



Traditional Chinese Solaris User's Guide

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Preface

The *Traditional Chinese Solaris User's Guide* provides information about the Solaris™ Operating System (Solaris OS) for users, system administrators, and developers. The guide also describes Traditional Chinese localized Solaris desktop tools and utilities.

About This Book

This guide offers information on using, customizing, and administering the Traditional Chinese Solaris Operating System.

How This Book Is Organized

Each chapter of this guide covers a different aspect of the Traditional Chinese Solaris software.

Part I introduces the features of the Traditional Chinese Solaris Operating System.

- [Chapter 1](#) describes the new features and the language support that are available in this release

Part II includes end-user information.

- [Chapter 2](#) discusses the design of the Traditional Chinese Solaris software and provides information on the supported locales.
- [Chapter 3](#) describes the features of the Traditional Chinese Common Desktop Environment (CDE) for windowed applications.
- [Chapter 4](#) describes the different Traditional Chinese character input modes and provides procedures that you can use to enter and convert Traditional Chinese characters.

- [Chapter 5](#) describes how to use the `mailx`, `talk`, `xtobif`, `stdconvtool`, and `iconv` utilities. The chapter also provides tables of code conversion modules.
- [Chapter 6](#) describes line printer, PostScript™ printer, and laser printer support in this release.
Part III includes information for system administrators.
- [Chapter 7](#) provides procedures on setting a default locale, adding a new locale, and changing font directories.
- [Chapter 8](#) discusses input method server basics and application display.
- [Chapter 9](#) provides information on PostScript, bitmap, and TrueType fonts.
- [Chapter 10](#) discusses printing to line printers and to PostScript printers.
- [Chapter 11](#) provides information on TTY STREAMS, command, setup, and terminal support.
- [Appendix A](#) discusses Traditional Chinese text and conversion utilities. The chapter also describes the binary Compatibility Package and provides a procedure for running binary code from previous Solaris releases.
- [Appendix B](#) provides information on mapping Traditional Chinese keyboard functions.
- [Glossary](#) defines key words and phrases found in the Traditional Chinese Solaris documentation.

Related Books

The following books include further details on the topics covered in this guide.

- *Solaris 10 Release Notes* offers the most up-to-date information about the features offered in this release.
- *Solaris 10 Installation Guide* describes the process of installing the Solaris Operating System.
- *Solaris Advanced User's Guide* provides information on the Solaris command line interface (CLI).
- *International Language Environments Guide* describes the internationalization and the localization features that are available for application developers in this release.

Accessing Sun Documentation Online

The docs.sun.comSM Web site enables you to access Sun technical documentation online. You can browse the archive or search for a specific book title or subject at <http://docs.sun.com>.

Typographic Conventions

The following table describes the typographic changes used in this book.

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -ato</code> list all files. <code>machine_name% you have mail.</code>
AaBbCc123	What you type, contrasted with on-screen computer output	<code>machine_name% su</code> Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename.</code>
<i>AaBbCc123</i>	Book titles, new words, or terms, or words to be emphasized.	Read Chapter 6 in <i>User's Guide</i> . These are called <i>class</i> options. You must be <i>root</i> to do this.

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell prompt	machine_name%
C shell superuser prompt	machine_name#
Bourne shell and Korn shell prompt	\$
Bourne shell and Korn shell superuser prompt	#

Features Overview

This part introduces the features of the Traditional Chinese Solaris Operating System (Solaris OS).

Overview of Features

The Traditional Chinese Solaris Operating System (Solaris OS) is the internationalization and localization of the Solaris Operating System and the Common Desktop Environment (CDE) window system.

This chapter describes the new features and the language support that are available in the release of the current Traditional Chinese release.

Note – The information in this book applies to the Traditional Chinese used in Taiwan and Hong Kong .

New Localized Features

Several new features are available in the current Solaris release of the Traditional Chinese Operating System.

- UDC (user defined character) support for all of the Traditional Chinese locales, which include `zh_TW.EUC`, `zh_TW`, `zh_TW.BIG5`, and `zh_TW.UTF-8` locales. You can define new characters with the `sdtudctool` utility. You can then enter the characters with the native codepoint input method. Finally, you can use the `mp` command with the `-u` option to print the characters.
- HKSCS-2001 support in the Solaris Operating System. HKSCS-1999 is replaced by the HKSCS-2001 standard in the `zh_HK.BIG5HK` locale and in all the Chinese UTF-8 locales (`zh_CN.UTF-8`, `zh_HK.UTF-8`, and `zh_TW.UTF-8`). Changes in the HKSCS-2001 standard include:
 - 116 new characters.

- ISO 10646 mappings for most of the HKSCS-1999 characters. The mappings that are defined in the Private User Area (PUA) of ISO/IEC 10646-1:1993 have changed to the corresponding code points of Unicode Supplementary Ideograph Plane in Unicode 3.2.
- Extended CNS11643 support.
In the Solaris 9 release, the `zh_TW.EUC/zh_TW` locale supported only the first 3 planes of CNS 11643-1992. In the current Solaris Operating System, all of the CNS 11643-1992 planes are supported.

Note – No fonts are available in this release for the characters in the new supported planes.

- Unicode 3.2 support. The `zh_TW.UTF-8` and the `zh_HK.UTF-8` locales have been updated to support the new 3.2 version of the Unicode Standard. The new version introduces an additional 1,016 new characters and contains various normative and informative changes.

Unicode 3.2 also defines the following UTF-8 byte sequences as invalid.

- 0xED as the first byte
- 0xA0 to 0xBF as the second byte

These sequences exclude the surrogate code points between U+D800 and U+DFFF. To comply with the new definition, the UTF-8 `iconv` modules have been enhanced to detect the newly defined UTF-8 invalid byte sequences.

- In the current Solaris release, the `mp` printing utility replaces the `xetops` and the `xutops` utilities.

Note – The `xetops` and `xutops` printing utilities are no longer supported in the Solaris Operating System. The utilities were formerly used to convert Traditional Chinese text files to PostScript. The conversion enabled the printing of Traditional Chinese characters to PostScript printers with no resident Asian fonts. The `xetops` utility was used in the `zh_TW.EUC/zh_TW` and `zh_TW.BIG5` locales. The `xutops` utility was used in the `zh_TW.UTF-8` and `zh_TW.HK` locales.

The `mp` printing utility was first released with the Solaris 9 Operating System.

Language Support

The Solaris system builds inherent internationalization features into every localized product. Localization facilities support the ANSI C recommendations for internationalization and localization that define the locale and related categories.

Locales Attributes

A *locale* contains the culturally specific information and conventions of the language for a particular global region. Each process in the Solaris Operating System has the following set of locale attributes:

- **Locale settings**, which provide the `locale` and `setlocale` commands you use to list and set attributes before you start a process from the command line.
For example, the Traditional Chinese locales and the English/ASCII locale both have a category that defines the display of time and date according to the cultural format, as well as the actual Traditional Chinese or English/ASCII characters for the time and date.
- **Code Sets**, which support coding conventions for the CNS11643 and BIG5 character sets. These sets enable you to input, display, and print Traditional Chinese text in file names, system messages, and terminal (TTY), email, and data file content.
- **htt** input method server, which handles Traditional Chinese input for the Solaris Operating System. The `htt` server receives your keyboard input and converts it to Traditional Chinese characters that are used in Traditional Chinese applications.

Traditional Chinese Locales

The Traditional Chinese Solaris Operating System provides simultaneous support for the locales in the following table. The locales look the same to the end user, but the internal character encoding is different.

TABLE 1-1 Traditional Chinese Locales

Locale	Description
zh_TW.EUC (zh_TW)	Traditional Chinese EUC locale (CNS11643-1992)
zh_TW.BIG5	Traditional Chinese BIG5
zh_TW.UTF-8	Traditional Chinese UTF-8 (Unicode 3.2)

TABLE 1-1 Traditional Chinese Locales *(Continued)*

Locale	Description
zh_HK.BIG5HK	Traditional Chinese (Hong Kong) BIG5-HKSCS
zh_HK.UTF-8	Traditional Chinese (Hong Kong) UTF-8 (Unicode 3.2)

Traditional Chinese Code Sets

The following table lists supported code sets for each Traditional Chinese locale.

TABLE 1-2 Traditional Chinese Code Sets

Locale	Code Set
zh_TW.EUC (zh_TW)	cns11643
zh_TW.BIG5	BIG5
zh_TW.UTF-8	UTF-8
zh_HK.BIG5HK	BIG5-HKSCS
zh_HK.UTF-8	Unicode 3.2

Traditional Chinese Input Methods and Fonts

The Traditional Chinese Solaris Operating System provides input methods and fonts that enable you to enter, display, and print any character in any language. The following input methods are supported for the Traditional Chinese locales.

- New ChuYin
- ChuYin
- TsangChieh
- Array
- Boshiamy
- DaYi
- JianYi
- Cantonese
- NeiMa (EUC, BIG5, BIG5-HKSCS)
- English-Chinese
- Optional codetable Input Methods, such as PinYin

For a complete list of fonts supported for the Traditional Chinese locales, see [Chapter 9](#).

Input Method Auxiliary Window

The input method auxiliary window supports the following functions:

- Input method switching
- Input methods properties configuration
- Lookup tables for the following character sets:
 - HKSCS
 - CNS11643
 - BIG5
 - Unicode
- User-defined characters
- Input method help
- Virtual keyboard

Locale Categories

You can use the following general and specific categories as defined by ANSI C for the Traditional Chinese and English locales.

- General `LC_ALL` setting that invokes all of the categories for locale-related aspects of the system.
- Specific settings for particular aspects of the system, which include:
 - `LC_CTYPE`
 - `LC_TIME`
 - `LC_NUMERIC`
 - `LC_MONETARY`
 - `LC_COLLATE`
 - `LC_MESSAGES`

For example, the Traditional Chinese and the English/ASCII locales have the `LC_TIME` category that defines the display of the time and date according to the cultural format, as well as the actual Traditional Chinese or English/ASCII characters used in the display.

PART II

End-User Information

This part includes end-user information.

Introduction to the Traditional Chinese Solaris Software

This chapter describes the design of the Traditional Chinese Solaris software, and the locales supported in the Traditional Chinese Solaris system. The chapter discusses the following topics:

- “Design of the Traditional Chinese Solaris Operating System” on page 23
- “Traditional Chinese Locales” on page 24
- “How to Set the Locale at Login” on page 24

Design of the Traditional Chinese Solaris Operating System

The Traditional Chinese localization of the internationalized release of CDE provides two work environments: a user environment and a developer environment. Each environment is localized to handle the linguistic and cultural conventions that are unique to the Traditional Chinese language.

- The user environment has desktop tools and a window manager (dtwm) that are customized to communicate in the language of a particular locale.
- The development environment provides internationalized versions of Xlib and Motif that programmers use to develop localized applications. For further information, see the *International Language Environments Guide*.

Traditional Chinese Locales

The Traditional Chinese Solaris product includes the following locales:

- C — ASCII English environment
- zh_TW — Traditional Chinese environment in extended UNIX Code (EUC) that supports the CNS 11643–1992 standard
- zh_TW.BIG5 — Traditional Chinese environment in BIG5 code
- zh_HK.BIG5HK — Traditional Chinese environment in BIG5-HKSCS code that supports the Hong Kong Supplementary Character Set (HKSCS), which is a supplementary character set of the BIG5 and ISO 10646 coding schemes
- zh_HK.UTF-8 — Traditional Chinese (Hong Kong) environment in Unicode 3.2
- zh_TW.EUC — Symbolic links to the zh_TW locale
- zh_TW.UTF-8 — Traditional Chinese environment in Unicode 3.2

How to Set the Locale at Login

1. Choose Language from the options menu on the login screen.



2. Select the desired locale for your CDE session.

Your choices are the C, zh_TW, zh_TW.BIG5, zh_TW.UTF-8, zh_HK.BIG5HK, or the zh_HK.UTF-8 locale.

Traditional Chinese Localization of CDE

The following sections provide information on the Traditional Chinese localization of the Traditional Chinese Common Desktop Environment (CDE) for windowed applications.

- “Traditional Chinese Graphical User Interface” on page 27
- “The Localized CDE Desktop” on page 28

Traditional Chinese Graphical User Interface

The Traditional Chinese CDE Motif graphical user interface is similar in layout and design to the U.S. release of CDE. Traditional Chinese CDE supports multibyte characters and Traditional Chinese messages with Motif objects. Differences in character width and proportional spacing cause minor differences in the exact layout of some Motif objects.

All application windows that can take Traditional Chinese input include a *status area* associated with their input window to show the current conversion mode. With an input conversion mode on, as Traditional Chinese is being typed its entry point becomes a highlighted (reverse video) *preedit area* until the input is converted to Traditional Chinese or special characters and committed. Some input modes also provide conversion choices among several Traditional Chinese characters on menus.

Traditional Chinese Input/Output

To accommodate the diversity of Traditional Chinese, the Solaris software provides several different input methods for entering Traditional Chinese characters. With these methods you can enter ASCII/English characters, Traditional Chinese radicals, and Traditional Chinese characters using an ASCII keyboard or a Traditional Chinese keyboard.

Your Traditional Chinese input is stored temporarily as an intermediate representation. You then use the conversion manager program to transform the representation into a displayed character string.

The Localized CDE Desktop

The following desktop tools are available in this release. All of the tools can handle Traditional Chinese input and output.

Address Manager – Carries out remote operations and finds information about the systems and users on your network. This application can speed up such tasks as sending email, logging in remotely, and setting appointments on someone else's calendar.

Application Manager – Manages the tools and other software applications available on your system.

Audio Tool – Records, plays, and saves audio files in AU, AIFF, and WAV format.

Calculator – Mimics the function of a hand-held calculator.

Calendar Manager – Manages appointments and To Do lists. You can use this application to set and distribute appointment reminders.

Clock – Displays the current time in analog or digital format. You can control the display of local time with this application.

Console – Starts a `dtterm` terminal emulator as your workspace console window.

File Manager – Displays the files and folders on your system. You can move, copy, open, and delete files and folders with this application. You can also use the application to view the contents of your floppy diskettes and CD-ROMs.

Find Files – Enables you to search your system for files or folders that match specific search criteria. Your criteria might include, for example, the name, location, or the size of a file or folder you want to find.

Front Panel – Controls for access to applications and utilities and utilities on the system. The Front Panel is a centrally-located window that occupies all workspaces.

Help – Displays searchable help information for CDE.

Icon Editor – Enables you to create new icons or modify existing icons.

Image Viewer – Enables you to view, print, and save the contents of file types such as GIF, TIFF, JPEG, and PostScript. You can use the Snapshot function of this application to capture a picture of a window or another part of your screen. The picture is saved as a raster file in bitmap format.

Mailer – Handles the distribution, receipt of your electronic mail messages.

Performance Meter – Monitors various aspects of system performance.

Print Manager – Enables you to submit, view, and cancel print jobs. This application is the graphical front-end to the print command. It supports *drag-and-drop* file transfer operations.

Process Manager – Display the processes that are currently running on your workstation. The application enables to perform actions on the active processes.

Text Editor – Enables you to create and edit text files. The application is used in CDE tools such as the Mailer composition window.

Style Manager – Enables you to customize some of the visual elements and system device behaviors of your workspace environment, such as: colors and fonts, keyboard, mouse, window, and session start-up behaviors.

Terminal – Acts as an ASCII character terminal that you can use to enter UNIX® commands at a system shell prompt.

Entering Traditional Chinese Text

This chapter provides procedures and other information that you can use to enter Traditional Chinese text. The chapter discusses the following topics:

- “Character Input Overview” on page 31
- “Character Sets” on page 32
- “Input Window Areas” on page 32
- “Using Traditional Chinese Input Methods” on page 34
- “Setting Input Method Options” on page 40
- “Input Method Utilities” on page 41
- “ASCII Character Input” on page 49
- “Array Input Mode” on page 50
- “Boshiamy Input Mode” on page 53
- “DaYi Input Mode” on page 55
- “New ChuYin Input Method” on page 57
- “ChuYin Input Mode” on page 72
- “Telecode Input Mode” on page 74
- “TsangChieh Input Mode” on page 76
- “ChienI Input Mode” on page 78
- “NeiMa Input Method” on page 81
- “English_Chinese Input Method” on page 83
- “Code Table Input Method Interface” on page 85

Character Input Overview

This chapter describes the Traditional Chinese Solaris input modes that you can use to enter the following kinds of characters.

- ASCII/English characters
- Traditional Chinese characters
- Special symbols

You can type all of these characters in the input areas of the following application windows:

- In terminal emulation (TTY) windows, such as Terminal windows
- In text entry areas, such as those found in the Text Editor and Mailer applications
- In dialog boxes, such as the new folder name box in the File Manager application
- In other special use subwindows, such as pop-ups

Character Sets

The Traditional Chinese Operating System conforms to the CNS 11643 standard, updated in late 1992, and the BIG5 character sets.

The BIG5 character sets are part of the CNS 11643-1992 standard. The BIG5 standard includes 13,461 characters defined by five major Taiwanese computer vendors (including the Institute of Information Industry) in May, 1984. Although BIG5 is not the national standard, it is more widely used than the CNS 11634-1992.

Traditional Chinese Solaris software provides code conversion between Chinese code conventions and three levels of support:

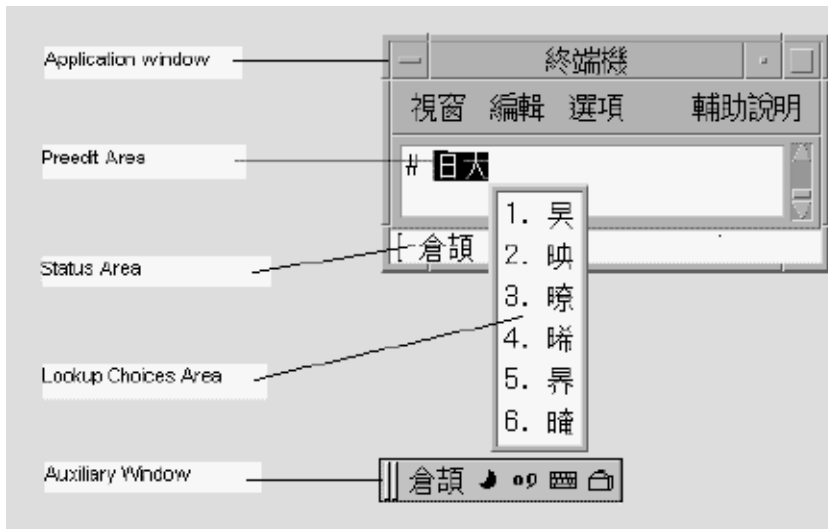
- User commands support file transfers for existing files in different codes.
- Library functions support application development for existing codes.
- STREAMS modules support existing TTY devices using different codes.

Input Window Areas

In the Traditional Chinese operating system, application subwindows contain two areas that are used to enter Traditional Chinese characters. A lookup choice window and an auxiliary window are also available in Chinese input mode.

- **Preedit area** – The text entry area that holds your character formations before you *commit* them.

Note – When you commit characters, the characters are put in the text block that is assembled for the application.



- **Status area** – The area at the lower left of the application subwindow that displays the current conversion mode and the active keyboard. Later sections in this chapter discuss keyboard switching and using the available conversion modes.
- **Lookup choice window** – A popup window that displays Hanja or special character lookup choices which are available for the conversion of characters or radicals in the preedit area.
- **Auxiliary window** – This window contains a *palette* of icons that provide you the following functions and utilities to simplify text entry and to manage input methods:
 - Input method switching
 - Chinese full-width/half-width character mode switching
 - Chinese/English punctuation mode switching
 - Input method properties setting
 - Input method selection
 - Lookup tables for BIG5, EUC_TW, BIG5 HKSCS, and Unicode characters sets
 - Virtual keyboard

The input method auxiliary windows support all the UTF-8 locales and the following Traditional Chinese locales:

- zh_TW/zh_TW.EUC
 - zh_TW.BIG5
 - zh_TW.UTF-8
 - zh_HK.BIG5HK
 - zh_HK.UTF-8
- Two kinds of input methods are supported:
- Methods based on a code table, such as TsangChieh

- Methods developed by a vendor, such as NewChuYin or NeiMa

Using Traditional Chinese Input Methods

This section provides procedures that you can use to select and switch between different input methods.

▼ How to Select an Input Method

1. In the typing area, press **Control-spacebar** to turn on **Traditional Chinese conversion**.

An auxiliary window appears.



2. Select the desired input method through one of the following actions:

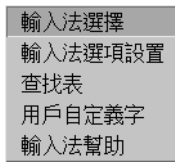
- In the status area of the application subwindow, use the function keys to switch input methods: the F2 key for the first input method, the F3 key for the second input method, and so on.

Tip – You can also press **Control-Escape** repeatedly until you reach the desired input method.

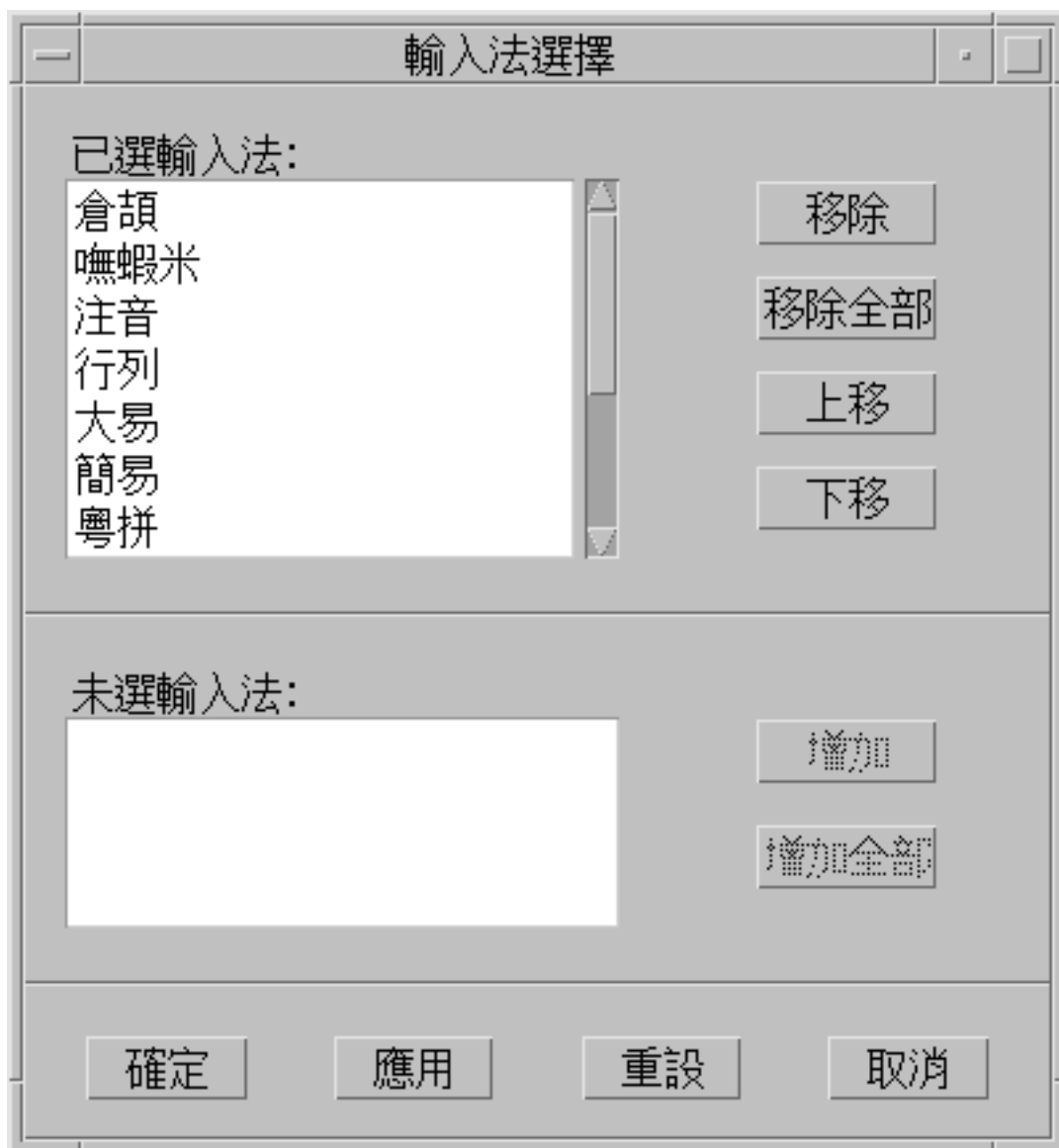
- Use the input method panel.
 - a. Click the utilities button in the auxiliary window.



The utilities menu appears.



- b. Click the input method selection item from the utilities menu.
The input method selection panel appears.



- c. Select the input method you want to use from the input selection panel.
After you select an input method, click OK or Apply to activate the setting.
The first input method you select is the default input method.

Note – When you press Control-spacebar to activate Chinese input, the default input method is selected.

Note – If you change input methods, you can press Control-Escape to return to the default input method.

▼ How Access Input Method Help

Help pages display in the default browser, such as Netscape Navigator™.

- **Select the input method help option from the utility menu to display the help pages in a browser.**

▼ How to Switch Between Half_width and Full_width Character Mode

- **Switch between half_width character mode and full_width character mode through one of the following actions.**
 - In the status area of an application subwindow, type Shift-spacebar to switch between half_width character mode and full_width character mode.
 - In the auxiliary window, click the half_width/full_width button.

The input method system is in full_width character mode when this button appears in the auxiliary window:



The input method system is in half_width character mode when this button appears in the auxiliary window:



When the system is in full_width mode, the full_width character of the input key is committed. For example, when you input an a in full_width mode, the full_width a is committed.



▼ How Switch Between Chinese and English Punctuation Modes

- **Switch between Chinese punctuation mode and English punctuation mode through one of the following actions.**
 - In the status area of an application subwindow, type Control- to switch between Chinese punctuation mode and English punctuation mode.
 - In the auxiliary window, click the Chinese/English punctuation button.The input method system is in Chinese punctuation mode when this button appears in the auxiliary window:



The input method system is in English punctuation mode when this button appears in the auxiliary window:



When you type a function key in Chinese punctuation mode, the corresponding Chinese punctuation character is committed to the application. For example, when

you type the \$ key in Chinese punctuation mode, the Traditional Chinese currency symbol character NT\$ is committed to the application.



The punctuation key includes the characters: , . / > ; ' " \$! ^ _ -

The map between English keys and Chinese punctuation is shown in the following illustration.

!	!
"	"
\$	NT\$
&	—
,	,
((
))
.	。
:	:
;	;
<	<<
>	>>
?	?
@	·
\	、
^	…
-	—

Setting Input Method Options

Four code table input options are available for the input method you select.

- **Display candidates key by key** – This option causes the input method to search a dictionary table when you press a valid key. Candidates for selection then display in the lookup window.

If this option is not active, the character mapped to the key you press appears in the preedit area. When you press the spacebar, the input method engine searches the dictionary table and displays the available candidates for the character in the preedit area.

- **Display external codes** – This option displays the external codes of the candidates you enter display in a lookup window.
- **Automatically commit if only one candidate** – This option commits the external code of a character when only one candidate is available. If this option is not selected, the external code of a character appears in a lookup window even when only one candidate is available.
- **Display keymap character for every external code** – This option displays the character mapped to a valid key in the preedit area when you press the key.

▼ How to Select an Input Method Option

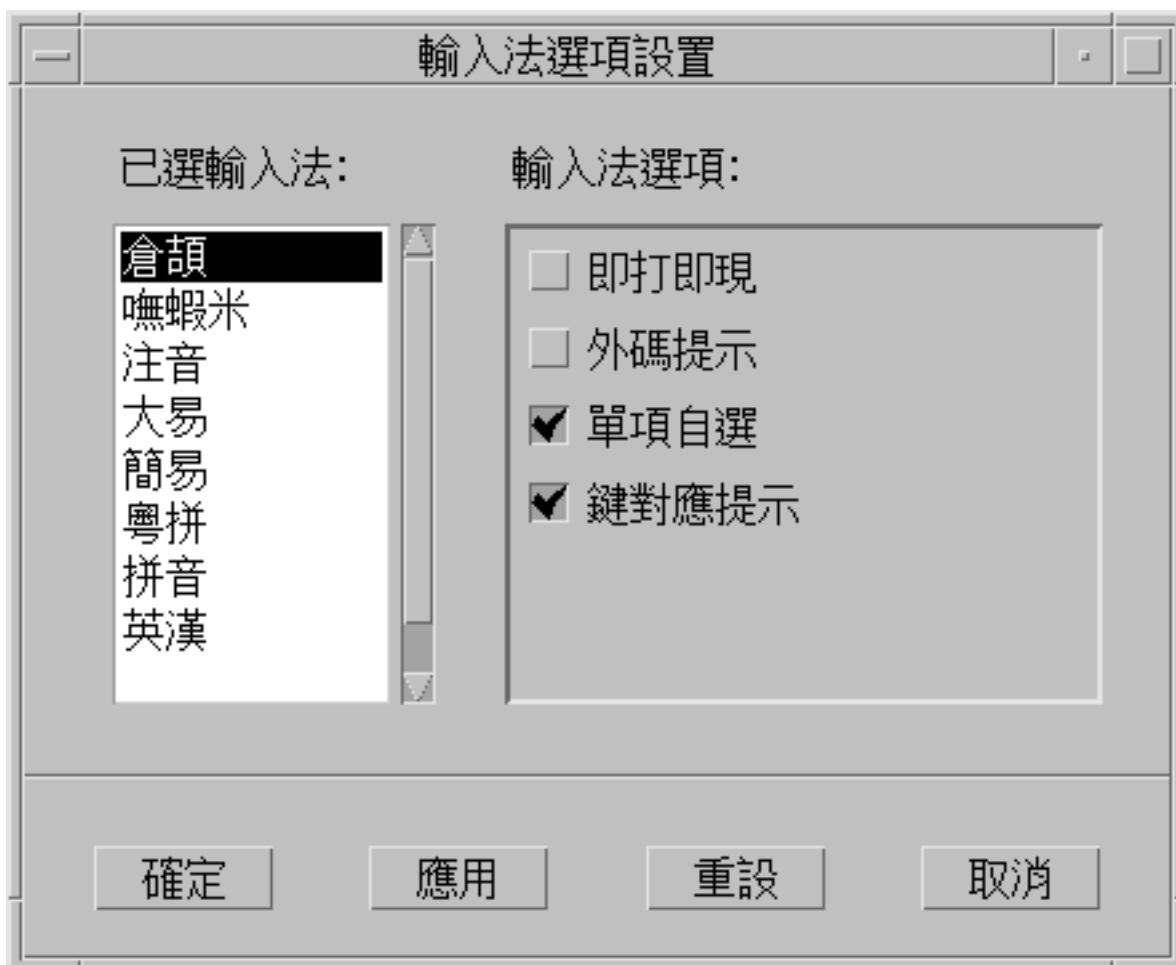
You can use this procedure to make selections in the input method options panel.

1. **Click the input method selection item from the utilities menu.**

The input method selection panel appears.

2. **Select an input method from the selection panel.**

The input method options panel appears.



3. Select an input method option.
4. Click OK or Apply to activate the selection.

Input Method Utilities

After you make your input method selections, you can use the information and the procedures in this section to take the following actions:

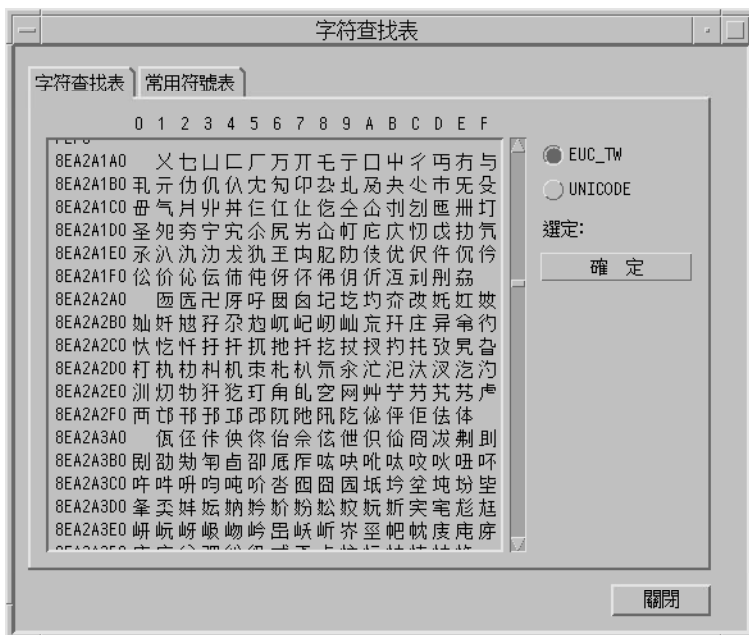
- Activate lookup table selection
- Select a virtual keyboard

- Create user defined characters

Lookup Table

From a lookup table, you can search for and select the Chinese characters you want to input. Three kinds of lookup tables are available:

- Lookup table with native encoding, such as EUC_TW in the zh_TW/zh_TW.EUC locale, or BIG5 encoding in the zh_TW.BIG5 locale



- Lookup table with UNICODE encoding



- Lookup table for special characters, such as Greek letters or Mathematical symbols



▼ How to Activate Lookup Table Selection

1. Click the utilities button in the auxiliary window.
2. Click the lookup item from the selection menu.

When you activate the lookup option, the characters that are available for a string you type in the preedit area display for selection in a lookup choice window.

▼ How to Search and Select Lookup Choices

1. Type a string you want to convert in the preedit area.

The lookup choice window appears.

You can use the following keys to search through the characters and radicals that are available for your string.

Period (.) Moves forward to the next page of choices

Comma (,) Moves backward through the choices

2. Type the number or letter of the label of the lookup choice you want to select.

Your choice is substituted for the string in the preedit area.

Virtual Keyboards

You can use virtual keyboards as lookup utilities to simplify the input of certain special symbols. You can also use virtual keyboards to display the keymap of input methods, such as TsangChieh.

The Traditional Chinese system supports several virtual keyboards.

PC Keyboard

The following figure shows the PC virtual keyboard.



TsangChieh Keyboard

The TsangChieh keyboard displays the keymap of TsangChieh input method that is based on Chinese radicals.



Array Keyboard

The following figure shows the Array virtual keyboard.



DaYi Keyboard

The following figure shows the DaYi virtual keyboard.



Boshiamy Keyboard

The following figure shows the Boshiamy virtual keyboard.



ChienI Keyboard



▼ How to Select a Virtual Keyboard

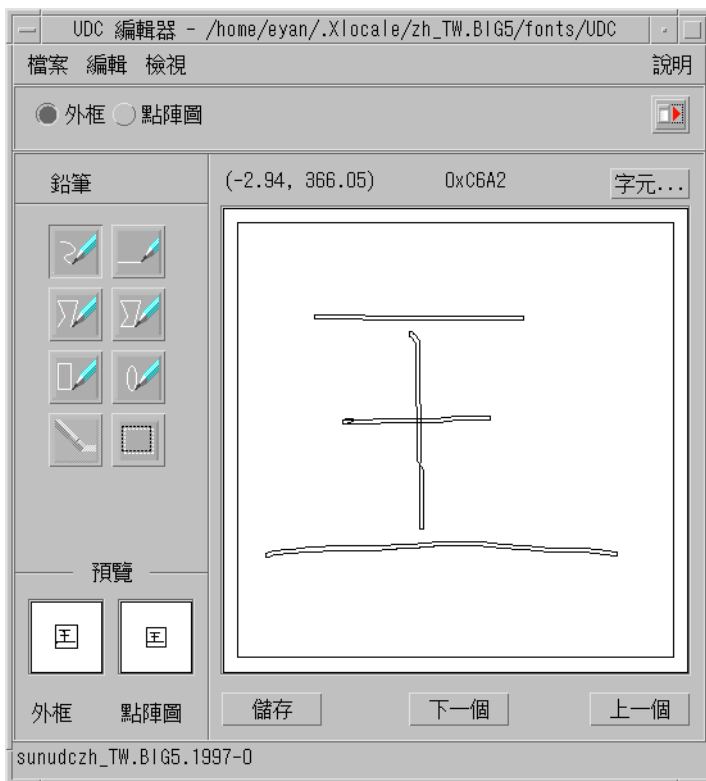
- Click the virtual keyboard button in the auxiliary window.
The virtual keyboard for the active input method appears.

User-Defined Characters (UDC)

The user-defined character (UDC) editor tool enables you to draw and save new characters. Once you ascribe a character to an input method, the character can be displayed in an application.

▼ How to Activate the UDC Tool

- Select the user defined character item on the utility menu to activate the UDC tool.



ASCII Character Input

Applications start in ASCII mode. You can toggle ASCII mode on or off by pressing Control-spacebar or the Chinese/English key on a Chinese keyboard. For example, you can use ASCII mode to type the echo command shown in the following figure.



When you turn on the ASCII input mode, the following indicator appears in the status area.

[英文]

When you turn off ASCII input mode, an indicator for the default input mode appears.

Array Input Mode

In the array input mode, 260 radicals that compose Chinese characters are assigned to the keys in ten columns of three rows in the array virtual keyboard. To use the array input mode effectively, you need to memorize only ten basic keystrokes. All radicals are naturally allocated on the keyboard by the basic keystrokes.

▼ How to Type Array Text

1. Select the Array input mode.

Follow the steps in the procedure [“How to Select an Input Method” on page 34](#) to select the input mode.

Array appears in the status window.



2. Type the x key and press the spacebar.

The array input converter finds several matching characters that display in a lookup choice window.



3. Type the 1 key to commit the first character.

The radicals are converted and the corresponding character appears.



Boshiamy Input Mode

Boshiamy input mode works with the radicals that you use to compose Chinese characters. The radicals in this mode are easy to memorize by the shape, the sound, or the meaning. You can memorize the following rules to help you quickly enter Chinese characters:

- Cut off long
- Patch up short

▼ How to Type Boshiamy Text

1. Select the Boshiamy input mode.

Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input mode.

Boshiamy appears in the status window.



2. Type the set of radicals uoo.



3. Press the spacebar to commit the corresponding Chinese character.



DaYi Input Mode

Similar to the TsangChieh input mode, DaYi conversion works with the radicals that compose Chinese characters. The keystroke sequence of the DaYi input mode follows the Chinese writing sequence. You need to memorized only a few rules to use this input mode.

▼ How to Type DaYi Text

1. **Select the input method.**

Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input method.

DaYi appears in the status window.



2. Type the set of radicals: ;o.



3. Press the spacebar to commit the corresponding Chinese character.



New ChuYin Input Method

This section describes the features in the New ChuYin input method. The section also explains how to use some of the features in the following Traditional Chinese locales: zh_TW.EUC, zh_TW.BIG5, zh_TW.UTF8, zh_HK.BIG5HK, and zh_HK.UTF-8.

The New ChuYin input method provides support for the following features:

- Phrase input
- Storing and recalling user-defined phrases
- Using only consonants to input simplified ChuYin
- Editing the preedit string
- Adjusting the frequency of phrase lookup and single Chinese character lookup

▼ How to Type New ChuYin Text

- **Select the input method.**

Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input method.

New ChuYin appears in the status window.



▼ How to Enter a Single Character

This procedure describes how to enter the following character:

撞

1. Using the New ChuYin input method, type the key sequence 5j.
The lookup table appears for the characters highlighted in the preedit area.



2. Type tone 4.

The preedit area and the lookup table change.



Note – The first candidate is committed when you press the spacebar. If you type another tone value, the choices for that tone appear. For example, when you type tone 1 for a Chinese character, the choices for tone 1 appear.

3. Press Shift-D to commit the fourth candidate.
The committed character appears.



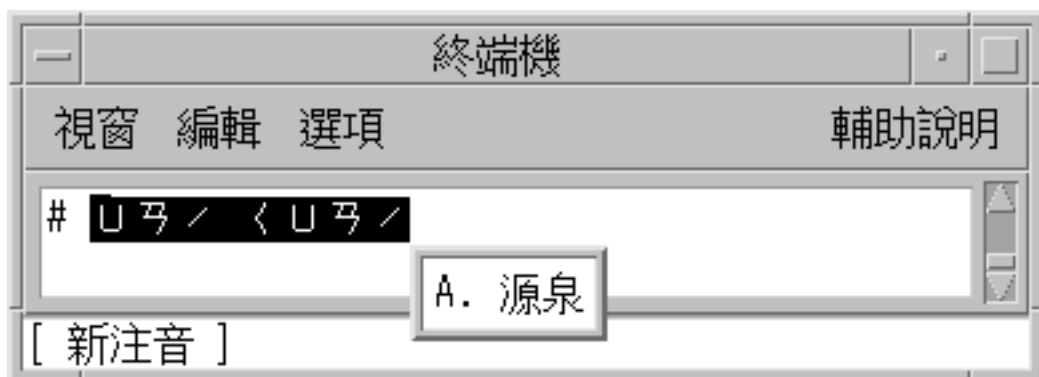
▼ How to Type Stored Words and Phrases

New ChuYin input method provides intelligent word and phrase input functions. When you type ChuYin key sequences, the input method automatically locates the related words and phrases in a system dictionary.

For example, this procedure describes how to enter the following phrase:

源泉

1. Using the New ChuYin input method, type the key sequence `m06 fm06`
The lookup table appears for the characters that are highlighted in the preedit area.



2. Press the spacebar or type Shift-A to commit the selection.



▼ How to Define New Phrases

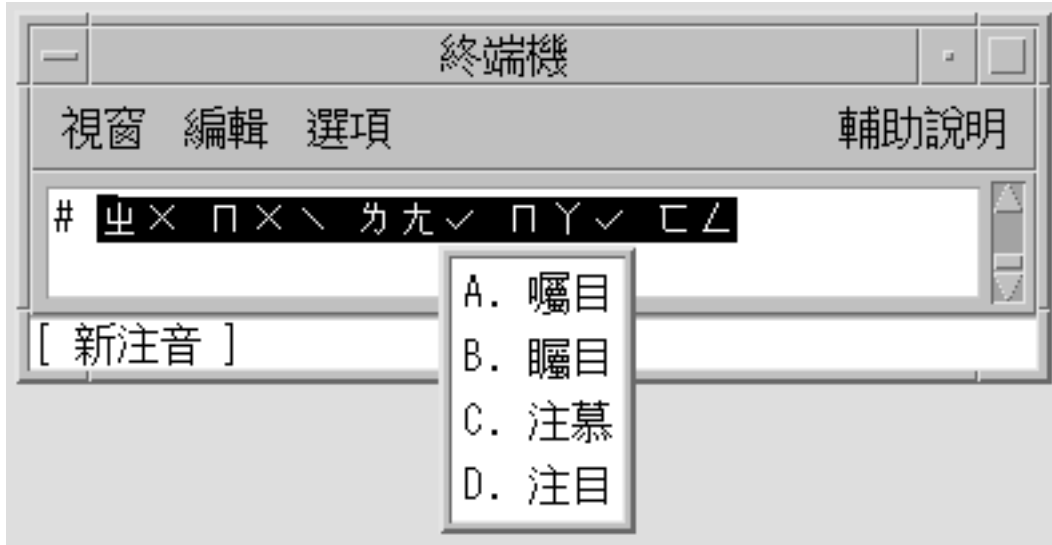
You can define single phrases with up to 8 Chinese characters.

For example, this procedure describes how to define the following new phrase:

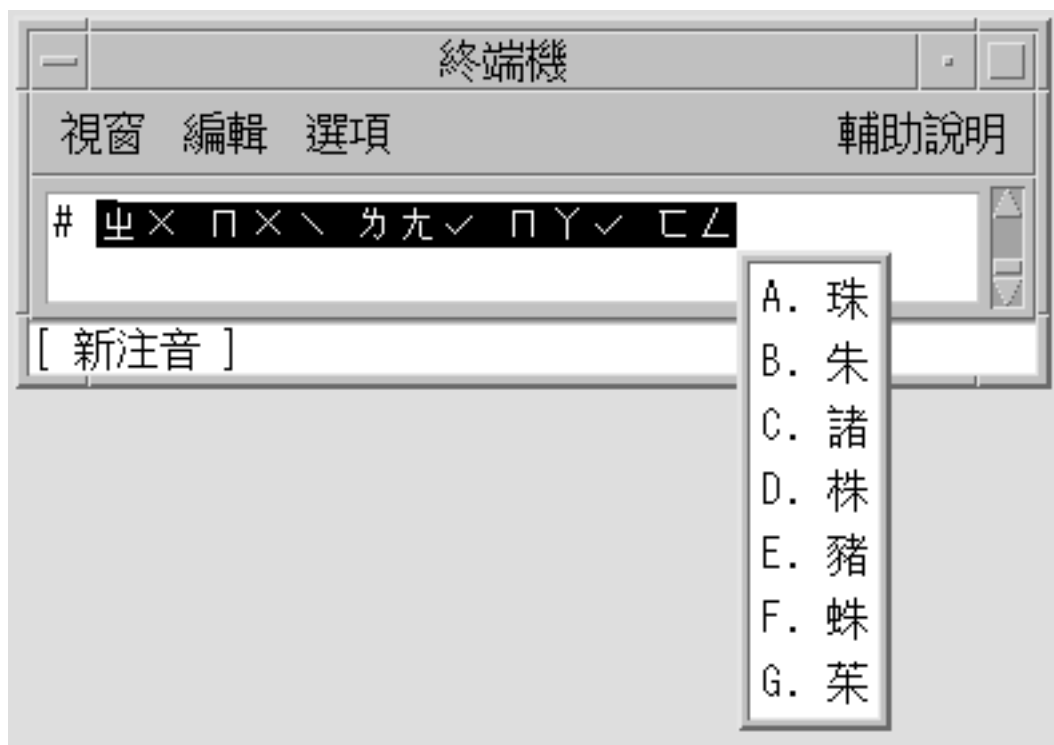
珠穆朗瑪峰

1. Using the New ChuYin input method, type the key sequence `5ja4x;3a83z/`.
The new ChuYin input method automatically adds spaces between each syllable.

The first Chinese character is not shown in the lookup window.

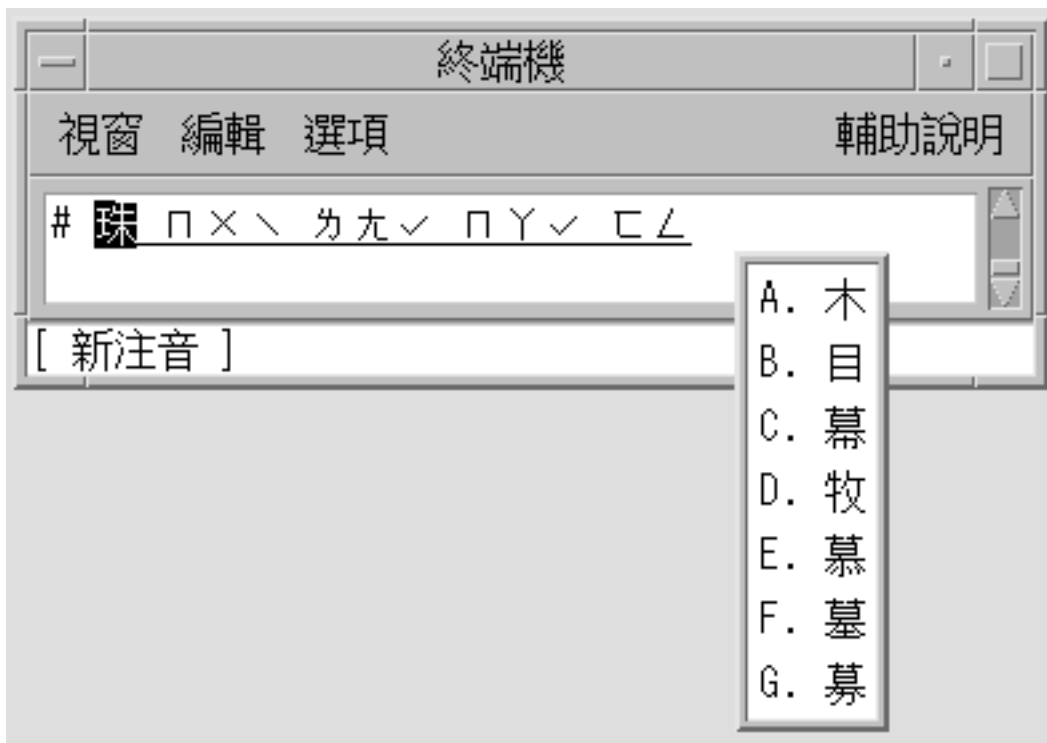


2. Press the Return key to change to the single character group.

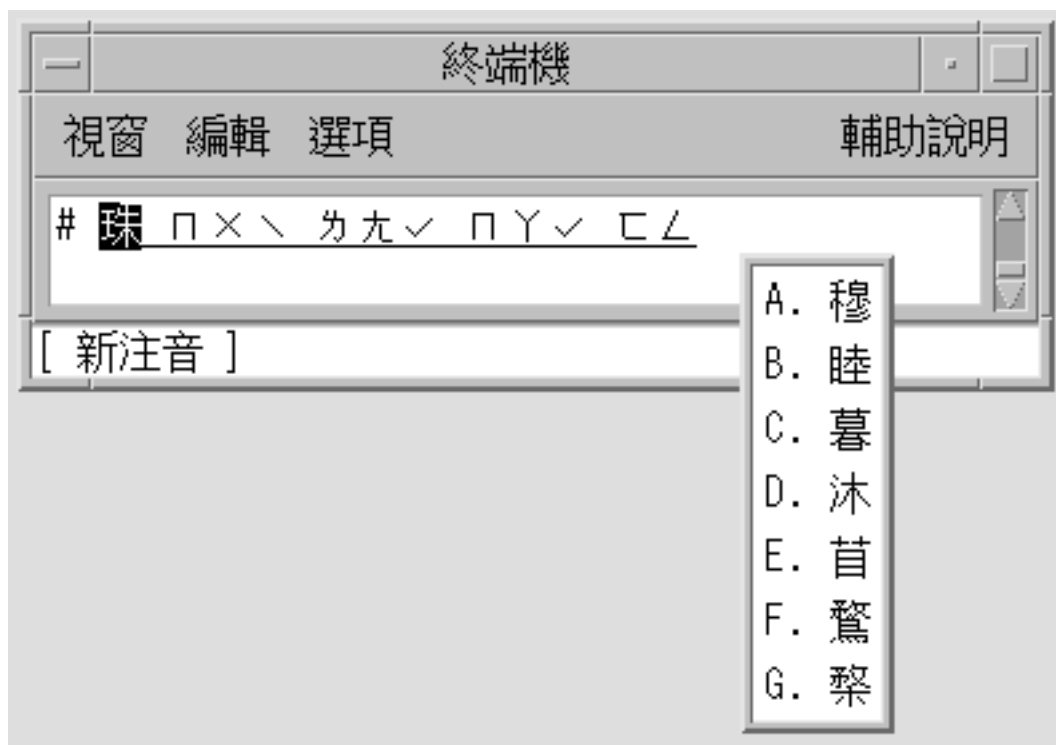


3. Press the spacebar to select the first character.

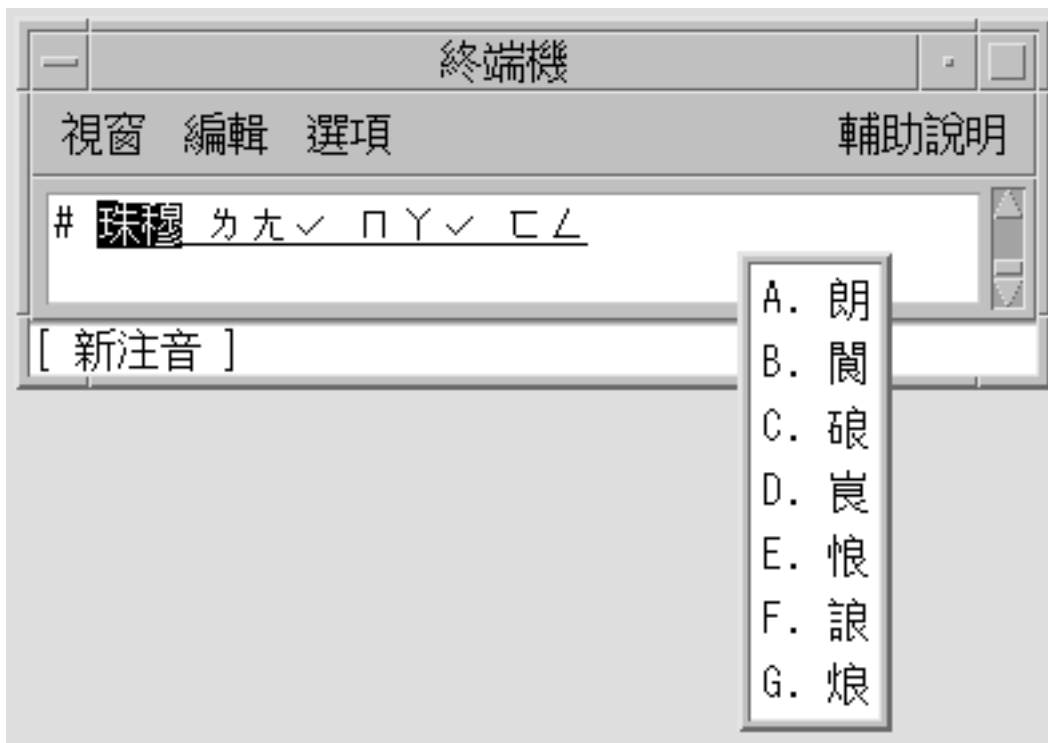
The first character is inserted into the preedit string. The second character does not appear in the lookup window.



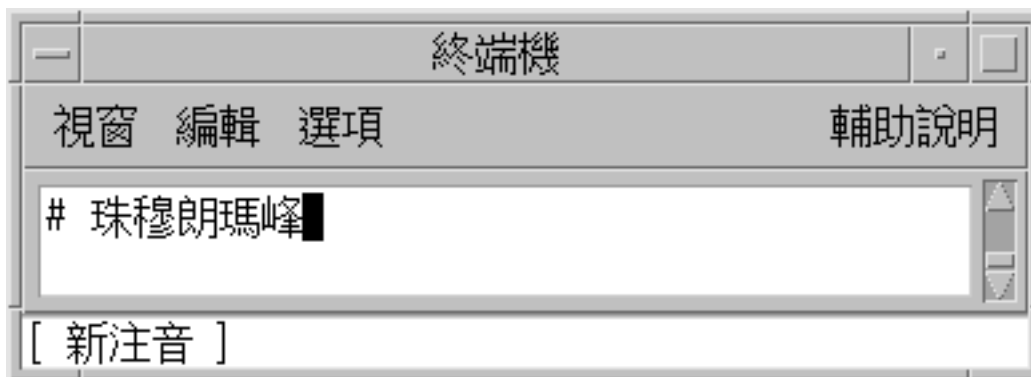
4. Press the] key to go to next page, which contains the second Chinese character.



5. Press the spacebar to select the second Chinese character.

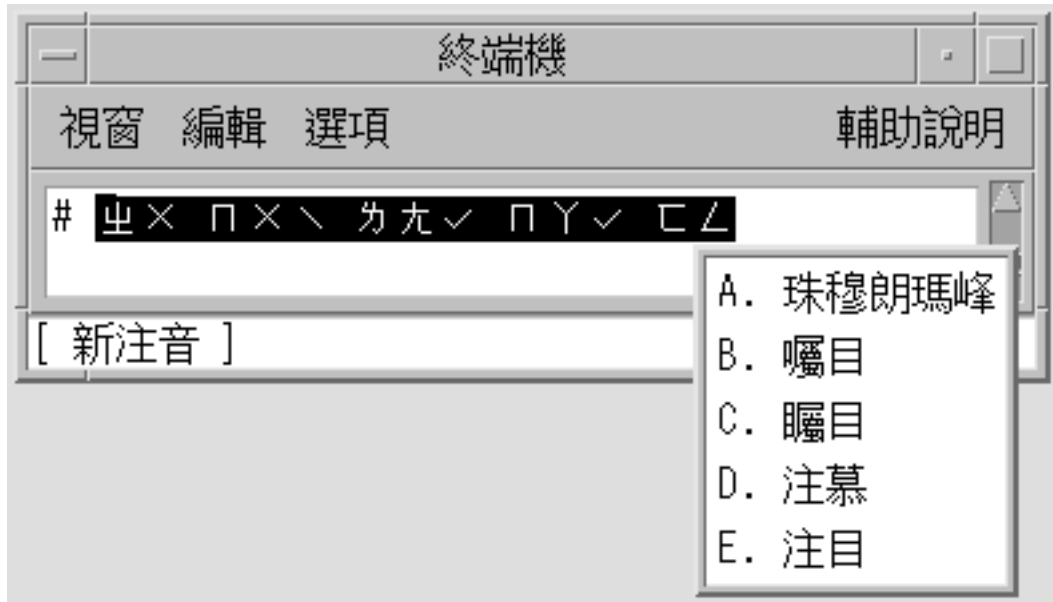


6. Repeat the previous steps to input the third, fourth, and fifth Chinese characters.
The phrase is committed automatically after the last Chinese character is selected.



The new phrase is saved.

When you type the string 5jaj4x;3a83z/ now, the new phrase appears for selection in the lookup window.

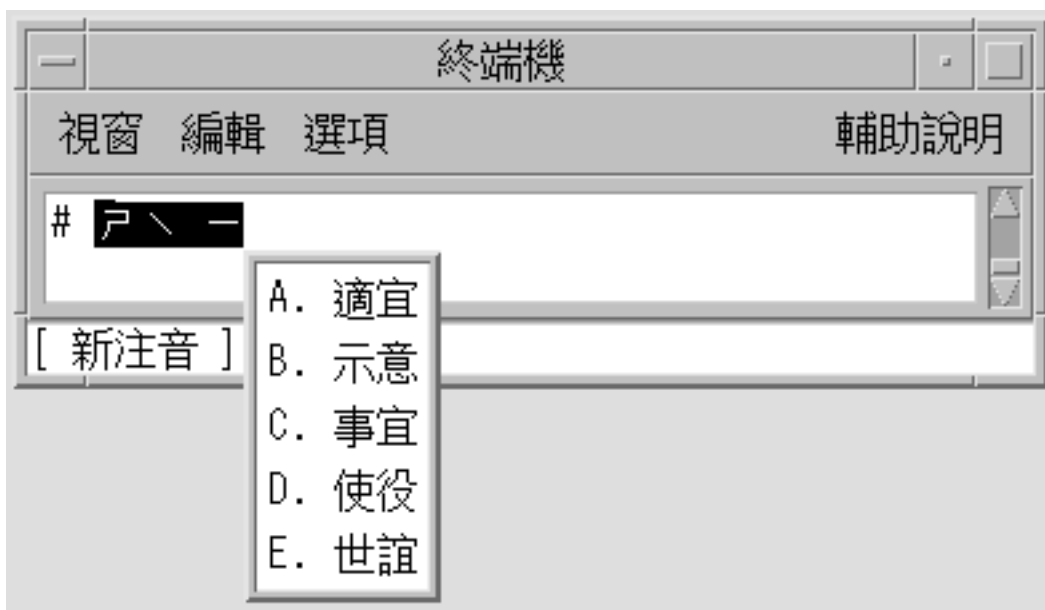


▼ How to Change the Sequence of Frequently Used Chinese Characters and Phrases

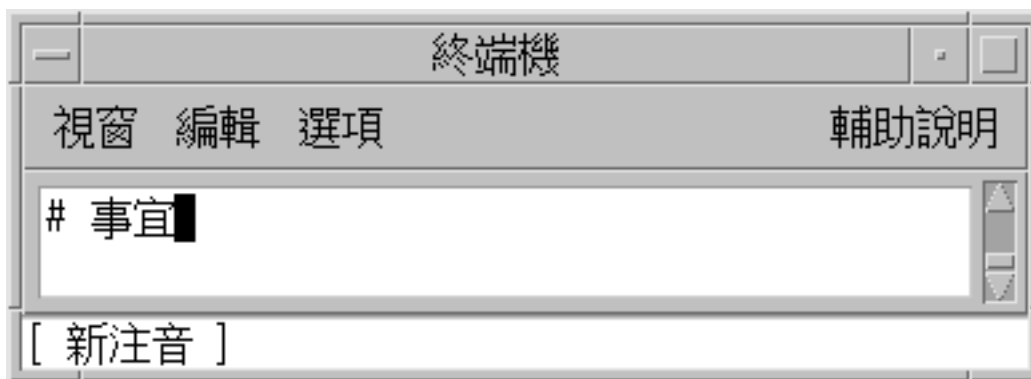
The New ChuYin input method automatically recalls the most recently selected list items. The items appear at the top of a list of phrases and characters for easy selection.

1. **Using the New ChuYin input method, type the key sequence gfu.**

Note the sequence of the choices that appear.

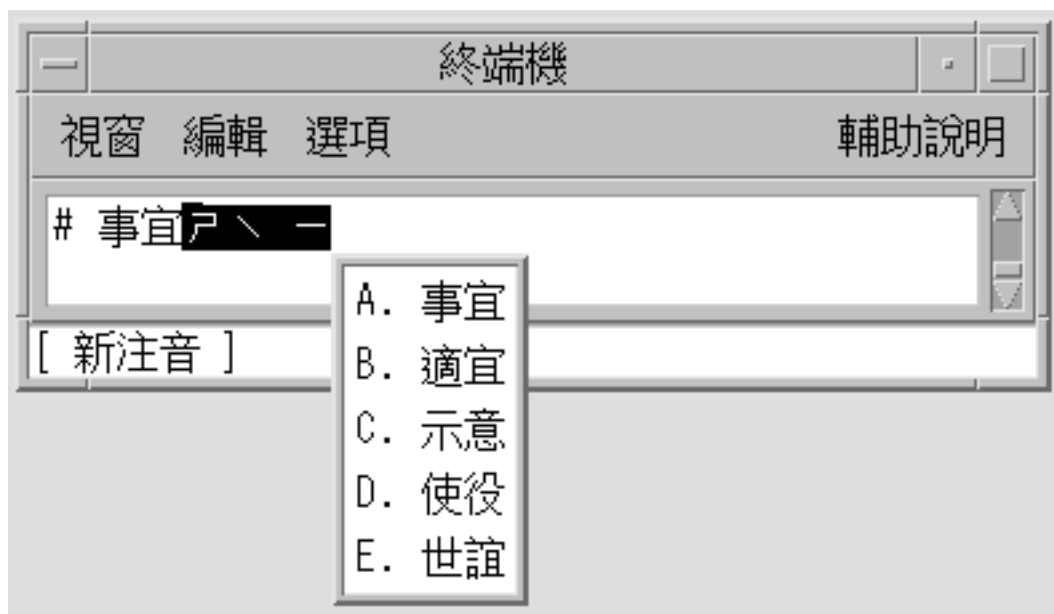


2. Select the third item, C, from the list of lookup choices.



3. Type the **gfu** key sequence again.

The selection you made for **gfu** in the previous step now appears as the first choice in the list.



▼ How to Display Input Phrases by Typing a Consonant

You can enter a complete phrase with a single Chinese consonant.

For example, this procedure describes how to input the following phrase:

事半功倍

- Using the New ChuYin input method, type the consonant of the Chinese character **g1e1**.

The complete phrase appears in the lookup window.

▼ How to Edit the Preedit String

1. **Using the New ChuYin input method, press the Shift key with the A, B, C, D, E, F, or G key to select the preedit string.**
2. **Press an edit key.**

The following table shows the definitions of the edit keys.

[a-z, 0-9, ,./;'-]	ChuYin keystroke
Home	Moves to the start of the preedit line
End	Moves to the end of the preedit line
Right	Moves the caret in the preedit line to the right.
Delete	Deletes the PinYin character following the caret on the preedit line.
Backspace	Deletes the PinYin character preceding the caret on the preedit line.

Using Page Scroll Keys

The selections related to a ChuYin preedit string can be split to two groups, one group for phrases and the other group for single Chinese characters. The phrase candidates are at the top of the list. You can use the keys defined in the following table scroll through the available candidates.

TABLE 4-1 Page Scroll Key Definitions

Key	Definition
[Scrolls to previous page
]	Scrolls to next page
Return	More to another group

▼ How to Switch Between PinYin and ChuYin Mode

You can toggle back and forth between PinYin mode and ChuYin mode with a keystroke.

- **Using the New ChuYin input method, press Alt-1 to switch between ChuYin mode and PinYin mode.**

In PinYin mode, the PinYin phonetics are same as the keystroke.

ChuYin Input Mode

ChuYin is another common input mode. This mode applies the Chinese phonetic symbols to the phonetics of Mandarin Chinese. When a typed sequence of phonetics uniquely matches a Chinese character, the phonetics are automatically converted and the character is displayed. However, if more than one character matches a sequence of phonetics, a lookup selection area appears that shows you the available choices. Several pages of lookup choices are available for some phonetic sequences.

▼ How to Type ChuYin Text

The following example uses ChuYin mode to enter Chinese characters that represent the statement, “Taipei’s weather is very hot.”

1. Select the input method.

Follow the steps in the procedure “How to Select an Input Method” on page 34 to select the input method.

ChuYin appears in the status window.



2. Type w96.

The ChuYin input converter finds several matching characters and displays a lookup choice window.



Telecode Input Mode

Telecode conversion uses the old four-digit codes used by the Taiwan Telephone & Telegraph Bureau. The four-digit codes uniquely identify 16356 Chinese characters. The codes are organized into two planes: plane 1, numbered from 0000 to 8045 and plane 2, numbered from .0000 to.8489.

▼ How to Type Telecode Input

This section contains instructions on how to use the Telecode input mode to input Chinese characters

1. Select the input method.

Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input method.

Telecode appears in the status area.



2. Type the first three digits of the code 3456.



3. Press the spacebar.

The Telecode input converter finds a single matching character.



TsangChieh Input Mode

TsangChieh is the default input mode that you use to type Chinese and other non-ASCII characters when ASCII mode is toggled off. TsangChieh conversion works with the radicals that compose Chinese characters. Each Chinese character has a keystroke sequence that is made up of the radicals that compose a character. A TsangChieh keystroke sequence often defines a single Chinese character. When a sequence defines more than one character, you are presented with different input choices.

You can also use the TsangChieh conversion mode to type the characters in the Chinese National Standard 11643. To type characters in this mode, press the Z key then the three-letter code assigned to the character by the standard.

▼ How to Type in the TsangChieh Mode

To type Chinese characters in the TsangChieh input mode, type the Chinese radicals that make up the Chinese character. If you do not have a Taiwan Chinese keyboard that shows the radicals on the keycaps, refer to a picture of the Chinese keyboard to see how the Chinese radicals map to your keyboard.

1. Select the input method.

Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input method.

TsangChieh appears in the status area.



2. Type **ir**.

The radicals appear highlighted in the preedit area.



3. Press the spacebar to commit the corresponding character.



ChienI Input Mode

The ChienI input mode is a simplification of the TsangChieh mode. In the ChienI mode, you enter only the first and last keystrokes of a TsangChieh sequence for a Chinese character. Lookup selections then appear for the keystrokes you enter.

Typing ChienI Input

1. **Select the input mode.**

Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input mode.

ChienI appears in the status area.



2. Type the key sequence **ak**.

The ChienI input converter finds several matching characters and displays a lookup choice window.



3. Press 1 to select the appropriate character.

The radical is converted and the correct character appears.



NeiMa Input Method

In the NeiMa input method, you use a four-digit or an eight-digit hexadecimal internal code to enter Chinese characters or symbols. You can use the following input methods in the Traditional Chinese locales.

- EUC_TW NeiMa input method in the zh_TW.EUC locale
- BIG5 NeiMa input method in the zh_TW.BIG5 locale
- BIG5+HKSCS input method in the zh_HK.BIG5HK locale

▼ How to Input NeiMa Text

This section contains instructions on how to use the BIG5 internal codes to input Chinese characters and symbols.

1. Select the input method.

Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input mode.

BIG5 NeiMa code input method appears in the status area.



2. Type the first three keys of a four-key sequence that represent a character. In this example, type the b96 keys of the sequence b968.



3. Type the fourth key. In this example, type the 8 key.
The character is automatically committed in the preedit area.



English_Chinese Input Method

You can use the English_Chinese input method in both `zh_TW.EUC` and `zh_TW.BIG5` locales. With this method, you type English words of up to 15 keystrokes that are mapped to Chinese phrases. For each keystroke, a lookup window displays characters that match your input. To select a character, you type the number that corresponds to your lookup choice. For more information, see [“How to Search and Select Lookup Choices”](#) on page 44.

▼ How to Type English_Chinese Characters

The following procedure shows you how to use this input method to enter the Traditional Chinese phrase for the English word, “hello”.

1. Follow the steps in the procedure [“How to Select an Input Method”](#) on page 34 to select the input mode.

English_Chinese conversion mode appears in the status area.



2. Type the key sequence `hello`.



3. Type the 4 key to select the corresponding Traditional Chinese phrase.



Code Table Input Method Interface

The current Solaris operating system provides a code table input method interface that enables Chinese users to add new input methods into their system.

Creating a Code Table

A code table is a plain text dictionary file that contains a list Chinese characters, words, and phrases that are mapped to input keystrokes. When you type the specified keystrokes, the associated characters, words, and phrases appear for selection.

The code table file contains the following sections:

- [Description] This section describes the following attributes of the code table.
 - Name: Code table name
 - Encode: UTF-8, GB, GB2312, GBK, or BIG5 encoding used the code table
 - WildChar: Wild character used for input codes
 - UsedCodes: Valid characters for input
 - MaxCodes: Maximum number of input codes for one item
- [Comment]
- [Key_Prompt] This section specifies the prompt string of an input key. The prompt string appears in the preedit area of the application subwindow.

- [Function_Key] This section specifies the key definitions of certain function keys.
 - PageUp: Scroll up a list of selection items
 - PageDown: Scroll down a list of selection items
 - BackSpace: Delete an input code
 - ClearAll: Clears all the input areas, such as preedit area and the lookup area
- [Phrase] This section specifies the input codes and the corresponding phrases. The Chinese phrases must be separated by spaces. The format of each line is `keystroke_sequence word1 word2 word3 ...`
- [Single] This section specifies the input codes and the corresponding Chinese characters. The format of each line is `keystroke_sequence Characterlist`. The `Characterlist` characters are not separated by spaces.
- [Options] This section specifies the options of the code table input method that you can turn on or off in the following entries.
 - HelpInfo_Mode: Display help information
 - KeyByKey_Mode: Display lookup candidates key by key or only when the spacebar is pressed.
 - KeyPrompt_Mode: Display the prompt string of the input key in the preedit area.
 - AutoSelect_Mode: Commit the lookup choice automatically when only a single candidate is available.
 - SelectKey_Mode: Select numbers, uppercase letters, or lowercase letters.

The following example shows a code table file.

```

[ Description ]
Name:          倉頡
Encode:       B:G5HK
UsedCodes:    abcdeafghijklmnopqrstuvwxyz
WildChar:     ?
MaxCodes:     5

[ Key_Prompt ]
a             日
b             月
c             金
d             木
e             水
f             火
g             土
h             土
i             竹
j             戈
k             十
l             大
m             中
n             一
o             馬
p             人
q             心
r             手
s             口
t             尸
u             戶
v             甘
w             山
x             女
y             田
z             雞

[ Function_Key ]
PageUp:       [ < ^P
PageDown:     [ > ^N
BackSpace:    ^H ^?

[ Options ]
KeyByKey_Mode:      OFF
HelpInfo_Mode:     OFF
AutoSelect_Mode:   ON
KeyPrompt_Mode:    ON
SelectKey_Mode:    Number

[ Single ]
a             日
aa           胡

```

▼ How to Create a New Code Table Input Method

1. Create and edit the code table source file.

Prepare the code table source file to define the mapping of characters, words, or phrases to input keystrokes.

2. Convert the source code table file to binary format.

Use the `txt2bin` utility to convert the code table text file to binary file.

```
# /usr/lib/im/locale/zh_TW/common/txt2bin source_codetable_file  
binary_codetable_file
```

Note – You can find the `txt2bin` and `bin2txt` are utilities in the directory:
`/usr/lib/im/locale/zh_TW/common/`

3. Add the code table to the input method specification file, `/usr/lib/im/locale/zh_TW/sysime.cfg`.

For example, if your new code table binary file is called `newim.data`, add the entry `newim` to the input method specification file, `sysime.cfg`.

4. Restart the `htt` input method server by typing the following commands as root.

```
# /etc/init.d/IIim stop  
# /etc/init.d/IIim start
```

The new input method is ready to use when you log in to the system.

Localized Applications

This chapter describes the applications and code conversion utilities that you use in the Traditional Chinese operating system. The chapter discusses the following topics:

- “Using the `mailx` Utility With Traditional Chinese Characters” on page 89
- “Using `talk` With Traditional Chinese Characters” on page 90
- “`xtobdf` Utility” on page 90
- “`runb5` Utility” on page 90
- “`sdtconvtool` Utility” on page 90
- “`iconv` Command” on page 91

Using the `mailx` Utility With Traditional Chinese Characters

The encoding variable in `.mailrc` does not affect Mailer behavior, but it does set `mailx` function. To send email in formats other than 7-bit ASCII, such as 8-bit Traditional Chinese characters, you must use `/usr/SUNWale/bin/mailx`. The *encoding* variable in `.mailrc` sets encoding formats for `mailx`.

International transmission conventions require header information to contain only ASCII characters. Traditional Chinese characters should not be used in the header (including the Subject line) with Mailer or with `mailx`.

Note – The `/bin/mailx` application has not been localized and cannot send or receive Traditional Chinese characters.

Using `talk` With Traditional Chinese Characters

To use Traditional Chinese characters with `talk`, the `/usr/SUNWale/bin/talk` application is required because `/bin/talk` is not localized.

`xtobdf` Utility

Traditional Chinese Solaris software provides the following BDF font generator:

`xtobdf` – Converts an X server font to a BDF font.

`runb5` Utility

The `runb5` utility permits terminal-based BIG5 applications to run under the Solaris TTY window environment.

`sdtconvtool` Utility

The `sdtconvtool` graphic user interface utility enables file conversion between various codesets. The `sdtconvtool` functionality is similar to `iconv`.

The following procedure describes how to convert a file. In this example, a file encoded in UTF-8 is converted to BIG5 encoding.

▼ How to Convert a File Using `sdtconvtool`

1. In the source codeset field of the `sdtconvtool` panel, select the codeset of the file to be converted.

Scroll through the pull-down list and select the codeset of the file to be converted. In this example, select UTF-8.

2. **In the source file path field, type the path in the path of the file to be converted.**
Alternatively, you can click the Browse button and select the name of the file to be converted. In this example, type or select the `/tmp/en_US.UTF-8` file.

Note – You can use the Clear button to the right of the Browse button to remove a path you enter.

3. **In the target codeset field, select the codeset to which the file will be converted.**
In this example, select BIG5.
4. **In the target path field, type the path for the converted file.**
In this example, type or select `/tmp/BIG5.all.txt`.
5. **Press the start conversion button to begin the conversion process.**

Note – The Clear All Fields button erases both the source file and target file path names.

iconv Command

The `iconv` command converts the characters or sequences of characters in a file from one codeset to another. The command then writes the results to standard output. The Traditional Chinese Solaris software includes special filters for the `iconv` command.

If no conversion exists for a particular character, the character is converted to the underscore “_” in the target codeset. The following options are supported:

- `-f from-code` — Symbol of the input codeset
- `-t to-code` — Symbol of the output codeset

The following table lists the codeset conversion modules that are supported in Traditional Chinese Solaris software.

TABLE 5-1 Codeset Conversion Modules

Source Code	Symbol	Target Code	Symbol
CNS 11643	zh_TW-euc	BIG5	zh_TW-big5
CNS 11643	zh_TW-euc	ISO 2022-7	zh_TW-iso2022-7
BIG5	zh_TW-big5	CNS 11643	zh_TW-euc
BIG5	zh_TW-big5	ISO 2022-7	zh_TW-iso2022-7
ISO 2022-7	zh_TW-iso2022-7	CNS 11643	zh_TW-euc
ISO 2022-7	zh_TW-iso2022-7	BIG5	zh_TW-big5
CNS 11643	zh_TW-euc	ISO 2022-CN-EXT	zh_TW-iso2022-CN-EXT
ISO 2022-CN-EXT	zh_TW-iso2022-CN-EXT	CNS 11643	zh_TW-euc
BIG5	zh_TW-big5	ISO 2022-CN	zh_TW-iso2022-CN-EXT
ISO 2022-CN	zh_TW-iso2022-CN	BIG5	zh_TW-big5
UTF-8	UTF-8	CNS 11643	zh_TW-euc
CNS 11643	zh_TW-euc	UTF-8	UTF-8
UTF-8	UTF-8	BIG5	zh_TW-big5
BIG5	zh_TW-big5	UTF-8	UTF-8
UTF-8	UTF-8	ISO 2022-7	zh_TW-iso2022-7
ISO 2022-7	zh_TW-iso2022-7	UTF-8	UTF-8
IBM Cp937	zh_TW-cp937	UTF-8	UTF-8
UTF-8	UTF-8	IBM Cp937	zh_TW-cp937
BIG5+	zh_TW-big5p	UTF-8	UTF-8
BIG5+HKSCS	zh_TW-big5hk	UTF8	UTF8
CNS 11643	zh_TW-euc	UTF8	UTF8
UTF-8	UTF-8	BIG5+	zh_TW-big5p
UTF-8	UTF-8	BIG5+HKSCS	zh_HK-big5hk
BIG5HK	zh_HK-big5hk	UTF-8	UTF-8

In the following example, an EUC mail file is converted to BIG5:

```
system% iconv -f zh_TW-euc -t zh_TW-big5 mail.euc > mail.big5
```

For further information, see the `iconv(3C)` and the `iconv_TW(5)` man pages. These utilities can be used for converting files for printing.

Traditional Chinese Solaris Printing Facilities

This chapter Traditional Chinese Solaris Operating System supports the printing of Traditional Chinese output to the following types of printers:

- Line printer with built-in Traditional Chinese fonts
- PostScript-based printer with built-in scalable fonts
- Any PostScript-based printer for bitmap printing

Note – Review the manufacturer’s documentation on installing the printer before you use the information in this chapter in this chapter.

Line Printer Support

For the Traditional Chinese Solaris Operating System to run a line printer, the printer must recognize one or both of the supported code sets, EUC and UTF-8.

Using the EUC to BIG5 Filter

A printer that does not support EUC needs filters that convert EUC files for printing. Use the commands in this section to print EUC files to non-EUC printers.

The following commands install the printer `lp1` on port `ttya`. The commands signal the print service that `lp1` accepts only BIG5 format files. See the `lpadmin(1M)` man page for more information.

```
# lpadmin -p lp1 -v /dev/ttya -I Big5
# accept lp1
# enable lp1
```

You can use an `lpfilter` command as shown in the following example to print files with formats that are not supported by the printer. The command signals the print service that a converter called *filter-name* is available through the filter description file named in *pathname*.

```
# lpfilter -f filter-name -F pathname
```

The following example shows the output of *pathname* for a converter called `euctobig5`. The *pathname* filter converts the default input type to BIG5 with the `euctobig5` converter.

```
Input types: simple
Output types: BIG5
Command: euctobig5
```

To print an EUC format file, use a command line such as the following.

```
system% lp -d lp1 EUC-filename
```

To print a BIG5 format file, use a command line such as the following.

```
system% lp -d lp1 -T BIG5 Big5-filename
```

Using Configuration Files for Printing With an Epson Dot Matrix Printer

Traditional Chinese Solaris software provides configurable files that allow users to configure the available built-in font ranges according to their own equipment. Traditional Chinese Solaris software provides a configuration file that defines the built-in fonts in the Epson dot matrix printers.

Modify the configuration file according to your printing equipment before using it:

- Modify `/usr/lib/lp/files/cns.epson.conf` if you are working with a `zh_TW` file.
- Modify `/usr/lib/lp/files/big5.epson.conf` if you are working with a `zh_TW.BIG5` file.

Printing a CNS File to an Epson Dot Matrix Printer

For instance, the following configuration file, `/usr/lib/lp/files/cns.epson.conf`, is used for setting up an Epson LQ-1070C+ Chinese dot matrix printer. In the example, the Epson LQ-1070C+ is composed of built-in Traditional Chinese fonts for CNS 11643 plane 1 and plane 2. You can specify available fonts in different planes and in different directories.

```
# @(#)cns.epson.conf 1.5 96/04/10 SMI; ALE
# CNS Print Filter Configuration File for Epson Dot Matrix Printers
#
```

```
ACCEPT CODE RANGE:
  PLANE 1:
    0x2121 - 0x234e
    0x2421 - 0x2570
    0x4421 - 0x7d4b
  PLANE 2:
    0x2121 - 0x7244
```

```
FONT FILES:
  PLANE 1:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/mingL1-24.pcf.Z
  PLANE 2:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/mingL2-24.pcf.Z
  PLANE 3:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/mingL3-24.pcf.Z
  PLANE 4:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/mingL4-24.pcf.Z
  PLANE 5:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/mingL5-24.pcf.Z
  PLANE 6:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/mingL6-24.pcf.Z
  PLANE 7:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/mingL7-24.pcf.Z
  PLANE 8:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 9:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 10:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 11:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 12:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 13:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 14:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 15:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
  PLANE 16:
    /usr/openwin/lib/locale/zh_TW/X11/fonts/75dpi/sungNotdef-24.pcf.Z
```

An `lpfilter` command line such as the following can be used to print files whose format is not supported by the printer:

```
# lpfilter -f filter-name -F filename
```

The above command tells LP that a converter called *filter-name* (for example `cns.epson.filter`) is available through the filter description file named *filename*.

If you are installing an Epson dot matrix printer, the content of the filter description file, `cns.epson.fd`, should be as follows:

```
Input types: simple
Output types: EUC
```

Command: `cns.epson.filter`

This filter takes the default input and converts it to a dot matrix data stream by with the `cns.epson.filter`.

For example, the following command line tells the printer service that printer `lp2` accepts only files of EUC format. The command line also installs printer `lp2` on the bidirectional parallel port `/dev/bpp0`. See the `lpadmin(1M)` man page for more information.

```
# lpadmin -p lp2 -v /dev/bpp0 -I EUC
# accept lp2
# enable lp2
```

To print a file that contains Chinese characters in EUC format to an Epson dot-matrix printer, use the following command.

```
system% lp -d lp2 EUC-filename
```

Printing a BIG5 File to an Epson Dot Matrix Printer

Traditional Chinese Solaris software provides a configuration file that defines for `zh_TW.BIG5` files the built-in fonts in the Epson dot matrix printers. Modify the configuration file according to your printing equipment before using it. The contents of the `/usr/lib/lp/files/big5.epson.conf` configuration file can be as follows:

```
# @(#)big5.epson.conf      1.6 96/05/06 SMI; ALE
#
# Big5 Print Filter Configuration File for Epson Dot Matrix Printers
#

ACCEPT CODE RANGE:
  PLANE 1:
    0xA140 - 0xA3E0
    0xA440 - 0xC6A1
    0xC940 - 0xF9D5

FONT FILES:
  PLANE 1:
    /usr/openwin/lib/locale/zh_TW.BIG5/X11/fonts/75dpi/mingL1B5-24.pcf.Z
```

You can use an `lpfilter` command line such as the following to print files of a format that is not supported by the printer.

```
# lpfilter -f filter-name -F filename
```

The above command tells LP that a converter called `filter-name` is available through the filter description file named `filename`.

The following is an example of a filter description file called `big5.epson.fd` for an Epson dot matrix printer that references a converted called `big5.epson.filter`.


```
Input types: simple
Output types: BIG5
Command: big5.epson.filter
```

This filter takes the default type file input and converts it to a dot matrix data stream by using the `big5.epson.filter`.

For example, the following command sequence installs the printer `lp2` on the bidirectional parallel port `/dev/bpp0`. The commands also tell the LP printer service that printer `lp2` accepts only `zh_TW.BIG5` format files. See the `lpadmin(1M)` man page for more information.

```
# lpadmin -p lp2 -v /dev/bpp0 -I BIG5
# accept lp2
# enable lp2
```

To print a file that contains Chinese characters in `zh_TW.BIG5` format to an Epson dot-matrix printer, use the following command:

```
system% lp -d lp2 BIG5-filename
```

Laser Printer Support

An application must have the `mp` utility to print EUC, BIG5, BIG5HK or UTF-8 files to a PostScript-based printer.

Using the `mp` Utility

The `mp` utility supports all Asian locales. As a printing filter, `mp` generates a properly formatted version of the file content in PostScript format. Depending on the locale's system font configuration for `mp`, the Postscript output file contains glyph images from a scalable or a bitmap system font. The `mp` print filter is enhanced in the current Solaris release to print files of a certain type for each locale. See the `mp(1)` man page for more information.

TABLE 6-1 Files Printed With `mp` in Each Locale

File Printed	Locale
EUC	zh_TW
BIG5	zh_TW.BIG5
BIG5HK	zh_HK.BIG5HK

TABLE 6-1 Files Printed With `mp` in Each Locale (Continued)

File Printed	Locale
UTF-8	zh_TW.UTF-8
	zh_HK.UTF-8

You can use a command line such as the following to print a file with Traditional Chinese characters. The file might also include ASCII/English characters.

```
system% mp filename | ld -d printer
```

Using `mp` as an Xprt (X Print Server) Client

Using `mp` as an Xprt client enables `mp` to print the output of any printer connected to a network supported by an Xprt print service. As an Xprt client, `mp` supports PostScript and many versions of PCL.

The Xprt client attempts a connection to an Xprt server based on the following rules:

- When the `-D printer_name@machine[:dispNum]` or `-P printer_name@machine[:dispNum]` options are used with the `mp` command, `mp` attempts to connect to an Xprt print service on `machine[:dispNum]` with `printer_name`.

If the above attempted connection to `machine[:dispNum]` fails or if the argument given to `-D` or `-P` is just `printer_name`, then the `mp` command checks the `XPSEVERLIST` for Xprt servers that support the `printer_name` argument. For example:

```
system% setenv XPSEVERLIST "machine1[:dispNum1] machine2[:dispNum2] \  
machine3[:dispNum3]"
```

- If no server is found using above rules, `mp` checks for an `XPDISPLAY` environment variable set to `machine[:dispNum]`. For example:

```
system% setenv XPDISPLAY "machine[:dispNum]"
```

- If the `XPDISPLAY` variable is not set or if the variable is invalid, `mp` tries to connect to the default display `:2100`. If the default display value is also invalid, `mp` exits with an error message.

The `/usr/lib/lp/locale/C/mp` directory contains `.xpr` print page sample layout files for Xprt client. The sample files are for 300 dpi printers. If the target printer has a different dpi value, the dpi value of the sample files is automatically converted to the resolution of the target printer.

PART **III**

System Administrator Information

This part includes system administrator information.

Configuring a Traditional Chinese Solaris System

You can use the procedures this chapter to set a system-wide default locale or to add a new locale from the Solaris DVD and CD media. You also change the font path set by the `Xsession` script included in the Traditional Chinese Solaris operating system. This chapter includes the following sections.

- “Setting the Default Locale” on page 101
- “Changing Font Directories” on page 112

Setting the Default Locale

This section describes methods to set the default locale.

▼ How to Set a System-Wide Default Locale

1. **Become superuser.**
2. **In the `/etc/default/init` file, add or update the `LANG` variable with the appropriate locale.**

```
LANG=locale
```

You can set the `LANG` variable with one of the following locales: `C`, `zh_TW`, `zh_TW.BIG5`, `zh_TW.UTF-8`, `zh_HK.BIG5HK`, `zh_HK.UTF-8`

3. **Instruct all users to exit CDE.**
4. **Kill the `dtconfig` process.**

```
# /usr/dt/bin/dtconfig -kill
```

5. **Reboot the system.**

```
# reboot
```

Using Aliases to Set the Locale

You can use aliases to change locales in a terminal window without typing long commands or editing your `.dtlogin` file and running `source` every time.

▼ How to Set Up Locale Aliases for the Korn Shell

- Put aliases such as the following in your `.profile` file.

```
alias twn_EUC "export LANG=zh_TW; /bin/stty cs8 -istrip defeucw"
alias twn_BIG5 "export LANG=zh_TW.BIG5; /bin/stty cs8 -istrip \defeucw"
alias asc "export LANG=C; /bin/stty cs7 istrip defeucw"
alias twn_UTF-8 "export LANG=zh_TW.UTF-8; /bin/stty cs8 -istrip defeucw"
```

▼ How to Set Up Locale Aliases for the C Shell

- Put aliases like the following in your `.cshrc` file.

```
alias twn_EUC "setenv LANG zh_TW; /bin/stty cs8 -istrip defeucw"
alias twn_BIG5 "setenv LANG zh_TW.BIG5; /bin/stty cs8 -istrip \defeucw"
alias asc "setenv LANG C; /bin/stty cs7 istrip defeucw"
alias twn_UTF-8 "setenv LANG=zh_TW.UTF-8; /bin/stty cs8 -istrip defeucw"
```

Managing the Input Method Server

This chapter describes the basic display features of the input method server. The input method server (IM server) handles Traditional Chinese input for Traditional Chinese Solaris software. The IM server receives keyboard input and makes the input available as Traditional Chinese characters to Traditional Chinese Solaris applications. The IM server can serve any internationalized X Window application that uses X Window Input Method (XIM) application program interfaces (API) to receive language input.

This chapter discusses the following topics:

- [“Input Method Server Basic Properties” on page 103](#)
- [“How and When `htt` Is Started” on page 104](#)
- [“Using the `iiim` Server in `zh_TW.UTF-8` Locale” on page 104](#)

Input Method Server Basic Properties

The Traditional Chinese Solaris operating system starts the IM server automatically when you start the Solaris operating system in a locale that requires an input method. The IM server continues to run and service applications that are started and connected to it.

Traditional Chinese Solaris applications that use the IM server for Traditional Chinese character input typically find the IM server running when they start. To use the IM server’s service for language input, the IM server should be running before an application is started. If the IM server is not running when an application is started, the application might not be able to get the input service even if IM server is started later.

htt Processes

The input method server comprises three related processes running together. The processes are `htt`, `htt_xbe`, and `htt_server`. One process controls the input method server properties, another controls the population of the input method server (that is, a “watchdog” process), and the third handles input methods of clients.

Usually, you don’t need to know the details of these three processes. When `htt` is started, `htt_xbe` and `htt_server` are started automatically.

How and When htt Is Started

The `htt` process must be running before an application starts in order for the application to use the `htt` input method server to receive Traditional Chinese input. The C locale does not require `htt`. If you change the default locale from C to another locale that requires `htt`, you must start `htt` in the same terminal window. You can start `htt` with a command such as the one shown in the following example.

```
system% /usr/openwin/bin/htt -if twle -xim htt_xbe &
```

When the locale is set to `zh_TW` or `zh_TW.BIG5`, `htt` is started automatically when the Traditional Chinese windowing environment starts. In CDE, `htt` is started from the `/usr/dt/config/Xsession.d/0020.dtims` script. This script is executed by `Xsession`, which runs at every initialization stage upon a user’s login from `dtlogin`. This script ensures that `htt` is started before other applications in CDE.

Using the iim Server in zh_TW.UTF-8 Locale

The Internet Intranet Input Method Server (`iim`) supports both European local input methods using Compose key and Asian remote input methods using the IIM Protocol. The default language engine is English/European, which supports ASCII and some European Languages such as German and French.

To switch to other language engines, press Control-spacebar, as with other Asian locales.

To switch to Chinese input methods, click the left mouse button in the status aea. The following list of language engines appears:

- Cyrillic
- Greek
- Hindi
- Thai
- Arabic
- Hebrew
- Unicode Hex
- Unicode Octal
- Lookup
- Traditional Chinese

The following language engines appear if their corresponding locales are installed:

- Japanese – if `ja` locale is installed
- Korean – if `ko` locale is installed.
- Simplified Chinese – if `zh` locale is installed.
- Traditional Chinese (Hong Kong) – if `zh_HK.BIG5HK` locale is installed.

After the Traditional Chinese language engine is selected, you can use function keys to switch between different input methods:

- F2 – TsangChieh input mode
- F3 – Array input mode
- F4 – ChuYin input mode
- F5 – Boshiamy input mode
- F6 – ChienI input mode
- F7 – I-Tien input mode
- F8 – DaYi input mode
- F9 – Cantonese input mode
- F10 – English-Chinese input mode
- F11 – TeleCode input mode
- F12 – NewChuYin input mode

For more detailed information about each input method, see [Chapter 4](#).

Fonts

This chapter describes the PostScript, TrueType and bitmap fonts supported for use in the Traditional Chinese Solaris operating system. The topics in this chapter discuss how to use and to edit the fonts:

- “Display PostScript System (DPS)” on page 107
- “TrueType and Bitmap Fonts” on page 112

Display PostScript System (DPS)

The Traditional Chinese Solaris operating system provides PostScript fonts in the Display PostScript System (DPS). This section describes the fonts and the DPS facilities. For further details, see *Programming the Display PostScript System with X*, published by Adobe Systems.

Using Traditional Chinese PostScript Fonts and DPS Facilities

The Traditional Chinese Solaris operating system provides the DPS fonts listed in the following table.

TABLE 9-1 Traditional Chinese DPS Fonts

Font Name	Description
Kai-Medium	Alias of Kai-Medium-EUC-H

TABLE 9-1 Traditional Chinese DPS Fonts *(Continued)*

Font Name	Description
Kai-Medium-EUC-H	Kai-Medium font, EUC encoding, horizontal display; can be used like a Roman font
Kai-Medium-EUC-V	Kai-Medium font, EUC encoding, vertical display; can be used like a Roman font
Kai-Medium-H	Kai-Medium font, horizontal display, for making a composite with a Roman font
Kai-Medium-V	Kai-Medium font, vertical display; for making a composite with a Roman font
Ming-Light	Alias of Ming-Light-EUC-H
Ming-Light-EUC-H	Ming-Light font, EUC encoding, horizontal display; can be used like a Roman font
Ming-Light-EUC-V	Ming-Light font, EUC encoding, vertical display; can be used like a Roman font
Ming-Light-H	Ming-Light font, horizontal display, for making a composite with a Roman font
Ming-Light-V	Ming-Light font, vertical display; for making a composite with a Roman font

The following figure shows a sample of Kai-Medium and Ming-Light fonts.



Creating Composite Roman and Traditional Chinese Fonts

You can create composite fonts with a Roman font and one of the following Traditional Chinese fonts.

- Ming-Light-H
- Ming-Light-V
- Kai-Medium-H
- Kai-Medium-V

For example, the following PostScript code defines a sample composite font, Times-Italic+Kai-Medium. The Times-Italic font is used for the ASCII characters and the Kai-Medium horizontal font is used for the Traditional Chinese characters.

```
/Times-Italic+Kai-Medium
13 dict begin
```

```

        /FontName 1 index def
        /FMapType 4 def
        /Encoding [ 0 1 ] def
        /WMode 0 def
        /FontType 0 def
        /FontMatrix [1.0 0.0 0.0 1.0 0.0 0.0] def
        /FDepVector [
                                /Times-Italic findfont
                                /Kai-Medium-H findfont
        ] def
currentdict
end
definefont pop

```

Using Traditional Chinese Fonts in DPS Programming

You can use Traditional Chinese fonts just as you use Roman fonts in DPS wrap definitions. The following code sample creates the display in the Hello World figure.

```

defineps PSWDisplayText(char *text)
    /pointSize 50 def
    /Helvetica pointSize selectfont
    (Hello World) stringwidth pop 2 div neg 0 moveto
    (Hello World) show

    /cpSize 40 def
    /Kai-Medium cpSize selectfont
    (text) stringwidth pop 2 div neg pointSize neg moveto
    (text) show
endps

```

You can include `PSWDisplayText` (*Chinese text*) in a C program to display the designated Chinese text.



The Traditional Chinese Solaris software provides TrueType support in DPS.

▼ How to Convert from BDF to PCF Format

Before Solaris applications can use a modified BDF file, the file must be converted to a PCF format file.

1. Use a command line such as the one in the following example to convert the BDF file to PCF format.

```
system% bdf2pcf -o myfont14.pcf myfont14.bdf
```

The `-o` option enables the matrix encoding used for Asian PCF font files.

2. Replace the BDF file in the following directory with the converted PCF file:
`$OPENWINHOME/lib/locale/zh_TW/fonts`

▼ How to Install and Check the Edited Font

1. To add a new bitmap, move the `.pcf` font file into your font directory.

Tip – You can use a command such as the following to compress the `.pcf` font file before you move it:

```
system% compress myfont14.pcf
```

2. Run the following commands in your font directory.

The .bdf file should not be in the font directory.

```
system% cat >> fonts.alias
-new-myfont-medium-r-normal--16-140-75-75-c-140-cns11643-16
Myfont-Medium14
^D
system% mkfontdir
system% xset +fp `pwd`
```

3. You can use a command such as the following example to view your font.

```
system% xfd -fn Myfont-Medium14
```

Changing Font Directories

The Xsession script in the /usr/dt/bin directory includes the font path /usr/openwin/lib/locale/locale/X11/fonts, where locale is either zh_ZW, zh_ZW.BIG5, or zh_ZW.UTF-8. To dynamically add a different font directory path, type the following commands:

```
system% xset +fp font_directory-path
system% xset fp rehash
```

TrueType and Bitmap Fonts

The tables in this section list the TrueType and bitmap fonts that are available for the zh_TW and the zh_HK.BIG5HK locales.

The following table shows the Traditional Chinese TrueType Fonts for the zh_TW locales.

TABLE 9-2 Traditional Chinese TrueType Fonts for the zh_TW Locales

Full Family Name	Subfamily	Format	Vendor	Encoding
Hei	R	TrueType	Hanyi	CNS11643.1992
Kai	R	TrueType	Hanyi	CNS11643.1992
Ming	R	TrueType	Hanyi	CNS11643.1992

The following table shows the Traditional Chinese bitmap fonts for the zh_TW locales.

TABLE 9-3 Traditional Chinese Bitmap Fonts for the zh_TW Locales

Full Family Name	Subfamily	Format	Encoding
Ming	R	PCF (12,14,16,20,24)	CNS11643.1992

The following table shows the TrueType fonts for the zh_HK.BIG5HK locale.

TABLE 9-4 TrueType Fonts for the zh_HK.BIG5HK Locale

Family Name	Subfamily	Format	Vendor	Encoding
Ming	R	TrueType	FangZheng	BIG5-HKSCS
Hei	R	TrueType	FangZheng	BIG5-HKSCS
Kai	R	TrueType	FangZheng	BIG5-HKSCS

The following table shows the bitmap fonts for the zh_HK.BIG5HK locale.

TABLE 9-5 Bitmap Fonts for the zh_HK.BIG5HK Locale

Family Name	Subfamily	Vendor	Format
Ming	R	PCF(12,14,16,20,24)	BIG5-HKSCS

Traditional Chinese Printing Facilities

This chapter describes how to print to a line printer. The chapter also provides information on how to use the mp utilities to print to a PostScript printer or to a line printer.

Printing From the Command Line

From the command line, you can print one of two ways:

- Directly to a line printer
- Using the mp utilities to convert text to bitmapped graphics

Printing With a Line Printer

The Traditional Chinese Solaris operating environment uses EUC code sets. Its printing applications (such as desktop tools) generate PostScript code that uses EUC. If you use different PostScript printing, make sure it has the same capabilities.

- To print an EUC file, use the following command:

```
system% lp EUC-filename
```

- To print a Big5 format file on a printer that supports this format, use the following command:

```
system% lp -d Big5_printer Big5-filename
```

For more information on setting up the Big5 filter, see *Traditional Chinese Solaris System Administrator's Guide*.

- To print a file that contains Traditional Chinese characters in EUC format on an Epson® dot matrix printer, use the following command:

```
system% lp -d Epson_printer EUC-filename
```

Printing With the mp Utility

As a print filter, `mp` generates a properly formatted version of contents in PostScript format. The PostScript output file contains glyph images from Solaris-resident scalable or bitmap fonts, depending on each locale's system font configuration for `mp`. The `mp` filter is enhanced in the current Solaris release to print files with different encoding text in the corresponding Asian locales.

The following command line will print a file containing Traditional Chinese characters, with or without ASCII/English characters:

```
system% mp -L $LANG filename | lp -d printer
```

The file may contain ASCII/English characters as well as Traditional Chinese. Refer to the `mp(1)` man page for more detailed information.

You can use the `mp` utility as a filter because `mp` accepts the `stdin` stream.

```
system% cat filename | mp | lp
```

You can set the utility as a printing filter for a line printer. For example, the following command sequence tells the printer service `LP` that the printer `lp1` accepts only `mp` format files. This command also installs the printer `lp1` on port `/dev/ttya`. See the `lpadmin(1M)` man page for more details.

```
system% lpadmin -p lp1 -v /dev/ttya -I MP  
system% accept lp1  
system% enable lp1
```

You can add the `lpfilter` utility for a filter by using the `lpfilter(1M)` command as follows:

```
system% lpfilter -f filtername -F pathname
```

The `lpfilter` command tells `lp` that a converter (in this case, `xutops`) is available through the filter description file named `path name`. The `pathname` can be determined as follows:

```
Input types: simple  
Output types: MP  
Command: /usr/bin/mp
```

The filter converts the default type file input to PostScript output using `/usr/bin/mp`.

To print a UTF-8 text file, use the following command:

```
system% lp -T MP UTF-8-file
```

For more details on the `mp` command, refer to the `mp(1)` man page.

Using mp as an Xprt (X Print Server) Client

When used as an Xprt client, `mp` can print the output of any printer connected to a network supported by an Xprt print service. As an Xprt client, `mp` supports PostScript and many versions of PCL.

The Xprt client attempts a connection to an Xprt server based on the following rules:

- When the `-D printer_name@machine[:dispNum]` or `-P printer_name@machine[:dispNum]` options are used with the `mp` command, `mp` attempts to connect to an Xprt print service on `machine[:dispNum]` with `printer_name`.

If the above attempted connection to `machine[:dispNum]` fails or if the argument given to `-D` or `-P` is just `printer_name`, then the `mp` command checks the `XPSEVERLIST` for Xprt servers that support the `printer_name` argument. For example:

```
system% setenv XPSEVERLIST "machine1[:dispNum1] machine2[:dispNum2] machine3[:dispNum3]"
```

- If no server is found using above rules, `mp` checks for an `XPDISPLAY` environment variable set to `machine[:dispNum]`. For example:

```
system% setenv XPDISPLAY "machine[:dispNum]"
```

- If the `XPDISPLAY` variable is not set or if the variable is invalid, `mp` tries to connect to the default display `:2100`. If the default display value is also invalid, `mp` exits with an error message.

The `/usr/lib/lp/locale/C/mp` directory contains `.xpr` print page sample layout files for Xprt client. The sample files are for 300 dpi printers. If the target printer has a different dpi value, the dpi value of the sample files is automatically converted to the resolution of the target printer.

TTY Environment and Support

This chapter assumes you are familiar with the following concepts:

- The Solaris Operating System communicates with external devices using STREAMS and `ioctl`.
- Different terminal types are supported by `termcap` and `terminfo`.

Refer to the `termio(7I)` man page for background information on STREAMS and TTY drivers.

This chapter discusses the following topics:

- “TTY Streams” on page 119
- “TTY Utilities” on page 120
- “TTY Commands” on page 122
- “TTY Setup Examples” on page 123
- “Terminal Support” on page 124
- “Installing a Terminal” on page 125

TTY Streams

The data path between a user’s shell and the terminal is called a *stream*. The data on a stream contain characters and control information that affect data handling, such as the control sequences that precede a change in code set or communication protocols. Data entering the stream from the terminal is raw or unprocessed. Data is sequentially processed by STREAMS modules for appropriate use by the shell or an application.

STREAMS provides a way to modularize the processing on a line, allowing processing instructions to be grouped in functional modules. These modules can be added or removed from the line so that different environments can be provided to a terminal according to the user’s needs.

Traditional STREAMS

The traditional STREAMS TTY environment contains a raw device driver, a line discipline module, and a stream head. The raw device driver provides an I/O interface between the kernel and the hardware. Because the driver is closest to the physical hardware, it provides basic communication protocols, baud rate switching, and other low level services. The line discipline module is a set of instructions or disciplines that transforms the raw data to processed data. This module includes handling the delete character, line kill character, and others. The stream head provides an interface between the user's process and the stream.

Traditional Chinese Solaris STREAMS

The Traditional Chinese Solaris Operating System uses the modular nature of STREAMS to support Traditional Chinese. In addition to the traditional TTY modules, this product implements code conversion in STREAMS. Chinese input is typically supplied by many existing Traditional Chinese TTYs and is not available in the Traditional Chinese Solaris TTY environment.

The Traditional Chinese Solaris Operating System enhances the traditional modules. Its line discipline handles proper cursor movement for wide characters as well as normal protocols. The Traditional Chinese Solaris software code conversion modules convert between two different character code formats, such as between BIG5 and EUC.

Code conversion depends on the appropriate flags or parameters being set. For example, if a BIG5 code terminal is being used, the input from the terminal is converted to EUC and the output to the terminal is converted to BIG5 code.

The major modules that can be pushed onto the stream are `ldterm` and `big5euc`.

- `ldterm` is a generic EUC line discipline module. It processes all normal line discipline functions and also handles proper cursor movement and backspacing for wide characters (EUC)
- `big5euc` controls code conversion between BIG5 and EUC

TTY Utilities

`ioctl` (input/output control) calls are low-level routines for handling device input and output.

The `termcap` and `terminfo` databases are used by applications to configure their terminal display appropriately.

EUC ioctl Features

The Traditional Chinese Solaris Operating System uses `ioctl` STREAMS commands for general EUC handling. The following is a summary of these `ioctl` calls and their effects:

<code>EUC_WGET</code>	Get <code>cswidth</code> values from TTY stream
<code>EUC_WSET</code>	Set <code>cswidth</code> values for TTY stream
<code>EUC_OXLOFF</code>	Set code conversion to OFF
<code>EUC_OXLON</code>	Set code conversion to ON

Character code conversion to and from the terminal is controlled by `EUC_OXLON` and `EUC_OXLOFF`.

termcap and terminfo Databases

`termcap` and `terminfo` are the databases used to tailor the terminal characteristics for an application.

The following table lists extensions to the `termcap` database:

TABLE 11-1 `ioctl` Requests and Descriptions

Variable	Description
<code>dv</code>	Device type: language and code set
<code>ci</code>	Init sequence for multiple code sets
<code>s0</code>	Shift into code set 0
<code>s1</code>	Shift into code set 1
<code>s2</code>	Shift into code set 2
<code>s3</code>	Shift into code set 3

The following table lists extensions to `terminfo`. The `s0-s3` string values are used as data announcement mechanisms for the respective code sets during terminal I/O.

TABLE 11-2 `terminfo` Variables and Descriptions

Variable	Capname	Tc	Description
<code>device_type</code>	<code>devt</code>	<code>dv</code>	Device type: language and code set
<code>code_set_init</code>	<code>csin</code>	<code>ci</code>	Init sequence for multiple code sets

TABLE 11-2 terminfo Variables and Descriptions (Continued)

Variable	Capname	Tc	Description
set0_des_set	s0ds	s0	Shift into code set 0
set1_des_set	s1ds	s1	Shift into code set 1
set2_des_set	s2ds	s2	Shift into code set 2
set3_des_set	s3ds	s3	Shift into code set 3

TTY Commands

The two commands for configuring and using the TTY environment are `setterm` and `/bin/stty`. `setterm` is used primarily to build the TTY stream for a particular terminal type, pushing the necessary modules onto the stream. `stty` changes the behavior of the modules in the stream.

setterm Command

The `setterm` command is used to configure the TTY STREAMS environment. This command can inquire about and manipulate STREAMS modules for a particular TTY port. The `setterm` command enables users to tailor their TTY STREAMS environment using system-provided or user-provided STREAMS modules.

The `setterm` command uses a terminal device name that reflects the `devt` (device type) field in the `terminfo` database for configuring STREAMS modules for a TTY port. The device name is matched with an entry of the same name in the `setterm` configuration file, `/usr/share/lib/setterm/zh_TW/conf.file`. This entry contains detailed instructions on which modules to pop and push in order to properly configure the STREAMS environment.

The `setterm` command can also take the device type as a direct argument. The device type is similarly matched with an entry in `/usr/share/lib/setterm/zh_TW/conf.file`.

The `setterm` configuration file uses a special language for instructions on what actions to take. This language enables users to determine the names of modules on the STREAMS stack, to push or pop modules on the stack, and to do other operations. `setterm` manipulates the STREAMS stack by making `ioctl` calls.

The Traditional Chinese Solaris Operating System provides special modules to enable or disable code conversion and to properly handle multibyte and wide characters. Pushing a module onto the stack enables the corresponding conversion. The default state for conversion is enabled.

For more information, see the `setterm(3CURSES)` man page.

`/bin/stty` Command

The `-defeucw` option to the `/bin/stty` command is used to modify STREAMS modules to reflect changes in the user's environment. The option does not work with a `/usr/ucb` version of `stty`, which has not been internationalized.

The following command queries the user's environment for information on EUC code set width and sets that information in the line discipline:

```
system% /bin/stty defeucw
```

For example, if the user has the environment variable `LC_CTYPE` set to `locale`, this option gets information on the number of bytes per character and the screen width per character for the code sets in the `zh_TW` environments. The option then sends this information to relevant modules in the stream.

TTY Setup Examples

The system administrator can add `setterm` in the startup script in `/etc/rcn.d` directory (where `n` is the run level) to run at the system boot time. Also, users can run the `setterm` command at login to configure the stream for their terminal, including the appropriate modules for Traditional Chinese input code conversion. The following examples using `setterm` can be run as commands typed at a system prompt or included in system files such as `.cshrc`, `.login`, and the startup script. Such commands can either explicitly set the device type or use the `terminfo` database.

Configuring STREAMS for Traditional Chinese Solaris Software

Use the following command to explicitly configure the STREAMS module for a BIG5 terminal use.

```
setterm -x big5
```

This usage is independent of `terminfo`.

You can use a VT-100 terminal, which is BIG5 compatible, on a system with an entry such as the following example in the `terminfo` database:

```
vt100-b|VT-100-compatible with Big-5 chars,  
lines#40, .csin=E(BE)IE[?1h, csin=E(BE)I, devt=PACKBig5,  
s0ds=E(H, s1ds=E$@, s2ds=E(H, use=cit600,
```

Use the following configuration command to reference the VT-100 entry:

```
setterm -t vt100-b
```

For `setterm` to work properly in this application, `/usr/share/lib/setterm/zh_TW/conf.file` must contain an entry that corresponds to the device type. An entry such as the following example instructs `setterm` to place the appropriate conversion modules in the TTY stream.

```
#
big5throw \
    popeto zs|mcp|mti|ptem \
    push big5euc \
    push ldterm \
    push ttcompat \
    run {stty defeucw} \
    catch

#
GenericEUC|EUCthrow \
    popeto zs|mcp|mti|ptem \
    push ldterm \
    push ttcompat \
    run {stty defeucw} \
    catch

#
ASCIIthrow \
    popeto zs|mcp|mti|ptem \
    push ldterm \
    push ttcompat \
    catch

#
```

Once configured, conversion is enabled by default. Applications can also set features through `ioctl()` function calls.

Terminal Support

The Traditional Chinese Solaris Operating System supports BIG5 terminals. The terminals should have built-in Traditional Chinese fonts and input methods.

Installing a Terminal

If you have not added a terminal to your system, install the terminal in ASCII mode only.

▼ How to Add Terminals Through the Serial Port Interface

You can use the serial ports option from the Admintool menu to configure the serial ports for terminals. Serial ports provide the easiest means to install a terminal.

Note – A Chinese terminal that supports CNS 11643 is installed as you would install an ASCII terminal.

1. Become superuser.

```
system% su
```

2. Type admintool.

The admintool menu will appear.

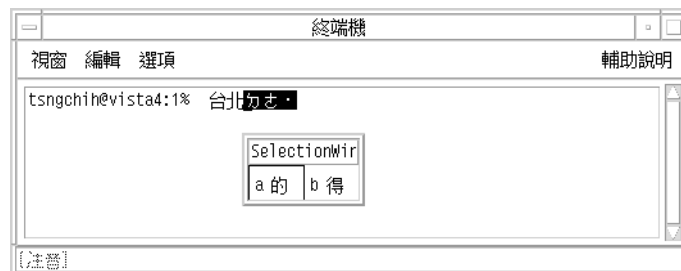
```
system# admintool
```

3. Select the Serial Ports icon.

4. Select Edit on the Serial Ports menu.

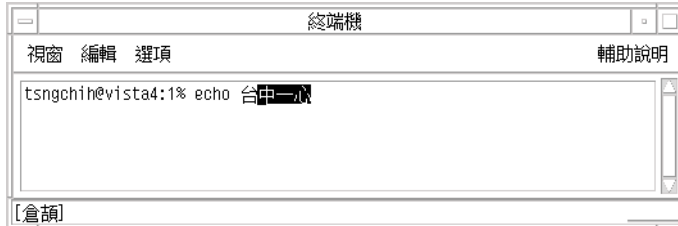
Modify Service submenu appears.

5. On the Modify Service submenu, select Enabled, Baud Rate 9600, and provide the terminal type.



6. Under Expert Options, select Create utemp entry and enter the appropriate module in the Streams Modules field.

Note – To install a terminal that supports BIG5 code for the Traditional Chinese Solaris Operating System, add `big5euc` to the Streams Modules field.



How to Add Terminals Through the Command Line

The following procedure is required to set up a terminal on `ttya` port through the command line.

1. Determine the port monitor version number by typing the following command:

```
# ttyadm -v
```

The port monitor version number displays.

2. Type the following commands, substituting the port monitor version number for *ver*.

```
# pmadm -r -p zsmon -s ttya
# sacadm -a -p zsmon -t ttymon -c /usr/lib/saf/ttymon -v ver
```

For more information, see the `pmadm(1M)` and `sacadm(1M)` man pages.

3. To add a login service, use the `pmadm` command that matches your terminal type.

- For EUC terminals, use the following command.

```
#pmadm -a -p zsmon -s ttya -i root -fu -v ver -m "`ttyadm -S y \
-T terminal_type -d /dev/ttya -l 9600 -m ldterm,ttcompat -s \
/usr/bin/login`"
```

- For BIG5 code terminals, use the STREAMS module `big5euc` in the `ttyadm` command.

```
# pmadm -a -p zsmon -s ttya -i root -fu -v ver -m "`ttyadm -S y \
-T terminal_type -d /dev/ttya -l 9600 -m big5euc,ldterm,ttcompat -s \
/usr/bin/login`"
```

4. Turn on the terminal.

Familiarize yourself with the documentation that accompanies the terminal.

5. Log in to the terminal.

6. Check to see that the installation is correct.

```
# setenv LANG locale
# /bin/stty cs8 -istrip defeucw
```

Note – These values show that the operating system is set to communicate with the terminal in 8-bit no-parity mode. Make sure the terminal is set up in 8-bit no-parity mode. Refer to the terminal’s setup manual for the proper way to set terminal options.

Setting a User’s TTY

Do the following to verify that your TTY is set up properly.

1. Type the `/bin/stty` command with the `-a` option.

```
system% /bin/stty -a
```

2. If the `cs8`, `-istrip` values are not listed, use the following command to set them.

```
system% /bin/stty cs8 -istrip defeucw
```

This is the last step in setting up a terminal.

▼ How to Use a BIG5 TTY With an EUC Locale

1. If you are using a BIG5 type terminal, you must run the following command as superuser to load the STREAMS module into the kernel.

```
# modload /kernel/strmod/big5euc
```

2. Type the following command.

```
system% setterm -x big5
```


Binary Compatibility Package

Applications compiled under Chinese OpenWindows™ 2.x or Solaris 1.x or SunOS 4.x systems have different binary formats than the current Chinese Solaris release. Older applications can nevertheless be run under the current Chinese release without being recompiled by using the application's included binary compatibility package (BCP).

Note – SUNWowbcp must be included in your system configuration in order to run the following commands. See your system administrator for installation.

The following BCP command runs the compiled binary code of earlier SunOS4.x, Solaris 1.x, or Chinese OpenWindows 2.x applications without recompilation. However, OpenWindows V2 Chinese applications will display no input server status region. As shown in the following examples, the command calls the application by its old name (*old_application_name*) and sets the basic locale, input language, and display language using the older version's specific locale name (*old-locale*):

```
system% old_application_name -lc_basiclocale  
old-locale -lc_inputlang old-locale  
 \ -lc_displaylang old-locale
```

The following example shows the command you use to run the compiled binary code of an earlier version of the `textedit` application on the current Traditional Chinese Solaris Operating System:

```
system% textedit -lc_displaylang tchinese -lc_basiclocale tchinese \  
 -lc_inputlang tchinese
```

Due to incompatibilities between Traditional Chinese Solaris 2.x and 1.x applications, you cannot cut and paste Chinese characters between them.

Traditional Chinese Test Utilities

Every utility listed in this section is supported, but for this version of Solaris, you are encouraged to use the XPG4 internationalization APIs as described in the *International Language Environments Guide*.

The utilities in the following table test various aspects of the Traditional Chinese (CNS 11643) national standard character set. These utilities also assume that the character being tested is part of the national standard character set. Each utility returns true if the character meets the test requirement referenced in the description.

The arguments for the functions in the following table must be characters in wide character code (WC), `wchar_t`. For more information, see [“Asian-Specific Utilities” on page 131](#) and the `hctype(3x)` man page.

TABLE A-1 Traditional Chinese Test Utilities

Utility	Description
<code>ishalpha</code>	Tests for a Roman character in the CNS 11643 character set.
<code>ishupper</code>	Tests for an uppercase Roman character as defined by the CNS 11643 character set.
<code>ishlower</code>	Tests for a lowercase Roman character in the CNS 11643 character set.
<code>ishdigit</code>	Tests for a number in the CNS 11643 character set.
<code>ishspace</code>	Tests for the space character in the CNS 11643 character set.
<code>ishpunct</code>	Tests for a punctuation character in the CNS 11643 character set.
<code>ishparen</code>	Tests for a left or right parenthesis in the CNS 11643 character set.
<code>ishphontone</code>	Tests for a Mandarin phonetic tone.
<code>ishradical</code>	Tests for a Chinese character radical.
<code>ishline</code>	Tests for a ruled line symbol in the CNS 11643 character set.
<code>ishunit</code>	Tests for a unit character in the CNS 11643 character set.
<code>ishsci</code>	Tests for a scientific symbol in the CNS 11643 character set.
<code>ishgen</code>	Tests for a general symbol in the CNS 11643 character set.
<code>ishgreek</code>	Tests for a Greek character in the CNS 11643 character set.

Asian-Specific Utilities

This section describes functions for wide character and string input and output, character classification, and conversion functions for the Korean or Chinese character sets. Asian Solaris software implements a wide character library for handling Korean or Chinese character codes according to industry standards.

Routines that have Korean or Chinese language-specific dependency are in their own language-specific library, which is linked with the corresponding C compiler option. In the Traditional Chinese Solaris software, `libhle` is linked with `-lhle`. Refer to the appropriate man page for more information.

Asian Solaris software defines `WC` as a constant-width, four-byte code. `WC` uses the ANSI C data type `wchar_t`, which Solaris software defines in `wchar.h` as follows:

```
typedef long wchar_h;
```

In Solaris software, `long` is four bytes.

Conversion Utilities

The conversion utilities described in this section are available, but you should use `iconv` as a standard function.

Asian Solaris software provides facilities for various conversions, for example:

- Characters within a code set, such as converting uppercase ASCII to lowercase.
- Between different conventions for national standard character sets, such as:
 - Between Combination and Completion code, both KS C 5601-1987 and KS C 5601-1992
 - Between GB and EUC.
 - Between CNS 11643 code and BIG5
- Between code formats such as EUC and WC.

Programs using the general multibyte conversion utilities should include the header files `widec.h` and `wctype.h`. Traditional Chinese Solaris routines (such as `ishxxx`) are declared in `zh_TW/xctype.h`.

Programs using the general multibyte conversion utilities should include three header files: `wctype.h`, `widec.h`, and `zh_TW/xctype.h`.

As with classification functions described in the previous section, the use of these utilities can be controlled by the `setlocale` function. Locale-specific routines are contained in a locale-specific library. For Traditional Chinese, that library is `libhle`. The library can be linked during compilation using the C compiler option `-lhle`.

Conversion Within a Code Set

The multibyte conversion functions are similar to the one-byte conversion functions `toupper()` and `tolower()`. These functions convert wide-characters to other wide characters. For more information on conversion routines, see the man pages for `wconv(3)` for all locales and `hconv(3)` for Traditional Chinese.

The routines listed in the following table are in the regular Chinese C library:

TABLE A-2 Chinese C Library Conversion Routines

Function	Description
<code>tohupper()</code>	Converts code set 1 Roman lowercase to uppercase
<code>tohlower()</code>	Converts code set 1 Roman uppercase to lowercase

Conversion for Traditional Chinese Character Codes

The routines listed in the following table perform character-based code conversion on the CNS-11643 character set. They convert characters in the set between CNS-11643, EUC, and Big5 formats. To use these routines, the library `h1e` must be linked using the C compiler option `-lh1e`. For more information, see the `hconv(3x)` man page.

TABLE A-3 Character-Based Code Conversion Routines

Function	Description
<code>cbig5toeuc()</code>	Converts BIG5 character to EUC
<code>cnstoeuc()</code>	Converts CNS character to EUC
<code>ceuctobig5()</code>	Converts EUC character to BIG5
<code>ceuctocns()</code>	Converts EUC character to CNS

TABLE A-4 Character-Based Code Conversion Routines (cont)

Function	Description
<code>big5toeuc()</code>	Converts BIG5 string to EUC.
<code>cnstoeuc()</code>	Converts CNS string to EUC.
<code>euctobig5()</code>	Converts EUC string to BIG5.
<code>euctocns()</code>	Converts EUC string to CNS.

Mapping Traditional Chinese Keyboard Functions

This appendix shows how to configure a Sun Chinese keyboard to make selected key functions when you need them.

The Chinese Type-4 keyboard does not have a Compose key. You can use the `xmodmap` command to make any key function as Compose. In the following example, the right Meta key is set to function as the Compose key:

```
system% xmodmap -e "remove mod1 = Meta_R"
system% xmodmap -e "keysym Meta_R = Multi_key"
```

See the `$OPENWINHOME/share/etc/keytables/Taiwan4.kt` file and the `xmodmap(1)` man page for more information.

The Chinese Type-5 keyboard does not have an AltGraph key. You can use the `xmodmap` command to make any key function as AltGraph. In the following example, the right Meta key is set to function as the AltGraph key:

```
system% xmodmap -e "remove mod1 = Meta_R"
system% xmodmap -e "keysym Meta_R = Mode_switch"
```

See the `$OPENWINHOME/share/etc/keytables/Taiwan5.kt` file and the `xmodmap(1)` man page for more information.

Glossary

ANSI	American National Standards Institute. ANSI proposes standard definitions for different computing languages. The most recent standard for the C language, prepared by the ANSI C X3J11 Committee, includes library functions for computing with multibyte characters for international usage, as well as a new data type, <code>wchar_t</code> , for dealing with four-byte characters. This standard is not completed, so it is referred to as the “proposed ANSI C standard,” or ANSI C-X3J11.
ASCII	American Standard Code for Information Interchange. ASCII is a seven-bit code containing English upper and lowercase letters, punctuation, numbers and control codes. The eighth bit in each byte is used by different applications for parity checking, communication and message passing protocols, compacting data, or other purposes. Applications that are intended to be internationalized cannot use this bit and use multiple code sets or multibyte characters, and utilities that handle multiple code sets or multibyte characters.
BIG5	A commonly used code set in Taiwan.
category	In the Traditional Chinese Solaris documentation set, <code>category</code> is related to localization. A category is a portion of a country’s language representation and cultural conventions. For instance, the date is often represented in the U.S. as <i>month, day, year</i> ; while in another country it might be <i>day, month, year</i> . The date and time can be thought of as one category of a local language. Categories also refer to the program categories, the environment variables that are related to categories, and the ANSI localization tables for each category.
character set	A set of elements used for the organization, control, or representation of data. Character sets may be composed of alphabets, ideograms, or other units. Character sets may contain other character sets, which

causes unclear boundaries. For example, the CNS 11643 character set contains English, Greek, and Chinese character sets in addition to Chinese radicals and many other characters.

CNS	<p>Taiwan's Chinese National Standard. This standard is the Taiwan analogue to ASCII. In this document set, CNS refers to the code set defined by CNS 11643. It contains the Chinese characters, phonetic symbols and radicals, control codes, punctuation, and western alphabets, including Roman and Greek characters. Each character is two bytes long, with the highest or most significant bit of each byte set to zero. In other words, CNS uses the lower seven bits of each byte. Due to the size of the Taiwan Chinese character set, the character sets are divided into multiple codeplanes, with the default plane containing the most commonly used characters. ISO 2022 provides mechanisms for shifting from one codeplane to another.</p> <p>After its revision in 1992, CNS 11643 defines 48,000 characters, which are divided among codeplanes 1-7, codeplanes 8-16 are undefined, but are included in the code set architecture. Codeplanes 1 and 2 (common and rarely used characters) are unaffected by the revision. Characters that were in codeplane 14, a provisional user-defined plane, have been standardized into codeplane 3, with the overflow in codeplane 4.</p>
code set	<p>A set of unambiguous rules that establishes a character set and the one-to-one relationship between each character in the character set and its bit representation. For example, the English character set, including punctuation and numbers, can be mapped to the ASCII code set in such a way that each character corresponds to only one bit code, and no bit code corresponds to more than one character. A code set is also called a coded character set.</p>
commit	<p>Characters entered in the preedit area that are put in the text block which is assembled for the application.</p>
EUC	<p>Extended UNIX Code. Describes four code sets modelled on ISO-2022. Each code set can contain one or more different character sets, like the Hangul and Hanja character sets in KS C 5601. The four code sets are referred to as code sets 0, 1, 2, and 3. In this guide, these code sets are sometimes abbreviated as cs0, cs1, cs2, and cs3. Other internationalization efforts sometimes call these code sets g0, g1, g2, and g3. code set 0 is also called the primary code set, and code sets 1, 2, and 3 are called the supplementary code sets. In the Korean and Chinese implementations of the EUC codes, the primary code set (cs0) contains ASCII and begins with a zero in the most significant bit.</p>
EUC-CNS	<p>The EUC representation of CNS 11643. For code set 1, this standard is the normal CNS code with a one in the most significant bit of each byte. In other words, EUC-CNS equals CNS plus 0x8080. For example, the CNS character 0x212A becomes the EUC-CNS character 0xA1AA. Or in binary, 00100001 00101010 becomes 10100001 10101010. For code</p>

sets 2 and 3, characters are also prefixed by single shift bytes SS2 and SS3. In addition, code set 2 requires a codeplane byte. The code of a code set-2 character is SS2 followed by codeplane byte followed by EUC-CNS. The codeplane byte is plane number added to 0xA0. For example, plane 2 has codeplane byte 0xA2.

ISO	International Standards Organization. Composed of a number of professional societies and companies, this organization studies and makes recommendations on internationalization issues. ISO 2022 proposes and describes the Extended UNIX Codes. Other ISO proposals include the European 8-bit code and communication protocols for internationalization.
locale	A locale describes a language or cultural environment. Its setting affects the display or manipulation of language-dependent features. Traditional Chinese Solaris software provides <code>C</code> for U.S.A, <code>zh_TW</code> for Traditional Chinese extended UNIX code, and <code>zh_TW.BIG5</code> for the Traditional Chinese Big5 locale.
POSIX	Portable Operating System for Computer Environments. An IEEE standards group comprising seven committees that create documents for standardizing and internationalizing UNIX. POSIX document 1003.1 deals with the kernel and system calls. 1003.2 concerns the C-shell and standard libraries. The other five deal with real-time computing, communications and networking, and other issues.
Unicode	The international character set and encoding developed by the Unicode Consortium.
Wide character code (WC)	A constant-width four-byte code, called WC in Asian Solaris documentation, for the internal representation of EUC codes using the new ANSI-C data type <code>wchar_t</code> . Although EUC does not specify limits on the size of the supplementary code sets (code set 0 is always one byte), WC specifies a character as four bytes. Standardizing on four bytes takes up more memory space than necessary if the environment is primarily ASCII, but this practice also speeds processing time for strings of mixed characters. The 1000th character always begins at byte 4000 (and the 0th character starts at byte 0). This practice is useful for any type of indexing in applications.
X/Open	X/Open started as a consortium of international UNIX vendors from Europe, USA, and Asia. It is now one of the major standards organizations like POSIX and ANSI; source of <i>X/Open System Interface Portability Guide</i> .

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