are called bidirectional languages.

- Workstations that have the ability to display Arabic and Hebrew character sets also have the ability of right-to-left cursor movement. Right-to-left cursor movement on input fields can be achieved in one of the following ways:
 - Pressing a special function key available on Hebrew and Arabic keyboards called the Reverse key. This is a toggle function that moves the cursor to the other side of the field, allows for cursor movement in the opposite direction, and also changes the language layer from Latin to Hebrew or Arabic and back again.
 - Using the DDS cursor control codes for display files. When the CHECK keyword is used with a cursor-controlled code, it specifies that the cursor is to move from right to left. The valid cursor control codes are:

- RL** Right-to-left cursor movement within fields
- RLTB** Right-to-left, top-to-bottom cursor movement from field to field

For more information, see the *DDS Reference*.

- The user interface manager gives the following bidirectional support for creating online information:
 - BIDI=RTL/LTR

This attribute controls the directional orientation of the help modules in the panel group.

RTL indicates that the help in the panel group is bidirectional and should be displayed with a right-to-left orientation. This is performed by initiating the keyword with the user interface manager.

LTR indicates that the help in the panel group is bidirectional and should be displayed with a left-to-right orientation.
 - :RT and :ERT

Reverse-direction-text tags indicate that the enclosed text has an orientation that is opposite to the orientation of the panel group.

For a list of UIM tags, see the *Guide to Programming Displays*.
- The system does not check to make sure that all display files opened to the display station are capable of right-to-left cursor movement. Therefore, it is the responsibility of users to ensure that the proper display files are used.

Designing and Coding Guidelines for Bidirectional Languages

Bidirectional languages have special considerations and restrictions when developing NLS-enabled applications:

- National language versions

There are no national language versions on the AS/400 system for bidirectional languages. Therefore, culture-dependent values stored in system messages and displays used when building menus and help panels will always be in English. See Figure 3-15 on page 3-37 for an example of a translated display in which part of the display has remained in English because of the absence of an NLV in the translated language.
- Truncation

Avoid truncation of output and constant character fields because the farthest-right positions of these fields contain the beginning part of the information for right-to-left languages. For example:

Customer Name	for left-to-right languages
would be	
emaN remotsuC	for right-to-left languages

and the truncation of the four right characters would result in incomprehensible data. Additionally in Arabic, the shape of a letter in a word changes, depending on which letter precedes or succeeds it, and on its own ability to connect to other letters. Truncation, even if it is done correctly, can also cause characters to be presented in the wrong shape.
- Layout of displays

The presentation of data should have a right-to-left orientation. Literals should appear on the right side of the fields they describe as displayed in Figure 3-21 on page 3-54. Some displays may require special coding for bidirectional languages.

```

                                Display Employee Record (DSPEMPRCD)
                                Type choices, press Enter.
Code, *ALL      _____      . . . . .Employee code
Name, *ALL      _____      . . . . . Field Name
Name            _____      . . . . .File Name
Name, *LIBL     _____      . . . . . Library Name
*CONS, *PRINT   _____      . . . . .Output to

More keys=F24  Cancel=F12  Refresh=F5  Prompt=F4  Exit=F3

```

Figure 3-21. Layout of a Display for Bidirectional Languages

- Long Fields

Avoid defining input fields that span more than one line. When the field is stored and displayed as one entity, the result for bidirectional languages would not be what the user intended.

For example, the *Description* field as shown in the following display, is stored as:

ABCDEFGHIJKLMN

when keyed in English.

```

                                Add Another Description
User ID/Address . . . . . :      *ANY      *ANY
Type choice, press Enter.
Description . . . . .      ABCDEFG
                           HIJKLMN

```

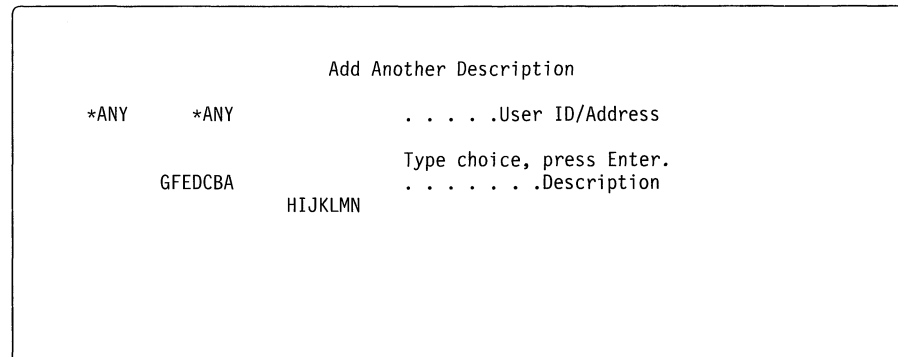
It would be stored as:

GFEDCBA NMLKJIH

when using a bidirectional language, instead of:

NMLKJIHGFEDCBA

which was the intent of the user when typing this field as shown in the following example.



- Variable positioning

Your application must allow for variables to be in any order. For example, the following message in English:

File &1 in library &2 not found

would be

dnuof ton &2 yrarbil ni &1 eliF

in bidirectional languages, where variable 2 is before variable 1.

- Monocasing

Hebrew and Arabic have no case-sensitive characters. To avoid the incorrect presentation of characters, no case-sensitive checking or substitution should be performed.

- CHECK(RL) and CHECK(RB)

These options are valid only for display stations capable of right-to-left movement, and have the following restrictions:

- Option indicators are not valid with cursor control codes.
- CHECK(RZ) and CHECK(RB) are not valid with these keywords.
- A field that spans more than one line gives a warning message.
- The check digit for modulus checking is the farthest-right byte in the field.
- CHECK(RL) applies to character fields only.

- Online information

The special bidirectional tags have the following restrictions:

- When combining online help information from several panel groups that do not have the same value for the BIDI tag, the end user must use the hot key sequence to read the opposite orientation online help information.
- The headings and bottom lines of each help panel are displayed in English in reverse as there is no NLV available for Hebrew and Arabic.

- Coded Character Set Identifier (CCSID)

As bidirectional languages have special character sets that are unique, no exchange of data is feasible into other languages. There is no need for data mapping. In these cases, the CCSID value of 65535 can be used.

When exchanging data in a language that uses Latin characters and when special characters that are not part of the invariant character set are needed, use CCSID 00424 for Hebrew and CCSID 00420 for Arabic for data mapping to take place. For a list of supported CCSIDs, see Appendix F, “Coded Character Set Identifiers (CCSIDs).”

- Phrasing left and right

Avoid using left and right terms. For example, *right margin* in Hebrew or Arabic documents would be the beginning of the line and not the end. Use the words *start* and *end* in place of the words *right* and *left*.

- Abbreviations

The Arabic language does not use abbreviations; therefore, it is advisable to use complete words.

Chapter 4. National Language Support in AS/400 Licensed Programs

This chapter discusses special considerations for national language support for various functions of the OS/400 licensed program as well as for other AS/400 licensed programs.

AS/400 licensed programs have two parts: the program code needed to make the programs work, and the textual data, consisting of messages, prompts, displays, and online information. The textual data is translated into the different national languages; the program code is not.

OS/400 Functions and National Language Support

Distributed Database

As an SAA platform, the OS/400 licensed program supports SAA distributed relational database, SQL, and data types, including date, time, and time stamp. This SAA support allows read and write access from an AS/400 system to another AS/400 system, from an AS/400 system to an OS/2 Extended Edition, or from an AS/400 system to the following IBM Enterprise System operating systems:

- MVS/ESA
- MVS/XA
- VM/SP
- VM/ESA

The SAA Common Programming Interface (CPI) for database is Structured Query Language (SQL). Interactive access to distributed relational database is possible using the prompted functions of interactive SQL. Distributed flat file access is through AS/400 systems, personal computers, System/36 systems, and System/38 systems.

For more information on distributed database, refer to "Related Architectures" on page 1-9 and "CCSID Support in Other System Components" on page 2-14.

Library List

The language used for textual data (displays, messages, printed output, and online help information) is controlled by the library list for the job. By adding a national language library to the system portion of the library list, different national language versions of information can be presented.

The textual data for the system's primary language is stored in the same libraries as the program code for the IBM licensed programs. For example, if the primary language of the system is English, then libraries such as QSYS, QHLPSYS, and QSSP contain textual data in English. The QSYS and QHLPSYS libraries are on the system portion of the library list. Libraries for other licensed programs (such as QRPGRPG for RPG/400) are added to the library list by the system when they are needed.

Textual data for national language versions other than the system's primary language is installed in secondary national language libraries, which each contain a single national language version of the displays, messages, command prompts, and help information for *all* IBM licensed programs. The name of a secondary language library is in the form QSYSnnnn, where nnnn is a language feature code. For example, the feature code for French is 2928, so the secondary language library name for French is QSYS2928. For a list of language feature codes, see Appendix B, "National Language Version Default System Values."

If you want information presented in the primary language of the system, no special action is required. To present information in a different language, users must change their system library lists so that the desired national language library is positioned before all other libraries in the system library list that contain national language information.

For example, to present the French version of displays, messages, and so on, the user could enter the following command to place French information at the top of the library list:

```
CHGSYSLIBL LIB(QSYS2928) OPTION(*ADD)
```

To remove a library from the library list enter:

```
CHGSYSLIBL LIB(QSYS2928) OPTION(*REMOVE)
```

Note: The authority shipped with the CHGSYSLIBL command does not allow all users to run the command.

Graphical Data Display Manager (GDDM)

Graphical Data Display Manager (GDDM) is a function of the operating system that processes both text and graphics for printed output on a display station, printer, or plotter. The symbol set in GDDM is independent of the system values. The default symbol set is based strictly on the language of the system.

GDDM supports DBCS graphics symbol set for the Japanese, Korean (vector support only), and Traditional Chinese languages.

Files are assigned the CCSID value of the job attribute or user profile during the install process. The CCSID value is based on the QCCSID system value of the primary language if no CCSID value was specified on the job attribute or user profile.

Refer to the *GDDM Programming Guide*, SC33-0536, for more information.

Interactive Data Definition Utility (IDDU)

Interactive Data Definition Utility (IDDU) is a program that guides you through the steps required to describe (define) the characteristics of data and the contents of files stored on your system and to maintain those data definitions in data dictionaries.

IDDU can be used to specify date and date formats when developing internationalized applications, similar to how DDS was used for the application example in Chapter 3, "Developing an Internationalized Application."

Refer to the *IDDU User's Guide* for more information about data definitions, field definitions, and format definitions.

Question-and-Answer Function (Q & A)

The question-and-answer function (Q & A) function allows a user to consult a technical expert when additional information is needed to answer a question or solve a problem. A user may first search one or more Q & A databases to attempt to get information. If the information provided is not sufficient, the user can ask a question which will be answered by a technical expert.

A Q & A database named QSYSQST is supplied with OS/400 program. This Q & A database includes answers to common questions concerning the AS/400 system.

This supplied database is provided with information translated only for the primary language installed on the system. There is no equivalent database provided for a secondary language when loaded.

REXX/400

REXX is a general-purpose programming language, and is particularly suited for the following:

- Command procedures
- Applications
- Prototyping
- Personal computing

The REstructured eXtended eXecutor (REXX) is supported by an interpreter that is part of the OS/400 licensed program.

REXX/400 interprets REXX procedures in the CCSID of the source file. REXX procedures in source files with a CCSID of 65535 are interpreted using the standard REXX parsing tables. Procedures that do not use REXX Extension Characters should be kept in CCSID 65535 source files.

REXX procedures in source files with a supported CCSID other than 65535 can be written using the REXX Extension Characters, including DBCS characters, for REXX variable names or labels. This also enables REXX procedures to be written using operator characters that vary from code page to code page (like the REXX NOT ('\') operator character) without source code character substitution.

Note: When using code page 290 (CCSID 00290), the system requires that commands be entered in uppercase letters A through Z.

Appendix K, "REXX/400 Extension Characters" contains a list of tables that define the set of REXX extension characters. These tables, along with the CCSID tables in Appendix F, "Coded Character Set Identifiers (CCSIDs)" and the code pages in Appendix N, "Code Pages," can be used to determine the meaning of each character to the REXX language.

To determine the single-byte code page for the CCSID from Table F-2 on page F-1:

- For the EBCDIC single-byte (encoding 1100 CCSIDs), see Appendix F, "Coded Character Set Identifiers (CCSIDs)"

- For mixed single-byte and double-byte (encoding 1301) CSSIDs (except for CCSID 00423), see Appendix F, “Coded Character Set Identifiers (CCSIDs)”

The tables in Appendix N, “Code Pages” are used to identify the characters in each code page. The tables in Appendix K, “REXX/400 Extension Characters” are then used to identify how each global character graphic identifier (GCGID) is interpreted by the REXX language.

The OPTIONS 'ETMODE' does the following:

- Specifies that literal strings and comments containing DBCS characters are checked for being valid DBCS strings. This is useful to prevent the ending of a comment by the '*' code point within a double-byte character string.
- Has no effect in REXX procedures in source files with a supported CCSID other than 65535 and is ignored in these REXX procedures.
- Is in effect for the REXX source files with mixed single-byte and double-byte CCSIDs (encoding X'1301') and attempts to change this option are ignored.

Options 'NOETMODE' is in effect for the REXX source files with EBCDIC single-byte CCSIDs (encoding X'1100') and attempts to change this option are ignored.

SNA Distribution Services (SNADS)

SNA Distribution Services (SNADS) is an IBM asynchronous distribution service that defines a set of rules to receive, route, and send electronic mail in a network of systems.

SNADS supports the use of CCSIDs as follows:

- All user IDs, destination system names, and distribution queue names are in CCSID 00500.
- When these names are on any commands or displays, they are converted to and from CCSID 00500.
- Input data is considered to be in the CCSID of the job. If the CCSID of the job is 65535, the data is assumed to be in CCSID 00500.
- The DDS CHRID (character set and code page) support is used to convert the data for displays and listings. If the file CHRID attribute is changed to something other than character set 697 and code page 500, the results are unpredictable.
- Data should be correctly converted between CHRID 697 500 of the file attribute and the CHRID of your device.
- CHRID has been removed from displays and listings on text descriptions and job names (distribution log entries).
- Conversion of distribution queue commands is supported by CCSIDs.

Sort Utility

The sort utility provides the following sorting and reformatting possibilities: to copy and to merge files; or to add information, to summarize data, and to refer to existing records in other files.

When using the graphic data type G, make sure to specify the exact character positions of the data to be sorted. The shift-in (SI) and shift-out (SO) characters are not needed to specify double-byte character set (DBCS) data.

For more information on sorting DBCS data, refer to the *Sort User's Guide and Reference*.

Spellchecking

Spelling functions are available on the AS/400 system through an application program interface (API) for documents that are created without using the SAA OfficeVision/400 licensed program. You can do the following:

- Check the spelling of a word or list of words.
- Retrieve a list of words that are similar to the word that is being used.

The Language Dictionaries/400 licensed program does not need to be installed for this support. You can specify IBM-created or user-created language dictionaries to be used when performing the spelling functions. The Create Spelling Aid Dictionary (CRTSPADCT) command allows you to create your own dictionaries.

System/36 Environment

The OS/400 System/36 environment can display output in various national languages on the same system. This allows information in one national language to be presented to one user while information in a different national language is presented to another user. The presentation of displays, messages, and menus is based on the current setting of the job's library list.

User Data

The data in the display files, menus, and online help information that is part of the user applications is not converted to a CCSID value when created. Textual information in database files, such as field text, column headings, and file text, is stored with the appropriate CCSID of the job but is not converted. When this information is extracted by other products and components, it is generally converted to the CCSID of the job. For example, when the Display File Field Description (DSPFFD) command is issued, the text and column headings for fields are converted to the CCSID of the job.

Source files containing procedures should be assigned a CCSID of 65535, or the job CCSID should be set to 65535 when the job runs.

Database management support can convert the data read from or written to database files. The job CCSID determines the code page and character set to use for this conversion. The value of the job CCSID is the same as the system value (QCCSID), unless it is changed through the user's profile or the Change Job (CHGJOB) command.

- If data is being read from a database file and the CCSID of the file is the same as the job CCSID, no conversion is done.
- If data is being read from a database file and the CCSID of the file and the job CCSID are different, the data is converted to the CCSID of the job.
- If data is being written to a database file and the CCSID of the file is the same as the job CCSID, no conversion is done.
- If data is being written to a database file and the CCSID of the file and the job CCSID are different, the data is converted to match the CCSID of the file.

- Program-described files are assigned CCSID 65535.

Double-Byte Character Set Support

The AS/400 system maintains an internal DBCS job attribute for every job running on the system. The job attribute indicates if the job is capable of handling double-byte character data. The job attribute is based on the value of job CCSID and the value of the DBCS system value (QIGC).

- If the job CCSID is mixed, the job is DBCS capable.
- If the job CCSID is SBCS, the job is not DBCS capable.

Note: The job CCSID cannot be mixed if the DBCS system value (QIGC) indicates a DBCS national language version is not installed on the system.

IGC Parameter

The System/36 environment uses the IGC procedure to set or reset the DBCS job attribute. The IGC procedure is similar to the IGC SESSION prompt on the System/36 Sign On display.

For more information, refer to the *Concepts and Programmer's Guide for the System/36 Environment*.

Advanced DBCS Printer Support/400 Licensed Program

The Advanced DBCS Printer Support/400 provides the advanced function printing on the DBCS printers such as 5575, 5577, 5587, and floor-standing DBCS printers 5227, 5327, and 5427. This support also includes forms generation, logo creation, special symbols, large characters and OCR symbols, and merging the spool data with the form. This licensed program provides DBCS support with the following utilities:

- Advanced Page Printer Writer Utility (APPW)
- Advanced DBCS Printer Writer Utility (APW)
- IBM 5583 Kanji Print Function (KPF)
- Printer Form Description/Symbol Migration Aid Utility
- Printer Function Control (PFC)

For more information, refer to the *5583 Kanji Print Function User's Guide and Reference*, SH18-2179.

Advanced Function Printing DBCS Fonts/400 Licensed Program

The Advanced Function Printing DBCS Fonts/400 licensed program provides DBCS fonts for use on 240 dots-per-inch, page IPDS printers supported by the Advanced Function Printing (AFP) software integrated within the Operating System/400 licensed program and the Advanced Function Printing Utilities/400 licensed program.

Refer to the *Licensed Programs Specifications: Advanced Function Printing DBCS/Fonts*, GC21-2375.

Advanced Function Printing Utilities/400 Licensed Program

The Advanced Function Printing Utilities/400 provides the advanced function printing on IPDS printers supported by the Advanced Function Printing (AFP) software integrated within the Operating System/400 licensed program. This includes forms design and generation, logo and image creation, AFP resource management, and the ability to print data from the database file in formats with various fonts and bar codes without developing any application programs. This licensed program provides the following utilities:

- Overlay Utility
- Resource Management Utility
- Print Format Utility

For more information, refer to the *Advanced Function Printing Utilities/400 User's Guide*, SH18-2416, and *Guide to Programming for Printing*, SC41-8194.

Application Dictionary Services/400 Licensed Program

The Application Dictionary Services/400 licensed program is an integrated programmer productivity tool that provides a method for program development and maintenance. It is a dictionary that provides the ability to reference and cross-reference data on the AS/400 system.

AS/400 SAA AD/Cycle Application Development Manager/400

The SAA AD/Cycle Application Development Manager licensed program functions as a change management tool for application development. Project administrators use the SAA Application Development Manager/400 program to define project hierarchies for their application development, and to define the creation and movement of parts, within a project hierarchy, by application developers.

When developing an application, several parts of the application must be translated into different languages. These parts are commands, messages, display files, and printer files. The Application Development Manager/400 can be used to help you manage this translation. The creation of the application should be done in the same language by all the developers.

For more information about developing applications, refer to the *Application Development Manager/400 User's Guide*.

AS/400 Application Development Tools Licensed Program

Application Development Tools is a set of programs consisting of:

- **Advanced Printer Function (APF):** used to design symbols, logos, special characters, large characters, and forms tailored to a business or data processing application. The function supports printing of any design on the 5224/5225 dot matrix printers.
- **Character Generator Utility (CGU):** used to define and maintain user-defined double-byte characters and related sort information.
- **Data File Utility (DFU):** used to enter, maintain, and display records in a database file.

DFU supports the graphic data type.

Refer to the *Data File Utility User's Guide and Reference*, SC09-1338, for more information.

- **Programming Development Manager (PDM):** used to perform several operations (such as copy, delete, and rename) from lists of libraries, objects and members. PDM also allows users to create user-defined options to perform operations beyond those supplied by the PDM-supplied options.
- **Report Layout Utility (RLU):** used to create, change, and save report prototypes.
- **Screen Design Aid (SDA):** used to design, create, and maintain displays and menus.
- **Source Entry Utility (SEU):** used to create and change source members.

When programming with DBCS characters, you must have the following:

- The DBCS Operating System/400 feature on the system.
- A DBCS-capable display station.
- Each DBCS character string started with a shift-out (SO) character and ended with a shift-in (SI) character.
- A DBCS-capable printer.

The *JOBCCSID value for the CHRID parameter is not supported by the SEU Edit or Browse display in display file QDSDDSPF.

AS/400 BASIC Licensed Program

BASIC (Beginner's All Purpose Symbolic Instruction Code) is a programming language with a small list of commands and a simple syntax, primarily designed for numeric applications.

See "High-Level Languages (Literals and Encoding)" on page 3-39 for CCSID considerations.

AS/400 Business Graphics Utility Licensed Program

AS/400 Business Graphics Utility (BGU) is used to design, plot, display, and print charts.

This licensed program supports the graphic data type (G) by converting it to the DBCS-open data type (O).

Application Program Driver/400

Application Program Driver/400 (APD/400) is a licensed program used to integrate multiple applications into a common environment and to integrate functions common to those applications. The APD/400 licensed program provides a standardized interface that allows users to access their applications and to switch between applications.

For more information, refer to the *APD/400 Developer's Guide*.

SAA C/400 Licensed Program

The SAA C/400 licensed program is the Systems Application Architecture platform C programming language available on the AS/400 system, including system specific functions.

The C/400 compiler and library:

- Support multiple-byte and wide characters or graphic data as defined by IBM's Common Programming Interface. Multiple-byte characters are supported in comments, string literals, and characters constants.

See “High-Level Languages (Literals and Encoding)” on page 3-39 for CCSID considerations. See the *SAA CPI C Reference*, SC09-1308, for the supported DBCS library functions.

- Only recognize coded character set identifier (CCSID) 00037 for variant syntactic characters. See “High-Level Languages (Literals and Encoding)” on page 3-39 for a discussion of variant syntactic characters. See “Syntactic/Invariant Character Set 640” on page O-1 for a list of those characters.
 - If a CCSID other than 00037 is used, unexpected compile-time errors leading to unsuccessfully compiled programs could result.
 - If you want to use a CCSID other than 00037, do not use variant syntactic characters.
 - To ensure compatibility, the job CCSID and the source CCSID should be the same.
 - If the source CCSID or the job CCSID is set to a CCSID of 65535, no conversion is done.
- Provide predefined locales for France, Germany, Italy, Spain, the United Kingdom, and the United States for language-sensitive functions.

CallPath/400 Licensed Program

The CallPath/400* licensed program provides a software platform link between an AS/400 system and a Private Branch Exchange (PBX) that enables AS/400 applications to provide enhanced business services, personalize caller interactions, improve customer service, enhance employee productivity, increase revenues, and improve the use of assets. The synergy of data and telephony processing can be especially valuable to customers who perform telephone marketing and telephone servicing.

The CallPath/400 program is available in all primary and secondary languages.

CICS/400 Licensed Program

The IBM CICS/400 licensed program enables transactions entered at remote workstations to be processed concurrently by user-written application programs. The licensed program includes functions for building, using, and maintaining databases, and for communicating with CICS and other operating systems.

The CICS/400 program is available in English, German, Japanese, and Korean.

SAA COBOL/400 Licensed Program

The COBOL/400 licensed program is the Systems Application Architecture platform COBOL programming language available on the AS/400 system. It includes system-specific functions.

COBOL (COmmon Business-Oriented Language) is a high-level programming language, based on English, that is used primarily for commercial data processing.

See “High-Level Languages (Literals and Encoding)” on page 3-39 for CCSID considerations.

See “Sort Sequence with the COBOL/400 Licensed Program” on page 3-45 for the sort sequence table and language identifier considerations.

In general COBOL handles DBCS characters in the same way it handles alphanumeric characters. Therefore, it is up to you to know (or have the COBOL program check) which data items contain DBCS characters, and make sure the program receives and processes the information correctly.

Refer to the *COBOL/400* User's Guide* for more information.

SAA AD/Cycle CoOperative Development Environment/400

The SAA AD/Cycle CoOperative Development Environment/400 licensed program provides an SAA application development and maintenance utility for editing, compiling, and debugging third-generation programming languages within the AD/Cycle framework. An attached personal computer is used as a work station.

Only one national language version of the CODE/400 licensed program can be installed on the work station. To switch languages, the program must be installed on the work station again.

The CODE/400 licensed program supports the DBCS version of OS/2 licensed program in all national language versions.

Cryptographic Support/400 Licensed Program

Cryptographic Support/400 provides support for the encryption and decryption of data and provides functions to assist the user in managing cryptographic keys. The encrypt/decrypt function is performed in accordance with the ANSI Data Encryption Algorithm/Data Encryption Standard (DEA/DES).

Cryptographic Support/400 does not support the double-byte character set.

For more information, refer to *Cryptographic Support/400 User's Guide*, SC41-8080.

SAA FORTRAN/400 Licensed Program

The SAA FORTRAN/400 licensed program is the Systems Application Architecture Common Programming Interface (CPI) Level 1 FORTRAN language on the AS/400 system to support portability among the SAA platforms.

The SAA FORTRAN/400 programming language enables FORTRAN applications to be developed on the AS/400 system or migrated from other IBM and non-IBM systems. FORTRAN/400 assists users in developing applications, maintaining data, and creating reports.

See “High-Level Languages (Literals and Encoding)” on page 3-39 for CCSID considerations.

The FORTRAN/400 licensed program supports the double-byte character set (DBCS) used by customers in Japan, Korea, Taiwan, People's Republic of China and Hong Kong. This capability expands the application solution base to include Asian applications. The DBCS support allows users to write programs that manipulate DBCS data.

Integrated Language Environment C/400* (ILE C/400)

The Integrated Language Environment C/400 licensed program uses a System Application Architecture platform C programming language. The ILE C/400 program uses the ILE model on the AS/400 system.

The ILE C/400 compiler and library:

- Allow compiling source code in any EBCDIC code page except code page 290.
- Support multi-byte and wide characters or graphic data as defined by IBM's common interface. Multi-byte characters are supported in comments, strings, literals, and character constants.
- Provide predefined locales for France, Germany, Italy, Spain, the United Kingdom and the United States for language-sensitive functions that use sort sequence tables and language identifiers.

A **locale** is an object that contains information about valid alphanumeric characters, the collating sequence, and the format of numbers, currency, dates, and time. You can use locales to customize your application programs without hard-coded information for character sets, the collating sequence, and the format of numbers, currency, dates, and time.

For more information, refer to *ILE* C/400 Programmer's Guide and Reference*.

Language Dictionaries/400 Licensed Program

The Language Dictionaries/400 licensed program provides spelling dictionaries for OfficeVision/400. The language dictionaries for the different national languages are not considered textual data; no textual data is associated with this licensed program. None of the dictionaries are translated into a secondary language.

The following language dictionaries are available:

Table 4-1. OfficeVision/400 Language Dictionaries

Language	Dictionary
Brazilian Portuguese	BRAZIL
Catalonia Region of Spain	CATALA
Danish	DANSK
Dutch	NEDERLND
Finnish (hyphenation only)	SUOMI
French	FRANCAIS
French Canadian	FRA2
German	DEUTSCH
Greek	GREEK
Icelandic	ISLENSK
Italian	ITALIANO
Legal	LEGAL
Medical	MEDICAL
National Portuguese	PORTUGAL
Norwegian	NORSK
Spanish	ESPANA
South Africa	AFRIKAAN
Swedish	SVENSK
Swiss-German	DSCHWEIZ
UK English	UK
US English	US

For more information, refer to *Systems Application Architecture* OfficeVision/400*: Learning about OfficeVision/400 Word Processing*, SC41-9617.

SAA OfficeVision/400 Licensed Program

OfficeVision/400 prepares, sends, and receives mail; schedules appointments on calendars; maintains directories of names and addresses; and files and retrieves documents. OfficeVision/400 also provides word processing functions and the capability to work on behalf of other users.

Changing the System Primary Language

Additional changes are needed for the OfficeVision/400 program when the primary language of the system is changed.

Before Changing Your Primary Language:

The documents supplied by IBM are found in two folders, QWPDOCS and QPRFFLR. QWPDOCS is a general-use folder used by OfficeVision/400. When it is shipped from IBM, it contains one document, QNOTE. This document is the default shell note to use the Send Note function of OfficeVision/400. QPRFFLR is the folder used to contain all of the text profile documents for OfficeVision/400. When it is shipped from IBM, it contains one document, SYSTEM. This document is the default text profile used to create new documents on the AS/400 system.

If you have changed one or more of the IBM-supplied documents, the changed versions of the documents are saved by default. If you have not changed one or more of these documents, or added any other documents to folders QWPDOCS and QPRFFLR, delete the documents and the folders containing them to allow the new primary national language version of the documents to restore on the system.

1. If you are sure the documents in QWPDOCS have not been changed, enter the following command:

```
DLTDLO DLO(*ALL) FLR(QWPDOCS)
```

Press the Enter key.

2. If you are sure the documents in QPRFFLR have not been changed, enter the following command:

```
DLTDLO DLO(*ALL) FLR(QPRFFLR)
```

Press the Enter key.

After Changing Your Primary Language:

- Code page considerations:

OfficeVision/400 stores code page and character set information within the documents it creates. This information is used to convert characters in the document when it is displayed or printed and to correctly display national characters.

If there are work stations on the system that are configured different from the system code page and character set and documents are created or edited on those work stations, the data is stored in the system CHRID. Text appears correctly on the work station where it was created, but appears incorrectly on work stations that are configured in a different code page. When text has been created using a work station configured with a different CHRID, the only way to change the CHRID is to create the documents again using a text profile that was created on a work station with the CHRID you want for your document. This applies to document details as well as document text.

When changing the primary national language version on your system, the QCHRID system value is the default character set and code page that is determined by the primary national language version. When automatic configuration is used to configure work stations, it will assign character set and code page based on the system value (QCHRID). Therefore, when automatic configuration is used and the primary national language version is changed, the device descriptions may need to be changed using the CHGDEV DSP command.

Enter the following command:

```
CHGDEV DSP DEVD(device-name) CHRID(character-set code-page)
```

Press the Enter key.

You need to create the text profile again after your configuration is changed so that new documents are created in the new CHRID.

- Default values:

When new users begin to use OfficeVision/400, user profiles are initialized using the current primary national language version. Choices, such as whether to see measurements in English or metric, will default or are set at that time. If the primary national language version is changed later, new users will default to the new primary national language version values. Existing user profiles are not changed. To change the values for user profiles that already exist, the user can go to the display where the default is used and change the value. The value entered is saved in the user profile as the new default. For more information on OfficeVision/400 character set and code page considerations, see *Office Services Concepts and Programmer's Guide*.

Work station controller issued messages and prompts in the office editor are limited to two national languages. If more than two national languages are used by office editor users from a single work station controller (local only), all of the remaining secondary language user's issued messages and prompts will be in the secondary language of the work station controller. This limitation is the result of the storage capacity of the work station controller. Remote work station controllers support a single language for office editor prompts and messages.

- CPX8416 message changes:

The OfficeVision/400 program uses several of the values from the message CPX8416. When the primary language is changed, some of the values within this message should also be changed, especially for the CHRID value. Use the Work with Message Description (WRKMSGD) command to make changes to the message. For performance reasons, the OfficeVision/400 program keeps an internal copy of the message. To update the internal copy of the message with the latest changes, you must do an IPL of the system or issue the following command:

```
CALL QOCLOADM QCPIMSG
```

- OfficeVision/400 assigns CCSID 65535 to all files. No conversion is done to the data that is passed back. For example, when OfficeVision/400 calls Query/400 for data/text merge, it passes a CCSID of 65535 so no conversion is done to the data that is passed back.

Using Double-Byte Character Set Data

The calendar, system distribution directory, and administration functions of OfficeVision/400 allow double-byte data to be entered from a double-byte capable display station. This double-byte support should only be used as part of the OfficeVision/400 DOS direct connect environment from a PS/55 work station.

Only certain prompts on the calendar, system distribution directory, and administration displays are capable of accepting DBCS information. The *Using OfficeVision/400** manual contains a list of these prompts.

Using Text Search Services

Text search services allows searching for documents having a particular phrase, word, word part, or a combination of these in the document. To locate a document by text search, document information must first be put into the text index. The process of extracting words and word parts from the text of a document and then storing this information into the text index is called **indexing**.

- If a supported AS/400 language dictionary is installed on the system which matches the language identifier of a document, then it is used while indexing the document. The **language identifier** is an optional three character identifier that is in the document's details.
- If an appropriate language dictionary is not available when a document is indexed, all unique words of a document's text are stored in the text index.

Language dictionaries corresponding to the following languages and language identifiers may be installed and used during indexing a document and text search.

Table 4-2. OfficeVision/400 Language Identifiers for Text Search Services

Language	Identifier
Belgium Dutch	NLB
Belgium French	FRB
Brazilian Portuguese	PTB
Canadian French	FRC
Catalan	CAT
Danish	DAN
Dutch	NLD
French	FRA
German	DEU
Icelandic	ISL
Italian	ITA
Norwegian Bokmål	NOR
Nynorsk Norwegian	NON
Portuguese	PTG
Spanish	ESP
Swedish	SVE
Swiss-German	DES
UK English	ENG
US English	ENU

Note: Spelling functions are available for documents without using the SAA OfficeVision/400 licensed program. For more information, see “Spellchecking” on page 4-5.

OSI Communications Subsystems/400 Licensed Program

IBM OSI Communications Subsystem/400 provides communications support for Open System Interconnection (OSI) on the AS/400 system.

IBM OSI Communications Subsystem/400 is available in English and Japanese.

OSI File Services/400 Licensed Program

OSI File Services/400 makes the OSI file transfer access and management (FTAM) protocols available for AS/400 systems. OSI File Services/400, together with OSI Communications Subsystems/400, allows AS/400 systems to participate in networks where OSI FTAM protocols are required for communications.

IBM OSI File Services/400 is available in English and Japanese.

OSI Message Services/400 Licensed Program

OSI Message Services/400 allows OfficeVision/400 users to send and receive mail between users within an OSI (Open System Interconnection) network using the 1984 version of the X.400 protocols. **X.400** is a CCITT (International Telegraph and Telephone Consultative Committee) standard for international electronic mail (messages). OSI Message Services/400:

- Provides capability to convert between system-supported character sets and code pages and IA5 ASCII (character set 1169, code page 1009).

- Allows the conversion between IA5 ASCII (International Alphabet ASCII) and EBCDIC code page 435.
- Provides capability to convert between all national language versions to and from the T.61 standard. **T.61** is a CCITT standard for character encoding to allow the standard interchange of user addresses in the X.400 protocol.

The IBM-supplied program, QDCXLATE, makes possible this mixed-byte (1 or 2 bytes) set to a single byte set conversion by adding a new attribute field of mixed byte character. X.400 matches the different national language versions with the information received in T.61 format. Refer to “CCITT T.61 Graphic Character Conversions” on page I-12 for a listing of all tables used by the QDCXLATE program and the T.61 standard.

IBM OSI Message Services/400 is available in English and Japanese.

AS/400 Pascal Licensed Program

Pascal is a general purpose, high-level programming language that is used to write programs that are block-structured, independent routines.

When using AS/400 Pascal with DBCS characters, you must have the following:

- The DBCS Operating System/400 feature on the system.
- A DBCS-capable display station.
- Each DBCS character string started with a shift-out (SO) character and ended with a shift-in (SI) character.
- A DBCS-capable printer.

See “High-Level Languages (Literals and Encoding)” on page 3-39 for CCSID considerations.

For more information, refer to *Languages: Pascal Reference*, SC09-1210.

PC Support/400 Licensed Program

PC Support/400 is a licensed program that provides system functions to an attached personal computer.

When used with OS/2, PC Support/400 supports all of the national languages shown in Appendix J, “PC Support National Language Information.” Unlike the AS/400 system that has a primary language and secondary languages, PC Support/400 provides a language or multiple languages on the personal computer. The language you want to install on the personal computer must already be installed on the AS/400 system and is determined by setting the language environment variable.

For a list of the values for the PC Support program, see Appendix J, “PC Support National Language Information” on page J-1.

For more information about:

- Installing and using PC Support/400 in a multilingual environment
- Special considerations for using CCSIDs and the sort sequence tables

See the *PC Support/400 OS/2 Installation and Administration Guide* and the *PC Support/400 DOS Installation and Administration Guide*.

RUMBA*/400

RUMBA/400 is a feature of the PC Support/400 licensed program. The RUMBA/400 feature provides 5250 display emulation for users of the Microsoft Windows** program and OS/2 licensed program.

For more information, see the *RUMBA/400 Guide and Reference*.

Performance Tools/400 Licensed Program

IBM Performance Tools/400 provides a set of reporting, analysis and modeling functions to assist the user in managing the performance of the AS/400 system. It provides printed and online reports, in either graphic or tabular form, portraying the performance and utilization of AS/400 systems.

For more information, see *Performance Tools Subset/400 Guide*.

Point-of-Sale Communications Utility/400 Licensed Program

The Point-of-Sale Communications Utility/400 provides connectivity through retail controllers for the AS/400 system to be used as an in-store processor or as a host system. The program is used in the retail distribution and supermarket industries. With Point-of-Sale systems, these industries are able to provide automatic processing of such functions as sales tracking, accounting, maintaining price files, electronic funds transfer, and credit authorization.

For more information, see the *Point-of-Sale Communications Utility/400 Programmer's Guide*.

AS/400 PL/I Licensed Program

AS/400 PL/I is a high-level language available on the AS/400 system. The PL/I licensed program is capable of handling a large variety of data structures and easily allows variation of precision in numeric computation.

See "High-Level Languages (Literals and Encoding)" on page 3-39 for CCSID considerations.

Considerations for DBCS are discussed in the Technical Newsletter (TNL) (SN09-1564) to the *PL/I User's Guide and Reference* manual.

Query/400 Licensed Program

Query/400 is an easy-to-use, menu-driven program that gives a wide range of users the ability to extract up-to-date information from the database on the AS/400 system. Query/400 allows users to define and change queries, manage their libraries of queries, and run the queries without having programming knowledge. The Query/400 licensed program is distinct from OS/400 Query Management, which provides the SAA Common Programming Interface (CPI) for SQL query requests and the SQL/400 Query Manager.

Query/400 provides the following to users of different national language versions:

- Default editing consistent with the national language version of the end user is assumed for fields defined without any editing.
- Double-byte versions are supported; however, no national language collating is provided for any double-byte character sets.

Warnings are issued when working with queries on an SBCS system and those queries have been defined with DBCS data or on a DBCS system. These warnings indicate to the user that the query may not function as expected due to hardware requirements.

Query/400 has a prompt on the Specify Processing Options display:

```
Ignore character substitution warnings . . . Y Y=Yes,N=No
```

The default is to ignore the warning (Y). Character substitution may occur when converting between two CCSID tags. For the CCSID conversions that may cause substitution to be used, see “Substitution Characters” on page F-5. If you are not converting between CCSIDs, specify the default of yes (Y) to ignore. If you want to have an error shown when substitution characters occur for conversions between CCSID tags, specify no (N) for the Ignore character substitution warnings option.

Query/400 considerations when operating in a multilingual system environment are as follows:

- Queries created with a national language collating sequence run with the collating sequence as defined by the national language for each end user.
- Queries created with default editing use the default editing as defined by the national language version for each end user.
- If date and time constants are used, specify them in an SAA format. This prevents confusion about which format was used when the same query is referred to in different national language versions.
- If the CHAR function is being used on the Define Result Fields display, specify a format instead of defaulting to the job format. Doing this ensures the same format is used by all jobs that run the query.

Query/400 has the following CCSID support:

- Query definitions are assigned a CCSID value.
- Files created by Query/400 are assigned a CCSID value. Fields in file definitions and various field attributes such as column headings can have individual CCSID values.
- The language collating sequences used by Query/400 have an associated CCSID value.
- The user-defined collating sequence has a CCSID value.
- User-created translation tables used as a collating sequence have a CCSID value of 65535.
- Variant characters are recognized in any CCSID. The || (concatenate symbol) is an example of a variant character.

The Query/400 program supports the sort sequence tables for the languages as shown in Appendix H, “Sort Sequence Tables” on page H-1.

Query/400 also supports alternate collating sequence tables for the following languages:

Table 4-3. Language Collating Sequence Support by Query/400

Belgium Dutch	Italian
Belgium French	Italian MNCS
Danish	Norwegian
Dutch	Portuguese
English	Portuguese MNCS
Finnish	Spanish
French	Spanish MNCS
French MNCS	Swedish
French Canadian	Swiss French MNCS
German	Swiss German MNCS
German MNCS	Swiss Italian MNCS
Icelandic	United Kingdom

The sequence tables for the languages are used when creating internationalized applications.

The default editing and language collating sequence functions are described in the *Query/400 User's Guide*.

RM/COBOL-85 for the AS/400 Licensed Program

The RM/COBOL-85 for the AS/400 licensed program is an application language that conforms to the American National Standard COBOL 85. It includes a number of extensions.

See “High-Level Languages (Literals and Encoding)” on page 3-39 for CCSID considerations.

SAA RPG/400 Licensed Program

The AD/Cycle RPG/400 licensed program is the Systems Application Architecture platform RPG programming language available on the AS/400 system, including system-specific functions.

See “High-Level Languages (Literals and Encoding)” on page 3-39 for CCSID considerations.

See “Sort Sequence with the RPG/400 Licensed Program” on page 3-43 for sort sequence considerations.

SAA Structured Query Language/400 Licensed Program

The SAA SQL/400 licensed program provides the SAA Common Programming Interface (CPI) for relational database access and an end-user interface for SQL users. Application programmers have a powerful yet easy-to-use set of commands with a prompted interface to access and manipulate data from local or remote rela-

tional databases. Menus guide the SQL user in creating and maintaining expert queries, customizing reports, and creating, maintaining, and querying tables.

SQL provides support for null, date, time, and time stamp definitions, and variable length field support. SAA distributed database function provides read and write access to remote data and provides SAA enterprise-wide data connectivity.

SQL/400 provides the following to users of different national language versions:

- Default editing consistent with the end user's national language version is assumed for fields defined without any editing.
- Support for assigning CCSIDs while precompiling programs. **Compile** means to convert a program written in a high-level language into a machine-language program.
- Support for entering and recognizing variant characters in any CCSID. The concatenate symbol is an example of a variant character.

When entering DBCS data on the Enter SQL Statements display, each line of data must contain as many shift-out characters as shift-in characters. To assist processing a DBCS data string requiring more than one line, interactive SQL removes the extra shift-out and shift-in characters.

DBCS characters are allowed in comments, string literals, and character constants. Variables in programs and columns in tables may contain double-byte data and the character set that the data is encoded. Conversion between compatible CCSIDs is performed.

SQL/400 supports CCSIDs, but most compilers do not, and unpredictable results can occur. For example, there may be situations where:

- Source will compile but will not precompile.
- Source will precompile but will not compile.

For more information on CCSIDS, see “High-Level Languages (Literals and Encoding)” on page 3-39,

The SQL/400 licensed program supports the sort sequence tables for all languages as described shown Appendix H, “Sort Sequence Tables” on page H-1.

Refer to the *SQL/400* Programmer's Guide* for a complete discussion of using SQL/400 to develop applications.

SQL/400 Query Manager

SAA Structured Query Language/400 Query Manager is a collection of tools that enable users to work with the capabilities of the structured query language (SQL). SQL/400 Query Manager provides an interactive tool for building, maintaining, managing, and processing SQL queries. In addition, these tools offer the capability to report on database tables in a *forms-based interface*.

SQL/400 Query Manager supports assigning CCSIDs based on the user's information. Query objects can use CCSID conversion, but query forms cannot be converted if the text is in a different CCSID.

Query Manager can use the sort sequence tables.

SAA SystemView System Manager/400 Licensed Program

The SystemView System Manager/400 licensed program provides the capability for an AS/400 system in a network to function as a service provider for other AS/400 systems in the network.

For more information, see *SystemView* System Manager/400 User's Guide*.

SAA SystemView Managed System Services/400 Licensed Program

The SystemView Managed System Services/400 licensed program enables a system to be managed from a central site ES/9000 system running the IBM NetView Distribution Manager program. Managed System Services/400 enables objects and program temporary fixes (PTFs) to be sent or retrieved, PTFs to be applied, programs to be run, and the central site system to control an initial program load (IPL) of the system.

For more information, refer to *Managed System Services/400 User's Guide*.

SystemView Information Warehouse* DataHub* Support/400

DataHub Support/400 is a family of products designed to manage complex database environments by providing integrated database systems management functions for IBM SAA relational database management systems (RDBMSs).

DataHub/400 Release 1 supports the following IBM SAA RDBMSs:

- DATABASE 2 (DB2) on MVS
- SQL/DS on VM ESA
- OS/400 database
- Database Manager for OS/2.

For more information about DataHub Support/400, see *Finance Communications Programmer's Guide*.

IBM SAA SystemView OMEGAMON** Services/400

The IBM and Candle Corporation SAA SystemView OMEGAMON Services/400 licensed program monitors system resources and objects in realtime, and logs events when the situations happen.

For more information, see *IBM OMEGAVIEW/400 Guide*.

AS/400 System/38 Utilities Licensed Program

AS/400 System/38 Utilities is comprised of:

- **System/38-Compatible Data File Utility (DFU/38)** helps you maintain data files using predefined information in your database. You can create data entry, file maintenance, and inquiry applications, using DFU/38 in the System/38 environment only.
- **System/38-Compatible Query Utility (Query/38)** allows you to use database files without changing the content of the files. You can print or display the

results of a Query/38 procedure in a report format or store the results in a data-base file, using Query/38 in the System/38 environment only.

- **System/38-Compatible Text Management Utility (Text Management/38)** allows you to create, revise, print, and store letters, forms, and similar documents using Text Management/38 in the System/38 environment only.

TCP/IP Connectivity Utilities/400 Licensed Program

Transmission Control Protocol/Internet Protocol (TCP/IP*) Connectivity Utilities/400 allows an AS/400 system to interface with other systems that have implemented the TCP/IP network functions. This capability enhances the AS/400 system's capacity for interconnection with IBM and multiple OEM networks.

When using File Transfer Protocol (FTP) or TELNET in a multilingual environment:

- If you establish an FTP or TELNET connection between two AS/400 systems that have different primary languages, the data is displayed or stored in the EBCDIC code page of the source system.
- When using FTP in ASCII mode, the data of the system sending the file is translated from its stored EBCDIC code page to ASCII and then from ASCII to the EBCDIC code page of the receiving system. The variant characters may be interpreted differently on the receiving system if the sending and receiving EBCDIC code pages are different.

The TCP/IP licensed program does not support DBCS data when using FTP or Simple Mail Transfer Protocol (SMTP). However, it is supported for the 5555 locally attached devices that use a TELNET connection to another AS/400 system supporting DBCS data or a system that supports 3270 DBCS data.

The VT220 server support uses conversion tables to map between the EBCDIC code page of the AS/400 system and the ASCII-based code page of the VT220 terminal. This conversion tables are list in Appendix I, "Graphic Character Conversion Tables" on page I-1.

Refer to the *TCP/IP Guide* for more information about the File Transfer Protocol, TELNET, and the Simple Mail Transfer Protocol.

Appendix A. National Language Version Feature Codes

The following table lists the National Language Versions, their feature codes, and the program libraries from which they are available.

National Language Version (NLV)	Feature Codes	Program Libraries							
		ISMD	SPC	CSPD	JSPD	MSPD	ASPD	ARSPD	BSPD
Belgium Dutch MNCS	x963	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
Belgium French MNCS	x966	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
Brazilian Portuguese	x980	N/A	N/A	N/A	N/A	N/A	N/A	N/A	PS
Canadian French MNCS	x981	S	PS	PS	N/A	N/A	N/A	N/A	N/A
Danish	x926	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
Dutch Netherlands	x923	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
English Uppercase	x950	N/A	PS	N/A	N/A	N/A	PS	N/A	N/A
English Uppercase and Lowercase	x924	PS	PS	PS	PS	PS	PS	PS	PS
English Uppercase Support for DBCS	x938	P	PS	N/A	PS	N/A	PS	N/A	N/A
English Uppercase and Lowercase Support for DBCS	x984	P	PS	N/A	PS	N/A	PS	N/A	N/A
Finnish	x925	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
French	x928	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
French MNCS	x940	N/A	PS	N/A	N/A	N/A	N/A	N/A	N/A
German	x929	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
German MNCS	x939	N/A	PS	N/A	N/A	N/A	N/A	N/A	N/A
Greek	x957	N/A	PS	N/A	N/A	N/A	N/A	N/A	N/A
Icelandic	x958	N/A	PS	N/A	N/A	N/A	N/A	N/A	N/A
Italian	x932	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
Italian MNCS	x942	N/A	PS	N/A	N/A	N/A	N/A	N/A	N/A
Japanese DBCS	x962	S	S	N/A	PS	N/A	S	N/A	N/A
Korean DBCS	x986	S	S	N/A	N/A	N/A	PS	N/A	N/A
Norwegian	x933	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
Portuguese	x922	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
Portuguese MNCS	x996	N/A	PS	N/A	N/A	N/A	N/A	N/A	N/A
Simplified Chinese DBCS	x989	S	S	N/A	N/A	N/A	PS	N/A	N/A
Spanish	x931	S	PS	N/A	N/A	PS	N/A	PS	N/A
Swedish	x937	S	PS	N/A	N/A	N/A	N/A	N/A	N/A
Traditional Chinese DBCS	x987	S	S	N/A	N/A	N/A	PS	N/A	N/A
Turkish	x956	N/A	PS	N/A	N/A	N/A	N/A	N/A	N/A

Legend:

ISMD IBM Software Manufacturing and Delivery - Boulder, Colorado
 SPC Software and Publications Center - Copenhagen, Denmark
 CSPD Canadian Software Production and Distribution - Toronto
 JSPD Japanese Software Production and Distribution - Tokyo
 MSPD Mexican Software Production and Distribution - Mexico City
 ASPD Australian Software Production and Distribution - Sydney
 ARSPD Argentina Software Production and Distribution - Buenos Aires
 BSPD Brazilian Software Production and Distribution - Rio de Janeiro

x 2 for primary language; 5 for secondary language
 P Primary language (29nn)
 S Secondary language (59nn)
 DBCS Double-Byte Character Set
 MNCS Multinational Character Set
 N/A Not available

Licensed Programs for National Language Versions

The following tables show which licensed programs are translated for a national language version.

Table A-2 (Page 1 of 2). Translated National Language Versions (Part 1 of 2)

Licensed Program	National Language Versions									
	Brazilian Portuguese	Danish	Dutch ¹	English ²	Finnish	French ³	German ⁴	Greek	Icelandic	Italian ⁴
Operating System/400 ⁵	X	X	X	X	X	X	X	X	X	X
SAA AD/Cycle Application Development Manager/400				X		X	X			X
AFP DBCS Fonts				X						
Applications Dictionary Services/400				X						
Application Program Driver/400		X	X	X	X		X	X		
AS/400 BASIC				X		X				
SAA CoOperative Development Environment/400				X			X			X
SAA COBOL/400				X		X	X			
Point-of-Sale Communications Utility/400				X		X				
CICS/400				X						
AS/400 Communications Utilities				X			X			
Cryptographic Support/400				X						
AS/400 Business Graphics Utility			X	X	X	X	X	X		X
SAA C/400				X						
DataHub Support/400				X						
SAA FORTRAN/400				X						
SAA ILE C/400				X						
IBM OMEGAMON/400				X						
RM-COBOL-85 for the AS/400				X						
PC Support/400	X	X	X	X	X	X	X	X	X	X
RUMBA/400	X	X	X	X	X	X	X	X	X	X
Communications Manager				X						
AS/400 PL/I				X						
AS/400 Pascal				X						
Performance Tools/400				X						X
AS/400 Application Development Tools			X	X		X	X			X
Query/400	X	X	X	X	X	X	X	X	X	X
SAA RPG/400				X		X	X			X
SAA SystemView System Manager/400				X			X			

Table A-2 (Page 2 of 2). Translated National Language Versions (Part 1 of 2)

Licensed Program	National Language Versions									
	Brazilian Portuguese	Danish	Dutch ¹	English ²	Finnish	French ³	German ⁴	Greek	Icelandic	Italian ⁴
SAA SystemView Managed System Services/400				X						
AS/400 System/38 Utilities				X		X	X			X
SAA Structured Query Language/400			X	X	X	X	X			
TCP/IP Connectivity Utilities/400				X						
SAA OfficeVision/400	X	X	X	X	X	X	X	X	X	X
CallPath/400				X			X	X		X
OSI Message Services/400				X						
OSI File Services/400				X						
OSI Communications Subsystem/400				X						
Advanced Function Printing Utilities/400				X	X	X	X			
Advanced DBCS Printer Support/400				X						
Notes: 1 Includes Belgian Dutch. 2 Includes English UC, English UC DBCS, English UC and LC, and English UC and LC DBCS 3 Includes Belgian, Canadian, and MNCS. 4 Includes MNCS version. 5 May not necessarily be the entire Operating System/400.										

Table A-3 (Page 1 of 2). Translated National Language Versions (Part 2 of 2)

Licensed Program	National Language Versions								
	Japanese	Korean	Norwegian	Portuguese ¹	Simplified Chinese	Spanish	Swedish	Traditional Chinese	Turkish
Operating System/400 ²	X	X	X	X	X	X	X	X	X
SAA AD/Cycle Application Development Manager/400	X					X			
AFP DBCS Fonts									
Application Dictionary Services/400									
Application Program Driver/400	X		X	X		X	X		X
AS/400 BASIC	X					X			
SAA CoOperative Development Environment/400	X								
SAA COBOL/400	X					X			
Point-of-Sale Communications Utility/400	X			X		X			
CICS/400	X	X							
AS/400 Communications Utilities	X					X			
Cryptographic Support/400									
AS/400 Business Graphics Utility	X				X	X	X		X
SAA C/400	X								
DataHub Support/400									
SAA FORTRAN/400	X								
SAA ILE C/400	X	X			X				
SAA OMEGAMON/400	X								
RM-COBOL-85 for the AS/400	X					X			
PC Support/400	X	X	X	X	X	X	X	X	X
RUMBA/400	X		X	X		X	X		
Communications Manager									
AS/400 PL/I	X								
AS/400 Pascal	X								
Performance Tools/400	X					X			
AS/400 Application Development Tools	X	X			X	X		X	
Query/400	X	X	X	X	X	X	X	X	X
SAA RPG/400	X	X				X			
SAA SystemView System Manager/400	X	X				X			
SAA SystemView Managed System Services/400	X								
AS/400 System/38 Utilities	X					X			

Table A-3 (Page 2 of 2). Translated National Language Versions (Part 2 of 2)

Licensed Program	National Language Versions								
	Japanese	Korean	Norwegian	Portuguese ¹	Simplified Chinese	Spanish	Swedish	Traditional Chinese	Turkish
SAA Structured Query Language/400	X	X	X		X	X		X	X
TCP/IP Connectivity Utilities/400	X					X			
SAA OfficeVision/400	X	X	X	X	X	X	X	X	X
CallPath/400	X	X							
OSI Message Services/400	X								
OSI File Services/400	X								
OSI Communications Subsystem/400	X								
Advanced Function Printing Utilities/400	X				X	X			
Advanced DBCS Printer Support/400	X				X				
Notes:									
1 Includes MNCS version.									
2 May not necessarily be the entire Operating System/400.									

Appendix B. National Language Version Default System Values

The following charts show some of the system values associated with each National Language Version. The system values shown for each version are listed by keyword. They are as follows:

Keyword	Description
QCHRID	SBCS character set/code page
QDECFMT	Decimal format
QKBDTYPE	Keyboard type
QCURSYM	Currency symbol
QDATSEP	Date separator
QDATFMT	Date format
QTIMSEP	Time separator
QCCSID	Coded character set identifier
QCNTYID	Country identifier
QLANGID	Language identifier

Belgium Dutch MNCS (Feature 2963)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00500	J	BLI	F	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00500	BE	NLB

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Belgium French MNCS (Feature 2966)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00500	J	BLI	F	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00500	BE	FRB

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Brazilian Portuguese (Feature 2980)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00037	J	BRB	\$	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00037	BR	PTB

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Canadian French MNCS (Feature 2981)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00500	Blank	CAI	\$	Hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	Colon (:)	00500	CA	FRC

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Danish (Feature 2926)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00277	J	DMB	Colon (:)	Hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Period (.)	00277	DK	DAN

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Dutch Netherlands (Feature 2923)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00037	J	NEB	\$	Hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00037	NL	NLD

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

English Uppercase (Feature 2950)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00037	Blank	USB	\$	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
MDY	Colon (:)	00037	GB	ENP

Note:

1. This is the recommended QCCSID value to be if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

English Uppercase and Lowercase (Feature 2924)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00037	Blank	USB	\$	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
MDY	Colon (:)	00037	US	ENU

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

English Uppercase DBCS (Feature 2938)

See note 1.

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00037	Blank	JKB	Yen sign	Slash (/)

QDATfmt	QTIMSEP	QCCSID ²	QCNTYID	QLANGID
MDY	Colon (:)	65535	US	ENP

Note:

1. The QIGC value is set to 1.
2. Because this national language version is not specific to any country, 65535 is used. You should change this system value to an appropriate CCSID after installing your system, or change the job or user profile CCSID attribute. Here are the recommended CCSID values and CHRID changes that occur.

- 05026 for Japanese with no lowercase characters, CHRID is set to 1172 290.
- 05035 for Japanese with both uppercase and lowercase characters.

System and product files not explicitly assigned a CCSID value will be assigned CCSID 05035 if DBCS capable and CCSID 01027 for SBCS only files.

English Uppercase and Lowercase DBCS (Feature 2984)

See note 1.

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
01175 00037	Blank	TAB	\$	Slash (/)

QDATfmt	QTIMSEP	QCCSID ²	QCNTYID	QLANGID
MDY	Colon (:)	00937	US	ENU

Note:

1. The QIGC value is set to 1.
2. Because this national language version is not specific to any country, 65535 is used. You should change this system value to an appropriate CCSID after installing your system, or change the job or user profile CCSID attribute. Here are the recommended CCSID values and CHRID changes that occur.

- 00937 for Traditional Chinese
- 00935 for Simplified Chinese
- 00933 for Korean

Finnish (Feature 2925)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00278	J	FNB	F	Period (.)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Period (.)	00278	FI	FIN

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

French (Feature 2928)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00297	J	FAB	F	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00297	FR	FRA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

French MNCS (Feature 2940)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00500	J	SFI	F	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00500	CH	FRS

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

German (Feature 2929)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00273	J	AGB	\$	Period (.)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00273	DE	DEU

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

German MNCS (Feature 2939)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00500	J	SGI	\$	Period (.)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Comma (,)	00500	CH	DES

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Greek (Feature 2957)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00925 00875	J	GNB	\$	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00875	GR	ELL

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Icelandic (Feature 2958)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00871	J	ICB	\$	Hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00871	IS	ISL

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Italian (Feature 2932)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00280	Blank	ITB	Lira sign	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Period (.)	00280	IT	ITA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Italian MNCS (Feature 2942)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00500	Blank	ITI	Lira sign	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Comma (,)	00500	CH	ITS

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Japanese (Katakana) DBCS (Feature 2962)

See note 1.

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
01172 00290	Blank	JKB	Yen sign	Hyphen (-)

QDATFMT	QTIMSEP	QCCSID ²	QCNTYID	QLANGID
YMD	Colon (:)	05026	JP	JPN

Note:

1. The QICG system value is set to 1.
2. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Korean DBCS (Feature 2986)

See note 1.

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
01173 00833	Blank	KOB	WON sign	Period (.)

QDATFMT	QTIMSEP	QCCSID ²	QCNTYID	QLANGID
YMD	Colon (:)	00933	KR	KOR

Note:

1. The QICG system value is set to 1.
2. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Norwegian (Feature 2933)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00277	J	NWB	\$	Period (.)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00277	NO	NON
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.				

Portuguese (Feature 2922)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00037	J	PRB	\$	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00037	PT	PTG
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.				

Portuguese MNCS (Feature 2996)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00500	J	PRI	\$	Hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00500	PT	PTG
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.				

Spanish (Feature 2931)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00284	J	SPB	\$	Slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	00284	ES	ESP
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.				

Swedish (Feature 2937)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
00697 00278	J	SWB	\$	Hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	Period (.)	00278	SE	SVE

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Simplified Chinese DBCS (PRC) (Feature 2989)

See note 1.

QCHRID ²	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
01174 00836	Blank	RCB	\$	Period (.)

QDATFMT	QTIMSEP	QCCSID ³	QCNTYID	QLANGID
YMD	Colon (:)	00935	CN	CHS

Note:

1. The QIGC system value is set to 1.
2. For Version 1 Release 2 and Release 3, the character set and code page is 00101 00037.
3. This is the recommended QCCSID value if you want to use CDRA support.

Traditional Chinese DBCS (ROC) (Feature 2987)

See note 1.

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
01175 00037	Blank	TAB	\$	Slash (/)

QDATFMT	QTIMSEP	QCCSID ²	QCNTYID	QLANGID
YMD	Colon (:)	00937	TW	CHT

Note:

1. The QICG system value is set to 1.
2. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

Turkish (Feature 2956)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
01152 01026	J	TKB	\$	Slash (/)

QDATfmt	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	Colon (:)	01026	TR	TRK

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all NLVs, the default QCCSID value is 65535.

System Values for Other Languages

The following table shows some of the system values associated with languages and countries that do not have a National Language Version. The system values must be set immediately after receiving the system or after initially installing the operating system.

You also have to change the message, CPX8416, in the QCPFMSG message file in library QSYS to reflect the changed system values.

Albanian (Albania)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	ROB	lek	Hyphen (-)

QDATfmt	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00870	AL	SQI

Arabic (Bahrain)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	dinar	slash (/)

QDATfmt	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	BH	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Egypt)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	pound	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	EG	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Iraq)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	dinar	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	IQ	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Jordan)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	dinar	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	JO	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Kuwait)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	dinar	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	KW	ARA
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Arabic (Lebanon)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	pound	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	LB	ARA
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Arabic (Libyan Arab Jamahiriya)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	dinar	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	LY	ARA
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Arabic (Oman)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	riyal	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	OM	ARA
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Arabic (Qatar)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	riyal	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	QA	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Saudi Arabia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	riyal	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	SA	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Sudan)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	pound	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	SD	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Syrian Arab Republic)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	pound	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	SY	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (United Arab Emirates)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	dirham	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	AE	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Arabic (Yemen)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0235 0420	blank	CLB	dinar	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	comma (,)	00420	YE	ARA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Afrikaans (South Africa)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0697 0037	J	USB	rand	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00037	ZA	AFR

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Australian English (Australia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0697 0037	J	USB	dollar	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	period (.)	000037	AU	ENA

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Byelorussia (Belarus)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0960 0880		CYB		

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
		00880	BY	BEL

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Bulgarian (Bulgaria)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0960 0880	blank	CYB	lev	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00880	BG	BGR

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Croatian (Croatia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	YGI	dinar	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00870	HR	HRV
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Czech (Czech Republic)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	ROB	Koruna	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00870	CS	CSY
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Hebrew (Israel)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0941 0424	blank	NCB	new shekel	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	colon (:)	00424	IL	HEB
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Hungarian (Hungary)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	ROB	forint	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00870	HU	HUN
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Irish Gaelic (Ireland)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0697 0285	J	UKB	punt	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	colon (:)	00285	IE	GAE

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Macedonian (Macedonia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0960 0880	blank	CYB	tolar	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00880	MK	MKD

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Polish (Poland)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	ROB	zloty	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	colon (:)	00870	PL	PLK

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Rhaetic-Romantic (Switzerland)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0697 0500	blank		franc	period (.)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	colon (:)	00500	CH	RMS
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Romanian (Romania)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	ROB	lei	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00870	RO	ROM
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Russian (Russia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0960 0880	blank	CYB	ruble	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	period (.)	00880	RU	RUS
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Serbian Cyrillic (Serbia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0960 0880	blank	CYB		

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
		00880	SQ	SRB
Note:				
1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

Serbian Latin (Serbia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0960 0880	blank	CYB		

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
		00880	SQ	SRB

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Slovakian (Slovakia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	ROB	koruna	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00870	NA	SKY

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Slovenian (Slovenia)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0959 0870	blank	YGI	dinar	hyphen (-)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
YMD	colon (:)	00870	SI	SLO

Note:

1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.

Thai (Thailand)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0939 0838	blank	THB	baht	space

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
DMY	colon (:)	00838	TH	THA
Note: 1. This is the recommended QCCSID value if you want to use CDRA support. For all national language versions (NLVs), the default QCCSID value is 65535.				

UK English (United Kingdom)

QCHRID	QDECfmt	QKBDTYPE	QCURSYM	QDATSEP
0697 0285	J	UKB	pound	slash (/)

QDATFMT	QTIMSEP	QCCSID ¹	QCNTYID	QLANGID
MDY	colon (:)	00285	GB	ENG
Note: 1. This is the recommended QCCSID value if you want to use CDRA support. The default QCCSID value is 65535.				

Appendix C. National Language Keyboard Types and SBCS Code Pages

The following table lists the keyboard types and code pages for each national language supported by the AS/400 system. The Create Device Display (CRTDEV DSP) command uses the KBDTYPE parameter.

Table C-1 (Page 1 of 2). National Language Keyboard Types and SBCS Code Pages

Language	KBDTYPE Parameter	EBCDIC Character Set	EBCDIC SBCS Code Page	EBCDIC CCSID	IBM Personal Computer SBCS Code Page
Arabic	CLB	235	420	00420	864
Austria/Germany	AGB	697	273	00273	437
Austria/Germany Multinational (MNCS)	AGI	697	500	00500	850
Belgium MNCS	BLI	697	500	00500	850
Brazilian Portuguese	BRB	697	037	00037	850
Canadian French	CAB	341	260	65535	863
Canadian French MNCS	CAI	697	500	00500	850
Cyrillic	CYB	960	880	00880	855
Denmark	DMB	697	277	00277	850
Denmark MNCS	DMI	697	500	00500	850
Finland/Sweden	FNB	697	278	00278	850
Finland/Sweden MNCS	FNI	697	500	00500	850
France (Azerty)	FAB	697	297	00297	437
France (Azerty) MNCS	FAI	697	500	00500	850
France (Qwerty)	FQB	697	297	00297	437
France (Qwerty) MNCS	FQI	697	500	00500	850
Greek (See note 2.)	GNB	925	875	00875	869
Hebrew	NCB	941	424	00424	862
Iceland	ICB	697	871	00871	850
Iceland MNCS	ICI	697	500	00500	850
International	INB	697	500	00500	850
International MNCS	INI	697	500	00500	850
Italy	ITB	697	280	00280	437
Italy MNCS	ITI	697	500	00500	850
Japan-English	JEB	697	281	65535	See note 1.
Japan-English MNCS	JEI	697	500	00500	See note 1.
Japanese-Kanji and Katakana	JKB	1172	290	05026	See note 1.
Japanese-Kanji and US English	JUB	697	037	See note 3.	See note 1.
Japanese-Katakana	KAB	332	290	00290	See note 1.
Korean	KOB	1173	833	00833	See note 1.
Latin 2	ROB	959	870	00870	852
Netherlands	NEB	697	037	00037	850

Table C-1 (Page 2 of 2). National Language Keyboard Types and SBCS Code Pages

Language	KBDTYPE Parameter	EBCDIC Character Set	EBCDIC SBCS Code Page	EBCDIC CCSID	IBM Personal Computer SBCS Code Page
Netherlands MNCS	NEI	697	500	00500	850
Norway	NWB	697	277	00277	850
Norway MNCS	NWI	697	500	00500	850
Portugal	PRB	697	037	00037	850
Portugal MNCS	PRI	697	500	00500	850
Simplified Chinese	RCB	1174	836	00836	932
Spain	SPB	697	284	00284	850
Spain MNCS	SPI	697	500	00500	850
Spanish Speaking	SSB	697	284	00284	437
Spanish Speaking MNCS	SSI	697	500	00500	850
Sweden	SWB	697	278	00278	437
Sweden MNCS	SWI	697	500	00500	850
Switzerland/French MNCS	SFI	697	500	00500	850
Switzerland/German MNCS	SGI	697	500	00500	850
Thai	THB	938	838	00838	See note 1.
Traditional Chinese	TAB	1175	037	00937	See note 1.
Turkey	TKB	1152	1026	01026	857
United Kingdom	UKB	697	285	00285	437
United Kingdom MNCS	UKI	697	500	00500	850
United States and Canada	USB	697	037	00037	437
United States and Canada MNCS	USI	697	500	00500	850
Languages of the former Yugoslavia	YGI	959	870	00870	852

Notes:

1. There is no IBM personal computer SBCS code page associated with this KBDTYPE.
2. For KBDTYPE GKB, the EBCDIC code page is 423 and the IBM Personal Computer SBCS code page is 851.
3. Recommend single-byte CCSID 00037.

SBCS Keyboard and Display Part Numbers by Language

The following tables list the part numbers of the SBCS displays and keyboards that should be used for each language or country supported by the AS/400 system. Users of a particular national language version can verify if they have the correct display and keyboard by checking part numbers. The keyboard numbers are printed on the bottom of the keyboards. If the keyboard or display for that language is not correct, the characters displayed may not be correct.

Determining Display Part Numbers: To determine the part number for the model-unique Licensed Internal Code of the display, use the following procedure:

1. Press and hold any key on the keyboard while powering the display on.
2. Move the cursor to
Test Work station
and press the Enter key.

Note: The second line of text on the screen contains a 7-digit number in its second field from the right. This is the part number.

3477 and 3476 Keyboard and Display Part Numbers

The following table lists the part numbers for the 3477 and 3476 displays. Blank entries in the keyboard columns mean that keyboard part numbers are not available at this time.

Table C-2 (Page 1 of 5). 3477 and 3476 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Parameter	1A (122-Key) Keyboard	G Keyboard	Displays
Arabic	CLB	1394332	1394436	38F5818, 56F8919, 65F2991, 65F2999, 79F2045, 79F2047, 95F4178, 95F5896, 79F7084, 79F7100, 95F5971, 95F5983, 23F1581, 56F9585, 38F8008
Austria/Germany	AGB	1394312	1394416	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Austria/Germany MNCS	AGI	1394312	1394416	Same as Austria/Germany
Belgium MNCS	BLI	1394313	1394417	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Brazilian Portuguese	BRB	1394319	1394423	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604

Table C-2 (Page 2 of 5). 3477 and 3476 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
Canadian French	CAB	1395662	1395567	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Canadian French MNCS	CAI	1395662	1395567	Same as Canadian French
Cyrillic	CYB	1394329	1394433	38F5824, 56F8925, 65F2993, 65F3001, 79F5045, 79F5047, 95F5893, 95F5905, 79F7097, 95F4108, 95F5980, 07G2167, 23F1584, 56F9596
Denmark	DMB	1394314	1394418	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Denmark MNCS	DMI	1394314	1394418	Same as Denmark
Finland/Sweden	FNB	1394315	1394419	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Finland/Sweden MNCS	FNI	1394315	1394419	Same as Finland/Sweden
France (Azerty)	FAB	1394316	1394420	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
France (Azerty) MNCS	FAI	1394316	1394420	Same as France (Azerty)
France (Qwerty)	FQB			38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
France (Qwerty) MNCS	FQI			Same as France (Qwerty)
Greek (Code Page 875)	GNB	1396767	1396768	56F9587, 79F7039, 79F7048, 79F7040, 79F7049, 95F5922, 95F5925, 95F5923, 95F5926
Greek (Code Page 423)	GKB	1394325	1394429	56F9587, 23F1582, 56F8958, 56F8960, 56F8959, 56F8961, 79F2049, 79F5043, 79F2050, 79F5044, 95F5885, 95F5899, 95F5886, 95F5900
Hebrew	NCB	1394331	1394435	23F1583, 56F9595, 79F7094, 95F4105, 95F5977, 07G2164, 38F5822, 56F8923, 65F2989, 65F2997, 79F2041, 79F2043, 95F5889, 95F5902

Table C-2 (Page 3 of 5). 3477 and 3476 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
Iceland	ICB	1394330	1394434	38F5820, 56F8921, 56F8958, 56F8960, 79F5043, 79F2049, 95F5885, 95F5899, 23F1582, 56F9587, 79F7087, 95F4102, 95F5974, 07G2161
Iceland MNCS	ICI	1394330	1394434	Same as Iceland
International	INB			38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
International MNCS	INI			
Italy	ITB	1394317	1394421	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Italy MNCS	ITI	1394317	1394421	Same as Italy
Japan-English	JEB			38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Japan-English MNCS	JEI			Same as Japan-English
Japanese-Katakana	KAB	1395664	1395669	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Latin 2	ROB	1394328	1394432	38F5824, 56F8925, 65F2993, 65F3001, 79F5045, 79F5047, 95F5893, 95F5905, 79F7097, 95F4108, 95F5980, 07G2167, 23F1584, 56F9596
Netherlands	NEB		1394427	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Netherlands MNCS	NEI		1394427	Same as Netherlands
Norway	NWB	1394318	1394422	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Norway MNCS	NWI	1394318	1394422	Same as Norway

Table C-2 (Page 4 of 5). 3477 and 3476 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
Portugal	PRB	1394319	1394423	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604, 79F2036, 79F2039, 95F5915, 95F5918, 38F8010
Portugal MNCS	PRI	1394319	1394423	Same as Portugal
Spain	SPB	1394320	1394424	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Spain MNCS	SPI	1394320	1394424	Same as Spain
Spanish Speaking	SSB	1395663	1395668	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Spanish Speaking MNCS	SSI	1395663	1395668	Same as Spanish Speaking
Sweden	SWB	1394315	1394419	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Sweden MNCS	SWI	1394315	1394419	Same as Sweden
Switzerland/French MNCS	SFI	1394321	1394425	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Switzerland/German MNCS	SGI	1394322	1394426	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
Thai	THB		1395670	56F9597
Turkey	TKB	1394326	1394430	38F5818, 56F8919, 65F2991, 65F2999, 79F2045, 79F2047, 95F4178, 95F5896, 79F7084, 79F7100, 95F5971, 95F5983, 23F1581, 56F9585, 79F7044, 79F7046

Table C-2 (Page 5 of 5). 3477 and 3476 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
United Kingdom	UKB	1394324	1394428	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
United Kingdom MNCS	UKI	1394324	1394428	Same as United Kingdom
United States/Canada	USB	1395661, 1395660	1395666, 1395665	38F5835, 38F5843, 38F5845, 56F8934, 65F2987, 65F2995, 79F2020, 79F2029, 79F2032, 95F4167, 95F4171, 95F4174, 64F9705, 95F5908, 79F5064, 95F5911, 79F7019, 79F7020, 79F7022, 79F7025, 95F4144, 95F4146, 07G2170, 95F5941, 95F5943, 07G2172, 07G2174, 07G2176, 38F7998, 38F7999, 23F1574, 23F1585, 56F9556, 56F9557, 56F9604
United States/Canada MNCS	USI	1394167	1394193	Same as United States/Canada
Languages of the former Yugoslavia	YGI	1394327	1394431	38F5824, 56F8925, 65F2993, 65F3001, 79F5045, 79F5047, 95F5893, 95F5905, 79F7097, 95F4108, 95F5980, 07G2167, 23F1584, 56F9596

3486 and 3487 Keyboard and Display Part Numbers by Language

The following table lists the part numbers of the 3486 and 3487 displays and keyboards that should be used for each language or country supported by the AS/400 system. Blank entries in the keyboard columns mean that keyboard part numbers are not available at this time.

Table C-3 (Page 1 of 4). 3486 and 3487 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
Arabic	CLB	1394332	1394436	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Austria/Germany	AGB	1394312	1394416	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Austria/Germany MNCS	AGI	1394312	1394416	Same as Austria/Germany
Belgium MNCS	BLI	1394313	1394417	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Canadian French	CAB	1395662	1395567	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Canadian French MNCS	CAI	1395662	1395567	Same as Canadian French
Denmark	DMB	1394314	1394418	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Denmark MNCS	DMI	1394314	1394418	Same as Denmark

Table C-3 (Page 2 of 4). 3486 and 3487 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
Finland/Sweden	FNB	1394315	1394419	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Finland/Sweden MNCS	FNI	1394315	1394419	Same as Finland/Sweden
France (Azerty)	FAB	1394316	1394420	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
France (Azerty) MNCS	FAI	1394316	1394420	Same as France (Azerty)
Greek (Code Page 875)	GNB	1396767	1396768	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Greek (Code Page 423)	GKB	1394325	1394429	Same as Greek (Code Page 875)
Hebrew	NCB	1394331	1394435	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Italy	ITB	1394317	1394421	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Italy MNCS	ITI	1394317	1394421	Same as Italy
Japanese-Katakana	KAB	1395664	1395669	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336

Table C-3 (Page 3 of 4). 3486 and 3487 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
Netherlands	NEB		1394427	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Netherlands MNCS	NEI		1394427	Same as Netherlands
Norway	NWB	1394318	1394422	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Norway MNCS	NWI	1394318	1394422	Same as Norway
Portugal	PRB	1394319	1394423	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Portugal MNCS	PRI	1394319	1394423	Same as Portugal
Spain	SPB	1394320	1394424	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Spain MNCS	SPI	1394320	1394424	Same as Spain
Spanish Speaking	SSB	1395663	1395668	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Spanish Speaking MNCS	SSI	1395663	1395668	Same as Spanish Speaking
Sweden	SWB	1394315	1394419	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Sweden MNCS	SWI	1394315	1394419	Same as Sweden

Table C-3 (Page 4 of 4). 3486 and 3487 Keyboard and Display Part Numbers by Language

Language	KBDTYPE Param- eter	1A (122-Key) Keyboard	G Keyboard	Displays
Switzerland/French MNCS	SFI	1394321	1394425	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Switzerland/German MNCS	SGI	1394322	1394426	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
Thai	THB		1395670	07G8571, 0655322, 065312
Turkey	TKB	1394326	1394430	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
United Kingdom	UKB	1394324	1394428	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
United Kingdom MNCS	UKI	1394324	1394428	Same as United Kingdom
United States/Canada	USB	1395661, 1395660	1395666, 1395665	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336
United States/Canada MNCS	USI	1394167	1394193	Same as United States/Canada
Languages of the former Yugoslavia	YGI	1394327	1394431	06G5310, 06G5311, 06G5312, 06G5313, 06G5314, 06G5315, 06G5316, 06G5320, 06G5321, 06G5322, 06G5323, 06G5324, 06G5325, 06G5326, 06G5330 06G5331, 06G5332, 06G5333, 06G5334, 06G5335 06G5340, 06G5341, 06G5342, 06G5343, 06G5344 06G5345, 07G8611, 07G8567, 07G8568, 07G8569 06G8570, 07G8571, 07G8572, 06G5333, 06G5336

Keyboard Support for Other Devices

- Enhanced G and 122-key keyboards are not available for 5251, 5291, and 5292 display stations. These display stations use only the F keyboard (similar to the 122-key keyboard).
- The 3180 display station supports the 122-key keyboard but not the enhanced keyboard. The 3179, 3196, and 3197 support the 122-keyboard and the enhanced keyboard.
- The 3486 and 3487 display stations support all languages listed on Table C-2 on page C-3 (except for Thai) on all levels of hardware. No checking of the part numbers for the display stations is necessary.
- The 3486 and 3487 display stations do not need the correct language keyboard to show the code page for a language. The code page used by the display station matches what is specified in the configuration record.
- The 3488 display station supports the following languages or countries on all levels of hardware. No checking of part numbers is necessary. The 3488 display station does not need the correct language keyboard to show a code page for one of the supported languages. The code page used must match the one in the configuration record as long as it is among the supported languages.
 - Austrian/German
 - Belgium
 - Canadian French
 - Danish
 - Dutch
 - Finnish/Swedish
 - French (with AZERTY keyboard)
 - Italian
 - Norwegian
 - Portuguese
 - Spanish
 - Swiss-French
 - Swiss-German
 - U.K. English
 - U.S. English
- The 3476, 3486, 3487, and 3488 display stations support the U.S. data entry keyboard (part numbers 35G4750 and 35G4751).

Appendix D. Multilingual Support for the AS/400 Workstation Controller

There are limitations in the workstation controller to provide multilingual support.

- The workstation must be able to transmit and receive data in the required language.
- Each workstation controller supports a maximum number of languages at the same time, regardless of the keyboard types. This maximum number is in addition to the U.S. English support.
 - Twinaxial workstation controllers support a maximum of 3 languages.
 - ASCII workstation controllers support a maximum of 7 languages.
- The number of keyboard types allowed on a workstation controller is dependent on the different keyboard types required.

Determining Number of Keyboard Types

To determine the number of keyboard types that the twinaxial or ASCII controllers can support, you must understand the following:

- A twinaxial or ASCII workstation controller can support several types of keyboards and languages.
- Each of the supported languages may be available on more than one of the supported keyboards.
- For each workstation controller, the size of the translation table for each keyboard is different.
- The matrix for languages used on each supported keyboard type is called a keyboard and language **computational factor**. The computational factor assigned to each keyboard type determines whether all required keyboard types can be supported on one workstation controller.
- The sum of the computational factors for each required keyboard type determines whether all required keyboard types can be supported on one workstation controller.
- If the sum of the computational factors for the required keyboard types exceeds the maximum limit, the language for the *first* workstation that caused the overflow and any additional work stations default to U.S. English.
- To recover from a keyboard type overflow, you can do one of the following:
 - Attach the workstation causing the overflow to a second workstation controller.
 - On the same workstation controller, configure the workstations causing the overflow to some other keyboard type that reduces the sum of the computational factor within the maximum limits.

Keyboard Types on the Twinaxial Workstation Controller

The twinaxial workstation controller supports the following types of IBM keyboards:

- 5250 typewriter keyboard
- 5250 data entry keyboard
- 122-key typewriter keyboard
- 122-key data entry keyboard
- Enhanced keyboard

The sum of the computational factors for a language and keyboard type must not exceed 22 for the twinaxial workstation controller. The following table shows the computational factor for each language, keyboard type, and the KBDTYPE parameter.

Note: The actual number for each type of keyboard does *not* have any impact on the sum. For example, the computational factor is 3 whether there are 3 or 30 enhanced keyboards running Austrian/German.

Table D-1 (Page 1 of 2). Language/Keyboard Computational Factor Table						
Language	KBDTYPE	Keyboard Types				
		5250 Type-writer	5250 Data Entry	122-key Type-writer	122-key Data Entry	Enhanced
Arabic	CLB	2	N/A	2	N/A	2.5
Austria/Germany	AGB	1	1	1	N/A	3
Austria/Germany MNCS	AGI	1	1	1	N/A	3
Belgium MNCS	BLI	1	1	1	N/A	3
Brazilian Portuguese	BRB	1	1	1	N/A	3
Canadian French	CAB	1	1	1	1	3
Canadian French MNCS	CAI	1	1	1	1	3
Cyrillic	CYB	2	N/A	2	N/A	2.5
Denmark	DMB	1	1	1	N/A	3
Denmark MNCS	DMI	1	1	1	N/A	3
Finland/Sweden	FNB	1	1	1	N/A	3
Finland/Sweden MNCS	FNI	1	1	1	N/A	3
France (Azerty)	FAB	1	1	1	N/A	3
France (Azerty) MNCS	FAI	1	1	1	N/A	3
France (Qwerty)	FQB	1	1	N/A	N/A	N/A
France (Qwerty) MNCS	FQI	1	1	N/A	N/A	N/A
Greek	GNB	2	N/A	2	N/A	2.5
Hebrew	NCB	2	N/A	2	N/A	2.5
Iceland	ICB	1	N/A	1	N/A	3
Iceland MNCS	ICI	1	N/A	1	N/A	3
International	INB	1	1	N/A	N/A	N/A
International MNCS	INI	1	1	N/A	N/A	N/A
Italy	ITB	1	1	1	N/A	3
Italy MNCS	ITI	1	1	1	N/A	3
Japan-English	JEB	1	1	N/A	N/A	N/A
Japan-English Multinational	JKB	1	1	N/A	N/A	N/A

Table D-1 (Page 2 of 2). Language/Keyboard Computational Factor Table

Language	KBDTYPE	Keyboard Types				
		5250 Type-writer	5250 Data Entry	122-key Type-writer	122-key Data Entry	Enhanced
Japanese-Kanji and Katakana	JKB	N/A	N/A	N/A	N/A	2.5
Japanese-Kanji and US English	JUB	N/A	N/A	1	N/A	N/A
Japanese-Katakana	KAB	2	2	2	2	2.5
Korean	KOB	1	1	1	1	1
Latin 2	ROB	1	N/A	1	N/A	1.5
Netherlands	NEB	1	1	1	1	3
Netherlands MNCS	NEI	1	1	1	1	3
Norway	NWB	1	1	1	1	3
Norway MNCS	NWI	1	1	1	1	3
Portugal	PRB	1	1	1	N/A	3
Portugal MNCS	PRI	1	1	1	N/A	3
Simplified Chinese	RCB	1	1	1	1	1
Spain	SPB	1	1	1	N/A	3
Spain MNCS	SPI	1	1	1	N/A	3
Spanish Speaking	SSB	1	1	1	1	3
Spanish Speaking MNCS	SSI	1	1	1	1	3
Sweden	SWB	1	1	1	N/A	3
Sweden MNCS	SWI	1	1	1	N/A	3
Switzerland/French MNCS	SFI	1	N/A	1	N/A	3
Switzerland/ German MNCS	SGI	1	N/A	1	N/A	3
Thai	THB	N/A	N/A	N/A	N/A	2.5
Traditional Chinese	TAB	1	1	1	1	1
Turkey	TKB	1	N/A	1	N/A	1.5
United Kingdom	UKB	1	1	1	1	3
United Kingdom MNCS	UKI	1	1	1	1	3
United States/Canada	USB	See note.				
United States/Canada MNCS	USI	1	1	1	1	3
Languages of the former Yugoslavia	YGI	N/A	N/A	N/A	N/A	1.5

Note: Information about USB is not included, since it is always available and does not take up any additional space in the workstation controller.

To use the country/keyboard computational factor table, do the following:

1. Identify the language down the first column of the table.
2. Identify the keyboard type across the row for the selected language.
3. Record the computational factor listed for each keyboard type.
4. Repeat the first three steps for all the required keyboard types.
5. Add the computational factor for all required keyboard types.
 - a. If the sum of all computational factors does **not** exceed 22, then the twinaxial workstation controller can support all the required keyboard types for the languages.

- b. If the sum of the computational factors exceeds 22, then the twinaxial workstation controller will **not** support all the required keyboard types for the languages.

Keyboard Types on an ASCII Workstation Controller

The maximum number of country/keyboard types on the ASCII workstation controller is 14. The following languages are supported on the controller without having to customize the display station or printer.

Countries or Languages Supported without Workstation Customization

Arabic	Austria/Germany
Austria/Germany MNCS	Belgium MNCS
Canadian French	Canadian French MNCS
Denmark	Denmark MNCS
Finland/Sweden	Finland/Sweden MNCS
France (Azerty)	France (Azerty) MNCS
Hebrew	Italy
Italy MNCS	Norway
Norway MNCS	Portugal
Portugal MNCS	Spain
Spain MNCS	Spanish Speaking
Spanish Speaking MNCS	Sweden
Sweden MNCS	Swiss/French
Swiss/French MNCS	Swiss/German
Swiss/German MNCS	United Kingdom
United Kingdom MNCS	United States/Canada
United States/Canada MNCS	

Countries or Languages Supported Using Workstation Customization

Using the workstation customization functions, the following countries or languages can also be supported by the ASCII workstation controller.

Greek	Cyrillic
Icelandic	Icelandic MNCS
Brazilian Portuguese	Latin 2
Turkish	Languages of the former Yugoslavia
Thai	

Appendix E. Planning Checklist

To avoid any last minute surprises when your system arrives, use this planning checklist to record your system needs for national language support and multilingual support.

Table E-1 (Page 1 of 2). Checklist for National Language and Multilingual Support

Check Off	Question	Response
	What national language version for the primary language are you going to install? (Refer to "Setting Up the National Language Version" on page 1-2.)	
	What program library can it be ordered from? (Refer to Appendix A, "National Language Version Feature Codes" on page A-1.)	
	Are you going to use a DBCS national language version as a secondary language? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	
	Are you aware that the latest 5250 PC emulation is necessary to support graphic data type? (Refer to the marketing support representative in your country.)	
	What national language version for the secondary language are you to going install, if any? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	
	Do you want to change your subsystem to change the language of your initial sign-on display? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	
	What release level of the national language version for the primary language are you ordering? (Refer to "Using and Changing the Primary Language" on page 2-1.)	
	Are the release levels of the national language version for the secondary language and the primary language you are ordering the same? (Refer to "Using and Changing the Secondary Language" on page 2-4.)	
	What local work station controllers support your language? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What display stations and keyboards are required to support your language? (To determine the display stations and keyboards, refer to "Ordering Equipment and Software" on page 2-22 and Appendix D, "Multilingual Support for the AS/400 Workstation Controller" on page D-1.)	

Table E-1 (Page 2 of 2). Checklist for National Language and Multilingual Support

Check Off	Question	Response
	What printers support your language? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What keyboard ID are you using for your local devices? (Refer to Appendix B, "National Language Version Default System Values" on page B-1.)	
	What remote work station controllers support your language? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What display stations and keyboards support your language from a remote location? (Refer to "Ordering Equipment and Software" on page 2-22 and Appendix D, "Multilingual Support for the AS/400 Workstation Controller" on page D-1.)	
	What printers support your language from a remote location? (Refer to "Ordering Equipment and Software" on page 2-22.)	
	What keyboard ID are you using for your remote devices? (Refer to Appendix B, "National Language Version Default System Values" on page B-1.)	
	Are you considering the workstation customization function for work stations? (Refer to <i>Workstation Customization Function Programmer's Guide</i> .)	
	What applications support your languages on the local system? (Contact your marketing support representative in your country.)	
	What applications support your languages on the remote system? (Contact your marketing support representative in your country.)	
	Do you want all your database files with the CCSID of the primary language? (Refer to "Database Management Support for Coded Character Set Identifiers" on page 2-7.)	
	Are you aware of the limitations in multilingual and multiple system settings for CCSIDs? (Refer to "Major Limitations" on page 2-16.)	
	Do you want the language ID and country ID different from the primary language? (Refer to "Changing National-Language-Dependent Functions in User Profiles" on page 1-15.)	
	Do you want to work with sort sequence tables in your applications? (Refer to "National Language Sequence Support" on page 1-10.)	

Appendix F. Coded Character Set Identifiers (CCSIDs)

This appendix shows the encoding schemes, the character set, and code page for coded character set identifiers (CCSIDs) on the AS/400 system.

Encoding Schemes for the Coded Character Set Identifiers

Table F-1 describes the encoding scheme used for the CCSIDs.

Table F-1. Encoding Scheme ID Values in CDRA Level 1

Encoding Scheme Identifier	Encoding Scheme	Interpretation
1100	EBCDIC	Single byte, no code extension is allowed.
1200	EBCDIC	Double byte, no code extension is allowed.
1301	EBCDIC	Mixed single-byte and double-byte, using the shift-out (SO) and shift-in (SI) method.
2100	IBM-PC Data	Single byte, no code extension is allowed.
2200	IBM-PC Data	Double-byte, no code extension is allowed.
2300	IBM-PC Data	Mixed single-byte and double-byte, no (explicit) code extension.
4100	ISO 8	Single byte, no code extension is allowed.

Code Pages and Character Sets for the Coded Character Set Identifiers

Table F-2 table lists the coded character set identifiers (CCSIDs) supported by the AS/400 database and licensed programs. Refer to the *Character Data Representation Architecture - Executive Overview* for a complete listing of all CCSIDs.

Table F-2 (Page 1 of 4). Coded Character Set Identifiers (CCSID)

CCSID	Code Page	Char-acter Set	Encoding (see note)	Description
00037	00037	00697	1100	US, Canada, Netherlands, Portugal, Brazil, New Zealand, Australia
00256	00256	00337	1100	Netherlands
00273	00273	00697	1100	Austria, Germany
00277	00277	00697	1100	Denmark, Norway
00278	00278	00697	1100	Finland, Sweden
00280	00280	00697	1100	Italy
00284	00284	00697	1100	Spain, Latin America
00285	00285	00697	1100	United Kingdom
00290	00290	01172	1100	Japan Katakana (extended range)
00297	00297	00697	1100	France

Table F-2 (Page 2 of 4). Coded Character Set Identifiers (CCSID)

CCSID	Code Page	Character Set	Encoding (see note)	Description
00300	00300	01001	1200	Japan English
00301	00301	00370	2200	Japanese PC Data
00420	00420	00235	1100	Arabic-speaking countries
00423	00423	00218	1100	Greece
00424	00424	00941	1100	Hebrew
00437	00437	01212	2100	PC Data; PC Base; USA
00500	00500	00697	1100	Belgium, Canada, Switzerland, International Latin-1
00813	00813	00925	4100	ISO 8859-7; Greek/Latin
00819	00819	00697	4100	ISO 8859-1; Latin Alphabet No. 1
00833	00833	01173	1100	Korea (extended range)
00834	00834	00934	1200	Korea Host DB
00835	00835	00935	1200	Traditional Chinese (extended range)
00836	00836	01174	1100	Simplified Chinese (extended range)
00837	00837	00937	1200	Simplified Chinese
00838	00838	01176	1100	Thailand (extended range)
00850	00850	01106	2100	PC Data; MLP 222 Latin Alphabet
00852	00852	01232	2100	PC Data; Latin-2 Multilingual
00857	00857	01237	2100	PC Data; Turkey Latin #5
00860	00860	01213	2100	PC Data; Portugal
00861	00861	01214	2100	PC Data; Iceland
00862	00862	01217	2100	PC Data; Hebrew
00863	00863	01214	2100	PC Data; Canada
00864	00864	01244	2100	PC Data; Arabic
00865	00865	01216	2100	PC Data; Denmark, Norway
00869	00869	01249	2100	PC Data; Greek
00870	00870	00959	1100	Latin-2 Multilingual
00871	00871	00697	1100	Iceland
00874	00874	01176	2100	Thai PC Data
00875	00875	00925	1100	Greece
00880	00880	00960	1100	Cyrillic Multilingual
00891	00891	01224	2100	Korean PC Data (non-extended)
00897	00897	01122	2100	Japanese PC Data (non-extended)
00903	00903	01185	2100	Simplified Chinese PC Data (non-extended)
00904	00904	00103	2100	Traditional Chinese PC Data
00905	00905	00965	1100	Turkey Latin-3

Table F-2 (Page 3 of 4). Coded Character Set Identifiers (CCSID)

CCSID	Code Page	Character Set	Encoding (see note)	Description
00912	00912	00959	4100	ISO 8859-2; ROECE Latin-2 Multilingual
00915	00915	01150	2100	ISO 8859-5; Cyrillic
00916	00916	00941	4100	ISO 8859-8; Hebrew
00920	00920	01152	4100	ISO 8859-9; Latin 5
00926	00926	00934	2100	Korean PC Data
00927	00927	00935	2100	Traditional Chinese PC Data
00928	00928	00937	2100	Simplified Chinese PC Data
00930	00290 00300	01172 01001	1301	Japan Katakana (extended range) 4370 UDC (User Defined Characters)
00933	00833 00834	01173 00937	1301	Korea (extended range)
00935	00836 00837	01174 00937	1301	Simplified Chinese (extended range)
00937	00037 00835	01175 00935	1301	Traditional Chinese (extended range)
00939	01027 00300	01172 01001	1301	Japan English (extended range) 4370 UDC
00932	00897 00301	01122 00376	2300	Korean (non-extended)
00934	00891 00926	01224 00934	2300	Japan (non-extended)
00936	00903 00928	01185 00937	2300	Simplified Chinese (non-extended)
00938	00904 00927	00103 00935	2300	Traditional Chinese (non-extended)
00942	01041 00301	01172 00370	2300	Japanese PC Data Mixed
00944	01040 00926	01173 00934	2300	Korean PC Data Mixed
00946	01042 00928	01174 00937	2300	Simplified Chinese PC Data Mixed
00948	01043 00927	01123 00934	2300	Korean PC Data Mixed
01025	01025	01150	1100	Cyrillic Multilingual
01026	01026	01152	1100	Turkey Latin 5 CECP
01027	01027	01172	1100	Japan English (extended range)
01040	01040	01173	2100	Korean Latin PC Data extended
01041	01041	01174	2100	Japanese PC Data extended
01042	01042	01175	2100	Simplified Chinese PC Data extended
01043	01043	01175	2100	Traditional Chinese PC Data extended

Table F-2 (Page 4 of 4). Coded Character Set Identifiers (CCSID)

CCSID	Code Page	Character Set	Encoding (see note)	Description
01046	01046	01177	4100	PC Data - Arabic Extended
01088	01088	01278	2100	Korean PC Data single-byte
04396	00300	00370	1200	Japanese Host DB including 1880
04948	00852	00959	2100	Latin 2 PC Data Multilingual
04951	00855	01150	2100	Cyrillic PC Data Multilingual
04952	00856	00941	2100	Hebrew PC Data
04953	00857	01152	2100	Turkey PC Data Latin 5
04960	00864	00235	2100	Arabic PC Data
04965	00869	00925	2100	Greek PC Data
05026	00290 00300	01172 00370	1301	Japan Katakana (extended range) 1880 UDC
05035	01027 00300	01172 00370	1301	Japan English (extended range) 1880 UDC
28709	00037	01175	1100	Traditional Chinese (extended range).
65534				Look at lower level CCSID.
65535				Special value indicating data is hex and should not be converted. This is the default for the QCCSID system value.

Note: See "Encoding Scheme" on page 1-5 for a discussion of encoding schemes.

Substitution Characters

The following CCSID values use substitution.

Table F-3 (Page 1 of 2). Conversions Where Substitution Can Occur

From CCSID	To CCSID
00037	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 00948, 01027, 01043, 05026, 05035
00256	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00273	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00277	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 05026, 05035
00278	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00280	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00284	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00285	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00290	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00297, 00500, 00833, 00836, 00871, 00897, 00933, 00935, 00937, 00942, 01041
00297	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00300	00301
00301	00300, 04396
00420	04960
00437	00870, 00871, 00880, 01025
00500	00290, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00833	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00290, 00297, 00500, 00836, 00871, 00930, 00935, 00937, 00939, 00944, 01027, 01040, 05026, 05035
00836	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00290, 00297, 00500, 00833, 00871, 00903, 00930, 00933, 00937, 00939, 00946, 01027, 01042, 05026, 05035
00837	00928
00838	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00297, 00500, 00871, 00937
00850	00870, 00880, 01025
00870	00437, 00880, 00915, 01025, 04951
00871	00290, 00437, 00833, 00836, 00838, 00930, 00933, 00935, 00939, 01027, 05026, 05035
00880	00437, 00850, 00870, 00912, 00915, 04948, 04951
00897	01027
00903	00836
00912	00880, 01025
00915	00870, 00880
00930	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00297, 00500, 00833, 00836, 00871, 00933, 00935, 00937, 00942, 01041
00933	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00290, 00297, 00500, 00836, 00871, 00930, 00934, 00935, 00937, 00939, 00944, 01027, 01040, 05026, 05035
00934	00933
00935	00037, 00256, 00277, 00278, 00280, 00284, 00285, 00290, 00297, 00500, 00833, 00871, 00930, 00933, 00936, 00937, 00939, 00946, 01027, 01042, 05026, 05035
00936	00935

Table F-3 (Page 2 of 2). Conversions Where Substitution Can Occur

From CCSID	To CCSID
00937	00290, 00833, 00836, 00930, 00933, 00935, 00938, 00939, 00948, 01027, 01043, 05026, 05035
00938	00937
00939	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00297, 00500, 00833, 00836, 00871, 00933, 00935, 00937, 00942, 01041
00942	00290, 00930, 00939, 01027, 05026, 05035
00944	00833, 00933
00946	00836, 00935
00948	00037, 00937
01025	00437, 00850, 00870, 00912, 04948
01027	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00297, 00500, 00833, 00836, 00871, 00933, 00935, 00937, 00942, 01041
01040	00833, 00933
01041	00290, 00930, 00939, 01027, 05026, 05035
01042	00836, 00935
01043	00037, 00937
04396	00301
04948	00880, 01025
04951	00870, 00880
04960	00420
05026	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00297, 00500, 00833, 00836, 00871, 00933, 00935, 00937, 00942, 01041
05035	00037, 00256, 00273, 00277, 00278, 00280, 00284, 00285, 00297, 00500, 00833, 00836, 00871, 00933, 00935, 00937, 00942, 01041

Associated CCSIDs

The following table shows the associated CCSIDs for a given CCSID value. If a CCSID does not have an associated CCSID value for an encoding scheme, — (not defined) is shown in the table.

Table F-4 (Page 1 of 3). Associated CCSIDs and Encoding Schemes

Input CCSID	1100	1200	1301	2100	2200	2300	4100
00037	00037	00835	00937	000437	—	00948	00819
00256	00256	00835	00937	—	—	00948	00819
00273	00273	—	—	00850	—	—	00819
00277	00277	—	—	00865	—	—	00819
00278	00278	—	—	00850	—	—	00819
00280	00280	—	—	00850	—	—	00819
00284	00284	—	—	00850	—	—	00819
00285	00285	—	—	00850	—	—	00819

Table F-4 (Page 2 of 3). Associated CCSIDs and Encoding Schemes

Input CCSID	1100	1200	1301	2100	2200	2300	4100
00290	00290	04396	05026	01041	00301	00942	—
00297	00297	—	—	00850	—	—	00819
00300	00290	00300	00930	01041	00301	00942	—
00420	00420	—	—	00864	—	—	01046
00423	00423	—	—	00869	—	—	00813
00424	00424	—	—	00862	—	—	00916
00500	00500	—	—	00850	—	—	00819
00833	00833	00834	00933	01040	00926	00944	—
00834	00833	00834	00933	01040	00926	00944	—
00835	28709	00835	00937	01043	00927	00948	—
00836	00836	00837	00935	—	00928	00946	—
00837	00836	00837	00935	01042	00928	00946	—
00838	00838	—	—	00874	—	—	—
00870	00870	—	—	00852	—	—	00912
00871	00871	—	—	—	—	—	00819
00875	00875	—	—	00869	—	—	00813
00891	00833	00834	00933	00891	00926	00934	—
00897	00290	04396	05026	00897	00301	00932	—
00903	00836	00837	00935	00903	00928	00936	—
00904	28209	00835	00937	00904	00927	00938	—
00905	00905	—	—	00857	—	—	00920
00926	00833	00834	00933	01040	00926	00944	—
00927	28209	00835	00937	01043	00927	00948	—
00928	00836	00837	00935	01042	00928	00926	—
00930	00290	00300	00930	01041	00301	00942	—
00932	00290	04396	05026	00897	00301	00932	—
00933	00833	00834	00833	01040	00926	00944	—
00934	00833	00834	00933	00891	00926	00934	—
00935	00836	00837	00935	01042	00928	00946	—
00936	00836	00837	00935	00903	00928	00936	—
00937	28709	00835	00937	01043	00927	00948	—
00938	28709	00835	00937	00904	00927	00938	—
00939	01027	00300	00939	01041	00301	00942	—
00942	00290	04396	05026	01041	00301	00942	—
00944	00833	00834	00933	01040	00926	00944	—
00946	00836	00837	00935	01042	00928	00946	—
00948	28709	00835	00937	01043	00927	00948	—
01025	01025	—	—	00855	—	—	—

Table F-4 (Page 3 of 3). Associated CCSIDs and Encoding Schemes

Input CCSID	1100	1200	1301	2100	2200	2300	4100
01026	01026	—	—	00852	—	—	00290
01027	01027	04396	05035	01041	00301	00942	—
01040	00833	00834	00933	01040	00926	00944	—
01041	00290	04396	05026	01041	00301	00942	—
01042	00836	00837	00935	01042	00928	00946	—
01043	28709	00835	00937	01043	00927	00928	—
04396	00290	04396	05026	01041	00301	00942	—
05026	00290	04396	05026	01041	00301	00942	—
05035	01027	04396	05035	01041	00301	00942	—
28709	28709	00835	00937	01043	00927	00948	—

Appendix G. Language and Country Identifiers

Language and country identifiers are used by the SAA OfficeVision/400 licensed program for text search services and the OS/400 licensed program for sort sequence support. Sort sequence support is for single-byte character set (SBCS) languages only.

Language Identifiers

Following are the language names and corresponding identifiers.

Table G-1 (Page 1 of 2). National Language Identifiers

Language Name	Language ID	Primary Using Country	OS/400 Sort Sequence	OV/400 Text Search Services
Afrikaans (Afrikaans)	AFR	South Africa	Yes	No
Albanian (Shqip)	SQI	Albania	Yes	No
Arabic (Arabi)	ARA	Arab Countries	Yes	No
Byelorussian (Belaruskaja [mova])	BEL	Belarus	Yes	No
Bulgarian (Bulgarski)	BGR	Bulgaria	Yes	No
Catalan (Catala)	CAT	Spain	Yes	Yes
Traditional Chinese (Zhongwen) (SBCS only)	CHT	Republic of China	Yes	No
Simplified Chinese (SBCS only)	CHS	People's Republic of China	Yes	No
Czech (Cesky)	CSY	Czech Republic	Yes	No
Danish (Dansk)	DAN	Denmark	Yes	Yes
German (Deutsch)	DEU	Germany	Yes	Yes
Swiss German (Schweizer-Deutsch)	DES	Switzerland	Yes	Yes
Greek (Ellinika)	ELL	Greece	Yes	Yes
Australian English	ENA	Australia	Yes	Yes
UK English (English)	ENG	United Kingdom	Yes	Yes
US English (English)	ENU	United States	Yes	Yes
English Upper Case	ENP	United States	Yes	Yes
Spanish (Espanol)	ESP	Spain	Yes	Yes
Finnish (Suomi)	FIN	Finland	Yes	Yes
French (Francais)	FRA	France	Yes	Yes
Belgian French	FRB	Belgium	Yes	Yes
Canadian French	FRC	Canada	Yes	Yes
Swiss French (Suisse- francais)	FRS	Switzerland	Yes	Yes
Irish Gaelic (Irish) (Gaeilge)	GAE	Ireland	Yes	No
Hebrew (Ivrit)	HEB	Israel	Yes	No
Croatian (Hrvatski)	HRV	Croatia	Yes	No

Table G-1 (Page 2 of 2). National Language Identifiers

Language Name	Language ID	Primary Using Country	OS/400 Sort Sequence	OV/400 Text Search Services
Hungarian (Magyar)	HUN	Hungary	Yes	No
Icelandic (Islenska)	ISL	Iceland	Yes	Yes
Italian (Italiano)	ITA	Italy	Yes	Yes
Swiss Italian (Italiano svizzero)	ITS	Switzerland	Yes	Yes
Japanese Katakana (Nihongo)	JPN	Japan	Yes (SBCS only)	Yes (SBCS only)
Korean (Choson-o; Hanguk-o)	KOR	Korea, Republic of	Yes (SBCS only)	No
Macedonian (Makednonski)	MKD	Countries of the former Yugoslavia	Yes	No
Dutch (Nederlands)	NLD	Netherlands	Yes	Yes
Belgian Dutch	NLB	Belgium	Yes	Yes
Norwegian - Bokmal (Norsk - Bokmal)	NOR	Norway	Yes	Yes
Norwegian - Nynorsk (Norsk - Nynorsk)	NON	Norway	Yes	Yes
Polish (Polski)	PLK	Poland	Yes	No
Portuguese (Portugues)	PTG	Portugal	Yes	Yes
Brazilian Portuguese	PTB	Brazil	Yes	Yes
Rhaeto-Romanic (Romontsch)	RMS	Switzerland	Yes	No
Romanian (Romana)	ROM	Romania	Yes	No
Russian (Russkij)	RUS	Russia	Yes	No
Slovakian (Slovensky)	SKY	Slovakia	Yes	No
Slovenian (Slovenski)	SLO	Slovenia	Yes	No
Serbian (Latin) (Srpski [Latin])	SRL	Countries of the former Yugoslavia	Yes	No
Serbian (Cyrillic)	SRB	Countries of the former Yugoslavia	Yes	No
Swedish (Svenska)	SVE	Sweden	Yes	Yes
Thai (Thai)	THA	Thailand	Yes	No
Turkish (Turkce)	TRK	Turkey	Yes	Yes

Country Identifiers

Following are the country names and corresponding identifiers.

Table G-2 (Page 1 of 3). Country Identifiers

Country Name	Country ID
Afghanistan	AF
Albania	AL
Algeria	DZ
American Samoa	AS
Andorra	AD
Angola	AO
Anguilla	AI
Antarctica	AQ
Antigua and Barbuda	AG
Argentina	AR
Armenia	AM
Aruba	AW
Australia	AU
Austria	AT
Azerbaijan	AZ
Bahamas	BS
Bahrain	BH
Bangladesh	BD
Barbados	BB
Belarus	BY
Belgium	BE
Belize	BZ
Benin	BJ
Bermuda	BM
Bhutan	BT
Bolivia	BO
Bosnia/Herzegovina	BA
Botswana	BW
Bouvet Island	BV
Brazil	BR
British Indian Ocean Territory	IO
Brunei Darussalam	BN
Bulgaria	BG
Burkina Faso	BF
Burundi	BI
Burma	BU
Cambodia	KH
Cameroon, United Republic of	CM
Canada	CA
Cape Verde	CV
Cayman Islands	KY
Central African Republic	CF
Chad	TD
Chile	CL
China	CN
Christmas Island	CX
Cocos (Keeling) Islands	CC
Colombia	CO
Comoros	KM
Congo	CG
Cook Islands	CK

Table G-2 (Page 1 of 3). Country Identifiers

Country Name	Country ID
Costa Rica	CR
Ivory Coast	CI
Croatia	HR
Cuba	CU
Cyprus	CY
Czech Republic	CS
Denmark	DK
Djibouti	DJ
Dominica	DM
Dominican Republic	DO
East Timor	TP
Ecuador	EC
Egypt	EG
El Salvador	SV
Equatorial Guinea	GQ
Estonia	EE
Ethiopia	ET
Falkland Islands (Malvinas)	FK
Faroe Islands	FO
Fiji	FJ
Finland	FI
France	FR
French Guiana	GF
French Polynesia	PF
French Southern Territories	TF
Gabon	GA
Gambia	GM
Georgia	GE
Germany	DE
Ghana	GH
Gibraltar	GI
Greece	GR
Greenland	GL
Grenada	GD
Guadeloupe	GP
Guam	GU
Guatemala	GT
Guinea	GN
Guinea-Bissau	GW
Guyana	GY
Haiti	HT
Heard and McDonald Islands	HM
Honduras	HN
Hong Kong	HK
Hungary	HU
Iceland	IS
India	IN
Indonesia	ID
Iran (Islamic Republic of)	IR
Iraq	IQ
Ireland	IE
Israel	IL
Italy	IT
Jamaica	JM
Japan	JP

Table G-2 (Page 2 of 3). Country Identifiers

Country Name	Country ID
Jordan	JO
Kazakhstan	KK
Kenya	KE
Kiribati	KI
Korea, Democratic	KP
People's Republic of	
Korea, Republic of	KR
Kuwait	KW
Kyrgyzstan	KG
Lao People's Demo- cratic Republic	LA
Latvia	LV
Lebanon	LB
Lesotho	LS
Liberia	LR
Libyan Arab Jamahiriya	LY
Liechtenstein	LI
Lithuania	LT
Luxembourg	LU
Macau	MO
Macedonia	MK
Madagascar	MG
Malawi	MW
Malaysia	MY
Maldives	MV
Mali	ML
Malta	MT
Marshall Islands	MH
Martinique	MQ
Mauritania	MR
Mauritius	MU
Mexico	MX
Micronesia	FM
Moldava, Republic of	MD
Monaco	MC
Mongolia	MN
Montenegro	ME
Montserrat	MS
Morocco	MA
Mozambique	MZ
Myanmar	MM
Namibia	NA
Nauru	NR
Nepal	NP
Netherlands	NL
Netherlands Antilles	AN
New Caledonia	NC
Neutral Zone	NT
New Zealand	NZ
Nicaragua	NI
Niger	NE
Nigeria	NG
Niue	NU
Norfolk Island	NF
Northern Mariana Islands	MP
Norway	NO
Oman	OM
Pakistan	PK
Palau	PW

Table G-2 (Page 2 of 3). Country Identifiers

Country Name	Country ID
Panama	PA
Papua New Guinea	PG
Paraguay	PY
Peru	PE
Philippines	PH
Pitcairn	PN
Poland	PL
Portugal	PT
Puerto Rico	PR
Qatar	QA
Reunion	RE
Romania	RO
Russia	RU
Rwanda	RW
Saint. Helena	SH
Saint Kitts and Nevis	KN
Saint Lucia	LC
Saint Pierre and Miquelon	PM
Saint Vincent and the Grenadines.	VC
Western Samoa	WS
San Marino	SM
Sao Tome and Principe	ST
Saudi Arabia	SA
Senegal	SN
Seychelles	SC
Sierra Leone	SL
Serbia	SQ
Singapore	SG
Slovenia	SI
Solomon Islands	SB
Somalia	SO
South Africa	ZA
Spain	ES
Sri Lanka	LK
Sudan	SD
Suriname	SR
Svalbard and Jan Mayen Islnds	SJ
Swaziland	SZ
Sweden	SE
Switzerland	CH
Syrian Arab Republic	SY
Taiwan, Province of China	TW
Tajikistan	TJ
Tanzania, United Republic of	TZ
Thailand	TH
Togo	TG
Tokelau	TK
Tonga	TO
Trinidad and Tobago	TT
Tunisia	TN
Turkmenistan	TM
Turkey	TR
Turks and Caicos Islands	TC
Tuvalu	TV

Table G-2 (Page 3 of 3). Country Identifiers

Country Name	Country ID
Uganda	UG
Ukraine	UA
United Arab Emirates	AE
United Kingdom	GB
United States Minor Outlying Islands	UM
United States of America	US
Uruguay	UY
Uzbekistan	UZ
Vanuatu	VU
Vatican City State	VA
Venezuela	VE
Vietnam	VN
Virgin Islands (British)	VG
Virgin Islands (U.S.)	VI
Wallis and Futuna Islands	WF
Western Sahara	EH
Yemen, Republic of	YE
Countries of the former Yugoslavia	YU
Zaire	ZR
Zambia	ZM
Zimbabwe	ZW

Appendix H. Sort Sequence Tables

This appendix contains a list of the sort sequence tables available on the AS/400 system. The following tables show the relative sort sequence weights for characters sorted using the default sort sequence tables shipped with the system.

When looking at these tables, consider the following:

- Several tables shipped with the system represent a single sort sequence, each encoded with a different coded character set identifier (CCSID) value. Not all of the characters in a given sort sequence exist in every CCSID in which the sort sequence is encoded.
- Use the language identifier (LANGID) parameter and the sort sequence (SORTSEQ) parameter to access the unique-weight tables (*LANGIDUNQ) or the shared-weight tables (*LANGIDSHR).
- When using the relative sort sequence, the relative weights shown in these tables differ from the actual weights in the sort sequence table on the system. The relative weights shown in these tables are examples only.
- The relative unique weight of a character is shown by the order of the characters in the table. The relative unique weight is determined by assigning a weight of 1 to the first character in the table and incrementing by 1 for each of the following characters until the end of the table is reached.
- GCGID is the graphic character global identifier.

Table H-1. Tables Shipped with System

Sort Sequence	SBCS CCSIDs	Shared Name	Unique Name
Arabic	00420	QARA01A4S	QARA01A4U
Cyrillic	00880	QCYR0370S	QCYR0370U
Cyrillic	01025	QCYR0401S	QCYR0401U
Danish	00277	QDAN0115S	QDAN0115U
Danish	00500	QDAN01F4S	QDAN01F4U
Greek	00423	QELL01A7S	QELL01A7U
Greek	00875	QELL036BS	QELL036BU
Hebrew	00424	QHEB01A8S	QHEB01A8U
Icelandic	00871	QISL0367S	QISL0367U
Icelandic	00500	QISL01F4S	QISL01F4U
Japanese	00290	QJPN0122S	QJPN0122U
Japanese	01027	QJPN0403S	QJPN0403U
Korean	00833	QU0R0341S	QU0R0341U
Latin 1	00037	QLA10025S	QLA10025U
Latin 1	00256	QLA10100S	QLA10100U
Latin 1	00273	QLA10111S	QLA10111U
Latin 1	00280	QLA10118S	QLA10118U
Latin 1	00284	QLA1011CS	QLA1011CU
Latin 1	00285	QLA1011DS	QLA1011DU
Latin 1	00297	QLA10129S	QLA10129U
Latin 1	00500	QLA101F4S	QLA101F4U
Latin 1	00836	QLA10344S	QLA10344U
Latin 2	00870	QLA20366S	QLA20366U
Norwegian	00277	QNOR0115S	QNOR0115U
Norwegian	00500	QNOR01F4S	QNOR01F4U
Russian	00880	QRUS0370S	QRUS0370U
Russian	01025	QRUS0401S	QRUS0401U
Spanish	00284	QESP011CS	QESP011CU
Spanish	00500	QESP01F4S	QESP01F4U
Swedish/Finnish	00278	QSNF0116S	QSNF0116U
Swedish/Finnish	00500	QSNF01F4S	QSNF01F4U
Thai	00838	QTHA0346S	QTHA0346U
Turkish	00905	QTRK0389S	QTRK0389U
Turkish	01026	QTRK0402S	QTRK0402U

Sort Sequence for Arabic

The Arabic sort sequence table is used with the Arabic language.

Table H-2 (Page 1 of 4). Arabic Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SP320000	(SHY)	3
SP100000	-	4
SP080000	,	5
SP080007	‘	6
SP140000	;	7
SP140007	؛	8
SP130000	:	9
SP020000	!	10
SP150000	?	11
SP150007	؟	12
SP120000	/	13
SP110000	.	14
SD130000	`	15
SD190000	~	16
SP050000	’	17
SP040000	"	18
SP060000	(	19
SP070000	)	20
SM060000	[	21
SM080000	]	22
SM110000	{	23
SM140000	}	24
SM050000	@	25
SC010000	☒	26
SC040000	¢	27
SC030000	\$	28
SM040007	*	29
SM070000	\	30
SM030000	&	31
SM010000	#	32

Table H-2 (Page 1 of 4). Arabic Sort Sequence

GCGID	Character	Shared Weight
SM020007	٪	33
SA010000	+	34
SA060000	÷	35
SA070000	×	36
SA030000	<	37
SA040000	=	38
SA050000	>	39
SM660000	⌋	40
SM130000	|	41
SM650000	!	42
SP300000	(RSP)	43
SP310000	(NSP)	43
SM870000	ل	43
ND100000	0	44
ND100001	.	44
ND010000	1	45
ND010001	١	45
ND020000	2	46
ND020001	٢	46
ND030000	3	47
ND030001	٣	47
ND040000	4	48
ND040001	٤	48
ND050000	5	49
ND050001	٥	49
ND060000	6	50
ND060001	٦	50
ND070000	7	51
ND070001	٧	51
ND080000	8	52
ND080001	٨	52
ND090000	9	53
ND090001	٩	53
LA010000	a	54
LA020000	A	54
LB010000	b	55

Table H-2 (Page 2 of 4). Arabic Sort Sequence

GCGID	Character	Shared Weight
LB020000	B	55
LC010000	c	56
LC020000	C	56
LD010000	d	57
LD020000	D	57
LE010000	e	58
LE020000	E	58
LF010000	f	59
LF020000	F	59
LG010000	g	60
LG020000	G	60
LH010000	h	61
LH020000	H	61
LI010000	i	62
LI020000	I	62
LJ010000	j	63
LJ020000	J	63
LK010000	k	64
LK020000	K	64
LL010000	l	65
LL020000	L	65
LM010000	m	66
LM020000	M	66
LN010000	n	67
LN020000	N	67
LO010000	o	68
LO020000	O	68
LP010000	p	69
LP020000	P	69
LQ010000	q	70
LQ020000	Q	70
LR010000	r	71
LR020000	R	71
LS010000	s	72
LS020000	S	72
LT010000	t	73

Table H-2 (Page 2 of 4). Arabic Sort Sequence

GCGID	Character	Shared Weight
LT020000	T	73
LU010000	u	74
LU020000	U	74
LV010000	v	75
LV020000	V	75
LW010000	w	76
LW020000	W	76
LX010000	x	77
LX020000	X	77
LY010000	y	78
LY020000	Y	78
LZ010000	z	79
LZ020000	Z	79
AX300000	ء	80
AA210000	آ	80
AA210001	أ	80
AA210002	إ	80
AA210006	آ	80
AA310000	أ	80
AA310001	إ	80
AA310002	أ	80
AA310006	إ	80
AW310000	ؤ	80
AA310401	أ	80
AA310406	أ	80
AY310001	ع	80
AY310000	ع	80
AA010000	ا	81
AA010001	ا	81
AA010002	ا	81
AA010006	ا	81
AB010000	ب	82
AB010003	ب	82
AT020000	ة	83
AT010000	ت	83
AT010003	ت	83

Table H-2 (Page 3 of 4). Arabic Sort Sequence

GCGID	Character	Shared Weight
AT470000	ث	84
AT470003	ث	84
AG230000	ج	85
AG230003	ج	85
AH450000	ح	86
AH450003	ح	86
AH470000	خ	87
AH470003	خ	87
AD010000	د	88
AD470000	ذ	89
AR010000	ر	90
AZ010000	ز	91
AS010006	س	92
AS010000	س	92
AS010003	س	92
AS230006	ش	93
AS230000	ش	93
AS230003	ش	93
AS450006	ص	94
AS450000	ص	94
AS450003	ص	94
AD450006	ض	95
AD450000	ض	95
AD450003	ض	95
AT450000	ط	96
AZ450000	ظ	97
AC470000	ع	98
AC470002	ع	98
AC470003	ع	98
AC470004	ع	98
AG310000	غ	99
AG310002	غ	99
AG310003	غ	99
AG310004	غ	99
AF010000	فا	100
AF010003	ف	100

Table H-2 (Page 3 of 4). Arabic Sort Sequence

GCGID	Character	Shared Weight
AQ010000	ق	101
AQ010003	ق	101
AK010000	ك	102
AK010003	ك	102
AL010000	ل	103
AL010003	ل	103
AL220000	لا	104
AL220003	لا	104
AL320000	لا	104
AL320003	لا	104
AL020000	لا	104
AL020003	لا	104
AM010000	م	105
AM010003	م	105
AN010000	ن	106
AN010003	ن	106
AH010000	ه	107
AH010003	ه	107
AH010007	ه	107
AH010004	ه	107
AW010000	و	108
AA020000	ى	109
AA020001	ى	109
AA020002	ى	109
AY010000	ي	109
AY010001	ي	109
AY010002	ي	109
AY010003	ي	109
AA070000	ء	110
AU070000	ء	111
AI070000	ء	112
AA050000	ا	113
AA050004	ا	113
AU050000	ا	114
AU050004	ا	114
AI050000	ا	115

Table H-2 (Page 4 of 4). Arabic Sort Sequence

GCGID	Character	Shared Weight
AI050004	ـ	115
AE050000	•	116
AE050004	◌◌	116
AX100000	◌◌◌	117
AX100004	◌◌◌◌	117
SM860000	◌◌◌◌◌	118

Sort Sequence for Cyrillic

The Cyrillic sort sequence table is used with the following languages: Albanian, Byelorussian, Bulgarian, Macedonian, and Serbian Cyrillic.

Table H-3 (Page 1 of 3). Cyrillic Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SP320000	(SHY)	3
SP100000	-	4
SP080000	,	5
SP140000	;	6
SP130000	:	7
SP020000	!	8
SP150000	?	9
SP120000	/	10
SP110000	.	11
SD130000	`	12
SD150000	^	13
SD190000	~	14
SP050000	'	15
SP040000	"	16
SP060000	(	17
SP070000	)	18
SM060000	[	19
SM080000	]	20
SM110000	{	21
SM140000	}	22
SM240000	§	23
SM050000	@	24
SC010000	☒	25
SC030000	\$	26
SM040000	*	27
SM070000	\	28
SM030000	&	29
SM000000	N ^o	30
SM010000	#	31

Table H-3 (Page 1 of 3). Cyrillic Sort Sequence

GCGID	Character	Shared Weight
SM020000	%	32
SA010000	+	33
SA030000	<	34
SA040000	=	35
SA050000	>	36
SM130000	|	37
SP300000	(RSP)	38
ND100000	0	39
ND010000	1	40
ND020000	2	41
ND030000	3	42
ND040000	4	43
ND050000	5	44
ND060000	6	45
ND070000	7	46
ND080000	8	47
ND090000	9	48
LA010000	a	49
LA020000	A	49
LB010000	b	50
LB020000	B	50
LC010000	c	51
LC020000	C	51
LD010000	d	52
LD020000	D	52
LE010000	e	53
LE020000	E	53
LF010000	f	54
LF020000	F	54
LG010000	g	55
LG020000	G	55
LH010000	h	56
LH020000	H	56
LI010000	i	57
LI020000	I	57
LJ010000	j	58

Table H-3 (Page 2 of 3). Cyrillic
Sort Sequence

GCGID	Character	Shared Weight
LJ020000	J	58
LK010000	k	59
LK020000	K	59
LL010000	l	60
LL020000	L	60
LM010000	m	61
LM020000	M	61
LN010000	n	62
LN020000	N	62
LO010000	o	63
LO020000	O	63
LP010000	p	64
LP020000	P	64
LQ010000	q	65
LQ020000	Q	65
LR010000	r	66
LR020000	R	66
LS010000	s	67
LS020000	S	67
LT010000	t	68
LT020000	T	68
LU010000	u	69
LU020000	U	69
LV010000	v	70
LV020000	V	70
LW010000	w	71
LW020000	W	71
LX010000	x	72
LX020000	X	72
LY010000	y	73
LY020000	Y	73
LZ010000	z	74
LZ020000	Z	74
KA010000	a	75
KA020000	A	75
KB010000	б	76

Table H-3 (Page 2 of 3). Cyrillic
Sort Sequence

GCGID	Character	Shared Weight
KB020000	Б	76
KV010000	в	77
KV020000	В	77
KG010000	г	78
KG020000	Г	78
KD010000	д	79
KD020000	Д	79
KG110000	ѓ	80
KG120000	Ѓ	80
KD610000	ђ	81
KD620000	Ђ	81
KE010000	e	82
KE020000	E	82
KE150000	е	83
KE160000	Е	83
KE170000	ë	84
KE180000	Ё	84
KZ210000	ж	85
KZ220000	Ж	85
KZ010000	з	86
KZ020000	З	86
KZ150000	s	87
KZ160000	S	87
KI010000	и	88
KI020000	И	88
KI110000	i	89
KI120000	I	89
KI170000	ï	90
KI180000	Ї	90
KJ110000	й	91
KJ120000	Й	91
KJ010000	j	92
KJ020000	J	92
KK010000	к	93
KK020000	К	93
KL010000	л	94

Table H-3 (Page 3 of 3). Cyrillic Sort Sequence

GCGID	Character	Shared Weight
KL020000	Л	94
KL410000	ль	95
KL420000	Ль	95
KM010000	М	96
KM020000	М	96
KN010000	Н	97
KN020000	Н	97
KN110000	нь	98
KN120000	Нь	98
KO010000	о	99
KO020000	О	99
KP010000	п	100
KP020000	П	100
KR010000	р	101
KR020000	Р	101
KS010000	с	102
KS020000	С	102
KT010000	т	103
KT020000	Т	103
KK110000	ќ	104
KK120000	Ќ	104
KC110000	ћ	105
KC120000	Ћ	105
KU010000	у	106
KU020000	У	106
KU230000	ў	107
KU240000	Ў	107
KF010000	ф	108
KF020000	Ф	108
KH010000	х	109
KH020000	Х	109
KC010000	ц	110
KC020000	Ц	110
KC210000	ч	111
KC220000	Ч	111
KG210000	ц	112

Table H-3 (Page 3 of 3). Cyrillic Sort Sequence

GCGID	Character	Shared Weight
KG220000	Ц	112
KS210000	ш	113
KS220000	Ш	113
KS150000	щ	114
KS160000	Щ	114
KU210000	ъ	115
KU220000	Ъ	115
KY010000	ы	116
KY020000	Ы	116
KX110000	ь	117
KX120000	Ь	117
KE130000	э	118
KE140000	Э	118
KU150000	ю	119
KU160000	Ю	119
KA150000	я	120
KA160000	Я	120

Sort Sequence for Danish

The Danish sort sequence table is used with the Danish language.

Table H-4 (Page 1 of 4). Danish Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	-	3
SP320000	(SHY)	4
SP100000	-	5
SP080000	,	6
SP140000	;	7
SP130000	:	8
SP020000	!	9
SP030000	i	10
SP150000	?	11
SP160000	¿	12
SP120000	/	13
SP110000	.	14
SD110000	'	15
SD130000	`	16
SD150000	^	17
SD170000	¨	18
SD190000	~	19
SD630000	•	20
SD410000	ˆ	21
SP050000	†	22
SP040000	”	23
SP170000	«	24
SP180000	»	25

Table H-4 (Page 1 of 4). Danish Sort Sequence

GCGID	Character	Shared Weight
SP060000	(	26
SP070000	)	27
SM060000	[	28
SM080000	]	29
SM110000	{	30
SM140000	}	31
SM240000	§	32
SM250000	¶	33
SM520000	©	34
SM530000	®	35
SM050000	@	36
SC010000	¤	37
SC040000	¢	38
SC030000	\$	39
SC020000	£	40
SC050000	¥	41
SM040000	*	42
SM070000	\	43
SM030000	&	44
SM010000	#	45
SM020000	%	46
SA010000	+	47
SA020000	±	48
SA060000	÷	49
SA070000	×	50
SA030000	<	51
SA040000	=	52
SA050000	>	53

Table H-4 (Page 2 of 4). Danish Sort Sequence

GCGID	Character	Shared Weight
SM660000	⌈	54
SM130000	|	55
SM650000	ı	56
SM190000	°	57
SM170000	μ	58
SP300000	(RSP)	59
ND100000	0	60
NF040000	¼	60
NF010000	½	60
NF050000	¾	60
ND010000	1	61
ND011000	1	61
ND020000	2	62
ND021000	2	62
ND030000	3	63
ND031000	3	63
ND040000	4	64
ND050000	5	65
ND060000	6	66
ND070000	7	67
ND080000	8	68
ND090000	9	69
LA010000	a	70
LA020000	A	70
SM210000	ª	70
LA110000	á	70
LA120000	Á	70
LA130000	à	70

Table H-4 (Page 2 of 4). Danish Sort Sequence

GCGID	Character	Shared Weight
LA140000	À	70
LA150000	â	70
LA160000	Â	70
LA190000	ã	70
LA200000	Ã	70
LB010000	b	71
LB020000	B	71
LC010000	c	72
LC020000	C	72
LC410000	ç	72
LC420000	Ç	72
LD010000	d	73
LD020000	D	73
LD630000	ð	73
LD620000	Ð	73
LE010000	e	74
LE020000	E	74
LE110000	é	74
LE120000	É	74
LE130000	è	74
LE140000	È	74
LE150000	ê	74
LE160000	Ê	74
LE170000	ë	74
LE180000	Ë	74
LF010000	f	75
LF020000	F	75
LG010000	g	76

Table H-4 (Page 3 of 4). Danish Sort Sequence

GCGID	Character	Shared Weight
LG020000	G	76
LH010000	h	77
LH020000	H	77
LI010000	i	78
LI020000	I	78
LI110000	í	78
LI120000	Í	78
LI130000	ì	78
LI140000	Ì	78
LI150000	î	78
LI160000	Î	78
LI170000	ï	78
LI180000	Ï	78
LJ010000	j	79
LJ020000	J	79
LK010000	k	80
LK020000	K	80
LL010000	l	81
LL020000	L	81
LM010000	m	82
LM020000	M	82
LN010000	n	83
LN020000	N	83
LN190000	ñ	83
LN200000	Ñ	83
LO010000	o	84
LO020000	O	84
SM200000	ø	84

Table H-4 (Page 3 of 4). Danish Sort Sequence

GCGID	Character	Shared Weight
LO110000	ó	84
LO120000	Ó	84
LO130000	ò	84
LO140000	Ò	84
LO150000	ô	84
LO160000	Ô	84
LO190000	õ	84
LO200000	Õ	84
LP010000	p	85
LP020000	P	85
LQ010000	q	86
LQ020000	Q	86
LR010000	r	87
LR020000	R	87
LS010000	s	88
LS020000	S	88
LS610000	ß	88
LT010000	t	89
LT020000	T	89
LT630000	þ	89
LT640000	Ð	89
LU010000	u	90
LU020000	U	90
LU110000	ú	90
LU120000	Ú	90
LU130000	ù	90
LU140000	Û	90
LU150000	û	90

Table H-4 (Page 4 of 4). Danish Sort Sequence

GCGID	Character	Shared Weight
LU160000	Û	90
LV010000	v	91
LV020000	V	91
LW010000	w	92
LW020000	W	92
LX010000	x	93
LX020000	X	93
LY010000	y	94
LY020000	Y	94
LY110000	ý	94
LY120000	Ý	94
LY170000	ÿ	94
LU170000	ü	94
LU180000	Ü	94
LZ010000	z	95
LZ020000	Z	95
LA510000	æ	96
LA520000	Æ	96
LA170000	ä	96
LA180000	Ä	96
LO610000	ø	97
LO620000	Ø	97
LO170000	ö	97
LO180000	Ö	97
LA270000	å	98
LA280000	Å	98

Sort Sequence for Greek

The Greek sort sequence table is used with the Greek language.

Table H-5 (Page 1 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SP320000	(SĪY)	3
SP100000	-	4
SM120000	—	5
SP080000	,	6
SP140000	;	7
SP130000	:	8
SP020000	!	9
SP150000	?	10
SP120000	/	11
SP110000	.	12
SD110000	'	13
SD130000	`	14
SD150000	^	15
SD170000	¨	16
SD730000	ˆ	17
SD190000	~	18
SD630000	•	19
SD410000	˙	20
SP050000	˘	21
SP190000	˘	22
SP200000	˘	23
SP040000	"	24
SP170000	«	25

Table H-5 (Page 1 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
SP180000	»	26
SP060000	(	27
SP070000	)	28
SM060000	[	29
SM080000	]	30
SM110000	{	31
SM140000	}	32
SM240000	§	33
SM520000	©	34
SM050000	@	35
SC030000	\$	36
SC020000	£	37
SM040000	*	38
SM070000	\	39
SM030000	&	40
SM010000	#	41
SM020000	%	42
SA010000	+	43
SA020000	±	44
SA030000	<	45
SA040000	=	46
SA050000	>	47
SM660000	∩	48
SM130000	|	49
SM650000	!|	50
SM190000	°	51
SP300000	(RSP)	52
ND100000	0	53

Table H-5 (Page 2 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
NF010000	½	53
ND010000	1	54
ND020000	2	55
ND021000	²	55
ND030000	3	56
ND031000	³	56
ND040000	4	57
ND050000	5	58
ND060000	6	59
ND070000	7	60
ND080000	8	61
ND090000	9	62
GA020000	Α	63
GA010000	α	63
GA120000	Ά	63
GA110000	ά	63
GB020000	Β	64
GB010000	β	64
GG020000	Γ	65
GG010000	γ	65
GD020000	Δ	66
GD010000	δ	66
GE020000	Ε	67
GE010000	ε	67
GE120000	Έ	67
GE110000	έ	67
GZ020000	Ζ	68
GZ010000	ζ	68

Table H-5 (Page 2 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
GE320000	Η	69
GE310000	η	69
GE720000	Ή	69
GE710000	ή	69
GT620000	Θ	70
GT610000	θ	70
GI020000	Ι	71
GI010000	ι	71
GI120000	Ϊ	71
GI110000	ί	71
GI180000	Ϊ̂	71
GI170000	ϊ	71
GI730000	ΐ	71
GK020000	Κ	72
GK010000	κ	72
GL020000	Λ	73
GL010000	λ	73
GM020000	Μ	74
GM010000	μ	74
GN020000	Ν	75
GN010000	ν	75
GX020000	Ξ	76
GX010000	ξ	76
GO020000	Ο	77
GO010000	ο	77
GO120000	Ό	77
GO110000	ό	77
GP020000	Π	78

Table H-5 (Page 3 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
GP010000	π	78
GR020000	Ρ	79
GR010000	ρ	79
GS020000	Σ	80
GS010000	σ	80
GS610000	ς	80
GT020000	Τ	81
GT010000	τ	81
GU020000	Υ	82
GU010000	υ	82
GU120000	Ϛ	82
GU110000	ύ	82
GU180000	Ϛ̈	82
GU170000	Ϛ̄	82
GU730000	Ϛ̇	82
GF020000	Φ	83
GF010000	φ	83
GH020000	Χ	84
GH010000	χ	84
GP620000	Ψ	85
GP610000	ψ	85
GO320000	Ω	86
GO310000	ω	86
GO720000	Ϡ	86
GO710000	ώ	86
LA020000	Α	87
LA010000	α	87
LA130000	ὰ	87

Table H-5 (Page 3 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
LA150000	â	87
LA170000	ä	87
LA180000	Ä	87
LB020000	Β	88
LB010000	b	88
LC020000	С	89
LC010000	c	89
LC410000	ç	89
LC420000	Ç	89
LD020000	Д	90
LD010000	d	90
LE020000	Е	91
LE010000	e	91
LE110000	é	91
LE130000	è	91
LE150000	ê	91
LE170000	ë	91
LF020000	F	92
LF010000	f	92
LG020000	G	93
LG010000	g	93
LH020000	H	94
LH010000	h	94
LI020000	I	95
LI010000	i	95
LI150000	î	95
LI170000	ï	95
LJ020000	J	96

Table H-5 (Page 4 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
LJ010000	j	96
LK020000	K	97
LK010000	k	97
LL020000	L	98
LL010000	l	98
LM020000	M	99
LM010000	m	99
LN020000	N	100
LN010000	n	100
LO020000	O	101
LO010000	o	101
LO150000	ô	101
LO170000	ö	101
LO180000	Ö	101
LP020000	P	102
LP010000	p	102
LQ020000	Q	103
LQ010000	q	103
LR020000	R	104
LR010000	r	104
LS020000	S	105
LS010000	s	105
LT020000	T	106
LT010000	t	106
LU020000	U	107
LU010000	u	107
LU130000	ù	107
LU150000	û	107

Table H-5 (Page 4 of 4). Greek Sort Sequence

GCGID	Character	Shared Weight
LU170000	ü	107
LU180000	Ü	107
LV020000	V	108
LV010000	v	108
LW020000	W	109
LW010000	w	109
LX020000	X	110
LX010000	x	110
LY020000	Y	111
LY010000	y	111
LY170000	ÿ	111
LZ020000	Z	112
LZ010000	z	112

Sort Sequence for Hebrew

The Hebrew sort sequence table is used with the Hebrew language.

Table H-6 (Page 1 of 3). Hebrew Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM100000	==	3
SM150000	-	4
SP320000	(SHY)	5
SP100000	-	6
SP080000	,	7
SP140000	;	8
SP130000	:	9
SP020000	!	10
SP150000	?	11
SP120000	/	12
SP110000	.	13
SD110000	'	14
SD130000	`	15
SD150000	^	16
SD170000	..	17
SD190000	~	18
SD410000	׃	19
SP050000	׳	20
SP040000	"	21
SP170000	«	22
SP180000	»	23
SP060000	(	24
SP070000	)	25

Table H-6 (Page 1 of 3). Hebrew Sort Sequence

GCGID	Character	Shared Weight
SM060000	[	26
SM080000	]	27
SM110000	{	28
SM140000	}	29
SM570000	•	30
SM240000	§	31
SM250000	¶	32
SM520000	©	33
SM530000	®	34
SM050000	@	35
SC010000	⌘	36
SC040000	¢	37
SC030000	\$	38
SC020000	£	39
SC050000	¥	40
SM040000	*	41
SM070000	\	42
SM030000	&	43
SM010000	#	44
SM020000	%	45
SA010000	+	46
SA020000	±	47
SA060000	÷	48
SA070000	×	49
SA030000	<	50
SA040000	=	51
SA050000	>	52
SM660000	⌌	53

Table H-6 (Page 2 of 3). Hebrew Sort Sequence

GCGID	Character	Shared Weight
SM130000		54
SM650000	י	55
SM190000	°	56
SM170000	μ	57
SP300000	(RSP)	58
ND100000	0	59
NF040000	¼	59
NF010000	½	59
NF050000	¾	59
ND010000	1	60
ND011000	1	60
ND020000	2	61
ND021000	2	61
ND030000	3	62
ND031000	3	62
ND040000	4	63
ND050000	5	64
ND060000	6	65
ND070000	7	66
ND080000	8	67
ND090000	9	68
LA010000	a	69
LA020000	A	69
LB010000	b	70
LB020000	B	70
LC010000	c	71
LC020000	C	71
LD010000	d	72

Table H-6 (Page 2 of 3). Hebrew Sort Sequence

GCGID	Character	Shared Weight
LD020000	D	72
LE010000	e	73
LE020000	E	73
LF010000	f	74
LF020000	F	74
LG010000	g	75
LG020000	G	75
LH010000	h	76
LH020000	H	76
LI010000	i	77
LI020000	I	77
LJ010000	j	78
LJ020000	J	78
LK010000	k	79
LK020000	K	79
LL010000	l	80
LL020000	L	80
LM010000	m	81
LM020000	M	81
LN010000	n	82
LN020000	N	82
LO010000	o	83
LO020000	O	83
LP010000	p	84
LP020000	P	84
LQ010000	q	85
LQ020000	Q	85
LR010000	r	86

Table H-6 (Page 3 of 3). Hebrew Sort Sequence

GCGID	Character	Shared Weight
LR020000	R	86
LS010000	s	87
LS020000	S	87
LT010000	t	88
LT020000	T	88
LU010000	u	89
LU020000	U	89
LV010000	v	90
LV020000	V	90
LW010000	w	91
LW020000	W	91
LX010000	x	92
LX020000	X	92
LY010000	y	93
LY020000	Y	93
LZ010000	z	94
LZ020000	Z	94
HX330000	א	95
HB010000	ב	96
HG010000	ג	97
HD010000	ד	98
HH010000	ה	99
HW010000	ו	100
HZ010000	ז	101
HH450000	ח	102
HT450000	ט	103
HY010000	י	104
HK610000	ך	105

Table H-6 (Page 3 of 3). Hebrew Sort Sequence

GCGID	Character	Shared Weight
HK010000	כ	106
HL010000	ל	107
HM610000	ם	108
HM010000	מ	109
HN610000	ן	110
HN010000	נ	111
HS010000	ס	112
HX350000	ע	113
HP610000	ף	114
HP010000	פ	115
HS610000	ץ	116
HS450000	צ	117
HQ010000	ק	118
HR010000	ר	119
HS210000	ש	120
HT010000	ת	121

Sort Sequence for Icelandic

The Icelandic sort sequence table is used with the Icelandic language.

Table H-7 (Page 1 of 4). Icelandic Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	-	3
SP320000	(SHY)	4
SP100000	-	5
SP080000	,	6
SP140000	;	7
SP130000	:	8
SP020000	!	9
SP030000	¡	10
SP150000	?	11
SP160000	¿	12
SP120000	/	13
SP110000	.	14
SD110000	'	15
SD130000	`	16
SD150000	^	17
SD170000	¨	18
SD190000	~	19
SD630000	•	20
SD410000	•	21
SP050000	’	22
SP040000	”	23
SP170000	«	24
SP180000	»	25

Table H-7 (Page 1 of 4). Icelandic Sort Sequence

GCGID	Character	Shared Weight
SP060000	(	26
SP070000	)	27
SM060000	[	28
SM080000	]	29
SM110000	{	30
SM140000	}	31
SM240000	§	32
SM250000	¶	33
SM520000	©	34
SM530000	®	35
SM050000	@	36
SC010000	⌘	37
SC040000	¢	38
SC030000	\$	39
SC020000	£	40
SC050000	¥	41
SM040000	*	42
SM070000	\	43
SM030000	&	44
SM010000	#	45
SM020000	%	46
SA010000	+	47
SA020000	±	48
SA060000	÷	49
SA070000	×	50
SA030000	<	51
SA040000	=	52
SA050000	>	53

Table H-7 (Page 2 of 4). Icelandic Sort Sequence

GCGID	Character	Shared Weight
SM660000	Ƿ	54
SM130000	|	55
SM650000	ǀ	56
SM190000	°	57
SM170000	μ	58
SP300000	(RSP)	59
ND100000	0	60
NF040000	¼	60
NF010000	½	60
NF050000	¾	60
ND010000	1	61
ND011000	¹	61
ND020000	2	62
ND021000	²	62
ND030000	3	63
ND031000	³	63
ND040000	4	64
ND050000	5	65
ND060000	6	66
ND070000	7	67
ND080000	8	68
ND090000	9	69
LA010000	a	70
LA020000	Á	70
SM210000	ª	70
LA130000	à	70
LA140000	À	70
LA150000	â	70

Table H-7 (Page 2 of 4). Icelandic Sort Sequence

GCGID	Character	Shared Weight
LA160000	Â	70
LA270000	å	70
LA280000	Å	70
LA170000	ä	70
LA180000	Ä	70
LA190000	ã	70
LA200000	Ã	70
LA110000	á	71
LA120000	Á	71
LB010000	b	72
LB020000	B	72
LC010000	c	73
LC020000	C	73
LC410000	ç	73
LC420000	Ç	73
LD010000	d	74
LD020000	D	74
LD630000	ð	75
LD620000	Ð	75
LE010000	e	76
LE020000	E	76
LE130000	è	76
LE140000	È	76
LE150000	ê	76
LE160000	Ê	76
LE170000	ë	76
LE180000	Ë	76
LE110000	é	77

Table H-7 (Page 3 of 4). Icelandic Sort Sequence

GCGID	Character	Shared Weight
LE120000	É	77
LF010000	f	78
LF020000	F	78
LG010000	g	79
LG020000	G	79
LH010000	h	80
LH020000	H	80
LI010000	i	81
LI020000	I	81
LI130000	ì	81
LI140000	Ì	81
LI150000	î	81
LI160000	Î	81
LI170000	ï	81
LI180000	Ï	81
LI110000	í	82
LI120000	Í	82
LJ010000	j	83
LJ020000	J	83
LK010000	k	84
LK020000	K	84
LL010000	l	85
LL020000	L	85
LM010000	m	86
LM020000	M	86
LN010000	n	87
LN020000	N	87
LN190000	ñ	87

Table H-7 (Page 3 of 4). Icelandic Sort Sequence

GCGID	Character	Shared Weight
LN200000	Ñ	87
LO010000	o	88
LO020000	O	88
SM200000	º	88
LO130000	ò	88
LO140000	Ò	88
LO150000	ô	88
LO160000	Ô	88
LO190000	õ	88
LO200000	Õ	88
LO110000	ó	89
LO120000	Ó	89
LP010000	p	90
LP020000	P	90
LQ010000	q	91
LQ020000	Q	91
LR010000	r	92
LR020000	R	92
LS010000	s	93
LS020000	S	93
LS610000	ß	93
LT010000	t	94
LT020000	T	94
LU010000	u	95
LU020000	U	95
LU130000	ù	95
LU140000	Û	95
LU150000	û	95

Table H-7 (Page 4 of 4). Icelandic Sort Sequence

GCGID	Character	Shared Weight
LU160000	Û	95
LU170000	ü	95
LU180000	Û	95
LU110000	ú	96
LU120000	Ú	96
LV010000	v	97
LV020000	V	97
LW010000	w	98
LW020000	W	98
LX010000	x	99
LX020000	X	99
LY010000	y	100
LY020000	Y	100
LY170000	ÿ	100
LY110000	ý	101
LY120000	Ý	101
LZ010000	z	102
LZ020000	Z	102
LT630000	þ	103
LT640000	Þ	103
LA510000	æ	104
LA520000	Æ	104
LO170000	ö	105
LO180000	Ö	105
LO610000	ø	105
LO620000	Ø	105

Sort Sequence for Japanese

The Japanese sort sequence table is used for the SBCS Japanese Katakana language.

Table H-8 (Page 1 of 3). Japanese Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	-	3
SP100000	-	4
SP080000	,	5
SP140000	;	6
SP130000	:	7
SP020000	!	8
SP150000	?	9
SP120000	/	10
SP110000	.	11
SD130000	,	12
SD150000	^	13
SD190000	~	14
SP050000	'	15
SP040000	"	16
SP060000	(	17
SP070000	)	18
SM060000	[	19
SM080000	]	20
SM110000	{	21
SM140000	}	22
SM050000	@	23
SC040000	¢	24
SC030000	\$	25
SC020000	£	26
SC050000	¥	27
SM040000	*	28

Table H-8 (Page 1 of 3). Japanese Sort Sequence

GCGID	Character	Shared Weight
SM070000	\	29
SM030000	&	30
SM010000	#	31
SM020000	%	32
SA010000	+	33
SA030000	<	34
SA040000	=	35
SA050000	>	36
SM660000	∟	37
SM130000	|	38
ND100000	0	39
ND010000	1	40
ND020000	2	41
ND030000	3	42
ND040000	4	43
ND050000	5	44
ND060000	6	45
ND070000	7	46
ND080000	8	47
ND090000	9	48
LA010000	a	49
LA020000	A	49
LB010000	b	50
LB020000	B	50
LC010000	c	51
LC020000	C	51
LD010000	d	52
LD020000	D	52
LE010000	e	53
LE020000	E	53
LF010000	f	54
LF020000	F	54
LG010000	g	55
LG020000	G	55
LH010000	h	56
LH020000	H	56

Table H-8 (Page 2 of 3). Japanese Sort Sequence

GCGID	Character	Shared Weight
LI010000	i	57
LI020000	I	57
LJ010000	j	58
LJ020000	J	58
LK010000	k	59
LK020000	K	59
LL010000	l	60
LL020000	L	60
LM010000	m	61
LM020000	M	61
LN010000	n	62
LN020000	N	62
LO010000	o	63
LO020000	O	63
LP010000	p	64
LP020000	P	64
LQ010000	q	65
LQ020000	Q	65
LR010000	r	66
LR020000	R	66
LS010000	s	67
LS020000	S	67
LT010000	t	68
LT020000	T	68
LU010000	u	69
LU020000	U	69
LV010000	v	70
LV020000	V	70
LW010000	w	71
LW020000	W	71
LX010000	x	72
LX020000	X	72
LY010000	y	73
LY020000	Y	73
LZ010000	z	74
LZ020000	Z	74

Table H-8 (Page 2 of 3). Japanese Sort Sequence

GCGID	Character	Shared Weight
JQ700000	。	75
JQ710000	「	76
JQ720000	」	77
JQ730000	、	78
JQ740000	・	79
JX700000	ー	80
JA000000	ア	81
JA010000	ア	81
JI000000	イ	82
JI010000	イ	82
JU000000	ウ	83
JU010000	ウ	83
JE000000	エ	84
JE010000	エ	84
JO000000	オ	85
JO010000	オ	85
JK100000	カ	86
JK200000	キ	87
JK300000	ク	88
JK400000	ケ	89
JK500000	コ	90
JS100000	サ	91
JS200000	シ	92
JS300000	ス	93
JS400000	セ	94
JS500000	ソ	95
JT100000	タ	96
JT200000	チ	97
JT300000	ツ	98
JT310000	ッ	98
JT400000	テ	99
JT500000	ト	100
JN100000	ナ	101
JN200000	ニ	102
JN300000	ヌ	103
JN400000	ネ	104

Table H-8 (Page 3 of 3). Japanese
Sort Sequence

GCGID	Character	Shared Weight
JN500000	ノ	105
JH100000	ハ	106
JH200000	ヒ	107
JH300000	フ	108
JH400000	ヘ	109
JH500000	ホ	110
JM100000	マ	111
JM200000	ミ	112
JM300000	ム	113
JM400000	メ	114
JM500000	モ	115
JY100000	ヤ	116
JY110000	ャ	116
JY300000	ユ	117
JY310000	ュ	117
JY500000	ヨ	118
JY510000	ョ	118
JR100000	ラ	119
JR200000	リ	120
JR300000	ル	121
JR400000	レ	122
JR500000	ロ	123
JW100000	ワ	124
JW500000	ヲ	125
JN000000	ン	126
JX710000	・	127
JX720000	。	128

Sort Sequence for Korean

The Korean sort sequence table is used with the Korean language.

Table H-9 (Page 1 of 3). Korean Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	-	3
SP100000	-	4
SP080000	,	5
SP140000	;	6
SP130000	:	7
SP020000	!	8
SP150000	?	9
SP120000	/	10
SP110000	.	11
SD130000	`	12
SD150000	^	13
SD190000	~	14
SP050000	'	15
SP040000	"	16
SP060000	(	17
SP070000	)	18
SM060000	[	19
SM080000	]	20
SM110000	{	21
SM140000	}	22
SM050000	@	23
SC040000	¢	24
SC030000	\$	25

Table H-9 (Page 1 of 3). Korean Sort Sequence

GCGID	Character	Shared Weight
SC140000	₩	26
SM040000	*	27
SM070000	\	28
SM030000	&	29
SM010000	#	30
SM020000	%	31
SA010000	+	32
SA030000	<	33
SA040000	=	34
SA050000	>	35
SM660000	⌋	36
SM130000	|	37
SM650000	!	38
ND100000	0	39
ND010000	1	40
ND020000	2	41
ND030000	3	42
ND040000	4	43
ND050000	5	44
ND060000	6	45
ND070000	7	46
ND080000	8	47
ND090000	9	48
LA010000	a	49
LA020000	A	49
LB010000	b	50
LB020000	B	50
LC010000	c	51

Table H-9 (Page 2 of 3). Korean Sort Sequence

GCGID	Character	Shared Weight
LC020000	C	51
LD010000	d	52
LD020000	D	52
LE010000	e	53
LE020000	E	53
LF010000	f	54
LF020000	F	54
LG010000	g	55
LG020000	G	55
LH010000	h	56
LH020000	H	56
LI010000	i	57
LI020000	I	57
LJ010000	j	58
LJ020000	J	58
LK010000	k	59
LK020000	K	59
LL010000	l	60
LL020000	L	60
LM010000	m	61
LM020000	M	61
LN010000	n	62
LN020000	N	62
LO010000	o	63
LO020000	O	63
LP010000	p	64
LP020000	P	64
LQ010000	q	65

Table H-9 (Page 2 of 3). Korean Sort Sequence

GCGID	Character	Shared Weight
LQ020000	Q	65
LR010000	r	66
LR020000	R	66
LS010000	s	67
LS020000	S	67
LT010000	t	68
LT020000	T	68
LU010000	u	69
LU020000	U	69
LV010000	v	70
LV020000	V	70
LW010000	w	71
LW020000	W	71
LX010000	x	72
LX020000	X	72
LY010000	y	73
LY020000	Y	73
LZ010000	z	74
LZ020000	Z	74
SP490000		75
OG000000	ㄱ	76
OG100000	ㄴ	77
OG200000	ㄷ	78
ON000000	ㄹ	79
ON150000	ㅁ	80
ON100000	ㅂ	81
OD000000	ㅅ	82
OD100000	ㅇ	83

Table H-9 (Page 3 of 3). Korean Sort Sequence

GCGID	Character	Shared Weight
OL000000	ㄱ	84
OL200000	ㄴ	85
OL400000	ㄷ	86
OL100000	ㄹ	87
OL600000	ㄺ	88
OL700000	ㄻ	89
OL500000	ㄼ	90
OL300000	ㄽ	91
OM000000	ㅇ	92
OB000000	ㅅ	93
OB100000	ㅆ	94
OB200000	ㅈ	95
OS000000	ㅊ	96
OS100000	ㅌ	97
ON200000	ㅇ	98
OJ000000	ㅍ	99
OJ100000	ㅑ	100
OC200000	ㅓ	101
OK000000	ㅕ	102
OT000000	ㅗ	103
OP000000	ㅛ	104
OH000000	ㅜ	105
OA000000	ㅠ	106
OA200000	ㅝ	107
OY200000	ㅞ	108
OY250000	ㅟ	109
OE200000	ㅠ	110
OE000000	ㅢ	111

Table H-9 (Page 3 of 3). Korean Sort Sequence

GCGID	Character	Shared Weight
OY400000	ㅣ	112
OY300000	ㅤ	113
OO000000	ㅥ	114
OO100000	ㅦ	115
OO200000	ㅧ	116
OO300000	ㅨ	117
OY500000	ㅩ	118
OU000000	ㅪ	119
OU300000	ㅫ	120
OU200000	ㅬ	121
OU400000	ㅭ	122
OY600000	ㅮ	123
OE300000	ㅯ	124
OE400000	ㅰ	125
OI000000	ㅱ	126

Sort Sequence for Latin-1

The Latin-1 sort sequence tables are used with the following languages: Afrikaans, Brazilian Portuguese, Belgian Dutch, Belgian French, Canadian French, Catalan, Dutch, English Australia, English Japan, English UK, English US, English Uppercase, French, German, Irish Gaelic, Italian, Portuguese, Rhaetic-Romantic, Simplified Chinese, Swiss French, Swiss German, Swiss Italian, and Traditional Chinese.

Table H-10 (Page 1 of 4). Latin 1 Common Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM100000	==	3
SM150000	-	4
SP320000	(S̄HY)	5
SP100000	-	6
SP080000	,	7
SP140000	;	8
SP130000	:	9
SP020000	!	10
SP030000	¡	11
SP150000	?	12
SP160000	¿	13
SP120000	/	14
SP110000	.	15
SD110000	'	16
SD130000	`	17
SD150000	^	18
SD170000	¨	19
SD190000	~	20
SD630000	•	21

Table H-10 (Page 1 of 4). Latin 1 Common Sort Sequence

GCGID	Character	Shared Weight
SD410000	,	22
SP050000	'	23
SP040000	"	24
SP170000	«	25
SP180000	»	26
SP060000	(	27
SP070000	)	28
SM060000	[	29
SM080000	]	30
SM110000	{	31
SM140000	}	32
SM240000	§	33
SM250000	¶	34
SM520000	©	35
SM530000	®	36
SM050000	@	37
SC010000	☒	38
SC040000	¢	39
SC030000	\$	40
SC070000	f	41
SC060000	₣	42
SC020000	£	43
SC050000	¥	44
SC120000	¥	44
SM040000	*	45
SM070000	\	46
SM030000	&	47
SM010000	#	48

Table H-10 (Page 2 of 4). Latin 1
Common Sort Sequence

GCGID	Character	Shared Weight
SM020000	%	49
SA010000	+	50
SA020000	±	51
SA060000	÷	52
SA070000	×	53
SA030000	<	54
SA040000	=	55
SA050000	>	56
SM660000	∟	57
SM130000	|	58
SM650000	¡	59
SM190000	°	60
SM170000	μ	61
SP300000	(RSP)	62
SP310000	(NSP)	62
ND100000	0	63
NF040000	¼	63
NF010000	½	63
NF050000	¾	63
ND010000	1	64
ND011000	1	64
ND020000	2	65
ND021000	2	65
ND030000	3	66
ND031000	3	66
ND040000	4	67
ND050000	5	68
ND060000	6	69

Table H-10 (Page 2 of 4). Latin 1
Common Sort Sequence

GCGID	Character	Shared Weight
ND070000	7	70
ND080000	8	71
ND090000	9	72
LA010000	a	73
LA020000	À	73
SM210000	ª	73
LA110000	á	73
LA120000	Á	73
LA130000	à	73
LA140000	À	73
LA150000	â	73
LA160000	Â	73
LA270000	å	73
LA280000	Å	73
LA170000	ä	73
LA180000	Ä	73
LA190000	ã	73
LA200000	Ã	73
LA510000	æ	73
LA520000	Æ	73
LB010000	b	74
LB020000	B	74
LC010000	c	75
LC020000	C	75
LC410000	ç	75
LC420000	Ç	75
LD010000	d	76
LD020000	D	76

Table H-10 (Page 3 of 4). Latin 1
Common Sort Sequence

GCGID	Character	Shared Weight
LD630000	ð	76
LD620000	Ð	76
LE010000	e	77
LE020000	E	77
LE110000	é	77
LE120000	É	77
LE130000	è	77
LE140000	È	77
LE150000	ê	77
LE160000	Ê	77
LE170000	ë	77
LE180000	Ë	77
LF010000	f	78
LF020000	F	78
LG010000	g	79
LG020000	G	79
LH010000	h	80
LH020000	H	80
LI610000	ı	81
LI010000	i	81
LI020000	I	81
LI110000	í	81
LI120000	Í	81
LI130000	ì	81
LI140000	Ì	81
LI150000	î	81
LI160000	Î	81
LI170000	ï	81

Table H-10 (Page 3 of 4). Latin 1
Common Sort Sequence

GCGID	Character	Shared Weight
LI180000	ï	81
LJ010000	j	82
LJ020000	J	82
LK010000	k	83
LK020000	K	83
LL010000	l	84
LL020000	L	84
LM010000	m	85
LM020000	M	85
LN010000	n	86
LN020000	N	86
LN190000	ñ	86
LN200000	Ñ	86
LO010000	o	87
LO020000	O	87
SM200000	º	87
LO110000	ó	87
LO120000	Ó	87
LO130000	ò	87
LO140000	Ò	87
LO150000	ô	87
LO160000	Ô	87
LO170000	ö	87
LO180000	Ö	87
LO190000	õ	87
LO200000	Õ	87
LO610000	ø	87
LO620000	Ø	87

Table H-10 (Page 4 of 4). Latin 1
Common Sort Sequence

GCGID	Character	Shared Weight
LO510000	œ	87
LO520000	Œ	87
LP010000	p	88
LP020000	P	88
LQ010000	q	89
LQ020000	Q	89
LR010000	r	90
LR020000	R	90
LS010000	s	91
LS020000	S	91
LS610000	ß	91
LT010000	t	92
LT020000	T	92
LT630000	þ	92
LT640000	Ð	92
LU010000	u	93
LU020000	U	93
LU110000	ú	93
LU120000	Ú	93
LU130000	ù	93
LU140000	Û	93
LU150000	û	93
LU160000	Û	93
LU170000	ü	93
LU180000	Ü	93
LV010000	v	94
LV020000	V	94
LW010000	w	95

Table H-10 (Page 4 of 4). Latin 1
Common Sort Sequence

GCGID	Character	Shared Weight
LW020000	W	95
LX010000	x	96
LX020000	X	96
LY010000	y	97
LY020000	Y	97
LY110000	ý	97
LY120000	Ý	97
LY170000	ÿ	97
LY180000	ÿ	97
LZ010000	z	98
LZ020000	Z	98

Sort Sequence for Latin-2

The Latin-2 sort sequence table is used with the following languages: Albanian, Croatian, Czech, Hungarian, Romanian, Serbian Latin, Slovakian, Polish, Romanian, and Slovenian.

Table H-11 (Page 1 of 3). Latin-2 Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SP320000	(SHY)	3
SP100000	-	4
SP080000	,	5
SP140000	;	6
SP130000	:	7
SP020000	!	8
SP150000	?	9
SP120000	/	10
SP110000	.	11
SD110000	'	12
SD130000	`	13
SD230000	~	14
SD150000	^	15
SD210000	v	16
SD270000	°	17
SD170000	..	18
SD250000	"	19
SD190000	~	20
SD290000	•	21
SD410000	•	22
SD430000	˘	23
SP050000	˙	24
SP040000	"	25
SP060000	(	26
SP070000	)	27
SM060000	[	28
SM080000	]	29
SM110000	{	30
SM140000	}	31

Table H-11 (Page 1 of 3). Latin-2 Sort Sequence

GCGID	Character	Shared Weight
SM240000	§	32
SM050000	@	33
SC010000	⊘	34
SC030000	\$	35
SM040000	*	36
SM070000	\	37
SM030000	&	38
SM010000	#	39
SM020000	%	40
SA010000	+	41
SA060000	÷	42
SA070000	×	43
SA030000	<	44
SA040000	=	45
SA050000	>	46
SM130000	|	47
SP300000	(RSP)	48
ND100000	0	49
ND010000	1	50
ND020000	2	51
ND030000	3	52
ND040000	4	53
ND050000	5	54
ND060000	6	55
ND070000	7	56
ND080000	8	57
ND090000	9	58
LA010000	a	59
LA020000	A	59
LA110000	á	59
LA120000	Á	59
LA230000	ă	59
LA240000	Ă	59
LA150000	â	59
LA160000	Â	59
LA170000	ä	59

Table H-11 (Page 2 of 3). Latin-2
Sort Sequence

GCGID	Character	Shared Weight
LA180000	Ä	59
LA430000	ą	59
LA440000	Ą	59
LB010000	b	60
LB020000	B	60
LC010000	c	61
LC020000	C	61
LC110000	ć	61
LC120000	Ć	61
LC210000	č	61
LC220000	Č	61
LC410000	ç	61
LC420000	Ç	61
LD010000	d	62
LD020000	D	62
LD210000	ď	62
LD220000	Ď	62
LD610000	đ	62
LD620000	Đ	62
LE010000	e	63
LE020000	E	63
LE110000	é	63
LE120000	É	63
LE210000	ě	63
LE220000	Ě	63
LE170000	ë	63
LE180000	Ë	63
LE430000	ę	63
LE440000	Ę	63
LF010000	f	64
LF020000	F	64
LG010000	g	65
LG020000	G	65
LH010000	h	66
LH020000	H	66
LI010000	i	67

Table H-11 (Page 2 of 3). Latin-2
Sort Sequence

GCGID	Character	Shared Weight
LI020000	I	67
LI110000	í	67
LI120000	Í	67
LI150000	î	67
LI160000	Î	67
LJ010000	j	68
LJ020000	J	68
LK010000	k	69
LK020000	K	69
LL010000	l	70
LL020000	L	70
LL110000	ĺ	70
LL120000	Ĺ	70
LL210000	ļ	70
LL220000	Ļ	70
LL610000	ł	70
LL620000	Ł	70
LM010000	m	71
LM020000	M	71
LN010000	n	72
LN020000	N	72
LN110000	ń	72
LN120000	Ń	72
LN210000	ň	72
LN220000	Ň	72
LO010000	o	73
LO020000	O	73
LO110000	ó	73
LO120000	Ó	73
LO150000	ô	73
LO160000	Ô	73
LO170000	ö	73
LO180000	Ö	73
LO250000	õ	73
LO260000	Õ	73
LP010000	p	74

Table H-11 (Page 3 of 3). Latin-2
Sort Sequence

GCGID	Character	Shared Weight
LP020000	P	74
LQ010000	q	75
LQ020000	Q	75
LR010000	r	76
LR020000	R	76
LR110000	í	76
LR120000	Ř	76
LR210000	ř	76
LR220000	Ř̃	76
LS010000	s	77
LS020000	S	77
LS110000	ś	77
LS120000	Ś	77
LS210000	š	77
LS220000	Š	77
LS410000	ş	77
LS420000	Ş	77
LS610000	ß	77
LT010000	t	78
LT020000	T	78
LT210000	ť	78
LT220000	Ť	78
LT410000	ţ	78
LT420000	Ț	78
LU010000	u	79
LU020000	U	79
LU110000	ú	79
LU120000	Ú	79
LU270000	û	79
LU280000	Û	79
LU170000	ü	79
LU180000	Ü	79
LU250000	ů	79
LU260000	Ů	79
LV010000	v	80
LV020000	V	80

Table H-11 (Page 3 of 3). Latin-2
Sort Sequence

GCGID	Character	Shared Weight
LW010000	w	81
LW020000	W	81
LX010000	x	82
LX020000	X	82
LY010000	y	83
LY020000	Y	83
LY110000	ý	83
LY120000	Ý	83
LZ010000	z	84
LZ020000	Z	84
LZ110000	ź	84
LZ120000	Ź	84
LZ210000	ž	84
LZ220000	Ž	84
LZ290000	ż	84
LZ300000	Ż	84

Sort Sequence for Norwegian

The Norwegian sort sequence table is used with the Norwegian Bokmal and Norwegian Nyorsk languages.

Table H-12 (Page 1 of 4). Norwegian Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	-	3
SP320000	(SHY)	4
SP100000	-	5
SP080000	,	6
SP140000	;	7
SP130000	:	8
SP020000	!	9
SP030000	i	10
SP150000	?	11
SP160000	¿	12
SP120000	/	13
SP110000	.	14
SD110000	'	15
SD130000	`	16
SD150000	^	17
SD170000	¨	18
SD190000	~	19
SD630000	•	20
SD410000	‚	21
SP050000	†	22
SP040000	”	23
SP170000	«	24
SP180000	»	25

Table H-12 (Page 1 of 4). Norwegian Sort Sequence

GCGID	Character	Shared Weight
SP060000	(	26
SP070000	)	27
SM060000	[	28
SM080000	]	29
SM110000	{	30
SM140000	}	31
SM240000	§	32
SM250000	¶	33
SM520000	©	34
SM530000	®	35
SM050000	@	36
SC010000	¤	37
SC040000	¢	38
SC030000	\$	39
SC020000	£	40
SC050000	¥	41
SM040000	*	42
SM070000	\	43
SM030000	&	44
SM010000	#	45
SM020000	%	46
SA010000	+	47
SA020000	±	48
SA060000	÷	49
SA070000	×	50
SA030000	<	51
SA040000	=	52
SA050000	>	53

Table H-12 (Page 2 of 4). Norwegian Sort Sequence

GCGID	Character	Shared Weight
SM660000	⌈	54
SM130000	|	55
SM650000	!	56
SM190000	°	57
SM170000	μ	58
SP300000	(RSP)	59
ND100000	0	60
NF040000	¼	60
NF010000	½	60
NF050000	¾	60
ND010000	1	61
ND011000	1	61
ND020000	2	62
ND021000	2	62
ND030000	3	63
ND031000	3	63
ND040000	4	64
ND050000	5	65
ND060000	6	66
ND070000	7	67
ND080000	8	68
ND090000	9	69
LA010000	a	70
LA020000	A	70
SM210000	ª	70
LA110000	á	70
LA120000	Á	70
LA130000	à	70

Table H-12 (Page 2 of 4). Norwegian Sort Sequence

GCGID	Character	Shared Weight
LA140000	À	70
LA150000	â	70
LA160000	Â	70
LA170000	ä	70
LA180000	Ä	70
LA190000	ã	70
LA200000	Ã	70
LB010000	b	71
LB020000	B	71
LC010000	c	72
LC020000	C	72
LC410000	ç	72
LC420000	Ç	72
LD010000	d	73
LD020000	D	73
LD630000	ð	73
LD620000	Ð	73
LE010000	e	74
LE020000	E	74
LE110000	é	74
LE120000	É	74
LE130000	è	74
LE140000	È	74
LE150000	ê	74
LE160000	Ê	74
LE170000	ë	74
LE180000	Ë	74
LF010000	f	75

Table H-12 (Page 3 of 4). Norwegian Sort Sequence

GCGID	Character	Shared Weight
LF020000	F	75
LG010000	g	76
LG020000	G	76
LH010000	h	77
LH020000	H	77
LI010000	i	78
LI020000	I	78
LI110000	í	78
LI120000	Í	78
LI130000	ì	78
LI140000	Ì	78
LI150000	î	78
LI160000	Î	78
LI170000	ï	78
LI180000	Ï	78
LJ010000	j	79
LJ020000	J	79
LK010000	k	80
LK020000	K	80
LL010000	l	81
LL020000	L	81
LM010000	m	82
LM020000	M	82
LN010000	n	83
LN020000	N	83
LN190000	ñ	83
LN200000	Ñ	83
LO010000	o	84

Table H-12 (Page 3 of 4). Norwegian Sort Sequence

GCGID	Character	Shared Weight
LO020000	O	84
SM200000	ø	84
LO110000	ó	84
LO120000	Ó	84
LO130000	ò	84
LO140000	Ò	84
LO150000	ô	84
LO160000	Ô	84
LO170000	ö	84
LO180000	Ö	84
LO190000	õ	84
LO200000	Õ	84
LP010000	p	85
LP020000	P	85
LQ010000	q	86
LQ020000	Q	86
LR010000	r	87
LR020000	R	87
LS010000	s	88
LS020000	S	88
LS610000	ß	88
LT010000	t	89
LT020000	T	89
LT630000	þ	89
LT640000	Þ	89
LU010000	u	90
LU020000	U	90
LU110000	ú	90

Table H-12 (Page 4 of 4). Norwegian Sort Sequence

GCGID	Character	Shared Weight
LU120000	Ú	90
LU130000	ù	90
LU140000	Û	90
LU150000	û	90
LU160000	Û	90
LU170000	ü	90
LU180000	Û	90
LV010000	v	91
LV020000	V	91
LW010000	w	92
LW020000	W	92
LX010000	x	93
LX020000	X	93
LY010000	y	94
LY020000	Y	94
LY110000	ý	94
LY120000	Ý	94
LY170000	ÿ	94
LZ010000	z	95
LZ020000	Z	95
LA510000	æ	96
LA520000	Æ	96
LO610000	ø	97
LO620000	Ø	97
LA270000	å	98
LA280000	Å	98

Sort Sequence for Russian

The Russian sort sequence table is used for the Russian language.

Table H-13 (Page 1 of 3). Russian Sort Sequence Table

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SP320000	(SĪȚȚ)	3
SP100000	-	4
SP080000	,	5
SP140000	;	6
SP130000	:	7
SP020000	!	8
SP150000	?	9
SP120000	/	10
SP110000	.	11
SD130000	`	12
SD150000	^	13
SD190000	~	14
SP050000	'	15
SP040000	"	16
SP060000	(	17
SP070000	)	18
SM060000	[	19
SM080000	]	20
SM110000	{	21
SM140000	}	22
SM240000	§	23
SM050000	@	24
SC010000	⊗	25
SC030000	\$	26
SM040000	*	27
SM070000	\	28
SM030000	&	29
SM000000	Nº	30
SM010000	#	31
SM020000	%	32

Table H-13 (Page 1 of 3). Russian Sort Sequence Table

GCGID	Character	Shared Weight
SA010000	+	33
SA030000	<	34
SA040000	=	35
SA050000	>	36
SM130000	|	37
SP300000	(RSP)	38
ND100000	0	39
ND010000	1	40
ND020000	2	41
ND030000	3	42
ND040000	4	43
ND050000	5	44
ND060000	6	45
ND070000	7	46
ND080000	8	47
ND090000	9	48
LA010000	a	49
LA020000	A	49
LB010000	b	50
LB020000	B	50
LC010000	c	51
LC020000	C	51
LD010000	d	52
LD020000	D	52
LE010000	e	53
LE020000	E	53
LF010000	f	54
LF020000	F	54
LG010000	g	55
LG020000	G	55
LH010000	h	56
LH020000	H	56
LI010000	i	57
LI020000	I	57
LJ010000	j	58
LJ020000	J	58

Table H-13 (Page 2 of 3). Russian Sort Sequence Table

GCGID	Character	Shared Weight
LK010000	k	59
LK020000	K	59
LL010000	l	60
LL020000	L	60
LM010000	m	61
LM020000	M	61
LN010000	n	62
LN020000	N	62
LO010000	o	63
LO020000	O	63
LP010000	p	64
LP020000	P	64
LQ010000	q	65
LQ020000	Q	65
LR010000	r	66
LR020000	R	66
LS010000	s	67
LS020000	S	67
LT010000	t	68
LT020000	T	68
LU010000	u	69
LU020000	U	69
LV010000	v	70
LV020000	V	70
LW010000	w	71
LW020000	W	71
LX010000	x	72
LX020000	X	72
LY010000	y	73
LY020000	Y	73
LZ010000	z	74
LZ020000	Z	74
KA010000	a	75
KA020000	A	75
KB010000	б	76
KB020000	Б	76

Table H-13 (Page 2 of 3). Russian Sort Sequence Table

GCGID	Character	Shared Weight
KV010000	в	77
KV020000	В	77
KG010000	г	78
KG020000	Г	78
KD010000	д	79
KD020000	Д	79
KG110000	ѓ	79
KG120000	Ђ	79
KD610000	ђ	79
KD620000	Ђ	79
KE010000	e	80
KE020000	E	80
KE150000	е	80
KE160000	Е	80
KE170000	ë	80
KE180000	Ë	80
KZ210000	ж	81
KZ220000	Ж	81
KZ010000	з	82
KZ020000	З	82
KZ150000	s	82
KZ160000	S	82
KI010000	и	83
KI020000	И	83
KI110000	i	83
KI120000	I	83
KI170000	ï	83
KI180000	Ï	83
KJ110000	й	84
KJ120000	Й	84
KJ010000	j	84
KJ020000	J	84
KK010000	к	85
KK020000	К	85
KL010000	л	86
KL020000	Л	86

Table H-13 (Page 3 of 3). Russian Sort Sequence Table

GCGID	Character	Shared Weight
KL410000	љ	86
KL420000	Љ	86
KM010000	м	87
KM020000	М	87
KN010000	н	88
KN020000	Н	88
KN110000	њ	88
KN120000	Њ	88
KO010000	о	89
KO020000	О	89
KP010000	п	90
KP020000	П	90
KR010000	р	91
KR020000	Р	91
KS010000	с	92
KS020000	С	92
KT010000	т	93
KT020000	Т	93
KK110000	ќ	93
KK120000	Ќ	93
KC110000	ћ	93
KC120000	Ћ	93
KU010000	у	94
KU020000	У	94
KU230000	џ	94
KU240000	Џ	94
KF010000	ф	95
KF020000	Ф	95
KH010000	х	96
KH020000	Х	96
KC010000	ц	97
KC020000	Ц	97
KC210000	ч	98
KC220000	Ч	98
KG210000	џ	98
KG220000	Џ	98

Table H-13 (Page 3 of 3). Russian Sort Sequence Table

GCGID	Character	Shared Weight
KS210000	ш	99
KS220000	Ш	99
KS150000	щ	100
KS160000	Щ	100
KU210000	ъ	101
KU220000	Ъ	101
KY010000	ы	102
KY020000	Ы	102
KX110000	ь	103
KX120000	Ь	103
KE130000	э	104
KE140000	Э	104
KU150000	ю	105
KU160000	Ю	105
KA150000	я	106
KA160000	Я	106

Sort Sequence for Spanish Speaking

The Spanish Speaking sort sequence table is used with Spanish and Latin American Spanish languages.

Table H-14 (Page 1 of 3). Spanish Speaking Sort Sequence

GCID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	—	3
SP320000	(SHY)	4
SP100000	-	5
SP080000	,	6
SP140000	;	7
SP130000	:	8
SP020000	!	9
SP030000	¡	10
SP150000	?	11
SP160000	¿	12
SP120000	/	13
SP110000	.	14
SD110000	'	15
SD130000	`	16
SD150000	^	17
SD170000	..	18
SD190000	~	19
SD630000	•	20
SD410000	•	21
SP050000	’	22
SP040000	”	23
SP170000	«	24
SP180000	»	25
SP060000	(	26
SP070000	)	27
SM060000	[	28
SM080000	]	29
SM110000	{	30
SM140000	}	31
SM240000	§	32

Table H-14 (Page 1 of 3). Spanish Speaking Sort Sequence

GCID	Character	Shared Weight
SM250000	¶	33
SM520000	©	34
SM530000	®	35
SM050000	@	36
SC010000	⊗	37
SC040000	¢	38
SC030000	\$	39
SC020000	£	40
SC050000	¥	41
SM040000	*	42
SM070000	\	43
SM030000	&	44
SM010000	#	45
SM020000	%	46
SA010000	+	47
SA020000	±	48
SA060000	÷	49
SA070000	×	50
SA030000	<	51
SA040000	=	52
SA050000	>	53
SM660000	¬	54
SM130000	|	55
SM650000	!	56
SM190000	°	57
SM170000	μ	58
SP300000	(RSP)	59
ND100000	0	60
NF040000	¼	60
NF010000	½	60
NF050000	¾	60
ND010000	1	61
ND011000	1	61
ND020000	2	62
ND021000	2	62
ND030000	3	63

Table H-14 (Page 2 of 3). Spanish Speaking Sort Sequence

GCID	Character	Shared Weight
ND031000	3	63
ND040000	4	64
ND050000	5	65
ND060000	6	66
ND070000	7	67
ND080000	8	68
ND090000	9	69
LA010000	a	70
LA020000	À	70
SM210000	ª	70
LA110000	á	70
LA120000	Á	70
LA130000	à	70
LA140000	À	70
LA150000	â	70
LA160000	Â	70
LA270000	å	70
LA280000	Å	70
LA170000	ä	70
LA180000	Ä	70
LA190000	ã	70
LA200000	Ã	70
LA510000	æ	70
LA520000	Æ	70
LB010000	b	71
LB020000	B	71
LC010000	c	72
LC020000	C	72
LC410000	ç	72
LC420000	Ç	72
LD010000	d	73
LD020000	D	73
LD630000	ð	73
LD620000	Ð	73
LE010000	e	74
LE020000	E	74

Table H-14 (Page 2 of 3). Spanish Speaking Sort Sequence

GCID	Character	Shared Weight
LE110000	é	74
LE120000	É	74
LE130000	è	74
LE140000	È	74
LE150000	ê	74
LE160000	Ê	74
LE170000	ë	74
LE180000	Ë	74
LF010000	f	75
LF020000	F	75
LG010000	g	76
LG020000	G	76
LH010000	h	77
LH020000	H	77
LI010000	i	78
LI020000	I	78
LI110000	í	78
LI120000	Í	78
LI130000	ì	78
LI140000	Ì	78
LI150000	î	78
LI160000	Î	78
LI170000	ï	78
LI180000	Ï	78
LJ010000	j	79
LJ020000	J	79
LK010000	k	80
LK020000	K	80
LL010000	l	81
LL020000	L	81
LM010000	m	82
LM020000	M	82
LN010000	n	83
LN020000	N	83
LN190000	ñ	84
LN200000	Ñ	84

Table H-14 (Page 3 of 3). Spanish Speaking Sort Sequence

GCID	Character	Shared Weight
LO010000	o	85
LO020000	O	85
SM200000	º	85
LO110000	ó	85
LO120000	Ó	85
LO130000	ò	85
LO140000	Ò	85
LO150000	ô	85
LO160000	Ô	85
LO170000	ö	85
LO180000	Ö	85
LO190000	õ	85
LO200000	Õ	85
LO610000	ø	85
LO620000	Ø	85
LP010000	p	86
LP020000	P	86
LQ010000	q	87
LQ020000	Q	87
LR010000	r	88
LR020000	R	88
LS010000	s	89
LS020000	S	89
LS610000	ß	89
LT010000	t	90
LT020000	T	90
LT630000	þ	90
LT640000	Þ	90
LU010000	u	91
LU020000	U	91
LU110000	ú	91
LU120000	Ú	91
LU130000	ù	91
LU140000	Û	91
LU150000	û	91
LU160000	Û	91

Table H-14 (Page 3 of 3). Spanish Speaking Sort Sequence

GCID	Character	Shared Weight
LU170000	ü	91
LU180000	Ü	91
LV010000	v	92
LV020000	V	92
LW010000	w	93
LW020000	W	93
LX010000	x	94
LX020000	X	94
LY010000	y	95
LY020000	Y	95
LY110000	ý	95
LY120000	Ý	95
LY170000	ÿ	95
LZ010000	z	96
LZ020000	Z	96

Sort Sequence for Swedish and Finnish

The Swedish and Finnish sort sequence table is used for the Swedish and Finnish languages.

Table H-15 (Page 1 of 3). Swedish and Finnish Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	—	3
SP320000	(SHY)	4
SP100000	-	5
SP080000	,	6
SP140000	;	7
SP130000	:	8
SP020000	!	9
SP030000	¡	10
SP150000	?	11
SP160000	¿	12
SP120000	/	13
SP110000	.	14
SD110000	'	15
SD130000	`	16
SD150000	^	17
SD170000	¨	18
SD190000	~	19
SD630000	•	20
SD410000	◌	21
SP050000	’	22
SP040000	”	23
SP170000	«	24
SP180000	»	25
SP060000	(	26
SP070000	)	27
SM060000	[	28
SM080000	]	29
SM110000	{	30
SM140000	}	31

Table H-15 (Page 1 of 3). Swedish and Finnish Sort Sequence

GCGID	Character	Shared Weight
SM240000	§	32
SM250000	¶	33
SM520000	©	34
SM530000	®	35
SM050000	@	36
SC010000	∕	37
SC040000	¢	38
SC030000	\$	39
SC020000	£	40
SC050000	¥	41
SM040000	*	42
SM070000	\	43
SM030000	&	44
SM010000	#	45
SM020000	%	46
SA010000	+	47
SA020000	±	48
SA060000	÷	49
SA070000	×	50
SA030000	<	51
SA040000	=	52
SA050000	>	53
SM660000	∟	54
SM130000	|	55
SM650000	¡	56
SM190000	°	57
SM170000	μ	58
SP300000	(RSP)	59
ND100000	0	60
NF040000	¼	60
NF010000	½	60
NF050000	¾	60
ND010000	1	61
ND011000	1	61
ND020000	2	62
ND021000	2	62

Table H-15 (Page 2 of 3). Swedish and Finnish Sort Sequence

GCGID	Character	Shared Weight
ND030000	3	63
ND031000	³	63
ND040000	4	64
ND050000	5	65
ND060000	6	66
ND070000	7	67
ND080000	8	68
ND090000	9	69
LA010000	a	70
LA020000	A	70
SM210000	ª	70
LA110000	á	70
LA120000	Á	70
LA130000	à	70
LA140000	À	70
LA150000	â	70
LA160000	Â	70
LA190000	ã	70
LA200000	Ã	70
LB010000	b	71
LB020000	B	71
LC010000	c	72
LC020000	C	72
LC410000	ç	72
LC420000	Ç	72
LD010000	d	73
LD020000	D	73
LD630000	ð	73
LD620000	Ð	73
LE010000	e	74
LE020000	E	74
LE110000	é	74
LE120000	É	74
LE130000	è	74
LE140000	È	74
LE150000	ê	74

Table H-15 (Page 2 of 3). Swedish and Finnish Sort Sequence

GCGID	Character	Shared Weight
LE160000	Ê	74
LE170000	ë	74
LE180000	Ë	74
LF010000	f	75
LF020000	F	75
LG010000	g	76
LG020000	G	76
LH010000	h	77
LH020000	H	77
LI010000	i	78
LI020000	I	78
LI110000	í	78
LI120000	Í	78
LI130000	ì	78
LI140000	Ì	78
LI150000	î	78
LI160000	Î	78
LI170000	ï	78
LI180000	Ï	78
LJ010000	j	79
LJ020000	J	79
LK010000	k	80
LK020000	K	80
LL010000	l	81
LL020000	L	81
LM010000	m	82
LM020000	M	82
LN010000	n	83
LN020000	N	83
LN190000	ñ	83
LN200000	Ñ	83
LO010000	o	84
LO020000	O	84
SM200000	º	84
LO110000	ó	84
LO120000	Ó	84

Table H-15 (Page 3 of 3). Swedish and Finnish Sort Sequence

GCGID	Character	Shared Weight
LO130000	ò	84
LO140000	Ò	84
LO150000	ô	84
LO160000	Ô	84
LO190000	õ	84
LO200000	Õ	84
LP010000	p	85
LP020000	P	85
LQ010000	q	86
LQ020000	Q	86
LR010000	r	87
LR020000	R	87
LS010000	s	88
LS020000	S	88
LS610000	ß	88
LT010000	t	89
LT020000	T	89
LT630000	þ	89
LT640000	Þ	89
LU010000	u	90
LU020000	U	90
LU110000	ú	90
LU120000	Ú	90
LU130000	ù	90
LU140000	Û	90
LU150000	û	90
LU160000	Û	90
LV010000	v	91
LV020000	V	91
LW010000	w	92
LW020000	W	92
LX010000	x	93
LX020000	X	93
LY010000	y	94
LY020000	Y	94
LY110000	ý	94

Table H-15 (Page 3 of 3). Swedish and Finnish Sort Sequence

GCGID	Character	Shared Weight
LY120000	Ý	94
LY170000	ÿ	94
LU170000	ü	94
LU180000	Ü	94
LZ010000	z	95
LZ020000	Z	95
LA270000	å	96
LA280000	Å	96
LA170000	ä	97
LA180000	Ä	97
LA510000	æ	97
LA520000	Æ	97
LO170000	ö	98
LO180000	Ö	98
LO610000	ø	98
LO620000	Ø	98

Sort Sequence for Thai

The Thai sort sequence table is used with the Thai language.

Table H-16 (Page 1 of 4). Thai Sort Sequence

GCID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SP100000	-	3
SP080000	,	4
SP140000	;	5
SP130000	:	6
SP020000	!	7
SP150000	?	8
SP120000	/	9
SP110000	.	10
SD130000	`	11
SD150000	^	12
SD190000	~	13
SP050000	'	14
SP040000	"	15
SP060000	(	16
SP070000	)	17
SM060000	[	18
SM080000	]	19
SM110000	{	20
SM140000	}	21
SM050000	@	22
SC040000	¢	23
SC030000	\$	24
SC130000	฿	25

Table H-16 (Page 1 of 4). Thai Sort Sequence

GCID	Character	Shared Weight
SM040000	*	26
SM070000	\	27
SM030000	&	28
SM010000	#	29
SM020000	%	30
SA010000	+	31
SA030000	<	32
SA040000	=	33
SA050000	>	34
SM660000	∟	35
SM130000	|	36
SM650000	!	37
SP300000	(RSP)	38
ND100000	0	39
ND100002	○	39
ND010000	1	40
ND010002	◉	40
ND020000	2	41
ND020002	◌	41
ND030000	3	42
ND030002	◌	42
ND040000	4	43
ND040002	◌	43
ND050000	5	44
ND050002	◌	44
ND060000	6	45
ND060002	◌	45
ND070000	7	46

Table H-16 (Page 2 of 4). Thai Sort Sequence

GCID	Character	Shared Weight
ND070002	๗	46
ND080000	๘	47
ND080002	๘	47
ND090000	๙	48
ND090002	๙	48
LA010000	a	49
LA020000	A	49
LB010000	b	50
LB020000	B	50
LC010000	c	51
LC020000	C	51
LD010000	d	52
LD020000	D	52
LE010000	e	53
LE020000	E	53
LF010000	f	54
LF020000	F	54
LG010000	g	55
LG020000	G	55
LH010000	h	56
LH020000	H	56
LI010000	i	57
LI020000	I	57
LJ010000	j	58
LJ020000	J	58
LK010000	k	59
LK020000	K	59
LL010000	l	60

Table H-16 (Page 2 of 4). Thai Sort Sequence

GCID	Character	Shared Weight
LL020000	L	60
LM010000	m	61
LM020000	M	61
LN010000	n	62
LN020000	N	62
LO010000	o	63
LO020000	O	63
LP010000	p	64
LP020000	P	64
LQ010000	q	65
LQ020000	Q	65
LR010000	r	66
LR020000	R	66
LS010000	s	67
LS020000	S	67
LT010000	t	68
LT020000	T	68
LU010000	u	69
LU020000	U	69
LV010000	v	70
LV020000	V	70
LW010000	w	71
LW020000	W	71
LX010000	x	72
LX020000	X	72
LY010000	y	73
LY020000	Y	73
LZ010000	z	74

Table H-16 (Page 3 of 4). Thai Sort Sequence

GCID	Character	Shared Weight
LZ020000	Z	74
BK100000	ก	75
BK200000	ข	76
BK300000	ค	77
BK400000	ค	78
BK500000	ค	79
BK600000	ฃ	80
BN100000	ง	81
BC100000	จ	82
BX100000	ฉ	83
BS100000	ช	84
BX200000	ฌ	85
BX300000	ฎ	86
BY100000	ญ	87
BD100000	ฉ	88
BT100000	ฉ	89
BT200000	ซ	90
BT300000	ท	91
BT400000	ฒ	92
BN200000	ณ	93
BD200000	ด	94
BT500000	ต	95
BT600000	ถ	96
BT700000	ท	97
BT800000	ธ	98
BN300000	น	99
BB100000	บ	100
BP100000	ป	101

Table H-16 (Page 3 of 4). Thai Sort Sequence

GCID	Character	Shared Weight
BP200000	ฝ	102
BF100000	ฝ	103
BP300000	พ	104
BF200000	พ	105
BP400000	ภ	106
BM100000	ม	107
BY200000	ย	108
BR100000	ร	109
BR200000	ร	110
BL100000	ล	111
BL200000	ล	112
BW100000	ว	113
BS200000	ศ	114
BS300000	ษ	115
BS400000	ส	116
BH100000	ห	117
BL300000	ฬ	118
BO100000	อ	119
BH200000	ฮ	120
BQ200000	ฯ	121
BA200000	๕๕	122
BA100000	๕๕	123
BA300000	๕๕	124
BA400000	๕๕	125
BI100000	๕๕	126
BI200000	๕๕	127
BU100000	๕๕	128
BU200000	๕๕	129

Table H-16 (Page 4 of 4). Thai Sort Sequence

GCID	Character	Shared Weight
BU300000	๑	130
BU400000	๑๒	131
BQ300000	•	132
BE200000	๒	133
BE300000	๒๒	134
BO200000	๓	135
BA500000	๓๒	136
BA600000	๓๓	137
BA700000	๓๔	138
BQ100000	๓๕	139
BE100000	๓๖	140
BZ100000	๓๗	141
BZ200000	๓๘	142
BZ300000	๓๙	143
BZ400000	๓๙	144
BZ500000	๓๙	145
BN400000	๓๙	146

Sort Sequence for Turkish

The Turkish sort sequence table is used with the Turkish language.

Table H-17 (Page 1 of 4). Turkish Sort Sequence

GCGID	Character	Shared Weight
SP010000	(SP)	1
SP090000	—	2
SM150000	—	3
SP320000	(SHY)	4
SP100000	-	5
SP080000	,	6
SP140000	;	7
SP130000	:	8
SP020000	!	9
SP030000	;	10
SP150000	?	11
SP160000	;	12
SP120000	/	13
SP110000	.	14
SD110000	'	15
SD130000	`	16
SD230000	~	17
SD150000	^	18
SD170000	..	19
SD190000	~	20
SD290000	.	21
SD630000	.	22
SD410000	.	23
SP050000	'	24
SP040000	"	25
SP170000	«	26
SP180000	»	27
SP060000	(	28
SP070000	)	29
SM060000	[	30
SM080000	]	31
SM110000	{	32

Table H-17 (Page 1 of 4). Turkish Sort Sequence

GCGID	Character	Shared Weight
SM140000	}	33
SM240000	§	34
SM250000	¶	35
SM520000	©	36
SM530000	®	37
SM050000	@	38
SC010000	⊗	39
SC040000	¢	40
SC030000	\$	41
SC020000	£	42
SC050000	¥	43
SM040000	*	44
SM070000	\	45
SM030000	&	46
SM010000	#	47
SM020000	%	48
SA010000	+	49
SA020000	±	50
SA060000	÷	51
SA070000	×	52
SA030000	<	53
SA040000	=	54
SA050000	>	55
SM660000	⌋	56
SM130000	|	57
SM650000	!	58
SM190000	°	59
SM170000	μ	60
SP300000	(RSP)	61
ND100000	0	62
NF040000	¼	62
NF010000	½	62
NF050000	¾	62
ND010000	1	63
ND011000	1	63
ND020000	2	64

Table H-17 (Page 2 of 4). Turkish Sort Sequence

GCGID	Character	Shared Weight
ND021000	2	64
ND030000	3	65
ND031000	3	65
ND040000	4	66
ND050000	5	67
ND060000	6	68
ND070000	7	69
ND080000	8	70
ND090000	9	71
LA010000	a	72
LA020000	À	72
SM210000	ª	72
LA110000	á	72
LA120000	Á	72
LA130000	à	72
LA140000	À	72
LA150000	â	72
LA160000	Â	72
LA270000	å	72
LA280000	Å	72
LA170000	ä	72
LA180000	Ä	72
LA190000	ã	72
LA200000	Ã	72
LA510000	æ	72
LA520000	Æ	72
LB010000	b	73
LB020000	B	73
LC010000	c	74
LC020000	C	74
LC150000	ê	74
LC160000	Ê	74
LC290000	ç	75
LC300000	Ç	75
LC410000	ç	76
LC420000	Ç	76

Table H-17 (Page 2 of 4). Turkish Sort Sequence

GCGID	Character	Shared Weight
LD010000	d	77
LD020000	D	77
LE010000	e	78
LE020000	E	78
LE110000	é	78
LE120000	É	78
LE130000	è	78
LE140000	È	78
LE150000	ê	78
LE160000	Ê	78
LE170000	ë	78
LE180000	Ë	78
LF010000	f	79
LF020000	F	79
LG010000	g	80
LG020000	G	80
LG150000	ğ	80
LG160000	Ğ	80
LG230000	ğ	81
LG240000	Ğ	81
LG290000	ğ	82
LG300000	Ğ	82
LH010000	h	83
LH020000	H	83
LH150000	ĥ	83
LH160000	Ĥ	83
LH610000	h̃	84
LH620000	H̃	84
LI610000	ı	85
LI020000	I	85
LI010000	i	86
LI300000	İ	86
LI110000	í	86
LI120000	Í	86
LI130000	ì	86
LI140000	Ì	86

Table H-17 (Page 3 of 4). Turkish Sort Sequence

GCGID	Character	Shared Weight
LI150000	î	86
LI160000	Î	86
LI170000	ï	86
LI180000	Ï	86
LJ010000	ĵ	87
LJ020000	J	87
LJ150000	ĵ	87
LJ160000	Ĵ	87
LK010000	k	88
LK020000	K	88
LL010000	l	89
LL020000	L	89
LM010000	m	90
LM020000	M	90
LN010000	n	91
LN020000	N	91
LN190000	ñ	91
LN200000	Ñ	91
LO010000	o	92
LO020000	O	92
SM200000	º	92
LO110000	ó	92
LO120000	Ó	92
LO130000	ò	92
LO140000	Ò	92
LO150000	ô	92
LO160000	Ô	92
LO190000	õ	92
LO200000	Õ	92
LO610000	ø	92
LO620000	Ø	92
LO170000	ö	93
LO180000	Ö	93
LP010000	p	94
LP020000	P	94
LQ010000	q	95

Table H-17 (Page 3 of 4). Turkish Sort Sequence

GCGID	Character	Shared Weight
LQ020000	Q	95
LR010000	r	96
LR020000	R	96
LS010000	s	97
LS020000	S	97
LS150000	ŝ	97
LS160000	Ŝ	97
LS610000	ß	97
LS410000	ş	98
LS420000	Ş	98
LT010000	t	99
LT020000	T	99
LU010000	u	100
LU020000	U	100
LU110000	ú	100
LU120000	Ú	100
LU130000	ù	100
LU140000	Û	100
LU150000	û	100
LU160000	Û	100
LU230000	ü	101
LU240000	Û	101
LU170000	ü	102
LU180000	Ü	102
LV010000	v	103
LV020000	V	103
LW010000	w	104
LW020000	W	104
LX010000	x	105
LX020000	X	105
LY010000	y	106
LY020000	Y	106
LY170000	ÿ	106
LZ010000	z	107
LZ020000	Z	107
LZ290000	ž	108

Table H-17 (Page 4 of 4). Turkish
Sort Sequence

GCGID	Character	Shared Weight
LZ300008	Ž	108

Appendix I. Graphic Character Conversion Tables

Following is a list of conversion tables on the AS/400 system. It gives the table object name and the description and value of the character set and code page converted from and converted to. The character sets with the *N characters in the From Value field indicates any character set.

These conversion tables are used to convert data from one character set and code page to another. To convert the data, call the program QDCXLATE. See the *CL Programmer's Guide* for more information on QDCXLATE.

Table I-1 (Page 1 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Library: QSYS				
QASCII	EBCDIC		ASCII	
QEBCDIC	ASCII		EBCDIC	
QSYSTRNTBL	Lowercase		Uppercase	
Library: QUSRSYS				
QA3BA69A3R	International Alphabet 5	(*N 1009)	Cyrillic, Multilingual	(1150 1025)
QA3BA7AA3S	International Alphabet 5	(*N 1009)	Turkey EBCDIC	(1152 1026)
QA3BA7W836	International Alphabet 5	(*N 1009)	People's Republic of China	(1174 836)
QA3B103367	International Alphabet 5	(*N 1009)	ASCII	(103 367)
QA3B218423	International Alphabet 5	(*N 1009)	Greece	(218 423)
QA3B332290	International Alphabet 5	(*N 1009)	Japan Katakana	(332 290)
QA3B697037	International Alphabet 5	(*N 1009)	USA/Canada	(697 037)
QA3B697273	International Alphabet 5	(*N 1009)	Austria/Germany	(697 273)
QA3B697277	International Alphabet 5	(*N 1009)	Denmark/Norway	(697 277)
QA3B697278	International Alphabet 5	(*N 1009)	Finland/Sweden	(697 278)
QA3B697280	International Alphabet 5	(*N 1009)	Italy	(697 280)
QA3B697284	International Alphabet 5	(*N 1009)	Spain/Latin America	(697 284)
QA3B697297	International Alphabet 5	(*N 1009)	France	(697 297)
QA3B697500	International Alphabet 5	(*N 1009)	Multinational #5	(697 500)
QA3B697871	International Alphabet 5	(*N 1009)	Iceland	(697 871)
QA3B925875	International Alphabet 5	(*N 1009)	Greece	(925 875)
QA3B933833	International Alphabet 5	(*N 1009)	Korea	(933 833)
QA3B936836	International Alphabet 5	(*N 1009)	People's Republic of China	(936 836)
QA3B959870	International Alphabet 5	(*N 1009)	Latin 2, Multilingual	(959 870)

Table I-1 (Page 2 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
QA3B960880	International Alphabet 5	(*N 1009)	Cyrillic, Multilingual (old)	(960 880)
QA3D697500	VT220 Germany	(*N 1011)	Multinational #5	(697 500)
QA3E697500	VT220 Italy	(*N 1012)	Multinational #5	(697 500)
QA3M697500	VT220 Canadian/French	(*N 1020)	Multinational #5	(697 500)
QA3N697500	VT220 Switzerland	(*N 1021)	Multinational #5	(697 500)
QA3P697500	VT220 Spain	(*N 1023)	Multinational #5	(697 500)
QA3QA93A33	CCITT T.61 (EBCDIC)	(*N 1024)	CCITT T.61 IBM PC	(1252 1036)
QA3RA69855	Cyrillic, Multilingual	(*N 1025)	PC-Cyrillic	(1150 855)
QA3RA69915	Cyrillic, Multilingual	(*N 1025)	8-bit ASCII/ISO Cyrillic	(1150 915)
QA3RA7RA3B	Cyrillic, Multilingual	(*N 1025)	International Alphabet 5	(1169 1009)
QA3R337256	Cyrillic, Multilingual	(*N 1025)	Multinational #1	(337 256)
QA3R697037	Cyrillic, Multilingual	(*N 1025)	USA/Canada	(697 037)
QA3R697500	Cyrillic, Multilingual	(*N 1025)	Multinational #5	(697 500)
QA3R697850	Cyrillic, Multilingual	(*N 1025)	PC-Multilingual	(697 850)
QA3R919437	Cyrillic, Multilingual	(*N 1025)	PC-USA	(919 437)
QA3R959852	Cyrillic, Multilingual	(*N 1025)	PC-Latin 2	(959 852)
QA3R959870	Cyrillic, Multilingual	(*N 1025)	Latin 2, Multilingual	(959 870)
QA3R959912	Cyrillic, Multilingual	(*N 1025)	8-bit ASCII/ISO Latin 2	(959 912)
QA3R960880	Cyrillic, Multilingual	(*N 1025)	Cyrillic, Multilingual (old)	(960 880)
QA3SA7A857	Turkey EBCDIC	(*N 1026)	PC-Turkey	(1152 857)
QA3SA7A920	Turkey EBCDIC	(*N 1026)	ASCII-Turkey	(1152 920)
QA3SA7RA3B	Turkey EBCDIC	(*N 1026)	International Alphabet 5	(1169 1009)
QA3S337037	Turkey EBCDIC	(*N 1026)	USA/Canada	(337 037)
QA3S337256	Turkey EBCDIC	(*N 1026)	Multinational #1	(337 256)
QA3S337500	Turkey EBCDIC	(*N 1026)	Multinational #5	(337 500)
QA3S965905	Turkey EBCDIC	(*N 1026)	PC-Turkey	(965 905)
QA3T697037	Japan (Latin Extended)	(*N 1027)	USA/Canada	(697 037)
QA3T697500	Japan (Latin Extended)	(*N 1027)	Multinational #5	(697 500)
QA33A93A3Q	CCITT T.61 IBM PC	(*N 1036)	CCITT T.61 (EBCDIC)	(1252 1024)
QA5K697500	VT100 Line drawing set	(*N 1090)	Multinational #5	(697 500)
QA5U697500	* Undefined in resource	(*N VT220 Multinational)	Multinational #5	(697 500)
QA5V697500	VT220 British	(*N 1101)	Multinational #5	(697 500)
QA5W697500	VT220 Dutch	(*N 1102)	Multinational #5	(697 500)
QA5X697500	VT220 Finnish	(*N 1103)	Multinational #5	(697 500)

Table I-1 (Page 3 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
QA5Y697500	VT220 French	(*N 1104)	Multinational #5	(697 500)
QA5Z697500	VT220 Norwegian/Danish	(*N 1105)	Multinational #5	(697 500)
QA51697500	VT220 Swedish	(*N 1106)	Multinational #5	(697 500)
QA52697500	VT220 Norwegian/Danish Alt	(*N 1107)	Multinational #5	(697 500)
Q037A69A3R	USA/Canada	(*N 037)	Cyrillic, Multilingual	(1150 1025)
Q037A7AA3S	USA/Canada	(*N 037)	Turkey EBCDIC	(1152 1026)
Q037A7RA3B	USA/Canada	(*N 037)	International Alphabet 5	(1169 1009)
Q037A7UA3T	USA/Canada	(*N 037)	Japan (Latin Extended)	(1172 1027)
Q037A7U290	USA/Canada	(*N 037)	Japan Katakana	(1172 290)
Q037A7W836	USA/Canada	(*N 037)	People's Republic of China	(1174 836)
Q037A7Y838	USA/Canada	(*N 037)	Thai Extended	(1176 838)
Q037A7Y874	USA/Canada	(*N 037)	PC-Thai Extended	(1176 874)
Q037337256	USA/Canada	(*N 037)	Multinational #1	(337 256)
Q037337437	USA/Canada	(*N 037)	PC-USA	(337 437)
Q037337850	USA/Canada	(*N 037)	PC-Multilingual	(337 850)
Q037337860	USA/Canada	(*N 037)	PC-Portugal	(337 860)
Q037337863	USA/Canada	(*N 037)	PC-Canadian French	(337 863)
Q037337904	USA/Canada	(*N 037)	PC-People's Republic of China	(337 904)
Q037936836	USA/Canada	(*N 037)	People's Republic of China	(936 836)
Q037959870	USA/Canada	(*N 037)	Latin 2, Multilingual	(959 870)
Q037960880	USA/Canada	(*N 037)	Cyrillic, Multilingual (old)	(960 880)
Q037965905	USA/Canada	(*N 037)	PC-Turkey	(965 905)
Q038337256	USA/ASCII	(*N 038)	Multinational #1	(337 256)
Q256A69A3R	Multinational #1	(*N 256)	Cyrillic, Multilingual	(1150 1025)
Q256A7AA3S	Multinational #1	(*N 256)	Turkey EBCDIC	(1152 1026)
Q256A7V833	Multinational #1	(*N 256)	Korea	(1173 833)
Q256A7W836	Multinational #1	(*N 256)	People's Republic of China	(1174 836)
Q256A7X037	Multinational #1	(*N 256)	USA/Canada	(1175 037)
Q256001256	Multinational #1	(*N 256)	Multinational #1	(001 256)
Q256101037	Multinational #1	(*N 256)	USA/Canada	(101 037)
Q256101367	Multinational #1	(*N 256)	ASCII	(101 367)
Q256103038	Multinational #1	(*N 256)	USA/ASCII	(103 038)

Table I-1 (Page 4 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q256218423	Multinational #1	(*N 256)	Greece	(218 423)
Q256235420	Multinational #1	(*N 256)	Arabic Bilingual	(235 420)
Q256265273	Multinational #1	(*N 256)	Austria/Germany	(265 273)
Q256269274	Multinational #1	(*N 256)	Belgium	(269 274)
Q256273275	Multinational #1	(*N 256)	Brazil	(273 275)
Q256277276	Multinational #1	(*N 256)	Canada (French)	(277 276)
Q256281277	Multinational #1	(*N 256)	Denmark/Norway	(281 277)
Q256285278	Multinational #1	(*N 256)	Finland/Sweden	(285 278)
Q256288297	Multinational #1	(*N 256)	France	(288 297)
Q256289279	Multinational #1	(*N 256)	France	(289 279)
Q256293280	Multinational #1	(*N 256)	Italy	(293 280)
Q256297281	Multinational #1	(*N 256)	Japan (Latin)	(297 281)
Q256301282	Multinational #1	(*N 256)	Portugal	(301 282)
Q256305283	Multinational #1	(*N 256)	Spain	(305 283)
Q256309284	Multinational #1	(*N 256)	Spain/Latin America	(309 284)
Q256313285	Multinational #1	(*N 256)	United Kingdom	(313 285)
Q256332290	Multinational #1	(*N 256)	Japan Katakana	(332 290)
Q256337037	Multinational #1	(*N 256)	USA/Canada	(337 037)
Q256337273	Multinational #1	(*N 256)	Austria/Germany	(337 273)
Q256337274	Multinational #1	(*N 256)	Belgium	(337 274)
Q256337275	Multinational #1	(*N 256)	Brazil	(337 275)
Q256337276	Multinational #1	(*N 256)	Canada (French)	(337 276)
Q256337277	Multinational #1	(*N 256)	Denmark/Norway	(337 277)
Q256337278	Multinational #1	(*N 256)	Finland/Sweden	(337 278)
Q256337280	Multinational #1	(*N 256)	Italy	(337 280)
Q256337281	Multinational #1	(*N 256)	Japan (Latin)	(337 281)
Q256337282	Multinational #1	(*N 256)	Portugal	(337 282)
Q256337283	Multinational #1	(*N 256)	Spain	(337 283)
Q256337284	Multinational #1	(*N 256)	Spain/Latin America	(337 284)
Q256337285	Multinational #1	(*N 256)	United Kingdom	(337 285)
Q256337297	Multinational #1	(*N 256)	France	(337 297)
Q256337833	Multinational #1	(*N 256)	Korea	(337 833)
Q256338257	Multinational #1	(*N 256)	Multinational #2	(338 257)
Q256339258	Multinational #1	(*N 256)	Multinational #3	(339 258)
Q256340259	Multinational #1	(*N 256)	Symbols, Set #7	(340 259)
Q256341260	Multinational #1	(*N 256)	Canada French	(341 260)
Q256697871	Multinational #1	(*N 256)	Iceland	(697 871)

Table I-1 (Page 5 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q256925875	Multinational #1	(*N 256)	Greece	(925 875)
Q256933833	Multinational #1	(*N 256)	Korea	(933 833)
Q256936836	Multinational #1	(*N 256)	People's Republic of China	(936 836)
Q256938838	Multinational #1	(*N 256)	Thai Extended	(938 838)
Q256941424	Multinational #1	(*N 256)	Israel (Hebrew)	(941 424)
Q256959870	Multinational #1	(*N 256)	Latin 2, Multilingual	(959 870)
Q256960880	Multinational #1	(*N 256)	Cyrillic, Multilingual (old)	(960 880)
Q257337256	Multinational #2	(*N 257)	Multinational #1	(337 256)
Q258337256	Multinational #3	(*N 258)	Multinational #1	(337 256)
Q259337256	Symbols, Set #7	(*N 259)	Multinational #1	(337 256)
Q260337256	Canada French	(*N 260)	Multinational #1	(337 256)
Q273A7RA3B	Austria/Germany	(*N 273)	International Alphabet 5	(1169 1009)
Q273337256	Austria/Germany	(*N 273)	Multinational #1	(337 256)
Q273337437	Austria/Germany	(*N 273)	PC-USA	(337 437)
Q273337850	Austria/Germany	(*N 273)	PC-Multilingual	(337 850)
Q274337256	Belgium	(*N 274)	Multinational #1	(337 256)
Q275337256	Brazil	(*N 275)	Multinational #1	(337 256)
Q276337256	Canada (French)	(*N 276)	Multinational #1	(337 256)
Q277A7RA3B	Denmark/Norway	(*N 277)	International Alphabet 5	(1169 1009)
Q277337256	Denmark/Norway	(*N 277)	Multinational #1	(337 256)
Q277337850	Denmark/Norway	(*N 277)	PC-Multilingual	(337 850)
Q277337865	Denmark/Norway	(*N 277)	PC-Nordic	(337 865)
Q278A7RA3B	Finland/Sweden	(*N 278)	International Alphabet 5	(1169 1009)
Q278337256	Finland/Sweden	(*N 278)	Multinational #1	(337 256)
Q278337437	Finland/Sweden	(*N 278)	PC-USA	(337 437)
Q278337850	Finland/Sweden	(*N 278)	PC-Multilingual	(337 850)
Q279337256	France	(*N 279)	Multinational #1	(337 256)
Q280A7RA3B	Italy	(*N 280)	International Alphabet 5	(1169 1009)
Q280337256	Italy	(*N 280)	Multinational #1	(337 256)
Q280337437	Italy	(*N 280)	PC-USA	(337 437)
Q280337850	Italy	(*N 280)	PC-Multilingual	(337 850)
Q281337256	Japan (Latin)	(*N 281)	Multinational #1	(337 256)
Q282337256	Portugal	(*N 282)	Multinational #1	(337 256)
Q282337850	Portugal	(*N 282)	PC-Multilingual	(337 850)
Q282337860	Portugal	(*N 282)	PC-Portugal	(337 860)
Q283337256	Spain	(*N 283)	Multinational #1	(337 256)

Table I-1 (Page 6 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q284A7RA3B	Spain/Latin America	(*N 284)	International Alphabet 5	(1169 1009)
Q284337256	Spain/Latin America	(*N 284)	Multinational #1	(337 256)
Q284337437	Spain/Latin America	(*N 284)	PC-USA	(337 437)
Q284337850	Spain/Latin America	(*N 284)	PC-Multilingual	(337 850)
Q285337256	United Kingdom	(*N 285)	Multinational #1	(337 256)
Q285337437	United Kingdom	(*N 285)	PC-USA	(337 437)
Q285337850	United Kingdom	(*N 285)	PC-Multilingual	(337 850)
Q290A7RA3B	Japan Katakana	(*N 290)	International Alphabet 5	(1169 1009)
Q290337256	Japan Katakana	(*N 290)	Multinational #1	(337 256)
Q290337897	Japan Katakana	(*N 290)	PC-Japan	(337 897)
Q290697037	Japan Katakana	(*N 290)	USA/Canada	(697 037)
Q290697500	Japan Katakana	(*N 290)	Multinational #5	(697 500)
Q297A7RA3B	France	(*N 297)	International Alphabet 5	(1169 1009)
Q297337256	France	(*N 297)	Multinational #1	(337 256)
Q297337437	France	(*N 297)	PC-USA	(337 437)
Q297337850	France	(*N 297)	PC-Multilingual	(337 850)
Q367A7RA3B	ASCII	(*N 367)	International Alphabet 5	(1169 1009)
Q367337256	ASCII	(*N 367)	Multinational #1	(337 256)
Q367697500	ASCII	(*N 367)	Multinational #5	(697 500)
Q420235864	Arabic Bilingual	(*N 420)	PC-Arabic	(235 864)
Q420337256	Arabic Bilingual	(*N 420)	Multinational #1	(337 256)
Q423A7RA3B	Greece	(*N 423)	International Alphabet 5	(1169 1009)
Q423218851	Greece	(*N 423)	PC-Greece (old)	(218 851)
Q423697256	Greece	(*N 423)	Multinational #1	(697 256)
Q423925875	Greece	(*N 423)	Greece	(925 875)
Q423998869	Greece	(*N 423)	PC-Greece	(998 869)
Q424697256	Israel (Hebrew)	(*N 424)	Multinational #1	(697 256)
Q424941862	Israel (Hebrew)	(*N 424)	PC-Israel	(941 862)
Q437A0ZA5S	PC-USA	(*N 437)	PC-Farsi	(A0Z 1098)
Q437A69A3R	PC-USA	(*N 437)	Cyrillic, Multilingual	(1150 1025)
Q437A7X037	PC-USA	(*N 437)	USA/Canada	(1175 037)
Q437101037	PC-USA	(*N 437)	USA/Canada	(101 037)
Q437337037	PC-USA	(*N 437)	USA/Canada	(337 037)
Q437337273	PC-USA	(*N 437)	Austria/Germany	(337 273)
Q437337278	PC-USA	(*N 437)	Finland/Sweden	(337 278)
Q437337280	PC-USA	(*N 437)	Italy	(337 280)
Q437337284	PC-USA	(*N 437)	Spain/Latin America	(337 284)

Table I-1 (Page 7 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q437337285	PC-USA	(*N 437)	United Kingdom	(337 285)
Q437337297	PC-USA	(*N 437)	France	(337 297)
Q437337500	PC-USA	(*N 437)	Multinational #5	(337 500)
Q437959870	PC-USA	(*N 437)	Latin 2, Multilingual	(959 870)
Q437960880	PC-USA	(*N 437)	Cyrillic, Multilingual (old)	(960 880)
Q500A0MA5K	Multinational #5	(*N 500)	VT100 Line drawing set	(1272 1090)
Q500A00A5Z	Multinational #5	(*N 500)	VT220 Norwegian/Danish	(A00 1105)
Q500A05A5U	Multinational #5	(*N 500)	VT220 Multinational	(A05 A5U)
Q500A06A5V	Multinational #5	(*N 500)	VT220 British	(A06 1101)
Q500A07A5W	Multinational #5	(*N 500)	VT220 Dutch	(A07 1102)
Q500A08A5X	Multinational #5	(*N 500)	VT220 Finnish	(A08 1103)
Q500A69A3R	Multinational #5	(*N 500)	Cyrillic, Multilingual	(1150 1025)
Q500A7AA3S	Multinational #5	(*N 500)	Turkey EBCDIC	(1152 1026)
Q500A7RA3B	Multinational #5	(*N 500)	International Alphabet 5	(1169 1009)
Q500A7UA3T	Multinational #5	(*N 500)	Japan (Latin Extended)	(1172 1027)
Q500A7U290	Multinational #5	(*N 500)	Japan Katakana	(1172 290)
Q500A7W836	Multinational #5	(*N 500)	People's Republic of China	(1174 836)
Q500A7X037	Multinational #5	(*N 500)	USA/Canada	(1175 037)
Q500A7Y838	Multinational #5	(*N 500)	Thai Extended	(1176 838)
Q500A7Y874	Multinational #5	(*N 500)	PC-Thai Extended	(1176 874)
Q500A8EA3M	Multinational #5	(*N 500)	VT220 Canadian/French	(A8E 1020)
Q500A8FA3N	Multinational #5	(*N 500)	VT220 Switzerland	(A8F 1021)
Q500A8HA3P	Multinational #5	(*N 500)	VT220 Spain	(A8H 1023)
Q500BAAA51	Multinational #5	(*N 500)	VT220 Swedish	(BAA 1106)
Q500BABA52	Multinational #5	(*N 500)	VT220 Norwegian/Danish Alt	(BAB 1107)
Q500103367	Multinational #5	(*N 500)	ASCII	(103 367)
Q500265A3D	Multinational #5	(*N 500)	#7 Bit Germany	(265 1011)
Q500289A5Y	Multinational #5	(*N 500)	VT220 French	(289 1104)
Q500293A3E	Multinational #5	(*N 500)	#7 Bit Italy	(293 1012)
Q500337437	Multinational #5	(*N 500)	PC-USA	(337 437)
Q500337836	Multinational #5	(*N 500)	People's Republic of China	(337 836)
Q500337850	Multinational #5	(*N 500)	PC-Multilingual	(337 850)
Q500337860	Multinational #5	(*N 500)	PC-Portugal	(337 860)

Table I-1 (Page 8 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q500337861	Multinational #5	(*N 500)	PC-Iceland	(337 861)
Q500337863	Multinational #5	(*N 500)	PC-Canadian French	(337 863)
Q500337865	Multinational #5	(*N 500)	PC-Nordic	(337 865)
Q500697037	Multinational #5	(*N 500)	USA/Canada	(697 037)
Q500697280	Multinational #5	(*N 500)	Italy	(697 280)
Q500925875	Multinational #5	(*N 500)	Greece	(925 875)
Q500936836	Multinational #5	(*N 500)	People's Republic of China	(936 836)
Q500959870	Multinational #5	(*N 500)	Latin 2, Multilingual	(959 870)
Q500960880	Multinational #5	(*N 500)	Cyrillic, Multilingual (old)	(960 880)
Q500965905	Multinational #5	(*N 500)	PC-Turkey	(965 905)
Q500981851	Multinational #5	(*N 500)	PC-Greece (old)	(981 851)
Q500998869	Multinational #5	(*N 500)	PC-Greece	(998 869)
Q813998869	8-bit ASCII/ISO Greece	(*N 813)	PC-Greece	(998 869)
Q833A7RA3B	Korea	(*N 833)	International Alphabet 5	(1169 1009)
Q833337256	Korea	(*N 833)	Multinational #1	(337 256)
Q833337891	Korea	(*N 833)	PC-Korea	(337 891)
Q833933256	Korea	(*N 833)	Multinational #1	(933 256)
Q836A7RA3B	People's Republic of China	(*N 836)	International Alphabet 5	(1169 1009)
Q836A7X037	People's Republic of China	(*N 836)	USA/Canada	(1175 037)
Q836101037	People's Republic of China	(*N 836)	USA/Canada	(101 037)
Q836337256	People's Republic of China	(*N 836)	Multinational #1	(337 256)
Q836337500	People's Republic of China	(*N 836)	Multinational #5	(337 500)
Q836337903	People's Republic of China	(*N 836)	PC-People's Republic of China	(337 903)
Q836936500	People's Republic of China	(*N 836)	Multinational #5	(936 500)
Q838A7Y500	Thai Extended	(*N 838)	Multinational #5	(1176 500)
Q838A7Y874	Thai Extended	(*N 838)	PC-Thai Extended	(1176 874)
Q838337037	Thai Extended	(*N 838)	USA/Canada	(337 037)
Q850A69A3R	PC-Multilingual	(*N 850)	Cyrillic, Multilingual	(1150 1025)
Q850337A5R	PC-Multilingual	(*N 850)	Farsi EBCDIC	(337 1097)
Q850337037	PC-Multilingual	(*N 850)	USA/Canada	(337 037)
Q850337273	PC-Multilingual	(*N 850)	Austria/Germany	(337 273)

Table I-1 (Page 9 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q850337277	PC-Multilingual	(*N 850)	Denmark/Norway	(337 277)
Q850337278	PC-Multilingual	(*N 850)	Finland/Sweden	(337 278)
Q850337280	PC-Multilingual	(*N 850)	Italy	(337 280)
Q850337282	PC-Multilingual	(*N 850)	Portugal	(337 282)
Q850337284	PC-Multilingual	(*N 850)	Spain/Latin America	(337 284)
Q850337285	PC-Multilingual	(*N 850)	United Kingdom	(337 285)
Q850337297	PC-Multilingual	(*N 850)	France	(337 297)
Q850337500	PC-Multilingual	(*N 850)	Multinational #5	(337 500)
Q850337871	PC-Multilingual	(*N 850)	Iceland	(337 871)
Q850959870	PC-Multilingual	(*N 850)	Latin 2, Multilingual	(959 870)
Q850960880	PC-Multilingual	(*N 850)	Cyrillic, Multilingual (old)	(960 880)
Q851218423	PC-Greece (old)	(*N 851)	Greece	(218 423)
Q851925875	PC-Greece (old)	(*N 851)	Greece	(925 875)
Q852A69A3R	PC-Latin 2	(*N 852)	Cyrillic, Multilingual	(1150 1025)
Q852959870	PC-Latin 2	(*N 852)	Latin 2, Multilingual	(959 870)
Q852960880	PC-Latin 2	(*N 852)	Cyrillic, Multilingual (old)	(960 880)
Q853965905	PC-Latin 3	(*N 853)	PC-Turkey	(965 905)
Q855A69A3R	PC-Cyrillic	(*N 855)	Cyrillic, Multilingual	(1150 1025)
Q855959870	PC-Cyrillic	(*N 855)	Latin 2, Multilingual	(959 870)
Q855960880	PC-Cyrillic	(*N 855)	Cyrillic, Multilingual (old)	(960 880)
Q857A7AA3S	PC-Turkey	(*N 857)	Turkey EBCDIC	(1152 1026)
Q857965905	PC-Turkey	(*N 857)	PC-Turkey	(965 905)
Q860337037	PC-Portugal	(*N 860)	USA/Canada	(337 037)
Q860337282	PC-Portugal	(*N 860)	Portugal	(337 282)
Q860337500	PC-Portugal	(*N 860)	Multinational #5	(337 500)
Q861337500	PC-Iceland	(*N 861)	Multinational #5	(337 500)
Q861337871	PC-Iceland	(*N 861)	Iceland	(337 871)
Q862941424	PC-Israel	(*N 862)	Israel (Hebrew)	(941 424)
Q863337037	PC-Canadian French	(*N 863)	USA/Canada	(337 037)
Q863337500	PC-Canadian French	(*N 863)	Multinational #5	(337 500)
Q864235420	PC-Arabic	(*N 864)	Arabic Bilingual	(235 420)
Q865337277	PC-Nordic	(*N 865)	Denmark/Norway	(337 277)
Q865337500	PC-Nordic	(*N 865)	Multinational #5	(337 500)
Q869218423	PC-Greece	(*N 869)	Greece	(218 423)
Q869337256	PC-Greece	(*N 869)	Multinational #1	(337 256)

Table I-1 (Page 10 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q869337500	PC-Greece	(*N 869)	Multinational #5	(337 500)
Q869925813	PC-Greece	(*N 869)	8-bit ASCII/ISO Greece	(925 813)
Q869925875	PC-Greece	(*N 869)	Greece	(925 875)
Q869981851	PC-Greece	(*N 869)	PC-Greece (old)	(981 851)
Q870A69A3R	Latin 2, Multilingual	(*N 870)	Cyrillic, Multilingual	(1150 1025)
Q870A69855	Latin 2, Multilingual	(*N 870)	PC-Cyrillic	(1150 855)
Q870A69915	Latin 2, Multilingual	(*N 870)	8-bit ASCII/ISO Cyrillic	(1150 915)
Q870A7RA3B	Latin 2, Multilingual	(*N 870)	International Alphabet 5	(1169 1009)
Q870337256	Latin 2, Multilingual	(*N 870)	Multinational #1	(337 256)
Q870697037	Latin 2, Multilingual	(*N 870)	USA/Canada	(697 037)
Q870697500	Latin 2, Multilingual	(*N 870)	Multinational #5	(697 500)
Q870697850	Latin 2, Multilingual	(*N 870)	PC-Multilingual	(697 850)
Q870919437	Latin 2, Multilingual	(*N 870)	PC-USA	(919 437)
Q870959852	Latin 2, Multilingual	(*N 870)	PC-Latin 2	(959 852)
Q870959912	Latin 2, Multilingual	(*N 870)	8-bit ASCII/ISO Latin 2	(959 912)
Q870960880	Latin 2, Multilingual	(*N 870)	Cyrillic, Multilingual (old)	(960 880)
Q871A7RA3B	Iceland	(*N 871)	International Alphabet 5	(1169 1009)
Q871337850	Iceland	(*N 871)	PC-Multilingual	(337 850)
Q871337861	Iceland	(*N 871)	PC-Iceland	(337 861)
Q871697256	Iceland	(*N 871)	Multinational #1	(697 256)
Q874A7Y500	PC-Thai Extended	(*N 874)	Multinational #5	(1176 500)
Q874A7Y838	PC-Thai Extended	(*N 874)	Thai Extended	(1176 838)
Q874337037	PC-Thai Extended	(*N 874)	USA/Canada	(337 037)
Q875A7RA3B	Greece	(*N 875)	International Alphabet 5	(1169 1009)
Q875218423	Greece	(*N 875)	Greece	(218 423)
Q875337256	Greece	(*N 875)	Multinational #1	(337 256)
Q875337500	Greece	(*N 875)	Multinational #5	(337 500)
Q875925813	Greece	(*N 875)	8-bit ASCII/ISO Greece	(925 813)
Q875981851	Greece	(*N 875)	PC-Greece (old)	(981 851)
Q875998869	Greece	(*N 875)	PC-Greece	(998 869)
Q880A69A3R	Cyrillic, Multilingual (old)	(*N 880)	Cyrillic, Multilingual	(1150 1025)
Q880A69855	Cyrillic, Multilingual (old)	(*N 880)	PC-Cyrillic	(1150 855)
Q880A69915	Cyrillic, Multilingual (old)	(*N 880)	8-bit ASCII/ISO Cyrillic	(1150 915)
Q880A7RA3B	Cyrillic, Multilingual (old)	(*N 880)	International Alphabet 5	(1169 1009)

Table I-1 (Page 11 of 11). Conversion Tables on the AS/400 System

Table Object Name	From Description	From Value	To Description	To Value
Q880337256	Cyrillic, Multilingual (old)	(*N 880)	Multinational #1	(337 256)
Q880697037	Cyrillic, Multilingual (old)	(*N 880)	USA/Canada	(697 037)
Q880697500	Cyrillic, Multilingual (old)	(*N 880)	Multinational #5	(697 500)
Q880697850	Cyrillic, Multilingual (old)	(*N 880)	PC-Multilingual	(697 850)
Q880919437	Cyrillic, Multilingual (old)	(*N 880)	PC-USA	(919 437)
Q880959852	Cyrillic, Multilingual (old)	(*N 880)	PC-Latin 2	(959 852)
Q880959870	Cyrillic, Multilingual (old)	(*N 880)	Latin 2, Multilingual	(959 870)
Q880959912	Cyrillic, Multilingual (old)	(*N 880)	8-bit ASCII/ISO Latin 2	(959 912)
Q891337833	PC-Korea	(*N 891)	Korea	(337 833)
Q897337290	PC-Japan	(*N 897)	Japan Katakana	(337 290)
Q897358037	PC-Japan	(*N 897)	USA/Canada	(358 037)
Q897640037	PC-Japan	(*N 897)	USA/Canada	(640 037)
Q903A7W836	PC-People's Republic of China	(*N 903)	People's Republic of China	(1174 836)
Q903337836	PC-People's Republic of China	(*N 903)	People's Republic of China	(337 836)
Q904337037	PC-People's Republic of China	(*N 904)	USA/Canada	(337 037)
Q905A7AA3S	PC-Turkey	(*N 905)	Turkey EBCDIC	(1152 1026)
Q905337037	PC-Turkey	(*N 905)	USA/Canada	(337 037)
Q905697500	PC-Turkey	(*N 905)	Multinational #5	(697 500)
Q905965853	PC-Turkey	(*N 905)	PC-Latin 3	(965 853)
Q905965857	PC-Turkey	(*N 905)	PC-Turkey	(965 857)
Q912A69A3R	8-bit ASCII/ISO Latin 2	(*N 912)	Cyrillic, Multilingual	(1150 1025)
Q912959870	8-bit ASCII/ISO Latin 2	(*N 912)	Latin 2, Multilingual	(959 870)
Q912960880	8-bit ASCII/ISO Latin 2	(*N 912)	Cyrillic, Multilingual (old)	(960 880)
Q915A69A3R	8-bit ASCII/ISO Cyrillic	(*N 915)	Cyrillic, Multilingual	(1150 1025)
Q915959870	8-bit ASCII/ISO Cyrillic	(*N 915)	Latin 2, Multilingual	(959 870)
Q915960880	8-bit ASCII/ISO Cyrillic	(*N 915)	Cyrillic, Multilingual (old)	(960 880)
Q920A7AA3S	ASCII-Turkey	(*N 920)	Turkey EBCDIC	(1152 1026)

CCITT T.61 Graphic Character Conversions

The following chart is a list of T.61 conversions supported on the AS/400 system. It gives the table name and the description and value of the character set and code page converted from and converted to. The *N character in the From Value field means any character set is used.

These conversion tables are used to convert data to and from character set 1253 on code page 1024 to another supported character set and code page. To convert the data, call the program QDCXLATE. See the *CL Programmer's Guide* for more information on QDCXLATE and CCITT T.61 conversions.

Table I-2 (Page 1 of 2). T.61 Conversions on the AS/400 System

Table Name	From Description	From Value	To Description	To Value
QA3BA94A3Q	International Alphabet 5	(*N 1009)	CCITT T.61 (EBCDIC)	(A94 1024)
QA3QA69A3R	CCITT T.61 (EBCDIC)	(*N 1024)	Cyrillic, Multilingual	(1150 1025)
QA3QA7AA3S	CCITT T.61 (EBCDIC)	(*N 1024)	Turkey EBCDIC	(1152 1026)
QA3QA7RA3B	CCITT T.61 (EBCDIC)	(*N 1024)	International Alphabet 5	(1169 1009)
QA3QA7W836	CCITT T.61 (EBCDIC)	(*N 1024)	People's Republic of China	(1174 836)
QA3Q103367	CCITT T.61 (EBCDIC)	(*N 1024)	ASCII	(103 367)
QA3Q218423	CCITT T.61 (EBCDIC)	(*N 1024)	Greece	(218 423)
QA3Q332290	CCITT T.61 (EBCDIC)	(*N 1024)	Japan Katakana	(332 290)
QA3Q697037	CCITT T.61 (EBCDIC)	(*N 1024)	USA/Canada	(697 037)
QA3Q697273	CCITT T.61 (EBCDIC)	(*N 1024)	Austria/Germany	(697 273)
QA3Q697277	CCITT T.61 (EBCDIC)	(*N 1024)	Denmark/Norway	(697 277)
QA3Q697278	CCITT T.61 (EBCDIC)	(*N 1024)	Finland/Sweden	(697 278)
QA3Q697280	CCITT T.61 (EBCDIC)	(*N 1024)	Italy	(697 280)
QA3Q697284	CCITT T.61 (EBCDIC)	(*N 1024)	Spain/Latin America	(697 284)
QA3Q697297	CCITT T.61 (EBCDIC)	(*N 1024)	France	(697 297)
QA3Q697500	CCITT T.61 (EBCDIC)	(*N 1024)	Multinational #5	(697 500)
QA3Q697871	CCITT T.61 (EBCDIC)	(*N 1024)	Iceland	(697 871)
QA3Q925875	CCITT T.61 (EBCDIC)	(*N 1024)	Greece	(925 875)
QA3Q933833	CCITT T.61 (EBCDIC)	(*N 1024)	Korea	(933 833)
QA3Q936836	CCITT T.61 (EBCDIC)	(*N 1024)	People's Republic of China	(936 836)
QA3Q959870	CCITT T.61 (EBCDIC)	(*N 1024)	Latin 2, Multilingual	(959 870)
QA3Q960880	CCITT T.61 (EBCDIC)	(*N 1024)	Cyrillic, Multilingual (old)	(960 880)
QA3RA94A3Q	Cyrillic, Multilingual	(*N 1025)	CCITT T.61 (EBCDIC)	(A94 1024)
QA3SA94A3Q	Turkey EBCDIC	(*N 1026)	CCITT T.61 (EBCDIC)	(A94 1024)
Q037A94A3Q	USA/Canada	(*N 037)	CCITT T.61 (EBCDIC)	(A94 1024)
Q273A94A3Q	Austria/Germany	(*N 273)	CCITT T.61 (EBCDIC)	(A94 1024)
Q277A94A3Q	Denmark/Norway	(*N 277)	CCITT T.61 (EBCDIC)	(A94 1024)

Table I-2 (Page 2 of 2). T.61 Conversions on the AS/400 System

Table Name	From Description	From Value	To Description	To Value
Q278A94A3Q	Finland/Sweden	(*N 278)	CCITT T.61 (EBCDIC)	(A94 1024)
Q280A94A3Q	Italy	(*N 280)	CCITT T.61 (EBCDIC)	(A94 1024)
Q284A94A3Q	Spain/Latin America	(*N 284)	CCITT T.61 (EBCDIC)	(A94 1024)
Q290A94A3Q	Japan Katakana	(*N 290)	CCITT T.61 (EBCDIC)	(A94 1024)
Q297A94A3Q	France	(*N 297)	CCITT T.61 (EBCDIC)	(A94 1024)
Q367A94A3Q	ASCII	(*N 367)	CCITT T.61 (EBCDIC)	(A94 1024)
Q423A94A3Q	Greece	(*N 423)	CCITT T.61 (EBCDIC)	(A94 1024)
Q500A94A3Q	Multinational #5	(*N 500)	CCITT T.61 (EBCDIC)	(A94 1024)
Q833A94A3Q	Korea	(*N 833)	CCITT T.61 (EBCDIC)	(A94 1024)
Q836A94A3Q	People's Republic of China	(*N 836)	CCITT T.61 (EBCDIC)	(A94 1024)
Q870A94A3Q	Latin 2, Multilingual	(*N 870)	CCITT T.61 (EBCDIC)	(A94 1024)
Q871A94A3Q	Iceland	(*N 871)	CCITT T.61 (EBCDIC)	(A94 1024)
Q875A94A3Q	Greece	(*N 875)	CCITT T.61 (EBCDIC)	(A94 1024)
Q880A94A3Q	Cyrillic, Multilingual (old)	(*N 880)	CCITT T.61 (EBCDIC)	(A94 1024)

Monocase Tables

The following is a list of monocase tables on the AS/400 system.

Table I-3. Monocase Tables

Code Page	Table Object for Monocase	Description
037	Q037	USA/Canada (EBCDIC)
256	Q256	International 1 (EBCDIC)
260	Q260	Canadian French (EBCDIC)
273	Q273	Germany/Austria (EBCDIC)
277	Q277	Denmark, Norway (EBCDIC)
278	Q278	Finland, Sweden (EBCDIC)
280	Q280	Italy (EBCDIC)
281	Q281	Japan Latin (EBCDIC)
284	Q284	Spain/Latin America (EBCDIC)
285	Q285	United Kingdom (EBCDIC)
290	Q290	Japanese Katakana extended
297	Q297	France (EBCDIC)
420	Q420	Arabic Bilingual (EBCDIC)
423	Q423	Greece (EBCDIC)
424	Q424	Israel (Hebrew)
437	Q437	USA (IBM Personal Computer)
500	Q500	Multilingual #5
833	Q833	Korean Extended (EBCDIC)
836	Q836	Simplified Chinese Extended (EBCDIC)
838	Q838	Thai Extended (EBCDIC)
850	Q850	Multilingual (IBM Personal Computer)
851	Q851	Greece (IBM Personal Computer)
857	Q857	Turkey (ISO 8859-5)
860	Q860	Portugal (IBM Personal Computer)
861	Q861	Iceland (IBM Personal Computer)
862	Q862	Israel (IBM Personal Computer)
863	Q863	Canadian French (IBM Personal Computer)
864	Q864	Arabic (IBM Personal Computer)
865	Q865	Nordic (IBM Personal Computer)
870	Q870	Multilingual (ISO 8859-2)
871	Q871	Iceland (EBCDIC)
875	Q875	Greece (EBCDIC)
880	Q880	Cyrillic, Multilingual
891	Q891	Korea (IBM Personal Computer)
897	Q897	Japan PC #1 (IBM Personal Computer)
903	Q903	People's Republic of China (IBM Personal Computer)
904	Q904	Republic of China (IBM Personal Computer)
905	Q905	PC-Turkey (ISO 8859-9)
1025	QA3R	Cyrillic, Multilingual (EBCDIC)
1026	QA3S	Turkey (ISO 8859-9)
1027	QA3T	Japanese (Latin) Extended (EBCDIC)

Appendix J. PC Support National Language Information

The following table lists the national language information recommended for the INZPCS (Initialize PC Support/400) command when configuring your system for PC Support/400.

Language	Primary Using Country	NLV Feature Code Number	EBCDIC Code Page	Prim./ Code Page (1)	Sec. Code Page (1)	Keyboard ID's			Alternative Graphic (3)	Layer 100 (4)	Lock Sed. (5)	Numeric Pad (6)
						PC	5250	G and 122				
Arabic	Arabic Speaking	N/A (2)	420	864 (2)	850	238	238	239	N/A	N	CCS	N/A
Belgium Dutch	Belgium	2963	500	850	437	120	269	120	C	Y	SSC	Comma
Belgium French	Belgium	2966	500	850	437	120	269	120	C	Y	SSC	Comma
Brazilian Portuguese	Brazil	2980	037	850	270	N/A	N/A	275	C	Y	SSC	Comma
Canadian French	Canada	2981	500	850	863	103B	277	058	S	Y	CCS	Comma
Danish	Denmark	2926	277	850	865	267	281	159	S	Y	CCS	Comma
Dutch	Netherlands	2923	037	850	437	103B	101	143	C	Y	CCS	Comma
Dutch MNCS	Belgium	2963	500	850	437	103B	101	143	C	Y	CCS	Comma
English U/L	United States	2924	037	437	850	101G	101	101G	C	Y	CCS	Comma
English UC	United States	2950	037	437	850	103B	101	103F	C	Y	CCS	Period
English UK	Great Britain	N/A	285	437	850	166	313	166	C	Y	CCS	Period
English UC (DBCS)	Japan	2938	290	897	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
English U/L (DBCS)	Japan	2984	037	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Finnish	Finland	2925	278	850	437	268	285	153	S	Y	CCS	Comma
French	France	2928	297	437	850	248	189	120	C	Y	SSC	Comma
French-MNCS	Switzerland	2940	500	850	437	NA	150F	150F	C	Y	SSC	Period
German	Germany/Austria	2929	273	437	850	249	265	129	C	Y	SSC	Comma
German-MNCS	Switzerland	2939	500	850	437	N/A	150G	150G	C	Y	SSC	Period
Greek	Greece	2957	875	869	850	N/A	N/A	319/218 (8)	N/A	N	SSC	Comma
Hebrew	Israel	N/A (2)	424	862	850	212	210	113	N/A	N	CCS	N/A
Icelandic	Iceland	2958	871	850	861	197	197	197	C	Y	CCS	Comma
Italian	Italy	2932	280	437	850	247	293	142	C	Y	SSC	Comma
Italian MNCS	Switzerland	2942	500	850	437	N/A	150G	150G	N/A	N/A	N/A	N/A
Japanese (DBCS)	Japan	2962	300/290 (7)	301/897 (7)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Korean (DBCS)	Korea	2986	834/833 (7)	926/891 (7)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Norwegian	Norway	2933	277	850	865	266	281N	155	S	Y	CCS	Comma
Portuguese	Portugal	2922	037	850	860	270	163	163	C	Y	CCS	Comma
Portuguese MNCS	Portugal	2996	500	850	860	270	163	163	N/A	N/A	N/A	N/A
Spanish	Spain	2931	284	850	437	172	172	173	C	Y	CCS	Comma
Spanish-LAD	Latin American	N/A (2)	284	437	850	246	170	171	C	Y	CCS	Comma
Simplified Chinese	People's Republic of China	2989	837/836 (7)	928/903 (7)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Swedish	Sweden	2937	278	437	850	268	285	153	S	Y	CCS	Comma
Thai	Thailand	2924	838	874	N/A	N/A	N/A	191	N/A	N/A	CCS	Period
Traditional Chinese	Taiwan	2987	835/037 (7)	927/904 (7)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table J-1 (Page 2 of 2). PC Support National Language Information

Language	Primary Using Country	NLV Feature Code Number	EBCDIC Code Page	Prim./ Code Page (1)	Sec. Code Page (1)	Keyboard ID's			Alternative Graphic (3)	Layer 100 (4)	Lock Sed. (5)	Numeric Pad (6)
						PC	5250	G and 122				
Turkish	Turkey	2956	1026	857	850	N/A	N/A	179	C	Y	CCS	Period

Legend:

Throughout this chart, N/A = Not applicable. G in the Keyboard ID column refers to the Enhanced G (Graphics) keyboard.

1. IBM Personal Computer code page
2. No national language version.
3. Determines how alternative graphics support is activated on PC and AT keyboards:
 - C By pressing the ALT and CTRL key at the same time
 - S By pressing the ALT and SHIFT key at the same time
4. Determines whether the Special-character keyboard sets are available.
5. Determines lock legend for base, SHIFT, and ALT key states.
 - C CAPSLOCK
 - S SHIFTLOCK
6. Determines whether a period or a comma appears on the numeric pad.
7. The first value is the DBCS code page and the second value is the SBCS code page. The INZPC command recognizes only the SBCS code page.
8. This is the old keyboard ID that can be used with IBM Personal Computer code page 851 and EBCDIC code page 423.

Appendix K. REXX/400 Extension Characters

The tables in this appendix show the entire extended character set for REXX/400 and the meaning of each character to REXX.

These tables can be used with the code page tables in Appendix F, "Coded Character Set Identifiers (CCSIDs)" to determine how each character can be used when writing a REXX procedure in a particular code page.

GCGID	A graphic character global identifier
Description	The description of the GCGID
	A/F/U Arabic, Farsi, and Urdu languages
Isolated	A character is in its isolated shape when it is not linked with the preceding or the succeeding character.
Final	A character is in its final shape when it is linked with the preceding character but not with the succeeding character.
Initial	A character is in its initial shape when it is not linked with the preceding character but is connected to the succeeding character.
Middle	A character is in its middle shape when it is linked with both the preceding characters and succeeding characters.
Type	See the following:
NAME	Valid character for variable name or label
INVALID	Not a valid REXX character
NUMBER	REXX numeric character (0 - 9)
OPER	REXX operator character (* /)
PUNCT	REXX punctuation character (comma, semicolon)
STRING	String delimiter (quotation mark, apostrophe)
WHITE	Whitespace (blank or space)

REXX/400 Extension Characters-Axxxxxxx GCGIDs

GCGID	Description		Type
AA010000	Aleph (A/F/U)	Isolated	NAME
AA010002	Aleph (A/F/U)	Final	NAME
AA020000	Aleph Maksura (A)	Isolated	NAME
AA020002	Aleph Maksura (A)	Final	NAME
AA210000	Aleph Madda (A) Aleph Maddey (F) Aleph Madd (U)	Isolated Isolated Isolated	NAME
AA210002	Aleph Madda (A) Aleph Maddey (F)	Final Final	NAME
AA310000	Aleph Hamza (A) Aleph Hamzey (F)	Isolated Isolated	NAME
AA310002	Aleph Hamza (A) Aleph Hamzey (F)	Final Final	NAME
AB010000	Beh (A/F/U)	Isolated-Final	NAME
AB010003	Beh (A/F/U)	Initial-Middle	NAME
AC470000	Ayn (A/F/U)	Isolated	NAME
AC470002	Ayn (A/F/U)	Final	NAME

GCGID	Description		Type
AC470003	Ayn (A/F/U)	Initial	NAME
AC470004	Ayn (A/F/U)	Middle	NAME
AD010000	Dal (A/F/U)	Isolated-Final	NAME
AD450000	Dud (A)	Isolated-Final (1st part)	NAME
AD450003	Dud (A) Zad (F) Duad (U)	Initial-Middle Initial-Middle Initial-Middle	NAME
AD470000	Thal (A) Zal (F/U)	Isolated-Final Isolated-Final	NAME
AF010000	Feh (A/F/U)	Isolated-Final	NAME
AF010003	Feh (A/F/U)	Initial-Middle	NAME
AG230000	Jeem (A/F/U)	Isolated-Final	NAME
AG230003	Jeem (A/F/U)	Initial-Middle	NAME
AG310000	Ghayn (A/F/U)	Isolated	NAME

GCGID	Description	Type	
AG310002	Ghayn (A/F/U) Final	NAME	
AG310003	Ghayn (A/F/U) Initial	NAME	
AG310004	Ghayn (A/F/U) Middle	NAME	
AH010000	Heh (A/F) Isolated-Final	NAME	
AH010003	Heh (A/F) Initial	NAME	
AH010004	Heh (A/F) Middle	NAME	
AH450000	Hah (A) Isolated-Final Hey (F) Isolated-Final Heh (U) Isolated-Final	NAME	
AH450003	Hah (A) Initial-Middle Hey (F) Initial-Middle Heh (U) Initial-Middle	NAME	
AH470000	Khah (A) Isolated-Final Khey (F) Isolated-Final Kheh (U) Isolated-Final	NAME	
AH470003	Khah (A) Initial-Middle Khey (F) Initial-Middle Kheh (U) Initial-Middle	NAME	
AK010000	Caf (A) Isolated-Final	NAME	
AK010003	Caf (A/F/U) Initial-Middle	NAME	
AL010000	Lam (A/F/U) Isolated-Final	NAME	
AL010003	Lam (A/F) Initial-Middle	NAME	
AL020000	Lamaleph (A/F) Isolated	NAME	
AL020003	Lamaleph (A/F) Final	NAME	
AL220000	Lamaleph Madda (A) Isolated Lamaleph Maddey (F) Isolated	NAME	
AL220003	Lamaleph Madda (A) Final Lamaleph Maddey (F) Final	NAME	
AL320000	Lamaleph Hamza (A) Isolated Lamaleph Hamzey (F) Isolated	NAME	
AL320003	Lamaleph Hamza (A) Final Lamaleph Hamzey (F) Final	NAME	
AM010000	Meem (A/F/U) Isolated-Final	NAME	
AM010003	Meem (A/F/U) Initial-Middle	NAME	
AN010000	Noon (A/F/U) Isolated-Final	NAME	
AN010003	Noon (A/F/U) Initial-Middle	NAME	
AQ010000	Qaf (A/F/U) Isolated-Final	NAME	
AQ010003	Qaf (A/F/U) Initial-Middle	NAME	

GCGID	Description	Type	
AR010000	Reh (A/F/U) Isolated-Final	NAME	
AS010000	Seen (A) Isolated-Final (1st part)	NAME	
AS010003	Seen (A/F/U) Initial-Middle	NAME	
AS230000	Sheen (A) Isolated-Final (1st part)	NAME	
AS230003	Sheen (A/F/U) Initial-Middle	NAME	
AS450000	Sad (A) Isolated-Final (1st part)	NAME	
AS450003	Sad (A/F) Initial-Middle Suad (U) Initial-Middle	NAME	
AT010000	Teh (A/F/U) Isolated-Final	NAME	
AT010003	Teh (A/F/U) Initial-Middle	NAME	
AT020000	Teh Marbuta (A) Isolated-Final Teh Mudawara (U) Isolated-Final	NAME	
AT450000	Tah (A/F) Isolated-Final-Initial-Middle Toey (U) Isolated-Final-Initial-Middle	NAME	
AT470000	Theh (A/F/U) Isolated-Final	NAME	
AT470003	Theh (A/F/U) Initial-Middle	NAME	
AW010000	Waw (A) Isolated-Final Vav (F) Isolated-Final Waow (U) Isolated-Final	NAME	
AW310000	Waw Hamza (A) Isolated-Final Vav Hamzey (F) Isolated-Final Waow Hamza (U) Isolated-Final	NAME	
AX100000	Shadda (A/F) Isolated Shadd (U) Isolated	NAME	
AX100004	Shadda (A/F) Middle Shadd (U) Middle	NAME	
AX300000	Hamza (A/U) Isolated Hamzey (F) Isolated	NAME	
AY010000	Yeh (A) Isolated	NAME	
AY010002	Yeh (A) Final	NAME	
AY010003	Yeh (A) Initial-Middle	NAME	
AY310000	Yeh Hamza (A) Initial-Middle	NAME	
AZ010000	Zayn (A) Isolated-Final Zey (F) Isolated-Final Zeh (U) Isolated-Final	NAME	

GCGID	Description	Type
AZ450000	Zah (A/F) Isolated-Final-Initial-Middle Zoey (U) Isolated-Final-Initial-Middle	NAME

REXX/400 Extension Characters-Bxxxxxxx GCGIDs

GCGID	Description	Type
BA100000	a - (Upper Vowel)	NAME
BA200000	a - (Middle Vowel)	NAME
BA300000	a - (Middle Vowel)	NAME
BA400000	am - (Middle Vowel)	NAME
BA500000	ai - (Middle Vowel)	NAME
BA600000	ai - (Middle Vowel)	NAME
BA700000	a - (Middle Vowel)	NAME
BB100000	Bo	NAME
BC100000	Cho	NAME
BD100000	Do	NAME
BD200000	Do	NAME
BE100000	e/a - (Upper Vowel)	NAME
BE200000	e - (Middle Vowel)	NAME
BE300000	e - (Middle Vowel)	NAME
BF100000	Fo	NAME
BF200000	Fo	NAME
BH100000	Ho	NAME
BH200000	Ho	NAME
BI100000	i - (Upper Vowel)	NAME
BI200000	i - (Upper Vowel)	NAME
BK100000	Ko	NAME
BK200000	Kho	NAME
BK300000	Kho	NAME
BK400000	Kho	NAME
BK500000	Kho	NAME
BK600000	Kho	NAME
BL100000	Lo	NAME
BL200000	Lu	NAME
BL300000	Lo	NAME
BM100000	Mo	NAME
BN100000	Ngo	NAME
BN200000	No	NAME
BN300000	No	NAME
BN400000	a - (Upper Vowel)	NAME
BO100000	o	NAME
BO200000	o - (Middle Vowel)	NAME
BP100000	Po	NAME
BP200000	Pho	NAME
BP300000	Pho	NAME
BP400000	Pho	NAME
BQ100000	Thai Repeat Sign	NAME

GCGID	Description	Type
BQ200000	Thai Ellipsis	NAME
BQ300000	a - (Lower Vowel)	NAME
BR100000	Ro	NAME
BR200000	Ro	NAME
BS100000	So	NAME
BS200000	So	NAME
BS300000	So	NAME
BS400000	So	NAME
BT100000	To	NAME
BT200000	Tho	NAME
BT300000	Tho	NAME
BT400000	Tho	NAME
BT500000	To	NAME
BT600000	Tho	NAME
BT700000	Tho	NAME
BT800000	Tho	NAME
BU100000	u - (Upper Vowel)	NAME
BU200000	u - (Upper Vowel)	NAME
BU300000	u - (Lower Vowel)	NAME
BU400000	u - (Lower Vowel)	NAME
BW100000	Wo	NAME
BX100000	Xo	NAME
BX200000	Xo	NAME
BX300000	Xo	NAME
BY100000	Jo	NAME
BY200000	Yo	NAME
BZ100000	1st Tone Mark	NAME
BZ200000	2nd Tone Mark	NAME
BZ300000	3rd Tone Mark	NAME
BZ400000	4th Tone Mark	NAME
BZ500000	5th Tone Mark	NAME

REXX/400 Extension Characters-Gxxxxxxx GCGIDs

GCGID	Description	Type
GA010000	Alpha Small	NAME
GA020000	Alpha Capital	NAME
GA110000	Alpha Acute Small	NAME
GA120000	Alpha Acute Capital	NAME
GB010000	Beta Small	NAME
GB020000	Beta Capital	NAME
GD010000	Delta Small	NAME
GD020000	Delta Capital	NAME
GE010000	Epsilon Small	NAME
GE020000	Epsilon Capital	NAME
GE110000	Epsilon Acute Small	NAME
GE120000	Epsilon Acute Capital	NAME
GE310000	Eta Small	NAME

GCGID	Description	Type
GE320000	Eta Capital	NAME
GE710000	Eta Acute Small	NAME
GE720000	Eta Acute Capital	NAME
GF010000	Phi Small	NAME
GF020000	Phi Capital	NAME
GG010000	Gamma Small	NAME
GG020000	Gamma Capital	NAME
GH010000	Chi Small	NAME
GH020000	Chi Capital	NAME
GI010000	Iota Small	NAME
GI020000	Iota Capital	NAME
GI110000	Iota Acute Small	NAME
GI120000	Iota Acute Capital	NAME
GI170000	Iota Diaeresis Small	NAME
GI180000	Iota Diaeresis Capital	NAME
GI730000	Iota Acute and Diaeresis Small	NAME
GK010000	Kappa Small	NAME
GK020000	Kappa Capital	NAME
GL010000	Lambda Small	NAME
GL020000	Lambda Capital	NAME
GM010000	Mu Small	NAME
GM020000	Mu Capital	NAME
GN010000	Nu Small	NAME
GN020000	Nu Capital	NAME
GO010000	Omicron Small	NAME
GO020000	Omicron Capital	NAME
GO110000	Omicron Acute Small	NAME
GO120000	Omicron Acute Capital	NAME
GO310000	Omega Small	NAME
GO320000	Omega Capital	NAME
GO710000	Omega Acute Small	NAME
GO720000	Omega Acute Capital	NAME
GP010000	Pi Small	NAME
GP020000	Pi Capital	NAME
GP610000	Psi Small	NAME
GP620000	Psi Capital	NAME
GR010000	Rho Small	NAME
GR020000	Rho Capital	NAME
GS010000	Sigma Small	NAME
GS020000	Sigma Capital	NAME
GS610000	Sigma Small (Final Form)	NAME
GT010000	Tau Small	NAME
GT020000	Tau Capital	NAME
GT610000	Theta Small (See GT610001, GT610002)	NAME
GT620000	Theta Capital	NAME
GU010000	Upsilon Small	NAME
GU020000	Upsilon Capital	NAME
GU110000	Upsilon Acute Small	NAME
GU120000	Upsilon Acute Capital	NAME
GU170000	Upsilon Diaeresis Small	NAME

GCGID	Description	Type
GU180000	Upsilon Diaeresis Capital	NAME
GU730000	Upsilon Acute and Diaeresis Small	NAME
GX010000	Xi Small	NAME
GX020000	Xi Capital	NAME
GZ010000	Zeta Small	NAME
GZ020000	Zeta Capital	NAME

REXX/400 Extension Characters-Hxxxxxxx GCGIDs

GCGID	Description	Type
HB010000	Bet	NAME
HD010000	Dalet	NAME
HG010000	Gimel	NAME
HH010000	He	NAME
HH450000	Het	NAME
HK010000	Kaf	NAME
HK610000	Kaf (Final Form)	NAME
HL010000	Lamed	NAME
HM010000	Mem	NAME
HM610000	Mem (Final Form)	NAME
HN010000	Nun	NAME
HN610000	Nun (Final Form)	NAME
HP010000	Pe	NAME
HP610000	Pe (Final Form)	NAME
HQ010000	Qof	NAME
HR010000	Resh	NAME
HS010000	Samech	NAME
HS210000	Shin	NAME
HS450000	Zadi	NAME
HS610000	Zadi (Final Form)	NAME
HT010000	Tav	NAME
HT450000	Tet	NAME
HW010000	Waw	NAME
HX330000	Alef	NAME
HX350000	Ayin	NAME
HY010000	Yod	NAME
HZ010000	Zayin	NAME

REXX/400 Extension Characters-Jxxxxxxx GCGIDs

GCGID	Description	Type
JA000000	A	NAME
JA010000	a	NAME
JE000000	E	NAME
JE010000	e	NAME
JH100000	HA	NAME

GCGID	Description	Type
JH200000	HI	NAME
JH300000	HU or FU	NAME
JH400000	HE	NAME
JH500000	HO	NAME
JI000000	I	NAME
JI010000	i	NAME
JK100000	KA	NAME
JK200000	KI	NAME
JK300000	KU	NAME
JK400000	KE	NAME
JK500000	KO	NAME
JM100000	MA	NAME
JM200000	MI	NAME
JM300000	MU	NAME
JM400000	ME	NAME
JM500000	MO	NAME
JN000000	N	NAME
JN100000	NA	NAME
JN200000	NI	NAME
JN300000	NU	NAME
JN400000	NE	NAME
JN500000	NO	NAME
JO000000	O	NAME
JO010000	o	NAME
JQ700000	Katakana Full Stop	NAME
JQ710000	Katakana Left Bracket	NAME
JQ720000	Katakana Right Bracket	NAME
JQ730000	Katakana Comma	NAME
JQ740000	Katakana Conjunctive Symbol	NAME
JR100000	RA	NAME
JR200000	RI	NAME
JR300000	RU	NAME
JR400000	RE	NAME
JR500000	RO	NAME
JS100000	SA	NAME
JS200000	SI or SHI	NAME
JS300000	SU	NAME
JS400000	SE	NAME
JS500000	SO	NAME
JT100000	TA	NAME
JT200000	TI or CHI	NAME
JT300000	TU or TSU	NAME
JT310000	tu or tsu	NAME
JT400000	TE	NAME
JT500000	TO	NAME
JU000000	U	NAME
JU010000	u	NAME
JW100000	WA	NAME
JW500000	WO, Katakana Participle	NAME
JX700000	Prolonged Sound Symbol	NAME

GCGID	Description	Type
JX710000	Voiced Sound Symbol	NAME
JX720000	Semi-Voiced Sound Symbol	NAME
JY100000	YA	NAME
JY110000	ya	NAME
JY300000	YU	NAME
JY310000	yu	NAME
JY500000	YO	NAME
JY510000	yo	NAME

REXX/400 Extension Characters-Kxxxxxxx GCGIDs

GCGID	Description	Type
KA010000	a Small	NAME
KA020000	A Capital	NAME
KA150000	ya Small	NAME
KA160000	YA Capital	NAME
KB010000	b Small	NAME
KB020000	B Capital	NAME
KC010000	ts Small	NAME
KC020000	TS Capital	NAME
KC110000	c Special Small	NAME
KC120000	C Special Capital	NAME
KC210000	ch Small	NAME
KC220000	CH Capital	NAME
KD010000	d Small	NAME
KD020000	D Capital	NAME
KD610000	d Special Small	NAME
KD620000	D Special Capital	NAME
KE010000	e Small	NAME
KE020000	E Capital	NAME
KE130000	e Special Small	NAME
KE140000	E Special Capital	NAME
KE150000	ye Small	NAME
KE160000	YE Capital	NAME
KE170000	e Diaeresis Small	NAME
KE180000	E Diaeresis Capital	NAME
KF010000	f Small	NAME
KF020000	F Capital	NAME
KG010000	g Small	NAME
KG020000	G Capital	NAME
KG110000	g Special Small	NAME
KG120000	G Special Capital	NAME
KG210000	dz Special Small	NAME
KG220000	DZ Special Capital	NAME
KH010000	kh Small	NAME
KH020000	KH Capital	NAME
KI010000	i Small	NAME
KI020000	I Capital	NAME

GCGID	Description	Type
KI110000	i Special Small	NAME
KI120000	I Special Capital	NAME
KI170000	i Diaeresis Small	NAME
KI180000	I Diaeresis Capital	NAME
KJ010000	j Small	NAME
KJ020000	J Capital	NAME
KJ110000	j Special Small	NAME
KJ120000	J Special Capital	NAME
KK010000	k Small	NAME
KK020000	K Capital	NAME
KK110000	k Special Small	NAME
KK120000	K Special Capital	NAME
KL010000	l Small	NAME
KL020000	L Capital	NAME
KL410000	lj Small	NAME
KL420000	LJ Capital	NAME
KM010000	m Small	NAME
KM020000	M Capital	NAME
KN010000	n Small	NAME
KN020000	N Capital	NAME
KN110000	nj Small	NAME
KN120000	NJ Capital	NAME
KO010000	o Small	NAME
KO020000	O Capital	NAME
KP010000	p Small	NAME
KP020000	P Capital	NAME
KR010000	r Small	NAME
KR020000	R Capital	NAME
KS010000	s Small	NAME
KS020000	S Capital	NAME
KS150000	shch Small	NAME
KS160000	SHCH Capital	NAME
KS210000	sh Small	NAME
KS220000	SH Capital	NAME
KT010000	t Small	NAME
KT020000	T Capital	NAME
KU010000	u Small	NAME
KU020000	U Capital	NAME
KU150000	yu Small	NAME
KU160000	YU Capital	NAME
KU210000	Hard Sign Small	NAME
KU220000	Hard Sign Capital	NAME
KU230000	u Breve Small	NAME
KU240000	U Breve Capital	NAME
KV010000	v Small	NAME
KV020000	V Capital	NAME
KX110000	Soft Sign Small	NAME
KX120000	Soft Sign Capital	NAME
KY010000	y Small	NAME
KY020000	Y Capital	NAME

GCGID	Description	Type
KZ010000	z Small	NAME
KZ020000	Z Capital	NAME
KZ150000	s Special Small	NAME
KZ160000	S Special Capital	NAME
KZ210000	zh Small	NAME
KZ220000	zh Capital	NAME

REXX/400 Extension Characters-Lxxxxxxx GCGIDs

GCGID	Description	Type
LA010000	a Small	NAME
LA020000	A Capital	NAME
LA110000	a Acute Small	NAME
LA120000	A Acute Capital	NAME
LA130000	a Grave Small	NAME
LA140000	A Grave Capital	NAME
LA150000	a Circumflex Small	NAME
LA160000	A Circumflex Capital	NAME
LA170000	a Diaeresis Small	NAME
LA180000	A Diaeresis Capital	NAME
LA190000	a Tilde Small	NAME
LA200000	A Tilde Capital	NAME
LA230000	a Breve Small	NAME
LA240000	A Breve Capital	NAME
LA270000	a Overcircle Small	NAME
LA280000	A Overcircle Capital	NAME
LA430000	a Ogonek Small	NAME
LA440000	A Ogonek Capital	NAME
LA510000	ae Diphthong Small	NAME
LA520000	ae Diphthong Capital	NAME
LB010000	b Small	NAME
LB020000	B Capital	NAME
LC010000	c Small	NAME
LC020000	C Capital	NAME
LC110000	c Acute Small	NAME
LC120000	C Acute Capital	NAME
LC150000	c Circumflex Small	NAME
LC160000	C Circumflex Capital	NAME
LC210000	c Caron Small	NAME
LC220000	C Caron Capital	NAME
LC290000	c Overdot Small	NAME
LC300000	C Overdot Capital	NAME
LC410000	c Cedilla Small	NAME
LC420000	C Cedilla Capital	NAME
LD010000	d Small	NAME
LD020000	D Capital	NAME
LD210000	d Caron Small	NAME
LD220000	D Caron Capital	NAME

GCGID	Description	Type
LD610000	d Stroke Small	NAME
LD620000	D Stroke Capital/Eth Icelandic Capital	NAME
LD630000	eth Icelandic Small	NAME
LE010000	e Small	NAME
LE020000	E Capital	NAME
LE110000	e Acute Small	NAME
LE120000	E Acute Capital	NAME
LE130000	e Grave Small	NAME
LE140000	E Grave Capital	NAME
LE150000	e Circumflex Small	NAME
LE160000	E Circumflex Capital	NAME
LE170000	e Diaeresis Small	NAME
LE180000	E Diaeresis Capital	NAME
LE210000	e Caron Small	NAME
LE220000	E Caron Capital	NAME
LE430000	e Ogonek Small	NAME
LE440000	E Ogonek Capital	NAME
LF010000	f Small	NAME
LF020000	F Capital	NAME
LG010000	g Small	NAME
LG020000	G Capital	NAME
LG150000	g Circumflex Small	NAME
LG160000	G Circumflex Capital	NAME
LG230000	g Breve Small	NAME
LG240000	G Breve Capital	NAME
LG290000	g Overdot Small	NAME
LG300000	G Overdot Capital	NAME
LH010000	h Small	NAME
LH020000	H Capital	NAME
LH150000	h Circumflex Small	NAME
LH160000	H Circumflex Capital	NAME
LH610000	h Stroke Small	NAME
LH620000	H Stroke Capital	NAME
LI010000	i Small	NAME
LI020000	I Capital	NAME
LI110000	i Acute Small	NAME
LI120000	I Acute Capital	NAME
LI130000	i Grave Small	NAME
LI140000	I Grave Capital	NAME
LI150000	i Circumflex Small	NAME
LI160000	I Circumflex Capital	NAME
LI170000	i Diaeresis Small	NAME
LI180000	I Diaeresis Capital	NAME
LI300000	I Overdot Capital	NAME
LI610000	i Dotless Small	NAME
LJ010000	j Small	NAME
LJ020000	J Capital	NAME
LJ150000	j Circumflex Small	NAME
LJ160000	J Circumflex Capital	NAME
LK010000	k Small	NAME

GCGID	Description	Type
LK020000	K Capital	NAME
LL010000	l Small	NAME
LL020000	L Capital	NAME
LL110000	l Acute Small	NAME
LL120000	L Acute Capital	NAME
LL210000	l Caron Small	NAME
LL220000	L Caron Capital	NAME
LL610000	l Stroke Small	NAME
LL620000	L Stroke Capital	NAME
LM010000	m Small	NAME
LM020000	M Capital	NAME
LN010000	n Small	NAME
LN020000	N Capital	NAME
LN110000	n Acute Small	NAME
LN120000	N Acute Capital	NAME
LN190000	n Tilde Small	NAME
LN200000	N Tilde Capital	NAME
LN210000	n Caron Small	NAME
LN220000	N Caron Capital	NAME
LO010000	o Small	NAME
LO020000	O Capital	NAME
LO110000	o Acute Small	NAME
LO120000	O Acute Capital	NAME
LO130000	o Grave Small	NAME
LO140000	O Grave Capital	NAME
LO150000	o Circumflex Small	NAME
LO160000	O Circumflex Capital	NAME
LO170000	o Diaeresis Small	NAME
LO180000	O Diaeresis Capital	NAME
LO190000	o Tilde Small	NAME
LO200000	O Tilde Capital	NAME
LO250000	o Double Acute Small	NAME
LO260000	O Double Acute Capital	NAME
LO610000	o Slash Small	NAME
LO620000	O Slash Capital	NAME
LP010000	p Small	NAME
LP020000	P Capital	NAME
LQ010000	q Small	NAME
LQ020000	Q Capital	NAME
LR010000	r Small	NAME
LR020000	R Capital	NAME
LR110000	r Acute Small	NAME
LR120000	R Acute Capital	NAME
LR210000	r Caron Small	NAME
LR220000	R Caron Capital	NAME
LS010000	s Small	NAME
LS020000	S Capital	NAME
LS110000	s Acute Small	NAME
LS120000	S Acute Capital	NAME
LS150000	s Circumflex Small	NAME

GCGID	Description	Type
LS160000	S Circumflex Capital	NAME
LS210000	s Caron Small	NAME
LS220000	S Caron Capital	NAME
LS410000	s Cedilla Small	NAME
LS420000	S Cedilla Capital	NAME
LS610000	Sharp s Small	NAME
LT010000	t Small	NAME
LT020000	T Capital	NAME
LT210000	t Caron Small	NAME
LT220000	T Caron Capital	NAME
LT410000	t Cedilla Small	NAME
LT420000	T Cedilla Capital	NAME
LT630000	Thorn Icelandic Small	NAME
LT640000	Thorn Icelandic Capital	NAME
LU010000	u Small	NAME
LU020000	U Capital	NAME
LU110000	u Acute Small	NAME
LU120000	U Acute Capital	NAME
LU130000	u Grave Small	NAME
LU140000	U Grave Capital	NAME
LU150000	u Circumflex Small	NAME
LU160000	U Circumflex Capital	NAME
LU170000	u Diaeresis Small	NAME
LU180000	U Diaeresis Capital	NAME
LU230000	u Breve Small	NAME
LU240000	U Breve Capital	NAME
LU250000	u Double Acute Small	NAME
LU260000	U Double Acute Capital	NAME
LU270000	u Overcircle Small	NAME
LU280000	u Overcircle Capital	NAME
LV010000	v Small	NAME
LV020000	V Capital	NAME
LW010000	w Small	NAME
LW020000	W Capital	NAME
LX010000	x Small	NAME
LX020000	X Capital	NAME
LY010000	y Small	NAME
LY020000	Y Capital	NAME
LY110000	y Acute Small	NAME
LY120000	Y Acute Capital	NAME
LY170000	y Diaeresis Small	NAME
LZ010000	z Small	NAME
LZ020000	Z Capital	NAME
LZ110000	z Acute Small	NAME
LZ120000	Z Acute Capital	NAME
LZ210000	z Caron Small	NAME
LZ220000	Z Caron Capital	NAME
LZ290000	z Overdot Small	NAME
LZ300000	Z Overdot Capital	NAME
LZ300008	Z Overdot Capital	NAME

REXX/400 Extension Characters-Nxxxxxxx GCGIDs

GCGID	Description	Type
ND010000	One	NUMBER
ND010001	One (Arabic, Farsi, Urdu)	INVALID
ND010002	One, Thai	INVALID
ND011000	One Superscript	INVALID
ND020000	Two	NUMBER
ND020001	Two (Arabic, Farsi, Urdu)	INVALID
ND020002	Two, Thai	INVALID
ND021000	Two Superscript	INVALID
ND030000	Three	NUMBER
ND030001	Three (Arabic, Farsi, Urdu)	INVALID
ND030002	Three, Thai	INVALID
ND031000	Three Superscript	INVALID
ND040000	Four	NUMBER
ND040001	Four (Arabic)	INVALID
ND040002	Four, Thai	INVALID
ND050000	Five	NUMBER
ND050001	Five (Arabic)	INVALID
ND050002	Five, Thai	INVALID
ND060000	Six	NUMBER
ND060001	Six (Arabic, Urdu)	INVALID
ND060002	Six, Thai	INVALID
ND070000	Seven	NUMBER
ND070001	Seven (Arabic, Farsi)	INVALID
ND070002	Seven, Thai	INVALID
ND080000	Eight	NUMBER
ND080001	Eight (Arabic, Farsi, Urdu)	INVALID
ND080002	Eight, Thai	INVALID
ND090000	Nine	NUMBER
ND090001	Nine (Arabic, Farsi, Urdu)	INVALID
ND090002	Nine, Thai	INVALID
ND100000	Zero	NUMBER
ND100001	Zero (Arabic, Urdu)	INVALID
ND100002	Zero, Thai	INVALID
NF010000	One Half	INVALID
NF040000	One Quarter	INVALID
NF050000	Three Quarters	INVALID

REXX/400 Extension Characters-Oxxxxxxx GCGIDs

GCGID	Description	Type
OA000000	A (Basic Vowel)	NAME
OA200000	AE (Compound Vowel)	NAME
OB000000	B (Basic Consonant)	NAME
OB100000	BB (Compound Consonant)	NAME

GCGID	Description	Type
OB200000	BS (Compound Consonant)	NAME
OC200000	CH (Basic Consonant)	NAME
OD000000	D (Basic Consonant)	NAME
OD100000	DD (Compound Consonant)	NAME
OE000000	E (Compound Vowel)	NAME
OE200000	EO (Basic Vowel)	NAME
OE300000	EU (Basic Vowel)	NAME
OE400000	EUI (Compound Vowel)	NAME
OG000000	G (Basic Consonant)	NAME
OG100000	GG (Compound Consonant)	NAME
OG200000	GS (Compound Consonant)	NAME
OH000000	H (Basic Consonant)	NAME
OI000000	I (Basic Vowel)	NAME
OJ000000	J (Basic Consonant)	NAME
OJ100000	JJ (Compound Consonant)	NAME
OK000000	K (Basic Consonant)	NAME
OL000000	L (Basic Consonant)	NAME
OL100000	LB (Compound Consonant)	NAME
OL200000	LG (Compound Consonant)	NAME
OL300000	LH (Compound Consonant)	NAME
OL400000	LM (Compound Consonant)	NAME
OL500000	LP (Compound Consonant)	NAME
OL600000	LS (Compound Consonant)	NAME
OL700000	LT (Compound Consonant)	NAME
OM000000	M (Basic Consonant)	NAME
ON000000	N (Basic Consonant)	NAME
ON100000	NH (Compound Consonant)	NAME
ON150000	NJ (Compound Consonant)	NAME
ON200000	NG or W (Basic Consonant)	NAME
OO000000	O (Basic Vowel)	NAME
OO100000	OA (Compound Vowel)	NAME
OO200000	OAE (Compound Vowel)	NAME
OO300000	OI (Compound Vowel)	NAME
OP000000	P (Basic Consonant)	NAME
OS000000	S (Basic Consonant)	NAME
OS100000	SS (Compound Consonant)	NAME
OT000000	T (Basic Consonant)	NAME
OU000000	U (Basic Vowel)	NAME
OU200000	UE (Compound Vowel)	NAME
OU300000	UEO (Compound Vowel)	NAME
OU400000	UI (Compound Vowel)	NAME
OY200000	YA (Basic Vowel)	NAME
OY250000	YAE (Compound Vowel)	NAME
OY300000	YE (Compound Vowel)	NAME
OY400000	YEO (Basic Vowel)	NAME
OY500000	YO (Basic Vowel)	NAME
OY600000	YU (Basic Vowel)	NAME

REXX/400 Extension Characters-Sxxxxxxx GCGIDs

GCGID	Description	Type
SA010000	Plus Sign	OPER
SA020000	Plus or Minus Sign	INVALID
SA030000	Less Than Sign/Greater Than Sign (Arabic)	OPER
SA040000	Equal Sign	OPER
SA050000	Greater Than Sign/Less Than Sign (Arabic)	OPER
SA060000	Divide Sign	INVALID
SA070000	Multiply Sign	INVALID
SC010000	International Currency Symbol	INVALID
SC020000	Pound Sterling Sign	INVALID
SC030000	Dollar Sign	INVALID
SC040000	Cent Sign	INVALID
SC050000	Yen Sign	INVALID
SC060000	Peseta Sign	INVALID
SC070000	Florin Sign	INVALID
SC120000	Yuan Sign	INVALID
SC130000	Currency Symbol, Thailand	INVALID
SC140000	Won Sign	INVALID
SD110000	Acute Accent	INVALID
SD130000	Grave Accent	INVALID
SD150000	Circumflex Accent	INVALID
SD170000	Diaeresis/Umlaut Accent	INVALID
SD190000	Tilde Accent	INVALID
SD210000	Caron Accent	INVALID
SD230000	Breve Accent	INVALID
SD250000	Double Acute Accent	INVALID
SD270000	Overcircle Accent	INVALID
SD290000	Overdot Accent	INVALID
SD410000	Cedilla or Sedila Accent	INVALID
SD430000	Ogonek Accent	INVALID
SD630000	Middle Dot	INVALID
SD730000	Acute and Diaeresis Accent	INVALID
SM000000	Número Sign	INVALID
SM010000	Number Sign	INVALID
SM020000	Percent Sign	OPER
SM020007	Percent Sign (Arabic)	OPER
SM030000	Ampersand	OPER
SM040000	Asterisk	OPER
SM040007	Asterisk (Arabic Preference - 5 points)	OPER
SM050000	At Sign	INVALID
SM060000	Left Bracket	INVALID
SM070000	Backslash	OPER
SM080000	Right Bracket	INVALID
SM100000	Double Underscore	INVALID
SM110000	Left Brace	INVALID
SM120000	Long Dash/Throughscore	INVALID

GCGID	Description	Type
SM130000	Vertical Line/Logical OR	OPER
SM140000	Right Brace	INVALID
SM150000	Overline	INVALID
SM170000	Micro Symbol	INVALID
SM190000	Degree Symbol	INVALID
SM200000	Ordinal Indicator, Masculine	INVALID
SM210000	Ordinal Indicator, Feminine	INVALID
SM240000	Section Symbol (USA)/Paragraph Symbol (Europe)	INVALID
SM250000	Paragraph Symbol (USA)	INVALID
SM520000	Copyright Symbol	INVALID
SM530000	Registered Trademark Symbol	INVALID
SM570000	Bullet	INVALID
SM650000	Vertical Line, Broken	INVALID
SM660000	Logical NOT/End Of Line Symbol	OPER
SM860000	Tatweel (Connector)	INVALID
SM870000	Kasseh (Tail)	INVALID
SP010000	Space	WHITE
SP020000	Exclamation Point	NAME
SP030000	Exclamation Point, Inverted	INVALID
SP040000	Quotation Marks	STRING
SP050000	Apostrophe	STRING
SP060000	Left Parenthesis	PUNCT
SP070000	Right Parenthesis	PUNCT
SP080000	Comma	PUNCT
SP080007	Comma Rotated (Arabic)	INVALID
SP090000	Underline/Continuous Underscore	NAME
SP100000	Hyphen/Minus Sign	OPER
SP110000	Period/Full Stop	NAME
SP120000	Slash	OPER
SP130000	Colon	PUNCT
SP140000	Semicolon	PUNCT
SP140007	Semicolon, Rotated (Arabic)	INVALID
SP150000	Question Mark	NAME
SP150007	Question Mark, Reversed (Arabic)	INVALID
SP160000	Question Mark, Inverted	INVALID
SP170000	Left Angle Quotes	INVALID
SP180000	Right Angle Quotes	INVALID
SP190000	Left Single Quote	INVALID
SP200000	Right Single Quote	INVALID
SP300000	Required Space	INVALID
SP310000	Numeric Space	INVALID
SP320000	Syllable Hyphen	INVALID
SP490000	Korean Fill (NULL) Character	INVALID

Appendix L. Changing the Primary Language

This chapter includes two sets of instructions to change the primary language of your system.

- One set is for changing the primary language from a DBCS national language version to an SBCS national language version.
- The other set is for changing the primary language from an SBCS national language version to a DBCS national language version.

Attention

- You must upgrade your system to Version 2 Release 3 Modification 0 using your current primary language before you use these instructions.
- You cannot change your primary language to a language you currently have installed as a secondary language. You must first delete the secondary language before you change it to your primary language. Go to the *Licensed Programs and New Release Installation Guide* for more information about deleting secondary languages.

Before changing the primary language on your system from DBCS to SBCS or from SBCS to DBCS, read all of the following information. Make sure you understand all of the assumptions and restrictions before you start.

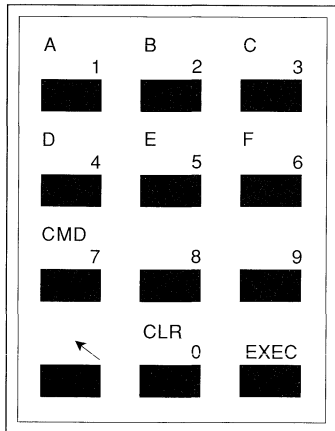
- These instructions can be used only if you are changing the primary language on your Version 2 Release 3 Modification 0 system.
- This upgrade requires two sets of distribution tapes:
 - A set in your current language to upgrade to Version 2 Release 3 Modification 0.
 - A set for your new language feature for Version 2 Release 3 Modification 0.
- You must have a set of distribution tapes with the new language feature you want to install on your system.
- You *cannot* use secondary language tapes to change your primary language from DBCS to SBCS or from SBCS to DBCS.
- Changing the primary language from DBCS to SBCS or SBCS to DBCS takes a significant amount of time (40 to 50 hours). This time includes doing an installation, restoring the whole system and user data, and performing two system save operations, and other necessary steps.
- A complete save operation of your system is included in this set of procedures before changing your primary language.
- Before you begin any save operation, it is recommended that you initialize enough tapes to complete the save operation.
- For additional information on saving and restoring your system, refer to the *Basic Backup and Recovery Guide*.
- If you have the QCCSID system value set to a value other than 65535, refer to Appendix B, “National Language Version Default System Values” on page B-1

to change the QCCSID system value to the new value after the installation process is completed.

Disabling and Enabling the High-Speed Feature on the 2440 Tape Unit

If you have a 2440 Tape Unit with the high-speed feature enabled, it must be disabled before you can install or restore the Licensed Internal Code. After the restore operation, you can enable the high-speed feature again. The high-speed feature is disabled or enabled from the control panel on the 2440 tape unit.

To find the control panel, open the front door of the 2440 Tape Unit. The control panel is located in the upper right-hand corner. Figure L-1 illustrates the control panel.



RV2W422-0

Figure L-1. 2440 Tape Unit

Disabling the High-Speed Feature: To disable the high-speed feature before the restore operation, do the following from the control panel.

1. Press the arrow key and then the CMD 7 key.
2. Press the 9 key and then the 2 key.
3. Press the EXEC key.
4. Press the arrow key and then the CMD 7 key.
5. Press the 9 key and then the 3 key.
6. Press the EXEC key.
7. Press the arrow key and then the CMD 7 key.
8. Press the 6 key twice.
9. Press the EXEC key.
10. Press the 1 key.
11. Press the EXEC key.

Enabling the High-Speed Feature: To enable the high-speed feature after the restore operation, do the following from the control panel.

1. Press the arrow key and then the CMD 7 key.
2. Press the 9 key and then the 2 key.
3. Press the EXEC key.
4. Press the arrow key and then the CMD 7 key.
5. Press the 9 key and then the 3 key.
6. Press the EXEC key.

7. Press the arrow key and then the CMD 7 key.
8. Press the 6 key twice.
9. Press the EXEC key.
10. Press the CLR 0 key.
11. Press the EXEC key.

To change the primary language from a DBCS national language version to a SBCS national language version, go to “Changing the Primary Language from DBCS to SBCS.”

To change the primary language from a SBCS national language version to a DBCS national language version, go to “Changing the Primary Language from SBCS to DBCS” on page L-26.

Changing the Primary Language from DBCS to SBCS

Changing the primary language from a DBCS to an SBCS national language version includes:

- Saving the entire system
- Installing the OS/400 licensed program
- Restoring user profiles, device configurations, user libraries, and authorities
- Installing licensed programs

Save the Entire System

Note: Make sure you upgrade your system to the new release before doing the save operation.

This save operation will be used later to restore user data to the system.

Using option 21 (Entire system) on the Save Menu allows you to save the entire system without entering the commands.

Attention

Saving access paths can significantly reduce recovery time. However, saving access paths increases the time it takes to save the system. If you do not want to save access paths, specify a **Y** for the *Prompt for commands* prompt on the Specify Command Defaults display. When you are prompted for the SAVLIB LIB(*NONSYS) command, change the access path parameter to *NO. If you prompt for commands, you cannot do an unattended save operation.

1. Sign on the system as QSYSOPR or QSECOFR.

Note: The system operator (QSYSOPR) and security officer (QSECOFR) user profiles are shipped with save system (*SAVSYS) and job control (*JOBCTL) special authorities. Ensure that you have not changed these special authorities in the QSYSOPR or QSECOFR user profiles.

2. Verify that no users are on the system and that no batch jobs are running:

WRKACTJOB

3. Display the system log QHST to verify it is up-to-date:

DSPLLOG LOG(QHST)

Displaying the QHST log automatically brings it up-to-date.

4. Display all copies of the system log:

```
WRKF FILE(QSYS/QHST*)
```

Look at the list to verify that you saved all copies of the log that are needed later.

5. Select option 4 (Delete) on the display to delete all but the current copies of the system log to prevent confusion about the date of the log. This step improves the performance of the SAVSYS command. For more information, select option 8 (Display file descriptions) to see when the History log was created and the last time that it was updated or changed.

6. Print a list of all the libraries on the system (you can use this list later if you need to restore a single library).

```
DSPOBJD OBJ(QSYS/*ALL) OBJTYPE(*LIB) OUTPUT(*PRINT)
```

7. Print a list of the current system values:

```
WRKSYSVAL OUTPUT(*PRINT)
```

8. Print a list of the current network attributes:

```
DSPNETA OUTPUT(*PRINT)
```

9. Print a list of the current configuration lists:

```
WRKCFGL
```

Select option 6 (Print)

10. Print a list of the current relational database directory entries:

```
DSPRDBDIRE OUTPUT(*PRINT)
```

Note: You may also create a CL program to save relational database directory entries. For more information and an example, see the discussion on Saving and Restoring Relational Database Directories in Chapter 7 of *Distributed Relational Database Guide*, SC41-0025.

11. Print a list of all the Licensed Internal Code fixes currently on the system:

```
DSPPTF LICPGM(*ALL) OUTPUT(*PRINT)
```

Keep this list with your backup log or your save system tapes for future reference.

12. Go to the Save menu:

```
GO SAVE
```

The Save menu is shown.

```
SAVE                               Save                               System:  RCHASLLZ
Select one of the following:

Save Data
  1. Files
  2. Libraries
  3. Documents and folders
  4. Programs
  5. Other objects
  6. Changed objects only
  7. Licensed programs
  8. Security data
  9. Storage
 10. Configuration

More...

Selection or command
====>

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
(C) COPYRIGHT IBM CORP. 1980, 1993.
```

13. Press the Page Down key to show the following display.

```
SAVE                               Save                               System:  RCHASLLZ
Select one of the following:

Save System Data
 20. All libraries other than system library
 21. Entire system
 22. All IBM libraries other than system library
 23. All user libraries
 24. All changed objects in user libraries

Save Office Data
 30. All documents, folders, and mail
 31. New and changed documents, new folders, all mail
 32. Documents and folders
 33. Mail only
 34. Calendars

More...

Selection or command
====>

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 Main menu
```

Doing an Unattended Save

To prevent an interrupted save operation caused by incomplete save messages, run the following commands before selecting option 21 from the Save menu:

1. To display the reply list sequence numbers currently used, type the following and press the Enter key.

```
WRKRPYLE
```

2. To add a reply list entry, type the following (where xxxx is an unused sequence number 1-9999) and press the Enter key.

```
ADDRPYLE SEQNBR(xxxx) MSGID(CPA3708) RPY('G')
```

3. To change the job, type the following and press the Enter key.

```
CHGJOB INQMSGRPY(*SYSRPLY)
```

Note: Communications messages with a severity of 99 that require a reply can stop an unattended save operation. If you are using communications, you need to identify the messages that may require a reply and then add them to the reply list.

14. Select option 21 (Entire system) from the Save menu and press the Enter key.

```
Specify Command Defaults
Type choices, press Enter.
Tape devices . . . . . TAP01      Names
      _____
      _____
Prompt for commands . . . . . Y      Y=Yes, N=No
Message queue delivery . . . . . *BREAK  *BREAK, *NOTIFY
```

Tape devices

You can specify up to four tape device names. If you specify more than one device, the system automatically switches to the next tape device when the current tape is full. It is recommended that you use your alternate IPL device. This allows you to recover your system.

Prompt for commands

You can specify whether or not you want to be prompted for the commands. If you specify Y (Yes), the prompt display is shown and you can change the defaults on the commands. If you specify N (No), the system runs the commands without prompting (for unattended save operations) and uses the default values.

Check for active files

Allows you to specify whether or not you want to check for active files on tape. If you specify Y (Yes), the system sends a message when active files on tape are encountered. You can end the checking process or clear the existing files and continue. If N (No) is specified, all active files encountered during the save operation are cleared.

Message queue delivery

You can specify whether or not you want messages sent to the QSYSOPR message queue in *BREAK or *NOTIFY mode. If *BREAK is specified, any message of severity 99 that requires a reply will interrupt the save operation. If *NOTIFY is specified, messages with severity 99 that require a reply will not interrupt the save operation.

Note: If you are doing an unattended save operation and communications is active, change the message queue delivery to *NOTIFY mode.

Option 21 will guide you through the following commands if you select Y on the *Prompt for commands* prompt on the Specify Command Defaults display.

- a. ENDSBS SBS(*ALL) OPTION(*IMMED)
- b. CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK or *NOTIFY) SEV(99)
- c. SAVSYS
- d. SAVLIB LIB(*NONSYS) ACCPTH(*YES)
- e. SAVDLO DLO(*ALL) FLR(*ANY)
- f. STRSBS SBSD(controlling-subsystem)

Notes:

- a. Ensure that device configuration objects not used in the restore operation are varied off.
 - b. Ensure that tape devices, tape controllers, or work station devices that you are using for the restore operation are varied on. These configuration objects will be excluded from the restore operation (message CPF379C in the job log).
15. Continue loading tapes when the system sends a message asking you to load the next volume.

If a media error occurs...

If an unrecoverable media error occurs during the SAVLIB procedure, you can restart the procedure using the STRLIB parameter on the SAVLIB command. The STRLIB parameter is valid only when *NONSYS, *ALLUSR, or *IBM is specified for the SAVLIB or SAVCHGOBJ command.

The basic recovery steps for a save operation are:

1. Check the job log to determine the library where the previous SAVLIB LIB(*NONSYS, *IBM, or *ALLUSR) failed. Find the last library saved, which is indicated by a successful save completion message.
2. Load the next tape and ensure the tape is initialized.
3. Type the following and press the Enter key:

```
SAVLIB LIB(*NONSYS, *IBM or *ALLUSR) DEV(tape-device-name)
      ENDOPT(*LEAVE) STRLIB(library-name) ACCPTH(*YES)
      OMITLIB(library-name)
```

where the *library-name* for the STRLIB and the OMITLIB parameters is the last library successfully saved. This starts the save operation on the library after the last successfully saved library. Specify the value for the ACCPTH parameter that was specified on the previous SAVLIB command.

Note: Restoring the system using this set of media requires two RSTLIB SAVLIB(*NONSYS, *ALLUSR, or *IBM) commands to restore the libraries.

16. The job log contains information about the save operation. To verify that all objects were saved, you should spool the job log for printing, along with the job's remaining spooled output, if any.

```
DSPJOBLOG * OUTPUT(*PRINT)
```

It is important to view or print this job log because all user data will be deleted in the following steps.

Install SBCS Version 2, Release 3 Modification 0

To change the primary language, you need to install Version 2, Release 3 Modification 0 of the Operating System/400 licensed program on your system. You will need the set of distribution tapes with the new SBCS language feature.

1. Sign on the system as QSECOFR.
2. Change the QSYSOPR message queue to break mode:
CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK) SEV(60)
3. To end all jobs before installing the Licensed Internal Code, type:

```
ENDSBS SBS(*ALL) OPTION(*IMMED)
```

and press the Enter key. Messages are displayed indicating when the subsystems have ended and the system is in a restricted state. After the subsystems have ended, continue with step 4.

4. Power down the system before installing the Licensed Internal Code by entering:

```
PWRDWSYS OPTION(*IMMED)
```


When the Power On light goes off all racks of the 9406 System Unit or the control panel on the 9404 System Unit or AS/400 9402 System Unit, continue with step 5 on page L-9.

5. Ensure the key is in the keylock switch on the control panel.
6. Turn the key in the keylock switch until it points to the Manual position.
7. Press the Function Select switch to display **02** in the Function display on the control panel.
8. Press the Enter button on the control panel.
 - Note:** If you do not power down the system, do the following after ending the subsystems:
 - a. Press the Function Select switch to display 03 (Continue the IPL) in the Function display on the control panel.
 - b. Press the Enter button on the control panel.
9. Select IPL type D (this specifies that the IPL source comes from tape) by pressing the Function Select switch on the control panel until **D** is shown on the Data display.
10. Press the Enter button on the control panel.
 - Note:** If you do not power down the system, do the following after ending the subsystems:
 - a. Press the Function Select switch to display 03 (Continue the IPL) in the Function display on the control panel.
 - b. Press the Enter button on the control panel.
11. For the 9406 System Unit, ensure that the power switches for the tape unit used for the IPL and all disk units are in the On position.
12. Find the Licensed Internal Code tape, which is the first volume of the SBCS Version 2 Release 3 Modification 0 distribution tapes.
13. Place the tape in the tape unit used for the IPL. For more information on loading the tape, see the setup manual for the device.
 - Note:** If your tape unit cannot be loaded when the power is off, continue with the next step. You will be prompted later by an SRC code for the tape.
14. Switch on power to the system by pushing the Power switch on the control panel up. The switch returns to center after you push it. The 9402 System Unit has a green button labeled Power On on the control panel.
15. If you could not load your tape in a previous step, load the first tape volume into the tape unit used for the IPL. Make the device ready and then continue with the next step.
16. If the system attention light is on and one of the SRC codes shown in the following table is displayed in the Data display, complete the instructions for that SRC code. Otherwise, continue with the next step.

Table L-1. SRC Codes for Installing the SBCS Version 2 Release 3.0

Symptom	Action
A100 1933 A12x 1933 (x is any character)	This SRC is shown if the tape device for the alternate IPL is not ready. Make sure the correct tape is loaded and make the tape device ready. Wait for the System Attention light to go off. Then, continue with the next step. If the System Attention light stays on for more than 5 minutes, check to see if you have the correct tape loaded in the tape device for the alternate IPL and make the tape device ready. Then continue with the next step.
B1xx 1803 B1xx 1806 B1xx 1938	These SRCs are shown if the tape device for the alternate IPL was not found or was not ready. Make sure the tape device is powered on, the correct tape is loaded, and ready. Then continue with the next step.
B1xx 1934	This SRC is shown if the wrong tape is loaded. Load the correct tape and make the tape device ready. Then continue with the next step. This SRC is also shown if the high-speed feature is enabled on the 2440 Tape Unit. The high-speed feature must be disabled before installing or restoring the Licensed Internal Code.
2507 0001 2642 0001 2643 0001	These SRCs are shown if a tape is not loaded in the tape device for the alternate IPL. Make sure the correct tape is loaded in the correct drive and then continue with the next step.
<p>Note: If all SRCs listed in the table do not disappear from the control panel, do the following:</p> <ol style="list-style-type: none"> 1. Press the Function Select switch to display 03 (Continue the IPL) in the Function display on the control panel. 2. Press the Enter button on the control panel. 	

17. Ensure that the tape is online or ready. No action is required for tape units that perform this step automatically (such as the tape cartridge unit).

18. Ensure that the console display is turned on.

19. Wait for the yellow System Attention light on the control panel to light up.

There is a delay while the system loads information from the tape. SRCs showing status are continuously updated on the control panel while processing occurs. This can take from 5 to 20 minutes; the time varies depending on the speed of the tape unit and the processor speed for the specific system model.

When SRC A6xx 6001 is displayed, the system is prepared to start installing or restoring the Licensed Internal Code on the disk unit containing unit 1. Continue with the next step.

20. Select function code 24 by pressing the Function Select switch on the control panel until 24 is shown in the function display on the control panel.

Note: You must use function code 24 to install the SBCS version.

21. Press the Enter button on the control panel.

Warning: Option 24 (Install) deletes all information on the disk unit containing unit 1, including customer data. All system configuration information is also deleted. All disk units except unit 1 become nonconfigured units during the IPL.

The System Attention light may appear in 1 or 2 minutes and SRC A6xx 6002 is displayed. If you are sure you want to install the Licensed Internal Code, select function code 24 again and press the Enter button.

Note: If another SRC is displayed after A6xx 6001 that is not in the A6xx xxxx format, then the system needs additional attention. Call your service representative.

If the following SRCs are displayed after SRC A6xx 6001 is displayed, see *Basic Backup and Recovery Guide* for an explanation of these SRCs and the steps to follow.

A6xx 6002 Disk unit may contain a valid system
A6xx 6003 Disk unit not currently a load source
A6xx 6004 Disk unit not currently a load source
A6xx 6005 Disk unit not found

22. After pressing the Enter button on the control panel, the system starts displaying status SRCs again, which will be continuously updated to show the status of the install or restore operation. An example of a status SRC is D6xx 6201 (stand-alone install operation is running).
23. If the yellow system attention light is on again, and SRC A6xx 6048 (New tape volume needs to be loaded) is displayed, the system needs the next tape. The xx tells which volume needs to be loaded. Load the correct tape and make the device ready. The install or restore operation automatically continues.

If SRC A6xx 6051 appears, the stand-alone function is requesting the Model-Unique Licensed Internal Code tape found inside the back cover of the system unit or on the side of the 9402 C04, D02, and E02 System Unit. Unload the current tape from the tape device and load the Model-Unique Licensed Internal Code tape.

- A6xx 6051 Model-Unique Licensed Internal Code tape needs to be loaded
- A6xx 6052 Tape loaded was not the Model-Unique Licensed Internal Code

If another SRC A6xx xxxx is displayed, look up the displayed SRC in *Basic Backup and Recovery Guide*, and follow the instructions. For all other SRCs call your service representative.

Install the Operating System

You use two displays to select the installation options. The IPL or Install the System display allows you to install the operating system or work with the service tools. The Install the Operating System display allows you to set the options to be used for installing the system, and for setting the system date and time.

1. At the IPL or Install the System menu, type a **2** (Install the operating system).

Note: **Do not** use option 4 (Perform automatic installation of the operating system) to install the operating system.

2. Press the Enter key.

The Confirm Install of the Operating System display is shown.

3. Press the Enter key.

4. The Select a Language Group display is shown. This display shows the SBCS primary language on the distribution tapes.

The value specified on the display must be the same as the national language that is on the distribution media.

5. Press the Enter key.

After the language feature is displayed, the Confirm Language Feature Selection display is shown.

6. Press the Enter key to confirm the information. The Add All Disk Units display is shown.
7. Select option 1 (Add all disk units to the system auxiliary storage pool) if you want to add all of the nonconfigured units to the system auxiliary storage pool. Before adding the units to the system, all data stored on the nonconfigured units is deleted.

Note: Adding units can change the checksum set configuration of the system ASP. You can use option 3 (Perform disk configuration using DST) to calculate the effect of adding units to the system ASP.

8. Press the Enter key.

The formatting Disk Units display is shown when the disk units are configured.

Adding disk units takes several minutes. The time it takes depends on the size of each unit and the ability of the system to do multiple adds at the same time.

9. Status messages are displayed. The status messages shown do not require any action by the user.

After the IPL steps complete, the Install the Operating System menu appears.

10. When the Install the Operating System display is shown, select option 1 (Take defaults). This option is selected when you are performing a total system restore operation. When you select option 1 (Default), the operating system is installed again and no more install options displays are shown. Do the following:

- a. Fill in the date and time.

Date

The system inserts the date based on the internal clock. If the date is incorrect, you can type over the date to change it.

Time

The system inserts the time based on the internal clock. If the time is incorrect, you can type over the time to change it.

- b. Press the Enter key.
- c. Messages are shown to indicate how many programs and language objects are restored. These messages are for your information only.
- d. Continue loading tapes in sequence when messages are shown that ask you to load the next tape. The system searches through the tapes and loads the necessary programs and language information. After processing all the system save tapes, the following message may be displayed at the bottom of a blank display:

Operating system has been installed. IPL in progress.

When the IPL is complete, the IPL Sign On display is shown and the system is ready to complete the IPL.

```

                                Sign On
                                System. . . . : XXX
                                Subsystem . . . : QBASE
                                Display . . . . : QCONSOLE

                                User. . . . . QSECOFR

                                Program/procedure . . . . . _____
                                Menu. . . . . _____
                                Current library . . . . . _____

```

- e. Type QSECOFR in the *User* prompt and the password required for that user ID in the *Password* prompt (if password security is active) on the Sign On display.

Attention

The password is the default password shipped with the system for QSECOFR user profile.

- f. Press the Enter key. Informational messages are displayed.
- g. If the Work with Licensed Program PTFs display appears, press F3 (Exit) to continue.
- h. When the IPL Options display is shown, respond to the prompts using the following information.

```

                                IPL Options

                                Type choices, press Enter.

                                System date . . . . . XX / XX / XX      MM / DD / YY
                                System time . . . . . XX : XX : XX      HH : MM : SS
                                Clear job queues. . . . . N              Y=Yes, N=No
                                Clear output queues . . . . . N          Y=Yes, N=No
                                Clear incomplete job logs . . . . . N      Y=Yes, N=No
                                Start print writers . . . . . Y          Y=Yes, N=No
                                Start this device only. . . . . N         Y=Yes, N=No

                                Set major system options. . . . . Y      Y=Yes, N=No
                                Define or change system at IPL. . . . . N   Y=Yes, N=No

```

- i. Enter the value for the *System date* field.

The date is displayed. The system date format shown can be YY/MM/DD, DD/MM/YY, or MM/DD/YY where MM means month, DD means day, and YY means year. For English, the default is MM/DD/YY; the default value differs according to the primary language.

If the date is not correct, you can type over the date to change it. The system date must have a year value in the range of 87 to 99, or 00 to 22.

- j. Enter the value for the *System time* field.

The current time is displayed. The time format is HH : MM : SS; HH means hour, MM means minutes, and SS means seconds. If you want to change the time, type it in accordance with the 24-hour clock. For example, for an IPL at 4:30 p.m., type 163000 for the time.

- k. Enter the value for the *Start this device only* field.

Note: Change this option only if you are going to continue restoring user profiles, device configuration objects, user libraries, and authorities.

Type a Y to start the console device only, or type an N to start all devices.

- l. Enter the value for the *Set major system options* field. If you installed the Licensed Internal Code using function code 24 (Install), the default value is set to Y.

Type an N for each option to leave them unchanged. Type Y to set the specific options.

Attention

1. Leave the default value of Y for the *Set the major system options* field. If the *Enable automatic configuration* field is set to N (No), an SRC A900 2000 status message is shown on the control panel later in the restore operation. The instructions to recover from SRC A900 2000 are provided at that time.
2. If you are using the System/36 environment on your system, ensure that the *Automatic configuration* field is set to N.

- m. Enter the value for the *Define or change system at IPL* field.

Type a Y to change the system values, or type an N to leave the system values unchanged.

- n. **Do not** press the Enter key yet.

Attention

You are restoring the operating system from the distribution tapes. The system has reset the system values and network attributes back to the IBM-supplied defaults. These values and attributes must be changed back to the values that were in effect at the time of the save operation. You should have a list of these values and attributes that was created at the time you performed your save operation.

For example, the QSECURITY value **must** be changed to the value in effect at the time of the save operation to ensure that the security information is restored correctly.

To change the system values, do the following:

1. Type a Y to display the Define or Change the System menu.
2. Select option 3 (System value commands) and press the Enter key.
3. Select option 3 (Work with system values) and press the Enter key.

Note: Do not change the system value for QIGC. This should be set to 1 for a DBCS system and 0 for a SBCS system.

4. Type a 2 in the *Option* column next to the system values you want to change and press the Enter key.
5. Change the values to the correct values and press the Enter key. Press F12 to return to the Define or Change the System at IPL menu.

If you had changed the network attributes from the IBM-supplied defaults, do the following:

1. Select option 4 (Network attributes commands) and press the Enter key.
2. Select option 2 (Change network attributes) and press the Enter key to display a list of network attributes.
3. Change the values to the correct network attributes and press the Enter key.
4. Press F12 (Cancel) to return to the Define or Change the System at IPL menu.
5. Press F3 to continue the IPL.

- o. Press the Enter key.
- p. The Edit Rebuild Access Paths display is shown during the IPL process (attended mode) when there are access paths marked for rebuild.
- q. Press the Enter key to continue.
- r. Press F3 (Exit and continue the IPL) to continue.

Did You Receive SRC A900 2000?

If you receive A900 2000 on the control panel and message CPF0975: *Console did not vary on* on the console display, automatic configuration is turned off. However, the system has created device description QCONSOLE to allow you to continue the restore operation. **Do not** create a user-defined device description for the console display. This will cause unpredictable results. Recovery for SRC A900 2000 is provided in the *Basic Backup and Recovery Guide*. If you did not receive SRC A900 2000, continue with the next task.

- s. Reply to any messages that might appear on the display.
- t. Press the Enter key to continue. The main menu is displayed.

```
MAIN                               AS/400 Main Menu                               System: XXXX
Select one of the following:

    1. User tasks
    2. Office tasks
    3. General system tasks
    4. Files, libraries, and folders
    5. Programming
    6. Communications
    7. Define or change the system
    8. Problem handling
    9. Display a menu
   10. Information Assistant options
   11. PC Support tasks

   90. Sign off

Selection or command
===> _____

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F23=Set initial menu
(C) COPYRIGHT IBM CORP. 1980, 1993
```

- u. Ensure the keylock switch is in the Normal position.
- v. Remove the distribution tape and identify the tape.
Note: This tape is loaded in “Installing Licensed Programs” on page L-19.
- w. This completes the restore operation for the operating system.

Restoring User Profiles, Device Configurations, User Libraries, and Authorities

Load the first tape from the save tapes that you created in “Save the Entire System” on page L-3 and proceed with restoring your system.

Using Option 21 (The system) on the Restore Menu

To restore user profiles, configuration objects, system resource management information user libraries, document library objects, and authority, use the following steps:

1. Sign on the system as the security officer; type QSECOFR in the user prompt and the password (if password security is active) associated with that user ID on the Sign On display.

Because function code 24 was used to install the Licensed Internal Code, the password is the default password shipped with the system for the QSECOFR user profile.

2. Press the Enter key.
3. Type the following command on the command line and press the Enter key.
CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK) SEV(60)
4. Ensure that the correct volume of your last set of save tapes is loaded and make the tape device ready. The tape should contain a file labeled QFILEUPR. Run the DSPTAP command and specify DATA(*LABELS) to find the file labeled QFILEUPR.

5. Go to the Restore menu:

GO RESTORE

The Restore menu is shown.

Doing an Unattended Restore Operation

To prevent an interrupted restore operation caused by incomplete restore messages, run the following commands before selecting option 21 from the Restore menu.

1. To display the reply list sequence numbers currently being used, type the following and press the Enter key.

WRKRPLYE

2. To add a reply list entry, type the following (where xxxx is an unused sequence number 1-9999) and press the Enter key.

ADDRPLYE SEQNBR(xxxx) MSGID(CPA3709) RPY('G')

3. To change the job, type the following and press the Enter key.

CHGJOB INQMSGRPY(*SYSRPLY)

6. Select option 21 (The system) on the Restore menu and press the Enter key. The Specify Command Defaults display is shown.

Specify Command Defaults		
Type choices, press Enter.		
Tape devices	TAP01	Names

Prompt for commands	Y	Y=Yes, N=No
Message queue delivery	*BREAK	*BREAK, *NOTIFY

Tape devices

You can specify up to four tape device names. If you specify more than one device, the system automatically switches to the next tape device after the current tape is read.

Prompt for commands

You can specify whether or not you want to be prompted for the commands. If you specify Y (Yes), the prompt display is shown and you can change the defaults on the commands. If you specify N (No) the system runs the commands without prompting and uses the default values.

Message queue delivery

You can specify whether or not you want messages sent in *BREAK or *NOTIFY mode to the QSYSOPR message queue. If *BREAK is specified, any message of severity 99 that requires a reply will interrupt the save operation. If *NOTIFY is specified, messages with severity 99 that require a reply will not interrupt the save operation.

Note: If you are doing an unattended save operation and communications is active, change the message queue delivery to *NOTIFY mode.

Option 21 will guide you through the following commands if you selected Y for the *Prompt for commands* prompt on the Specify Command Defaults display.

- a. ENDSBS SBS(*ALL) OPTION(*IMMED)
- b. CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK or *NOTIFY)
- c. RSTUSRPRF USRPRF(*ALL)
- d. RSTCFG OBJ(*ALL)
- e. RSTLIB SAVLIB(*NONSYS)
- f. RSTDLO DLO(*ALL) SAVFLR(*ANY)
- g. RSTAUT
- h. STRSBS

Notes:

- a. Ensure that device configuration objects not used in the restore operation are varied off.
 - b. Ensure that tape devices, tape controllers, or work station devices that you are using for the restore operation are varied on. These configuration objects will be excluded from the restore operation (message CPF379C in the job log).
7. Press the Enter Key.
 8. Continue loading the save tapes in sequence when the system sends a message to load the next volume.

If a media error occurs....

If an unrecoverable media error occurs during the RSTLIB procedure, you can restart the procedure using the STRLIB parameter on the RSTLIB command. The STRLIB parameter is valid only when *NONSYS, *ALLUSR, or *IBM is specified for the restore operation.

The basic recovery steps for a restore operation are:

1. Check the job log to determine the library where the previous RSTLIB SAVLIB(*NONSYS, *IBM, or *ALLUSR) failed. Find the last library restored, which is indicated by a successful restore completion message.
2. Load the first tape of the SAVLIB LIB(*NONSYS, *ALLUSR, or *IBM) media.
3. Type the following and press the Enter key:

```
RSTLIB SAVLIB(*NONSYS, *IBM or *ALLUSR) DEV(tape-device-name)
      ENDOPT(*LEAVE) STRLIB(library-name) OMITLIB(library-name)
```

where the *library-name* for the STRLIB and the OMITLIB parameters is the library where the RSTLIB failed. This starts the restore operation on the library after the library where the RSTLIB failed.

4. You will be asked to load the volume containing the starting library.
5. After the restore operation is complete, restore the library that failed using the media from a previous save operation.

Note: Consider eliminating the tape with the media error from the next save rotation cycle to avoid a tape error again.

9. This completes the restore operation.
10. Check the job log to ensure all objects were restored.

Note: If you have device descriptions with the keyword IGCFEAT or have the value JKB for parameter KBDTYPE, the device descriptions are not restored. However, these device descriptions are created if you have automatic configuration turned on.

11. If you are unsure what the QSECOFR password is, change it now.
Ignore all CPF3736, CPF3845, and CPF5715 messages during the restore procedure.

Installing Licensed Programs

1. Load the tape you noted in "Install the Operating System" on page L-11 from the set of distribution tapes with the SBCS language feature.
2. Type the following command:
CHGMSGQ QSYSOPR *BREAK SEV(60)
Press the Enter key.
3. A message display could be shown.
Press the Enter key.
Note: Ignore the messages that are shown.
4. Type the following command:

ENDSBS *ALL *IMMED

Press the Enter key.

5. The message Controlling subsystem ended to restricted condition is shown. Press the Enter key to continue.

6. Type the following command:

CHGMSGQ QSYSOPR *BREAK SEV(95)

Press the Enter key.

7. Turn the keylock switch on the control panel of your system to the Normal position. The AS/400 Main Menu (or the menu you chose as an initial menu) is shown.

8. Type the following command:

GO LICPGM

Press the Enter key.

The Work with Licensed Programs display is shown.

```
LICPGM                Work with Licensed Programs                System: XXXX
Select one of the following:

Manual Install
  1. Install all

Licensed Programs
  10. Display installed licensed programs
  11. Install licensed programs
  12. Delete licensed programs
  13. Save licensed programs

Secondary Languages
  20. Display installed secondary languages
  21. Install secondary languages
  22. Delete secondary languages

Selection or command
===> 1

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 main menu
(C) COPYRIGHT IBM CORP. 1980, 1993.
```

9. Type a 1

Press the Enter key. The Manual Install display is shown.

```

Manual Install
System: XXXX

Type choices, press Enter.

Install option . . . 1      1-Installed products
                          2-All products
                          3-New products

Tape device . . . . TAP01  Name

Automatic IPL . . . N     Y-Yes
                          N-No

F3=Exit  F12=Cancel
(C) COPYRIGHT IBM CORP. 1980, 1993.

```

10. Type the following:

Prompt	Entry
Install option	1
Tape device	TAP01
Automatic IPL	N

Notes:

- Option 1 (1-Installed products) installs all of the products you currently have installed on the system. If there are additional licensed programs on the distribution tape, go to *Licensed Programs and New Release Installation Guide*, SC41-9878, for more information about using the other install options.
- TAP01 is used for the tape device in this example. If you are using a different naming convention, type the name you have assigned to the tape device.

11. Press the Enter key.

One or both of the following displays show the status of the licensed programs and language objects as they are being installed on the system.

```

Installing Licensed Programs or PTFs
System: XXXX

Licensed program or PTF install in progress

```

The following display is an example of the display that is shown during the installation process.

```

                                Installing Licensed Programs or PTFs
                                System: XXXX
Licensed programs installed . . . . . :          1

Licensed
Program  Description                                Type   Language
5738SS1  OS/400 - Online Information                *LNG   2924

```

Note: This display shows which licensed programs and optional parts of licensed programs are being installed during the multiprocess installation process. After the *PGM objects and *LNG objects for each licensed program or optional part have been installed, the licensed program disappears from the display and the number for licensed programs installed changes to show how many are installed.

12. Continue loading tapes in sequence whenever messages similar to the following are shown:

```

                                Display Messages
                                System:   XXXX
Queue . . . . . : QSYSOPR                Program . . . . . : *DSPMSG
Library . . . . . : QSYS                  Library . . . . . :
Severity . . . . . : 95                   Delivery . . . . . : *BREAK

Type reply (if required), press Enter.
Load next tape volume on device TAP01 (C G)
Reply . . . . . G

```

13. Type a **G**

Note: **C** cancels processing. **G** (go) continues processing.

Press the Enter key. The Work with Licensed Programs display is shown when the installation process is complete.

```

LICPGM                Work with Licensed Programs                System: XXXX
Select one of the following:

Manual Install
  1. Install all

Licensed Programs
  10. Display installed licensed programs
  11. Install licensed programs
  12. Delete licensed programs
  13. Save licensed programs

Secondary Languages
  20. Display installed secondary languages
  21. Install secondary languages
  22. Delete secondary languages

Selection or command
===> _____
More...

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 main menu
Work with licensed programs function has completed.

```

14. When the installation process is complete, one of the following messages is shown on the bottom of the Work with Licensed Programs display:

- **Work with licensed programs function has completed.**
- **Work with licensed programs function not complete.**

15. The Work with Licensed Programs display is shown. Use the Page Down or Roll Up key to see the second display of the Work with Licensed Programs menu.

```

LICPGM                Work with Licensed Programs                System: XXXX
Select one of the following:

Redistribution
  40. Create a distribution tape
  41. Work with installation profiles

Completion Status
  50. Display log for messages

Related Commands
  70. Save and restore commands
  71. Program temporary fixes command

Selection or command
===> 50

Bottom

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistent
F16=AS/400 main menu
(C) COPYRIGHT IBM CORP. 1980, 1993.

```

16. Type **50**

Press the Enter key.

The Display Install History display is shown.

```

                                Display Install History
Type choices, press enter.
Start date . . . . . _____ MM/DD/YY
Start time . . . . . _____ HH:MM:SS
Output . . . . . *_____ *, *PRINT

F3=Exit  F12=Cancel
(C) COPYRIGHT IBM CORP. 1980, 1993.
```

17. Press the Enter key.
18. Look at the messages shown on the Display History Log Contents display. If any of the messages on the display:
 - a. Indicate a failure
 - b. Indicate that a licensed program was partially installedGo to the *Licensed Programs and New Release Installation Guide*, SC41-9878 to determine the problem. Otherwise, press F3 (Exit) twice.

Completing the Installation Process

1. After the tape has completed rewinding, remove it from the tape drive.
2. If you have additional licensed programs to install, go to *Licensed Programs and New Release Installation Guide* and complete your installation.

Note: If you have PC Support/400 installed on your system, the new release will be downloaded to your personal computer the first time you turn it on. If you did not have PC Support/400 installed before you started the installation process, and want to install it or any of the PC Support/400 options such as AS/400 PC Support PC Tools Folder, go to *Licensed Programs and New Release Installation Guide* to install it now.

Otherwise, continue with step 3.
3. If you have a secondary language installed, go to *Licensed Programs and New Release Installation Guide*, SC41-9878 to replace the secondary language and complete your installation. Otherwise, continue with step 4.
4. Install the cumulative PTF package (the package that came with your distribution tapes or a more current cumulative PTF package). Use the instructions in the *AS/400 PTF Shipping Information Letter*. Then return here and continue with step 5 on page L-25.

IMPORTANT

You must install a cumulative PTF package or do an IPL to complete the installation process. An IPL is required to start the Initialize System (INZSYS) process.

5. Use option 50 (Display log) on the Work with Licensed Program display to find the message **Initialize System (INZSYS) completed**.
 - a. Type **GO LICPGM** and press the Enter key.
 - b. Type **50** on the Work with Licensed Programs display and press the Enter key.
 - c. The Display Install History display is shown. Press the Enter key.

The Display History Log Contents display is shown. Find the message **Initialize System (INZSYS) started**. If you do not see this message on the display, wait a few minutes and select option 50 again. After the **Initialize System (INZSYS started** message is shown, wait for a period of time and look for the **Initialize System (INZSYS) completed** message. If you do not see this message on the display, see the *Licensed Programs and New Release Installation Guide*, SC41-9878 to determine the problem. The INZSYS process could take 2 or more hours to complete.

Note: If you receive any CPA0701 Inquiry messages, ignore them by typing an I to reply.

You have completed installing SBCS Version 2 Release 3 Modification 0 on your system.

Setting Up Configuration Lists and Relational Database Directory Entries

Use the lists from "Save the Entire System" on page L-3 to change the system values and network attributes back to their original values.

1. To set up the configuration lists, type the following command and press F4.

```
WRKCFGL
```

2. If you created a CL program to add the relational database directory entries, run that program. Otherwise, type the following command and press the Enter key.

```
WRKRDBDIRE
```

3. When you are finished, perform a normal IPL and return the system to normal operations.
4. Save your system (see "Save the Entire System" on page L-3).

Changing the Primary Language from SBCS to DBCS

Changing the primary language from an SBCS to DBCS language includes:

- Saving the entire system
- Installing the OS/400 licensed program
- Restoring user profiles, device configurations, user libraries, and authorities
- Installing licensed programs

1. Type the following command and press the Enter key.

```
DSPDBR FILE(QSYS/QADBXREF)
```

This shows you all of the logical files and SQL collections defined over file QSYS/QADBXREF:

Files Dependent On QSYS/QADBXREF			
Dependent File	Library	Sharing	JREF
QADBXDIC	QSYS	Data	
QADBXFIL	QSYS	Data	
QSQCOLUMNS	QSYS	Data	1
QSQTABLES	QSYS	Data	1

If the list shows only these four files, no SQL collections or user-created logical files exist over QSYS/QADBXREF. (If you do not use SQL, this is the normal case).

If the list shows more than these four files, SQL collections or user-created logical files exist over QSYS/QADBXREF.

2. Use the following command and press the enter key to print a copy of the list to use later in the instructions:

```
DSPDBR FILE(QSYS/QADBXREF) OUTPUT(*PRINT)
```

3. Type the following command and press the Enter key.

```
DSPDBR FILE(QSYS/QADBPKG)
```

This shows you all of the logical files and SQL collections defined over file QSYS/QADBPKG.

Files Dependent On QSYS/QADBPKG			
Dependent File	Library	Sharing	JREF
QADBLPKG	QSYS	Data	

If the list shows only the above file, no SQL collections or user-created logical files exist over QSYS/QADBPKG. (If you do not use SQL or your collections were created prior to Version 2 Release 1 Modification 1 and you have not created any SQL packages in collections, this is the normal case).

If the list has more than the one file shown, SQL collections or user-created logical files exist over QSYS/QADBPKG.

4. Use the following command and press the enter key to print a copy of the list to use later in the instructions:

```
DSPDBR FILE(QSYS/QADBPKG) OUTPUT(*PRINT)
```

5. Type the following command and press the Enter key.

```
DSPDBR FILE(QSYS/QADBXRDBD)
```

This shows you all of the logical files defined over file QSYS/QADBXRDBD.

Files Dependent On QSYS/QADBXRDBD			
Dependent File	Library	Sharing	JREF
QADBXRMTNM	QSYS	Data	

If the list shows only the above file, no user-created logical files exist over QSYS/QADBXRDBD.

- Use the following command and press the enter key to print a copy of the list to use later in the instructions:

```
DSPDBR FILE(QSYS/QADBXRDBD) OUTPUT(*PRINT)
```

- Each SQL collection can be identified by a series of files in the list. The name of the library containing the series of files is the name of the collection. For example, if there is one collection on the system named XXX, the list would look like:

Files Dependent On QSYS/QADBXREF			
Dependent File	Library	Sharing	JREF
QADBXDIC	QSYS	Data	
QADBXFIL	QSYS	Data	
QSQTABLES	QSYS	Data	1
QSQCOLUMNS	QSYS	Data	1
QSQTABLES	XXX	Data	1
QSQCOLUMNS	XXX	Data	1
SYSTABLES	XXX	Data	
SYSINDEXES	XXX	Data	
SYSCOLUMNS	XXX	Data	
SYSKEYS	XXX	Data	
SYSVIEWDEP	XXX	Data	
SYSVIEWS	XXX	Data	

Files Dependent On QSYS/QADBPKG			
Dependent File	Library	Sharing	JREF
QADBLPKG	QSYS	Data	
SYSPACKAGE	XXX	Data	

To obtain the owner and authorities for the SQL collections and the files in the SQL collections, enter the following commands:

```
DSPOBJAUT library-name OBJTYPE(*LIB) OUTPUT(*PRINT)
DSPOBJAUT library-name/data-dictionary-name OBJTYPE(*DTADCT)
OUTPUT(*PRINT)
```

Note: The library-name and the data-dictionary-name are the same as the collection name.

- Any other files whose name is not in the lists shown are user-created logical files that have been created over the system files QSYS/QADBXREF, QSYS/QADBPKG, and QSYS/QADBXRDBD. Some user-created logical files may be SQL views and some may have been created from DDS source. User-created logical files that were created from DDS source may need their DDS source modified after the installation process and may need to be created again. (The data type specified in position 35 for the logical file fields that are defined over field DBXTXT in QSYS/QADBXREF, over fields DBXPSHT and DBXPLNG in QSYS/QADBPKG, or over field DBXRDBT in QSYS/QADBXRDBD may need the data type changed from A or E to either O

or H. SQL views are handled automatically when RSTLIB LIB(*NONSYS) is restored.

Each SQL view can be identified by looking at the file description. Type the following command and press the Enter key.

```
DSPFD FILE(library-name/file-name)
```

For example, the following file description of SYSVIEWS shows that it is a SQL view:

```
File Description Header
File . . . . . : FILE      SYSVIEWS
Library . . . . . :          XXX
Type of file . . . . . :      Logical
File type . . . . . : FILETYPE *DATA
Auxiliary storage pool ID . . . . . :      01
Data Base File Attributes
Externally described file . . . . . :      Yes
Linked to data dictionary . . . . . :      Yes
File definition . . . . . : DFN      SYSVIEWS
Data dictionary . . . . . : DTADCT   XXX
SQL file type . . . . . :          VIEW
File level identifier . . . . . :      0910517121818
Creation date . . . . . :          09/01/92
```

If DSPFD does not display the line **SQL file type**, the file is not a SQL view.

Note: QSQCOLUMNS and QSQTABLES do not display the line **SQL file type**, but are part of the SQL collection.

For each of the user-created logical files that are *not* SQL views, enter the following commands to print a copy of the lists to use later in the instructions to create the logical files again.

```
DSPOBJD OBJ(library/file) OBJTYPE(*FILE) DETAIL(*FULL)
OUTPUT(*PRINT)
DSPOBJD OBJ(library/file) OBJTYPE(*FILE) DETAIL(*SERVICE)
OUTPUT(*PRINT)
DSPFD FILE(library/file) OUTPUT(*PRINT)
DSPFFD FILE(library/file) OUTPUT(*PRINT)
DSPOBJAUT OBJ(library/file) OBJTYPE(*FILE) OUTPUT(*PRINT)
```

Save the Entire System

This save operation will be used later to restore user data to the system.

Using option 21 (Entire system) on the Save Menu allows you to save the entire system without entering the commands.

Attention

Saving access paths can significantly reduce recovery time. However, saving access paths increases the time it takes to save the system. If you do not want to save access paths, specify a **Y** for the *Prompt for commands* prompt on the Specify Command Defaults display. When you are prompted for the SAVLIB LIB(*NONSYS) command, change the access path parameter to *NO. If you prompt for commands, you cannot do an unattended save operation.

1. Sign on the system as QSYSOPR or QSECOFR.

Note: The system operator (QSYSOPR) and security officer (QSECOFR) user profiles are shipped with save system (*SAVSYS) and job control (*JOBCTL) special authorities. Ensure that you have not changed these special authorities in the QSYSOPR or QSECOFR user profiles.

2. Verify that no users are on the system and that no batch jobs are running:

```
WRKACTJOB
```

3. Display the system log QHST to verify it is up to date:

```
DSPLLOG LOG(QHST)
```

Displaying the QHST log automatically brings it up to date.

4. Display all copies of the system log:

```
WRKF FILE(QSYS/QHST*)
```

Look at the list to verify that you saved all copies of the log that will be needed later.

5. Select option 4 (Delete) on the display to delete all but the current copies of the system log to prevent confusion about the date of the log. This step improves the performance of the SAVSYS command. Select option 8, Display file descriptions, to see when the History log was created and the last time that it was updated or changed.

6. Print a list of all the libraries on the system. You can use this list later if you need to restore a single library:

```
DSPOBJD OBJ(QSYS/*ALL) OBJTYPE(*LIB) OUTPUT(*PRINT)
```

7. Print a list of the current system values:

```
WRKSYSVAL OUTPUT(*PRINT)
```

8. Print a list of the current network attributes:

```
DSPNETA OUTPUT(*PRINT)
```

9. Print a list of the current configuration lists:

```
WRKCFGL
```

Select option 6 (Print)

10. Print a list of the current relational database directory entries:

```
DSPRDBDIRE OUTPUT(*PRINT)
```

Note: You may also create a CL program to save relational database directory entries. For more information and an example, see the discussion on Saving and Restoring Relational Database Directories in Chapter 7 of *Distributed Relational Database Guide*, SC41-0025.

11. Print a list of all the Licensed Internal Code fixes currently on the system:

```
DSPPTF LICPGM(*ALL) OUTPUT(*PRINT)
```

Keep this list with your backup log or your save system tapes for future reference.

12. If you did **not** identify any SQL collections in step 7 on page L-27 of "Changing the Primary Language from SBCS to DBCS," go to the next step. Otherwise, mount an initialized tape and enter the following command:

```
SAVLIB LIB(QSQL) DEV(tape-device-name) ENDOPT(*UNLOAD)
```

Remove the tape.

Note: This tape will be used in step 10 on page L-41 of the installation process.

13. Go to the Save menu. Type the following command and press the enter key:

GO SAVE

The Save menu is shown.

Load an initialized tape to perform the save operation of the system. Do not use the tape created in step 12 on page L-29.

```
SAVE                                Save                                System:  RCHASLLZ
Select one of the following:

Save Data
  1. Files
  2. Libraries
  3. Documents and folders
  4. Programs
  5. Other objects
  6. Changed objects only
  7. Licensed programs
  8. Security data
  9. Storage
 10. Configuration

Selection or command                                     More...
====>

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 Main menu
(C) COPYRIGHT IBM CORP. 1980, 1993.
```

14. Press the Page Down key to show the following display.

```
SAVE                                Save                                System:  RCHASLLZ
Select one of the following:

Save System Data
 20. All libraries other than system library
 21. Entire system
 22. All IBM libraries other than system library
 23. All user libraries
 24. All changed objects in user libraries

Save Office Data
 30. All documents, folders, and mail
 31. New and changed documents, new folders, all mail
 32. Documents and folders
 33. Mail only
 34. Calendars

Selection or command                                     More...
====>

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 Main menu
```

Doing an Unattended Save Operation

To prevent an interrupted save operation caused by incomplete save messages, run the following commands before selecting option 21 from the Save menu:

1. To display the reply list sequence numbers currently used, type the following and press the Enter key.

```
WRKRPLYE
```

2. To add a reply list entry, type the following (where xxxx is an unused sequence number 1-9999) and press the Enter key.

```
ADDRPLYE SEQNBR(xxxx) MSGID(CPA3708) RPY('G')
```

3. To change the job, type the following and press the Enter key.

```
CHGJOB INQMSGRPY(*SYSRPLY)
```

Note: Communications messages with a severity of 99 that require a reply can stop an unattended save operation. If you are using communications, you need to identify the messages that may require a reply and then add them to the reply list.

15. Select option 21 (Entire system) from the Save menu and press the Enter key.

Specify Command Defaults		
Type choices, press Enter.		
Tape devices	TAP01	Names

Prompt for commands	Y	Y=Yes, N=No
Message queue delivery	*BREAK	*BREAK, *NOTIFY

Tape devices

You can specify up to four tape device names. If you specify more than one device, the system automatically switches to the next tape device when the current tape is full. It is recommended that you use your alternate IPL device. This allows you to recover your system.

Prompt for commands

You can specify whether or not you want to be prompted for the commands. If you specify Y (Yes), the prompt display is shown and you can change the defaults on the commands. If you specify N (No), the system runs the commands without prompting (for unattended save operations) and uses the default values.

Check for active files

Allows you to specify whether or not you want to check for active files on tape. If you specify Y (Yes), the system sends a message when active files on tape are encountered. You can end the checking process or clear the existing files and continue. If N (No) is specified, all active files encountered during the save operation are cleared.

Message queue delivery

Allows you to specify whether or not you want messages sent in *BREAK or *NOTIFY mode to the QSYSOPR message queue. If *BREAK is specified, any message of severity 99 that requires a reply will interrupt the save operation. If *NOTIFY is specified, messages with severity 99 that require a reply will not interrupt the save operation.

Note: If you are doing an unattended save operation and communications is active, change the message queue delivery to *NOTIFY mode.

Option 21 will guide you through the following commands if you select Y on the *Prompt for commands* prompt on the Specify Command Defaults display.

- a. ENDSBS SBS(*ALL) OPTION(*IMMED)
- b. CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK or *NOTIFY) SEV(99)
- c. SAVSYS
- d. SAVLIB LIB(*NONSYS) ACCPTH(*YES)
- e. SAVDLO DLO(*ALL) FLR(*ANY)
- f. STRSBS SBSD(controlling-subsystem)

Notes:

- a. Ensure any device configuration objects not used in the restore operation are varied off.
 - b. Ensure that any tape devices, tape controllers, or work station device that you are using for the restore operation are varied on. These configuration objects will be excluded from the restore operation (message CPF379C in the job log).
16. Continue loading tapes when the system sends a message asking you to load the next volume.

If a media error occurs...

If an unrecoverable media error occurs during the SAVLIB procedure, you can restart the procedure using the STRLIB parameter on the SAVLIB command. The STRLIB parameter is valid only when *NONSYS, *ALLUSR, or *IBM is specified for the SAVLIB or SAVCHGOBJ command.

The basic recovery steps for a save operation are:

1. Check the job log to determine the library where the previous SAVLIB LIB(*NONSYS, *IBM, or *ALLUSR) failed. Find the last library saved, which is indicated by a successful save completion message.
2. Load the next tape and ensure the tape is initialized.
3. Type the following and press the Enter key:

```
SAVLIB LIB(*NONSYS, *IBM or *ALLUSR) DEV(tape-device-name)
        ENDOPT(*LEAVE) STRLIB(library-name) ACCPTH(*YES)
        OMITLIB(library-name)
```

where the *library-name* for the STRLIB and the OMITLIB parameters is the last library successfully saved. This starts the save operation on the library after the last successfully saved library. Specify the value for the ACCPTH parameter that was specified on the previous SAVLIB command.

Note: Restoring the system using this set of media requires two RSTLIB SAVLIB(*NONSYS, *ALLUSR, or *IBM) commands to restore the libraries.

17. The job log contains information about the save operation. To verify that all objects were saved, you should spool the job log for printing, along with the job's remaining spooled output, if any.

```
DSPJOBLOG * OUTPUT(*PRINT)
```

It is important to view or print this job log because all user data will be deleted in the steps under "Install DBCS Version 2, Release 3 Modification 0."

Install DBCS Version 2, Release 3 Modification 0

To change the primary language to a DBCS version, you need to install Version 2, Release 3 Modification 0 of the Operating System/400 program on your system. You will need the set of distribution tapes with the new DBCS language feature.

1. Sign on the system as QSECOFR.
2. Change the QSYSOPR message queue to break mode:

```
CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK) SEV(60)
```
3. To end all the jobs before installing the Licensed Internal Code, type:

```
ENDSBS SBS(*ALL) OPTION(*IMMED)
```

and press the Enter key. Messages are displayed indicating when the subsystems have ended and the system is in a restricted state. After the subsystems have ended, continue with step 4.

4. Power down the system before installing the Licensed Internal Code by entering:

```
PWRDWN SYS OPTION(*IMMED)
```

When the Power On light goes off all racks of the 9406 System Unit or the control panel on the AS/400 9402 System Unit or 9404 System Unit, continue with step 5 on page L-34.

5. Ensure the key is in the keylock switch on the control panel.
6. Turn the key in the keylock switch until it points to the Manual position.
7. Press the Function Select switch to display **02** in the Function display on the control panel.
8. Press the Enter button on the control panel.
9. Select IPL type D (this specifies that the IPL source comes from tape) by pressing the Function Select switch on the control panel until **D** is shown on the Data display.
10. Press the Enter button on the control panel.

Note: If you do not power down the system, do the following after ending the subsystems.

- a. Press the Function Select switch to display 03 (Continue the IPL) in the Function display on the control panel.
 - b. Press the Enter button on the control panel.
11. For the 9406 System Unit, ensure that the power switches for the tape unit used for the IPL and all disk units are in the On position.
 12. Find the Licensed Internal Code tape, which is the first volume of the DBCS Version 2 Release 3 Modification 0 distribution tapes.
 13. Place the tape in the tape unit used for the IPL. For more information on loading the tape, see the setup manual for the device.
Note: If your tape unit cannot be loaded when the power is off, continue with the next step. You will be prompted later by an SRC code for the tape.
 14. Switch on power to the system by pushing the Power switch on the control panel up. The switch returns to center after you push it. The 9402 System Unit has a green button labeled Power On on the control panel.
 15. If you could not load your tape in a previous step, load the first tape volume into the tape unit used for the IPL. Make the device ready and then continue with the next step.
 16. If the system attention light is on and one of the SRC codes shown in the following table is displayed in the Data display, complete the instructions for that SRC code. Otherwise, continue with the next step.

<i>Table L-2. SRC Codes for Installing the DBCS Version 2 Release 2.0</i>	
Symptom	Action
A100 1933 A12x 1933 (x is any character)	This SRC is shown if the tape device for the alternate IPL is not ready. Make sure the correct tape is loaded and make the tape device ready. Wait for the System Attention light to go off. Then, continue with the next step. If the System Attention light stays on for more than 5 minutes, check to see if you have the correct tape loaded in the tape device for the alternate IPL and make the tape device ready. Then continue with the next step.
B1xx 1803 B1xx 1806 B1xx 1938	These SRCs are shown if the tape device for the alternate IPL was not found or was not ready. Make sure the tape device is powered on, the correct tape is loaded, and ready. Then continue with the next step.
B1xx 1934	This SRC is shown if the wrong tape is loaded. Load the correct tape and make the tape device ready. Then continue with the next step. This SRC is also shown if the high-speed feature is enabled on the 2440 Tape Unit. The high-speed feature must be disabled before installing or restoring the Licensed Internal Code.
2507 0001 2642 0001 2643 0001	These SRCs are shown if a tape is not loaded in the tape device for the alternate IPL. Make sure the correct tape is loaded in the correct drive and then continue with the next step.
<p>Note: If any SRC listed in the table does not disappear from the control panel, do the following:</p> <ol style="list-style-type: none"> 1. Press the Function Select switch to display 03 (Continue the IPL) in the Function display on the control panel. 2. Press the Enter button on the control panel. 	

17. Ensure that the tape is online or ready. No action is required for tape units that perform this step automatically (such as the tape cartridge unit).

18. Ensure that the console display is turned on.

19. Wait for the yellow System Attention light on the control panel to light up.

There is a delay while the system loads information from the tape. SRCs showing status are continuously updated on the control panel while processing occurs. This can take from 5 to 20 minutes; the time varies depending on the speed of the tape unit and the processor speed for the specific system model.

When SRC A6xx 6001 is displayed, the system is prepared to start installing or restoring the Licensed Internal Code on the disk unit containing unit 1. Continue with the next step.

20. Select function code 24 by pressing the Function Select switch on the control panel until 24 is shown in the function display on the control panel.

Note: You must use function code 24 to install the DBCS version.

21. Press the Enter button on the control panel.

Warning: Option 24 (Install) deletes all information on the disk unit containing unit 1, including customer data. All system configuration information is also deleted. All disk units except unit 1 become nonconfigured units during the IPL.

The System Attention light may appear in 1 or 2 minutes and SRC A6xx 6002 is displayed. To install the Licensed Internal Code, select function code 24 again and press the Enter button.

Note: If another SRC is displayed after A6xx 6001 that is not in the A6xx xxxx format, then the system needs additional attention. Call your service representative.

If the following SRCs are displayed after SRC A6xx 6001 is displayed, see *Basic Backup and Recovery Guide* for an explanation of these SRCs and the steps to follow.

A6xx 6002 Disk unit may contain a valid system
A6xx 6003 Disk unit not currently a load source
A6xx 6004 Disk unit not currently a load source
A6xx 6005 Disk unit not found

22. After pressing the Enter button on the control panel, the system starts displaying status SRCs again, which will be continuously updated to show the status of the install or restore operation. An example of a status SRC is D6xx 6201 (stand-alone install operations is running).
23. If the yellow system attention light is on again, and SRC A6xx 6048 (New tape volume needs to be loaded) is displayed, the system needs the next tape. The xx tells which volume needs to be loaded. Load the correct tape and make the device ready. The install or restore operation automatically continues.

If SRC A6xx 6051 appears, the stand-alone function is requesting the Model-Unique Licensed Internal Code tape found inside the back cover of the system unit or on the side of the 9402 C04, D02, and E02 System Unit. Unload the current tape from the tape device and load the Model-Unique Licensed Internal Code tape.

- A6xx 6051 Model-Unique Licensed Internal Code tape needs to be loaded
- A6xx 6052 Tape loaded was not the Model-Unique Licensed Internal Code

If another SRC A6xx xxxx is displayed, look up the displayed SRC in *Basic Backup and Recovery Guide* and follow the instructions. For all other SRCs call your service representative.

Install the Operating System

You use two displays to select the installation options. The IPL or Install the System display allows you to install the operating system or work with the service tools. The Install the Operating System display allows you to set the options to be used for installing the system, and for setting the system date and time.

1. At the IPL or Install the System menu, type a **2** (Install the operating system).

Note: **Do not** use option 4 (Perform automatic installation of the operating system) to install the operating system.

2. Press the Enter key.

The Confirm Install of the Operating System display is shown.

3. Press the Enter key.

The Select a Language Group display is shown. This display shows the DBCS primary language on the distribution tapes.

The value specified on the display must be the same as the national language that is on the distribution media.

4. Press the Enter key.

After the language feature is displayed, the Confirm Language Feature Selection display is shown.

5. Press the Enter key to confirm the information.

Note: The Add All Disk Units display is shown only if disk units have been attached to the system and are in nonconfigured status.

6. Select option 1 (Add all disk units to the system auxiliary storage pool) if you want to add all of the nonconfigured units to the system auxiliary storage pool. Before adding the units to the system, all data stored on the nonconfigured units is deleted.

Note: Adding units can change the checksum set configuration of the system ASP. You can use option 3 (Perform disk configuration using DST) to calculate the effect of adding units to the system ASP.

7. Press the Enter key.

The formatting Disk Units display is shown while the disk units are being configured.

Adding disk units takes several minutes. The time it takes depends on the size of each unit and the ability of the system to do multiple additions at the same time.

8. Status messages are displayed. The status messages shown do not require any action by the user.

After the IPL steps complete, the Install the Operating System menu appears.

9. When the Install the Operating System display is shown, select option 1 (Take defaults). This option is selected when you are performing a total system restore operation. When you select option 1 (Default), the operating system is installed again and no more install options displays are shown. Do the following:

- a. Fill in the date and time.

Date

The system inserts the date based on the internal clock. If the date is incorrect, you can type over the date to change it.

Time

The system inserts the time based on the internal clock. If the time is incorrect, you can type over the time to change it.

- b. Press the Enter key.
- c. Messages are shown to indicate how many programs and language objects are restored. These messages are for your information only.
- d. Continue loading distribution tapes in sequence when messages are shown that ask you to load the next tape. The system searches through the tapes and loads the necessary programs and language information. When the operating system is installed, the following message may be displayed at the bottom of a blank display:

Operating system has been installed. IPL in progress.

When the IPL is complete, the IPL Sign On display is shown and the system is ready to complete the IPL.

```

                                Sign On
                                System. . . . . : XXX
                                Subsystem . . . : QBASE
                                Display . . . . . : QCONSOLE

                                User. . . . . QSECOFR

                                Program/procedure . . . . . _____
                                Menu. . . . . _____
                                Current library . . . . . _____

```

- e. Type QSECOFR in the *User* prompt and the password required for that user ID in the *Password* prompt (if password security is active) on the Sign On display.

Attention

The password is the default password shipped with the system for QSECOFR user profile.

- f. Press the Enter key. Informational messages are displayed.
- g. If the Work with Licensed Program PTFs display appears, press F3 (Exit) to continue.
- h. When the IPL Options display is shown, respond to the prompts using the following information.

```

                                IPL Options

                                Type choices, press Enter.

                                System date . . . . . XX / XX / XX      MM / DD / YY
                                System time . . . . . XX : XX : XX      HH : MM : SS
                                Clear job queues. . . . . N              Y=Yes, N=No
                                Clear output queues . . . . . N          Y=Yes, N=No
                                Clear incomplete job logs . . . . . N     Y=Yes, N=No
                                Start print writers . . . . . Y          Y=Yes, N=No
                                Start this device only. . . . . N        Y=Yes, N=No

                                Set major system options. . . . . Y      Y=Yes, N=No
                                Define or change system at IPL. . . . . N  Y=Yes, N=No

```

- i. Enter the value for the *system date* field.
- The date is displayed. The system date format shown can be YY/MM/DD, DD/MM/YY, or MM/DD/YY where MM means month, DD means day, and YY means year. For English, the default is MM/DD/YY; the default value differs according to the primary language

If the date is not correct, you can type over the date to change it. The system date must have a year value in the range of 87 to 99, or 00 to 22.

j. Enter the value for the *system time* field.

The current time is displayed. The time format is HH : MM : SS; HH means hour, MM means minutes, and SS means seconds. If you want to change the time, type it in accordance with the 24-hour clock. For example, for an IPL at 4:30 p.m., type 163000 for the time.

k. Enter the value for the *start this device only* field. The default is N.

Note: Change this option only if you are going to continue restoring user profiles, device configuration objects, user libraries, and authorities.

Type a Y to start the console device only.

l. Enter the value for the *set major system options* field. The default is different, depending on the type of restore operation. The default value is set to Y.

Type an N for each option to leave them unchanged. Type Y to set the specific options.

Attention

1. Leave the default value of Y for the *Set the major system options* field. If the *Enable automatic configuration* field is set to N, an SRC A900 2000 status message is shown on the control panel later in the restore operation. The instructions to recover from SRC A900 2000 are provided at that time.
2. If you are using the System/36 environment on your system, ensure that the automatic configuration is set to NO.

m. Enter the value for the *define or change system at IPL* field.

Type a Y to change the system values, or type an N to leave the system values unchanged.

n. **Do not** press the Enter key yet.

Attention

You are restoring the operating system from the distribution tapes, the system has reset the system values and network attributes back to the IBM-supplied defaults. The system values and network attributes must be changed to the values on the save media.

For example, the QSECURITY system value **must** be changed to the values in effect at the time of the save operation to ensure that the security information is restored correctly. To change the system values, do the following:

1. Type a Y to display the Define or Change the System menu and press the Enter key until the system value commands display is shown.
2. Select option 3 (System value commands) and press the Enter key.
3. Select option 3 (Work with system values) and press the Enter key.
Note: Do not change the system value for QIGC. This should be set to 1 for a DBCS system and 0 for a SBCS system.
4. Type a 2 in the *Option* column next to the system values you want to change and press the Enter key.
5. Change the values to the correct values and press the Enter key.
6. Press F12 to return to the Define or Change the System at IPL menu.

If you had changed the network attributes from the the IBM-supplied defaults, do the following:

1. Select option 4 (Network attributes) and press the Enter key to display a list of network attributes.
2. Select option 2 (Change network attributes).
3. Change the values to the correct network attributes and press the Enter key.
4. Press F12 (Cancel) to return to the Define or Change the System at IPL menu.
5. Press F3 to continue the IPL.

- o. Press the Enter key.
- p. The Edit Rebuild Access Paths display is shown during the IPL process (attended mode) when there are access paths marked for rebuild.
- q. Press the Enter key to continue.
- r. Press F3 (Exit and continue the IPL) to continue.

Did You Receive SRC A900 2000?

If you receive A900 2000 on the control panel and message CPF0975: *Console did not vary on* on the console display, automatic configuration is turned off. However, the system has created device description QCONSOLE to allow you to continue the restore operation. **Do not** create a user-defined device description for the console display. This will cause unpredictable results. Recovery for SRC A900 2000 is provided in the *Basic Backup and Recovery Guide*. If you did not receive SRC A900 2000, continue with the next task.

- s. Reply to any messages that might appear on the display.
- t. Press the Enter key to continue. The Main Menu is shown.

```
MAIN                      AS/400 Main Menu                      System: XXXX
Select one of the following:

    1. User tasks
    2. Office tasks
    3. General system tasks
    4. Files, libraries, and folders
    5. Programming
    6. Communications
    7. Define or change the system
    8. Problem handling
    9. Display a menu
   10. Information Assistant options
   11. PC Support tasks

   90. Sign off

Selection or command
===> _____

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F23=Set initial menu
(C) COPYRIGHT IBM CORP. 1980, 1993
```

- u. Turn the keylock switch is in the Normal position.
 - v. Remove the distribution tape after it rewinds.
Note: This tape will be the first tape loaded when restoring the licensed programs.
 - w. This completes the restore operation for the operating system.
10. If you did *not* identify any SQL collections in step 7 on page L-27 under “Changing the Primary Language from SBSCS to DBCS,” go to “Restoring User Profiles, Device Configurations, User Libraries, and Authorities.” Load the SAVLIB tape created in “Save the Entire System” step 12 on page L-29 and enter the following command:
- ```
RSTLIB SAVLIB(QSQL) DEV(tape-device-name) ENDOPT(*UNLOAD)
```
- Remove the SAVLIB tape that is currently on your system.
11. Enter the following commands:
- ```
ADDLIB LIB(QSQL)
STRSQL
```

For each SQL collection identified in step 7 on page L-27 under “Changing the Primary Language from SBCS to DBCS,” enter the following SQL statement (one at a time) and press the Enter key:

```
CREATE COLLECTION collection-name
```

12. Press the Enter key and then press F3 to exit SQL. Take default option 1, **Save and exit session.**

Restoring User Profiles, Device Configurations, User Libraries, and Authorities

Load the first tape from the save tapes that you created in “Save the Entire System” on page L-28 and proceed with restoring your system. Do not use the SAVLIB QSQL tape, which is the save tape from SQL.

Using Option 21 (The system) on the Restore Menu

To restore user profiles, configuration objects, system resource management information user libraries, document library objects, and authority, use the following steps:

1. Sign on the system as the security officer; type QSECOFR in the user prompt and the password (if password security is active) associated with that user ID on the Sign On display. Since function code 24 was used to install the Licensed Internal Code, the password is the default password shipped with the system for the QSECOFR user profile.
2. Press the Enter key.
3. Type the following command on the command line and press the Enter key.

```
CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK) SEV(60)
```
4. Ensure that the correct volume of your last set of save tapes is loaded and make the tape device ready. The tape should contain a file labeled QFILEUPR. Run the DSPTAP command and specify DATA(*LABELS) to find the file labeled QFILEUPR.
5. Go to the Restore menu:

```
GO RESTORE
```

The Restore menu is shown.

Doing an Unattended Restore Operation

To prevent an interrupted restore caused by incomplete restore messages, run the following commands before selecting option 21 from the Restore menu.

1. To display the reply list sequence numbers currently being used, type the following and press the Enter key.

```
WRKRPYLE
```
2. To add a reply list entry, type the following (where xxxx is an unused sequence number 1-9999) and press the Enter key.

```
ADDRPYLE SEQNBR(XXXX) MSGID(CPA3709) RPY('G')
```
3. To change the job, type the following and press the Enter key.

```
CHGJOB INQMSGRPY(*SYSRPLY)
```

6. Select option 21 (The system) on the Restore menu and press the Enter key. The Specify Command Defaults display is shown.

Specify Command Defaults		
Type choices, press Enter.		
Tape devices	TAP01	Names

Prompt for commands	Y	Y=Yes, N=No
Message queue delivery	*BREAK	*BREAK, *NOTIFY

Tape devices

You can specify up to four tape device names. If you specify more than one device, the system automatically switches to the next tape device after the current tape is read.

Prompt for commands

You can specify whether or not you want to be prompted for the commands. If you specify Y (Yes), the prompt display is shown and you can change the defaults on the commands. If you specify N (No), the system runs the commands without prompting and uses the default values.

Message queue delivery

Allows you to specify whether or not you want messages sent in *BREAK or *NOTIFY mode to the QSYSOPR message queue. If *BREAK is specified, any message of severity 99 that requires a reply will interrupt the save operation. If *NOTIFY is specified, messages with severity 99 that require a reply will not interrupt the save operation.

Note: If you are doing an unattended save operation and communications is active, change the message queue delivery to *NOTIFY mode.

Option 21 will guide you through the following commands if you selected Y for the *Prompt for commands* prompt on the Specify Command Defaults display.

- a. ENDSBS SBS(*ALL) OPTION(*IMMED)
- b. CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK or *NOTIFY)
- c. RSTUSRPRF USRPRF(*ALL)
- d. RSTCFG OBJ(*ALL)
- e. RSTLIB SAVLIB(*NONSYS)
- f. RSTDLO DLO(*ALL) SAVFLR(*ANY)
- g. RSTAUT
- h. STRSBS

Notes:

- a. Ensure any device configuration objects not used in the restore operation are varied off.
 - b. Ensure that any tape devices, tape controllers, or work station device that you are using for the restore operation are varied on. These configuration objects will be excluded from the restore operation (message CPF379C in the job log).
7. Press the Enter Key.
 8. Continue loading the save tapes in sequence when the system sends a message to load the next volume.

If a media error occurs....

If an unrecoverable media error occurs during the RSTLIB procedure, you can restart the procedure using the STRLIB parameter on the RSTLIB command. The STRLIB parameter is valid only when *NONSYS, *ALLUSR, or *IBM is specified for the restore operation.

The basic recovery steps for a restore operation are:

1. Check the job log to determine the library where the previous RSTLIB SAVLIB(*NONSYS, *IBM, or *ALLUSR) failed. Find the last library restored, which is indicated by a successful restore completion message.
2. Load the first tape of the SAVLIB LIB(*NONSYS, *ALLUSR, or *IBM) media.
3. Type the following and press the Enter key:

```
RSTLIB SAVLIB(*NONSYS, *IBM or *ALLUSR) DEV(tape-device-name)
        ENDOPT(*LEAVE) STRLIB(library-name) OMITLIB(library-name)
```

where the *library-name* for the STRLIB and the OMITLIB parameters is the library where the RSTLIB failed. This starts the restore operation on the library after the library where the RSTLIB failed.

4. You will be asked to load the volume containing the starting library.
5. After the restore operation is complete, restore the library that failed using the media from a previous save operation.

Note: Consider eliminating the tape with the media error from the next save rotation cycle to avoid a tape error again.

9. This completes the restore operation.
10. Use the following command and press the Enter key to display the job log:
DSPJOBLOG
11. Check the job log to ensure that all objects should be restored.

| **Notes:**

- | a. If you created SQL collections earlier message, CPF3779, can appear.
- | b. Ignore all CPF3205, CPF3225, CPF3283, CPF3750, CPF3756, CPF3766
| or CPF3876 messages that are associated with the files from the list in
| step 7 on page L-27.
- | c. Ignore all CPF3736, CPF3845, and CPF5715 messages during the restore
| authority procedure.
- | 12. If you are unsure of what the QSECOFR password is, change it now.

| **Installing Licensed Programs**

- | 1. Load the tape you noted in "Install the Operating System" on page L-36 from
| the set of distribution tapes with the DBCS language feature.

| **Note:** Use uppercase characters to reply to the system messages.

- | 2. Type the following command:

CHGMSGQ QSYSOPR *BREAK SEV(60)

Press the Enter key.

- | 3. A message display could be shown.

Press the Enter key.

Note: Ignore the messages that are shown.

- | 4. Type the following command:

ENDSBS *ALL *IMMED

Press the Enter key.

- | 5. The message Controlling subsystem ended to restricted condition is
| shown. Press the Enter key to continue.

- | 6. Type the following command:

CHGMSGQ QSYSOPR *BREAK SEV(95)

Press the Enter key.

- | 7. Turn the keylock switch on the control panel of your system to the Normal posi-
| tion. The AS/400 Main Menu (or the menu you chose as an initial menu) is
| shown.

- | 8. Type the following command:

GO LICPGM

Press the Enter key.

The Work with Licensed Programs display is shown.

```
LICPGM                Work with Licensed Programs                System: XXXX
Select one of the following:

Manual Install
  1. Install all

Licensed Programs
  10. Display installed licensed programs
  11. Install licensed programs
  12. Delete licensed programs
  13. Save licensed programs

Secondary Languages
  20. Display installed secondary languages
  21. Install secondary languages
  22. Delete secondary languages

Selection or command
====> 1

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 main menu
(C) COPYRIGHT IBM CORP. 1980, 1993.
```

9. Type a 1

Press the Enter key.

The Manual Install display is shown.

```
Manual Install                System: XXXX
Type choices, press Enter.

Install option . . . 1          1-Installed products
                                2-All products
                                3-New products

Tape device . . . . TAP01      Name

Automatic IPL . . . N          Y-Yes
                                N-No

F3=Exit  F12=Cancel
(C) COPYRIGHT IBM CORP. 1980, 1993.
```

10. Type the following:

<i>Prompt</i>	<i>Entry</i>
Install option	1
Tape device	TAP01
Automatic IPL	N

Notes:

- Option 1 (1-Installed products) installs all of the products you currently have installed on the system. If there are additional licensed programs on the distribution tape, go to *Licensed Programs and New Release Installation Guide*, SC41-9878 for more information about using the other install options.
- TAP01 is used for the tape device in this example. If you are using a different naming convention, type the name you have assigned to the tape device.

11. Press the Enter key.

One or both of the following displays show the status of the licensed programs and language objects as they are being installed on the system.

```
Installing Licensed Programs or PTFs                System: XXXX

Licensed program or PTF install in progress
```

The following display is an example of the display that is shown during the installation process.

```
Installing Licensed Programs or PTFs                System: XXXX
Licensed programs installed . . . . . : 1
Licensed
Program  Description                               Type  Language
5738SS1  OS/400 - Online Information                    *LNG  2924
```

Note: This display shows which licensed programs and optional parts of licensed programs are being installed during the multiprocess installation process. After the *PGM objects and *LNG objects for each licensed program or optional part have been installed, the licensed program disappears from the display and the number for licensed programs installed changes to show how many are installed.

12. Continue loading tapes in sequence whenever messages similar to the following are shown:

```

                                Display Messages
                                System: XXXX
Queue . . . . . : QSYSOPR          Program . . . . . : *DSPMSG
Library . . . . . : QSYS           Library . . . . . :
Severity . . . . . : 95            Delivery . . . . . : *BREAK

Type reply (if required), press Enter.
Load next tape volume on device TAP01 (C G)
Reply . . . . . G

```

13. Type a **G**

Note: **C** cancels processing. **G** (go) continues processing.

Press the Enter key.

The Work with Licensed Programs display is shown when the installation process is complete.

```

LICPGM          Work with Licensed Programs          System: XXXX

Select one of the following:

Manual Install
  1. Install all

Licensed Programs
  10. Display installed licensed programs
  11. Install licensed programs
  12. Delete licensed programs
  13. Save licensed programs

Secondary Languages
  20. Display installed secondary languages
  21. Install secondary languages
  22. Delete secondary languages

Selection or command                                     More...
====> _____

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 main menu
Work with licensed programs function has completed.

```

14. When the installation process is complete, one of the following messages is shown on the bottom of the Work with Licensed Programs display:

- **Work with licensed programs function has completed.**
- **Work with licensed programs function not complete.**

15. The Work with Licensed Programs display is shown. Use the Page Down or Roll Up key to see the second display of the Work with Licensed Programs menu.


```

LICPGM                Work with Licensed Programs                System: XXXX

Select one of the following:

Redistribution
  40. Create a distribution tape
  41. Work with installation profiles

Completion Status
  50. Display log for messages

Related Commands
  70. Save and restore commands
  71. Program temporary fixes command

Bottom

Selection or command
===> 50

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
(C) COPYRIGHT IBM CORP. 1980, 1993.
F16=AS/400 main menu

```

16. Type **50**

Press the Enter key.

The Display Install History display is shown.

```

Display Install History

Type choices, press enter.

Start date . . . . . _____ MM/DD/YY
Start time . . . . . _____ HH:MM:SS
Output . . . . . *_____ *, *PRINT

F3=Exit  F12=Cancel
(C) COPYRIGHT IBM CORP. 1980, 1993.

```

17. Press the Enter key.

18. Look at the messages shown on the Display History Log Contents display. If any of the messages on the display indicate a failure or a licensed program partially installed, go to *Licensed Programs and New Release Installation Guide*, SC41-9878 to determine the problem. Otherwise, press F3 (Exit) twice.

Completing the Installation Process

1. After the tape has completed rewinding, remove it from the tape drive.
2. If you have additional licensed programs to install, go to *Licensed Programs and New Release Installation Guide* and complete your installation.

Note: If you have PC Support/400 installed on your system, the new release will be downloaded to your personal computer the first time you turn it on. If you did not have PC Support/400 installed before you started the installation process, and want to install it or any of the PC Support/400 options such as AS/400 PC Support PC Tools Folder, go to *Licensed Programs and New Release Installation Guide* to install it now.

Otherwise, continue with step 3.

3. If you have a secondary language installed, go to *Licensed Programs and New Release Installation Guide* to replace the secondary language and complete your installation. Otherwise, continue with step 4.
4. Install the cumulative PTF package (the package that came with your distribution tapes or a more current cumulative PTF package). Use the instructions in the *AS/400 PTF Shipping Information Letter*. Then return here and continue with step 5.

IMPORTANT

You must install a cumulative PTF package or do an IPL to complete the installation process. An IPL is required to start the Initialize System (INZSYS) process.

5. Use option 50 (Display log) on the Work with Licensed Program display to find the message **Initialize System (INZSYS) completed**.
 - a. Type **GO LICPGM** and press the Enter key.
 - b. Type **50** on the Work with Licensed Programs display and press the Enter key.
 - c. The Display Install History display is shown. Press the Enter key.

The Display History Log Contents display is shown. Find the message **Initialize System (INZSYS) started**. If you do not see this message on the display, wait a few minutes and select option 50 again. After the **Initialize System (INZSYS) started** message is shown, wait for a period of time and look for the **Initialize System (INZSYS) completed** message. If you do not see this message on the display, go to *Licensed Programs and New Release Installation Guide* to determine the problem. The INZSYS process could take 2 or more hours to complete.

Note: If you receive any CPA0701 Inquiry messages, ignore them by typing an I to reply.

You have completed installing DBCS Version 2 Release 3 Modification 0 on your system.

Changing Authority and Ownership for Each SQL Collection

If you did *not* identify any SQL collections or user-created logical files in step 7 on page L-27 of “Changing the Primary Language from SBCS to DBCS,” go to “Setting Up Configuration Lists and Relational Database Directory Entries” on page L-52.

1. Enter the following commands to change authority and ownership for each SQL collection you printed at the end of step 7 on page L-27.

```
CHGOBJOWN OBJ(QSYS/collection-name) OBJTYPE(*LIB)
NEWOWN(new-owner-name)
GRTOBJAUT OBJ(QSYS/collection-name) OBJTYPE(*LIB)
USER(user-name) AUT(user-authority)
CHGOBJOWN OBJ(library-name/data-dictionary-name) OBJTYPE(*DTADCT)
NEWOWN(new-owner-name)
GRTOBJAUT OBJ(library-name/data-dictionary-name) OBJTYPE(*DTADCT)
USER(user-name) AUT(user-authority)
```

Note: Enter the GRTOBJAUT command so the same users have the same authority as they did before the installation process.

2. For each user created logical file that is *not* a SQL view (refer to step 7 on page L-27 of “Changing the Primary Language from SBCS to DBCS”):
 - a. Enter the DSPOBJD command to see if the file was restored. (Only logical files with fields over the field DBXTXT in QSYS/QADBREF, over fields DBXPSHT and DBXPLNG in QSYS/QADBPKG, or over field DBXRDBT in QSYS/QADBXRDBD are not restored correctly.) If the file does not exist, continue with the next step. Otherwise, process the next user-created logical file.
 - b. Find the DDS source for the logical file. The source file and member is identified in the DSPOBJD TYPE(*SERVICE) list.
 - c. Edit the DDS source. At least one field in the DDS source will reference the field DBXTXT, DBXPSHT, DBXPLNG, or DBXROBT. If the field type (column 35) in the DDS source is blank, the DDS source does not need to change. If the field type is A or E, you must change it to an O.
 - d. Enter the CRTLF command for the logical file referencing the modified DDS source. The parameters on the CRTLF command should be specified based on the attributes on the DSPFD list and DSPOBJD TYPE(*SERVICE) list.
 - e. If more than one member is shown on the DSPFD output, enter an ADDLFM command for each member. The parameters on the ADDLFM command should be specified based on the attributes on the DSPFD list.
 - f. Enter the CHGOBJOWN command for the logical file for the logical file to have the correct owner. The owner is identified in the DSPOBJD TYPE(*FULL) list.
 - g. Enter the GRTOBJAUT command for the logical file. The same users will have the same authority as they did before the installation process. The authorities that need to be granted (if any) are identified in the DSPOBJAUT list.

Setting Up Configuration Lists and Relational Database Directory Entries

Use the lists from “Save the Entire System” on page L-28 to change the system values and network attributes back to their original values.

1. To set up the configuration lists, type the following command and press F4.

```
WRKCFGL
```

2. If you created a CL program to add the relational database directory entries, run that program. Otherwise, type the following command and press the Enter key.

```
WRKRDBDIRE
```

3. When you are finished, perform a normal IPL and return the system to normal operations.
4. Save your system (see “Save the Entire System” on page L-28).

Appendix M. Keyboard Layouts

The keyboard layout samples are provided for your information. Use them with the table in Appendix J, "PC Support National Language Information." The special-character keyboard set is available only with the enhanced keyboard.

Enhanced Keyboard

Figure M-1 through Figure M-25 on page M-10 show the country-specific keyboard layouts for the the IBM Enhanced keyboards.

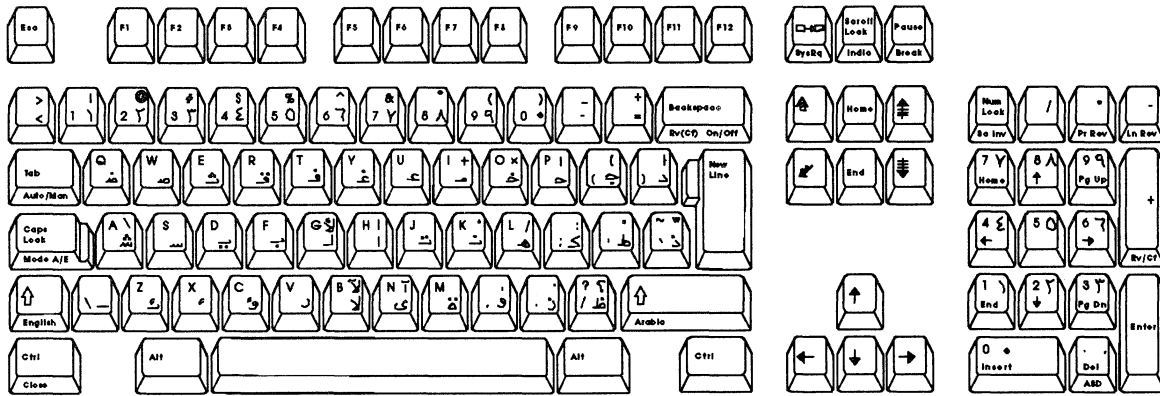


Figure M-1. Arabic Speaking IBM Enhanced Keyboard

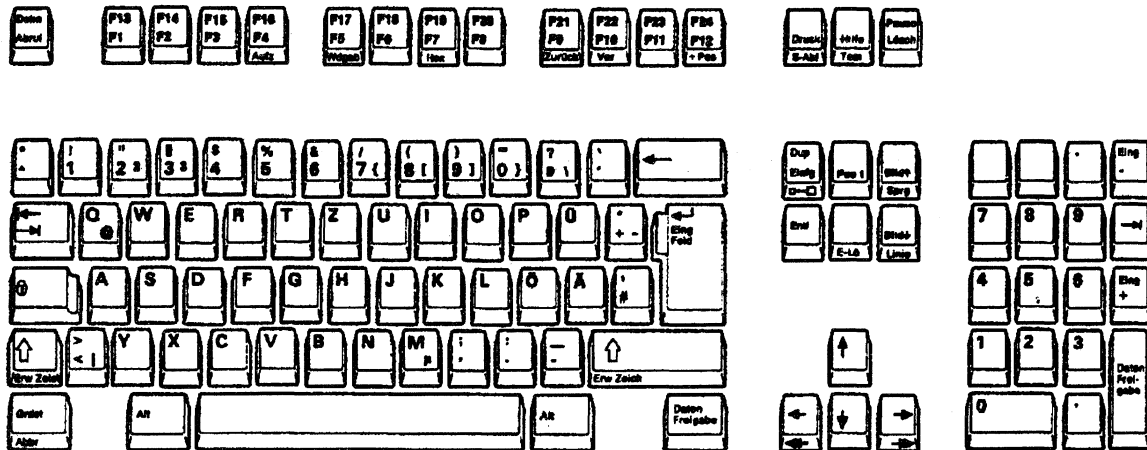


Figure M-2. Austrian/German IBM Enhanced Keyboard

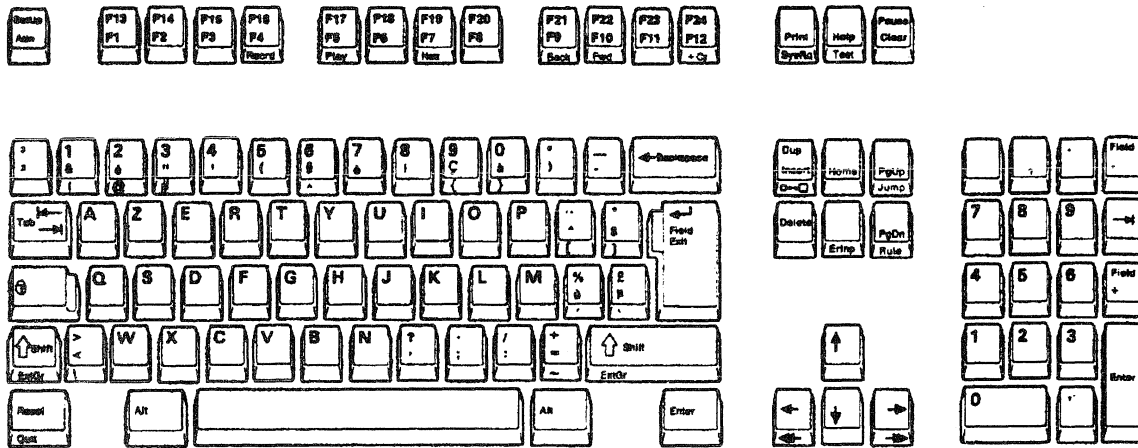


Figure M-3. Belgian IBM Enhanced Keyboard

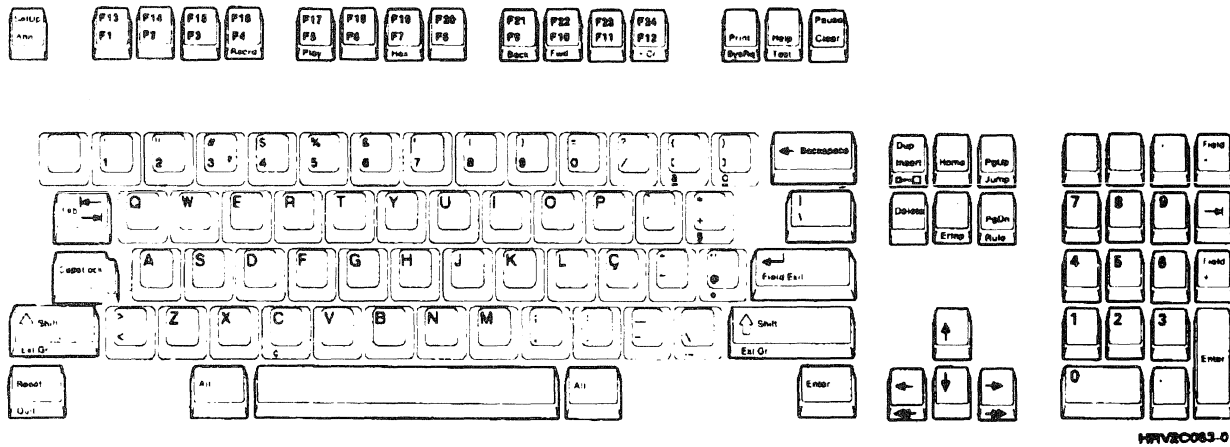


Figure M-4. Brazilian IBM Enhanced Keyboard

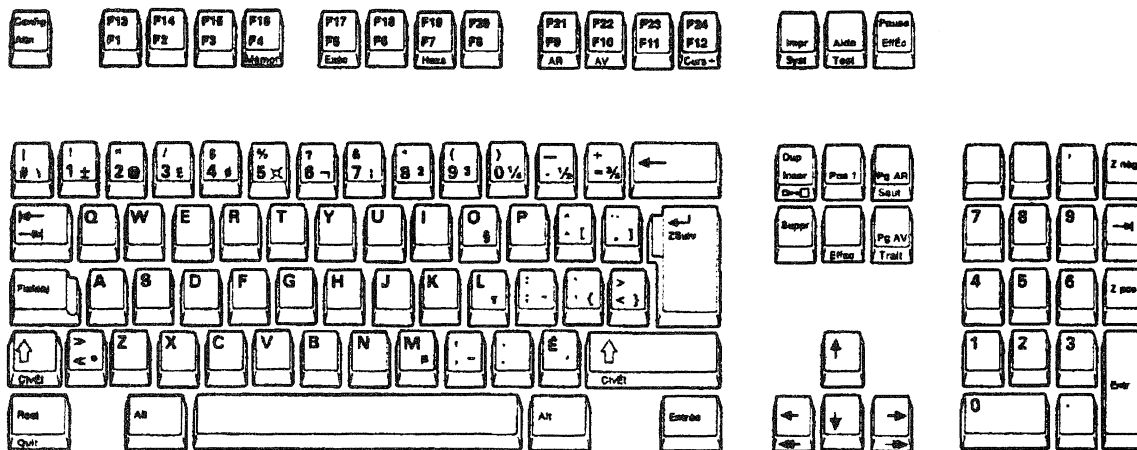


Figure M-5. Canadian French IBM Enhanced Keyboard

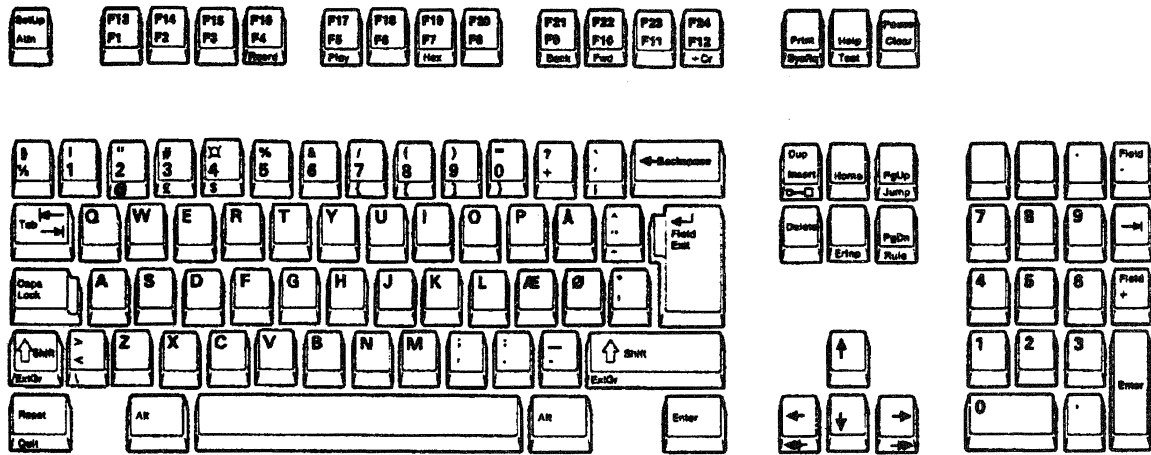


Figure M-6. Danish IBM Enhanced Keyboard

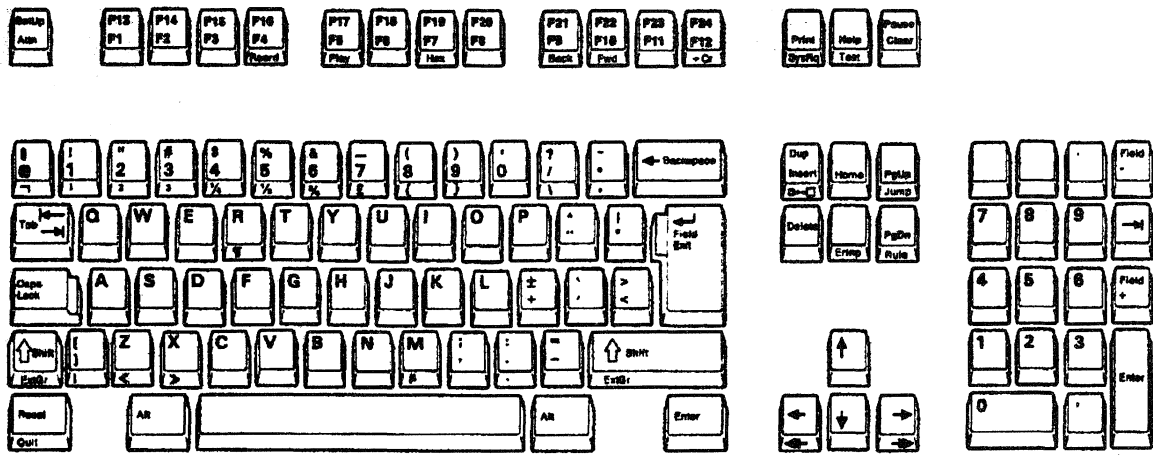


Figure M-7. Dutch IBM Enhanced Keyboard

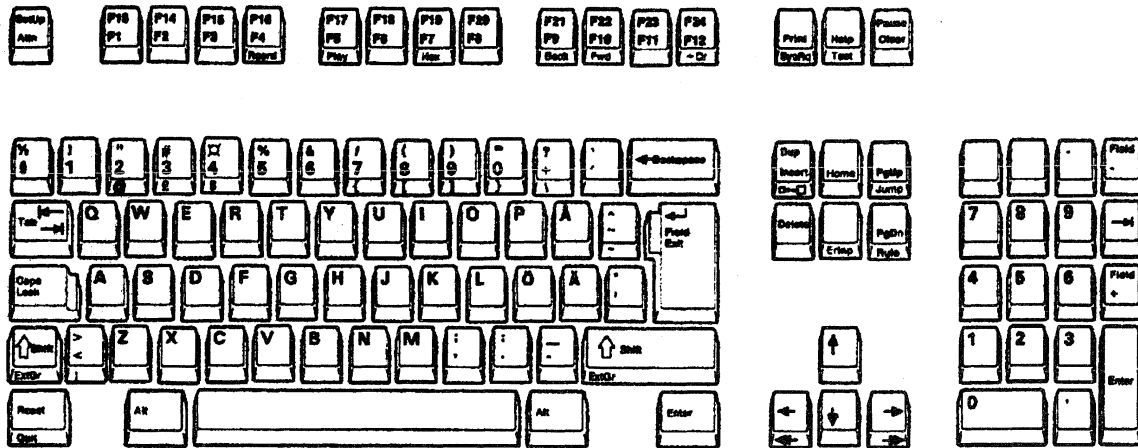


Figure M-8. Finnish/Swedish IBM Enhanced Keyboard

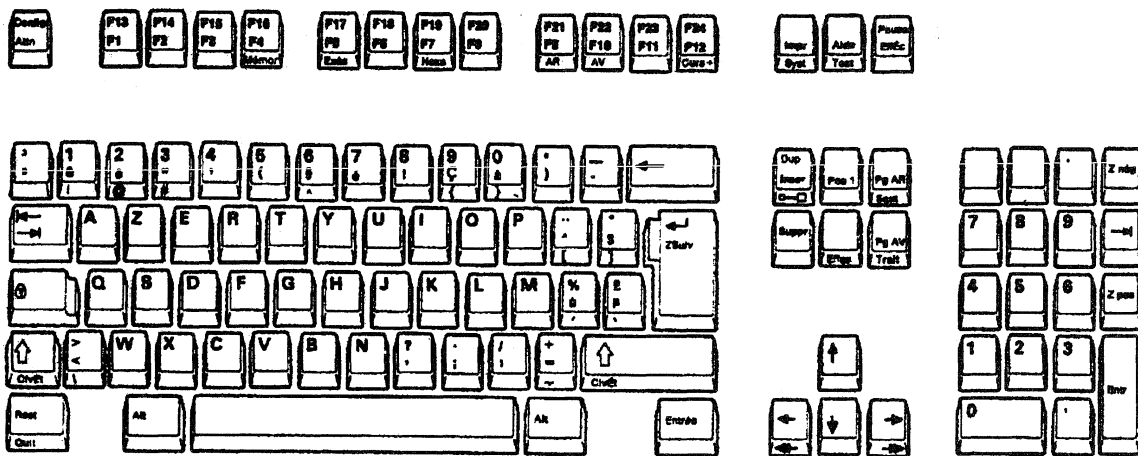


Figure M-9. French (AZERTY) IBM Enhanced Keyboard

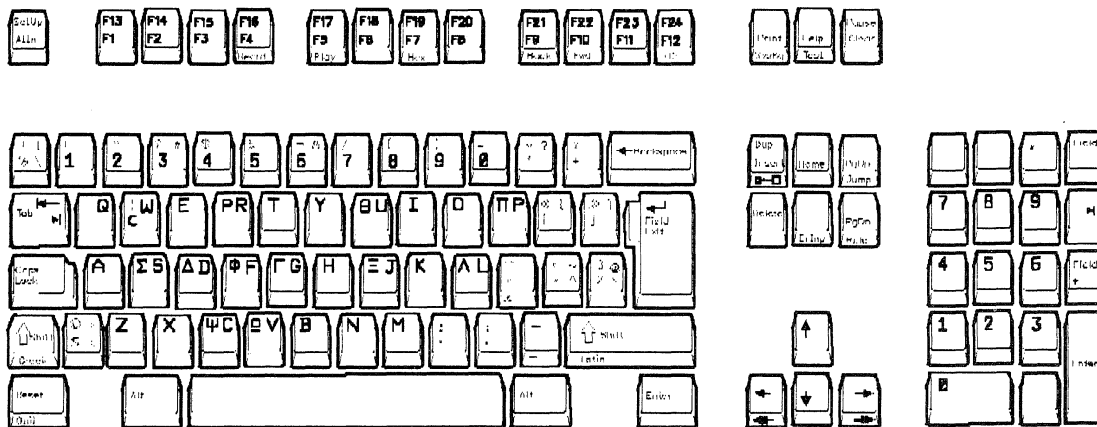


Figure M-10. Greek IBM Enhanced Keyboard

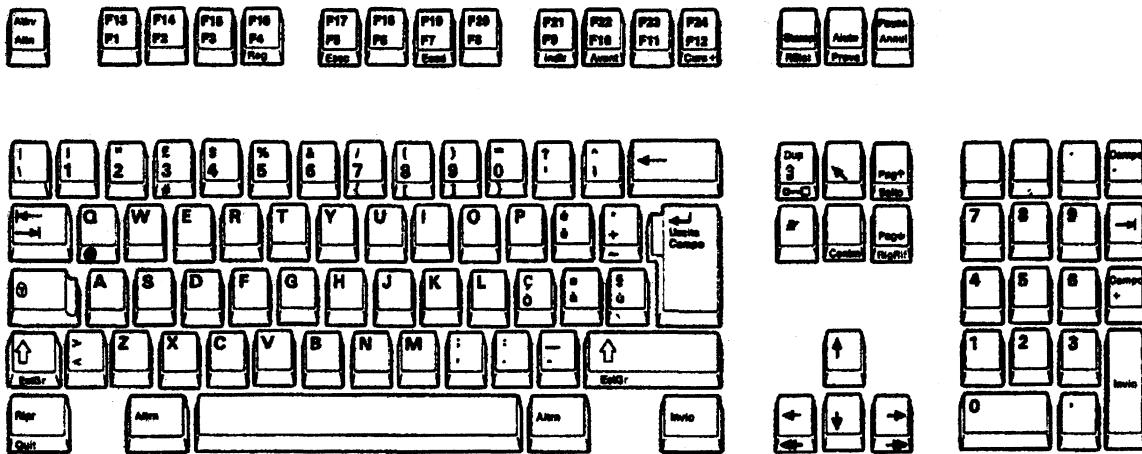


Figure M-11. Italian IBM Enhanced Keyboard

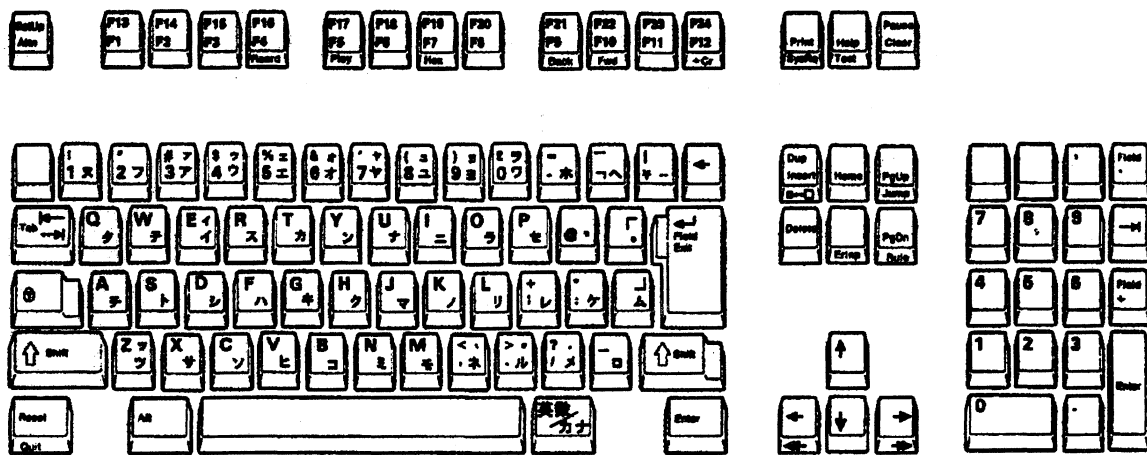


Figure M-12. Japanese IBM Enhanced Keyboard

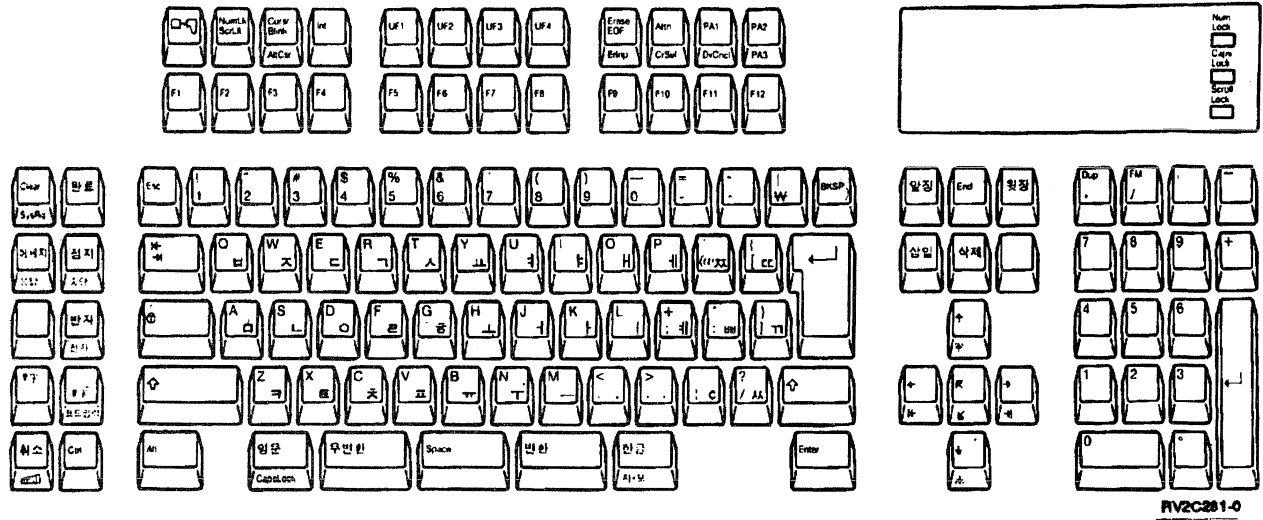


Figure M-13. Korean IBM Enhanced Keyboard

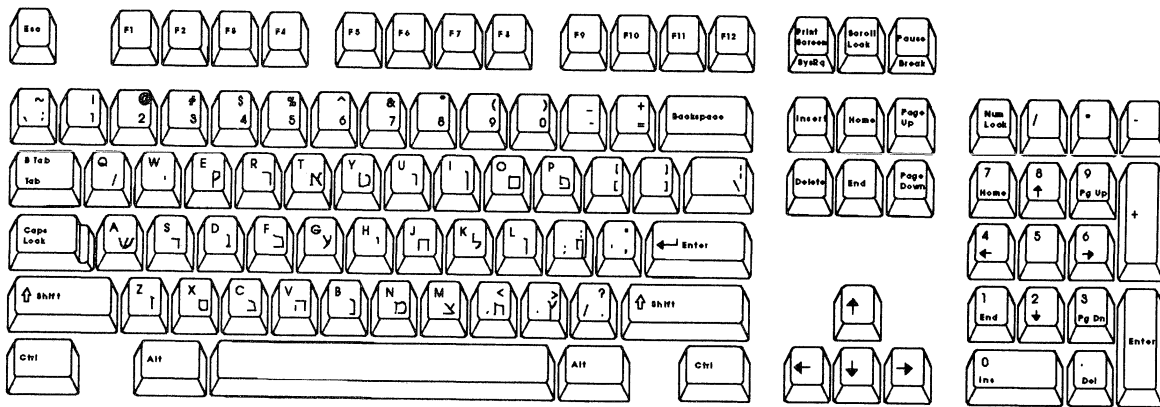


Figure M-14. Latin/Hebrew IBM Enhanced Keyboard

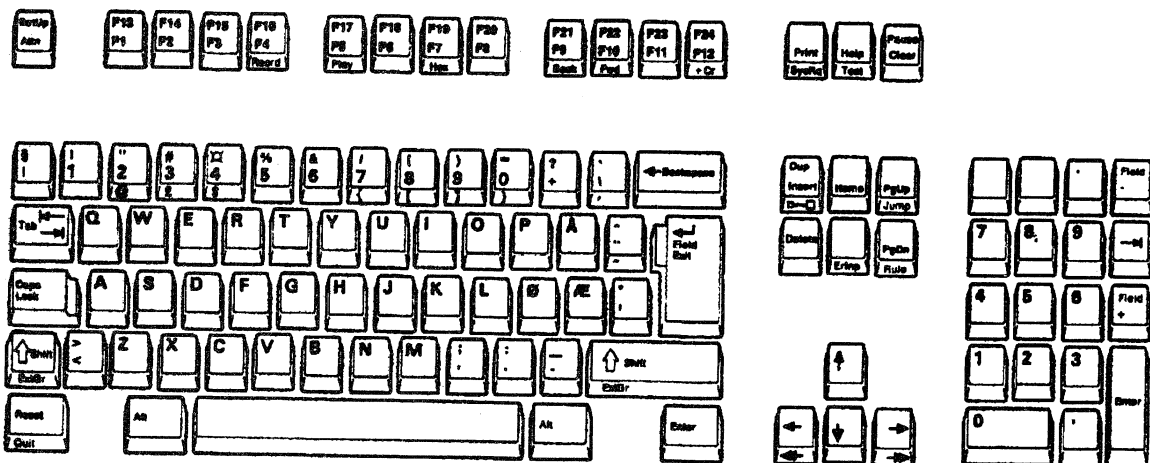


Figure M-15. Norwegian IBM Enhanced Keyboard

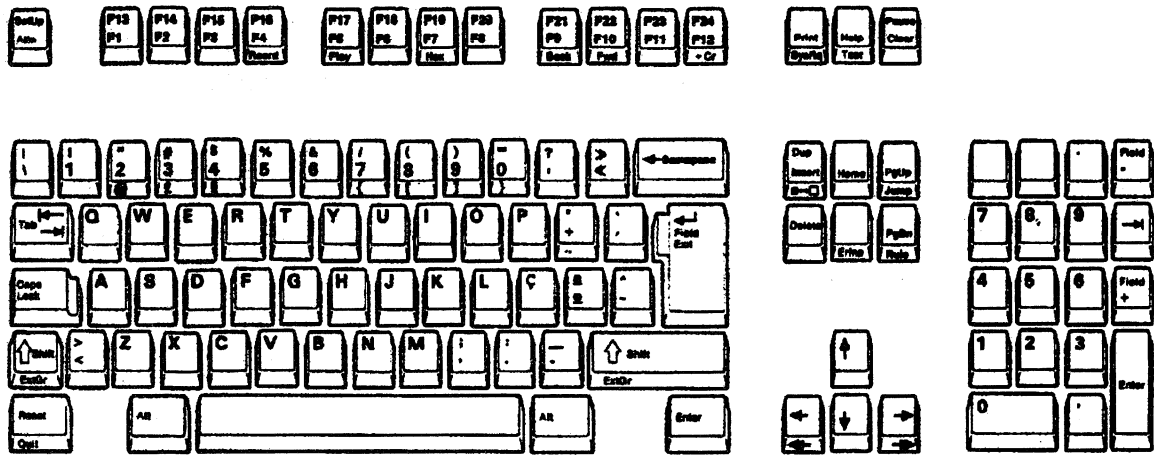


Figure M-16. Portuguese IBM Enhanced Keyboard

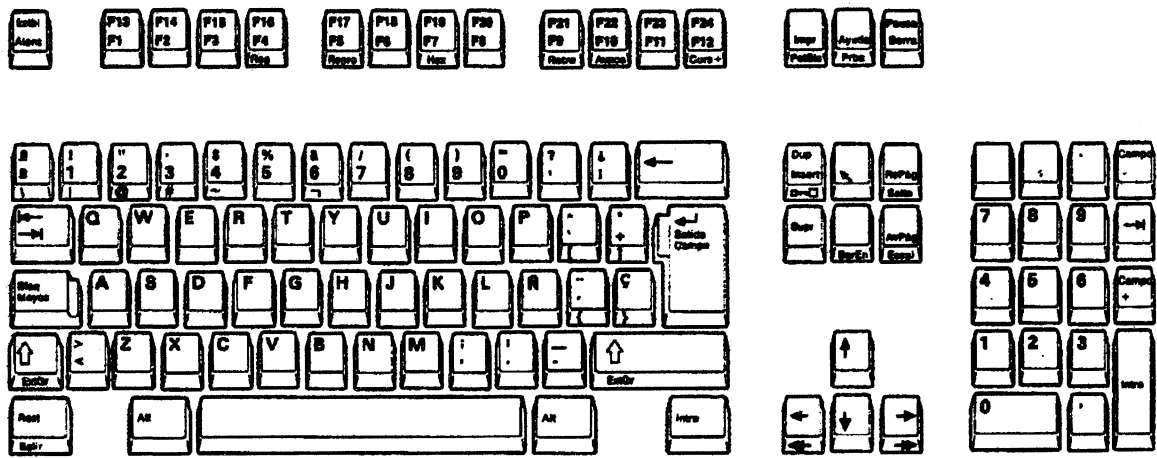


Figure M-17. Spanish IBM Enhanced Keyboard

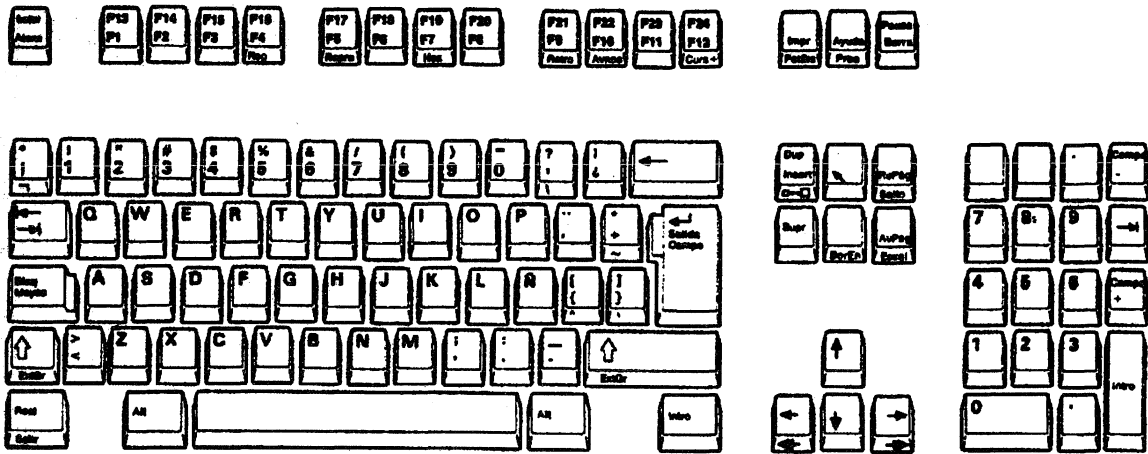


Figure M-18. Spanish-Speaking IBM Enhanced Keyboard

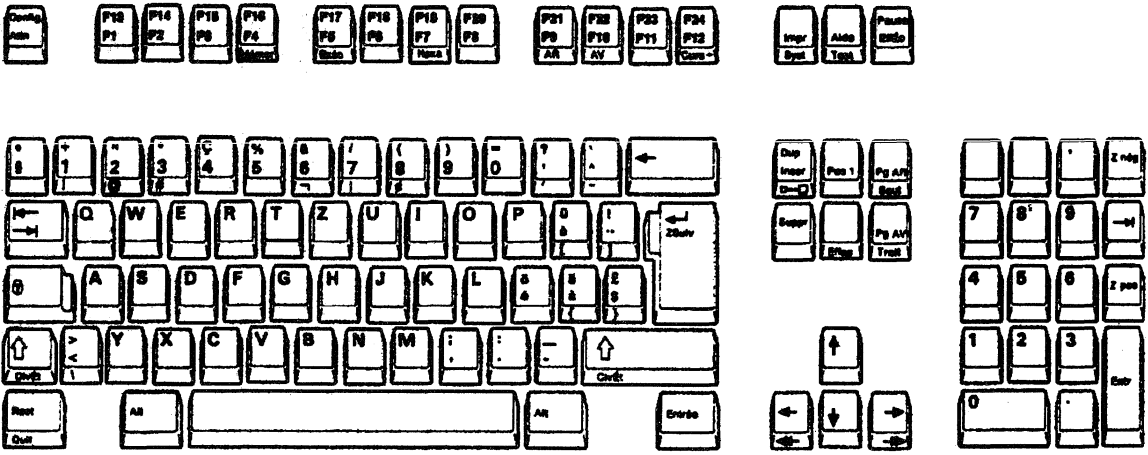


Figure M-19. Swiss-Bilingual-French IBM Enhanced Keyboard

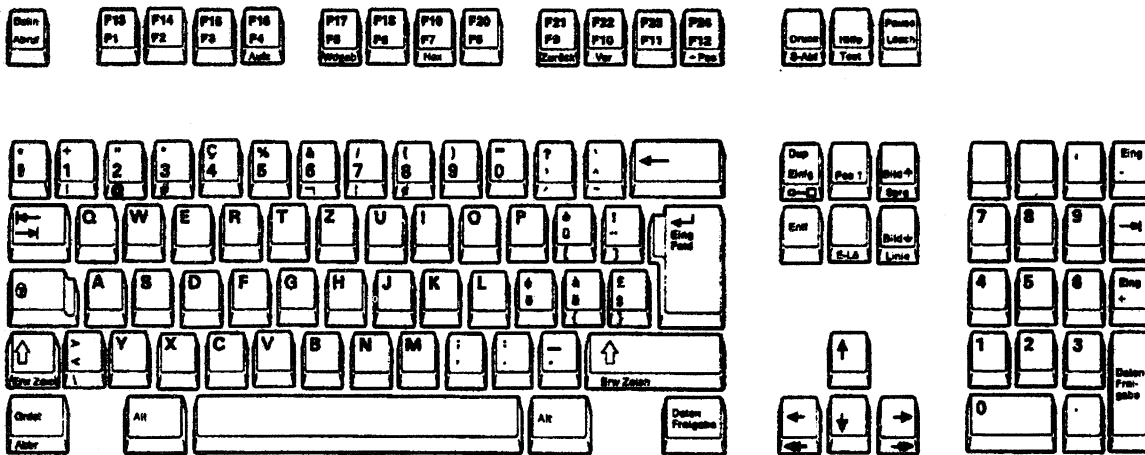


Figure M-20. Swiss-Bilingual-German IBM Enhanced Keyboard

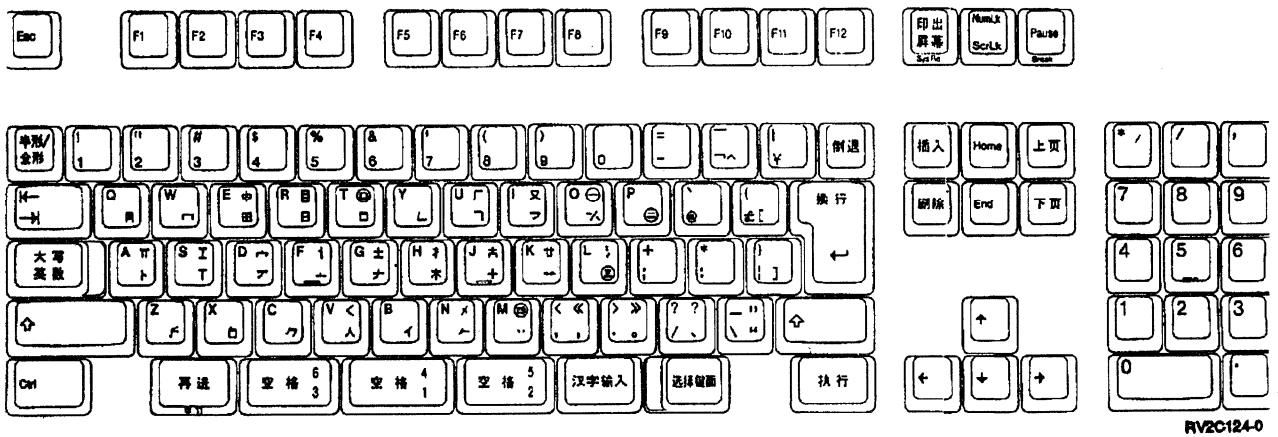


Figure M-21. Simplified Chinese IBM Enhanced Keyboard

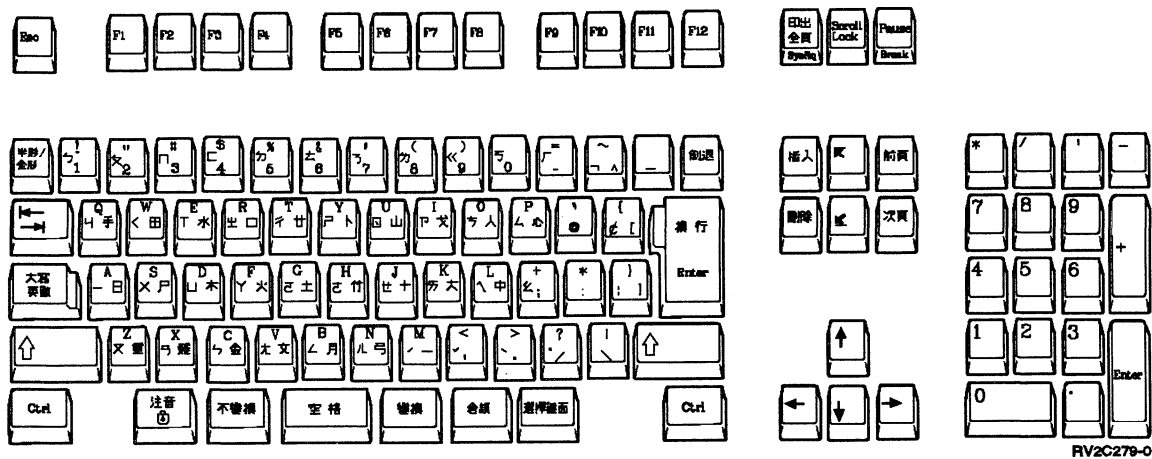


Figure M-22. Traditional Chinese IBM Enhanced Keyboard

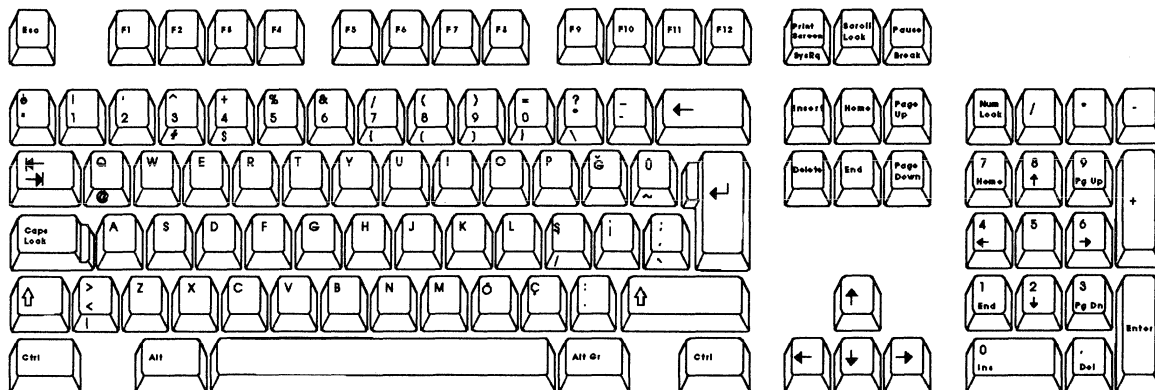


Figure M-23. Turkey IBM Enhanced Keyboard

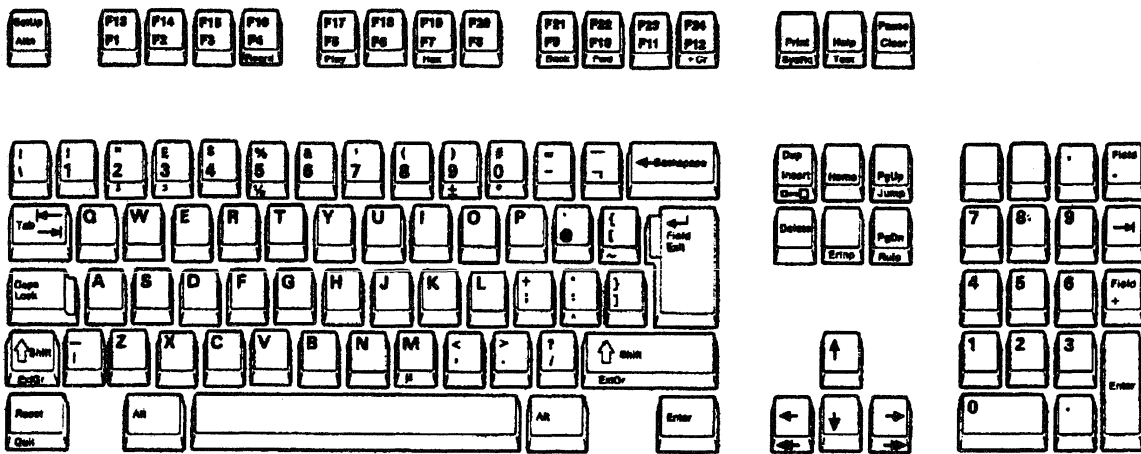


Figure M-24. U.K. English IBM Enhanced Keyboard

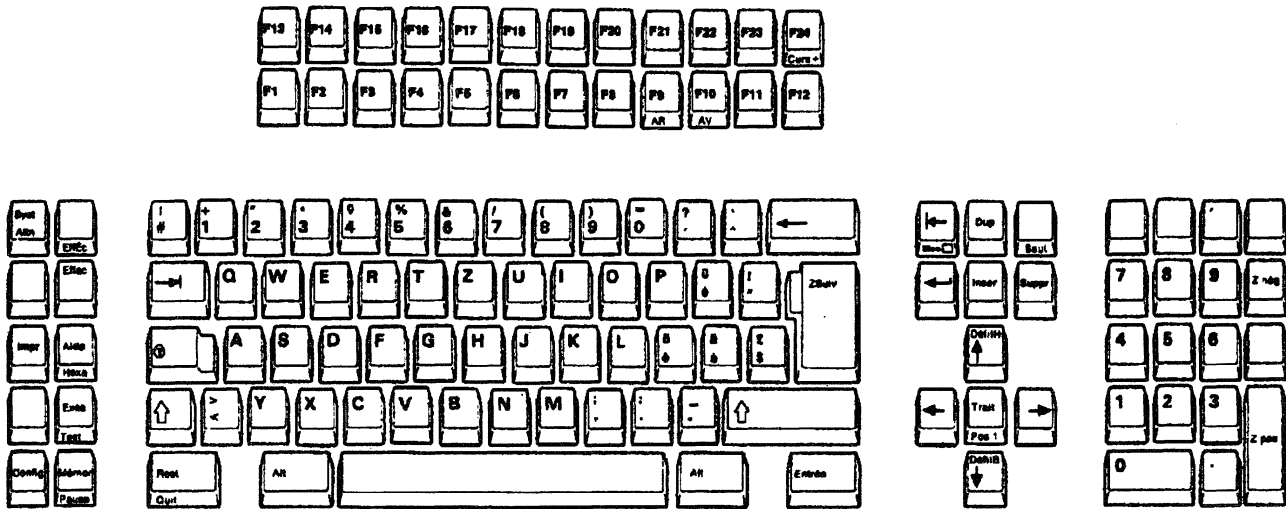
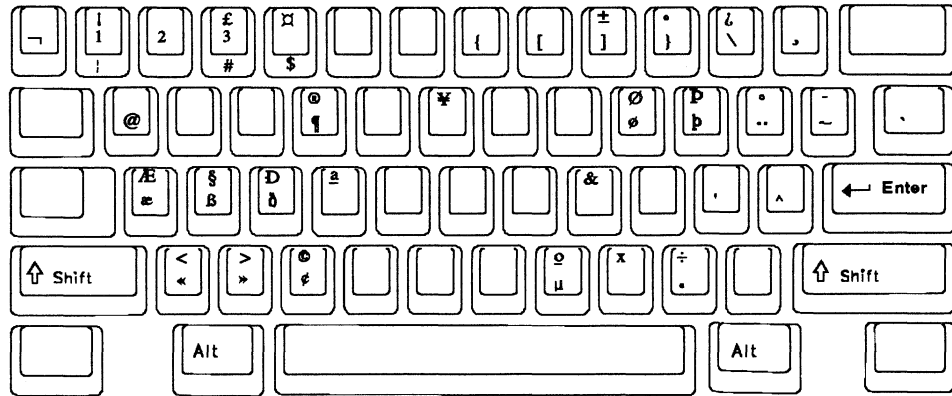


Figure M-25. U.S. English IBM Enhanced Keyboard

Special-Character Keyboard Set

The special-character keyboard set is available with the enhanced keyboard on most display stations. It allows a user to enter special characters that otherwise might not be available (labeled) on the keyboard. Figure M-26 shows all the characters in the special keyboard set and the keys on the enhanced keyboard to which each character is assigned. A special character may be assigned to a lowercase, uppercase, or ALT position on a key.

You can order a special template package, SCX21-9950, that contains the special-character keyboard set.



FV2C051-1

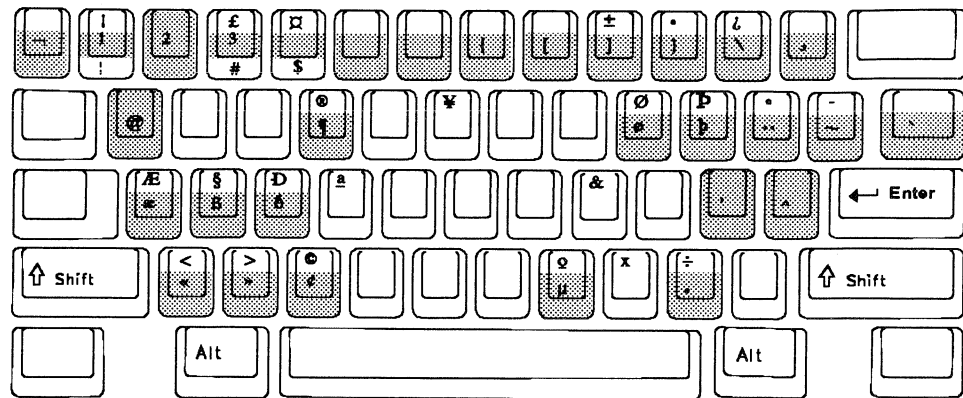
Figure M-26. Special-Character Keyboard Set

The special characters on the enhanced keyboard are used for this group of languages: Belgium, German, French, English, Icelandic, Italian, Spanish, Austrian, Danish, Portuguese, Swedish, Norwegian, Swiss/French, Swiss/German, Spanish Speaking, and Netherlands (Dutch).

Creating a Special Character

To create a special character, you press and hold the ALT key, and then press the Shift key. Next you press the key to which a special character is assigned. If a special character is assigned to an uppercase or ALT position, the shift or ALT key must be pressed in combination with the key assigned to the special character. The special-character keyboard function is active for only one special character at a time. The ALT and shift key sequence must be pressed prior to the entry of each special character.

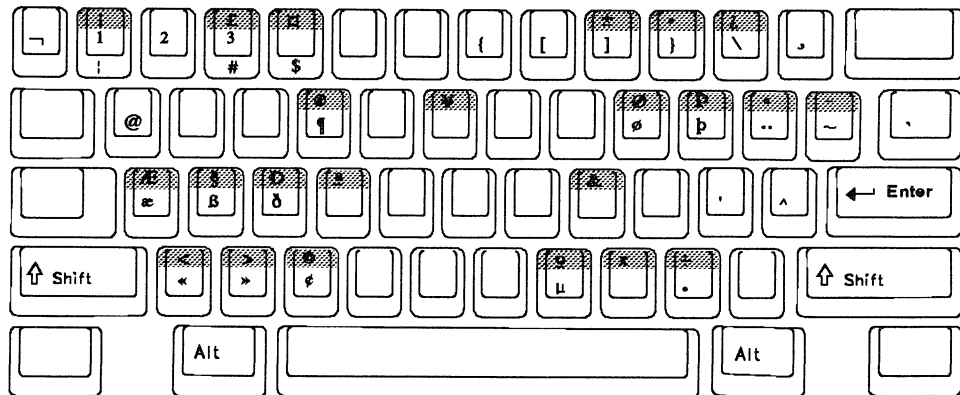
Figure M-27 highlights those special characters assigned to the lowercase positions.



RV2C052-2

Figure M-27. Special-Character Keyboard Set Lowercase Position

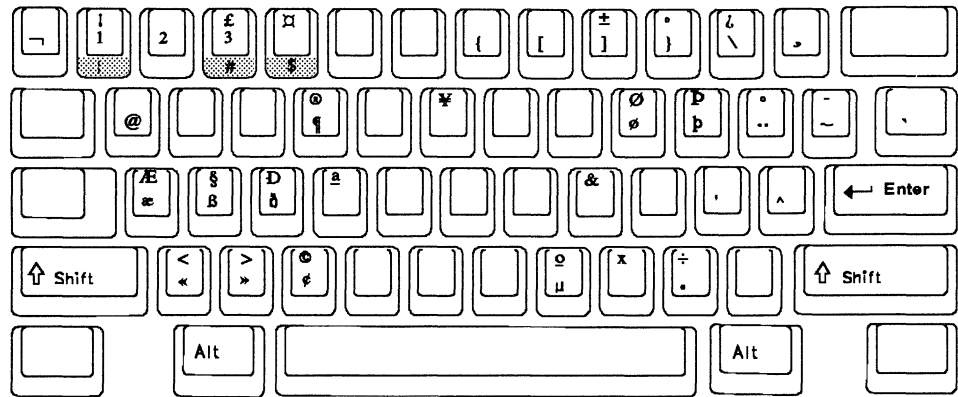
Figure M-28 highlights the special characters assigned to the uppercase position.



RV2C053-1

Figure M-28. Special-Character Keyboard Set Uppercase Position

Figure M-29 highlights the special characters assigned to the ALT key positions.



RV2C054-1

Figure M-29. Special-Character Keyboard Set with ALT Key Position

Special Character Example

For example, if you wanted to create the Å for German on an English keyboard, you should do the following:

1. Press and hold the ALT key, and then press the Shift key.
2. Press the Shift key with the



RV2C057-1

key. The Diacritic mode symbol appears at the bottom of the screen and is waiting for the next keystroke to complete the character.

3. You now press the Shift key and the



RV2C056-0

key. This produces the Å. If you press this key without also pressing the shift key, you would get å. The system accepts only uppercase or lowercase A's.

122-Key and 124-Key Typewriter Keyboards

Figure M-30 on page M-14 through Figure M-45 on page M-19 show the country-specific keyboard layouts for the the 122 and 124-key typewriter keyboards.

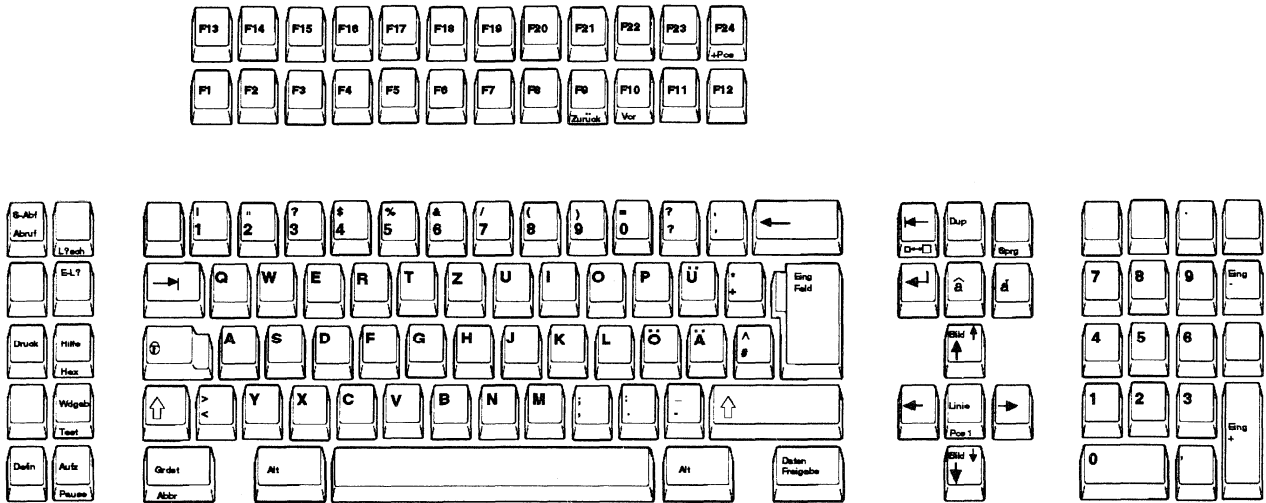


Figure M-30. Austrian/German 122-Key Typewriter Keyboard

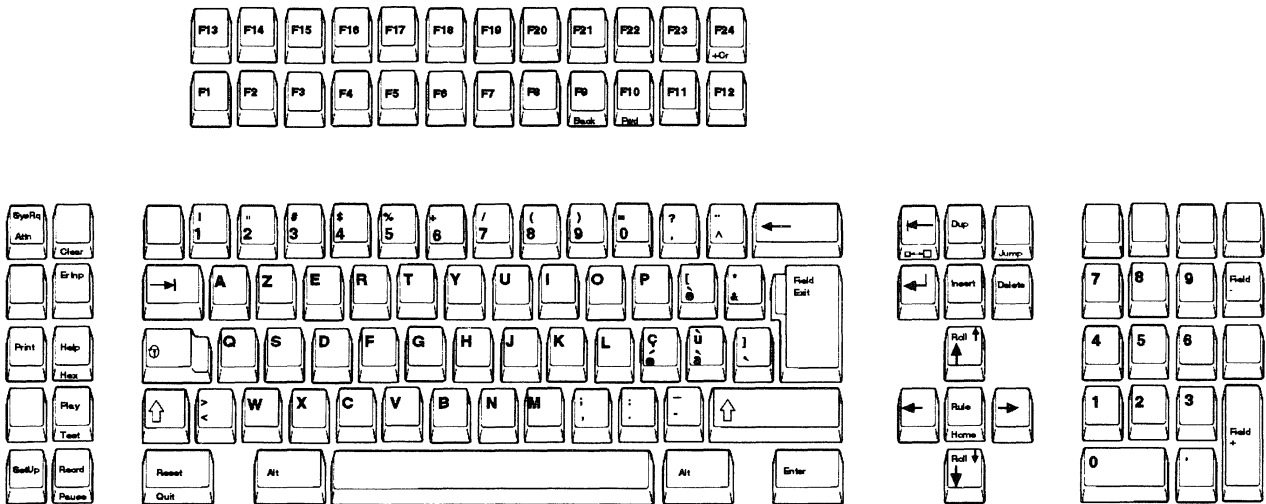


Figure M-31. Belgian 122-Key Typewriter Keyboard

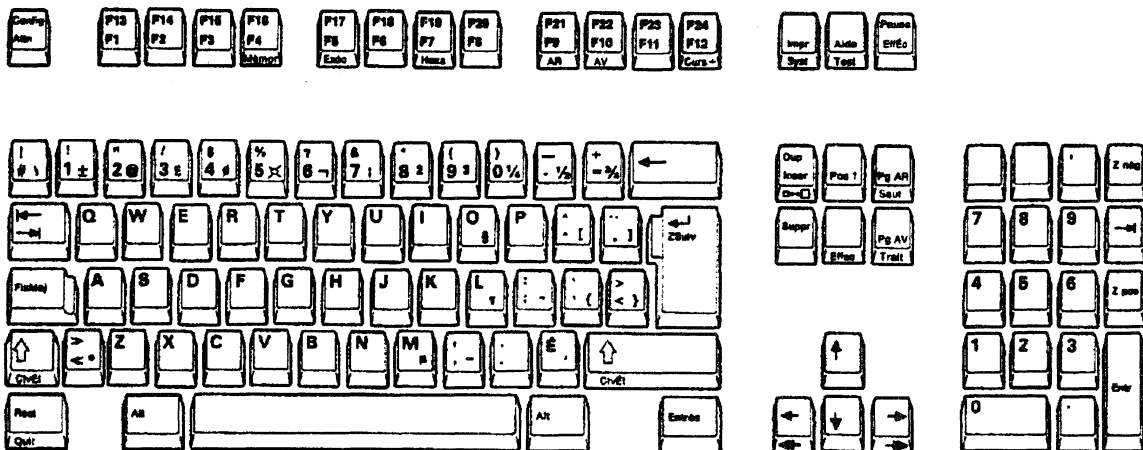


Figure M-32. Canadian French 122-Key Typewriter Keyboard

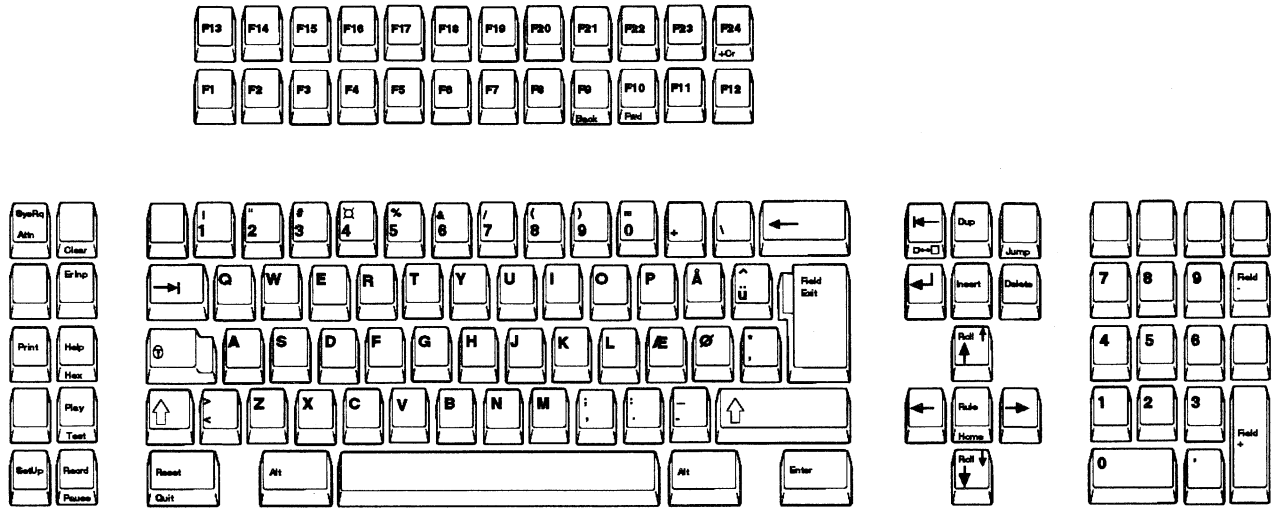


Figure M-33. Danish 122-Key Typewriter Keyboard

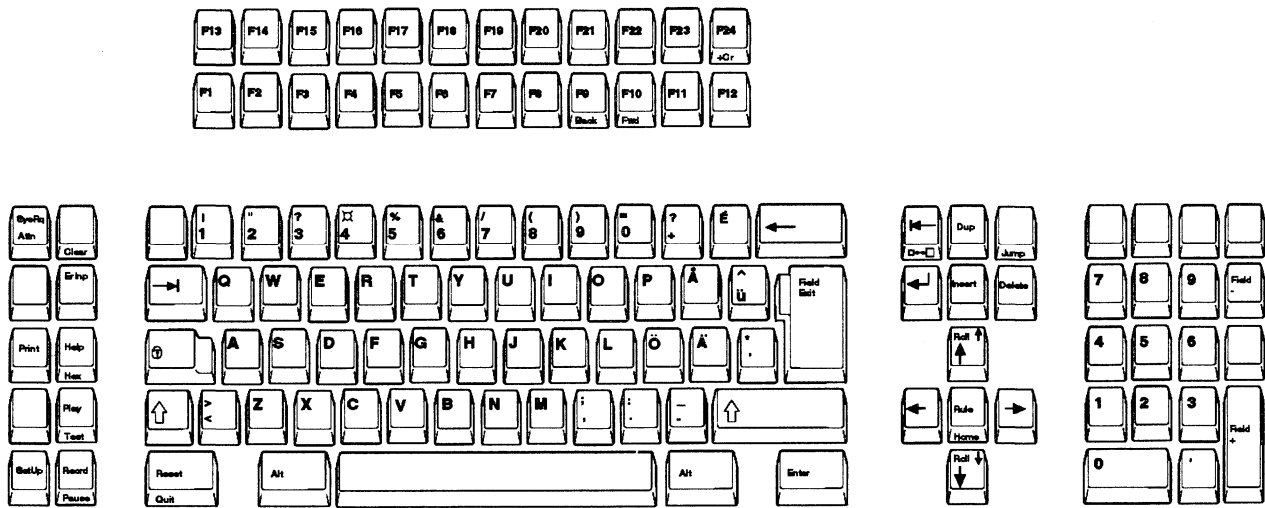


Figure M-34. Finnish/Swedish 122-Key Typewriter Keyboard

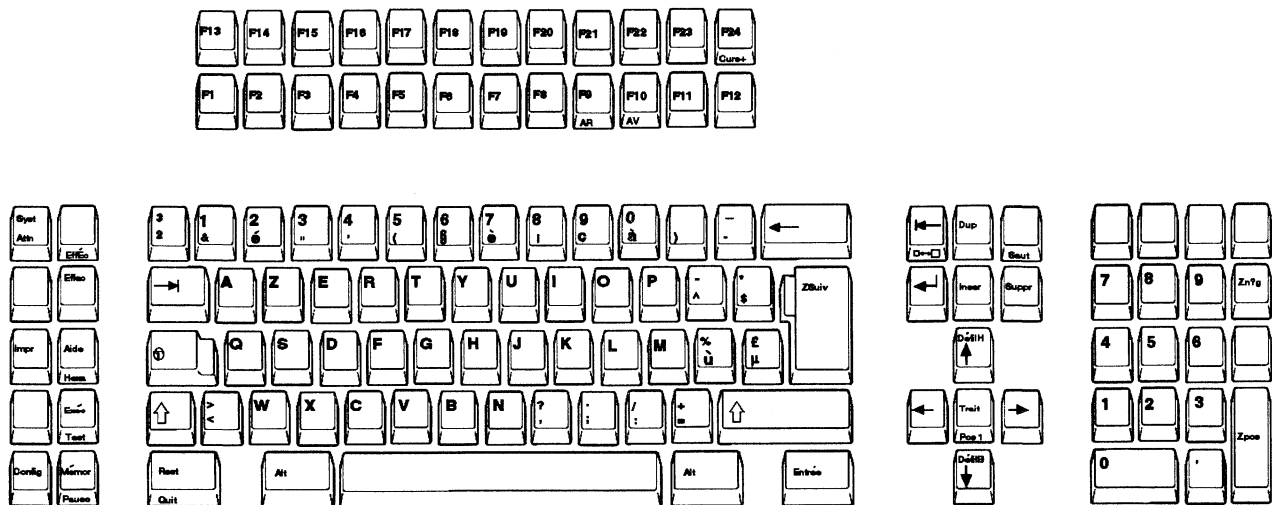


Figure M-35. French (AZERTY) 122-Key Typewriter Keyboard

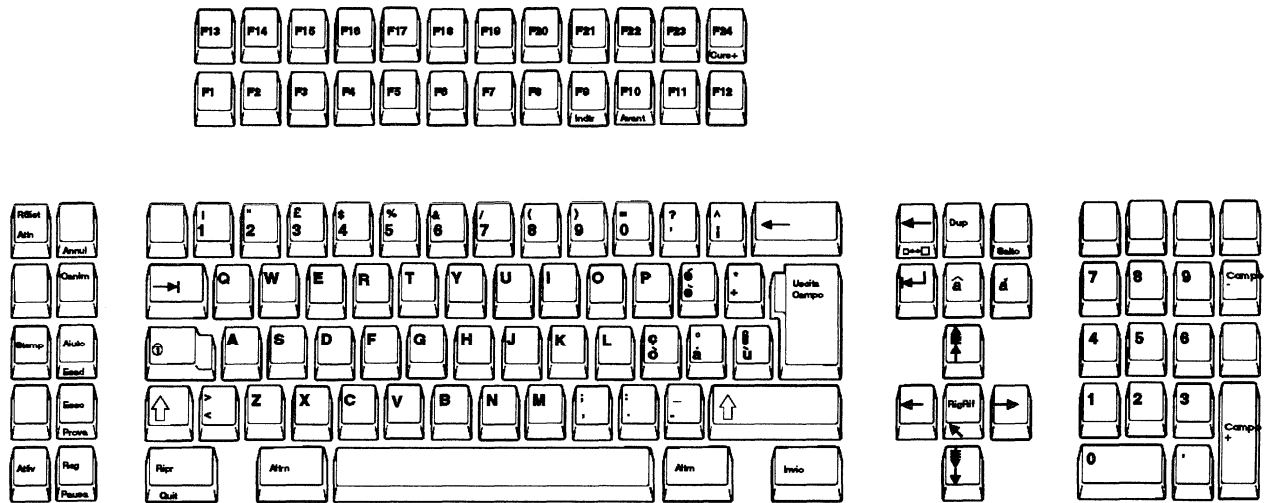


Figure M-36. Italian 122-Key Typewriter Keyboard

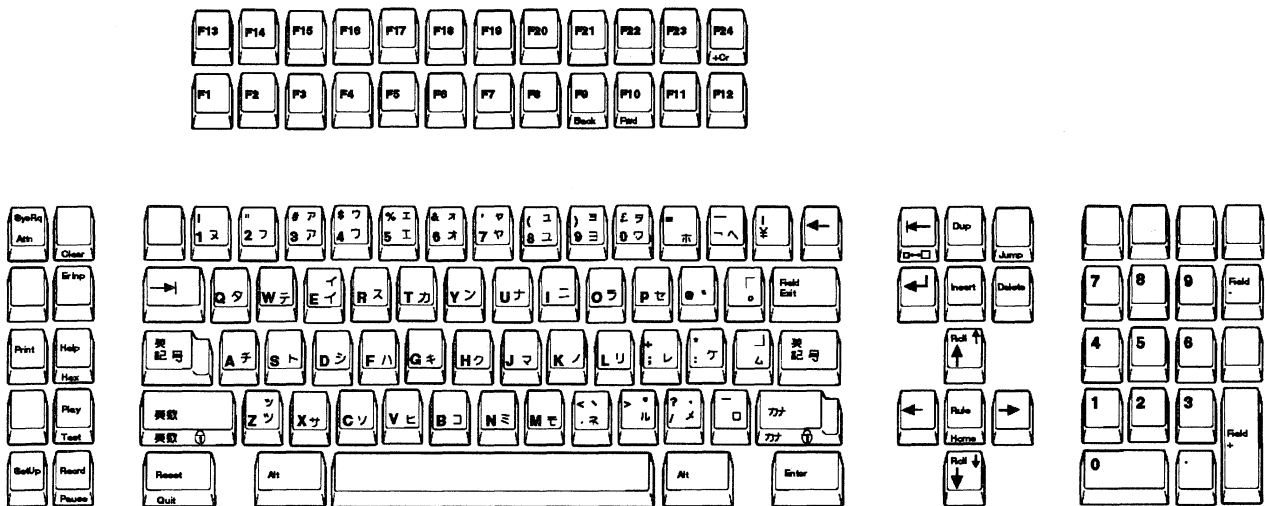


Figure M-37. Japanese Katakana 124-Key Typewriter Keyboard

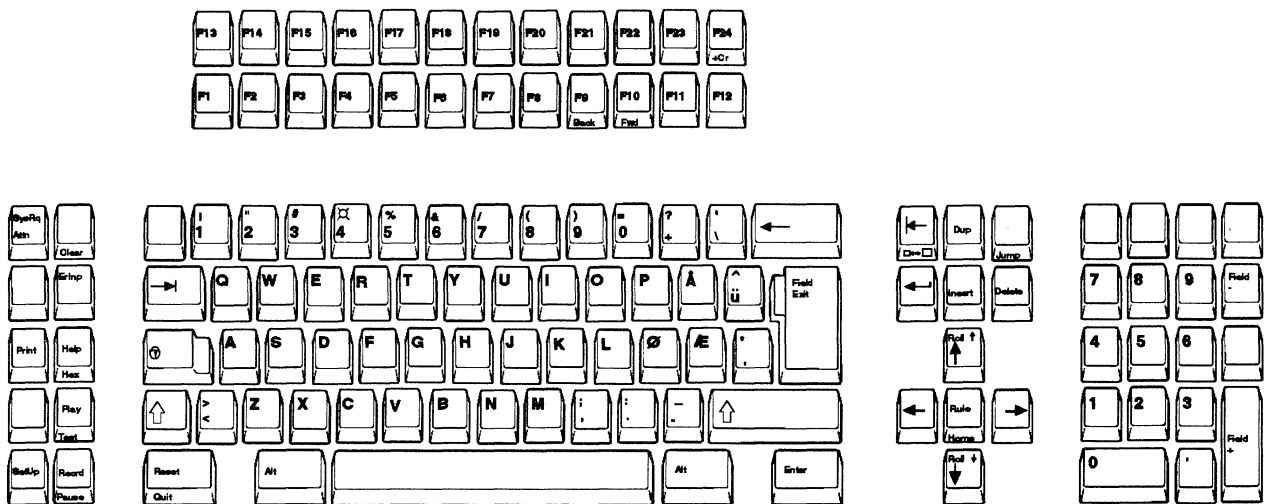


Figure M-38. Norwegian 122-Key Typewriter Keyboard

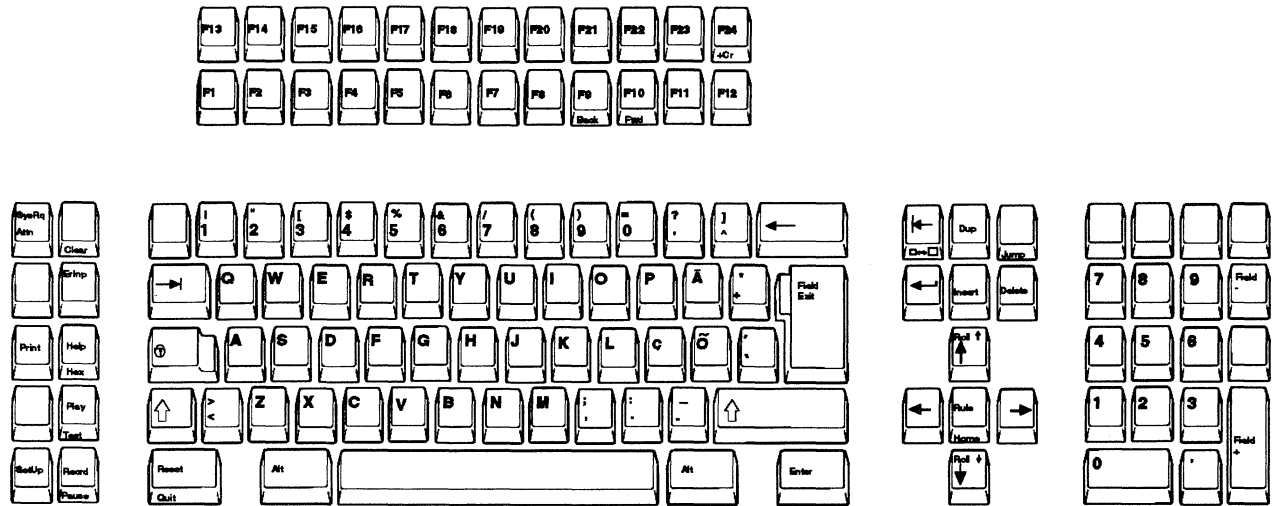


Figure M-39. Portuguese 122-Key Typewriter Keyboard

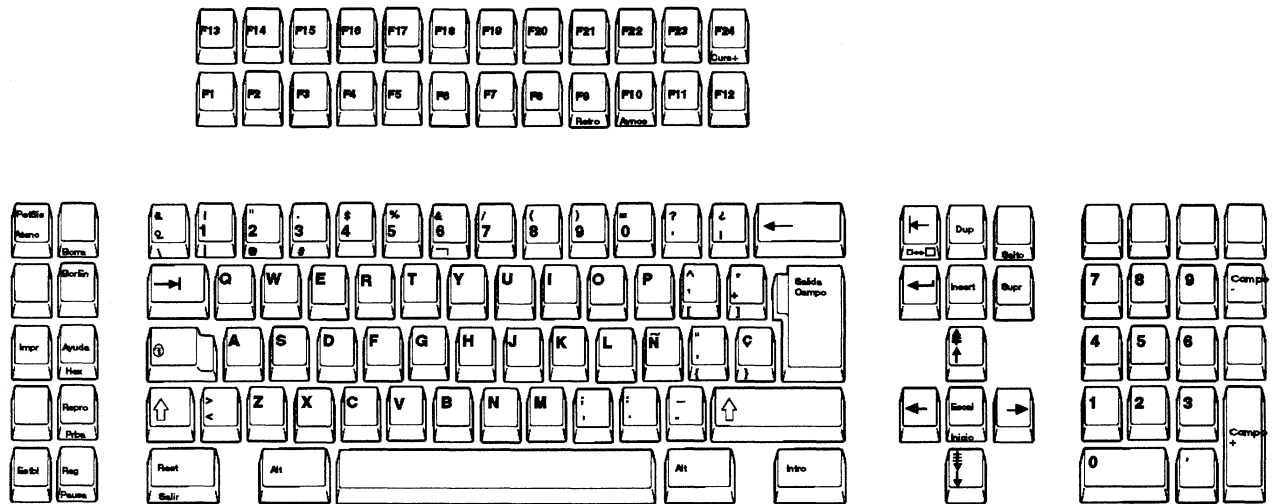


Figure M-40. Spanish 122-Key Typewriter Keyboard

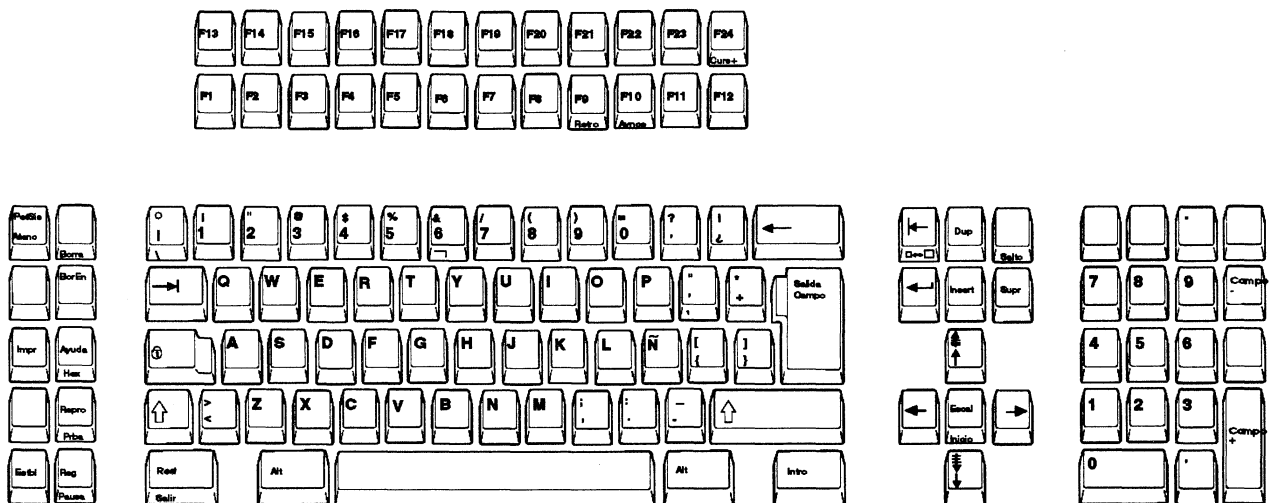


Figure M-41. Spanish-Speaking 122-Key Typewriter Keyboard

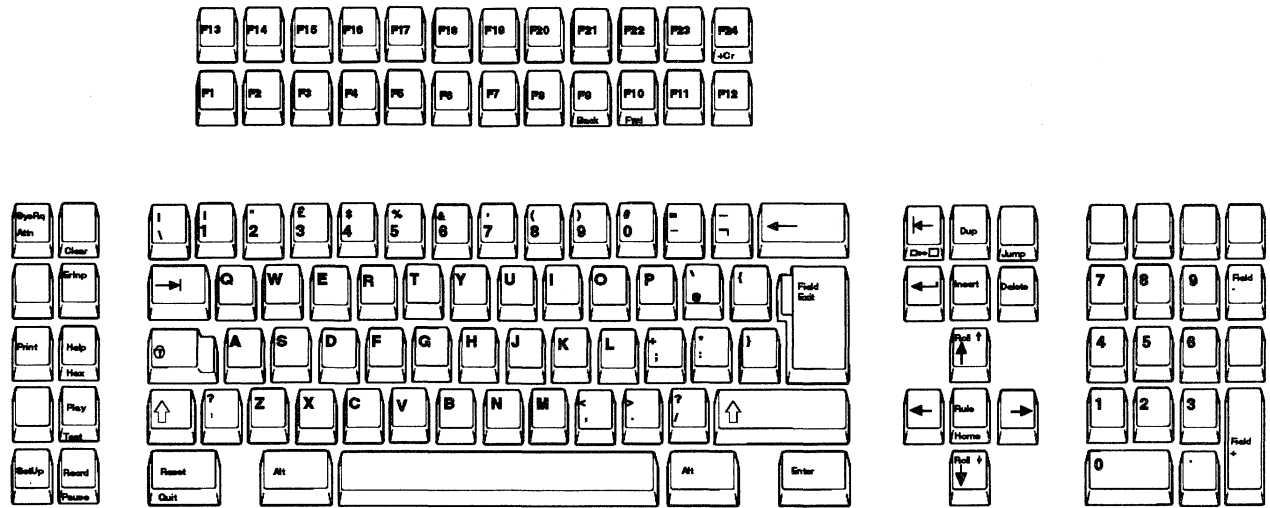


Figure M-44. U.K. English 122-Key Typewriter Keyboard

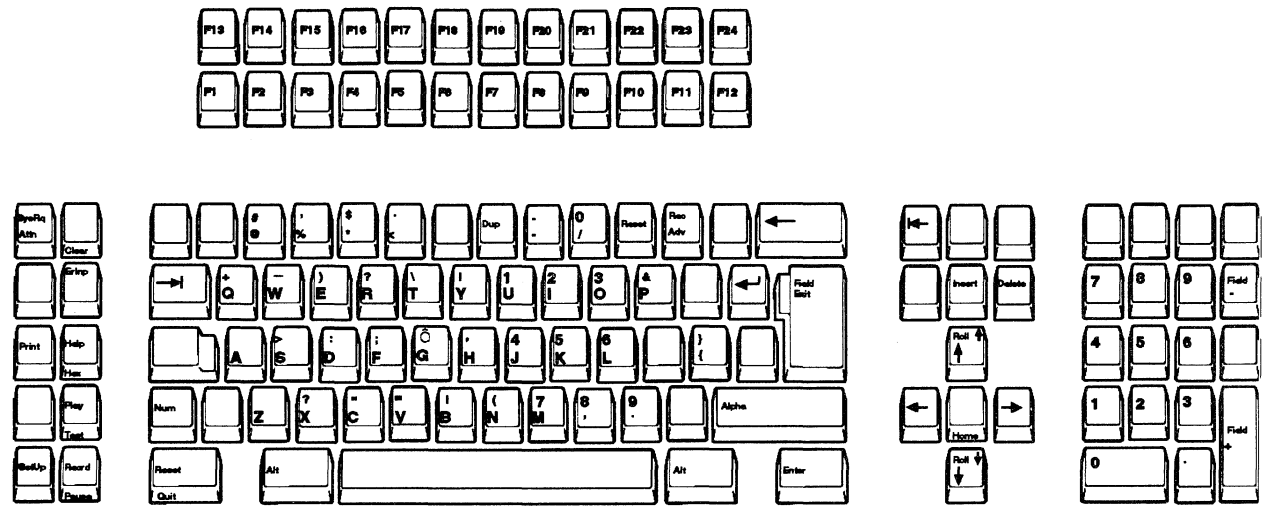


Figure M-45. U.S. English 122-Key Typewriter Keyboard

Appendix N. Code Pages

These code pages are for your information. Use them with the tables and charts in Appendix A, "National Language Version Feature Codes," Appendix B, "National Language Version Default System Values," Appendix J, "PC Support National Language Information," Appendix I, "Graphic Character Conversion Tables," and Appendix C, "National Language Keyboard Types and SBCS Code Pages."

Several of the IBM code pages match the International Standard ISO/IEC 8859. ISO/IEC 8859 consists of the following parts, under the general title *Information processing — 8-bit single-byte coded graphic character sets*:

- Part 1: Latin alphabet No. 1, 8859-1
- Part 2: Latin alphabet No. 2, 8859-2
- Part 3: Latin alphabet No. 3, 8859-3
- Part 4: Latin alphabet No. 4, 8835-4
- Part 5: Latin/Cyrillic alphabet, 8859-5
- Part 6: Latin/Arabic alphabet, 8858-6
- Part 7: Latin/Greek alphabet, 8859-7
- Part 8: Latin/Hebrew alphabet, 8859-8
- Part 9: Latin alphabet No. 5, 8859-9

The AS/400 system supports the standard with some IBM code pages. The IBM code pages and the equivalent standards are as follows:

Table N-1. ISO Standards and IBM Code Pages

Code Page	ISO Standard
500	8859-1
852	8859-2
870	8859-2
813	8859-7
857	8859-9
905	8859-9
920	8859-9
1026	8859-9

Notes:

1. Hexadecimal value 40 represents the space character on the EBCDIC code pages.
2. Hexadecimal value 20 represents the space character on the PC code pages.
3. Hexadecimal value FF represents the eight ones (11111111) control character.
4. The 8-digit alphanumeric label under each character in the code page chart is the graphic character global identifier (GCGID). The label is used with Appendix K, "REXX/400 Extension Characters" on page K-1 and Appendix H, "Sort Sequence Tables" on page H-1.

Code Page 037 (EBCDIC) USA/Canada

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	Ÿ 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	Ï 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	Ï 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	≠ SM210000	¡ SP030000	[SM060000	(S̄HY) 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	Û 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

Code Page 256 (EBCDIC) International #1

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 NT010000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SL0190000	£ SC020000	A LA020000	J LJ020000	(NSP) SP310000	1 NL010000
-2	â LA150000	ê LF150000	Â LA160000	Ê LF160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 NT020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	₣ SC060000	C LC020000	L LL020000	T LT020000	3 NL030000
-4	à LA130000	è LF130000	À LA140000	È LF140000	d LD010000	m LM010000	u LU010000	f SC070000	D LD020000	M LM020000	U LU020000	4 NT040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 NL050000
-6	ã LA190000	î LI150000	Ã LA200000	Ï LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 NT060000
-7	â LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 NL070000
-8	ç LC410000	i LI130000	Ç LC420000	Ï LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 NT080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 NL090000
-A	[SM060000	]	¡ SM650000	:	« SP170000	ª SM210000	ï SP030000	¬ SM660000	(SHY) SP320000	1 LI610000	2 NT021000	3 NT031000
-B	. SP110000	\$ SC030000	,	# 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	ˉ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	— SP090000	' SP050000	ý LY110000	, SD410000	Ý LY120000	ˆ 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	≡ SM100000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00256

Code Page 260 (EBCDIC) Canadian French

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000						é T.F110000	è T.F130000	ê SD410000	0 ND100000
-1			/ SP120000	É LE120000	a LA010000	j LJ010000	“ SD170000		A LA020000	J LJ020000		1 ND010000
-2	â T.A150000	ê T.F150000	Â T.A160000	Ê T.F160000	b T.B010000	k T.K010000	s T.S010000		B T.B020000	K T.K020000	S T.S020000	2 ND020000
-3		ë LE170000		Ë LE180000	c LC010000	l LL010000	t LT010000		C LC020000	L LL020000	T LT020000	3 ND030000
-4			À T.A140000	È T.F140000	d T.D010000	m T.M010000	u T.U010000		D T.D020000	M T.M020000	U T.U020000	4 ND040000
-5					e LE010000	n LN010000	v LV010000		E LE020000	N LN020000	V LV020000	5 ND050000
-6		î T.I150000		Î T.I160000	f T.F010000	o T.O010000	w T.W010000		F T.F020000	O T.O020000	W T.W020000	6 ND060000
-7		ï L.I170000		Ï L.I180000	g L.G010000	p L.P010000	x L.X010000		G L.G020000	P L.P020000	X L.X020000	7 ND070000
-8	ç T.C410000		Ç T.C420000		h T.H010000	q T.Q010000	y T.Y010000		H T.H020000	Q T.Q020000	Y T.Y020000	8 ND080000
-9				` SD130000	i L.I010000	r L.R010000	z L.Z010000		I L.I020000	R L.R020000	Z L.Z020000	9 ND090000
-A	à T.A130000	’ SD110000	ù T.U130000	;								
-B	· SP110000	\$ SC030000	,	# SM010000					ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000						ü T.U170000		Ü T.U180000
-D	(SP060000	) SP070000	— SP090000	’ SP050000								Û LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000								
-F	! SP020000	^ SL150000	? SP150000	” SP040000								(EO)

Code Page 00260

Code Page 273 (EBCDIC) Germany F.R./Austria

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	â LA270000	ï LI170000	Ã 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	Ï 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	;	« 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	§ SM240000	ð LT630000	æ LA510000	Ð LT620000	- SM150000	¡ SM650000	}	\ SM070000	] 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	´ ST110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	⊘ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Ö LO200000	(EO)

Code Page 00273

Code Page 277 (EBCDIC) Denmark, Norway

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 T.A510000	ä T.A270000	\ SM070000	0 NTD100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â T.A150000	ê T.F150000	Â T.A160000	Ê T.F160000	b T.B010000	k T.K010000	s T.S010000	¥ SC050000	B T.B020000	K T.K020000	S T.S020000	2 NTD020000
-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 T.A130000	è T.F130000	À T.A140000	È T.F140000	d T.D010000	m T.M010000	u T.U010000	© SM520000	D T.D020000	M T.M020000	U T.U020000	4 NTD040000
-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 T.A190000	î T.I150000	Ã T.A200000	Î T.I160000	f T.F010000	o T.O010000	w T.W010000	¶ SM250000	F T.F020000	O T.O020000	W T.W020000	6 NTD060000
-7	} SM140000	ï LI170000	§ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NI'040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç T.C410000	ì T.I130000	Ç T.C420000	Ï T.I140000	h T.H010000	q T.Q010000	y T.Y010000	½ NF010000	H T.H020000	Q T.Q020000	Y T.Y020000	8 NTD080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NI'050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	# SM010000	☒ SC010000	ø T.O610000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	(SHY) SP320000	1 NTD011000	2 NTD021000	3 NTD031000
-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 T.O620000	ð T.D630000	{ SM110000	Ð T.D620000	- SM150000	ö T.O170000	~ SD190000	Ö T.O180000	Ü T.U180000
-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 T.T630000	[SM060000	Þ T.T640000	' SD110000	ó T.O110000	ú T.U110000	Ó T.O120000	Ú T.U120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00277

Code Page 278 (EBCDIC) Finland, Sweden

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø T.O610000	Ø T.O620000	° SM190000	μ SM170000	ϕ SC040000	ä T.A170000	å T.A270000	Ê T.F120000	0 ND100000
-1	(RSP) SP300000	` SD130000	/ SP120000	\ SM070000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â T.A150000	ê T.F150000	Â T.A160000	Ê T.F160000	b T.B010000	k T.K010000	s T.S010000	¥ SC050000	B T.B020000	K T.K020000	S T.S020000	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 T.A130000	è T.F130000	À T.A140000	È T.F140000	d T.D010000	m T.M010000	u T.U010000	© SM520000	D T.D020000	M T.M020000	U T.U020000	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 T.A190000	ï T.I150000	Ã T.A200000	Ï T.I160000	f T.F010000	o T.O010000	w T.W010000	¶ SM250000	F T.F020000	O T.O020000	W T.W020000	6 ND060000
-7	} SM140000	ï LI170000	\$ SC030000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NI040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç T.C410000	ì T.I130000	Ç T.C420000	Ï T.I140000	h T.H010000	q T.Q010000	y T.Y010000	½ NF010000	H T.H020000	Q T.Q020000	Y T.Y020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	é LE110000	i LI010000	r LR010000	z LZ010000	¾ NI050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	§ SM240000	☒ SC010000	ö T.O170000	: SP130000	« SP170000	≠ SM210000	ì SP030000	¬ SM660000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	· SP110000	Å LA280000	, SP080000	Ä LA180000	» SP180000	∞ SM200000	ı SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ö T.O180000	ð T.D630000	æ T.A510000	Ð T.D620000	- SM150000	ı SM650000	~ ST190000	@ SM050000	Ü T.U180000
-D	(SP060000	) SP070000	— SP090000	´ SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Û LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ T.T630000	Æ T.A520000	Þ T.T640000	´ SD110000	ó T.O110000	ú T.U110000	Ó T.O120000	Ú T.U120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Ö LO200000	(EO)

Code Page 00278

Code Page 280 (EBCDIC) Italy

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 LF130000	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 LF150000	Â LA160000	Ê LF160000	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 LF140000	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	â LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NI040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	~ SD190000	Ç LC420000	Ï 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 NI050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	é LF110000	ò LO130000	: SP130000	« SP170000	ª SM210000	¡ 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

Code Page 281 (EBCDIC) Japan (Latin)

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø T.O610000	Ø T.O620000	° SM190000	μ SM170000	¢ SC040000	{ SM110000	}	\$ SC030000	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 T.A150000	ê T.F150000	Â T.A160000	Ê T.F160000	b T.B010000	k T.K010000	s T.S010000	\ SM070000	B T.B020000	K T.K020000	S T.S020000	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 T.A130000	è T.F130000	À T.A140000	È T.F140000	d T.D010000	m T.M010000	u T.U010000	© SM520000	D T.D020000	M T.M020000	U T.U020000	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 T.A190000	ï T.I150000	Ã T.A200000	Ï T.I160000	f T.F010000	o T.O010000	w T.W010000	¶ SM250000	F T.F020000	O T.O020000	W T.W020000	6 ND060000
-7	â LA270000	ï LI170000	Ã LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NI040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç T.C410000	ì T.I130000	Ç T.C420000	Ï T.I140000	h T.H010000	q T.Q010000	y T.Y010000	½ NF010000	H T.H020000	Q T.Q020000	Y T.Y020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	í LI010000	r LR010000	z LZ010000	¾ NI050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	£ SC020000	! SP020000	¡ SM650000	: SP130000	« SP170000	≠ SM210000	ì SP030000	^ SD150000	(SHY) SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	¥ SC050000	, SP080000	# SM010000	» SP180000	º SM200000	í SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð T.D630000	æ T.A510000	Ð T.D620000	~ SD190000	ö T.O170000	ü T.U170000	Ö T.O180000	Ü T.U180000
-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 T.T630000	Æ T.A520000	Þ T.T640000	' SD110000	ó T.O110000	ú T.U110000	Ó T.O120000	Ú T.U120000
-F	| SM130000	⌋ SM660000	? SP150000	" SP040000	± SA020000	∩ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00281

Code Page 284 (EBCDIC) Spain/Latin America

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	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	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 NI040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ï LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ı SM650000	ß LS610000	# SM010000	` SD130000	ı LI010000	r LR010000	z LZ010000	¾ NI050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	]	ñ LN190000	: SP130000	« SP170000	ª SM210000	ı SP030000	^ SD150000	(SHY) 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	đ LD630000	æ LA510000	Ð LD620000	- SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SM410000	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

Code Page 285 (EBCDIC) United Kingdom

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø T.O610000	Ø T.O620000	° 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 T.A150000	ê T.F150000	Â T.A160000	Ê T.F160000	b T.B010000	k T.K010000	s T.S010000	Ÿ SC050000	B T.B020000	K T.K020000	S T.S020000	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 T.A130000	è T.F130000	À T.A140000	È T.F140000	d T.D010000	m T.M010000	u T.U010000	© SM520000	D T.D020000	M T.M020000	U T.U020000	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 T.A190000	ï T.I150000	Ã T.A200000	Ï T.I160000	f T.F010000	o T.O010000	w T.W010000	¶ SM250000	F T.F020000	O T.O020000	W T.W020000	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 T.C410000	ì T.I130000	Ç T.C420000	Ï T.I140000	h T.H010000	q T.Q010000	y T.Y010000	½ NF010000	H T.H020000	Q T.Q020000	Y T.Y020000	8 ND080000
-9	ñ LN190000	β 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	¡ SP030000	^ ST150000	¯ (SHY) SP320000	1 NT011000	2 NT021000	3 NT031000
-B	· SP110000	£ SC020000	,	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	ô LO160000	û LU160000
-C	< SA030000	*	% SM020000	@ SM050000	ð T.D630000	æ T.A510000	Ð T.D620000	~ SD190000	ö T.O170000	ü T.U170000	Ö T.O180000	Ü T.U180000
-D	(SP060000	) SP070000	— SP090000	´ SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	;	> SA050000	= SA040000	þ T.T630000	Æ T.A520000	Þ T.T640000	´ SD110000	ó T.O110000	ú T.U110000	Ó T.O120000	Ú T.U120000
-F	| SM130000	∟ SM660000	? SP150000	" SP040000	± SA020000	∩ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Ï LO200000	(EO)

Code Page 00285

Code Page 290 (EBCDIC) Japanese (Katakana) Non-extended

Hex Digits 1st → 2nd ↓	4	5	6	7	8	9	A	B	C	D	E	F
-0	SP010000	& SM030000	- SP100000			ソ JS008000					\$ SC030000	0 ND100000
-1	。 JQ700000	エ JE010000	/ SP120000		ア JA000000	タ JT100000	- SM150000		A LA020000	J LJ020000		1 ND010000
-2	「 JQ710000	オ JO010000			イ JU000000	チ JT200000	へ JM400000		B LB020000	K LK020000	S LS020000	2 ND020000
-3	」 JQ720000	ヤ JY110000			ウ JU000000	ツ JT300000	ホ JM500000		C LC020000	L LL020000	T LT020000	3 ND030000
-4	、 JQ730000	ユ JY310000			エ JE000000	テ JT400000	マ JM100000		D LD020000	M LM020000	U LU020000	4 ND040000
-5	・ JQ740000	ヨ JY310000			オ JO000000	ト JT500000	ミ JM200000		E LE020000	N LN020000	V LV020000	5 ND050000
-6	ヲ JW500000	ツ JT310000			カ JK100000	ナ JN100000	ム JM300000		F LF020000	O LO020000	W LW020000	6 ND060000
-7	〒 JA010000				キ JK200000	ニ JN200000	ノ JM400000		G LG020000	P LP020000	X LX020000	7 ND070000
-8	イ JU100000	ー JX700000			ク JK300000	ヌ JN300000	モ JM500000		H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	フ JU010000				ケ JK400000	ネ JN400000	ヤ JY100000		I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	£ SC020000	! SP020000	:	コ JK500000	ノ JN500000	ユ JY300000	レ JR400000					
-B	。 (small) SP110000	¥ SC050000	, SP080000	# SM010000				ロ JR500000				
-C	< SA030000	* SM040000	% SM020000	@ SM050000	サ JS100000		ヨ JY500000	ワ JW100000				
-D	(SP060000	) SP070000	— SP090000	' SP050000	シ JS200000	ハ JH100000	ラ JR100000	ン JN000000				
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ス JS300000	ヒ JH200000	リ JR200000	。 (small) JX710000				
-F	| SM130000	フ (small) SM660000	? SP150000	" SP040000	セ JS400000	フ (small) JH300000	ル JR300000	。 (small) JX720000				EO

FV2C084-0

Note: The 290 non-extended code page is supported by keyboard identifiers JKB and KAB and system functions other than the functions listed by the 290 extended code page.

Code Page 290 (EBCDIC) Japanese (Katakana) Extended

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	[SM060000	] SM080000	ソ JS500000	~ SD190000	^ SD150000	{ SM110000	}	\$ SC030000	0 ND100000
-1	。 JQ700000	エ JE010000	/ SP120000	i LI010000	ア JA000000	タ JT100000	ー SM150000	¢ SC040000	A LA020000	J LJ020000		1 ND010000
-2	「 JQ710000	オ JO010000	a LA010000	j LI010000	イ JI000000	チ JT200000	へ JH400000	\ SM070000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	」 JQ720000	ヤ JY110000	b LB010000	k LK010000	ウ JU000000	ツ JT300000	ホ JH500000	t LT010000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	、 JQ730000	ユ JY310000	c LC010000	l LI010000	エ JE000000	テ JE400000	マ JM100000	u LU010000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	・ JQ740000	ヨ JY510000	d LD010000	m LM010000	オ JO000000	ト JT500000	ミ JM200000	v LV010000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ヲ JW500000	ッ JT310000	c LF010000	n LN010000	カ JK100000	ナ JN100000	ム JM300000	w LW010000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	ア JA010000		ƒ LI010000	o LO010000	キ JK200000	ニ JN200000	メ JM400000	x LX010000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	イ JI010000	ー JX700000	g LG010000	p LI010000	ク JK300000	ヌ JN300000	モ JM500000	y LY010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ウ JU010000		h LI1010000	、 SL130000	ケ JK400000	ネ JN400000	ヤ JY100000	z LZ010000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	£ SC020000	! SP020000		: SP130000	コ JK500000	ノ JN500000	ユ JY300000	レ JR400000				
-B	・ SP110000	¥ SC050000	,	# SM010000	q LQ010000	r LR010000	s LS010000	ロ JR500000				
-C	< SA030000	* SM040000	% SM020000	@ SM050000	サ JS100000		ヨ JY500000	ワ JW100000				
-D	(SP060000	) SP070000	_ SP090000	ゝ SP050000	シ JS200000	ハ JH100000	ラ JR100000	ン JN000000				
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ス JS300000	ヒ JH200000	リ JR200000	・ JX710000				
-F	| SM130000	⌋ SM660000	? SP150000	" SP040000	セ JS400000	フ JH300000	ル JR300000	° JX720000				(EO)

Code Page 00290

Note: The 290 extended code page is supported by the following system functions:

- National language sort sequence support.
- Monocase table Q290.
- Translation tables: QA3B332290, Q037A7U290, Q290A7RA3B, Q290697037, Q290697S00, A500A7U290, QA3Q332290, A290QA94A3Q
- Coded character set identifiers (CCSIDs)

Code Page 297 (EBCDIC) France

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 TF110000	è TF130000	ç TC410000	0 ND100000
-1	(RSP) SP300000	{ SM110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	# SM010000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â TA150000	ê TF150000	Â TA160000	Ê TF160000	b TB010000	k TK010000	s TS010000	¥ SC050000	B TB020000	K TK020000	S TS020000	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 TA140000	Ù TF140000	d TD010000	m TM010000	u TU010000	© SM520000	D TD020000	M TM020000	U TU020000	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 TA190000	î TI150000	Ã TA200000	Î TI160000	f TF010000	o TO010000	w TW010000	¶ SM250000	F TF020000	O TO020000	W TW020000	6 ND060000
-7	â LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NI040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	\ SM070000	ì TI130000	Ç TC420000	Ï TI140000	h TH010000	q TQ010000	y TY010000	½ NF010000	H TH020000	Q TQ020000	Y TY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	µ SM170000	i LI010000	r LR010000	z LZ010000	¾ NI050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	§ SM240000	ù TU130000	:	« SP170000	ª SM210000	¡ 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	à TA130000	ð TT630000	æ TA510000	Ð TD620000	- SM150000	ö TO170000	ü TU170000	Ö TO180000	Ü TU180000
-D	(SP060000	) SP070000	— SP090000	´ SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	¡ SM650000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ TT630000	Æ TA520000	Þ TT640000	´ SD110000	ó TO110000	ú TU110000	Ó TO120000	Ú TU120000
-F	! SP020000	^ SL150000	? SP150000	" SP040000	± SA020000	∩ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00297

Code Page 420 (EBCDIC) Arabic Bilingual

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 AI1470000	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 I.B010000	k I.K010000	s I.S010000	ي AI.220000	B I.B020000	K I.K020000	S I.S020000	2 NT020000
-3	ع AX100004		ت AT010000	د AI010000	c LC010000	l LL010000	t LT010000	ي AI.220003	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ـ SM860000		ث AT010003	ذ AT470000	d I.D010000	m I.M010000	u I.U010000	ي AI.320000	D I.D020000	M I.M020000	U I.U020000	4 NT040000
-5	ع SM870000	ث AY310000	ث AT470000	ر AK010000	e LE010000	n LN010000	v LV010000	ي AI.320003	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ه AX300000	ا AA010000	ث AT470003	ز AZ010000	f I.F010000	o I.O010000	w I.W010000		F I.F020000	O I.O020000	W I.W020000	6 NT060000
-7	آ AA210000	ا AA010002	ح AG230000	س AS010000	g LG010000	p LP010000	x LX010000		G LG020000	P LP020000	X LX020000	7 ND070000
-8	أ AA210002	ب AB010000	ح AC230003	س AS010003	h I.H010000	q I.Q010000	y I.Y010000	ي AI.020000	H I.H020000	Q I.Q020000	Y I.Y020000	8 NT080000
-9	أ AA310000	ب AB010003	ح AI1450000	، SP080007	i LI010000	r LR010000	z LZ010000	ي AI.020003	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	؄ SC040000	!SP020000	ا SM650000	؛ SP130000	ش AS230003	ع AC470000	غ AG310004	ل AI.010003	(SHY) SP320000	ى AA020000	ا NT010001	
-B	. SP110000	\$ SC030000	,SP080000	# SM010000	ص AS450000	ح AC470002	ف AF010000	م AM010000	ه AI1010003	ى AA020002	٢ ND020001	٦ ND060001
-C	< SA030000	* SM040007	% SM020007	@ SM050000	ص AS450003	ع AC470003	ف AF010003	م AM010003		ي AY010000		٧ NT070001
-D	(SP060000	) SP070000	ـ SP090000	، SP050000	ض AD450000	ع AC470004	ق AQ010000	ن AN010000	٤ AI1010004	ي AY010002	٣ ND030001	٨ ND080001
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ض AD450003	غ AG310000	ق AQ010003	ن AN010003		ي AY010003	٤ NT040001	٩ NT090001
-F	| SM130000	٧ SM660000	؟ SP150000	" SP040000	ط AT450000	غ AG310002	ك AK010000	ه AI1010000	و AW010000	.ND100001	٥ ND050001	(EO)

Code Page 00420

Code Page 423 (EBCDIC) Greece

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000		Ä TA180000	Ö TO180000	Ü TU180000		Š SD410000	‘ SD110000	° SM190000	0 ND100000
-1	A GA020000	K GK020000	/ SP120000	‘A GA120000	a LA010000	j LJ010000	“ SD170000	á GA110000	Α LA020000	Ј LJ020000		1 ND010000
-2	B GB020000	Λ GT.020000	Τ GT020000	‘E GE120000	b TB010000	k TK010000	s TS010000	έ GE110000	B TB020000	K TK020000	S TS020000	2 ND020000
-3	Γ GG020000	Μ GM020000	Υ GU020000	‘H GE200000	c LC010000	l LL010000	t LT010000	ή GE710000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	Δ GD020000	Ν GN020000	Φ GF020000	(RSP) SP300000	d TD010000	m TM010000	u TU010000	ï GI170000	D TD020000	M TM020000	U TU020000	4 ND040000
-5	E GE020000	Ξ GX020000	Χ GI1020000	‘I GI120000	e LE010000	n LN010000	v LV010000	ί GI110000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	Z GZ020000	O GO020000	Ψ GP620000	‘O GO120000	f TF010000	o TO010000	w TW010000	ό GO110000	F TF020000	O TO020000	W TW020000	6 ND060000
-7	H GE320000	Π GP020000	Ω GO320000	‘Y GU120000	g LG010000	p LP010000	x LX010000	ύ GU110000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	Θ GT620000	Ρ GR020000		‘Ω GO720000	h TH010000	q TQ010000	y TY010000	ÿ GU170000	H TH020000	Q TQ020000	Y TY020000	8 ND080000
-9	I GI020000	Σ GS020000		‘ 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	(SHY) SP320000	± SA020000	½ NF010000	ÿ TY170000
-B	. SP110000	\$ SC030000	, SP080000	£ SC020000	β GB010000	ρ GT610000	ξ GX010000	τ GT010000	ω GO310000	é LE110000	ö LO170000	ç LC410000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	γ GC010000	ι GI010000	ο GO010000	υ GU010000	â TA150000	ç TE130000	ô TO150000	Ç TC420000
-D	(SP060000	) SP070000	_ SP090000	‘ SP050000	δ GD010000	κ GK010000	π GP010000	φ GF010000	à LA130000	ë LE170000	û LU150000	
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ε GE010000	λ GT.010000	ρ GR010000	χ GH010000	ä TA170000	î TI150000	ù TU130000	
-F	! SP020000	^ SD150000	? SP150000	" SP040000	ζ GZ010000	μ GM010000	σ GS010000	ψ GP610000	ê LE150000	ï LI170000	ü LU170000	(EO)

Code Page 00423

Code Page 424 (EBCDIC) Israel (Hebrew)

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000			° SM190000	μ SM170000	^ ST150000	{ SM110000	}	\ SM070000	0 ND100000
-1	א HX330000	ב HY010000	ג SP120000	ד HT010000	ה LA010000	ו LJ010000	ז SD190000	ח SC020000	ט LA020000	י LJ020000	יא SA060000	יב ND010000
-2	כ HB010000	ל HK610000	מ HX350000		נ TB010000	ס TK010000	ע TS010000	פ SC050000	צ TB020000	ק TK020000	ר TS020000	ש NT020000
-3	ת HG010000	י HK010000	ך HP610000		כ LC010000	ל LL010000	ט LT010000	מ SM570000	צ LC020000	ל LL020000	ת LT020000	ש ND030000
-4	ך HT010000	ל HT010000	ם HP010000	(RSP) SP300000	ד TD010000	מ TM010000	ו TU010000	© SM520000	ד TD020000	מ TM020000	ו TU020000	ז NT040000
-5	ה HJ010000	ם HM610000	ץ HS610000		ע LE010000	נ LN010000	ו LV010000	§ SM240000	ע LE020000	נ LN020000	ו LV020000	ז ND050000
-6	ו HW010000	ז HM010000	ח HS450000		ט TF010000	ו TO010000	ז TW010000	ף SM250000	פ TF020000	ו TO020000	ז TW020000	ח NT060000
-7	ז HX010000	ח HN610000	ט HQ010000		י LG010000	פ LP010000	ק LX010000	¼ NI040000	ג LG020000	פ LP020000	ק LX020000	ר ND070000
-8	ח HH450000	ט HN010000	ך HR010000	= SM100000	ה TH010000	ק TQ010000	י TY010000	½ NF010000	ח TH020000	ק TQ020000	י TY020000	יב NT080000
-9	ט HT450000	י HS010000	יא HS210000	י SD130000	י LI010000	ר LR010000	ז LZ010000	¾ NI050000	י LI020000	ר LR020000	ז LZ020000	יב ND090000
-A	פ SC040000	י SP020000	י SM650000	י SP130000	« SP170000			[SM060000	(SHY) SP320000	1 NT011000	2 NT021000	3 NT031000
-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				· ST110000				
-F	| SM130000	⌋ SM660000	? SP150000	" SP040000	± SA020000	⊗ SC010000	® SM530000	× SA070000				(EO)

Code Page 00424

Code Page 435 (EBCDIC) Teletext Isomorphic

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		/ SP120000	‘ SP190000	á LA010000	ĵ LJ010000	~ SL190000	£ SC020000	A LA020000	J LJ020000	(NSP) SP310000	1 ND010000
-2		÷ SA060000	° ST270000	‘ SP200000	b LB010000	k LK010000	s LS010000	Ÿ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3		© SM520000	• SD290000	“ SP210000	c LC010000	l LL010000	t LT010000	- SL310000	C LC020000	L LL020000	T LT020000	3 ND030000
-4		™ SM540000		” SP220000	d LD010000	m LM010000	u LU010000	˘ SD430000	D LD020000	M LM020000	U LU020000	4 ND040000
-5		♪ SM930000	1/8 NF180000	← SL590000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6		1 ND011000	3/8 NF190000	↑ SL610000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	× SA070000	— SM120000	5/8 NF200000	→ SL600000	g LG010000	p LP010000	x LX010000	1/4 NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	• ST630000	Ω SM180000	7/8 NF210000	↓ SL620000	h LH010000	q LQ010000	y LY010000	1/2 NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	∟ SM660000	β LS610000		˘ SD130000	i LI010000	r LR010000	z LZ010000	3/4 NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	¡ SM650000	∶ SP130000	« SP170000	ª SM210000	ı SP030000	˙ SD450000	(SHY) SP320000	1 LI610000	2 ND021000	3 ND031000
-B	• SP110000	\$ SC030000	‚ SP080000	# SM010000	» SP180000	º SM200000	ı̇ SP160000	| SM130000	K LK610000	ħ LI1610000	˘ SD230000	Ĥ LI1620000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LT630000	æ LA510000	Ð LT620000	- SM150000	đ LT610000	ij LT510000	’n LTN630000	IJ LT520000
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	” SD250000	˘ SD410000		˘ SD170000	ł LL630000	æ LO510000	Ł LL640000	Œ LO520000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	’ SD110000	ł LT610000	ł LT610000	Ł LT620000	ƒ LT620000
-F	! SP020000	^ SD150000	? SP150000	” SP040000	± SA020000	⊘ SC010000	® SM530000	˘ SD210000	˘ LN610000	ł SM160000	Œ LN620000	(EO)

Code Page 00435

Code Page 437 (IBM Personal Computer) USA

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		◀ SM590000	(SP) SP010000	0 NT100000	@ SM050000	P TP020000	` ST130000	p TP010000	Ç TC420000	É TF120000	á TA110000	☐ SF140000	☐ SF020000	☐ SF460000	α GA010000	≡ SA480000
-1	☺ SS000000	◀ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	ü LU170000	æ LA510000	í LI110000	☐ SI150000	☐ SI070000	☐ SI470000	β LS610000	± SA020000
-2	☹ SS010000	↕ SM760000	" SP040000	2 ND020000	B TB020000	R TR020000	b TB010000	r TR010000	é TF110000	Æ TA520000	ó TO110000	☐ SF160000	☐ SF060000	☐ SF480000	Γ CG020000	≥ SA530000
-3	♥ SS020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	â LA150000	ô LO150000	ú LU110000	☐ SI110000	☐ SI080000	☐ SI490000	π GP010000	≤ SA520000
-4	♦ SS030000	¶ SM250000	\$ SC030000	4 ND040000	D TD020000	T TT020000	d TD010000	t TT010000	ä TA170000	ö TO170000	ñ TN190000	☐ SF090000	☐ SF100000	☐ SF500000	Σ CS020000	ƒ SS260000
-5	♣ SS040000	§ SM240000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	à LA130000	ò LO130000	Ñ LN200000	☐ SI190000	☐ SI050000	☐ SI510000	σ GS010000	J SS270000
-6	♠ SS050000	— SM700000	& SM030000	6 ND060000	F TF020000	V TV020000	f TF010000	v TV010000	ä TA270000	û TU150000	ª SM210000	☐ SF200000	☐ SF360000	☐ SF520000	μ GM010000	÷ SA060000
-7	• SM570000	↕ SM770000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ç LC410000	ù LU130000	º SM200000	☐ SI210000	☐ SI370000	☐ SI530000	τ GT010000	≈ SA700000
-8	☐ SM570001	↑ SM320000	(SP060000	8 ND080000	H TH020000	X TX020000	h TH010000	x TX010000	ê TE150000	ÿ TY170000	¿ SP160000	☐ SF220000	☐ SF380000	☐ SF540000	Φ GF020000	° SM190000
-9	○ SM750000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	ë LE170000	Ö LO180000	⌋ SM680000	☐ SI230000	☐ SI390000	☐ SI040000	Θ GT620000	• SA790000
-A	◉ SM750002	→ SM310000	* SM040000	:	J TJ020000	Z TZ020000	j TJ010000	z TZ010000	è TE130000	Ü TU180000	⌋ SM660000	☐ SI240000	☐ SI400000	☐ SI010000	Ω GO320000	· SD630000
-B	♂ SM280000	← SM300000	+ SA010000	;	K LK020000	[SM060000	k LK010000	{ SM110000	ï LI170000	ç SC040000	½ NI010000	☐ SI250000	☐ SI410000	☐ SI610000	δ GL010000	√ SA800000
-C	♀ SM290000	⌋ SA420000	, SP080000	< SA030000	L TL020000	\ SM070000	l TL010000	| SM130000	î LI150000	£ SC020000	¼ NF040000	☐ SF260000	☐ SF420000	☐ SF570000	∞ SA450000	ⁿ TN011000
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	ì LI130000	¥ SC050000	ı SP030000	☐ SI270000	☐ SI430000	☐ SI580000	φ GT010001	² NL021000
-E	♪ SM910000	▲ SM600000	. SP110000	> SA050000	N TN020000	^ ST150000	n TN010000	~ ST190000	Ä TA180000	Pts SC060000	« SP170000	☐ SF280000	☐ SF440000	☐ SF590000	ε GF010000	■ SM470000
-F	☀ SM690000	▼ SY040000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	◊ SM790000	Å LA280000	ƒ SC070000	» SP180000	☐ SI030000	☐ SI450000	☐ SI600000	∩ SA380000	(RSP) SP300000

Code Page 00437

Code Page 500 (EBCDIC) Multilingual #5

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	Ï LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	â 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 LI150000	Ç LC420000	Ï 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	:	« 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	@ SM050000	ð LT630000	æ LA510000	Ð LT620000	- 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

Code Page 813 (ISO 8859, Part 7) Greece

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0			(SP) 0 SP010000 NT010000	@ SM050000	P TP020000	` ST0130000	p TP010000				(RSP) ° SP300000 SM190000	í GT730000	Π GP020000	ύ GU730000	π GP010000	
-1			! 1 SP020000 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000				´ ± SP190000 SA020000	A GA020000	P GR020000	α GA010000	ρ GR010000	
-2			" 2 SP040000 NT020000	B TB020000	R TR020000	b TB010000	r TR010000				´ ² SP200000 NT0201000	B CB020000		β CB010000	ς CS610000	
-3			# 3 SM010000 ND030000	C LC020000	S LS020000	c LC010000	s LS010000				£ ³ SC020000 ND031000	Γ GS020000	Σ GS020000	γ GS010000	σ GS010000	
-4			\$ 4 SC030000 NT040000	D TD020000	T TT020000	d TD010000	t TT010000					´ Δ SD110000 GT020000	T GT020000	δ GT010000	τ GT010000	
-5			% 5 SM020000 ND050000	E LE020000	U LU020000	e LE010000	u LU010000					´ E SD730000 GE020000	Y GU020000	ε GE010000	υ GU010000	
-6			& 6 SM030000 NT060000	F TF020000	V TV020000	f TF010000	v TV010000				¡ Á SM650000 GA120000	Z GZ020000	Φ GF020000	ζ GZ010000	φ GF010000	
-7			´ 7 SP050000 ND070000	G LG020000	W LW020000	g LG010000	w LW010000				§ · SM240000 SD630000	H GE320000	X GI020000	η GE310000	χ GI010000	
-8			(8 SP060000 NT080000	H TH020000	X TX020000	h TH010000	x TX010000				¨ É SD170000 GF120000	Θ GT620000	Ψ GP620000	ϑ GT610000	ψ GP610000	
-9			) 9 SP070000 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000				© ¨ SM520000 GE720000	I GI020000	Ω GO320000	ι GI010000	ω GO310000	
-A			* : SM040000 SP130000	J TJ020000	Z TZ020000	j TJ010000	z TZ010000					´ I GT120000	K GR020000	ϊ GT180000	κ GR010000	ϊ GT170000
-B			+ ; SA010000 SP140000	K LK020000	[SM060000	k LK010000	{ SM110000				« » SP170000 SP180000	Λ GL020000	ÿ GU180000	λ GL010000	ü GU170000	
-C			, < SP080000 SA030000	L TL020000	\ SM070000	l TL010000	| SM130000				¬ ¸ SM660000 GO120000	O GM020000	M GA110000	ά GM010000	μ GO110000	ό GO110000
-D			- = SP100000 SA040000	M LM020000	] j SM080000	m LM010000	} SM140000				(STY) ½ SP320000 NF010000	N GN020000	έ GE110000	ν GN010000	ύ GU110000	
-E			. > SP110000 SA050000	N TN020000	^ ST0150000	n TN010000	~ ST0190000					´ Y GU120000	E GX020000	ή GE710000	ξ GX010000	ώ GO710000
-F			/ ? SP120000 SP150000	O LO020000	_ o SP090000	o LO010000					— Ω SM120000 GO720000	O GO020000	ί GI110000	ο GO010000		

Code Page 00813

Code Page 819 (ISO 8859, Part 1) Latin Alphabet No. 1

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0			(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000			(RSP) SP300000	° SM190000	À LA140000	Ð LD620000	à LA130000	ð LD630000
-1			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000			i SP030000	± SA020000	Á LA120000	Ñ LN200000	á LA110000	ñ LN190000
-2			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000			¢ SC040000	² ND021000	Â LA160000	Ò LO140000	â LA150000	ò LO130000
-3			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000			£ SC020000	³ ND031000	Ã LA200000	Ó LO120000	ã LA190000	ó LO110000
-4			\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000			¤ SC010000	' SD110000	Ä LA180000	Ô LO160000	ä LA170000	ô LO150000
-5			% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000			¥ SC050000	µ SM170000	Å LA280000	Õ LO200000	å LA270000	õ LO190000
-6			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000			¦ SM650000	¶ SM250000	Æ LA520000	Ö LO180000	æ LA510000	ö LO170000
-7			' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000			§ SM240000	· SD630000	Ç LC420000	×	ç LC410000	÷ SA060000
-8			(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000			¨ SD170000	ˆ SD410000	È LE140000	Ø LO620000	è LE130000	ø LO610000
-9			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000			© SM520000	¹ ND011000	É LE120000	Ù LU140000	é LE110000	ù LU130000
-A			* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000			ª SM210000	º SM200000	Ê LE160000	Ú LU120000	ê LE150000	ú LU110000
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000			« SP170000	» SP180000	Ë LE180000	Û LU160000	ë LE170000	û LU150000
-C			, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000			¬ SM660000	¼ NF040000	Ì LI140000	Ü LU180000	ì LI130000	ü LU170000
-D			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000			¯ (SHY) SP320000	½ NF010000	Í LI120000	Ý LY120000	í LI110000	ý LY110000
-E			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000			® SM530000	¾ NF050000	Î LI160000	Þ LT640000	î LI150000	þ LT630000
-F			/ SP120000	? SP150000	O LO020000	<u> </u> SP090000	o LO010000				- SM150000	¿ SP160000	Ï LI180000	ß LS610000	ï LI170000	ÿ LY170000

Code Page 00819

Code Page 833 (EBCDIC) Korea Extended

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	[SM060000	] SM080000		- SM150000	^ SD150000	{ SM110000	}	W SM140000	0 NTD100000
-1			/ SP120000		a LA010000	j LJ010000	~ SD190000		A LA020000	J LJ020000		1 ND010000
-2	SP490000	ㄸ OT100000	ㄷ OT300000	ㅈ OT000000	b TB010000	k TK010000	s TS010000	\ SM070000	B TB020000	K TK020000	S TS020000	2 NTD020000
-3	ㄱ OG000000	ㄴ OL000000	ㄹ OM000000	ㅊ OJ100000	c LC010000	l LL010000	t LT010000		C LC020000	L LL020000	T LT020000	3 ND030000
-4	ㅋ OG100000	ㄷ OT200000	ㅈ OB000000	ㅊ OC200000	d TD010000	m TM010000	u TU010000		D TD020000	M TM020000	U TU020000	4 NTD040000
-5	ㅌ OG200000	ㄹ OL400000	ㅊ OB100000	ㅋ OK000000	e LE010000	n LN010000	v LV010000		E LE020000	N LN020000	V LV020000	5 ND050000
-6	ㄴ ON000000	ㄷ OT100000	ㅈ OB200000	ㅊ OT000000	f TF010000	o TO010000	w TW010000		F TF020000	O TO020000	W TW020000	6 NTD060000
-7	ㅌ ON150000	ㄷ OL600000	ㅈ OS000000	ㅊ OP000000	g LG010000	p LP010000	x LX010000		G LG020000	P LP020000	X LX020000	7 ND070000
-8	ㅌ ON100000	ㅈ OT700000	ㅊ OS100000	ㅋ OH000000	h TH010000	q TQ010000	y TY010000		H TH020000	Q TQ020000	Y TY020000	8 NTD080000
-9	ㄴ OL000000	ㅈ OL500000	ㅇ ON200000	ㅊ SD130000	i LI010000	r LR010000	z LZ010000		I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	ϕ SC040000	! SP020000	| SM650000	: SP130000	ㅌ OA000000	ㅋ OY400000	ㅌ OY500000	ㅡ OF300000				
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	ㅈ OA200000	ㅋ OY300000	ㅌ OU000000	ㅌ OE400000				
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ㅌ OY200000	ㅌ OO000000	ㅋ OU300000	ㅌ OI000000				
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ㅈ OY250000	ㅌ OO100000	ㅋ OU200000					
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ㅌ OE200000	ㅋ OO200000	ㅌ OU400000					
-F	| SM130000	ㅌ SM660000	? SP150000	" SP040000	ㅋ OE000000	ㅌ OO300000	ㅌ OY600000					(EO)

Code Page 00833

Code Page 836 (EBCDIC) Simplified Chinese Extended

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000				~ SD190000	^ SD150000	{ SM110000	}	\$ SC030000	0 ND100000
-1		/ SP120000		a LA010000	j LJ010000	- SM150000		A LA020000	J LJ020000			1 ND010000
-2				b LB010000	k LK010000	s LS010000	\ SM070000	B LB020000	K LK020000	S LS020000		2 ND020000
-3				c LC010000	l LL010000	t LT010000		C LC020000	L LL020000	T LT020000		3 ND030000
-4				d LD010000	m LM010000	u LU010000		D LD020000	M LM020000	U LU020000		4 ND040000
-5				e LE010000	n LN010000	v LV010000		E LE020000	N LN020000	V LV020000		5 ND050000
-6				f LF010000	o LO010000	w LW010000		F LF020000	O LO020000	W LW020000		6 ND060000
-7				g LG010000	p LP010000	x LX010000		G LG020000	P LP020000	X LX020000		7 ND070000
-8				h LH010000	q LQ010000	y LY010000		H LH020000	Q LQ020000	Y LY020000		8 ND080000
-9			` SD130000	i LI010000	r LR010000	z LZ010000		I LI020000	R LR020000	Z LZ020000		9 ND090000
-A	£ SC020000	!	¡ SM650000	:				[SM060000				
-B	· SP110000	¥	,	#				] SM080000				
-C	< SA030000	*	%	@								
-D	(SP060000)	—	’								
-E	+ SA010000	;	>	=								
-F	| SM130000	∟	?	"								(EO)






























Code Page 00836

Code Page 838 (EBCDIC) Thai Extended

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	฿ SC130000				○ ND100002	{ SM110000	}	\ SM070000	0 ND100000
-1			/ SP120000		a LA010000	j LJ010000	~ SD190000	๑ ND010002	A LA020000	J LJ020000		1 ND010000
-2	ก BK100000	ข BC100000	ฅ BT100000	ง BT600000	b LB010000	k LK010000	s LS010000	๒ ND020002	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ช BK200000	ฉ BX100000	๗ BT200000	ค BT700000	c LC010000	l LL010000	t LT010000	๓ ND030002	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ข BK300000	ช BS100000	ท BT300000	ธ BT800000	d LD010000	m LM010000	u LU010000	๔ ND040002	D LD020000	M LM020000	U LU020000	4 ND040000
-5	ค BK400000	ช BX200000	ฒ BT400000	น BN300000	e LE010000	n LN010000	v LV010000	๕ ND050002	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ค BK500000	ณ BX300000	ณ 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	ฉ BT100000	ต BT500000	ฒ BT200000	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	¢ SC040000	! SP020000	¡ SM650000	: SP130000	ฝ BF100000	ร BR100000	ช BS300000	๑ BQ200000	.	๓ BQ300000	๗ BA700000	+ BZ400000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	พ BP300000	ภ BR200000	ส BS400000	๒ BA200000	๔ BL200000	๕ BE200000	๗ BQ100000	๘ BZ500000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ฟ BF200000	ล BL100000	ห BH100000	๓ BA100000	๕ BU100000	๕ BE300000	๗ BQ100000	๘ BZ400000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ภ BP400000	ภ BL200000	ฬ BL300000	๓ BA300000	๕ BU200000	๕ BO200000	๕ BZ100000	
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ม BM100000	ว BW100000	อ BO100000	๓ BA400000	๕ BU300000	๕ BA500000	๕ BZ200000	
-F	| SM130000	⌋ SM660000	? SP150000	" SP040000	ย BY200000	ศ BS200000	ย BI1200000	๓ BI100000	๕ BU400000	๕ BA600000	๕ BZ300000	(EO)

Code Page 00838

Code Page 850 (IBM Personal Computer) Multilingual

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶ SM590000	(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000	Ç LC420000	É LF120000	á LA110000	 SF140000	 SF020000	ð LD630000	Ó LO120000	(SHY) SP320000
-1	☺ SS000000	▶ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	ü LU170000	æ LA510000	í LI110000	 SI150000	 SI070000	Ð LD620000	ß LS610000	± SA020000
-2	☹ SS010000	↕ SM760000	" SP040000	2 ND020000	B LR020000	R LR020000	b LR010000	r LR010000	é LF110000	Æ LA520000	ó LO110000	 SF160000	 SF060000	Ê LF160000	Ô LO160000	≡ SM100000
-3	♥ SS020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	â LA150000	ô LO150000	ú LU110000	 SI110000	 SI080000	Ë LE180000	Ò LO140000	¼ NI050000
-4	♦ SS030000	¶ SM250000	\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000	ä LA170000	ö LO170000	ñ LN190000	 SF090000	 SF100000	È LF140000	õ LO190000	¶ SM250000
-5	♣ SS040000	§ SM240000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	à LA130000	ò LO130000	Ñ LN200000	Á LA120000	 SI050000	ı LI610000	Ö LO200000	§ SM240000
-6	♠ SS050000	— SM700000	& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000	å LA270000	û LU150000	ª SM210000	Â LA160000	ã LA190000	Í LI220000	μ SM170000	÷ SA060000
-7	• SM570000	↕ SM770000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ç LC410000	ù LU130000	º SM200000	À LA140000	Ã LA200000	Î LI600000	þ LT630000	¸ SL410000
-8	■ SM570001	↑ SM320000	(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000	ê LF150000	ÿ LY170000	ı̇ SP160000	© SM520000	 SF380000	İ LI180000	þ LT640000	° SM190000
-9	○ SM750000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	ë LE170000	ÿ LO180000	® SM530000	 SI230000	 SI390000	 SI040000	Ú LU120000	¨ SD170000
-A	● SM750002	→ SM310000	* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000	è LF130000	Ü LU180000	¬ SM660000	 SF240000	 SF400000	 SF010000	Û LU160000	· SD630000
-B	♂ SM280000	← SM300000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	ï LI170000	ø LO610000	½ NI010000	 SI250000	 SI410000	 SI610000	Ü LU140000	ı̇ ND011000
-C	♀ SM290000	└ SA420000	, SP080000	< SA030000	L LT020000	\ SM070000	l LT010000	| SM130000	î LI150000	£ SC020000	¼ NF040000	 SF260000	 SF420000	 SF570000	ý LY110000	³ NT031000
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	J SM080000	m LM010000	} SM140000	ì LI130000	Ø LO620000	ı̇ SP030000	€ SC040000	 SI430000	ı̇ SM650000	Ý LY120000	² ND021000
-E	♫ SM910000	▲ SM600000	. SP110000	> SA050000	N LN020000	^ ST150000	n LN010000	~ ST190000	Ä LA180000	× SA070000	« SP170000	¥ SC050000	 SF440000	Ï LI140000	— SM150000	■ SM470000
-F	☀ SM690000	▼ SV040000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	◊ SM790000	Å LA280000	ƒ SC070000	» SP180000	 SI030000	 SC010000	 SI600000	' SD110000	(RSP) SP300000

Code Page 00850

Code Page 851 (IBM Personal Computer) Greece

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶ SM590000	(SP) SP010000	0 ND100000	@ SM050000	P T.P020000	` ST130000	p T.P010000	Ç T.C420000	ı GT120000	ı GT170000	☐ SF140000	☐ SF020000	T GT020000	ζ GT7010000	̄ SP320000
-1	☺ SS000000	◀ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	ü LU170000		í GI730000	☐ SI150000	☐ SI070000	Y GU020000	η GE310000	± SA020000
-2	☹ SS010000	↕ SM760000	" SP040000	2 ND020000	B T.B020000	R T.R020000	b T.B010000	r T.R010000	é T.E110000	Ó G.O120000	ó G.O110000	☐ SF160000	☐ SF060000	Φ GF020000	ϑ GT610000	υ GU010000
-3	♥ SS020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	â LA150000	ô LO150000	ú GU110000	☐ SI110000	☐ SI080000	X GI1020000	ι GI010000	φ GF010000
-4	♦ SS030000	¶ SM250000	\$ SC030000	4 ND040000	D T.D020000	T T.T020000	d T.D010000	t T.T010000	ä T.A170000	ö T.O170000	À GA020000	☐ SF090000	☐ SF100000	Ψ GP620000	κ GK010000	χ GH010000
-5	♣ SS040000	§ SM240000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	à LA130000	Ÿ GU120000	B GB020000	K GK020000	☐ SI050000	Ω GO320000	λ GL010000	§ SM240000
-6	♠ SS050000	▬ SM700000	& SM030000	6 ND060000	F T.F020000	V T.V020000	f T.F010000	v T.V010000	À GA120000	û T.U150000	Γ GG020000	Λ GT020000	Π GP020000	α GA010000	μ GM010000	ψ GP610000
-7	• SM570000	↕ SM770000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ç LC410000	ù LU130000	Δ GD020000	M GM020000	P GR020000	β GB010000	ν GN010000	̄ SD410000
-8	☐ SM570001	↑ SM320000	(SP060000	8 ND080000	H T.H020000	X T.X020000	h T.H010000	x T.X010000	ê T.E150000	Ω G.O20000	E GF020000	N GN020000	☐ SF380000	γ GG010000	ξ GX010000	° SM190000
-9	○ SM750000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	ë LE170000	Ö LO180000	Z GZ020000	☐ SI230000	☐ SI390000	☐ SI040000	ο GO010000	¨ SD170000
-A	☐ SM750002	→ SM310000	* SM040000	;: SP130000	J T.J020000	Z T.Z020000	j T.J010000	z T.Z010000	è T.E130000	Ü T.U180000	H GF320000	☐ SI240000	☐ SI400000	☐ SI010000	π GP010000	ω GO310000
-B	♂ SM280000	← SM300000	+ SA010000	;: SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	ï LI170000	á GA110000	½ NI010000	☐ SI250000	☐ SI410000	☐ SI610000	ρ GR010000	ÿ GU170000
-C	♀ SM290000	↳ SA420000	, SP080000	< SA030000	L T.T020000	\ SM070000	l T.T010000	| SM130000	î T.T150000	£ SC020000	Θ GT620000	☐ SI260000	☐ SI420000	☐ SI570000	σ GS010000	ύ GU730000
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	Έ GE120000	έ GE110000	Ι GI020000	Ξ GX020000	☐ SI430000	☐ GI010000	ς GS610000	ώ GO710000
-E	♪ SM910000	▲ SM600000	. SP110000	> SA050000	N T.N020000	^ ST150000	n T.N010000	~ ST190000	Ä T.A180000	ή CE710000	« SP170000	Ο GO020000	☐ SI440000	ε GF010000	τ GT010000	☐ SM470000
-F	☀ SM690000	▼ SV040000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	◊ SM790000	‘H GE720000	ί GI110000	» SP180000	☐ SI030000	Σ GS020000	☐ SI600000	' SD110000	(RSP) SP300000

Code Page 00851

Code Page 852 (ISO 8859-2) Personal Computer

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶	(SP)	0	@	P	`	p	Ç	É	á	☐	☐	đ	Ó	(SHY)
-1	☺	◀	!	1	A	Q	a	q	ü	Ł	í	☐	☐	Đ	β	"
-2	☹	↕	"	2	B	R	b	r	é	Í	ó	☐	☐	Ď	Ô	˘
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	☐	☐	Ě	Ń	˘
-4	♦	¶	\$	4	D	T	d	t	ä	ö	Ą	☐	☐	ď	ń	˘
-5	♣	§	%	5	E	U	e	u	û	Ł	ą	Á	☐	Ň	ň	§
-6	♠	▬	&	6	F	V	f	v	é	ĭ	ž	Â	Ă	í	š	÷
-7	•	↕	'	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	˘
-8	☐	↑	(	8	H	X	h	x	ł	ś	Ę	Ş	☐	ě	Ŕ	°
-9	○	↓	)	9	I	Y	i	y	ë	Ö	ę	☐	☐	☐	Ú	˘
-A	☐	→	*	:	J	Z	j	z	Ő	Ü		☐	☐	☐	ı	˘
-B	♂	←	+	;	K	[	k	{	ő	Ŧ	ź	☐	☐	☐	Ű	ű
-C	♀	↳	,	<	L	\	l	|	î	ĩ	č	☐	☐	☐	ý	ř
-D	♪	↔	-	=	M	]	m	}	Ž	Ł	ş	Ž	☐	☐	Ý	ř
-E	♫	▲	.	>	N	^	n	~	Ä	×	«	ž	☐	☐	Û	ł
-F	☀	▼	/	?	O	_	o	◊	Ć	ć	»	☐	☐	☐	'	(RSP)

Code Page 00852

Code Page 857 (ISO 8859-5) Turkey

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		◀	(SP)	0	@	P	`	p	Ç	É	á	☐	☐	◌	Ó	Š(Y)
		SM590000	SP010000	NT010000	SM050000	T.P020000	SD130000	T.P010000	T.C420000	T.F120000	T.A110000	SF140000	SF020000	SM200000	T.O120000	SP320000
-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	☐	☐	◌	ß	±
	SS000000	SM630000	SP020000	NT010000	LA020000	LQ020000	LA010000	LQ010000	LU170000	LA510000	LI110000	SI'150000	SI'070000	SM210000	LS610000	SA020000
-2	☺	↕	"	2	B	R	b	r	é	Æ	ó	☐	☐	Ê	Ô	
	SS010000	SM760000	SP040000	NT020000	T.B020000	T.R020000	T.B010000	T.R010000	T.F110000	T.A520000	T.O110000	SF160000	SF060000	T.F160000	T.O160000	
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	☐	☐	Ë	Ò	¼
	SS020000	SP330000	SM010000	NT030000	LC020000	LS020000	LC010000	LS010000	LA150000	LO150000	LU110000	SI'110000	SI'080000	LE180000	LO140000	NI'050000
-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	☐	☐	È	ø	¶
	SS030000	SM250000	SC030000	NT040000	T.D020000	T.T020000	T.D010000	T.T010000	T.A170000	T.O170000	T.N190000	SF090000	SF100000	T.F140000	T.O190000	SM250000
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	☐		Õ	§
	SS040000	SM240000	SM020000	NT050000	LE020000	LU020000	LE010000	LU010000	LA130000	LO130000	LN200000	LA120000	SI'050000		LO200000	SM240000
-6	♠	—	&	6	F	V	f	v	ä	û	Ǧ	Â	ã	Í	μ	÷
	SS050000	SM700000	SM030000	NT060000	T.F020000	T.V020000	T.F010000	T.V010000	T.A270000	T.U150000	T.G240000	T.A160000	T.A190000	T.T120000	SM170000	SA060000
-7	•	↕	'	7	G	W	g	w	ç	ù	ğ	À	Ã	Î		¸
	SM570000	SM770000	SP050000	NT070000	LG020000	LW020000	LG010000	LW010000	LC410000	LU130000	LG230000	LA140000	LA200000	LI160000		SD410000
-8	☐	↑	(	8	H	X	h	x	ê	ï	ı	©	☐	İ	×	°
	SM570001	SM320000	SP060000	NT080000	T.H020000	T.X020000	T.H010000	T.X010000	T.F150000	T.I300000	SP160000	SM520000	SF380000	T.T180000	SA070000	SM190000
-9	○	↓	)	9	I	Y	i	y	ë	ö	®	☐	☐	Ï	Ú	ˆ
	SM750000	SM330000	SP070000	NT090000	LI020000	LY020000	LI010000	LY010000	LE170000	LO180000	SM530000	SI'230000	SI'390000	SI'040000	LU120000	SD170000
-A	☐	→	*	:	J	Z	j	z	è	ü	☐	☐	☐	Û	·	
	SM750002	SM310000	SM040000	SP130000	T.J020000	T.Z020000	T.J010000	T.Z010000	T.F130000	T.U180000	SM660000	SF240000	SF400000	SF010000	T.U160000	SD630000
-B	♂	←	+	;	K	[	k	{	ï	ø	½	☐	☐	Ü	ı	
	SM280000	SM300000	SA010000	SP140000	LK020000	SM060000	LK010000	SM110000	LI170000	LO610000	NI'010000	SI'250000	SI'410000	SI'610000	LU140000	NI011000
-C	♀	└	,	<	L	\	l	|	î	£	¼	☐	☐	ı	³	
	SM290000	SA420000	SP080000	SA030000	T.L020000	SM070000	T.T010000	SM130000	T.I150000	SC020000	NF040000	SF260000	SF420000	SF570000	T.T130000	NT031000
-D	♪	↔	-	=	M	J	m	}	ı	Ø	ı	☐	☐	ı	ÿ	²
	SM930000	SM780000	SP100000	SA040000	LM020000	SM080000	LM010000	SM140000	LI610000	LO620000	SP030000	SC040000	SI'430000	SM650000	LY170000	NI021000
-E	♪	▲	.	>	N	^	n	~	Ä	Ş	«	¥	☐	İ	—	☐
	SM910000	SM600000	SP110000	SA050000	T.N020000	SD150000	T.N010000	SD190000	T.A180000	T.S420000	SP170000	SC050000	SF440000	T.T140000	SM150000	SM470000
-F	☀	▼	/	?	O	_	o	☐	Å	ş	»	☐	☐	ı	'	(RSP)
	SM690000	SV040000	SP120000	SP150000	LO020000	SP090000	LO010000	SM790000	LA280000	LS410000	SP180000	SI'030000	SC010000	SI'600000	SD110000	SP300000

Code Page 00857

Code Page 860 (IBM Personal Computer) Portugal

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶ SM590000	(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000	Ç LC420000	É LF120000	á LA110000	☐ SF140000	☐ SF020000	☐ SF460000	α GA010000	≡ SA480000
-1	☺ SS000000	◀ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	ü LU170000	À LA140000	í LI110000	☐ SI150000	☐ SI070000	☐ SI470000	β LS610000	± SA020000
-2	☹ SS010000	↕ SM760000	" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000	é LE110000	È LF140000	ó LO110000	☐ SF160000	☐ SF060000	☐ SF480000	Γ GC020000	≥ SA530000
-3	♥ SS020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	â LA150000	ô LO150000	ú LU110000	☐ SI110000	☐ SI080000	☐ SI490000	π GP010000	≤ SA520000
-4	♦ SS030000	¶ SM250000	\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000	ã LA190000	õ LO190000	ñ LN190000	☐ SF090000	☐ SF100000	☐ SF500000	Σ CS020000	ƒ SS260000
-5	♣ SS040000	§ SM240000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	à LA130000	ò LO130000	Ñ LN200000	☐ SI190000	☐ SI050000	☐ SI510000	σ GS010000	Ƶ SS270000
-6	♠ SS050000	▬ SM700000	& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000	Á LA120000	Ú LU120000	ª SM210000	☐ SF200000	☐ SF360000	☐ SF520000	μ GM010000	÷ SA060000
-7	• SM570000	↕ SM770000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ç LC410000	ù LU130000	º SM200000	☐ SI210000	☐ SI370000	☐ SI530000	τ GT010000	≈ SA700000
-8	☐ SM570001	↑ SM320000	(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000	ê LE150000	ï LI140000	¿ SP160000	☐ SF220000	☐ SF380000	☐ SF540000	Φ CF020000	° SM190000
-9	○ SM750000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	Ê LE160000	Ï LI200000	Ò LO140000	☐ SI230000	☐ SI390000	☐ SI040000	Θ GT620000	• SA790000
-A	☐ SM750002	→ SM310000	* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000	è LE130000	Ü LU180000	↳ SM660000	☐ SF240000	☐ SF400000	☐ SF010000	Ω GO320000	· SD630000
-B	♂ SM280000	← SM300000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	Í LI120000	€ SC040000	½ NI010000	☐ SI250000	☐ SI410000	☐ SI610000	δ GD010000	√ SA800000
-C	♀ SM290000	└ SA420000	, SP080000	< SA030000	L LT020000	\ SM070000	l LT010000	| SM130000	Ô LO160000	£ SC020000	¼ NF040000	☐ SF260000	☐ SF420000	☐ SF570000	∞ SA450000	ⁿ LN011000
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	ì LI130000	Û LU140000	ì SP030000	☐ SI270000	☐ SI430000	☐ SI580000	φ GF010000	² ND021000
-E	♪ SM910000	▲ SM600000	. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000	Ã LA200000	Þs SC060000	« SP170000	☐ SF280000	☐ SF440000	☐ SF590000	ε GF010000	■ SM470000
-F	☀ SM690000	▼ SV040000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	◊ SM790000	Â LA160000	Ó LO120000	» SP180000	☐ SI030000	☐ SI450000	☐ SI600000	∩ SA380000	(RSP) SP300000

Code Page 00860

Code Page 861 (IBM Personal Computer) Iceland

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶	(SP) 0	@	P	`	p	Ç	É	á					α	≡
		SM590000	SP010000	ND010000	SM050000	T.P020000	SD130000	T.P010000	T.C420000	T.F120000	T.A110000	SF140000	SF020000	SF460000	GA010000	SA480000
-1	☺	◀	!	1	A	Q	a	q	ü	æ	í				β	±
	SS000000	SM630000	SP020000	ND010000	LA020000	LQ020000	LA010000	LQ010000	LU170000	LA510000	LI110000	SI150000	SI070000	SI470000	LS610000	SA020000
-2	☹	↕	"	2	B	R	b	r	é	Æ	ó				Γ	≥
	SS010000	SM760000	SP040000	ND020000	T.R020000	T.R020000	T.R010000	T.R010000	T.F110000	T.A520000	T.O110000	SF160000	SF060000	SF480000	GC020000	SA530000
-3	♥	!!	#	3	C	S	c	s	â	ô	ú				π	≤
	SS020000	SP330000	SM010000	ND030000	LC020000	LS020000	LC010000	LS010000	LA150000	LO150000	LU100000	SI110000	SI080000	SI490000	GP010000	SA520000
-4	♦	¶	\$	4	D	T	d	t	ä	ö	Á				Σ	ƒ
	SS030000	SM250000	SC030000	ND040000	T.D020000	T.T020000	T.D010000	T.T010000	T.A170000	T.O170000	T.A120000	SF090000	SF100000	SF500000	GS020000	SS260000
-5	♣	§	%	5	E	U	e	u	à	þ	Í				σ	J
	SS040000	SM240000	SM020000	ND050000	LE020000	LU020000	LE010000	LU010000	LA130000	LT630000	LI120000	SI190000	SI050000	SI510000	GS010000	SS270000
-6	♠	▬	&	6	F	V	f	v	å	û	Ó				μ	÷
	SS050000	SM700000	SM030000	ND060000	T.F020000	T.V020000	T.F010000	T.V010000	T.A270000	T.U150000	T.O120000	SF200000	SF360000	SF520000	GM010000	SA060000
-7	•	↕	'	7	G	W	g	w	ç	Ý	Ú				τ	≈
	SM570000	SM770000	SP050000	ND070000	LG020000	LW020000	LG010000	LW010000	LC410000	LY120000	LU120000	SI210000	SI370000	SI530000	GT010000	SA700000
-8	■	↑	(	8	H	X	h	x	ê	ý	ı				Φ	°
	SM570001	SM320000	SP060000	ND080000	T.H020000	T.X020000	T.H010000	T.X010000	T.F150000	T.Y110000	SP160000	SF220000	SF380000	SF540000	CF020000	SM190000
-9	○	↓	)	9	I	Y	i	y	ë	Ö	┘				⊖	•
	SM750000	SM330000	SP070000	ND090000	LI020000	LY020000	LI010000	LY010000	LE170000	LO180000	SM680000	SI230000	SI390000	SI040000	GT620000	SA790000
-A	●	→	*	:	J	Z	j	z	è	Ü	┘				Ω	•
	SM750002	SM310000	SM040000	SP130000	T.J020000	T.Z020000	T.J010000	T.Z010000	T.F130000	T.U180000	SM660000	SF240000	SF400000	SF010000	GO320000	SD630000
-B	♂	←	+	;	K	[	k	{	Ð	ø	½				δ	√
	SM280000	SM300000	SA010000	SP140000	LK020000	SM060000	LK010000	SM110000	LD620000	LO610000	NI010000	SI250000	SI410000	SI610000	GL010000	SA800000
-C	♀	┘	,	<	L	\	l	|	ð	£	¼				∞	∞ ⁿ
	SM290000	SA420000	SP080000	SA030000	T.I020000	SM070000	T.I010000	SM130000	T.D630000	SC020000	NF040000	SF260000	SF420000	SF570000	SA450000	T.N011000
-D	♪	↔	-	=	M	]	m	}	Þ	Ø	ı				φ	2
	SM930000	SM780000	SP100000	SA040000	LM020000	SM080000	LM010000	SM140000	LT640000	LO620000	SP030000	SI270000	SI430000	SI580000	GI010001	ND021000
-E	♪	▲	.	>	N	^	n	~	Ä	Pts	«				ε	■
	SM910000	SM600000	SP110000	SA050000	T.N020000	SD150000	T.N010000	SD190000	T.A180000	SC060000	SP170000	SF280000	SF440000	SF590000	CF010000	SM470000
-F	☀	▼	/	?	O	_	o	◊	Å	ƒ	»				∩	(RSP)
	SM690000	SV040000	SP120000	SP150000	LO020000	SP090000	LO010000	SM790000	LA280000	SC070000	SP180000	SI030000	SI450000	SI600000	SA380000	SP300000

Code Page 00861

Code Page 862 (IBM Personal Computer) Israel

HEX DIGITS	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
1ST →	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
2ND ↓																
-0		▶ (SP) SM590000	0 ND100000	@ SM050000	P LP020000	' ST130000	p LP010000	א HX330000	ב HN010000	á LA110000	☐ SF140000	☐ SF020000	☐ SF460000	α CA010000	≡ SA480000	
-1	☺ SS000000	▶ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	ב LB010000	ס LS010000	í LI110000	☐ SI150000	☐ SI070000	☐ SI470000	β LS610000	± SA020000
-2	☺ SS010000	↕ SM760000	" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000	ג HG010000	ע HX350000	ó LO110000	☐ SF160000	☐ SF060000	☐ SF480000	Γ GC020000	≥ SA530000
-3	♥ SS020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	ד LD010000	ף LP610000	ú LU110000	☐ SI110000	☐ SI080000	☐ SI490000	π GP010000	≤ SA520000
-4	♦ SS030000	¶ SM250000	\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000	ה HH010000	פ HP010000	ñ LN190000	☐ SF090000	☐ SF100000	☐ SF500000	Σ CS020000	ƒ SS260000
-5	♣ SS040000	§ SM240000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	ו LV010000	ץ LS610000	Ñ LN200000	☐ SI190000	☐ SI050000	☐ SI510000	σ GS010000	J SS270000
-6	♠ SS050000	▬ SM700000	& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000	ז HZ010000	צ HS450000	א SM210000	☐ SF200000	☐ SF360000	☐ SF520000	μ GM010000	÷ SA060000
-7	• SM570000	↕ SM770000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ח LL1450000	ק LQ010000	ע SM200000	☐ SI210000	☐ SI370000	☐ SI530000	τ GT010000	≈ SA700000
-8	☐ SM570001	↑ SM320000	(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000	ט HT450000	ך HR010000	י SP160000	☐ SF220000	☐ SF380000	☐ SF540000	Φ CF020000	° SM190000
-9	○ SM750000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	י LIY010000	ש LS210000	ך SM680000	☐ SI230000	☐ SI390000	☐ SI040000	Θ GT620000	• SA790000
-A	☐ SM750002	→ SM310000	* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000	ך HK610000	ת HT010000	ך SM660000	☐ SF240000	☐ SF400000	☐ SF010000	Ω CO320000	• ST630000
-B	♂ SM280000	← SM300000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	כ LK010000	ע SC040000	½ NI010000	☐ SI250000	☐ SI410000	☐ SI610000	δ GL010000	✓ SA800000
-C	♀ SM290000	└ SA420000	, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000	ל HL010000	£ SC020000	¼ NF040000	☐ SF260000	☐ SF420000	☐ SF570000	∞ SA450000	ⁿ LN011000
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	ם LM610000	¥ SC050000	י SP030000	☐ SI270000	☐ SI430000	☐ SI580000	φ GI010001	² ND021000
-E	♪ SM910000	▲ SM600000	. SP110000	> SA050000	N LN020000	^ ST150000	n LN010000	~ ST190000	נ HM010000	Pts SC060000	« SP170000	☐ SF280000	☐ SF440000	☐ SF590000	ε GE010000	■ SM470000
-F	☀ SM690000	▼ SY040000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	△ SM790000	ן LN610000	ף SC070000	» SP180000	☐ SI030000	☐ SI450000	☐ SI600000	∩ SA380000	(RSP) SP300000

Code Page 00862

Code Page 863 (IBM Personal Computer) Canadian French

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶ SM590000	(SP) SP010000	0 NT010000	@ SM050000	P LP020000	` ST0130000	p LP010000	Ç LC420000	Ê LF120000	ı SM650000	☐ SF140000	☐ SF020000	☐ SF460000	α GA010000	≡ SA480000
-1	☺ SS000000	◀ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	ü LU170000	È LE140000	' SL110000	☐ SI150000	☐ SI070000	☐ SI470000	β LS610000	± SA020000
-2	☹ SS010000	↕ SM760000	" SP040000	2 NT020000	B LR020000	R LR020000	b LR010000	r LR010000	é LF110000	Ê LF160000	ó LO110000	☐ SF160000	☐ SF060000	☐ SF480000	Γ GC020000	≥ SA530000
-3	♥ SS020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	â LA150000	ô LO150000	ú LU110000	☐ SI110000	☐ SI080000	☐ SI490000	π GP010000	≤ SA520000
-4	♦ SS030000	¶ SM250000	\$ SC030000	4 NT040000	D LD020000	T LT020000	d LD010000	t LT010000	Â LA160000	Ë LE180000	ˆ ST0170000	☐ SF090000	☐ SF100000	☐ SF500000	Σ CS020000	ƒ SS260000
-5	♣ SS040000	§ SM240000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	à LA130000	Ï LI180000	, SL0410000	☐ SI190000	☐ SI050000	☐ SI510000	σ GS010000	Ƶ SS270000
-6	♠ SS050000	▬ SM700000	& SM030000	6 NT060000	F LF020000	V LV020000	f LF010000	v LV010000	¶ SM250000	û LU150000	³ NT0310000	☐ SI200000	☐ SF360000	☐ SF520000	μ GM010000	÷ SA060000
-7	• SM570000	↕ SM770000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ç LC410000	ù LU130000	- SM150000	☐ SI210000	☐ SI370000	☐ SI530000	τ GT010000	≈ SA700000
-8	◼ SM570000	↑ SM320000	(SP060000	8 NT080000	H LH020000	X LX020000	h LH010000	x LX010000	ê LF150000	œ SC010000	î LI160000	☐ SF220000	☐ SF380000	☐ SF540000	Φ GF020000	° SM190000
-9	○ SM750000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	ë LE170000	Ô LO160000	∟ SM680000	☐ SI230000	☐ SI390000	☐ SI040000	Θ GT0620000	• SA790000
-A	◐ SM750000	→ SM310000	* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000	è LF130000	Û LU180000	∟ SM660000	☐ SF240000	☐ SF400000	☐ SF010000	Ω GO320000	• ST0630000
-B	♂ SM280000	← SM300000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	ï LI170000	ø SC040000	½ NI010000	☐ SI250000	☐ SI410000	☐ SI610000	δ GD010000	√ SA800000
-C	♀ SM290000	∟ SA420000	, SP080000	< SA030000	L LT020000	\ SM070000	l LT010000	| SM130000	î LI150000	£ SC020000	¼ NF040000	☐ SF260000	☐ SF420000	☐ SF570000	∞ SA450000	ⁿ LN011000
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	J SM080000	m LM010000	} SM140000	= SM100000	Û LU140000	¾ NI050000	☐ SI270000	☐ SI430000	☐ SI580000	φ GF010001	² ND021000
-E	♪ SM910000	▲ SM600000	. SP110000	> SA050000	N LN020000	^ ST0150000	n LN010000	~ ST0190000	À LA140000	Û LU160000	« SP170000	☐ SF280000	☐ SF440000	☐ SF590000	ε GF010000	■ SM470000
-F	☀ SM690000	▼ SV040000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	◻ SM790000	§ SM240000	ƒ SC070000	» SP180000	☐ SI030000	☐ SI450000	☐ SI600000	∩ SA380000	(RSP) SP300000

Code Page 00863

Code Page 864 (IBM Personal Computer) Arabic

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶ (SP) SM590000	0 SP010000	@ NTD100000	P SM050000	‘ T.P020000	p STD130000	° T.P010000	β SM190000	(RSP) GB010000	· SP300000	ϕ NTD100001	ذ SC040000	— ATD470000	ء SM860000	س AX100004
-1	☺ SS000000	◀ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	· SLD630000	∞ SA450000	(SITY) SP320000	ا ND010001	ء AX300000	ر AR010000	ف AI'010003	س AX100000
-2	♪ SM930000	↕ SM760000	" SP040000	2 NTD020000	B T.B020000	R T.R020000	b T.B010000	r T.R010000	° SA790000	ϕ GF010001	ل AA210002	ر NTD020001	آ AA210000	ز AZ010000	ق AQ010003	ن AN010000
-3	♪ SM910000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	✓ SA800000	± SA020000	£ SC020000	٣ ND030001	أ AA310000	س AS010003	ك AK010003	ه AI1010000
-4	☀ SM690000	¶ SM250000	\$ SC030000	4 NTD040000	D T.D020000	T T.T020000	d T.D010000	l T.T010000	½ SF150000	¼ NF010000	⊗ SC010000	ع NTD040001	ؤ AW310000	ش AS230003	ل AT.010003	ف AH010004
-5	≡ SF430000	§ SM240000	% SM020007	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	¼ SF100000	¼ NF040000	ل AA310002	ه ND050001	ح AC470002	ص AS450003	م AM010003	ي AA020002
-6	|| SF240000	■ SM700000	& SM030000	6 NTD060000	F T.F020000	V T.V020000	f T.F010000	v T.V010000	≈ SF110000	≈ SA700000		٦ NTD060001	ع AY310000	ض ATD450003	ن AN010003	ي AY010002
-7	⊕ SF440000	↕ SM770000	’ SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	⊕ SF050000	« SP170000		٧ ND070001	ا AA010000	ط AT450000	ه AI1010003	غ AG310004
-8	⊕ SF230000	↑ SM320000	(SP060000	8 NTD080000	H T.H020000	X T.X020000	h T.H010000	x T.X010000	⊕ SF090000	» SP180000	ا AA010002	ا NTD080001	ب AB010003	ظ AZ450000	و AW010000	ق AQ010000
-9	⊕ SF410000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	⊕ SF060000	لا AL320000	ب AB010000	٩ ND090001	ة AT020000	ع AC470003	ي AA020000	لا AL220000
-A	⊕ SF420000	→ SM310000	* SM040007	: SP130000	J T.J020000	Z T.Z020000	j T.J010000	z T.Z010000	⊕ SF080000	لا AL320003	ت AT010000	ف AF010000	ت AT010003	غ AC310003	ب AY010003	لا AL220003
-B	⊕ SF400000	← SM300000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	⊕ SF070000		ث AT470000	؛ SP140007	ث AT470003	ا SM650000	ض AD450000	ل AL010000
-C	⊕ SF250000	ل SA420000	, SP080000	< SA030000	L T.T020000	\ SM070000	l T.T010000	| SM130000	⊕ SF030000		، SP080007	س AS010000	ج AC230003	ع SM660000	ك AC470004	ك AK010000
-D	⊕ SF390000	↔ SM780000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	⊕ SF010000	لا AL020000	ج AG230000	ش AS230000	ح AI1450003	÷ SA060000	غ AG310002	ي AY010000
-E	⊕ SF380000	▲ SM600000	. SP110000	> SA050000	N T.N020000	^ ST150000	n T.N010000	~ ST190000	⊕ SF020000	لا AT.020003	ح AH450000	ص AS450000	خ AH470003	× SA070000	غ AC310000	■ SM470000
-F	⊕ SF260000	▼ SY040000	/ SP120000	? SP150000	O LO020000	<u> </u> SP090000	o LO010000	◻ SM790000	⊕ SF040000	، SM870000	خ AI1470000	؟ SP150007	د AD010000	ع AC470000	م AM010000	

Code Page 00864

Code Page 865 (IBM Personal Computer) Nordic

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶	(SP) 0	@	P	`	p	Ç	É	á				α	≡	
-1	☺	◀	!	I	A	Q	a	q	ü	æ	í			β	±	
-2	☹	↕	"	2	B	R	b	r	é	Æ	ó			Γ	≥	
-3	♥	!!	#	3	C	S	c	s	â	ô	ú			π	≤	
-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ			Σ	∫	
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ			σ	J	
-6	♠	—	&	6	F	V	f	v	å	û	ª			μ	÷	
-7	•	↕	'	7	G	W	g	w	ç	ù	º			τ	≈	
-8	■	↑	(	8	H	X	h	x	ê	ÿ	¿			Φ	°	
-9	○	↓	)	9	I	Y	i	y	ë	Ö	∟			Θ	•	
-A	●	→	*	:	J	Z	j	z	è	Ü	∟			Ω	·	
-B	♂	←	+	;	K	[	k	{	ï	ø	½			δ	√	
-C	♀	└	,	<	L	\	l	|	î	£	¼			∞	∞	
-D	♪	↔	-	=	M	]	m	}	ì	Ø	ı			φ	²	
-E	♫	▲	.	>	N	^	n	~	Ä	Pts	«			ε	■	
-F	☀	▼	/	?	O	_	o	◊	Å	ƒ	⊗			∩	(RSP)	

Code Page 00865

Code Page 869 (IBM Personal Computer) Greece

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		◀ (SP) SM590000	0 SP010000	@ ND100000	P SM050000	‘ T.P020000	’ ST130000	ˆ T.P010000		ı GT120000	ı̇ GT170000	◻ SF140000	◻ SF020000	Τ GT020000	ζ GT010000	̄ SP320000
-1	☺ SS000000	◀ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000		Ï G1180000	ı̇ G1730000	◻ SF150000	◻ SF070000	Υ GU020000	η GE310000	± SA020000
-2	☻ SS010000	↕ SM760000	" SP040000	2 ND020000	B T.B020000	R T.R020000	b T.B010000	r T.R010000		Ό GO120000	ό GO110000	◻ SF160000	◻ SF060000	Φ GF020000	ϑ GT610000	υ GU010000
-3	♥ SS020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000		ú GU110000	ı̇ SF110000	◻ SF080000	◻ SF100000	X GI020000	ι GI010000	φ GF010000
-4	♦ SS030000	¶ SM250000	\$ SC030000	4 ND040000	D T.D020000	T T.T020000	d T.D010000	t T.T010000		Α GA020000	◻ SF090000	◻ SF100000	◻ SF100000	Ψ GP620000	κ GT010000	χ CH010000
-5	♣ SS040000	§ SM240000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000		Υ GU120000	B GB020000	K GK020000	◻ SF050000	Ω GO320000	λ GL010000	§ SM240000
-6	♠ SS050000	— SM700000	& SM030000	6 ND060000	F T.F020000	V T.V020000	f T.F010000	v T.V010000	À GA120000	ÿ GU180000	Γ GC020000	Λ GT020000	Π GP020000	α GA010000	μ GM010000	ψ GP610000
-7	• SM570000	↕ SM770000	’ SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000		© SM520000	Δ GL020000	M GM020000	P GR020000	β GB010000	ν GN010000	’ SL730000
-8	◼ SM570001	↑ SM320000	(SP060000	8 ND080000	H T.H020000	X T.X020000	h T.H010000	x T.X010000	· ST630000	Ω GO720000	E GE020000	N GN020000	◻ SF380000	γ GT010000	ξ GX010000	° SM190000
-9	○ SM750000	↓ SM330000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	¬ SM660000	² ND021000	Z GZ020000	◻ SF230000	◻ SF390000	◻ SF040000	ο GO010000	” SL170000
-A	◼ SM750002	→ SM310000	* SM040000	: SP130000	J T.J020000	Z T.Z020000	j T.J010000	z T.Z010000	ı̇ SM650000	³ ND031000	H GH020000	◻ SF240000	◻ SF400000	◻ SF010000	π GP010000	ω GO310000
-B	♂ SM280000	← SM300000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	‘ SP190000	ά GA110000	½ NI010000	◻ SF250000	◻ SF410000	◻ SF610000	ρ GR010000	ü GU170000
-C	♀ SM290000	└ SA420000	, SP080000	< SA030000	L T.L020000	\ SM070000	l T.L010000	| SM130000	’ SP200000	£ SC020000	Θ GT620000	◻ SF260000	◻ SF420000	◻ SF570000	σ GS010000	ů GU730000
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	Έ GE120000	έ GE110000	Ι GI020000	Ξ GX020000	◻ SF430000	δ GL010000	ς GS610000	ώ GO710000
-E	♪ SM910000	▲ SM600000	. SP110000	> SA050000	N T.N020000	^ ST150000	n T.N010000	~ ST190000	— SM120000	ή GE710000	« SP170000	Ο GO020000	◻ SF440000	ε GE010000	τ GT010000	◼ SM470000
-F	☀ SM690000	▼ SV040000	/ SP120000	? SP150000	O LO020000	— SP090000	o LO010000	◻ SM790000	‘ GE720000	ί GI110000	» SP180000	◻ SF030000	Σ GS020000	◻ SF600000	’ SL110000	(RSP) SP300000

Code Page 00869

Code Page 870 (ISO 8859-2) Multilingual

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	˘ SD210000	˘ SD230000	˘ SD270000	ą LA430000	· SD290000	{ SM110000	}	\ SM140000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	á LA010000	ĵ LJ010000	˜ SD190000	Ą LA440000	À LA020000	Ĵ LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ç LA300000	Â LA160000	Ë LA400000	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	ł LT410000	û LU270000	" SD250000	Û LU280000	d LD010000	m LM010000	u LU010000	Ź 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	ź LZ110000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	í LI110000	Ç LC420000	Ĺ LI120000	h LH010000	q LQ010000	y LY010000	Ž LZ220000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	é LC110000	ß LS610000	Ć LC120000	` SD130000	i LI010000	r LR010000	z LZ010000	Ż LZ120000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	| SM130000	: SP130000	ś LS110000	ł LT610000	Ś LS120000	Ł LT620000	(SHY) SP320000	Ě LE220000	ď LD210000	Ď LD220000
-B	· SP110000	\$ SC030000	, SP080000	# SM010000	ñ LN210000	ń LN110000	Ń LN220000	Ň LN120000	ô LO150000	ů LU250000	Ô LO160000	Ů LU260000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	đ 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 LI110000	ĭ LL120000	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	^ SL150000	? SP150000	" SP040000	ş LS410000	Ŧ SC010000	Ş LS420000	× SA070000	õ LO250000	ě LE210000	Õ LO260000	(EO)

Code Page 00870

Code Page 871 (EBCDIC) Iceland

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	ϕ SC040000	þ LT630000	æ TA510000	' ST110000	0 NT100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ö LO170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â TA150000	ê TF150000	Â TA160000	Ê TF160000	b TB010000	k TK010000	s TS010000	¥ SC050000	B TB020000	K TK020000	S TS020000	2 NT020000
-3	ã LA170000	ë LE170000	Ã LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à TA130000	è TF130000	À TA140000	È TF140000	d TD010000	m TM010000	u TU010000	© SM520000	D TD020000	M TM020000	U TU020000	4 NT040000
-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	â TA190000	î TI150000	Ã TA200000	Î TI160000	f TF010000	o TO010000	w TW010000	¶ SM250000	F TF020000	O TO020000	W TW020000	6 NT060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NI040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç TC410000	ì TI130000	Ç TC420000	Ï TI140000	h TH010000	q TQ010000	y TY010000	½ NF010000	H TH020000	Q TQ020000	Y TY020000	8 NT080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ö LD630000	i LI010000	r LR010000	z LZ010000	¾ NI050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	þ LT640000	Æ TA520000	ı SM650000	: SP130000	« SP170000	ª SM210000	ı 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 TD620000	` SD130000	} SM140000	@ SM050000	- SM150000	~ SD190000	ü TU170000	^ SD150000	Û TU180000
-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 TO110000	ú TU110000	Ó TO120000	Ú TU120000
-F	! SP020000	Ö LO180000	? SP150000	" SP040000	± SA020000	⊘ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Code Page 00871

Code Page 874 (IBM Personal Computer) Thai Extended

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-	
-0			(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000				ฉิ BT200000	ภ BP400000	ะ BA200000	เ BF200000	อ ND100002	
-1			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000				ก BK100000	ฑ BT300000	ม BM100000	ะ BA100000	แ BE300000	อ ND010002
-2			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000				ข BK200000	ฒ BT400000	ย BY200000	า BA300000	โ BO200000	๒ ND020002
-3			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000				ข BK300000	ณ BN200000	ร BR100000	า BA400000	อ BA500000	๓ ND030002
-4			\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000				ค BK400000	ด BD200000	ถิ BR200000	ิ BT100000	เ BA600000	๔ ND040002
-5			% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000				ค BK500000	ต BT500000	ล BL100000	า BL200000	๕ BA700000	๕ ND050002
-6			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000				ข BK600000	ถิ BT600000	ภ BT200000	อ BU100000	๖ BQ100000	๖ ND060002
-7			' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000				ง BN100000	ก BT700000	ว BW100000	๗ BU200000	๗ BE100000	๗ ND070002
-8			(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000				จ BC100000	ฉิ BT800000	ค BS200000	ง BU300000	' BZ100000	๘ ND080002
-9			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000				ฉ BX100000	น BN300000	๗ BS300000	๗ BU400000	๘ BZ200000	๘ ND090002
-A			* SM040000	:	J SJ020000	Z LZ020000	j SJ010000	z LZ010000				ช BS100000	บ BB100000	ส BS400000	.BQ300000	๗ BZ300000	
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000				ช BX200000	ป BP100000	ห BL1100000		+ BZ400000	
-C			, SP080000	< SA030000	L LT020000	\ SM070000	l LT010000	| SM130000				ฃ BX300000	ฒ BT200000	พิ BT300000		๗ BZ500000	๘ SC040000
-D			- SP100000	= SA040000	M LM020000	J SM080000	m LM010000	} SM140000				ฎ BY100000	ฒ BT100000	อ BO100000		๗ BN400000	๘ SM660000
-E			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000				ฉ BT100000	พ BP300000	๗ BH200000			๙ SM650000
-F			/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000					ฉ BT100000	พ BF200000	๗ BQ200000	๘ SC130000		

Code Page 00874

Code Page 875 (EBCDIC) Greece

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	.. SD170000	‘ SD730000	° SM190000	‘ SD110000	£ SC020000	{ SM110000	}	\ SM070000	0 ND100000
-1	A GA020000	K GK020000	/ SP120000	‘A GA120000	a LA010000	j LJ010000	~ SD190000	á GA110000	A LA020000	J LJ020000		1 ND010000
-2	B GB020000	Λ GL020000	T GT020000	‘E GE120000	b LB010000	k LK010000	s LS010000	é GE110000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	Γ GG020000	M GM020000	Υ GU020000	‘H GE720000	c LC010000	l LL010000	t LT010000	ή GE710000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	Δ GD020000	N GN020000	Φ GF020000	(RSP) SP300000	d LD010000	m LM010000	u LU010000	ï GI70000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	E GE020000	Ξ GX020000	X GI1020000	‘I GI120000	e LE010000	n LN010000	v LV010000	í GI110000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	Z GZ020000	O GO020000	Ψ GP620000	‘O GO120000	f LF010000	o LO010000	w LW010000	ó GO110000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	H GE320000	Π GP020000	Ω GO320000	‘Y GU120000	g LG010000	p LP010000	x LX010000	ύ GU110000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	Θ GT620000	P GR020000	İ GI180000	‘Ω GO720000	h LH010000	q LQ010000	y LY010000	ü 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 GB310000	ν GN010000	ς GS610000	(S̄Y) SP320000	± SA020000	² ND021000	³ ND031000
-B	. SP110000	\$ SC030000	, SP080000	# SM010000	β GB010000	θ GT610000	ξ GX010000	τ GT010000	ω GO310000	½ NI010000	§ SM240000	© SM520000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	γ GC010000	ι GI010000	ο GO010000	υ GU010000	ί GI730000			
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	δ GD010000	κ GK010000	π GP010000	φ GI010000	ύ GU730000	· SD630000		
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ε GE010000	λ GI010000	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

Code Page 880 (EBCDIC) Cyrillic, Multilingual

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 KI110000	я KA150000	ь KX110000	{ SM110000	}	\ SM070000	0 ND100000
-1	(RSP) SF300000	Ь KL410000	/ SP120000	Ѡ KC120000	a LA010000	j LJ010000	~ SD190000	Ы KY010000	A LA020000	J LJ020000	Ѳ SC010000	1 ND010000
-2	ђ KD610000	њ KN110000	ѓ KC120000	ќ KK120000	b TB010000	k TK010000	s TS010000	з KZ010000	B TB020000	K TK020000	S TS020000	2 ND020000
-3	ѓ KG110000	ћ KC110000	Ё KE180000	(SITY) SP320000	c LC010000	l LL010000	t LT010000	ш KS210000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	ё KF170000	ќ KK110000	Є KF160000	Ў KU240000	d TD010000	m TM010000	u TU010000	э KF130000	D TD020000	M TM020000	U TU020000	4 ND040000
-5	є KE150000	ђ KU230000	Š KZ160000	Џ KG220000	e LE010000	n LN010000	v LV010000	щ KS150000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	s KZ150000	ц KC210000	І KI120000	ю KU150000	f TF010000	o TO010000	w TW010000	ч KC210000	F TF020000	O TO020000	W TW020000	6 ND060000
-7	i KI110000	Ъ KU220000	Ї KI180000	a KA010000	g LG010000	p LP010000	x LX010000	ь KU210000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ї KI170000	№ SM000000	J KT020000	б KB010000	h TH010000	q TQ010000	y TY010000	Ю KU160000	H TH020000	Q TQ020000	Y TY020000	8 ND080000
-9	j KJ010000	Ъ KD620000	Љ KL420000	` SD130000	i LI010000	r LR010000	z LZ010000	A KA020000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	| SM130000	: SP130000	д KD010000	к KK010000	р KR010000	Б KB020000	X KH020000	H KH020000	T 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 KI120000	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 00880

Code Page 891 (IBM Personal Computer) Korea

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		(SP)	0	@	P	`	p							궞		
-1			!	1	A	Q	a	q					ㄱ	ㄴ		
-2			"	2	B	R	b	r					ㄷ	ㄹ	ㅍ	ㅑ
-3			#	3	C	S	c	s					ㅓ	ㅕ	ㅗ	ㅛ
-4			\$	4	D	T	d	t					ㅜ	ㅠ	ㅜ	ㅠ
-5			%	5	E	U	e	u					ㅡ	ㅝ	ㅞ	ㅞ
-6			&	6	F	V	f	v					ㅟ	ㅠ	ㅟ	ㅠ
-7			'	7	G	W	g	w					ㅠ	ㅡ	ㅢ	ㅣ
-8			(	8	H	X	h	x					ㅤ	ㅥ		
-9			)	9	I	Y	i	y					ㅦ	ㅧ		
-A			*	:	J	Z	j	z					ㅨ	ㅩ	ㅪ	ㅫ
-B			←	;	K	[	k	{					ㅬ	ㅭ	ㅮ	ㅯ
-C			↑	,	<	L	W	l	|				ㅰ	ㅱ	ㅲ	ㅳ
-D			-	=	M	]	m	}					ㅴ	ㅵ	ㅶ	
-E			→	.	>	N	^	n	-				ㅷ	ㅸ	ㅹ	
-F			←	/	?	O	o						ㅺ		ㅻ	

Code Page 00891

Code Page 897 (IBM Personal Computer) Japan PC #1

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		SF440000	(SP) SP010000	0 NT0100000	@ SM050000	P T.P020000	` ST0130000	p T.P010000				一 TX700000	夕 IT100000	ミ IM200000		
-1	SF390000		! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000			。 JQ700000	ア JA000000	チ JT200000	ム JM300000		
-2	SF250000	↑ SM760000	" SP040000	2 NT020000	B T.R020000	R T.R020000	b T.R010000	r T.R010000			「 JQ710000	イ JI000000	ツ JT300000	メ IM400000		
-3	SF380000		# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000			」 JQ720000	ウ JU000000	テ JT400000	モ JM500000		
-4	SF260000	SF160000	\$ SC030000	4 NT040000	D T.D020000	T T.T020000	d T.D010000	t T.T010000			、 JQ730000	エ JF000000	ト IT500000	ヤ IY100000		
-5	SF240000	SF400000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000			・ JQ740000	オ JO000000	ナ JN100000	ユ JY300000		
-6	SF430000	SF410000	& SM030000	6 NT060000	F T.F020000	V T.V020000	f T.F010000	v T.V010000			ヲ IW500000	カ JK100000	ニ JN200000	ヨ JY500000		
-7	↓ SM330000	SF230000	´ SP050000	7 ND070000	G LC020000	W LW020000	g LC010000	w LW010000			ア JA010000	キ JK200000	ヌ JN300000	ラ JR100000		
-8			(SP060000	8 NT080000	H T.H020000	X T.X020000	h T.H010000	x T.X010000			イ IT010000	ク JK300000	ネ JN400000	リ IR200000		
-9	○ SM750000	SF420000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000			ウ JU010000	ケ JK400000	ノ JN500000	ル JR300000		
-A		SF140000	* SM040000	: SP130000	J T.J020000	Z T.Z020000	j T.J010000	z T.Z010000			エ JF010000	コ JK500000	ハ JH100000	レ IR400000		
-B	SP500000	← SM720000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000			オ JO010000	サ JS100000	ヒ JI200000	ロ JK500000		
-C		↑ SM320000	, SP080000	< SA030000	L T.L020000	¥ SC050000	l T.L010000	| SM130000			ヤ IY110000	シ JS200000	フ JH300000	ワ IW100000		
-D		SF110000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000			ユ JY310000	ス JS300000	へ JI400000	ん JN000000		
-E	SM470000	→ SM510000	. SP110000	> SA050000	N T.N020000	^ ST0150000	n T.N010000	- SM150000			ヨ IY510000	セ JS400000	ホ JH500000	・ IX710000		
-F	SM690000	← SM300000	/ SP120000	? SP150000	O LO020000	o SP090000					ッ JT310000	ソ JS500000	マ JM100000	。 JX720000		

Code Page 00897

Code Page 903 (IBM Personal Computer) People's Republic of China (PRC)

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		SF440000	(SP) SP010000	0 ND100000	@ SM050000	P TP020000	` SD130000	p TP010000								
-1	SI390000		! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000								
-2	SF250000	↑ SM760000	" SP040000	2 ND020000	B TB020000	R TR020000	b TB010000	r TR010000								
-3	SI380000		# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000								
-4	SF260000	SF160000	\$ SC030000	4 ND040000	D TD020000	T TT020000	d TD010000	t TT010000								
-5	SI240000	SI400000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000								
-6	SF430000	SF410000	& SM030000	6 ND060000	F TF020000	V TV020000	f TF010000	v TV010000								
-7	↓ SM330000	SI230000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000								
-8			(SP060000	8 ND080000	H TH020000	X TX020000	h TH010000	x TX010000								
-9	○ SM750000	SI420000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000								
-A		SF140000	* SM040000	: SP130000	J TJ020000	Z TZ020000	j TJ010000	z TZ010000								
-B	SP500000	← SM720000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000								
-C		↑ SM320000	, SP080000	< SA030000	L LT020000	Y SC120000	l LT010000	| SM130000								
-D		SI110000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000								
-E	SM470000	→ SM310000	. SP110000	> SA050000	N TN020000	^ ST050000	n TN010000	- SM150000								
-F	SM690000	← SM300000	/ SP120000	? SP150000	O LO020000	SP090000	o LO010000									

Code Page 00903

Code Page 904 (IBM Personal Computer) Republic of China (ROC)

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		SF440000	(SP) SP010000	0 NT0100000	@ SM050000	P T.P020000	` ST0130000	p T.P010000								
-1	SF390000		! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000								
-2	SF250000	↑ SM760000	" SP040000	2 NT020000	B T.R020000	R T.R020000	b T.R010000	r T.R010000								
-3	SF380000		# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000								
-4	SF260000	SF160000	\$ SC030000	4 NT040000	D T.D020000	T T.T020000	d T.D010000	t T.T010000								
-5	SF240000	SF400000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000								
-6	SF430000	SF410000	& SM030000	6 NT060000	F T.F020000	V T.V020000	f T.F010000	v T.V010000								
-7	↓ SM330000	SF230000	‘ SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000								
-8			(SP060000	8 NT080000	H T.H020000	X T.X020000	h T.H010000	x T.X010000								
-9	○ SM750000	SF420000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000								
-A		SF140000	* SM040000	: SP130000	J TJ020000	Z TZ020000	j TJ010000	z TZ010000								
-B	SP500000	← SM720000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000								
-C		↑ SM320000	, SP080000	< SA030000	L T.L020000	\ SM070000	l T.L010000	| SM130000								
-D		SF110000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000								
-E	■ SM470000	→ SM310000	. SP110000	> SA050000	N T.N020000	^ ST0150000	n T.N010000	~ ST0190000								
-F	☀ SM690000	← SM300000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000									

Code Page 00904

Code Page 905 (ISO 8859-9) PC-Turkey

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000		˘ SD230000	◦ SM190000	μ SM170000	· SD290000	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	z LZ290000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	}	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	Ž LZ300008	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		î LI150000		Î LI160000	f LF010000	o LO010000	w LW010000	] SM080000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	ç LC290000	ï LI170000	Ç LC300000	Ï LI180000	g LG010000	p LP010000	x LX010000		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 LI1610000	i LI010000	r LR010000	z LZ010000	\$ SC030000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ç LC420000	Ğ LG240000	Ş LS410000	:	ħ LH610000	ĥ LH150000	Ĥ LH620000	Ħ LH160000	(SHY) SP320000	´ SD130000	² ND021000	³ ND031000
-B	· SP110000	İ LI300000	, SP080000	Ö LO180000	ê LC150000	ğ LG150000	Ĉ LC160000	Ĝ LG160000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ş LS420000	ŝ LS150000	ĵ LJ150000	Ŝ LS160000	Ĵ LJ160000	~ SD190000	\ SM070000	# SM010000	" SP040000
-D	(SP060000	) SP070000	— SP090000	‘ SP050000	ű LU230000	˘ SD410000	Ů LU240000	“ SD170000	ò LO130000	ù LU130000	Ò LO140000	Û LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000				’ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	Ü LU180000	| SM130000	Ɔ SC010000	@ SM050000	× SA070000	ğ LG290000		Ğ LG300000	(EO)

Code Page 00905

Code Page 916 (ISO 8859-8) Hebrew

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0			(SP) 0 SP010000	@ ND100000	P SM050000	` LP020000	p SD130000				(RSP) ° SP300000				א HX330000	ב HN010000
-1			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000				± SA020000			ב HB010000	ס HS010000
-2			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000			¢ SC040000	² ND021000			ג HG010000	ע HX350000
-3			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000			£ SC020000	³ ND031000			ד HD010000	ף HP010000
-4			\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000			¤ SC010000	' SD110000			ה HH010000	פ HP010000
-5			% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000			¥ SC050000	µ SM170000			ו HW010000	ץ HS610000
-6			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000			¡ SM650000	¶ SM250000			ז HZ010000	צ HS450000
-7			' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000			§ SM240000	• SM570000			ח HH450000	ק HQ010000
-8			(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000			¨ SD170000	ˆ SD410000			ט HT450000	ך HR010000
-9			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000			© SM520000	¹ ND011000			י HY010000	ש HS210000
-A			* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000			× SA070000	÷ SA060000			ך HK610000	ת HT010000
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000			« SP170000	» SP180000			כ HK010000	
-C			, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000			¬ SM660000	¼ ₄ NF040000			ל HL010000	
-D			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000			(SHY) SP320000	½ ₂ NF010000			ם HM610000	
-E			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000			® SM530000	¾ ₄ NF050000			מ HM010000	
-F			/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000				- SM150000				ן SM100000	ס HN610000

Code Page 00916

Code Page 920 (ISO 8859-9) Turkey

HEX DIGITS	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
1ST →																
2ND ↓																
-0			(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000			(RSP) SP300000	° SM190000	À LA140000	Ğ LG240000	à LA130000	ğ LG230000
-1			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000			i SP030000	± SA020000	Á LA120000	Ñ LN200000	á LA110000	ñ LN190000
-2			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000			¢ SC040000	² ND021000	Â LA160000	Ò LO140000	â LA150000	ò LO130000
-3			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000			£ SC020000	³ ND031000	Ã LA200000	Ó LO120000	ã LA190000	ó LO110000
-4			\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000			¤ SC010000	' SD110000	Ä LA180000	Ô LO160000	ä LA170000	ô LO150000
-5			% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000			¥ SC050000	µ SM170000	Å LA280000	Ö LO200000	å LA270000	ö LO190000
-6			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000			¦ SM650000	¶ SM250000	Æ LA520000	Ö LO180000	æ LA510000	ö LO170000
-7			' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000			§ SM240000	· SD630000	Ç LC420000	×	ç	÷
-8			(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000			¨ SD170000	˙ SD410000	È LE140000	Ø LO620000	è LE130000	ø LO610000
-9			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000			© SM520000	¹ ND011000	É LE120000	Ù LU140000	é LE110000	ù LU130000
-A			* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000			ª SM210000	º SM200000	Ê LE160000	Ú LU120000	ê LE150000	ú LU110000
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000			« SP170000	» SP180000	Ë LE180000	Û LU160000	ë LE170000	û LU150000
-C			, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000			¬ SM660000	¼ NF040000	Ì LI140000	Ü LU180000	ì LI130000	ü LU170000
-D			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000			¯ (SHY) SP320000	½ NF010000	Í LI120000	İ LI300000	í LI110000	ı LI610000
-E			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000			® SM530000	¾ NF050000	Î LI160000	Ş LS420000	î LI150000	ş LS410000
-F			/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000				- SM150000	ı SP160000	Ï LI180000	ß LS610000	ï LI170000	ÿ LY170000

Code Page 00920

Code Page 1009 (7-Bit ISO) International Alphabet 5 (IA5)

COLUMN →		0-	1-	2-	3-	4-	5-	6-	7-
ROW ↓	→ BIT PATTERN ↓	000	001	010	011	100	101	110	111
-0	0000			(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000
-1	0001			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000
-2	0010			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000
-3	0011			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000
-4	0100			⊘ SC010000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000
-5	0101			% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000
-6	0110			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000
-7	0111			' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000
-8	1000			(SP080000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000
-9	1001			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000
-A	1010			* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000
-B	1011			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000
-C	1100			, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000
-D	1101			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000
-E	1110			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000
-F	1111			/ SP120000	? SP150000	O LO020000	<u> </u> SP090000	o LO010000	

Code Page 01009

Code Page 1024 (EBCDIC) Encoding of T.61 BTTX Characters

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø T.O610000	Ø T.O620000	° SM190000	μ SM170000	¢ SC040000				0 ND100000
-1		/ SP120000		a LA010000	j LJ010000	~ SD198000	£ SC020000	A LA020000	J LJ020000			1 ND010000
-2		÷ SA060000	° SD278000		b T.B010000	k T.K010000	s T.S010000	¥ SC050000	B T.B020000	K T.K020000	S T.S020000	2 ND020000
-3			· SD298000		c LC010000	l LL010000	t LT010000	- SD318000	C LC020000	L LL020000	T LT020000	3 ND030000
-4					d T.D010000	m T.M010000	u T.U010000	¸ ST438000	D T.D020000	M T.M020000	U T.U020000	4 ND040000
-5					e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6					f T.F010000	o T.O010000	w T.W010000	¶ SM250000	F T.F020000	O T.O020000	W T.W020000	6 ND060000
-7	× SA070000				g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	· SD630000	Ω SM180000			h T.H010000	q T.Q010000	y T.Y010000	½ NF010000	H T.H020000	Q T.Q020000	Y T.Y020000	8 ND080000
-9		β LS610000		` SD138000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	]		:	«	ª	ï			1	2	3
-B	. SP110000	\$ SC030000	,	#	»	º	¿	|	κ	ħ	˘	⚡
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð T.D630000	æ T.A510000	Ð T.D620000		đ	ij	'n	IJ
-D	(SP060000	) SP070000	_ SP090000	´ SP050000	" SD258000	ˆ SD418000	— SP098000	¨ SD178000	ı	œ	Ł	Œ
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ T.T630000	Æ T.A520000	Þ T.T640000	´ ST118000	ı	ı	Ł	Œ
-F	! SP020000	^ SD158000	? SP150000	" SP040000	± SA020000	⌘ SC010000		˘ SD218000	˘		Œ	(EO)

Code Page 01024

Code Page 1025 (EBCDIC) Cyrillic, Multilingual

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 KT110000	я KA150000	ь KX110000	{ SM110000	}	\ SM070000	0 NT010000
-1	(RSP) SP300000	Љ KL410000	/ SP120000	Ѣ KC120000	а LA010000	ј LJ010000	~ SD190000	Ы KY010000	А LA020000	Ј LJ020000	§ SM240000	1 ND010000
-2	ђ KT0610000	њ KN110000	ѓ KG120000	ќ KK120000	б LB010000	к LK010000	ѕ LS010000	з KZ010000	В LB020000	К LK020000	Ѕ LS020000	2 NT020000
-3	ѓ KG110000	ћ KC110000	Ё KE180000	(ЅТУ) SP320000	с LC010000	l LL010000	t LT010000	Ш KS210000	С LC020000	Л LL020000	Т LT020000	3 ND030000
-4	ё KF170000	ќ KN110000	Є KF160000	Ў KU240000	d LD010000	m LM010000	u LU010000	э KF130000	Д LD020000	М LM020000	У LU020000	4 NT040000
-5	є KE150000	ђ KU230000	Ѕ KZ160000	Ц KG220000	e LE010000	n LN010000	v LV010000	щ 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 NT060000
-7	i KI110000	Ђ 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 KT020000	б KB010000	h LH010000	q LQ010000	y LY010000	Ю KU160000	Н LH020000	Q LQ020000	У LY020000	8 NT080000
-9	j KJ010000	Ђ KD620000	Љ KL420000	` SD130000	i LI010000	r LR010000	z LZ010000	А KA020000	І LI020000	Р LR020000	Z LZ020000	9 ND090000
-A	[SM060000	]	| 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 KI120000	П KP020000	Ж KZ220000	Э KF140000
-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 KI020000	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

Code Page 1026 (ISO 8859-9) Turkey

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø T.O610000	Ø T.O620000	° SM190000	μ SM170000	¢ SC040000	ç T.C410000	ğ T.C230000	ü T.U170000	0 NT010000
-1	(RSP) SP300000	é L.E110000	/ SP120000	É L.E120000	a L.A010000	j L.J010000	ö L.O170000	£ SC020000	À L.A020000	Ï L.J020000	÷ S.A060000	1 N.D010000
-2	â T.A150000	ê T.E150000	Â T.A160000	Ê T.E160000	b T.B010000	k T.K010000	s T.S010000	Ÿ SC050000	B T.B020000	K T.K020000	S T.S020000	2 N.T020000
-3	ä L.A170000	ë L.E170000	Ä L.A180000	Ë L.E180000	c L.C010000	l L.L010000	t L.T010000	• S.D630000	C L.C020000	L L.L020000	T L.T020000	3 N.D030000
-4	à T.A130000	è T.E130000	À T.A140000	È T.E140000	d T.D010000	m T.M010000	u T.U010000	© S.M520000	D T.D020000	M T.M020000	U T.U020000	4 N.T040000
-5	á L.A110000	í L.I110000	Á L.A120000	Í L.I120000	e L.E010000	n L.N010000	v L.V010000	§ S.M240000	E L.E020000	N L.N020000	V L.V020000	5 N.D050000
-6	â T.A190000	î T.I150000	Ã T.A200000	Î T.I160000	f T.F010000	o T.O010000	w T.W010000	¶ S.M250000	F T.F020000	O T.O020000	W T.W020000	6 N.T060000
-7	å L.A270000	ï L.I170000	Å L.A280000	Ï L.I180000	g L.G010000	p L.P010000	x L.X010000	¼ N.I040000	G L.G020000	P L.P020000	X L.X020000	7 N.D070000
-8	{ S.M110000	ì T.I130000	[S.M060000	Ì T.I140000	h T.H010000	q T.Q010000	y T.Y010000	½ N.F010000	H T.H020000	Q T.Q020000	Y T.Y020000	8 N.T080000
-9	ñ L.N190000	ß L.S610000	Ñ L.N200000	ı L.I610000	i L.I010000	r L.R010000	z L.Z010000	¾ N.I050000	I L.I020000	R L.R020000	Z L.Z020000	9 N.D090000
-A	Ç T.C420000	Ğ T.C240000	Ş T.S410000	: S.P130000	« S.P170000	ª S.M210000	ı S.P030000	¬ S.M660000	(SHY) S.P320000	1 N.T011000	2 N.T021000	3 N.T031000
-B	· S.P110000	İ L.I300000	, S.P080000	Ö L.O180000	» S.P180000	º S.M200000	¿ S.P160000	| S.M130000	ô L.O150000	û L.U150000	Ô L.O160000	Û L.U160000
-C	< S.A030000	* S.M040000	% S.M020000	Ş T.S420000	} S.M140000	æ T.A510000	] S.M080000	- S.M150000	~ S.D190000	\ S.M070000	# S.M010000	" S.P040000
-D	(S.P060000	) S.P070000	— S.P090000	´ S.P050000	` S.D130000	´ S.D410000	\$ S.C030000	“ S.D170000	ò L.O130000	ù L.U130000	Ò L.O140000	Ù L.U140000
-E	+ S.A010000	; S.P140000	> S.A050000	= S.A040000	ı S.M650000	Æ T.A520000	@ S.M050000	’ S.D110000	ó T.O110000	ú T.U110000	Ó T.O120000	Ú T.U120000
-F	! S.P020000	^ S.D150000	? S.P150000	Û L.U180000	± S.A020000	Ɔ S.C010000	® S.M530000	× S.A070000	õ L.O190000	ÿ L.Y170000	Õ L.O200000	(EO)

Code Page 01026

Code Page 1027 (EBCDIC) Japanese (Latin) Extended

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	コ JK500000			- SM150000	^ SD150000	{ SM110000	}	\ SM070000	0 ND100000
-1		ウ JU010000	/ SP120000	サ JS100000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000		1 ND010000
-2	。 JQ700000	エ JF010000	イ JT000000	シ JS200000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	「 JQ710000	オ JU010000	ウ JU000000	ス JS300000	c LC010000	l LL010000	t LT010000	ヤ JY100000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	」 JQ720000	ヤ JY110000	エ JF000000	セ JS400000	d LD010000	m LM010000	u LU010000	ユ JY300000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	、 JQ730000	ユ JY310000	オ JO000000	ソ JS500000	e LE010000	n LN010000	v LV010000	ヨ JY500000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	・ JQ740000	ヨ JY510000	カ JK100000	タ JT100000	f LF010000	o LO010000	w LW010000	ヲ JY100000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	ヲ JW500000	ツ JT310000	キ JK200000	チ JT200000	g LG010000	p LP010000	x LX010000	リ JR200000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ア JA010000	ー JX700000	ク JK300000	ツ JT300000	h LH010000	q LQ010000	y LY010000	ル JR300000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	イ JI010000	ア JA000000	ケ JK400000	、 SD130000	i LI010000	r LR010000	z LZ010000	レ JR400000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	¢ SC040000	! SP020000		:	テ JT400000	ノ JN500000	マ JM100000	ロ JR500000				
-B	・ SP110000	\$ SC030000	,	# SM010000	ト JT500000	ハ JH110000	ミ JM200000	ワ JW100000				
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ナ JN100000	ヒ JH200000	ム JM300000	ン JN000000				
-D	(SP060000	) SP070000	_ SP090000	、 SP050000	ニ JN200000	フ JH300000	[SM060000	] SM080000				
-E	+ SA010000	; SP140000	> SA050000	= SA040000	ヌ JN300000	ヘ JH400000	メ JM400000	・ JX710000				
-F	| SM130000	∟ SM660000	? SP150000	" SP040000	ネ JN400000	ホ JH500000	モ JM500000	° JX720000				(EO)

Code Page 01027

Code Page 1036 (8-Bit ISO/ASCII) CCITT T.61 (BTTX)

HEX DIGIT'S 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0			(SP) SP010000	0 NT010000	@ SM050000	P TP020000		p LP010000				° SM190000			Ω SM180000	κ TK610000
-1			! SP020000	1 NL010000	A LA020000	Q LQ020000	a LA010000	q LQ010000			i SP030000	± SA020000	` SD138000		Æ LA520000	æ LA510000
-2			" SP040000	2 NT020000	B TB020000	R TR020000	b TB010000	r TR010000			¢ SC040000	² NT021000	' ST0118000		Ð TT620000	ð TT610000
-3				3 NL030000	C LC020000	S LS020000	c LC010000	s LS010000			£ SC020000	³ NL031000	^ SD158000		ə SM210000	ð LD630000
-4				4 NT040000	D TD020000	T LT020000	d TD010000	t LT010000			\$ SC030000	× SA070000	~ SD198000		Ĥ TH620000	ĥ TH610000
-5			% SM020000	5 NL050000	E LE020000	U LU020000	e LE010000	u LU010000			¥ SC050000	μ SM170000	- SD1318000			ı LI610000
-6			& SM030000	6 NT060000	F TF020000	V TV020000	f TF010000	v TV010000			# SM010000	¶ SM250000	˘ ST238000		İ TT520000	ij TT510000
-7			' SP050000	7 NL070000	G LG020000	W LW020000	g LG010000	w LW010000			§ SM240000	• SD630000	• SD298000		Ł LL640000	ł LL630000
-8			(SP060000	8 NT080000	H TH020000	X TX020000	h TH010000	x TX010000			☒ SC010000	÷ SA060000	¨ ST178000		Ł TT620000	ł TT610000
-9			) SP070000	9 NL090000	I LI020000	Y LY020000	i LI010000	y LY010000							Ø LO620000	ø LO610000
-A			* SM040000	: SP130000	J TJ020000	Z TZ020000	j TJ010000	z TZ010000					° SD278000		Œ T.O520000	œ T.O510000
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000				« SP170000	» SP180000	ˆ SD418000		◌ SM200000	β LS610000
-C			, SP080000	< SA030000	L LT020000		l LT010000	| SM130000				¼ NF040000	— SP098000		Ɔ TT640000	ɔ TT630000
-D			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000					½ NL010000	" SD258000		Ɔ LT620000	ɔ LT610000
-E			. SP110000	> SA050000	N TN020000		n TN010000					¾ NF050000	˘ ST438000		Ɔ TN620000	ɔ TN610000
-F			/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000					ı SP160000	˘ SD218000		'n LN630000	

Code Page 01036

Code Page 1040 (IBM Personal Computer) Korean Extended

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-	
-0		☐ SF440000	(SP) SP010000	0 ND100000	@ SM050000	P T.P020000	` SD130000	p T.P010000	¢ SC040000					₩ SP490000	₩ OT.300000		
-1	☐ SF390000		! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000					ㄱ OG300000	ㄴ OM000000			
-2	☐ SF250000	↕ SM760000	" SP040000	2 ND020000	B T.B020000	R T.R020000	b T.B010000	r T.R010000					ㄷ OG100000	ㄹ OB000000	ㅍ OA000000	ㅑ OY500000	
-3	☐ SF380000		# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000					ㅓ OG200000	ㅕ OB100000	ㅈ OA200000	ㅊ OU000000	
-4	☐ SF260000	☐ SF160000	\$ SC030000	4 ND040000	D T.D020000	T T.T020000	d T.D010000	t T.T010000					ㅖ ON000000	ㅗ OB200000	ㅜ OY200000	ㅠ OU300000	
-5	☐ SI240000	☐ SI400000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000					ㅛ ON150000	ㅝ OS000000	ㅞ OY250000	ㅟ OU200000	
-6	☐ SF430000	☐ SF410000	& SM030000	6 ND060000	F T.F020000	V T.V020000	f T.F010000	v T.V010000					ㅚ ON100000	ㅜ OS100000	ㅟ OE200000	ㅠ OU400000	
-7	☐ SM330000	☐ SI230000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000					ㅜ OD000000	ㅇ ON200000	ㅋ OE000000	ㅠ OY600000	
-8			(SP060000	8 ND080000	H T.H020000	X T.X020000	h T.H010000	x T.X010000					ㅝ OT100000	ㅞ OI000000			
-9	○ SM750000	☐ SI420000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000					ㅟ OL000000	ㅠ OJ100000			
-A		☐ SF140000	* SM040000	: SP130000	J T.J020000	Z T.Z020000	j T.J010000	z T.Z010000					ㅢ OI200000	ㅣ OC200000	ㅤ OY400000	ㅥ OE300000	
-B	☐ SP500000	☐ SM720000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000					ㅦ OL400000	ㅧ OK000000	ㅨ OY300000	ㅩ OE400000	
-C		☐ SM320000	, SP080000	< SA030000	L T.L020000	W SC140000	l T.L010000	| SM130000					ㅪ OI100000	ㅫ OT000000	ㅬ OO000000	ㅭ OT000000	
-D		☐ SI110000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000					ㅰ OL600000	ㅱ OP000000	ㅲ OO100000	ㅳ SM660000	
-E	☐ SM470000	☐ SM310000	. SP110000	> SA050000	N T.N020000	^ SD150000	n T.N010000	~ SM150000					ㅴ OI700000	ㅵ OH000000	ㅶ OO200000	ㅷ SM070000	
-F	☐ SM690000	☐ SM300000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000						ㅸ OL500000	ㅹ SM650000	ㅺ OO300000	ㅻ SD190000	





















Code Page 01040

Code Page 1041 (IBM Personal Computer) Japanese Extended

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		☒ SF440000	(SP) SP010000	0 ND010000	@ SM050000	P TP020000	' ST0130000	p LP010000	¢ SC040000		£ SC020000	一 JX700000	タ JT100000	ミ JM200000		
-1	☒ SI390000		! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000			。 JQ700000	ア JA000000	チ JT200000	ム JM300000		
-2	☒ SF250000	↑ SM760000	" SP040000	2 ND020000	B TB020000	R TR020000	b TB010000	r TR010000			「 JQ710000	イ JT000000	ツ JT300000	メ JM400000		
-3	☒ SI380000		# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000			」 JQ720000	ウ JU000000	テ JT400000	モ JM500000		
-4	☒ SF260000	■ SF160000	\$ SC030000	4 ND040000	D TD020000	T TT020000	d TD010000	t TT010000			、 JQ730000	エ JT000000	ト JT500000	ヤ JY100000		
-5	☒ SI240000	☒ SI400000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000			・ JQ740000	オ JO000000	ナ JN100000	ユ JY300000		
-6	☒ SF430000	☒ SF410000	& SM030000	6 ND060000	F TF020000	V TV020000	f TF010000	v TV010000			ヲ JW500000	カ JK100000	ニ JN200000	ヨ JY500000		
-7	↓ SM330000	☒ SI230000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000			ア JA010000	キ JK200000	ヌ JN300000	ラ JR100000		
-8			(SP060000	8 ND080000	H TH020000	X TX020000	h TH010000	x TX010000			イ JT010000	ク JK300000	ネ JN400000	リ JR200000		
-9	○ SM750000	☒ SI420000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000			ウ JU010000	ケ JK400000	ノ JN500000	ル JR300000		
-A		☒ SF140000	* SM040000	: SP130000	J TJ020000	Z TZ020000	j TJ010000	z TZ010000			エ JE010000	コ JK500000	ハ JH100000	レ JR400000		
-B	☒ SP500000	← SM720000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000			オ JO010000	サ JS100000	ヒ JH200000	ロ JR500000		
-C		↑ SM320000	, SP080000	< SA030000	L TL020000	¥ SC050000	l TL010000	| SM130000			ヤ JY110000	シ JS200000	フ JH300000	ワ JW100000		
-D		☒ SI110000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000			ユ JY310000	ス JS300000	へ JH400000	ン JN000000		☒ SM660000
-E	■ SM470000	→ SM310000	. SP110000	> SA050000	N TN020000	^ ST150000	n TN010000	- SM150000			ヨ JY510000	セ JS400000	ホ JH500000	・ JX710000		☒ SM070000
-F	☀ SM690000	← SM300000	/ SP120000	? SP150000	O LO020000	o SP090000	o LO010000				ツ JT310000	ソ JS500000	マ JM100000	° JX720000		~ SD190000

Code Page 01041

Code Page 1042 (IBM Personal Computer) Simplified Chinese Extended

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		 SF440000	(SP) SP010000	0 ND100000	@ SM050000	P T.P020000	` STJ130000	p T.P010000	£ SC020000							
-1	 SI390000		! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000								
-2	 SF250000	↑ SM760000	" SP040000	2 ND020000	B T.B020000	R T.R020000	b T.B010000	r T.R010000								
-3	 SI380000		# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000								
-4	 SF260000	 SF160000	\$ SC030000	4 ND040000	D T.D020000	T T.T020000	d T.D010000	t T.T010000								
-5	 SI240000	 SI400000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000								
-6	 SF430000	 SF410000	& SM030000	6 ND060000	F T.F020000	V T.V020000	f T.F010000	v T.V010000								
-7	↓ SM330000	 SI230000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000								
-8			(SP060000	8 ND080000	H T.H020000	X T.X020000	h T.H010000	x T.X010000								
-9	○ SM750000	 SI420000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000								
-A		 SF140000	* SM040000	: SP130000	J T.J020000	Z T.Z020000	j T.J010000	z T.Z010000								
-B	 SP500000	← SM720000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000								
-C		↑ SM320000	, SP080000	< SA030000	L T.L020000	¥ SC120000	l T.L010000	| SM130000								
-D		 SI110000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000								 SM660000
-E	 SM470000	→ SM310000	. SP110000	> SA050000	N T.N020000	^ STJ150000	n T.N010000	- SM150000								 SM070000
-F	 SM690000	← SM300000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000									 SD190000

Code Page 01042

Code Page 1043 (IBM Personal Computer) Traditional Chinese

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		(SP)	0	@	P	`	p	¢								
-1			!	1	A	Q	a	q								
-2			"	2	B	R	b	r								
-3			#	3	C	S	c	s								
-4			\$	4	D	T	d	t								
-5			%	5	E	U	e	u								
-6			&	6	F	V	f	v								
-7			'	7	G	W	g	w								
-8			(	8	H	X	h	x								
-9			)	9	I	Y	i	y								
-A			*	:	J	Z	j	z								
-B			+	;	K	[	k	{								
-C			,	<	L	\	l	|								
-D			-	=	M	]	m	}								
-E			.	>	N	^	n	~								
-F			/	?	O	_	o									


Code Page 01043

Code Page 1046 (Not ISO 1089) Arabic

HEX DIGITS	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
1ST →																
2ND ↓																
-0			(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000	ل AA310402	م AU050004	(RSP) SP300000	و ND100001	ع AC470003	ذ AD470000	ـ SM860000	ر AI050000
-1			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	× SA070000	ـ AI050004	آ AA210006	ا ND010001	ء AX300000	ر AR010000	ف AF010000	س AX100000
-2			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000	÷ SA060000	س AX100004	أ AA310006	آ ND020001	آ AA210000	ز AZ010000	ق AQ010000	ه AE050000
-3			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	سر AS010000	ـ AE050004	ل AA310406	آ ND030001	أ AA310000	س AS010006	ك AK010000	ق AQ010003
-4			\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000	شر AS230000	ـ AA050004	آ SC010000	آ ND040001	ؤ AW310000	ش AS230006	ل AL010000	ك AK010003
-5			% SM020007	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	ص AS450000	ع AY310002	ل AA010006	ه ND050001	ل AA310400	ص AS450006	م AM010000	ل AL010003
-6			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000	ض AD450000	ع AA020002	ك AY310000	آ ND060001	ع AY310006	ض AD450006	ن AN010000	ر SM870000
-7			' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ك AA070004	ب AY010003	ب AB010003	آ ND070001	ا AA010000	ط AT450000	ه AH010003	آ AL220000
-8			(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000		ي AY010002	ت AT010003	آ ND080001	ب AB010000	ظ AZ450000	و AW010000	آ AL320000
-9			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	■ SM470000	غ AG310002	ث AT470003	آ ND090001	ة AT020000	ع AC470000	ى AA020000	ل AL320400
-A			* SM040007	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000	⌈ SF110000	غ AG310003	ج AG230003	ش AS230003	ت AT010000	غ AG310000	ي AY010000	لا AL020000
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	⌋ SF100000	غ AG310004	ح AH450003	؛ SP140007	ث AT470000	ع AC470004	م AA070000	م AM010003
-C			, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000	⌋ SF030000	آ AL220003	، SP080007	ص AS450003	ج AG230000	آ AA210002	و AU070000	ن AN010003
-D			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	⌋ SF010000	آ AL320003	(SHY) SP320000	ض AD450003	ح AH450000	أ AA310002	ء AI070000	ف AH010004
-E			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000	⌋ SF020000	لا AL320402	ذ AH470003	ع AC470002	خ AH470000	ا AA010002	ـ AA050000	ه AH010000
-F			/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000		⌋ SF040000	لا AL020003	س AS010003	؟ SP150007	د AD010000	ف AF010003	م AU050000	

Code Page 01046

Code Page 1051 (8-Bit) H-P Emulation, Roman 8

HEX DIGITS 1ST → 2ND ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0			(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000				̄ SM620000	â LA150000	Å LA280000	Á LA120000	Ð LT640000
-1			! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000			À LA140000	Ý LY120000	ê LE150000	î LI150000	Ã LA200000	þ LT630000
-2			" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000			Â LA160000	ý LY110000	ô LO150000	Ø LO620000	ã LA190000	· SD630000
-3			# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000			È LE140000	° SD270200	û LU150000	Æ LA520000	Ð LD620000	µ GM010000
-4			\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000			Ê LE160000	Ç LC420000	á LA110000	å LA270000	ð LD630000	¶ SM250000
-5			% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000			Ë LE180000	ç LC410000	é LE110000	í LI110000	Í LI120000	¾ NF050000
-6			& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000			Î LI160000	Ñ LN200000	ó LO110000	ø LO610000	Ì LI140000	- SP100000
-7			' SP050001	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000			Ï LI180000	ñ LN190000	ú LU110000	æ LA510000	Ó LO120000	¼ NF040000
-8			(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000			' SD110100	ı SP030000	à LA130000	Ä LA180000	Ò LO140000	½ NF010000
-9			) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000			` SD130100	ı SP160000	è LE130000	ì LI130000	Õ LO200000	à SM210000
-A			* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000			^ SD150100	☒ SC010000	ò LO130000	Ö LO180000	õ LO190000	á SM200000
-B			+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000			¨ SD170100	£ SC020090	ù LU130000	Ü LU180000	Š LS220000	« SP170000
-C			, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000			~ SD190100	¥ SC050000	ä LA170000	É LE120000	š LS210000	■ SM470000
-D			- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000			Û LU140000	§ SM240000	ë LE170000	ï LI170000	Ú LU120000	» SP180000
-E			. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000			Û LU160000	f SC070000	ö LO170000	ß LS610000	ÿ LY180000	± SA020000
-F			/ SP120000	? SP150000	O LO020000	<u> </u> SP090000	o LO010000	 SF150000			£ SC020001	¢ SC040000	ü LU170000	Ô LO160000	ÿ LY170000	

Code Page 01051

Code Page 1088 (IBM Personal Computer) Korean

HEX DIGITS	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
1ST →	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
2ND ↓																
-0		⊕ SF050000	(SP) SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000								
-1	☐ SF010000	◀ SM630000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000								
-2	☐ SF030000	↕ SM760000	" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000								
-3	☐ SF020000	!! SP330000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000								
-4	☐ SF040000	☐ SM250000	\$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000								
-5	☐ SF110000	⊕ SF070000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000								
-6	☐ SF100000	⊕ SF060000	& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000								
-7	• SM570000	⊕ SF090000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000								
-8	◼ SM570001	↑ SM320000	(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000								
-9	○ SM750000	☐ SF080000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000								
-A	◼ SM750002	→ SM310000	* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000								
-B	♂ SM280000	← SM300000	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000								
-C	♀ SM290000	⌞ SA420000	, SP080000	< SA030000	L LL020000	W SC140000	l LL010000	| SM130000								
-D	♪ SM930000	↔ SM780000	- SP100000	= SA040000	M LM020000	]SM080000	m LM010000	} SM140000								
-E	♪ SM910000	▲ SM600000	. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000								
-F	☀ SM690000	▼ SV040000	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	☰ SM790000								

Code Page 01088

Appendix O. Graphic Character Set

The following character sets are included here because of their general usage or special usage for national language support. It is not intended to be an inclusive list of the registered character sets.

Syntactic/Invariant Character Set 640

A	B	C	D	E	F	G	H	I	J	K	L	M
LA020000	LB020000	LC020000	LD020000	LE020000	LF020000	LG020000	LH020000	LI020000	LJ020000	LK020000	LL020000	LM020000
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
LN020000	LO020000	LP020000	LQ020000	LR020000	LS020000	LT020000	LU020000	LV020000	LW020000	LX020000	LY020000	LZ020000
a	b	c	d	e	f	g	h	i	j	k	l	m
LA010000	LB010000	LC010000	LD010000	LE010000	LF010000	LG010000	LH010000	LI010000	LJ010000	LK010000	LL010000	LM010000
n	o	p	q	r	s	t	u	v	w	x	y	z
LN010000	LO010000	LP010000	LQ010000	LR010000	LS010000	LT010000	LU010000	LV010000	LW010000	LX010000	LY010000	LZ010000
0	1	2	3	4	5	6	7	8	9			
ND100000	ND010000	ND020000	ND030000	ND040000	ND050000	ND060000	ND070000	ND080000	ND090000			
+	<	=	>	%	&	*	"	'	()	,	_
SA010000	SA030000	SA040000	SA050000	SM020000	SM030000	SM040000	SP040000	SP050000	SP060000	SP070000	SP080000	SP090000
-	.	/	:	;	?							
SP100000	SP110000	SP120000	SP130000	SP140000	SP150000							

Character Set 00640

Country Extended Character Set 697

A	B	C	D	E	F	G	H	I	J	K	L	M
LA020000	LB020000	LC020000	LD020000	LE020000	LF020000	LG020000	LH020000	LI020000	LJ020000	LK020000	LL020000	LM020000
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
LN020000	LO020000	LP020000	LQ020000	LR020000	LS020000	LT020000	LU020000	LV020000	LW020000	LX020000	LY020000	LZ020000
a	b	c	d	e	f	g	h	i	j	k	l	m
LA010000	LB010000	LC010000	LD010000	LE010000	LF010000	LG010000	LH010000	LI010000	LJ010000	LK010000	LL010000	LM010000
n	o	p	q	r	s	t	u	v	w	x	y	z
LN010000	LO010000	LP010000	LQ010000	LR010000	LS010000	LT010000	LU010000	LV010000	LW010000	LX010000	LY010000	LZ010000
Á	Â	Ã	Ä	Å	Æ	Ç	Ð	É	È	Ê	Ë	
LA120000	LA140000	LA160000	LA180000	LA200000	LA280000	LA520000	LC420000	LD620000	LE120000	LE140000	LE160000	LE180000
Í	Î	Ï	Ï	Ñ	Ó	Ò	Ô	Ö	Õ	Ø	Þ	Ú
LI120000	LI140000	LI160000	LI180000	LN200000	LO120000	LO140000	LO160000	LO180000	LO200000	LO620000	LT640000	LU120000
Û	Û	Ü	Ý									
LU140000	LU160000	LU180000	LY120000									
á	â	ã	ä	å	æ	ç	ð	é	è	ê	ë	
LA110000	LA130000	LA150000	LA170000	LA190000	LA270000	LA510000	LC410000	LD630000	LE110000	LE130000	LE150000	LE170000
í	î	ï	ï	ñ	ó	ò	ô	ö	õ	ø	þ	þ
LI110000	LI130000	LI150000	LI170000	LN190000	LO110000	LO130000	LO150000	LO170000	LO190000	LO610000	LS610000	LT630000
ú	û	ü	ü	ý	ÿ							
LU110000	LU130000	LU150000	LU170000	LY110000	LY170000							
0	1	2	3	4	5	6	7	8	9			
ND010000	ND010000	ND020000	ND030000	ND040000	ND050000	ND060000	ND070000	ND080000	ND090000			
1	2	3	½	¼	¾	+	±	<	=	>	÷	×
ND011000	ND021000	ND031000	NF010000	NF040000	NF050000	SA010000	SA020000	SA030000	SA040000	SA050000	SA060000	SA070000
¤	£	§	¢	¥	'	`	^	¨	˜	˙	·	#
SC010000	SC020000	SC030000	SC040000	SC050000	SD110000	SD130000	SD150000	SD170000	SD190000	SD410000	SD630000	SM010000
%	&	*	@	[	\	\]	{	|	}	-	μ	°
SM020000	SM030000	SM040000	SM050000	SM060000	SM070000	SM080000	SM110000	SM130000	SM140000	SM150000	SM170000	SM190000
©	®	§	¶	©	®	¡	¬	!	¡	"	'	(
SM200000	SM210000	SM240000	SM250000	SM520000	SM530000	SM650000	SM660000	SP020000	SP030000	SP040000	SP050000	SP060000
)	,	—	-	.	/	:	;	?	¿	«	»	(RSP)
SP070000	SP080000	SP090000	SP100000	SP110000	SP120000	SP130000	SP140000	SP150000	SP160000	SP170000	SP180000	SP300000
(SHY)												
SP320000												

Character Set 00697

T.61 Character Set 1252

A LA020000	B LB020000	C LC020000	D LD020000	E LE020000	F LF020000	G LG020000	H LH020000	I LI020000	J LJ020000	K LK020000	L LL020000	M LM020000
N LN020000	O LO020000	P LP020000	Q LQ020000	R LR020000	S LS020000	T LT020000	U LU020000	V LV020000	W LW020000	X LX020000	Y LY020000	Z LZ020000
a LA010000	b LB010000	c LC010000	d LD010000	e LE010000	f LF010000	g LG010000	h LH010000	i LI010000	j LJ010000	k LK010000	l LL010000	m LM010000
n LN010000	o LO010000	p LP010000	q LQ010000	r LR010000	s LS010000	t LT010000	u LU010000	v LV010000	w LW010000	x LX010000	y LY010000	z LZ010000
Æ LA520000	Ð LD620000	Ĥ LH620000	Ï LI520000	Ł LL620000	Ł LL640000	Ŋ LN620000	Œ LO620000	Ø LO620000	ƒ LT620000	ƒ LT640000		
æ LA510000	ð LD610000	ĥ LH610000	ï LI510000	ł LL610000	ł LL630000	ŋ LN610000	œ LO610000	ø LO630000	ƒ LN610000	ƒ LN630000	œ LO510000	ø LO610000
ß LS610000	ƒ LT610000	ƒ LT630000										
0 ND100000	1 ND010000	2 ND020000	3 ND030000	4 ND040000	5 ND050000	6 ND060000	7 ND070000	8 ND080000	9 ND090000			
² ND021000	³ ND031000	½ NF010000	¼ NF040000	¾ NF050000	± SA010000	± SA020000	< SA030000	= SA040000	> SA050000	÷ SA060000	× SA070000	∞ SC010000
£ SC020000	\$ SC030000	¢ SC040000	¥ SC050000	' SD118000	` SD138000	^ SD158000	~ SD178000	~ SD188000	˘ SD218000	˘ SD238000	˘ SD258000	˘ SD278000
· SD298000	- SD318000	˘ SD418000	˘ SD438000	· SD630000	# SM010000	% SM020000	& SM030000	* SM040000	@ SM050000	[SM080000	] SM080000	| SM130000
μ SM170000	Ω SM180000	° SM190000	◊ SM200000	◊ SM210000	§ SM240000	¶ SM250000	! SP020000	¡ SP030000	" SP040000	' SP050000	(SP060000	) SP070000
, SP080000	— SP090000	— SP098000	- SP100000	· SP110000	/ SP120000	: SP130000	; SP140000	? SP150000	¿ SP160000	« SP170000	» SP180000	

Character Set 01252

T.61 Character Repertoire 1253 (1 of 2)

A	B	C	D	E	F	G	H	I	J	K	L	M
LA020000	LB020000	LC020000	LD020000	LE020000	LF020000	LG020000	LH020000	LI020000	LJ020000	LK020000	LL020000	LM020000
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
LN020000	LO020000	LP020000	LQ020000	LR020000	LS020000	LT020000	LU020000	LV020000	LW020000	LX020000	LY020000	LZ020000
a	b	c	d	e	f	g	h	i	j	k	l	m
LA010000	LB010000	LC010000	LD010000	LE010000	LF010000	LG010000	LH010000	LI010000	LJ010000	LK010000	LL010000	LM010000
n	o	p	q	r	s	t	u	v	w	x	y	z
LN010000	LO010000	LP010000	LQ010000	LR010000	LS010000	LT010000	LU010000	LV010000	LW010000	LX010000	LY010000	LZ010000
Á	Â	Ã	Ä	Å	Ă	Ȧ	Ǽ	Ȧ	Æ	Č	Ĉ	Č
LA120000	LA140000	LA160000	LA180000	LA200000	LA240000	LA280000	LA320000	LA440000	LA520000	LC120000	LC160000	LC220000
Ċ	Ç	Ď	Đ	É	È	Ê	Ë	Ě	Ė	Ē	Ę	Ĝ
LC300000	LC420000	LD220000	LD620000	LE120000	LE140000	LE180000	LE180000	LE220000	LE300000	LE320000	LE440000	LG160000
Ğ	Ġ	Ģ	Ĥ	Ħ	Í	Ĳ	Î	Ï	İ	Ī	Ĭ	Ĵ
LG240000	LG300000	LG420000	LH160000	LH620000	LI120000	LI140000	LI160000	LI180000	LI200000	LI300000	LI320000	LI440000
Ĵ	Ķ	ĸ	Ĺ	Ł	Ł	Ł	Ł	Ł	Ń	Ñ	Ň	Ņ
LI520000	LJ180000	LK420000	LI120000	LI220000	LI420000	LI620000	LI640000	LI640000	LN120000	LN200000	LN220000	LN420000
Ń	Ņ	Ň	Ņ	Ň	Ņ	Ň	Ņ	Ň	Ņ	Ň	Ņ	Ň
LO120000	LO140000	LO160000	LO180000	LO200000	LO260000	LO320000	LO520000	LO620000	LR120000	LR220000	LR420000	LS120000
Ŝ	Š	Ş	Ţ	Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț
LS160000	LS220000	LS420000	LT220000	LT420000	LT620000	LT640000	LU120000	LU140000	LU160000	LU180000	LU200000	LU240000
Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț	Ț
LU260000	LU280000	LU320000	LU440000	LW160000	LY120000	LY160000	LY180000	LZ120000	LZ220000	LZ300000		
á	à	â	ä	ã	ǎ	â	ā	ą	æ	ć	ĉ	č
LA110000	LA130000	LA150000	LA170000	LA190000	LA230000	LA270000	LA310000	LA330000	LA510000	LC110000	LC150000	LC210000
ċ	ç	ď	đ	ð	é	è	ê	ë	ě	é	ē	ę
LC280000	LC410000	LD210000	LD610000	LD630000	LE110000	LE130000	LE150000	LE170000	LE210000	LE290000	LE310000	LE430000
ġ	ġ	ġ	ġ	ĥ	ħ	í	ì	î	ï	ĩ	ī	ĵ
LG110000	LG150000	LG230000	LG290000	LH150000	LH810000	LI110000	LI130000	LI150000	LI170000	LI190000	LI310000	LI430000
ĵ	ı	ĵ	ķ	κ	ĺ	ļ	ł	ł	ł	ń	ñ	ň
LI510000	LI610000	LJ150000	LK410000	LK610000	LI110000	LI210000	LI410000	LI610000	LI630000	LN110000	LN190000	LN210000
ŋ	ŋ	ŋ	ó	ò	ô	ö	õ	õ	õ	œ	ø	í
LN410000	LN610000	LN630000	LO110000	LO130000	LO150000	LO170000	LO190000	LO250000	LO310000	LO510000	LO610000	LR110000
ř	ŗ	ś	ŝ	š	ş	ß	ţ	ţ	ţ	þ	ú	ù
LR210000	LR410000	LS110000	LS150000	LS210000	LS410000	LS610000	LT210000	LT410000	LT610000	LT630000	LU110000	LU130000
û	ü	ű	ű	ű	ű	ű	ű	ű	ű	ű	ű	ű
LU150000	LU170000	LU190000	LU230000	LU250000	LU270000	LU310000	LU430000	LW150000	LY110000	LY150000	LY170000	LZ110000
ž	ž											
LZ210000	LZ290000											
0	1	2	3	4	5	6	7	8	9			
ND100000	ND010000	ND020000	ND030000	ND040000	ND050000	ND060000	ND070000	ND080000	ND090000			
2	3	½	¼	¾	+	±	<	=	>	÷	×	∅
ND021000	ND031000	NF010000	NF040000	NF050000	SA010000	SA020000	SA030000	SA040000	SA050000	SA060000	SA070000	SC010000

Character Set 01253 (Sheet 1 of 2)

T.61 Character Repertoire 1253 (2 of 2)

£	\$	¢	¥	'	`	^	¨	˜	˘	˙	”	°
SC020000	SC030000	SC040000	SC050000	SD110000	SD130000	SD150000	SD170000	SD190000	SD210000	SD230000	SD250000	SD270000
.	-	ˆ	˜	•	#	%	&	*	@	[	]	|
SD290000	SD310000	SD410000	SD430000	SD630000	SM010000	SM020000	SM030000	SM040000	SM050000	SM060000	SM080000	SM130000
μ	Ω	◦	◌	≡	§	¶	!	ı	”	'	()
SM170000	SM180000	SM190000	SM200000	SM210000	SM240000	SM250000	SP020000	SP030000	SP040000	SP050000	SP060000	SP070000
,	—	-	.	/	:	;	?	¿	«	»		
SP080000	SP090000	SP100000	SP110000	SP120000	SP130000	SP140000	SP150000	SP160000	SP170000	SP180000		

Character Set 01253 (Sheet 2 of 2)

Bibliography

The following list of manuals shows where to go for additional details that are not contained in the *National Language Support Planning Guide* manual.

Table P-1 (Page 1 of 3). AS/400 Manuals

Title, Order Number, Short Title	Topic
Application Development Tools: Character Generator Utility User's Guide, SC09-1170 Short title: CGU User's Guide	Entire manual, DBCS
Application Development Tools: Data File Utility User's Guide and Reference, SC09-1381 Short title: DFU User's Guide and Reference	Working with DBCS
Application Development Tools: Report Layout Utility User's Guide and Reference, SC09-1416 Short title: RLU User's Guide and Reference	DBCS considerations
Application Development Tools: Screen Design Aid User's Guide and Reference, SC09-1340 Short title: SDA User's Guide and Reference	Using DBCS characters
Application Development Tools: Screen Design Aid User's Guide and Reference for the System/36 Environment, SC09-1418 Short title: SDA User's Guide/Reference for the System/36 Environment	DBCS considerations
Application Development Tools: Source Entry Utility User's Guide and Reference, SC09-1338 Short title: SEU User's Guide and Reference	DBCS considerations for DFU programs
Application Program Driver/400 User's Guide, SH12-6037 Short title: APD/400 User's Guide	DBCS considerations
Communications: Operating System/400* Communications Configuration Reference, SC41-0001 Short title: OS/400* Communications Configuration Reference	CRTDEVDSP command CRTDEVPRP command

Table P-1 (Page 1 of 3). AS/400 Manuals

Title, Order Number, Short Title	Topic
Data Description Specifications Reference, SC41-9620 Short title: DDS Reference	DBCS considerations CCSID information
Data Management Guide, SC41-9658 Short title: Data Management Guide	DBCS support
Database Guide, SC41-9659 Short title: Database Guide	DBCS considerations CCSID information
Device Configuration Guide, SC41-8106 Short title: Device Configuration Guide	CHRID and KBDTYPE Configuration of DBCS devices
Distributed Relational Database Guide, SC41-0025 Short title: Distributed Database Guide	Data definition and exchange
Guide to Programming Application and Help Displays, SC41-0011 Short title: Guide to Programming Displays	DBCS support for displays Using alternative character sets and code pages
Guide to Programming for Printing, SC41-8194 Short title: Guide to Programming for Printing	IPDS and SCS printers Advanced function printing
IBM Systems Application Architecture* SystemView* OMEGAVIEW/400 Guide, SC41-0134 Short title: IBM OMEGAVIEW/400 Guide	
Integrated Language Environment* C/400 Programmer's Guide and Reference, SC09-1520 Short title: ILE* C/400 Programmer's Guide and Reference	Locales and character sets
Languages: Systems Application Architecture* AD/Cycle* COBOL/400* User's Guide, SC09-1383 Short title: COBOL/400* User's Guide	Supporting international languages with DBCS
Languages: PL/I User's Guide and Reference, SC09-1156 TNL SN09-1564 Short title: PL/I User's Guide and Reference	DBCS support

Table P-1 (Page 2 of 3). AS/400 Manuals

Title, Order Number, Short Title	Topic
<i>Languages: Systems Application Architecture*</i> <i>AD/Cycle* RPG/400*</i> Reference, SC09-1349 Short title: <i>RPG/400* Reference</i>	DBCS data in RPG/400 programs
<i>Languages: Systems Application Architecture*</i> <i>AD/Cycle* RPG/400* User's Guide</i> , SC09-1348 Short title: <i>RPG/400* User's Guide</i>	Moving double-byte data
<i>Licensed Programs and New Release Installation Guide</i> , SC41-9878 Short title: <i>Licensed Programs and New Release Installation Guide</i>	Changing the primary language Installing a secondary language
<i>New Products Planning Information for Release 3--General Availability Edition</i> , GA41-0007-04 Short title: <i>New Products Planning Information--General Availability Edition</i>	Storage requirements
<i>Office Services Concepts and Programmer's Guide</i> , SC41-9758 Short title: <i>Office Services Concepts and Programmer's Guide</i>	Character set and code page considerations
<i>Operating System/400 Workstation Customization Function Programmer's Guide</i> , SC41-0056 Short title: <i>Workstation Customization Function Programmer's Guide</i>	National language considerations
<i>OV/400 and Query/400 Applications in a Multilingual Environment</i> , GG24-3579 <i>PC Support/400: DOS Installation and Administration Guide</i> , SC41-0006 Short title: <i>9406 Repair Guide and Parts Listing</i>	National language support, multilingual support
<i>PC Support/400: DOS Installation and Administration Guide (PS/55)</i> , SC41-0008 Short title: <i>PC Support/400 DOS Installation and Administration Guide (PS/55)</i>	Entire manual, DBCS
<i>PC Support/400: DOS User's Guide</i> , SC41-8199 Short title: <i>PC Support/400 User's Guide for DOS</i>	Information throughout, national language support

Table P-1 (Page 2 of 3). AS/400 Manuals

Title, Order Number, Short Title	Topic
<i>PC Support/400: DOS User's Guide (PS/55)</i> , SC41-2414 Short title: <i>PC Support/400 User's Guide for DOS (PS/55)</i>	Information throughout, national language support Entire manual, DBCS
<i>PC Support/400: OS/2 Installation and Administration Guide</i> , SC41-0007 Short title: <i>PC Support/400 OS/2 Installation and Administration Guide</i>	Information throughout, national language support
<i>PC Support/400: OS/2 Installation and Administration Guide (PS/55)</i> , SC41-0009 Short title: <i>PC Support/400 OS/2 Installation and Administration Guide (PS/55)</i>	Entire manual, DBCS
<i>PC Support/400: OS/2 User's Guide (PS/55)</i> , SC41-2415 Short title: <i>PC Support/400 User's Guide for OS/2 (PS/55)</i>	Entire manual, DBCS
<i>PC Support/400: RUMBA/400 Guide and Reference</i> , SC41-0135 Short title: <i>RUMBA/400 Guide and Reference</i>	Entire manual, DBCS
<i>Programming: Concepts and Programmer's Guide for the System/36 Environment</i> , SC41-9663 Short title: <i>Concepts and Programmer's Guide for the System/36 Environment</i>	National language support
<i>Programming: Control Language Programmer's Guide</i> , SC41-8077 Short title: <i>CL Programmer's Guide</i>	Objects and libraries (multilingual) Advanced programming Topics (mapping tables, DBCS) QDCXLATE IBM-supplied program
<i>Programming: Control Language Reference</i> , SC41-0030 Short title: <i>CL Reference</i>	Using double-byte character text in CL commands Individual commands
<i>Programming: Work Management Guide</i> , SC41-8078 Short title: <i>Work Management Guide</i>	System values
<i>Publications Guide</i> , GC41-9678 Short title: <i>Publications Guide</i>	Entire manual

Table P-1 (Page 3 of 3). AS/400 Manuals

Title, Order Number, Short Title	Topic
<i>Query/400 User's Guide</i> , SC41-9614 Short title: <i>Query/400 User's Guide</i>	Additional information for programmers DBCS considerations when defining result fields See <i>fields</i> in index
<i>SAA* AD/Cycle* Application Development Manager/400 Introduction and Planning Guide</i> , GC09-1377 Short title: <i>Application Development Manager/400 Introduction and Planning Guide</i>	Developing applications
<i>SAA* AD/Cycle* Application Development Manager/400 User's Guide</i> , SC09-1376 Short title: <i>Application Development Manager/400 User's Guide</i>	Developing applications
<i>Systems Application Architecture* Common Programming Interface C Reference – Level 2</i> , SC09-1308 Short title: <i>SAA* C Reference</i>	See <i>DBCS</i> in index
<i>Systems Application Architecture* OfficeVision/400*: Using OfficeVision/400</i> , SC41-9616 Short title: <i>Using OfficeVision/400*</i>	Using DBCS prompts
<i>Systems Application Architecture* Structured Query Language/400 Reference</i> , SC41-9608 Short title: <i>SQL/400* Reference</i>	See <i>double-byte character</i> in index CCSID information
<i>Systems Application Architecture* Structured Query Language/400 Programmer's Guide</i> , SC41-9609 Short title: <i>SQL/400* Programmer's Guide</i>	CCSID information
<i>System Introduction</i> , GC41-9766 Short title: <i>System Introduction</i>	National language support National languages System devices
<i>System Operations: Font Management Aid User's Guide</i> , SC21-2216.	Entire manual, DBCS
<i>System Concepts</i> , GC41-9802 Short title: <i>System Concepts</i>	National languages Multilingual support

Table P-1 (Page 3 of 3). AS/400 Manuals

Title, Order Number, Short Title	Topic
<i>System Operator's Guide</i> , SC41-8082 Short title: <i>Operator's Guide</i>	PTF information
<i>System Programmer's Interface Reference</i> , SC41-8223 Short title: <i>System Programmer's Interface Reference</i>	CCSID APIs
<i>SystemView* Information Warehouse DataHub Support/400 Installation and Operations Guide</i> , SC41-0099 Short title: <i>DataHub Support/400 Installation and Operations Guide</i>	
<i>SystemView* Managed System Services/400 User's Guide</i> , SC41-0142 Short title: <i>Managed System Services/400 User's Guide</i>	
<i>Transmission Control Protocol/Internet Protocol Guide</i> , SC41-9875 Short title: <i>TCP/IP Guide</i>	National language considerations
<i>Utilities: Data File Utility List for the System/36 Environment User's Guide and Reference</i> , SC09-1362 Short title: <i>DFU List for the System/36 Environment User's Guide and Reference</i>	DBCS considerations for DFU list programs
<i>Utilities: Interactive Data Definition Utility User's Guide</i> , SC41-9657 Short title: <i>IDDU User's Guide</i>	DBCS data type CCSID information
<i>Utilities: Sort User's Guide and Reference</i> , SC09-1363 Short title: <i>Sort User's Guide and Reference</i>	Sorting DBCS

Table P-2 (Page 1 of 2). Related Information

Title, Order Number	Topic
<i>Advanced Function Printing Utilities/400 User's Guide and Reference</i> , SH18-2416 Short title: <i>AFP Utilities User's Guide and Reference</i>	See DBCS in index
<i>Communications: SNA Japanese 3270 PC Emulation Installation Guide</i> , N:SC18-2461 Short title: <i>SNA Japanese 3270 PC Emulation Installation Guide</i>	Entire manual, DBCS
<i>Communications: SNA Japanese 3270 PC Emulation Operation Guide</i> , N:SC18-2462 Short title: <i>SNA Japanese 3270 PC Emulation Installation Guide</i>	Entire manual, DBCS
<i>Character Data Representation Architecture - Executive Overview</i> , GC09-1392	Entire manual, CCSID information
<i>Character Data Representation Architecture - Level 1 Reference</i> , SC09-1390	Entire manual, CCSID information
<i>Character Data Representation Architecture - Level 1 Registry</i> , SC09-1391	Entire manual, CCSID information
<i>Communications: SNA Hangeul 3270 PC Emulation Operation Guide</i> , K:SC18-2462 Short title: <i>SNA Hangeul 3270 PC Emulation Operation Guide</i>	Entire manual, DBCS
<i>Communications: SNA Traditional Chinese 3270 PC Emulation Operation Guide</i> , SC40-1347 Short title: <i>SNA Japanese 3270 PC Emulation Operation Guide</i>	Entire manual, DBCS
<i>Designing International Software</i> , GX09-1220	Entire manual

Table P-2 (Page 1 of 2). Related Information

Title, Order Number	Topic
<i>IBM Advanced Interactive Executive for the Personal Computer (AIX PS/2) Keyboard Description and Character Reference</i> , SC23-2837	Entire manual
<i>IBM InfoWindow 3477 User's Guide</i> , GA18-2923	Country-specific keyboard layouts
<i>IBM InfoWindow 3476 and 3477 Introduction and Installation Planning Guide</i> , GA18-2952	Functional descriptions
<i>National Language Design Guide: Designing Enabled Products, Volume 1</i> , SE09-8001	Entire manual
<i>National Language Design Guide: National Language Support Reference, Volume 2</i> , SE09-8002	Entire manual
<i>National Language Design Guide: Arabic Script Languages, Volume 3</i> , SE09-8003	Entire manual
<i>National Language Design Guide: Hebrew, Volume 4</i> , SE09-8004	Entire manual
<i>Printer Function Control User's Guide and Reference</i> , N:SH18-2409	Entire manual, DBCS
<i>Utilities: Advanced Page Printer Writer User's Guide and Reference</i> , N:SH18-2418 Short title: <i>Advanced Page Printer Writer User's Guide and Reference</i>	Entire manual, DBCS
<i>Utilities: Advanced Print Writer User's Guide and Reference</i> , SH18-2419 Short title: <i>Advanced Print Writer User's Guide and Reference</i>	Entire manual, DBCS

Table P-2 (Page 2 of 2). Related Information

Title, Order Number	Topic
<i>Utilities: IBM 5583 Kanji Print Function User's Guide, N:SH18-2179</i>	Entire manual, DBCS
Short title: <i>IBM 5583 Kanji Print Func- tion User's Guide</i>	
<i>Utilities: System/36 APW/KPF Migration Utilities User's Guide, N:SH18-2234</i>	Entire manual, DBCS
<i>5394 Remote Control Unit Setup Guide, GA27-3936</i>	National language considerations
<i>5394 Remote Control Unit Introduction and Installation Planning, SK2T-0316.</i>	National language considerations
<i>5494 Remote Control Unit Planning Guide, GA27-3936</i>	National language considerations
<i>5494 Remote Control Unit User's Guide, GA27-3960.</i>	National language considerations

Index

A

adding device

- display station 2-24
- printer 2-28
- workstation controller
 - ASCII 2-22
 - remote 2-22
 - twinaxial 2-22
- workstation customization 2-23

additional coding-related required information

- definition 1-6

Advanced DBCS Printer Support/400

- for national language support

Advanced Function Printing DBCS Fonts/400

- for national language support 4-6

Advanced Function Printing Utilities/400

- for national language support 4-7

advanced printer function

- definition 4-7

ALT key M-5

American Standard Code for Information Interchange (ASCII)

- definition 1-5

Application Development Tools

- for national language support 4-7

Application Dictionary Services/400

- for national language support 4-7

application program

- database definitions 3-25
- design consideration 3-3
- designing and coding for DBCS 3-49
- internationalized 3-1
- language or cultural considerations 3-12
- naming 3-23
- writing multilingual 3-1

Application Program Driver/400

- definition
- for national language support 4-8

Arabic

- bilingual, code page 420 (EBCDIC) N-15
- code page 1046 (Not ISO 1089) N-59
- code page 864 (IBM Personal Computer) N-34
- IBM Enhanced keyboard M-1
- sort sequence H-3

AS/400

- Application Development Manager/400 4-7
- description 4-7
- licensed program
 - Advanced DBCS Printer Support/400 4-6
 - Advanced Function Printing DBCS Fonts/400 4-6
 - Advanced Function Printing Utilities/400 4-7

AS/400 (continued)

licensed program (continued)

- Application Development Tools 4-7
- Application Dictionary Services/400 4-7
- Application Program Driver/400 4-8
- BASIC 4-8
- Business Graphic Utility 4-8
- C/400 4-9
- CallPath/400 4-9
- CICS/400 4-9
- COBOL/400 4-10
- CoOperative Development Environment/400 4-10
- Cryptographic Support/400 4-10
- DataHub Support/400 4-21
- description 4-8
- distributed database 4-1
- for national language support 4-1
- FORTRAN/400 4-11
- Integrated Language Environment C/400 4-11
- Language Dictionaries/400 4-11
- library list 4-1
- OfficeVision/400 4-12
- OSI Communications Subsystems/400 4-15
- OSI File Services/400 4-15
- OSI Message Services/400 4-15
- Pascal 4-16
- PC Support/400 4-16
- Performance Tools/400 4-17
- PL/I 4-17
- Point-of-Sale Communications Utility/400 4-17
- Query/400 4-17
- Question-and-Answer Function (Q & A) 4-3
- REXX/400 4-3
- RM/COBOL-85 for the AS/400 4-19
- RPG/400 4-19
- SAA SystemView OMEGAMON Services/400 4-21
- SNA Distribution Services (SNADS) 4-4
- sort utility 4-4
- Structured Query Language/400 4-19
- System/36 Environment 4-5
- System/38 utilities 4-21
- SystemView Managed System Services/400 4-21
- SystemView System Manager/400 4-21
- TCP/IP Connectivity Utilities/400 4-22

AS/400 database and licensed program

- supported coded character set identifier (CCSID) F-1

AS/400 Pascal

- definition 4-16

AS/400 PL/I

definition
for national language support 4-17

AS/400 System/38 utilities

definition 4-21

ASCII (American standard code for information interchange) 1-5**ASCII workstation controller**

languages supported D-4
ordering for language support 2-22
types attached to the AS/400 system D-4

Austrian/German

122-key typewriter keyboard M-7
IBM Enhanced keyboard M-1

automatic configuration

definition 2-3

automatic conversion 2-3**B****BASIC**

for national language support 4-8

Belgian

122-key typewriter keyboard M-7
IBM Enhanced keyboard M-1

BGU (Business Graphics Utility) 4-8**bibliography P-1****bidirectional language**

AS/400 system 3-52
considerations 3-53
definition 1-4
design and coding guidelines 3-52
restrictions 3-53

bind, definition 3-18**Brazilian Portuguese**

IBM Enhanced keyboard M-2

Business Graphics Utility (BGU)

description
for national language support 4-8

C**C/400**

coded character set identifier (CCSID) 4-9
definition
for national language support 4-9

CallPath/400

description
for national language support 4-9

Canadian French

122-Key typewriter keyboard M-7
code page 260 (EBCDIC) N-4
code page 863 (IBM Personal Computer) N-33
IBM Enhanced keyboard M-2

CCITT T.61

code page 1024 (EBCDIC) N-50

CCITT T.61 (continued)

code page 1036 (IBM Personal Computer) N-54
graphic character conversions I-12

CCSID (coded character set identifier)

additional coding-related required information 1-6
definition 1-6
example 2-32
major limitations 2-16
other system components 2-14
recommendations 2-16
SAA C/400
trigraph support 3-41
substitution characters F-5
support 2-6
database management 2-7
need for 1-8
work management 2-6
supported by AS/400 database and licensed program F-1
values 2-6
work management support 2-6
workstation function management
display file 2-8
printer file 2-11
user interface manager 2-13

CDRA (Character Data Representation Architecture)

change management support 2-14
coded character set identifier (CCSID)
manuals 1-9
definition 1-6
implementation for NLS-enabling 3-37
migration 2-14

Change Display Description (CHGDEVDS) command

KBDTYPE parameter 2-24

Change Job (CHGJOB) command

job attributes 1-16

Change Job Description (CHGJOB) command

library list 3-24

Change Printer File (CHGPRTF) command

CHRID parameter 2-3

Change User Profile (CHGUSRPRF) command

CCSID (coded character set identifier)
parameter 1-15
CNTRYID (country identifier) parameter 1-15
LANGID (language identifier) parameter 1-15
SORTSEQ (sort sequence) parameter 1-15

changes since previous edition xxi**changing**

assign CCSID values 2-6
device
display stations 2-30
printer 2-31
workstation controllers 2-30
display station to MNCS 2-24
job attribute 2-5

- changing** (*continued*)
 - national-language-dependent functions in user profile 1-15
 - national-language-dependent job attributes 1-16
 - primary language
 - from an DBCS version to a SBCS version L-3
 - from an SBCS version to a DBCS version L-26
 - overview 2-1
 - secondary language 2-4
- character data**
 - Character Data Representation Architecture (CDRA)
 - coded character set identifier (CCSID) 1-6
 - character set
 - definition 1-3
 - groups 1-3
 - subgroups 1-3
 - code page 1-5
 - code point 1-5
 - coded character set identifier (CCSID)
 - additional coding-related required information 1-6
 - encoding scheme 1-5
 - national language sequence support
 - sort sequence table 1-10
- Character Data Representation Architecture (CDRA)**
 - change management support 2-14
 - coded character set identifier (CCSID)
 - manuals 1-9
 - definition 1-6
 - implementation for NLS-enabling 3-37
 - migration 2-14
- character generator utility**
 - definition 4-7
- character information**
 - Character Data Representation Architecture (CDRA)
 - coded character set identifier (CCSID) 1-6
 - character set
 - groups 1-3
 - subgroups 1-3
 - code page 1-5
 - code point 1-5
 - encoding scheme 1-5
 - graphic character set
 - definition 1-3
 - national language sequence support
- character set**
 - definition 1-3
- character-set identifier**
 - CHRID (character identifier) parameter value 1-5
 - definition 1-5
 - QCHRID (character identifier) system value 1-5
- CHGDEVDSP (Change Display Description) command**
 - KBDTYPE parameter 2-24
- CHGJOB (Change Job) command**
 - job attributes
 - LANGID 1-16
- CHGJOB (Change Job) command** (*continued*)
 - job attributes (*continued*)
 - SRTSEQ 1-16
- CHGPRTF (Change Printer File) command**
 - CHRID parameter 2-3
- CHRID (character identifier) parameter**
 - description 2-28
 - example 2-32
 - value 1-5
- CICS/400**
 - definition
 - for national language support 4-9
- CNTRYID (country identifier) parameter value**
 - definition 1-15
- COBOL/400**
 - definition
 - for national language support 4-10
- code page**
 - 037 (EBCDIC) USA/Canada N-2
 - 256 (EBCDIC) international #1 N-3
 - 260 (EBCDIC) Canadian French N-4
 - 273 (EBCDIC) Germany F. R./Austria N-5
 - 277 (EBCDIC) Denmark, Norway N-6
 - 278 (EBCDIC) Finland, Sweden N-7
 - 280 (EBCDIC) Italy N-8
 - 281 (EBCDIC) Japan (Latin) N-9
 - 284 (EBCDIC) Spain/Latin America N-10
 - 285 (EBCDIC) United Kingdom N-11
 - 290 (EBCDIC) Japanese (Katakana) extended N-13
 - 290 (EBCDIC) Japanese (Katakana) non-extended N-12
 - 297 (EBCDIC) France N-14
 - 420 (EBCDIC) Arabic bilingual N-15
 - 423 (EBCDIC) Greece N-16
 - 424 (EBCDIC) Israel (Hebrew) N-17
 - 435 (EBCDIC) Teletext Isomorphic N-18
 - 437 (IBM Personal Computer) USA N-19
 - 500 (EBCDIC) multilingual #5 N-20
 - 813 (ISO 8859, part 7) Greece N-21
 - 819 (ISO 8859, part 1) Latin Alphabet No. 1 N-22
 - 833 (EBCDIC) Korea extended N-23
 - 836 (EBCDIC) Simplified Chinese Extended N-24
 - 838 (EBCDIC) Thai Extended N-25
 - 838 (IBM Personal Computer) Latin, Iceland N-31
 - 850 (IBM Personal Computer) Multilingual N-26
 - 851 (IBM Personal Computer) Greece N-27
 - 852 (ISO 8859-2) Personal Computer N-28
 - 857 (ISO 8859-5) Turkey N-29
 - 860 (IBM Personal Computer) Portugal N-30
 - 862 (IBM Personal Computer) Israel N-32
 - 863 (IBM Personal Computer) Canadian French N-33
 - 864 (IBM Personal Computer) Arabic N-34
 - 865 (IBM Personal Computer) Nordic N-35
 - 869 (IBM Personal Computer) Greece N-36
 - 870 (ISO 8859-2) Multilingual N-37

code page *(continued)*

- 871 (EBCDIC) Iceland N-38
- 874 (IBM Personal Computer) Thai Extended N-39
- 875 (EBCDIC) Greece N-40
- 880 (EBCDIC) Cyrillic, Multilingual N-41
- 891 (IBM Personal Computer) Korea N-42
- 897 (IBM Personal Computer) Japan PC #1 N-43
- 903 (IBM Personal Computer) People's Republic of China (PRC) N-44
- 904 (IBM Personal Computer) Republic of China (ROC) N-45
- 905 (ISO 8859-9) Turkey N-46
- 916 (ISO 8859-8) Hebrew N-47
- 920 (ISO 8859-9) Turkey N-48
- 1009 international alphabet 5 (IA5) N-49
- 1024 (EBCDIC) CCITT T.61 N-50
- 1025 (EBCDIC) Cyrillic, Multilingual N-51
- 1026 (ISO 8859-9) N-52
- 1027 (EBCDIC) Japanese (Latin) Extended N-53
- 1036 (IBM Personal Computer) CCITT T.61 N-54
- 1040 (IBM Personal Computer) Korean Extended N-55
- 1041 (IBM Personal Computer) Japanese Extended N-56
- 1042 (IBM Personal Computer) Simplified Chinese Extended N-57
- 1043 (IBM Personal Computer) Traditional Chinese Extended N-58
- 1046 (Not ISO 1089) Arabic N-59
- 1051 (8-Bit) H-P Emulation, Roman 8 N-60
- 1088 (IBM Personal Computer) Korean N-61
- definition 1-5
- examples N-1
- mapping 2-2

code point

- conversion 1-7
- definition 1-5

code-page identifier

- CHRID (character identifier) parameter value 1-5
- definition 1-5
- QCHRID (character identifier) system value 1-5

coded character set identifier

- QCCSID system value 1-12

coded character set identifier (CCSID)

- additional coding-related required information 1-6
- definition 1-6
- example 2-32
- major limitations 2-16
- other system components 2-14
- recommendations 2-16
- SAA C/400
 - trigraph support 3-41
- substitution characters F-5
- support 2-6
 - database management 2-7
 - need for 1-8
 - work management 2-6

coded character set identifier (CCSID) *(continued)*

- supported by AS/400 database and licensed program F-1
- values 2-6
- work management support
 - display file 2-6
- workstation function management
 - printer file 2-11
 - user interface manager 2-13

command CL

- Create Spelling Aid Dictionary (CRTSPADCT) command 4-5
- CRTSPADCT (Create Spelling Aid Dictionary) command 4-5

command prompt display 3-36, 3-37**command, CL**

- Create Table (CRTTBL) 2-20
- CRTTBL (Create Table) 2-20
- Work with Message Description (WRKMSGD) command 4-14
- WRKMSGD (Work with Message Description) command 4-14

compile, definition of 4-20**configuration**

- automatic 2-3
- manual 2-3

considerations in a multilingual system,**example 3-38****constant text string 3-26****conversion**

- definition xx, 1-7

CoOperative Development Environment/400

- definition
 - for national language support 4-10

coordinated universal time offset (QUTCFFSET) system value 1-12**country extended character set 697 O-2****country identifier (QCNTYID) system value 1-12****country/keyboard computational factor**

- definition D-1

CPX8416 message

- example 3-14
- OfficeVision/400
 - after changing your primary language 4-13
 - secondary language values 2-21
 - techniques for coding 3-13

Create Device Description (Display) (CRTDEV DSP)**command**

- KBDTYPE parameter 2-24

Create Device Description (Printer) (CRTDEV PRT)**command**

- IPDS printer
 - CHRID (character identifier) parameter 2-29

Create Job Description (CRTJOB D) command

- library list 3-24

Create Printer File (CRTPRTF) command
 CHRID parameter 2-3

Create Source Physical File (CRTSRCPF) command
 IGCDTA parameter 2-35

Create Spelling Aid Dictionary (CRTSPADCT) command 4-5

Create Table (CRTTBL) command 2-20

Create User Profile (CRTUSRPRF) command
 CNTRYID (country identifier) parameter 1-15
 LANGID (language identifier) parameter 1-15

creating
 different national language version message 3-33
 special character M-5
 table 2-20

CRTDEVDS (Create Device Description (Display)) command
 KBDTYPE parameter 2-24

CRTDEVPRT (Create Device Description (Printer)) command
 IPDS printer
 CHRID (character identifier) parameter 2-29

CRTPRTF (Create Printer File) command
 CHRID parameter 2-3

CRTSPADCT (Create Spelling Aid Dictionary) command 4-5

CRTSRCPF (Create Source Physical File) command
 IGCDTA parameter 2-35

CRTTBL (Create Table) command 2-20
 sort sequence

Cryptographic Support/400
 definition
 for national language support 4-10

cultural consideration
 application program 3-12
 date formats 3-14
 date presentation 3-15
 date separators 3-15
 sequence tables 3-18
 time formats 3-16
 time presentation 3-17
 time separator 3-17

culture-dependent system functions 1-16

culture-dependent system values 1-12

cumulative PTF package
 definition 2-29

currency symbol (QCURSYM) system value 1-12

cursor positioning specifications 3-26

customizing device
 display station 2-24
 display station to MNCS 2-24
 host print transform 2-23
 printer 2-28
 workstation customization 2-23

Cyrillic
 Multilingual code page 1025 (EBCDIC) N-51
 multilingual, code page 880 (EBCDIC) N-41

Cyrillic (continued)
 sort sequence H-6

D

Danish

122-Key typewriter keyboard M-7
 IBM Enhanced Keyboard M-2
 sort sequence H-8

data file utility

Application Development Tools 4-7
 definition 4-7

data types

DBCS (double-byte character set)
 physical file and logical file 3-52

database definition 3-25

database file 1-18

database management support

conversion to and from database files 2-7
 default CCSID values 2-7

date and time formats 1-13

date format

QATFMT system value 1-12
 valid 3-14

date presentation (editing) 3-15

date separator

QDATSEP system value 1-12
 valid 3-15

day of the month (QDAY) system value 1-12

DBCS (double-byte character set)

data types
 description 3-49
 physical file and logical file 3-52
 definition 1-5
 designing and coding guideline 3-49
 enabling 3-48
 encoding 1-5
 languages 1-5

DBCS and SBCS

single system supporting 2-35

DBCS system indicator (QIGC) system value 1-12

DDM (Distributed Data Management) 1-9

decimal format (QDECFMT) system value 1-12

default character set and code page (QCHRID)

system value 1-12

default system values

feature codes
 system values B-1
 national language version B-1
 system values B-1

default values for input fields 3-27

Denmark, Norway, code page 277 (EBCDIC) N-6

design consideration

application program 3-3

designing and coding guideline

defining menus
 example, display file menu for national language version 3-34

designing and coding guideline *(continued)*

- display file
 - application panels 3-25
 - constant text string 3-26
 - cursor positioning specifications 3-26
 - default values for input fields 3-27
 - field editing specifications 3-26
 - field validation specifications 3-27
 - input and output fields 3-26
- enabling for DBCS 3-48
- high-level language 3-39
- menus
 - program file menu for national language version 3-35
- online help information
 - user interface manager 3-29
- organization of application parts
 - compatibility of NLS components 3-21
- printer file 3-30
- program message 3-32

designing and coding guidelines

- display file
 - error message 3-28
 - source files 3-39

designing application coding guidelines 3-20

device

- adding 2-24
- changing 2-30
- customizing 2-24
- installing 2-30

device character ID (CHRID)

- example 2-32

DFU/38 (System/38-Compatible Data File Utility) 4-21

direct coding on an unnamed output field (literal) 3-9

display file

- constant text strings 3-26
- cursor positioning specifications 3-26
- default values for input fields 3-27
- designing and coding guideline 3-25
- error message 3-28
- field editing specifications 3-26
- field validation specifications 3-27
- input and output fields 3-26
- keywords and command parameters 1-17

display part number

- 3477 and 3476 C-3
- 3486 and 3487 C-8

display station

- multilingual environment 2-21
- multinational character setting
 - 102-key keyboard 2-25
 - 122-key typewriter keyboard 2-25
 - 3180 2-25
 - 3196 2-25
 - 3197 2-25

display station *(continued)*

- multinational character setting *(continued)*
 - 3476 2-25
 - 3477 2-25
 - 3486 2-25
 - 3487 2-25
 - 5250 keyboard 2-25
 - how to configure 2-25
 - IBM-enhanced keyboard 2-25
 - pass-through 2-21, 2-24

Distributed Data Management (DDM)

- definition 1-9

Distributed Relational Database Architecture (DRDA)

- definition 1-9

double-byte character set (DBCS)

- data types
 - description 3-49
 - physical file and logical file 3-52
- definition 1-5
- designing and coding guideline 3-49
- enabling 3-48
- encoding 1-5
- languages 1-5

DRDA (Distributed Relational Database Architecture)

- definition 1-9

Dutch

- IBM Enhanced keyboard M-2

E

early binding of messages 3-9

EBCDIC (extended binary coded decimal interchange code) 1-5

enabling

- bidirectional language
 - considerations 3-53
 - restrictions 3-53
- for DBCS 3-48
- for special languages 3-53

enabling for bidirectional language

- design and coding guidelines 3-52

enabling for special languages

- bidirectional language
 - layout of a display 3-54

encoding scheme

- definition 1-5

error message 3-28

example

- application in two different language versions 3-24
- command prompt display in English 3-36
- command prompt display in German 3-37
- considerations in a multilingual system 3-38
- create different NLV reports from printer piles 3-31
- creating different national language version message 3-33
- creating printer files 3-31

example *(continued)*

- direct coding on unnamed output field (literal)
- display file menu 3-34
- English uppercase and lowercase NLV display 3-14
- layout of display for bidirectional languages 3-54
- message CPX8416 3-14
- organization of application parts 3-22
- printer files
 - creating 3-31
- program file menu 3-35
- RPG program using variant characters 3-40
- single AS/400 system with single (primary) national language (Spanish) 1-18
- single system with DBCS as the primary language
 - DBCS and SBCS as secondary languages 2-35
- single system with single language 1-18
- single system with Spanish as the primary language and multiple secondary languages 2-32
- three systems, each using a different primary language 2-37
- use of English display station to enter German characters 2-25
- use of Italian display station to enter German characters 2-26

Extended Binary Coded Decimal Interchange Code (EBCDIC)

- definition 1-5

F

feature code

- national language version chart A-1
- program library A-1

field editing specifications 3-26

field reference file

- defining fields 3-24

field validation specifications 3-27

Finland, Sweden, code page 278 (EBCDIC) N-7

Finnish

- sort sequence table H-37

Finnish/Swedish

- 122-key typewriter keyboard M-7
- IBM Enhanced keyboard M-2

FORTRAN/400

- definition
 - for national language support 4-11

France, code page 297 (EBCDIC) N-14

French

- (AZERTY) IBM Enhanced keyboard M-2
- AZERTY 122-key typewriter keyboard M-7

G

GDDM (graphical data display manager) 4-2

Germany F.R./Austria, code page 273 (EBCDIC) N-5

graphic character

- definition 1-3

graphic character conversion table

- AS/400 system 1-1
- CCITT T.61 1-12
- monocase tables 1-14

graphic character set

- 1252 character set of T.61 code page O-3
- 1253 T.61 character repertoire O-4
- 640 syntactic/invariant O-1
- 697 country extended O-2
- country with extended O-1
- definition 1-3
- T.61 O-1

graphical data display manager (GDDM) 4-2

Greece

- code page 423 (EBCDIC) N-16
- code page 813 (ISO 8859, part 7) Greece N-21
- code page 851 (IBM Personal Computer) N-27
- code page 869 (IBM Personal Computer) N-36
- code page 875 (EBCDIC) N-40

Greek

- IBM Enhanced keyboard M-2
- sort sequence H-11

H

H-P Emulation

- code page 1051 (8-Bit) N-60

Hebrew

- code page 916 (ISO 8859-8) N-47

Hebrew sort sequence table H-14

high-level language

- database definition 3-25
- designing and coding guideline 3-39
- program
 - using in application 3-42

host print transform, definition of 2-23

I

Iceland

- code page 838 (IBM Personal Computer)
 - Latin N-31
- code page 871 (EBCDIC) N-38

Icelandic sort sequence table H-17

IDDU (interactive data definition utility) 4-2

indexing

- definition 4-14
- text search services 4-14

input and output fields 3-26

installing

- device
 - display stations 2-30
 - IPDS 2-31
 - SCS 2-31
 - workstation controllers 2-30

installing *(continued)*

hardware and the software PTFs 2-30

instructions for changing primary language

from DBCS to SBCS L-3

overview 2-1

SBCS to DBCS L-26

Integrated Language Environment C/400

description

for national language support 4-11

intelligent printer data stream (IPDS)

definition 2-28

interface

system and user 2-2

International #1, code page 256 (EBCDIC) N-3

international alphabet 5 (IA5)

code page 1009 N-49

internationalized application

application design 3-3

application maintenance 3-6

defining menus 3-33

definition 3-1

design 3-3

development process 3-2

documentation 3-4

education 3-3

implementing 3-3

localized support 3-1

NLS-enabled 3-1

packaging and installation 3-5

planning 3-2

purpose 3-3

testing 3-5

translation process 3-4

education 3-4

glossary 3-5

guidelines and instructions 3-5

physical equipment 3-4

tools 3-4

user interface 3-6

users of application 3-1

Israel

(Hebrew), code page 424 (EBCDIC) N-17

code page 862 (IBM Personal Computer) N-32

Latin/Hebrew IBM Enhanced keyboard M-2

Italian

122-Key typewriter keyboard M-7

IBM Enhanced keyboard M-2

Italy, code page 280 (EBCDIC) N-8

J

Japanese

code page 281 (EBCDIC) (Latin) N-9

code page 290 (EBCDIC) (Katakana)

extended N-13

code page 290 (EBCDIC) (Katakana)

non-extended N-12

Japanese *(continued)*

code page 897 (IBM Personal Computer) N-43

code page 1027 (EBCDIC) Latin Extended N-53

code page 1041 (IBM Personal Computer)

Extended N-56

IBM Enhanced keyboard M-2

Katakana 124-Key typewriter keyboard M-7

sort sequence table H-20

job attributes 1-16

K

Katakana

code page 290 (EBCDIC) Japanese Extended N-13

code page 290 (EBCDIC) Japanese

non-extended N-12

Japanese 124-Key typewriter keyboard M-7

keyboard layout

103/104 IBM enhanced keyboard (Non-U.S.) M-1

122 and 124-key typewriter keyboard

(Non-U.S.) M-7

Arabic Speaking M-1

Austrian/German M-1, M-7

Belgian M-1, M-7

Brazilian Portuguese M-2

Canadian French M-2, M-7

Danish M-2, M-7

Dutch M-2

Finnish/Swedish M-2, M-7

French (AZERTY) M-2, M-7

German/Austrian M-7

Greek M-2

Israel Latin/Hebrew M-2

Italian M-2, M-7

Japanese M-2

Japanese Katakana M-7

Korean M-2

Norwegian M-2, M-7

Portuguese M-3, M-7

Simplified Chinese M-3

Spanish M-3, M-8

Spanish-Speaking M-3, M-8

Swedish/Finnish M-7

Swiss-Bilingual-French M-3, M-8

Swiss-Bilingual-German M-3, M-8

Traditional Chinese M-3

Turkey M-3

U.K. English M-3, M-8

U.S. English M-3, M-8

keyboard part number

3477 and 3476 C-3

3486 and 3487 C-8

keyboard style

special-character

ALT key M-5

shift M-5

uppercase M-5

keyboard type

- ASCII workstation controller D-1
- country D-1
- EBCDIC SBCS code page C-1
- IBM personal computer SBCS code page C-1
- KBDFTYPE parameter C-1, D-1
- multilingual support D-1
- national language C-1
- twinaxial workstation controller D-1

Korean

- code page 1040 (IBM Personal Computer) Extended N-55
- code page 1088 (IBM Personal Computer) N-61
- code page 833 (EBCDIC) Korea N-23
- code page 891 (IBM Personal Computer) N-42
- IBM Enhanced keyboard M-2
- sort sequence table H-22

L

LANGID (language identifier) parameter value

- definition 1-15
- text search services 4-14

language

- multiple systems and multiple 2-37
- primary
 - changing 2-1
 - using 2-1
- secondary
 - changing 2-4
 - using 2-4
- single system with multiple 2-32

language character keyboard (QKBDTYPE) system value 1-12

language consideration

- application program 3-12
- date formats 3-14
- date presentation 3-15
- date separators 3-15
- sequence tables 3-18
- time formats 3-16
- time presentation 3-17
- time separator 3-17

Language Dictionaries/400

- for national language support 4-11

language identifier (LANGID) parameter value

- definition 1-15
- text search services 4-14

language identifier (QLANGID) system value 1-12

language-dependent system functions 1-16

language-dependent system values 1-12

language, single system with single 1-18

late binding of messages 3-10

Latin #5, Thai, code page 838 (EBCDIC) N-25

Latin 1

- code page 819 (ISO 8859, part 1) N-22

Latin 2

- code page 852 (ISO 8859-2) N-28

Latin-1

- sort sequence table H-25

Latin-2

- sort sequence table H-28

leap year adjustment (QLEAPADJ) system value 1-12

library list

- creating and changing 3-24

licensed program

- for national language support 4-1
- graphical data display manager
 - for national language support 4-2
- OS/400 distributed database
 - for national language support 4-1
- OS/400 interactive data definition utility
 - for national language support
- OS/400 library list
 - for national language support
- OS/400 Question-and-Answer Function (Q & A)
 - for national language support 4-3
- OS/400 System/36 environment
 - for national language support 4-5
- PC Support/400
 - RUMBA/400 4-17
- REXX/400
 - for national language support 4-3
- RUMBA/400 4-17
- secondary national language version A-2
- SNA Distribution Services (SNADS)
 - for national language support 4-4
- storage requirements 2-21
- Structured Query Language/400
 - SQL/400 Query Manager 4-20
- TCP/IP Connectivity Utilities/400
 - for national language support 4-22

localized

- definition 3-1

M

manual configuration

- definition 2-3

measurement systems 1-13

media error

- during RSTLIB procedure L-19, L-44

menu 1-18

menus

- defining for internationalized applications 3-33

message CPX8416

- example 3-14

message queue

- See also System Operator's Guide, SC41-8082*
- working with L-20, L-45

- messages, creating different national language version** 3-33
- migration**
 - OS/400 support 2-14
- mixed CCSID**
 - definition 1-6
- MNCS (multinational character set)** 2-2
- monetary values** 1-13
- monocase conversion tables** I-14
- month of the year (QMONTH) system value** 1-12
- multilingual**
 - application
 - guidelines 3-20
 - code page 850 (IBM Personal Computer) N-26
 - code page 870 (ISO 8859-2) N-37
 - environment
 - consideration 2-21
 - network
 - multiple languages 2-37
 - multiple systems 2-37
 - support
 - country D-1
 - definition 2-1
 - KBDDTYPE D-1
 - keyboard type D-1
 - multiple languages 2-1
 - planning checklist 2-39, E-1
 - primary language 2-1
 - secondary language 2-1
 - using 2-32
 - workstation controller D-1
- Multilingual #5, code page 500 (EBCDIC)** N-20
- multinational character set (MNCS)**
 - definition 2-2
- multiple languages**
 - multiple systems 2-37
 - single system with 2-32
- multiple systems**
 - multiple languages
 - example 2-37

N

- naming application parts** 3-23
- national language**
 - application 3-20
 - changing your primary 2-1
 - changing your secondary 2-4
 - display part number
 - 3477 and 3476 C-3
 - 3486 and 3487 C-8
 - display part numbers C-3
 - KBDDTYPE parameter C-1
 - keyboard part number
 - 3477 and 3476 C-3
 - 3486 and 3487 C-8

- national language (continued)**
 - keyboard part numbers C-3
 - keyboard type C-1
 - SBCS code pages C-1
 - support
 - AS/400 licensed program 4-1
 - AS/400 manuals P-1
 - definition 1-1
 - other printed information P-1
 - planning checklist E-1
 - using your primary 2-1
 - using your secondary 2-4
- national language version**
 - default system values B-1
 - definition 1-1, 1-2
 - feature codes
 - order numbers A-1
 - feature codes for system value B-1
 - primary 1-1
 - program library A-1
 - working with 1-1
- national-language-dependent function**
 - date and time formats 1-13
 - definition 1-13
 - measurement systems 1-13
 - monetary values 1-13
- NLS support, AS/400 licensed program** 4-1
- NLS-enabled product**
 - definition 3-1
- Nordic, code page 865 (IBM Personal Computer)** N-35
- Norwegian**
 - 122-key typewriter keyboard M-7
 - IBM Enhanced keyboard M-2
 - sort sequence table H-30

O

- OfficeVision/400**
 - after changing your primary language
 - code page considerations 4-13
 - CPX8416 message 4-14
 - default values 4-13
 - before changing your primary language 4-12
 - definition
 - for national language support 4-12
 - text search services
 - language identifier 4-14
 - using double-byte character set data 4-14
- online help information**
 - choosing the online help method 3-29
 - defining 3-29
 - help design guidelines 3-30
 - translation guidelines 3-30
- ordering equipment and software**
 - display station 2-24

ordering equipment and software *(continued)*

printer 2-28
workstation controller 2-22

OS/400

CCSID support 2-6
distributed database 4-1
graphical data display manager 4-2
 definition 4-2
interactive data definition utility
 definition 4-2
library list 4-1
licensed program
 spellchecking 4-5
Question-and-Answer Function (Q & A) 4-3
REXX/400
 definition 4-3
SNA Distribution Services (SNADS)
 definition 4-4
sort utility
 definition 4-4
 for national language support 4-4
 graphic data type 4-4
 spellchecking 4-5
System/36 environment 4-5

OSI Communications Subsystems/400

definition
 for national language support 4-15

OSI File Services/400

definition
 for national language support 4-15

OSI Message Services/400

definition
 for national language support 4-15

P

page, code N-1—N-60

panel group 1-18

 definition 3-29

Pascal, AS/400

description
 for national language support 4-16

PC Support/400

alternative graphic J-1
definition
 for national language support 4-16
EBCDIC MRI code page J-1
IBM personal computer primary MRI code page J-1
IBM personal computer secondary code page J-1
keyboards
 5250 J-1
 Enhanced G (Graphic) J-1
 PC J-1
language ID J-1
Layer 100 (special-character keyboard set) J-1
lock state (determines keyboard lock state)
 Alt key J-1

PC Support/400 *(continued)*

lock state (determines keyboard lock state) *(continued)*

 base key J-1

 shift key J-1

 national language version feature J-1

 numeric pad J-1

 primary using country J-1

People's Republic of China (PRC)

 code page 903 (IBM Personal Computer) N-44

Performance Tools/400

definition

 for national language support 4-17

personal computer USA, code page 437 N-19

physical file description

 working with database definitions 3-25

planning checklist

 multilingual support 2-39, E-1

 national language support 1-20, 2-39, E-1

Point-of-Sale Communications Utility/400 program

definition

 for national language support 4-17

Portugal

 code page 860 (IBM Personal Computer) N-30

Portuguese M-7

 122-key typewriter keyboard

 IBM Enhanced keyboard M-3

primary language

 changing 2-1

 definition 1-2

 program temporary fix 2-29

 using your 2-1

printer

 interpreting code points 2-28

 IPDS 2-28, 2-31

 ordering equipment and software 2-28

 SCS 2-31

printer file 1-17, 3-30

program library

 feature codes chart A-1

 national language version chart A-1

program message 3-32

program temporary fix

 definition 2-29

 primary language 2-29

 secondary language 2-29

programming development manager (PDM)

 definition 4-8

PTF considerations 2-29

Q

QCCSID (coded character set identifier) system

 value 1-12, B-1

QCHRID (character identifier) system value 1-5,

 B-1

QCHRID (default character set and code page)
 system value 1-12

QCNTYID (country identifier) system value 1-12, B-1

QCURSYM (currency symbol) system value 1-12, B-1

QDATE (system date) system value 1-12

QDATFMT (date format) system value 1-12, B-1

QDATSEP (date separator) system value B-1

QDATSEP (separator for dates) system value 1-12

QDAY (day of the month) system value 1-12

QDECFMT (decimal format) system value 1-12, B-1

QIGC (DBCS indicator) system value B-1

QIGC (DBCS system indicator) system value 1-12

QKBDTYPE (keyboard type) system value B-1

QKBDTYPE (language character keyboard) system value 1-12

QLANGID (language identifier) system value 1-12, B-1

QLEAPADJ (leap year adjustment) system value 1-12

QMONTH (month of the year) system value 1-12

QSRTSEQ (sort sequence) system value 1-12

QSYSLIBL (system part of library list) system value 1-12

QTIMSEP (time separator) system value 1-12, B-1

Query/38 (System/38-Compatible Query Utility) 4-21

Query/400
 coded character set identifier (CCSID) 4-17
 definition
 for national language support 4-17
 language collating sequence 4-17

QUTCFFSET (coordinated universal time offset) system value 1-12

QYEAR (year) system value 1-12

R

referring to specifications 3-24

related information P-1

remote workstation controller 2-22

replacing
 release using manual installation
 verifying installation L-48

report layout utility (RLU)
 definition 4-8

Republic of China (ROC)
 code page 904 (IBM Personal Computer) N-45

RLU (report layout Utility)
 definition 4-8

RM/COBOL-85 for the AS/400
 definition 4-19
 for national language support 4-19

RPG/400 licensed program
 definition
 for national language support 4-19

RPG/400 licensed program (*continued*)
 sort sequence support 3-43

RUMBA/400
 definition
 for national language support 4-17

Russian
 sort sequence table H-33

S

SAA AD/Cycle Application Development Manager, AS/400
 description 4-7
 for national language support 4-7

SAA SystemView OMEGAMON
 definition
 for national language support 4-21

SBCS (single-byte character set) 1-5

SBCS and DBCS
 single system supporting 2-35

screen design aid (SDA)
 definition 4-8

SDA (screen design aid)
 definition 4-8

secondary language
 changing your 2-4
 definition 1-2
 program temporary fix 2-29
 requirements 2-3
 using your 2-4

secondary national language version
 for licensed programs A-2

separator for dates (QDATSEP) system value 1-12

service tool
 messages 2-2
 online help information 2-2
 panels 2-2

setting up national language version
 language feature code 1-2
 primary language 1-2
 secondary languages 1-2

shared weight
 definition 1-15

shared-weight sort sequence
 definition 1-10

Shift key M-5

Simplified Chinese
 code page 1042 (IBM Personal Computer)
 Extended N-57
 IBM Enhanced keyboard M-3

Simplified Chinese Extended
 code page 836 (EBCDIC) N-24

single language, single system with 1-18

single system
 supporting DBCS and SBCS
 example 2-35

- single system** *(continued)*
 - with multiple languages 2-32
 - example 2-34
 - with single language 1-18
- single system supporting DBCS primary and DBCS secondary**
 - example 2-36
- single-byte character set (SBCS)**
 - definition 1-5
- sort sequence (QSYSLIBL) system value 1-12**
- sort sequence table**
 - Arabic H-3
 - available on system H-1
 - building tables 2-19
 - COBOL/400 licensed program 3-45
 - Create Table (CRTTBL) command 2-20
 - CRTTBL (Create Table) command 2-20
 - Cyrillic H-6
 - Danish H-8
 - database management 2-18
 - definition 1-10
 - Finnish H-37
 - Greek H-11
 - Hebrew H-14
 - Icelandic H-17
 - implementation notes 2-21
 - Japanese H-20
 - Korean H-22
 - Latin-1 H-25
 - Latin-2 H-28
 - Norwegian H-30
 - other system components 2-20
 - overview H-1
 - PC Support/400 licensed program 3-47
 - RPG/400 licensed program 3-43
 - Russian H-33
 - shared weight 1-15
 - Spanish-speaking H-35
 - specifying CL or HLL program 3-18
 - SQL/400 licensed program 3-46
 - Swedish H-37
 - system support 2-17
 - Thai H-39
 - Turkish H-42
 - unique weight 1-15
 - work management
 - job level 2-17
 - system level 2-17
 - user level 2-17
- source entry utility**
 - definition 4-8
- source files**
 - designing and coding guidelines 3-39
- Spain/Latin America, code page 284 (EBCDIC) N-10**
- Spanish**
 - 122-key typewriter keyboard M-8

- Spanish** *(continued)*
 - IBM Enhanced keyboard M-3
- Spanish-Speaking**
 - 122-Key typewriter keyboard M-8
 - IBM Enhanced keyboard M-3
 - sort sequence table H-35
- special character**
 - ALT key M-5
 - creating M-5
 - example M-7
 - Shift key M-5
- special-character keyboard set**
 - keyboard style M-5
- spellchecking**
 - OS/400 licensed program
 - for national language support 4-5
- SQL/400 Query Manager**
 - definition 4-20
 - for national language support 4-20
- storage requirements for licensed program 2-21**
- storing text in database files 3-11**
- Structured Query Language/400**
 - definition
 - for national language support 4-19
- substitution characters F-5**
- support, multilingual 2-21**
- Swedish**
 - sort sequence table H-37
- Swiss-Bilingual-French**
 - 122-key typewriter keyboard M-8
 - IBM Enhanced keyboard M-3
- Swiss-Bilingual-German**
 - 122-key typewriter keyboard M-8
 - IBM Enhanced keyboard M-3
- syntactic/invariant character set 640**
- system and user interface 2-2**
- System CCSID implementation**
 - workstation function management
 - user interface manager 2-13
- system date (QDATE) system value 1-12**
- system functions, language-dependent or culture-dependent**
 - CCSID Parameter 1-16
 - CHRID Parameter 1-16
 - display file 1-16
 - LANGTYPE Parameter 1-16
 - panel groups 1-16
 - printer file 1-16
 - TIME, TIMESTAMP, and DATE 1-16
 - UIM menus 1-16
- system part of library list (QSYSLIBL) system value 1-12**
- system supporting DBCS and SBCS 2-35**
- system value**
 - chart
 - QCCSID (coded character set identifier) B-1
 - QCHRID (character set/code page) B-1

system value *(continued)*

chart *(continued)*

QCNTYID (country identifier) B-1
QCURSYM (currency symbol) B-1
QDATFMT (date format) B-1
QDATSEP (date separator) B-1
QDECFMT (decimal format) B-1
QIGC (DBCS indicator) B-1
QKBDTYPE (keyboard type) B-1
QLANGID (language identifier) B-1
QTIMSEP (time separator) B-1

culture-dependent 1-12

for languages without a national language

version B-10

language-dependent 1-12

national-language-dependent

QCCSID 1-15

QCHRID 1-15

QCNTYID 1-15

QDECFMT 1-15

QLANGID 1-15

QSRTSEQ 1-15

QSYSLIBL 1-15

system with multiple languages 2-32

system with single language 1-18

System/38 utilities, AS/400

description

for national language support 4-21

System/38-Compatible Data File Utility (DFU/38)

definition 4-21

System/38-Compatible Query Utility (Query/38)

definition 4-21

**System/38-Compatible Text Management Utility
(Text Management/38)**

definition 4-22

**SystemView Information Warehouse DataHub
Support/400**

definition

for national language support 4-21

SystemView Managed System Services/400

definition

for national language support 4-21

SystemView System Manager/400

definition

for national language support 4-21

T

T.61

character repertoire O-4

definition 4-16

table

CCITT T.61 graphic character conversions 1-12

character conversion 1-1

creating 2-20

monocase 1-14

table *(continued)*

sort sequence H-1

substitution character F-5

TCP/IP (TELNET Communications Protocol) 4-22

techniques for coding message

CPX8416 3-13

early binding of messages 3-9

late binding of messages 3-10

storing text in database files 3-11

teletext isomorphic, code page 435 (EBCDIC)

TELNET Communications Protocol (TCP/IP) 4-22

temporary fix considerations 2-29

**Text Management/38 (System/38-Compatible Text
Management Utility)** 4-22

textual data

definition 1-1

Thai

code page 874 (IBM Personal Computer) N-39

sort sequence table H-39

time formats 3-16

time presentation (editing) 3-17

time separator

QTIMSEP system value 1-12

valid 3-17

Traditional Chinese

code page 1043 (IBM Personal Computer)

Extended N-58

IBM Enhanced keyboard M-3

Turkey

code page 1026 (ISO 8859-9) N-52

code page 857 (ISO 8859-5) Turkey N-29

code page 905 (ISO 8859-9) N-46

code page 920 (ISO 8859-9) N-48

IBM Enhanced keyboard M-3

Turkish

sort sequence table H-42

twinaxial workstation controllers 2-22

U

U.K. English

122-key typewriter keyboard M-8

IBM Enhanced keyboard M-3

U.S. English

122-key typewriter keyboard M-8

IBM Enhanced keyboard M-4

unique weight

definition 1-15

unique-weight sort sequence

definition 1-10

United Kingdom, code page 285 (EBCDIC) N-11

USA/Canada 037 (EBCDIC) N-2

user interface

coding techniques 3-8

considerations 3-6

description 2-2

user interface *(continued)*

- high-level language programs 3-42
- translation 3-6

user interface manager

- definition 3-29
- menus 2-13
- panel groups 2-13

using

- multilingual environment 2-32
- multilingual support 2-32
- national language support 1-1
- your primary language 2-1
- your secondary language 2-4

V

values, language-dependent and culture-dependent system 1-12, B-1

version, national language 1-1, A-1

W

work management support 2-6

Work with Message Description (WRKMSGD)

command 4-14

working with the PTF process 2-29

workstation controller

- ASCII 2-22
- remote 2-22
- Twinaxial 2-22

workstation customization

- definition 2-23
- devices supported 2-23
- host print transform 2-23
- mapping tables 2-23

workstation function management

- display file 2-8
- panel group 2-13
- printer file 2-11
- UIM menu 2-13

writing application

- coded character set identifier (CCSID)
 - enabling 3-37
- guidelines
 - coding 3-20
 - design 3-20

writing guideline

- national language 3-20

writing internationalized application

- defining menus 3-33
- designing and coding guidelines
 - commands 3-35
 - organization of application parts 3-20
- enabling for DBCS 3-48
 - designing and coding guideline 3-48

writing internationalized application *(continued)*

- national language support
 - referring to specifications 3-24
- organization of applications
 - naming conventions 3-23
- organization of parts
 - separate program modules 3-20

WRKMSGD (Work with Message Description)

command 4-14

X

X.400

- definition 4-16

Y

year (QYEAR) system value 1-12

Readers' Comments—We'd Like to Hear from You!

Application System/400
National Language Support
Planning Guide
Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				

THANK YOU!

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
 - Fax it
- United States and Canada: **800+937-3430**
Other countries: **(+1)+507+253-5192**
- Hand it to your IBM representative.

Note that IBM may use or distribute the responses to this form without obligation.

Name

Address

Company or Organization

Phone No.



Cut
Along

Fold and Tape

Please do not staple

Fold and Tape



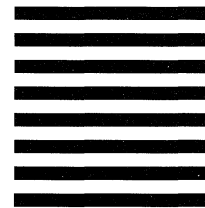
NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Cut
Along

Readers' Comments—We'd Like to Hear from You!

Application System/400
National Language Support
Planning Guide
Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				

THANK YOU!

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
- Fax it
- United States and Canada: **800+937-3430**
- Other countries: **(+1)+507+253-5192**
- Hand it to your IBM representative.

Note that IBM may use or distribute the responses to this form without obligation.

Name

Address

Company or Organization

Phone No.



Cut
Along

Fold and Tape

Please do not staple

Fold and Tape



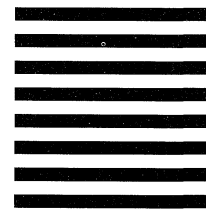
NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Cut o
Along

Readers' Comments—We'd Like to Hear from You!

Application System/400
National Language Support
Planning Guide
Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				

THANK YOU!

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
- Fax it
 - United States and Canada: **800+937-3430**
 - Other countries: **(+1)+507+253-5192**
- Hand it to your IBM representative.

Note that IBM may use or distribute the responses to this form without obligation.

Name

Address

Company or Organization

Phone No.

Readers' Comments—We'd Like to Hear from You!
GC41-9877-03



Cut
Along

Fold and Tape

Please do not staple

Fold and Tape



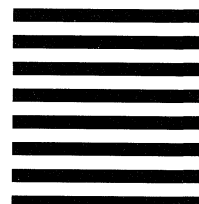
NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Readers' Comments—We'd Like to Hear from You!

Application System/400
National Language Support
Planning Guide
Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				

THANK YOU!

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
 - Fax it
 - Hand it to your IBM representative.
- United States and Canada: **800+937-3430**
Other countries: **(+1)+507+253-5192**

Note that IBM may use or distribute the responses to this form without obligation.

Name

Address

Company or Organization

Phone No.

Readers' Comments—We'd Like to Hear from You!
GC41-9877-03

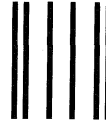


Cut
Along

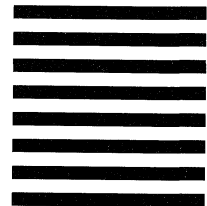
Fold and Tape

Please do not staple

Fold and Tape



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Readers' Comments—We'd Like to Hear from You!

Application System/400
National Language Support
Planning Guide
Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				
THANK YOU!				

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
- Fax it
 - United States and Canada: **800+937-3430**
 - Other countries: **(+1)+507+253-5192**
- Hand it to your IBM representative.

Note that IBM may use or distribute the responses to this form without obligation.

Name

Address

Company or Organization

Phone No.



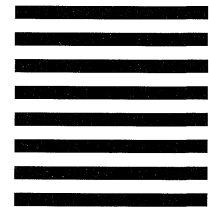
Fold and Tape

Please do not staple

Fold and Tape



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Readers' Comments—We'd Like to Hear from You!

Application System/400
National Language Support
Planning Guide
Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				

THANK YOU!

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
- Fax it
 - United States and Canada: **800+937-3430**
 - Other countries: **(+1)+507+253-5192**
- Hand it to your IBM representative.

Note that IBM may use or distribute the responses to this form without obligation.

Name _____

Address _____

Company or Organization _____

Phone No. _____

Readers' Comments—We'd Like to Hear from You!
GC41-9877-03



Cut
Along

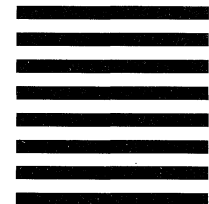
Fold and Tape

Please do not staple

Fold and Tape



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Readers' Comments—We'd Like to Hear from You!

Application System/400
 National Language Support
 Planning Guide
 Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				

THANK YOU!

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
 - Fax it
 - Hand it to your IBM representative.
- United States and Canada: **800+937-3430**
 Other countries: **(+1)+507+253-5192**

Note that IBM may use or distribute the responses to this form without obligation.

Name _____

Address _____

Company or Organization _____

Phone No. _____



Fold and Tape

Please do not staple

Fold and Tape



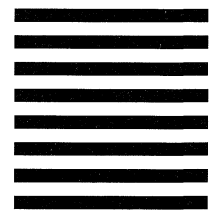
NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Readers' Comments—We'd Like to Hear from You!

Application System/400
National Language Support
Planning Guide
Version 2

Publication No. GC41-9877-03

Overall, how would you rate this manual?

	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Overall satisfaction				

How satisfied are you that the information in this manual is:

Accurate				
Complete				
Easy to find				
Easy to understand				
Well organized				
Applicable to your tasks				

THANK YOU!

Please tell us how we can improve this manual:

May we contact you to discuss your responses? Yes No

Phone: (____) _____ Fax: (____) _____

To return this form:

- Mail it
 - Fax it
- United States and Canada: **800+937-3430**
Other countries: **(+1)+507+253-5192**
- Hand it to your IBM representative.

Note that IBM may use or distribute the responses to this form without obligation.

Name _____

Address _____

Company or Organization _____

Phone No. _____



Cut
Along

Fold and Tape

Please do not staple

Fold and Tape



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN DEPT 245
IBM CORPORATION
3605 HWY 52 N
ROCHESTER MN 55901-9986



Fold and Tape

Please do not staple

Fold and Tape

Cut o
Along



Program Number: 5738-SS1

Printed in Ireland by Printech International plc

GC41-9877-03

