Tru64 UNIX

Technical Reference for Using Korean Features

August 2000

This guide provides the Korean-specific information and describes the Korean features
supported on the Compaq Tru64 UNIX system.

Software Version: Tru64 UNIX Version 5.1 or higher

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About This Manual

This guide provides Korean-specific information, such as character sets and locales, for end users and programmers so that they can develop internationalized applications in Korean locales on the Compaq Tru64 UNIX operating system. Details of the Korean features are also documented in this guide.

Intended Audience

This guide is intended for new and experienced end users and programmers who are interested in the Korean variant of the Compaq Tru64 UNIX operating system.

Structure of This Guide

This guide consists of nine chapters:

Chapter 1   Character Sets
            Describes the Korean character sets supported in the Compaq
            Tru64 UNIX operating system software

Chapter 2   Codesets and Codeset Conversion
            Describes the Korean codesets and the conversion among different
            codesets

Chapter 3   Locales
            Describes the Korean locales

Chapter 4   Local Language Devices
            Describes the local hardware devices that support the Korean
            locales

Chapter 5   Fonts
             Provides information on Korean fonts

Chapter 6   Keyboards
             Provides information on Korean keyboards

Chapter 7   Korean Input Methods
             Describes how to input Korean characters

Chapter 8   Korean Printing Support
             Introduces the Korean printing support

Chapter 9   Other Korean Features
             Describes other Korean features

Related Documents

Writing Software for the International Market

Programming for the World: A Guide to Internationalization, Sandra Martin
O'Donnell, Prentice Hall, 1994.

OSF/Motif User's Guide Revision 1.2, Open Software Foundation, Prentice Hall,
Englewood Cliffs, New Jersey 07632

OSF/Motif Style Guide Revision 1.2, Open Software Foundation, Prentice Hall,
Englewood Cliffs, New Jersey 07632

X Window System, Third Edition, Robert W. Scheifler and James Gettys, Digital
Press

Programmer's Supplement for Release 5 of the X Window System, Version 11,
David Flanagan, O'Reilly & Associates, Inc.

The Unicode Standard, Version 2.0, Unicode Inc., 1996, Addison-Wesley,
Reading, MA

*Information Technology-Universal Multiple-Octet Coded Character Set,
ISO/IEC 10646:* 1993

Conventions

The following typographical conventions are used in this manual:

% $	A percent sign represents the C shell system prompt. A dollar sign represents the system prompt for the Bourne and Korn shell.
#	A number sign represents the superuser prompt.
% **cat**	Boldface type in interactive examples indicates typed user input.
file	Italic (slanted) type indicates variable values, placeholders, and function argument names.
[|] {|}	In syntax definitions, brackets indicate items that are optional and braces indicate items that are required. Vertical bars separating items inside brackets or braces indicate that you choose one item from among those listed.
...	In syntax definitions, a horizontal ellipsis indicates that the preceding item can be repeated one or more times.
cat(1)	A cross-reference to a reference page includes the appropriate section number in parentheses. For example, cat(1) indicates that you can find information on the cat command in Section 1 of the reference pages.
[RETURN]	In an example, a key name enclosed in a box indicates that you press that key.
Ctrl/*x*	This symbol indicates that you hold down the first named key while pressing the key or mouse button that follows the slash. In examples, this key combination is enclosed in a box (for example [Ctrl/C]).

1

Character Sets

The Compaq Tru64 UNIX operating system software supports the following character sets that are relevant to the Korean language:

- KSC5636-1993
- KSC5601-1992
- Unicode
- ISO/IEC 10646

1.1 KSC5636-1993

This character set (published on January 6, 1993), formerly KSC5636-1989 (published on April 22, 1989) and sometimes referred to as KS-Roman, is the Korean analog to ASCII and ISO 646. The primary difference is that the ASCII backslash (0x5C) is represented as a Won symbol instead.

1.2 KSC5601–1992

This basic Korean character set standard enumerates 8,224 characters, 4,888 of which are Hanja, and 2,350 of which are precombined Hangul. The Hanja and Hangul blocks are arranged by reading (phonetically). The standard name has recently been changed to KS X 1001:1992. The more well-known name, KSC, is used throughout the book. The following is a break-down of the character set:

- Row 1: 94 symbols
- Row 2: 69 abbreviations and symbols
- Row 3: 94 full-width KSC5636-1993 characters
- Row 4: 94 Hangul elements

Character Sets

- Row 5: 68 lowercase and uppercase Roman numerals and lowercase and uppercase Greek alphabet

- Row 6: 68 line-drawing elements

- Row 7: 79 abbreviations

- Row 8: 91 phonetic symbols, circled characters, and fractions

- Row 9: 94 phonetic symbols, parenthesized characters, subscripts, and superscripts

- Row 10: 83 hiragana characters

- Row 11: 86 katakana characters

- Row 12: 66 lowercase and uppercase Cyrillic (Russian) alphabet

- Rows 16 through 40: 2,350 precombined Hangul (last is 40-94) characters

- Rows 42 through 93: 4,888 Hanja (last is 93-94) characters

Rows 41 and 94 are designated for user-defined characters.

The obsolete KSC5601-1987 character set is similar to the KSC5601-1992 character set. The 1992 edition provides more material in annexes.

Note that in the Hanja block (Rows 42 through 93), although there are 4,888 Hanja characters, not all are unique. The Hanja block is arranged by reading, and in those cases when a Hanja has more than one reading, that Hanja is duplicated (sometimes more than once) in the same character set. There are 268 such cases of duplicate Hanja characters in KSC5601-1992, therefore it contains 4,620 unique Hanja characters.

Korean Hangul characters are typically encoded in precombined form; 2 or 3 Hangul elements bound into a single character. The KSC5601-1992 character set enumerates 2,350 such precombined forms. While this number is sufficient for most purposes, it does not account for the total number of possible permutations. The encoding system that encodes all possible precombined Hangul characters is known as johab encoding (also known as "two-byte combination code" -- the Korean word "johab" means "combine"), and is described in Annex 3 of the KSC5601-1992 standard. This encoding is similar to encoding all possible three-letter words in English; while all combinations are possible, only a fraction represent real words.

Precombined Hangul can be composed of 19 initial, 21 medial, and 27 final Hangul elements (28 characters, if you count the placeholder). This provides a maximum of 11,172 precombined Hangul characters. Of these 67 Hangul elements, 51 are unique (some can occur in different positions). Each of these positions are encoded using five bits each (five bits can encode up to 32 unique objects). The encoding array looks as follows:

- Bit 1: always on

- Bits 2-6: initial Hangul element

- Bits 7-11: medial Hangul element

- Bits 12-16: final Hangul element

The initial and final elements are consonants, and the medial elements are vowels. This encoding must be treated as a 16-bit entity because the bit array of the medial Hangul element spans the first and second byte.

Figure 1–1: KSC5601 Character Set
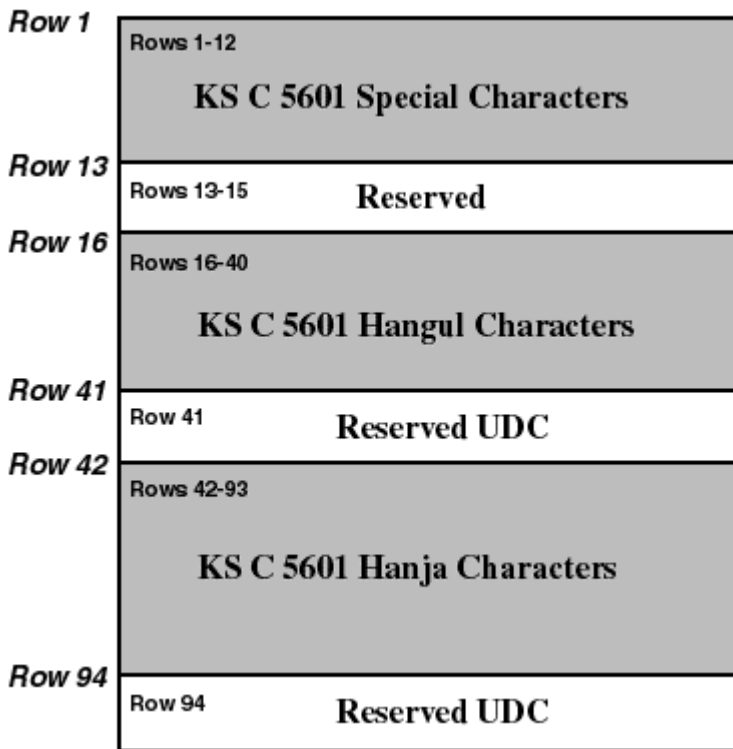
1.3 Unicode

The Unicode Standard, Version 3.0 specifies a universal character set (UCS) that contains definitions for 49,194 characters and also includes a Private Use Area for vendor- or user-defined characters. The main features of this character set are:

- All characters are treated as 16-bit units.

- Some nonspacing diacritic marks are defined, which can be combined with base characters in Unicode. For example, you can encode the character á as the 16-bit character *a* plus the 16-bit nonspacing grave accent. The result is a 32-bit composed

sequence. The Unicode standard provides rules for ordering characters so that parsing of character sequences is unambiguous.

- Characters have properties, such as base, numeric, spacing, combination, and directionality.

- The relationship between Unicode characters and the glyphs in the native language script that users see, type, or print is not necessarily one-to-one. A glyph may be mapped to a single character or a composite sequence. Conversely, more than one glyph can be mapped to a character.

- The ISO 8859-1 character set occupies the first 256 code positions (and the ASCII character set the first 128 positions) of the UCS.

1.4 ISO/IEC 10646

The ISO/IEC 10646 standard, which is specified in Information Technology-Universal Multiple-Octet Coded Character Set, ISO/IEC 10646, allows characters to be specified as either 32-bit units or like Unicode, as 16-bit units. In their 32-bit form, the 16-bit character values in Unicode are zero-extended.

2

Codesets and Codeset Conversion

The Compaq Tru64 UNIX operating system fully supports the following Korean codesets by including locales and codeset conversion support:

- DEC Korean
- Korean EUC (Extended UNIX Code)
- UTF-8

It also provides codeset conversion support for the following codesets:

- KSC5601 (Unified Hangul)
- ISO-2022-KR
- UCS-2/UCS-4

2.1 DEC Korean

The ASCII, KSC5636-1993 (KS Roman), and KSC5601-1992 character sets (excluding the additional Hangul characters defined an Annex 3 of the standard) are combined to form the DEC Korean codeset, which is denoted as `deckorean`.

DEC Korean uses a two-byte data representation for symbols and ideographic characters defined in KSC5601-1992. To differentiate KSC5601-1992 characters from ASCII, the most significant bit (MSB) of both bytes of KSC5601 characters is always set on.

Figure 2–1: Representations of DEC Korean Characters
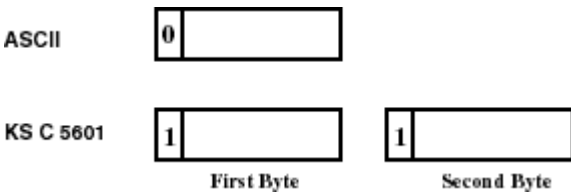
The first byte of a two-byte code determines its row number, while the second determines its column number. The following formula illustrates the code of a two-byte KSC5601 character in relation to its row and column numbers:

1st byte = A0 + row number

2nd byte = A0 + column number

For example, if a character is positioned at the first column of the 36th row, its encoding value is calculated as follows:

1st byte = A0 (hex) + 36 = C4 (hex)

2nd byte = A0 (hex) + 01 = A1 (hex)

In this case, the character code is C4A1.

Figure 2–2 illustrates the division of a two-byte code space and the position of KSC5601-1992 characters.

Figure 2–2: Code Space for KSC5601-1992
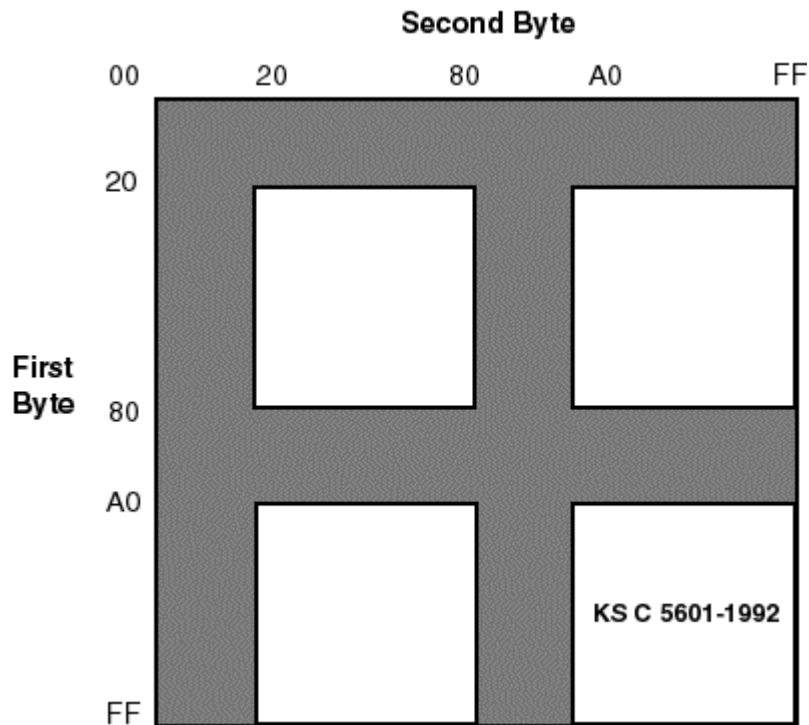
2.2 Korean EUC

Extended UNIX Code (EUC) is the codeset system extended by AT&T Bell Laboratories for use by various countries in the world. Korean EUC is the EUC codeset for representing Korean data. The encoding of Korean EUC is currently identical to that of DEC Korean, and is denoted as eucKR.

2.3 KSC5601 (Unified Hangul)

Microsoft has developed Unified Hangul Code (UHC) also known as "Extended Wansung" for its Windows 95 operating system. It is an optional character set of Win95K. Microsoft calls this Code Page 949.

UHC provides full compatibility with KSC5601-1992 EUC encoding, but adds additional encoding ranges to hold additional precombined Hangul characters (more precisely, the 8,822 that are needed to fully support the Johab character set). The following table provides the encoding ranges for UHC encoding:

Two-Byte Standard Characters	Encoding Ranges
First byte range	0x81-0xFE
Second byte ranges	0x41-0x5A, 0x61-0x7A and 0x81-0xFE

One-Byte Characters	Encoding Range
ASCII	0x21-0x7E

Note that the encoding ranges 0xA1A1 through 0xFEFE are identical in terms of character-to-code allocation with KSC5601-1992 in EUC Encoding.

2.4 ISO-2022-KR

The ISO-2022-KR codeset consists of the following character sets:

- ASCII

- KSC5601-1992

It is assumed that the starting code of the text is ASCII. ASCII and Korean characters are distinguished by use of the shift function. For example, the code SO indicates that the upcoming bytes are Korean characters as defined in KSC5601. To return to ASCII the SI code is used.

Therefore, the escape sequence, shift function, and character set used in a text are as follows:

Control Sequence	Character Set
SO	KSC5601-1992
SI	ASCII
ESC $) C	Appears once in the beginning of a line before any appearance of SO characters

Currently, the ISO-2022-KR codeset can be used in codeset conversion.

2.5 UCS-2/UCS-4

UCS is a standard character encoding for the universal character set specified in the Unicode and ISO/IEC 10646 standards. UCS has two forms; UCS-2 (16-bit, or 2 octet units) and UCS-4 (32-bit, or 4 octet units). Unicode uses the UCS-2 form, which is commonly used on personal computers. ISO/IEC allows either UCS-2 or UCS-4 encoding. UCS-4 encoding is in use on systems that can support the larger data unit size.

The current version of the Compaq Tru64 UNIX operating system supports both UCS-2 and UCS-4 encoding. UCS-4 is available in some Korean locales, and can be used in codeset conversion. For information about codeset conversion, see Section 2.7. For information about locales, see Chapter 3, Locales.

2.6 UTF-8

Unicode and ISO/IEC 10646 standards define transformation formats for the universal character set. For the most part, the following UCS transformation formats (UTFs) exist to transform UCS values into sequences of bytes to be handled by various byte-oriented protocols:

- UTF-8, the standard method for transforming UCS-4 or UCS-2 data into a sequence of 8-bit bytes and ensuring interchange transparency for characters from the ASCII character set (code positions 0 through 127).

- UTF-7, the standard interchange format for environments that strip the eighth bit from each byte.

- UTF-16, a transformation format that allows systems that can process only 16-bit units (specified by UCS-2 encoding) to support the extended character definition space that is included in UCS-4. In Compaq Tru64 UNIX, the UCS-2 encoding is the same as UTF-16.

The current version of the Compaq Tru64 UNIX operating system supports UTF-8. UTF-8 can be used in codeset conversion and in locales. For information about codeset conversion, see Section 2.7. For information about locale variants, see Chapter 3, Locales.

2.7 Codeset Conversion

The `iconv` utility provided by Compaq Tru64 UNIX converts the encoding of characters in one codeset to another and writes the results to standard output. The Korean codeset converters provided are shown in Table 2-1.

Table 2–1: Codeset Conversion

	DEC Korean	Korean EUC	ISO-2022-KR	KSC5601/cp949	UCS-2/ UTF-16	UCS-4	UTF-8
DEC Korean	-	Y	N	Y	Y	Y	Y
Korean EUC	Y	-	Y	N	N	N	N
ISO-2022-KR	N	Y	-	Y	N	N	N
KSC5601/cp949	Y	N	Y	-	Y	Y	Y
UCS-2/UTF-16	Y	N	N	Y	-	Y	Y
UCS-4	Y	N	N	Y	Y	-	Y
UTF-8	Y	N	N	Y	Y	Y	-

For example, you can enter the following command to convert a DEC Korean file to a Korean UTF-8 file:

```
% iconv -f deckorean -t UTF-8 <file>
```

Table 2-2 shows the codesets and the strings you use as parameters to the `iconv` utility.

Table 2–2: Codeset Names

Codeset	Parameter String
DEC Korean	Deckorean
Korean EUC	eucKR
ISO-2022-KR	ISO-2022-KR, iso-2022-kr
Unified Hangul	KSC5601, cp949
Universal Codeset	UCS-2, UCS-4
Universal Transfer Format	UTF-8

2.8 Codeset for Peripheral Devices

The Compaq Tru64 UNIX operating system provides a mechanism by which you configure your system to run applications with peripherals, such as terminals and printers, supporting different codesets. You can specify the codesets for the applications, terminals, and printers independently as shown in Table 2–3.

Table 2–3: Feasible Korean Codeset for Applications, Terminals, and Printers

Application Code	Terminal Code	Printer Code
DEC Korean	DEC Korean	DEC Korean
Korean EUC	Korean EUC	Korean EUC
UTF-8	UTF-8	

_____**Note** _____

The dxterm does not support UTF-8 as a terminal code. Use dtterm when UTF-8 is required for a terminal code.
_____

For details about setting up terminal code and printer code, see *Writing Software for the International Market.*

3

Locales

The Compaq Tru64 UNIX operating system supports the Korean locales shown in Table 3-1.

Table 3–1: Korean Locales

Codeset	Locale
DEC Korean	ko_KR ko_KR@ucs4 ko_KR.deckorean ko_KR.deckorean@ucs4
Korean EUC	ko_KR.eucKR
UTF-8	ko_KR.UTF-8

The ucs4 modifier indicates that UCS-4 is the internal wide character processing code. The classification information, however, is not provided for the full set of UCS-4 characters, but only for the characters defined in the Korean locale.

If you are using DECwindows Motif, you can choose the locale through the Language Menu of Session Manager. If you are using CDE, you can choose the Options option from the CDE login screen and then choose the Language submenu. The applicable locales are shown in Table 3-2.

Table 3–2: Korean Language Names

Locale	Language Name
ko_KR	Korean
ko_KR.deckorean	Korean (DEC Korean)
ko_KR.eucKR	Korean (EUC)
ko_KR.UTF-8	Korean (Unicode)

3.1 Sorting Behaviour In Korean Locales

Beginning with the Compaq Tru64 UNIX 4.0 release, to prevent intermixing valid
characters and undefined characters and to remove discrepancies between Korean locales,
the DEC Korean locale and the Korean EUC locale have the same collating order, and all
undefined characters collate after valid characters.

The following are value ranges for undefined characters in the DEC Korean and Korean
EUC locales:

- 0xA2E6 - 0xA2FE

- 0xA4D4

- 0xA5AB - 0xA5AF

- 0xA5BA - 0xA5C0

- 0xA5D9 - 0xA5E0

- 0xA5F9 - 0xA5FE

- 0xA6Ef - 0XA6FE

- 0xA7F0 - 0xA7FE

- 0xA8A5, 0xA8A7, 0xA8B0

- 0xAAF4 - 0xAAFE

- 0xABF7 - 0xABFE

- 0xACC2 - 0xACD0

- 0xACF2 - 0xACFE

- 0xADA1 - 0xADFE

- 0xAEA1 - 0xAEFE

- 0xAFA1 - 0xAFFE

- 0xC9A1 - 0xC9FE
- 0xF1A1 - 0xF1FD
- 0xFEA1 - 0xFEFE

4

Local Language Devices

4.1 Terminals

The Compaq Tru64 UNIX operating system software supports the VT382-K Korean terminal. Hangul DECterm is the emulation of the VT382-K Korean terminal which provides compatible functionality for running Korean character-cell terminal applications. The dtterm in a Korean locale also supports Korean character-cell terminal applications. For details about Hangul DECterm, see Chapter 9, Other Korean Features.

4.2 Printers

The Compaq Tru64 UNIX operating system supports the following dot matrix Korean printers:

- LA380-K printer

- DL510-KA printer

The following print filters are provided to support these Korean printers:

Filter Name	Designated For
la380kof	LA380-K printer
dl510kaof	DL510-KA printer
wwpsof	All level 2 PostScript printers or level 1 PostScript printers with composite font support

For details about setting up Korean printer queues, see Chapter 8, Korean Printing Support.

<div align="right">

5

</div>

<div align="right">

Fonts

</div>

5.1 DECwindows Fonts

The Compaq Tru64 UNIX operating system software provides the Korean DECwindows fonts described in Table 5-1 in various sizes and typefaces for 75 dpi (dots-per-inch) display devices.

Table 5–1: Korean Screen Fonts

Typefaces	Glyph Size	Bounding Box	Remarks
Screen	15 x 16	16 x 18	Mandatory font
	22 x 22	24 x 24	Mandatory font
Myungcho	15 x 16	16 x 16	Optional font
	22 x 22	24 x 24	Optional font
	30 x 30	32 x 32	Optional font
Gotic	15 x 16	16 x 16	Optional font
	22 x 22	24 x 24	Optional font

In addition to these Korean fonts, several miscellaneous fonts are also provided for use in Hangul DECterm and Motif toolkit.

The mandatory fonts are available after you install the mandatory Korean subsets. Other fonts are optional and are available only if you install the optional Korean font subset IOSKOFONTP*. If you cannot find the optional fonts on your system, please contact your system administrator.

No 100 dpi Korean fonts are provided in the Compaq Tru64 UNIX kit. To allow you to use the Korean fonts on 100 dpi display devices, a font alias file is provided to map the 75 dpi font names to the respective 100 dpi font names.

Fonts

5.2 XLFD Font Names

You must specify the DECwindows font names in X Logical Font Description (XLFD) format in your application programs or in the application resource files. You can specify wildcards (*) for any fields in the font names. For compatibility, font names retained the year 1987.

You can use the following font names for either 75 dpi or 100 dpi display devices. To explicitly state the display resolution, you can specify 75 and 100 in the X- and Y-resolution fields; that is, the second and third asterisks in the following XLFD names:

- Screen family:

  -ADECW-Screen-medium-r-normal--*-180-*-*-M-160-KSC5601.1987-1
  -ADECW-Screen-medium-r-normal--*-240-*-*-M-240-KSC5601.1987-1·

- Myungcho family:

  -ADECW-Myungcho-medium-r-normal--*-160-*-*-M-160-KSC5601.1987-1
  -ADECW-Myungcho-medium-r-normal--*-240-*-*-M-240-KSC5601.1987-1
  -ADECW-Myungcho-medium-r-normal--*-320-*-*-M-320-KSC5601.1987-1·

- Gotic family:

- -ADECW-Gotic-medium-r-normal--*-160-*-*-M-160-KSC5601.1987-1
  -ADECW-Gotic-medium-r-normal--*-240-*-*-M-240-KSC5601.1987-1·

Table 5-2 shows the XLFD font names and associated character sets for miscellaneous Korean screen fonts.

Table 5–2: XLFD of Miscellaneous Korean Screen Fonts

XLFD Font Name	Character Set
-ADECW-Screen-medium-r-normal--*-180-*-*-M-80-iso8859-1	ISO Latin-1
-ADECW-Screen-medium-r-normal--*-180-*-*-M-80-DEC-DECctrl	DEC Display Control
-ADECW-Screen-medium-r-normal--*-180-*-*-M-80-DEC-DECsuppl	DEC Supplemental
-ADECW-Screen-medium-r-normal--*-180-*-*-M-80-DEC-DECtech	DEC Technical
-ADECW-Screen-medium-r-normal--*-180-*-*-M-80-KS-Roman	KS Roman
-ADECW-Screen-medium-r-normal--*-240-*-*-M-120-iso8859-1	ISO Latin-1
-ADECW-Screen-medium-r-normal--*-240-*-*-M-120-DEC-DECctrl	DEC Display Control
-ADECW-Screen-medium-r-normal--*-240-*-*-M-120-DEC-DECsuppl	DEC Supplemental
-ADECW-Screen-medium-r-normal--*-240-*-*-M-120-DEC-DECtech	DEC Technical
-ADECW-Screen-medium-r-normal--*-240-*-*-M-120-KS-Roman	KS Roman

5.2.1 Bitmap Font Samples

Figures 5-1 and 5-2 show samples of the two families of Korean fonts.

Figure 5–1: Myungcho Font Sample
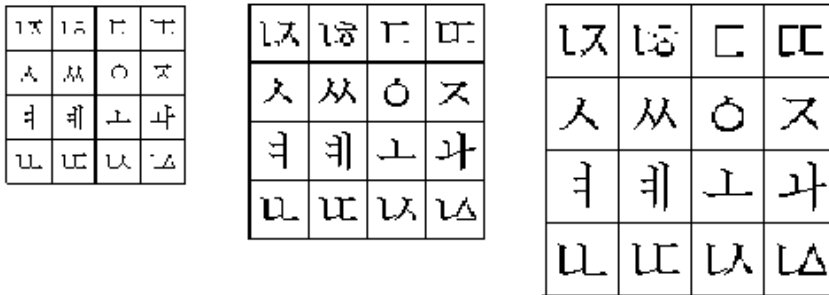
Figure 5–2: Gotic Font Sample
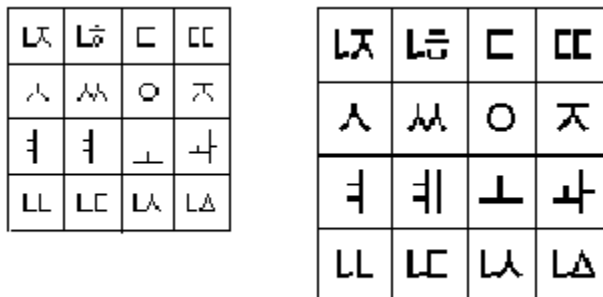
5.2.2 DECwindows Font Encoding

The Compaq Tru64 UNIX X Window System defines two encodings for the KSC5601 character set, as shown in Table 5-3 and Figure 5-3.

Table 5–3: Korean DECwindows Font Encoding

Encoding	Character Set Registry
GL	KSC5601.1987-0
GR	KSC5601.1987-1

Figure 5–3: Korean Font Encoding Schemes
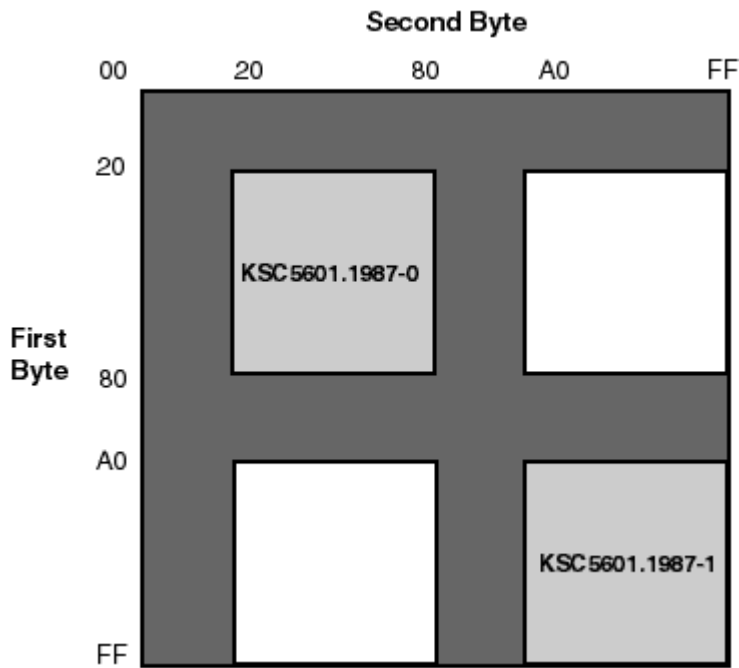
Different vendors may adopt different encoding schemes to produce their fonts. The Korean DECwindows fonts supplied by Compaq are in GR encoding.

To allow you to run applications on third-party workstations on which only GL-encoded fonts are installed, the Compaq implementation of X Windows Release 6 (X11R6) Xlib supports the conversion of GR encoding to GL encoding for text drawing and measurement as shown in Table 5-4.

Table 5–4: Font Encoding Conversion

From	To
KSC5601.1987-1	KSC5601.1987-0

For details, see *Writing Software for the International Market*.

5.2.3 Specifying Fonts in DECwindows Applications

The default font list used in the Motif Toolkit is shown in Table 5-5.

Table 5–5: Default Korean Fonts

XLFD Font Name	Character Set
-ADECW-Screen-medium-r-normal--*-180-*-*-M-80-iso8859-1	ISO8859-1
-ADECW-Screen-medium-r-normal--*-180-*-*-M-160-ksc5601.1987-1	KSC5601.1987-1
-ADECW-Screen-medium-r-normal--*-180-*-*-*-*-*	Fontset

To override the default font list of a Korean DECwindows application, you should specify both the ISO Latin-1 and Korean fonts as well as the Korean fontset when creating widget instances. For details, see *Writing Software for the International Market*.

5.3 Outline Fonts

The Compaq Tru64 UNIX operating system software provides the following Korean outline font for printing on PostScript printers and for display through the Level II Display PostScript extension:

- Munjo

The encoding of the Munjo font is the same as that illustrated in Figure 5-3.

The Korean outline font can be used for:

- Printing on PostScript printers. For details see Chapter 8, Korean Printing Support.

- Displaying through the X11R6 Type 1 rasterizer. To use these outline fonts, you must add the `$I18NPATH/usr/lib/X11/fonts/KoreanPS` directory to your font path by using the following command:

  ```
  % xset +fp $I18NPATH/usr/lib/X11/fonts/KoreanPS
  ```

- Displaying through Display PostScript. You can view PostScript files with Korean characters using the CDA Viewer or through the Display PostScript extension.

5.3.1 XLFD Font Names of Korean Outline Fonts

To use the Korean outline fonts through the Type 1 rasterizer, you can specify the font names in XLFD format in your application programs or in application resource files, just as you do ordinary DECwindows bitmap fonts.

To specify the XLFD font name of an outline font, replace the fields currently marked with 0 (zero) with the following information:

- Field 1 — The font height in number of dots. An asterisk is usually entered in this field.

- Field 2 — The font height in point size. For example, you can enter 240 to specify a 24 point font.

Fonts

- Fields 3 and 4 — The X- and Y-resolution. These fields usually have the value of 75 or 100.

- Field 5 — The average font width in point size. An asterisk is usually entered in this field.

For example, to use a 48 point font of the Munjo family in 100 dpi display device, you would specify:

```
-dyna-munjo-medium-r-normal--*-480-100-100-m-*-KSC5601.1987-1
```

6

Keyboards

For entering Korean language characters, the Compaq Tru64 UNIX operating system software supports all English keyboard types as well as the following Korean keyboard types:

- LK201-K

- LK401-K

These keyboards are the same as their English counterparts except that Korean characters are engraved on the keycaps. You do not need these keyboards to input Korean characters. You can use any keyboard and use the Korean input mode.

6.1 Keyboard Layout

The illustrations in this chapter show the keyboard layouts for the Korean input methods. Online copies of these pictures are available at the specified locations. These figures are in .ddif format and you can display them using an online viewer, or include them in a Microsoft Word document.

Figure 6–1: LK201-K keyboard Layout
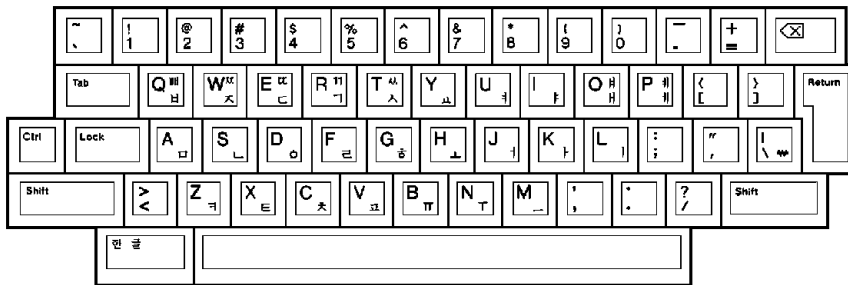
Required Keymap: us_lk201re

Location of File: /usr/lib/cda/hangul-lk201k.ddif

Figure 6–2: LK401-K keyboard Layout
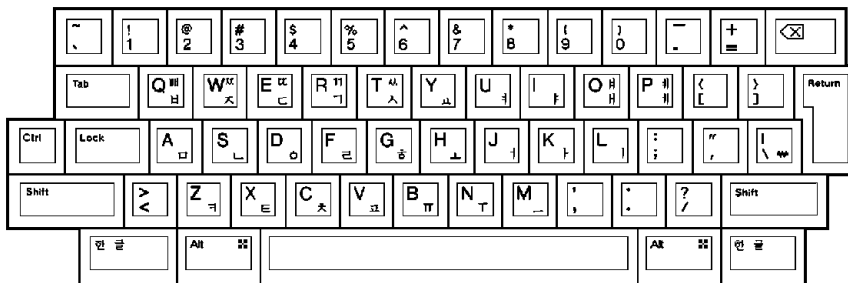
Required Keymap: us_lk401re

Location of File: /usr/lib/cda/hangul-lk401k.ddif

7

Korean Input Methods

This chapter provides an overview of Korean input methods. It describes:

- Activating and deactivating Korean input methods

- Interacting with input methods via a Motif-style interface (including root window, off-the-spot, over-the-spot, and on-the-spot interaction styles)

- Customizing the Input method

- Using the Hangul, Hanja, row-column code, and phrase input methods

7.1 Activating and Deactivating Korean Input Methods

7.1.1 Character–Cell Terminal Applications

For character-cell terminal applications, Korean input methods are implemented via the VT382-K Korean terminal firmware or are incorporated in the terminal emulation software, such as Hangul DECterm. Applications need not provide software to handle the input of Korean characters; the VT382-K terminal or Hangul DECterm provides the input method services.

Hangul DECterm can be regarded as a DECwindows Motif application and is activated and deactivated using the same methods as similar applications. See Section 7.1.2 for more information.

If you have a VT382-K terminal, select input mode by using the [Compose] key, which is located on the lower left side of the main keyboard. On the Korean version of the LK201 or LK401 keyboard (that is, LK201-K or LK401-K), the [Compose] key is labeled ＂한글＂ . For details, see Chapter 6.

After you activate the Korean input mode, the VT382-K terminal firmware or the input methods incorporated in Hangul DECterm compose Korean characters and return the input data as appropriate.

7.1.2 DECwindows Motif Applications

DECwindows Motif applications implement Korean input methods using an independent process called the input server. The Korean input server is an X client process that works on a standard X-server provided the required Korean fonts are installed. This means that the Korean input server can run on any system which can access your X display device, including the device itself.

The Korean input server provided by the Compaq Tru64 UNIX operating system is interoperable with all existing DECwindows Motif /Hangul platforms, including VMS DECwindows Motif /Hangul and UWS/Hangul. In addition, it can provide input method services to the R6 X library (Xlib) supported by Compaq Tru64 UNIX. You can write internationalized applications using the standard R6 application programming interface and communicate with this input server. For details about developing internationalized software with X11R6, see *Writing Software for the International Market*.

Before you can input Korean data, you must start the Korean input server on your workstation or any system that your workstation can access through the network. This release provides English and Korean interfaces to the input server. Make sure you have set up the correct session language before starting the input server. There are several ways to start the Korean input server:

- Using the Session Manager

  After logging in to a session, you can start the Korean input server by selecting "Hangul IM" from the Applications menu of the Session Manager, just like starting any DECwindows application.

- Starting the input server automatically

  If you start your session in a Korean locale, by default, the menu item "Hangul IM" is added to the Session Manager's Automatic Startup list. When you log in, the input server starts automatically. If you do not want to automatically start the input server, you can remove this item from the Automatic Startup list by using the Session Manager's Customize menu.

  _____**Note** _____

  Applications that are started before Hangul IM cannot connect to the input server. Therefore, Hangul IM should be the first item on the Automatic Startup list.

  _____

- Using commands

  To start the input server on the workstation you are using, enter the following command:

  ```
  % /usr/bin/X11/dxhangulim &
  ```

  To start the input server on a remote system, enter the following command on that system:

  ```
  % setenv DISPLAY <display-name>
  % /usr/bin/X11/dxhangulim &
  ```

  In the <display-name> field enter the display name for your workstation.

After you invoke the Korean input server, the DECwindows Motif applications that were internationalized to support Korean can communicate with the server for input method services.

7.1.3 CDE Applications

Common Desktop Environment (CDE) applications implement Korean input methods using an input server. Before you can input Korean data, you must start the Korean input server. There are two ways to start the Korean input servers in CDE:

- Starting the input server automatically

  If Korean language is selected on the CDE login menu, the Korean input server automatically starts. The following script runs automatically when you log in:

  ```
  /usr/dt/config/Xsession.d/0020.dtims
  ```

  The value of the DTSTARTIMS environment variable determines whether the specified Korean input server starts automatically.

- Using commands

  To start the input server on the workstation you are using, enter the following command:

  ```
  % /usr/bin/X11/dxhangulim &
  ```

  To start the input server on a remote system, enter the following command on that system:

  ```
  % setenv DISPLAY <display-name>
  % /usr/bin/X11/dxhangulim &
  ```

  In the <display-name> field, enter the display name for your workstation.

After you invoke the Korean input server, the DECwindows Motif applications that were internationalized to support Korean can communicate with the server for input method services.

7.2 Selecting Input Method

You can select the Korean input mode using the key sequences shown in Table 7-1.

Table 7–1: Key Sequences for Invoking the Korean Input Method

Input Method	VT382-K	LK201	DECwindows Motif LK401
Hangul	[Compose]	[Compose/Space]	[Compose]
Hanja	[Shift/Compose]	[Shift/Compose/Space]	[Shift/Compose]
Row-Column	[Ctrl/Compose]	[Ctrl/Compose/Space]	[Ctrl/Compose]
Phrase	—	[F6]	[F6]

_____**Note** _____

These key sequences can be customized through the Options menu provided by the input server.

_____

7.3 DECwindows Motif Interface

You can interact with the Korean input server through a Motif-style user interface that allows an input method to provide feedback about the data being edited. This feedback helps you compose a character, list choices for selection, provide options for customizing the input server, and so on.

7.3.1 Input Areas

The X Input Method specification defines the three input areas described in Table 7-2.

Table 7–2: Window Input Areas

Area	Description
Auxiliary area	An option menu helps you customize the Korean input methods and the input method window.
Status area	This area displays the internal state of the Korean input method that is critical to you.
Pre-edit area	This area displays the intermediate text that is being composed. This area also provides a lookup region which displays a list of valid candidates for the input key sequences.

7.3.2 Interaction Styles

The use of the input areas depends on the interaction style (or pre-edit style) selected for the application. The Korean input server supports four interaction styles:

- Root window

- Off-the-spot

- On-the-spot

- Over-the-spot

7.3.2.1 Root Window

If you want to display the pre-edit data in a separate input window which lies outside the application window, choose the root window interaction style. The input window is scalable and movable; you can modify its size and position to meet your preferences. If you want to free up more screen space, you can iconize the input method window. You can also choose to display pre-edited data in vertical or horizontal layout. Figure 7-1 shows an example of root window interaction style.

Figure 7–1: Root Window Interaction Style

If you are an experienced user, you may not need to perform input by looking at the pre-edit area. In this case, you can iconize the input window to improve performance. See Figure 7-2.

Figure 7–2: Icon of Korean Input Window

When the input window is iconized, you can continue to input Korean characters through a Korean application window. To let you know the input status, the input state is displayed on the icon title which is updated according to the input mode and the input focus. If you want to see the pre-edit data, you can double click on the icon to display the input window.

7.3.2.2 Off-the-Spot

If you want to display the pre-edit data in a fixed location of the application window, you can choose the off-the-spot interaction style. When you choose this interaction style, the

Korean input server creates the input window at the bottom of the application window. You no longer need to refer to the root window; you can iconize it to save screen area. Figure 7-3 shows an example of off-the-spot interaction style.

Figure 7–3: Off-the-Spot Interaction Style
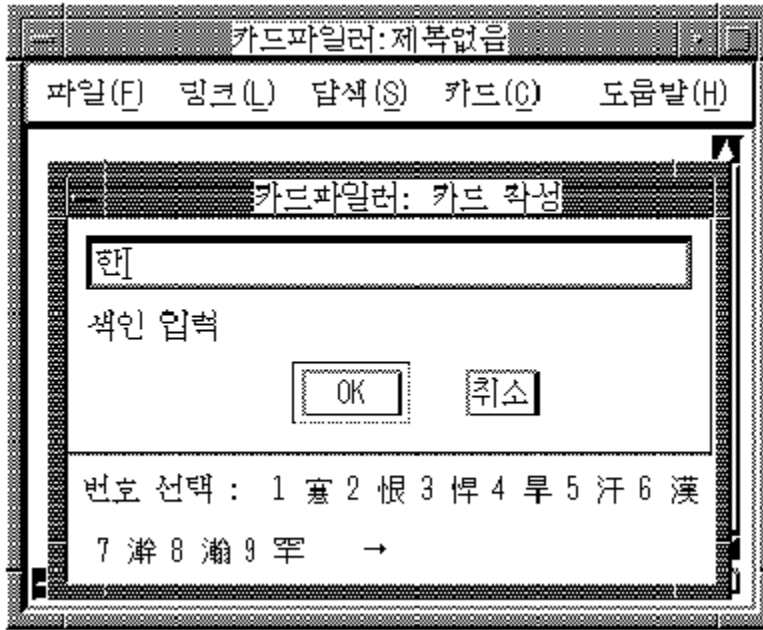
7.3.2.3 On-the-Spot

If you want to focus your attention at the point of insertion during Korean data input, you can choose the on-the-spot interaction style. In this style, the Korean input server directs your applications to display the pre-edit data in a way which is consistent with the appearance of the existing data in the input field. For instance, an application can select the font size and typeface to display the pre-edit data and control how the data is highlighted. You can also format existing data to allow the pre-edit data to be displayed at the insertion point. Figure 7-4 shows an example of on-the-spot interaction style.

Figure 7–4: On-the-Spot Interaction Style

7.3.2.4 Over-The-Spot

Another alternative which allows you to perform Korean data input at the point of insertion is the off-the-spot interaction style. In this style, an input window is created when you invoke the Korean input mode; the window is placed over the current point of insertion. The pre-edit data entered is displayed in this window. The look and feel is similar to that of the on-the-spot style, except that applications do not control the display attributes of the pre-edit data and no formatting is performed to accommodate the pre-edit. Therefore, there is less communication overhead between the Korean input server and applications. The performance of data entry through the over-the-spot interaction style is better. Figure 7-5 shows an example of over-the-spot interaction style.

Figure 7–5: Over-the-Spot Interaction Style
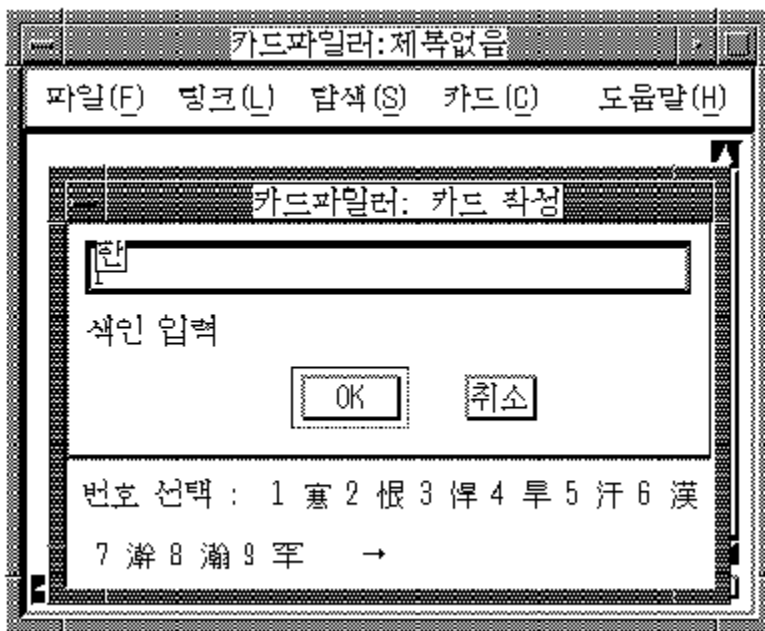
The VendorShell resource XmNpreeditType lets you specify the priority of the interaction styles of DECwindows Motif applications. By default, the resource value is "overthespot,offthespot,root,onthespot", in priority order. The first style is used if available in an input method, else the second, and so on.

To choose your preferred interaction style, you can either:

- Use the command line option -xrm to specify the resource value when you start an application. For example, the following command starts Cardfiler with the root window interaction style:

  ```
  % dxcardfiler -xrm '*preeditType: root' &
  ```

  To start Cardfiler with the off-the-spot interactive style, you can enter:

  ```
  % dxcardfiler -xrm '*preeditType: offthespot' &
  ```

  To start Cardfiler with the on-the-spot interactive style, you can enter:

  ```
  % dxcardfiler -xrm '*preeditType: onthespot' &
  ```

- Use the Session Manager's Options menu in XDM

— From the Session Manager's Options menu, select Input Method...

— In the popup Input Style Options window, click on one of the pre-edit styles

The XmNpreeditType resource is set to a priority list beginning with the pre-edit style that you have chosen.

After you choose your preferred interaction style, the applications you invoke start up with the new setting.

_____**Note** _____

Some applications, such as DECterm, may provide their own user interface to handle interaction styles. Those mechanisms may override the methods described here.
_____

7.3.3 Operations of Input Server

When you start the Korean input server, no application is connected to it and the string "No Connection" is displayed in the title bar to indicate the state. When an internationalized application is started in a Korean locale and becomes focused, the string "영문 :" is displayed in the status area, indicating that the application is connected to the Korean input server and the input mode is English. If you invoke a Korean input method, the input state displayed in the status area and the title bar is updated accordingly. If you change the input focus to a noninternationalized application window, the title of the input window changes to "No Connection" again.

The input server can maintain individual states of composing for different input contexts or application windows. In addition, under the root window interaction style, each application window can be associated with its own attributes, such as font size, font style, line spacing and foreground/background colors. You can set the input focus to an application window and then compose a Korean character or customize the input window in the way that you prefer. The input server can memorize the composing state and input your window attributes. The next time this application window gets the input focus, the input server can restore the original composing state and attributes. Also, the input window rises to the top to get your attention.

7.3.4 Options Menu

The auxiliary area of the input window provides an options menu where you can customize the input server. You can click the [ ] (Options) button to view the customization pulldown menu. The menu provides the following options:

• Vertical Layout (수직 레이아웃)

• Horizontal Layout (수평 레이아웃)

- Select Phrase Input Class （구문 입력 등급 선）
- User Phrase Database （사용자 구문 데이터베이스）
- System Phrase Database （시스템 구문 데이터베이스）
- Current Window （현재 창）
- Input Method Customization （입력 방법 설정）
- Help （도움말）
- Quit （중지）

7.3.4.1 Vertical Layout （수직 레이아웃）

You can choose this option only if the current layout is horizontal. When you choose this option, the input window and the layout of its contexts display in a vertical manner. The vertical input window remains at the same origin.

7.3.4.2 Horizontal Layout （수평 레이아웃）

You can choose this option only if the current layout is vertical. When you choose this option, the input window and the layout of its context display in a horizontal manner. The horizontal input window remains at the same origin.

7.3.4.3 Select Phrase Input Class （구문 입력 등급 선 택）

This option is provided for customizing the phrase input mode. In this release, DECwindows Motif shares the same phrase databases created and managed by the Compaq Tru64 UNIX Phrase Utility. Once you have created a phrase database and defined your phrase definitions, both character-cell terminal applications and DECwindows Motif applications can use the data for phrase input. To use the phrase databases, the LANG environment variable must be set to reflect the required codeset, that is, ko_KR.deckorean. For details about the Phrase Utility and phrase definition file, see *Writing Software for the International Market*.

The Select Phrase Input Class option allows you to focus on a particular class of phrases during phrase input. When you choose this option, a dialog box pops up and you can choose the phrase class that you want to use.

If you want to choose all classes, enter the "*" option. If you do this, the phrase input method searches all classes of phrase definitions for the phrase code that you have entered. When there are multiple phrases that match the phrase definition, a list box pops up. You can choose the right phrase definition by double clicking on the item in the list box.

7.3.4.4 User Phrase Database （사용자 구문 데이터베 이스）

The Phrase Input method allows you to access two phrase definition databases: the system phrase database and the user phrase database. You create and maintain your own private

phrase database for storing your frequently used phrases. This is called the user phrase database.

For details about creating phrase database, see *Writing Software for the International Market*.

If you choose the user phrase database option, your private user phrase database is used.

7.3.4.5 System Phrase Database (시스템 구문 데이터 베이스)

The system phrase database is for public access by all users using your system. It should be created and modified by your system administrator. If you choose the system phrase database option, the system phrase database is used.

_____**Note** _____

The databases that you can access are the ones available on the system on which you start your Korean input server.

_____

7.3.4.6 Current Window (현재 창)

You can associate an application window with a set of input window attributes. This option allows you to customize the attributes of a specific application window.

_____**Note** _____

This option is available only if you have selected root window as your interaction style and you have focused to an internationalized application input area. Otherwise, this option dims out. If you choose to use the off-the-spot, over-the-spot, or on-the-spot interaction style, the application determines these attributes.

_____

When you choose the current window option, a dialog box pops up and the following options are displayed:

- Font Size

  This option allows you to choose the font size used to display pre-edit data. You may choose to use either big font or small font by clicking on one of the following toggle buttons:

  — 큰 폰트 (Big Font)

  — 작은 폰트 (Small Font)

Choosing Big Font results in a bigger input window, which occupies more screen space.

- Font Typeface

  This option allows you to choose the font typeface to be used in the input window. Three typeface options are provided: Gotic, Myungcho or Screen.

  To choose the font typeface, click on one of the following toggle buttons:

  — 고딕 (Gotic)

  — 명조 (MyungCho)

  — 화면 (Screen)

  If you want to choose a typeface that is not on the options list, you can define it in the Korean input server resource file. This option will be shown beside the "기타 (Other):", label in the customization window.

- Line Spacing

  The Korean input server can display pre-edit data on multiple text lines. This may happen when a list of candidates is displayed for your selection. The Line Spacing option lets you adjust the spacing between these text lines. To adjust the line spacing, drag the Line Spacing slider (labeled as "행 띄기") or move the pointer to the desired position on the slider and click MB1.

- Foreground and Background Colors

  This option allows you to customize the foreground and background colors of the input window.

  For monochrome display, the following options are provided:

  — 흰바탕에 검은색 (Dark Text, Light Background)

  — 검은바탕에 흰색 (Light Text, Dark Background)

  For color display, you can choose from a palette of colors to design a visually pleasing input window. To customize the foreground or background color, you should first select the color that you want to change by clicking one of the following toggle buttons:

  — 전경색 색상 (Input Window Foreground Color)

  — 배경색 색상 (Input Window Background Color)

  A color mixing window pops up on top of the customization window. You can then mix the color using the three sliders which represent the intensities of the primary colors. The modified color is displayed on the right-half of the color box while the left-half shows you the original color.

7.3.4.7 Input Method Customization （입력 방법 설정）

There are several customizable attributes which globally apply to all input windows. In the Korean input server, they are:

- Bell Volume

  When you make an error during the composition of Korean characters, the bell rings to alert you. You can adjust the bell volume by dragging the Bell Volume slider (labeled as 벨 음량) or by moving the pointer to a desired position on the slider and clicking MB1.

- Invocation Key Sequences

  By default, the key sequences for invoking Korean input methods are predefined. You can change these default key sequences to meet your preference or working style. This option allows you to customize the following key sequences:

  — Start Hangul Input Method （한글 입력 시작）

  — End Hangul Input Method （한글 입력 종료）

  — Start Hanja Conversion （한자 변환 시작）

  — Start Row-column Conversion （행렬 변환 시 작）

  — Start Phrase Input （구문 입력 시작）

  — End Phrase Input （구문 입력 종료）

The bottom part of the dialog box provides an interface that you can use to customize a key sequence. It allows you to select a trigger key and to toggle the on/off state of the Ctrl, Alt and Shift modifiers. The trigger keys that you can choose include NoSymbol, [F1] - [F20], [Space], [Return], [Compose] and [A] through [Z]. If you choose NoSymbol, no invocation sequence is provided for the selected action.

For each modifier key, you can select the on/off state with the toggle buttons identified in Table 7-3.

Table 7–3: Modifier State Customization

Modifier	On State	Off State
Ctrl	"Ctrl"	"~Ctrl"
Shift	"Shift"	"~Shift"
Alt	"Alt"	"~Alt"

The tilde (~) sign means that you should not press that modifier key when invoking the action. In addition to the on/off state, you can deselect both of the states for a modifier

key, that is, neither state is selected. To do this, click the toggle button that is currently set on. If you deselected a modifier, the invocation key with or without holding the modifier key can be accepted by the input server.

When one of the invocation key sequences is selected, for example the "한글 입력 종료" (End Input Method) key sequence, the state of the toggle switches and the trigger key displayed at the bottom of the dialog box is updated to reflect the current value. The label at the bottom left-hand side of the window is changed to "한글 입력 종료". Figure 7-6 shows an example of customized invocation key sequences.

Figure 7–6: Customization of Invocation Key Sequences
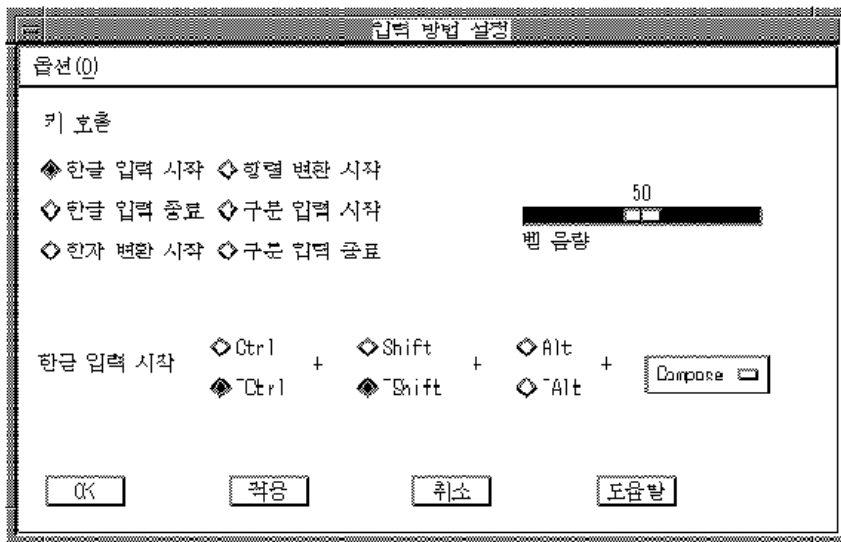
If you want to change the End Input Method key sequence to [Ctrl/Space], select the Ctrl, ~Alt, and ~Shift buttons.

7.3.4.8 Help (도움말)

This option provides online information about the Korean input server.

7.3.4.9 Quit (중지)

You can use this option to terminate the input server. If you choose this option, a dialog box pops up to confirm that you really want to exit.

7.3.5 Saving Your New Settings

All attributes which can be customized with "현재 창" (Current Window) and "입력 방법 설정" (Input Method Customization) can be saved into a resource file. You can

choose to save the current settings into a private resource file in your login directory. To reset or save the current settings, you can choose the options shown in Table 7-4 inside each customization window.

Table 7–4: Saving Customized Attributes

Function	Description
시스템 기본값 복원 (Restore system setting)	Restores all system default attributes
설정 사항을 기본값으로 저장 (Save Settings as Defaults)	Saves all current attributes as default values. These attributes are saved to a private resource file .DXHangulim in your login directory.

7.4 Hangul Input Method

Hangul characters are the most commonly used characters in Korea today. Each Hangul character represents one syllable. It is made up of a number of phonetic symbols called "Jamo". There are altogether 22 Jamos for composing Hangul characters and they can be entered through the keys on the main keyboard, as illustrated in Chapter 6.

The input sequence of Jamos should follow that of the pronounced syllables. The first Jamo input should always be a consonant. To enter a Hangul character, invoke the Hangul input method by pressing the respective key sequence and then enter the phonemes of the desired Hangul character.

For example, the string "한글" can be input using the Hangul method as follows:

Hangul Character	Key Sequence	Composition
한	[G],[K],[S]	ㅎ,하,한
글	[R],[M],[F]	ㄱ,그,글

To enter these characters, invoke the Hangul input method and then press [G] to enter the element "ㅎ" for "한".

$ ㅎ
한 글

When you press [K] to enter the element "ㅏ", the element is composed with "ㅎ" to form "하".

$ 하
한 글

When you press [S] to enter the element "ㄴ", the element is composed with "하" to form "한".

$ 한

한 글

To enter "글", press the elements [R], [M], [F].

$ 한글

한 글

7.5 Hanja Input Method

The word "Hanja" is equivalent to "Chinese Character". To enter Hanja, you should first enter the corresponding Hangul characters which represent their pronunciation and then convert them to Hanja.

To enter a Hanja, invoke the Hangul input method and enter the Hangul character that represents its pronunciation. Before sending the character to the application, press the respective key sequence to invoke the Hanja input method. A list of Hanja corresponding to the pronunciation is displayed in the pre-edit area for selection. To select the desired character, press the numeric key associated with the character on the main keyboard.

For example, the string "韓國" can be input using the Hanja input method as follows:

Hanja	Pronunciation	Key Sequence	Composition
韓	한	[G],[K],[S]	ㅎ, 하, 한
國	극	[R],[N],[R]	ㄱ, 구, 국

To enter the Hanja "韓", invoke the Hangul input method and enter the corresponding Hangul "한" by pressing [G], [K], [S].

$ 한

한 글

Then, invoke the Hanja mode:

$ 한
번호 선택   1.寒 2.恨 3.悍 4.旱 5.汗 6.漢 7.澣 8.瀚 9.罕 →

The right arrow sign (→) indicates that more candidates are available for selection. To view the candidates on the next row, press [Space] or the right arrow key.

```
$ 한
번호 선택    1.翰  2.閑  3.閒  4.限  5.韓
```

To move backward, press [Shift/Space] or the left arrow key (←).

To select the character you want, press the numeric key associated with the character. In this example, while displaying the second group of candidates, press [**5**].

```
$ 韓
한 글
```

Similarly, you can press [R], [N], [R] to compose "국" and then invoke the Hanja input method to convert "국" to "國".

After you complete the input of a character, the Hanja input mode exits and returns to the original input mode.

7.6 Row-Column Input Method

As described in Chapter 1, each character in the KSC5601-1992 character set is assigned a position in the character plane and can be uniquely identified by this position. You can enter Korean characters by specifying the row number and the column number of the desired character.

When the row-column mode is invoked, the following message is displayed in the pre-edit area.

```
행렬코드 입력 : _
```

When you enter the row-column code, the input data is echoed in the pre-edit area. Only the numeric keys are valid for the row-column input method.

```
행렬코드 입력 : 0264_
```

The data can be in the following format where XX is the row number and YY is the column number:

Types of format	Format	Example	Remark
4 Digit	XXYY	0263	KS Code
5 Digit	0XXYY	00263	KS Code
5 Digit	1XXYY	10263	DEC Extension

The Korean character is sent to the application after you enter a valid four-digit or five-digit code and press [Return] or [Enter].

For example, the row-column code of "한" is 3949. To enter this character using the row-column input method, invoke the input method, then press [3] [9] [4] [9] and [Return].

```
$
핸련 코드 입력:
```

Alternatively, if you enter a two-digit row number and then press [Enter] or [Return], a list of characters assigned to that row is displayed. You can choose the character that you want from the list of candidates.

7.7 Phrase Input Method

The phrase input method is designed to facilitate the input of frequently used phrases. You can prepare your own database of frequently used phrases, with each phrase being identified by a phrase code. To input a phrase, enter its phrase code and convert it to the respective phrase.

The Compaq Tru64 UNIX operating system provides a Phrase Utility that you use to create phrase databases. The Korean input server can directly access the phrase databases. In addition, you can choose the phrase database being used.

When you invoke the phrase input method, the string "PHRASE:" is displayed in the status area. You can enter the phrase by specifying the phrase code, for example:

```
$
```

PHRASE: KOREA

If the phrase code has corresponding data in the phrase definition database, the data is sent to the application as shown below:

```
$ 韓國
PHRASE:
```

To correct the phrase code while pre-editing, press the [Delete] key and re-enter the correct code.

The phrase code can consist of at most 8 English alphanumeric characters. The first character must be an English alphabet character, the remainder can be alphanumeric. If it has less than 8 characters, press [Return] or [Space] to signal the end of input. If it has exactly 8 characters, the respective phrase is automatically sent. You do not have to press [Return] after entering the last character.

For more information on creating phrase databases, see *Writing Software for the International Market* and the `phrase(1)` reference page.

<div align="right">

8

</div>

Korean Printing Support

This chapter introduces the Korean printing support provided by the Compaq Tru64 UNIX operating system software. It describes the supported printers, the print file formats, features, and the maintenance procedures for supporting Korean printing.

8.1 Supported Printers

8.1.1 Text Printers

The Compaq Tru64 UNIX software supports text printers with built-in Korean fonts.

8.1.2 PostScript Printers

The Compaq Tru64 UNIX software supports Korean printing on PostScript printers in two ways:

- Using the built-in or downloaded fonts installed in the printers

- Using the generic wwpsof PostScript print filter

For details about the supported printer types and print filters, see Chapter 4, Local Language Devices.

8.2 Print File Formats

The Compaq Tru64 UNIX software supports the printing of mixed ASCII and Korean characters in the following print file formats:

- Plain text files on text and PostScript printers

- Files with the nroff control sequences (for printing with underline, superscript, subscript and bold attributes) on text and PostScript printers

- PostScript files on PostScript printers

The print filters for PostScript printers automatically detect the format of a print file and convert it to the proper format for printing.

8.3 Printing Features

8.3.1 Software On-Demand Font Loading (SoftODL)

SoftODL is a mechanism through which a terminal or a bitmap printer downloads the relevant bitmap font information for a user-defined character (UDC) at the time the character is displayed or printed. The Korean bitmap printers that support this feature include:

- LA380-K
- DL510-KA

8.3.2 Codeset Conversion

The Compaq Tru64 UNIX software includes a codeset conversion mechanism to print text files that have a codeset different from the one used by the printer. For printers with built-in or downloaded Korean fonts, the codeset of the printer should be defined to match the codeset of the built-in fonts. For printers using the font faulting mechanism, the codeset of the printer should be defined to match the codeset of the font to be loaded.

8.3.3 Outline Fonts

The Compaq Tru64 UNIX operating system provides a large set of outline fonts for printing files in various languages. Depending on the number of local language support subsets installed on your system, more than 150 outline fonts may be available.

The outline font for Korean printing is:

- Munjo

This font is encoded in DEC Korean codeset.

8.4 Korean Printing Setup

8.4.1 Dot Matrix Printers

When configuring the LA380-K and DL510-KA dot matrix printers, the only special consideration is whether ODL printing should or should not be enabled. If enabled, you must specify the default ODL database path and style.

To configure a Korean dot matrix printer:

1. Use the `lprsetup` command to add the `la380k` or `dl510ka` printer.

2. At the following prompt, enter `y` if you want to enable ODL printing, and `n` if you do not.

```
Do you want to enable ODL? [n]
```

If you enter y, the default ODL database and style is enabled.

3. If you want to change the defaults, modify the `ya` capability after the following prompt:

```
Enter symbol name:
```

The following prompt is displayed:

```
Enter a new value for symbol 'ya'?
["plocale=ko_KR.deckorean"]
```

Enter the following command to specify the ODL database path and style:

```
"plocale=ko_KR.deckorean odldb=<default ODL database path>
odlstyle=<default ODL style>"
```

Be sure to include the double quotes around the parameters, to replace `plocale` with the value displayed in the previous prompt, and to replace the default ODL path and style with the suitable one.

To print Korean text files to print queues connected to dot matrix printers, use the `lpr` command. You can either set the LANG environment variable or use the `-A` option to denote the codeset of the text files. For example, enter the following command to print the file prepared in Korean EUC codeset:

```
% lpr -A "flocale=ko_KR.eucKR" my.file1
```

You can override the default ODL path by including the `odldb` and `odlstyle` options in the `-A` option of the `lpr` command. For example, enter the following command to use the ODL database in the `/usr/priv/odl` directory.

```
% lpr -A "odldb=/usr/priv odlstyle=normal-24x24" my.file2
```

8.4.2 The wwpsof PostScript Filter

This generic PostScript print filter supports the printing of Korean characters on printers that support PostScript level 2 or level 1 with composite font extension. The Munjo outline font must be installed for this filter to properly print Korean characters. No special configuration is needed when you set up a print queue using the wwpsof filter. However, when sending a Korean text file to that print queue you should be running in a Korean locale, or, you should specify the correct locale by using the -O option as follows:

```
%lpr -Olocale=ko_KR.eucKR my.file
```

See wwpsof(8) for more information about the use of this print filter.

9

Other Korean Features

9.1 Hangul DECterm

Hangul DECterm is a VT382-K terminal emulator. This section describes the Korean features that are specific to Hangul DECterm. For details about the common internationalized features provided by DECterm, see *Writing Software for the International Market.*

This chapter describes:

- Creating a Hangul DECterm window

- Hangul DECterm terminal emulator features

- Korean character input/output

- Other VT382-K functionality

9.1.1 Creating a Hangul DECterm Window

The terminal type that DECterm emulates is sensitive to the session language.

To create a Hangul DECterm window using the Session Manager:

1. Set the session language to one of the Korean locales.

2. Select DECterm from the Session Manager Applications menu.

Alternatively, you can use the `-xnllanguage` qualifier to specify the terminal type of the DECterm window to create. For example, you can use `ko_KR.deckorean` as the value for `-xnllanguage` to create a Hangul DECterm window:

```
% /usr/bin/X11/dxterm -xnllanguage \
ko_KR.deckorean
```

If you specify an unknown value for `-xnllanguage`, then ISO Latin-1 DECterm (Western European) is assumed. If no Korean font exists, the value defaults back to ISO Latin-1 DECterm.

The user interface language of Hangul DECterm always follows the terminal type. The language is independent of the language selection.

9.1.2 Customizing a DECterm Window

You can apply to your Hangul DECterm windows any customization features currently applicable to the ISO Latin-1 DECterm window except for the customization of the NRCS character sets.

You can save and restore customized features in the same way as in ISO Latin-1 DECterm.

9.1.3 Font Sizes

You can choose the 24x24, or 16x18 Korean fonts by selecting Big Font or Little Font from the Window... item of the Options menu selection box.

9.1.4 Terminal ID

Choosing the General... item from the Options menu allows you to change the general features, such as the terminal type, of the Hangul DECterm from the dialog box displayed. You can also choose VT382 ID from the dialog box.

9.1.5 Interaction Style

Choosing the Input Method... item from the Options menu allows you to select the interaction style for Hangul DECterm. For example, to select the root window interaction style, click on the Root Window button and then apply the change. If you click on the ISO Latin-1 Input button, Hangul DECterm disables the input of Korean data until another style is selected.

9.1.6 Input Server

Choosing the Input Method... item from the Options menu allows you to switch to use another input server for Hangul DECterm. By default, the Korean input server is used. To select another input server, click on the Other button and enter the input server name in the input field.

9.1.7 Copying Information

You can use the Edit menu option to copy information within or between DECterm windows. The cut-and-paste operation is enhanced to handle mixed ASCII and Korean characters.

9.1.8 Default Character Set

Korean DECterm supports KSC5601-1992 and all characters that the ISO Latin-1 DECterm supports.

The ISO Latin-1 DECterm uses the ISO 8859-1 character set as the default character set. You can change the default by choosing other options from the General... pull down menu on the Options menu. For Hangul DECterm, the default character set is KSC5601-1992.

In general, Hangul DECterm cannot display mixed MCS (or ISO Latin-1 Supplemental Graphic Characters) and Hangul characters. To achieve this function, you can output the data together with the designated character set escape sequences.

9.1.9 Korean Character Input/Output

You can enter Korean characters in Hangul DECterm by invoking any of the Korean input modes as described in Chapter 7. Mixed ASCII and Korean characters can be displayed properly in Hangul DECterm without any special settings.

9.1.10 Reconnecting the Input Server

The Hangul input server provides the Hangul character input capability. If this process does not exist or terminates for some reason, the following message is displayed:

```
The Hangul input method does not exist
```

You can restart the input server and use the Reset Terminal option from the Commands menu to reconnect the Hangul DECterm to the input server.

9.1.11 Other VT382–K Functionality

The following VT382-K functionality is implemented in the Hangul DECterm terminal emulator:

- Display characteristics and capabilities
- Text capabilities
  - Compatibility with 3 terminals:
    * VT300 mode
    * VT100 mode
    * VT52 mode
  - ANSI-compatible control functions
- Support for Terminal State Interrogation (TSI)
- All of the Korean input methods

Other Korean Features

- Support for the following character sets:
  - — DEC Special Graphics Character Set (line drawing)
  - — DEC Supplemental Character Set
  - — DEC Technical Character Set
  - — ISO Latin-1 Supplemental Character Set
  - — KS Roman
  - — KSC5601-1992 Korean Character Set
- Control representation mode
- Support for sixel graphics UDK editing function
- Korean character display attributes: reverse, underline, bold, blink, double height/width

For details about the VT382-K functions, refer to *VT382-K Programming Reference Manual* and *VT382-K User's Manual*.

9.1.12 Special Characters in nroff

The nroff utility has been internationalized to format text in various languages. When a Korean document is formatted using nroff, the following typical Korean formatting rules are used:

- Text line wrapping

  Korean text, like English text, uses space characters to separate words or as break points to wrap lines of text. A Korean line of text can be broken between any two consecutive Korean characters, with the following exceptions:

  — The following Korean characters cannot be placed at the beginning of a text line. They are called no-first characters.

  ` ˚ ‥ ‥ ‥ ‥ ˙˙ 〃 ‐ — ‖ ＼ ～ ' ″] 〉 》 」 』 】
  ! " ') , ‐. : ; > ?] ＾ ＿ ` }

  — The following Korean characters cannot be placed at the end of a text line. They are called no-last characters.

  ～ ' " 〔 〈 《 「 『 【 (< [{

- Right justification

  To justify the right margin of a paragraph, the nroff utility inserts space characters at proper break points. For English, space characters are usually inserted at word breaks. For Korean, space characters are inserted only at the following places:

  — Before one of the following can-space-before characters if it is not placed at the beginning of a text line.

  　　｀ °’ ” 〕 〉 》 」 』 】 ！ ＂ ＇ ） ， ＞〕 ？｝

  — After one of the following can-space-after characters if it is not placed at the end of a text line.

  　　‘ “ 〔 〈 《 「 『 【 （＜ 〔 ｛