

# ***Open Watcom OS/2 Help Compiler***

## ***User's Guide***



***Version 2.0***

Open **Watcom**

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# ***Preface***

The *Open Watcom OS/2 Help Compiler User's Guide* describes how to use the Open Watcom OS/2 Help Compiler to compile tagged text files (\*.ipf) into OS/2 help files (\*.inf or \*.hlp) for use with the OS/2 Information Presentation facility. The Open Watcom OS/2 Help Compiler runs under DOS/4G, OS/2, Windows 9x, Windows NT, and Linux.

## ***Acknowledgments***

This book was produced with the Open Watcom GML electronic publishing system, a software tool developed by WATCOM. In this system, writers use an ASCII text editor to create source files containing text annotated with tags. These tags label the structural elements of the document, such as chapters, sections, paragraphs, and lists. The Open Watcom GML software, which runs on a variety of operating systems, interprets the tags to format the text into a form such as you see here. Writers can produce output for a variety of printers, including laser printers, using separately specified layout directives for such things as font selection, column width and height, number of columns, etc. The result is type-set quality copy containing integrated text and graphics.

July, 1997.

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# ***The Open Watcom OS/2 Help Compiler***





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# 1 Introduction

Documentation for programs in the form of help files can make the user's life much easier. The Open Watcom OS/2 Help Compiler produces such documentation for the OS/2 operating system's Information Presentation Facility (IPF). It consumes text documents containing special IPF tags, commands, and (optionally) bit-mapped graphics, and outputs help files in the .inf or .hlp formats.

The IPF tags are similar to other SGML tags, the most familiar of which is likely HTML. The IPF tags allow you, the documentation author, to:

- Specify the source (highlighted text or regions of an image) and destination of hyper-link jumps
- Set right and left text margins
- Create lists, footnotes, notes, and various other kinds of notices
- Create tables
- Add illustrations in the form of examples, text figures, and bit-mapped graphics
- Change the size, style, and color of displayed text
- Change whether text spacing and new lines in the source are significant or not
- Customize the behavior of windows in the help viewer
- Create communication links to other applications

This document provides a basic description of how tags are used ("Using IPF Tags" on page 7) as well as a complete reference for each tag ("IPF Tag Reference" on page 13). For more advanced topics, please refer to IBM's "IPF Programming Guide and Reference" (ipfref.inf) which is available on the internet.



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## 2 Using the Open Watcom OS/2 Help Compiler

The Open Watcom OS/2 Help Compiler is a command line utility. It may be invoked as follows:

```
wipfc [options] input.ipf
```

### 2.1 Environment Variables

The Open Watcom OS/2 Help Compiler depends upon several environment variables that must be set correctly before wipfc is run.

|                    |   |
|--------------------|---|
| <b>WIPFC</b>       | This must be set to %watcom%\wipfc, which is the location of the files defining the local language encoding.        |
| <b>IPFCARTWORK</b> | Must point to your source of bit-mapped graphic images if your source file uses any.                                |
| <b>IPFCIMBED</b>   | Must point to your source of input files if your main source file includes other source files.                      |
| <b>TMP</b>         | Must point to a directory where temporary files that are generated by Open Watcom OS/2 Help Compiler can be stored. |

### 2.2 Command Line Flags

The behavior of the Open Watcom OS/2 Help Compiler can be altered using command line options. Each flag begins with a delimiter. Either '-' or '/' can be used. Each flag is given a longer descriptive name here, but only the first character after the delimiter is actually significant. Flag names are not case-sensitive.

#### 2.2.1 Switches

The switches change the state of the Open Watcom OS/2 Help Compiler in a yes/no fashion.

| <i>Name</i>            | <i>Description</i>   |
|------------------------|--|
| <b>inf</b>             | Generate an 'inf' file. Otherwise a 'hlp' file is created by default.  |
| <b>quiet</b>           | Operate quietly, suppressing the usual copyright information display.  |
| <b>suppress-search</b> | Suppress the generation of the full-text search table in the output file. This makes the help file smaller, but the user can't search for individual words.  |
| <b>xref</b>            | Generate additional output information, including a cross-reference of identifiers. This is saved in a file 'output-name.log' where 'output-name' is the base name of the help file being created. |

### 2.2.2 Options

The options give additional information to the Open Watcom OS/2 Help Compiler. Each option is immediately followed by the information to be passed into wipfc.

#### 2.2.2.1 localization

Help files can be created for different locales. This is done by using the **localization** option in the form of

```
-l xx_YY
```

where xx\_YY is the name of the locale (for example, en\_US). The localization information is stored in a text file (en\_US.nls in this case). You can create your own locales from the sample file xx\_YY.nls, but you may also need to create a corresponding entity file containing the definitions of "IPF Symbols" on page 43.

#### 2.2.2.2 output-name

You can specify the name of the help file that wipfc generates by using the **output-name** option. For example,

```
-o MyHelp
```

will cause wipfc to generate an output file (either inf or hlp depending on the -inf switch) with a base name of 'MyHelp'.

#### 2.2.2.3 warning-level

The Open Watcom OS/2 Help Compiler generates three different levels of warnings (1, 2, and 3). By default, all levels of warnings are displayed. You can suppress the display of warnings higher than level **n** by using the **warning-level** option. For example,

```
-w1
```

suppresses all warnings higher than level 1.

---

## 3 Using IPF Tags

Source files for the Open Watcom OS/2 Help Compiler consist of text (words, whitespace, punctuation, and entity references), markup tags, and commands. Each markup tag is described in detail elsewhere ("IPF Tag Reference" on page 13), as are the commands ("Using IPF Commands" on page 11).

Tags come in four flavors:

1. Tags that appear in the document header and control how the document behaves.
2. Tags that establish blocks. These tags can contain other tags as well as text.
3. Tags that are in-line and contain text or other in-line tags.
4. Formatting tags that can appear anywhere, but are usually in-line.

### 3.1 Text

Text consists of words, whitespace, punctuation, and entity references (symbols).

#### 3.1.1 Words

Words consist of letters and/or numbers (ABC123 is a single word, for example). Which letters are valid depends upon the current locale. For the default locale (en\_US, code page 850), the upper and lower case ASCII letters are allowed (A-Z, a-z). Other letters can be included via entity references.

#### 3.1.2 Whitespace

Whitespace consists of spaces, tabs, and new-line characters. Usually, single whitespace characters are not significant, but multiple whitespace characters are. Tab characters are not expanded, so count as a single whitespace character. New-lines are generally ignored.

Some tags create blocks where some or all forms of whitespace become significant. In these cases, new-line characters will cause line breaks and the text will be shown as you have formatted it. If the block is monospaced, spaces as well as new-lines will be significant.

#### 3.1.3 Punctuation

Punctuation is not part of a word. 'ABC123' is a single word, but 'ABC-123' is actually two words ('ABC' and '123') and a punctuation ('-').

Some forms of punctuation are used to delimit tags or entity references. When a colon (':') or ampersand ('&') begin a word, that word is treated as a tag or entity reference, respectively. Likewise, a period ('.') ends both tags and entity references. If you need to use such constructs, replace the punctuation character with an entity reference ('&colon;', '&amp;', and '&per;').

### 3.1.4 Entity References (Symbols)

Entities are symbolic references to single characters. During processing of the source file, valid entity references are removed and the matching single character is substituted. This allows you to include special characters that are outside the normal character set (for example, characters with diacriticals) in words.

Unless the entity reference is a punctuation symbol, a string of ...-word-entity-word-... (in any order) is considered to be a single word.

Unrecognized entity references will cause wipfc to generate a warning. Note that all entity references are case sensitive: &Alpha. and &alpha. are two different things.

## 3.2 Tag Syntax

All tags begin with a colon (':') and end with a period ('.'). In addition, many tags have flags or attribute=value pairs that appear inside the tag between the tag name and the end-of-tag delimiter ('.'). If you forget the end-of-tag delimiter, the numerous warnings that wipfc generates will be sure to let you know.

## 3.3 Tag Attributes

A tag may have one or more **attributes**. An attribute contains additional information that a tag needs. The attribute has a name, and may also have a value or keyword assigned to it.

For example, heading tags have a 'res' attribute that specifies a window identifier (a target for hyper-linked jumps).

```
:h1 res=001.How to make Popcorn
```

In this case, res is assigned the value 001.

Notice that attributes are part of the tag, and the end-of-tag delimiter always follows the last attribute.

Many tags have multiple attributes. If you like, you can place them on different lines or all on a single line. If you place them on different lines, however, the attribute and its assigned value must be on the same line. Spaces are allowed between the attribute, '=', and the value. If spaces are required within the value, the value must be enclosed in matching quotation marks ('', or "", but not '" or "').

Optional attributes all have default values and do not need to be specified unless you need to change the default. Other attributes are required, and wipfc will issue a warning if they are not specified.

Attributes may be specified in any order within a tag.

Some attributes may not have a value, in which case the presence of the attribute simply acts as a boolean flag. For those attributes that do have values, values can be numeric, text strings (with spaces, if quoted), or keywords. For example, the color tag specifies the foreground and/or background color for text. Only certain colors are supported, and each has a keyword:

```
default  
blue  
red
```

pink  
green  
cyan  
yellow  
neutral  
brown  
darkgray  
darkblue  
darkred  
darkpink  
darkgreen  
darkcyan  
black  
palegray

## 3.4 End Tags

Some tags require matching end tags to form an enclosing block of code. The end tag has the same name as the tag prefixed with the letter 'e'. For example, if "tag" had an end tag, it would be "etag".

## 3.5 Nesting Tags

Most tags can be arbitrarily nested within other tags. However, some tags can *only* be nested inside other tags. For example, the list-item tag (li) can only appear between opening and closing list tags.

In addition, there are a few tags that restrict the kinds of elements that they can contain. If you try to include a tag where it doesn't belong, wipfc will issue a warning, the tag will be ignored, and the result will not be what you hoped for!

## 3.6 Tags Requiring Text

Some tags (for example, heading tags) have text associated with them. This text can appear either immediately after the end-of-tag delimiter ('.') or on the next line. Note, however, that in this case the end-of-tag delimiter must be immediately followed by a new-line character. No other form of whitespace is allowed.

## 3.7 Units of Measure

Several tags have attributes that are measurements of one sort or another (window origin and extent, for example). Dimensional measurements can be one of three types: **absolute**, **relative**, or **dynamic**.

**Absolute** measurements consist of a number followed by a letter that indicates the unit of measurement. The units are:

- c: the average character width of the default system font.
- x: pixels.
- p: typographical points (about 1/72 inch).

**Relative** measurements consists of a number followed by the percent sign (%). The values is a percentage of the parent window width or height.

**Dynamic** measurements consist of a keyword. The actual value is computed at run-time based on the current size and position of the parent window. The keywords for x-axis values are:

- left: flush left in the parent window
- center: centered in the parent window
- right: flush right in the parent window

The keywords for y-axis values are:

- top: at the top of the parent window
- center: centered in the parent window
- bottom: at the bottom of the parent window

Note that the coordinate system for all window measurements has its origin at the lower left corner. Increasingly positive values represent movement upward and rightward.



---

## 4 Using IPF Commands

In addition to tags, the Open Watcom OS/2 Help Compiler recognizes 5 commands (or control words) that invoke special processing procedures. Each command must start with a period ('.') in the first column of a line, followed by the name of the command. Commands that start anywhere except the first column of a line will be treated as regular text.

The Open Watcom OS/2 Help Compiler recognizes these commands:

| <i>Command</i>      | <i>Description</i>  |
|---------------------|---|
| <i>.*</i>           | Begin a comment.  |
| <i>.br</i>          | Add a line break (start a new line).                                    |
| <i>.ce</i>          | Center a single line of text.   |
| <i>.im filename</i> | Imbed (include) <b>filename</b> as if it were text in the current file. |
| <i>.nameit</i>      | Define a macro for text substitution.                                   |

### 4.1 Comment

Comments are always useful. They allow you to document your documentation! Any text on a line beginning with the comment command ('.\*') is passed over without further processing.

Don't put a comment within a tag, or between a tag and text that must immediately follow it.

### 4.2 *br*

There are times when you want to interrupt the normal flow of text and begin a new line. The *.br* command does just that. It must be the only thing on the line.

Any text following a *.br* command on the same line will be ignored.

### 4.3 *ce*

The *ce* command (*.ce*) centers the line of text that follows it.

The single line of text may not contain any other tags, but may contain *nameit* and entity references.

### 4.4 *imbed*

The Open Watcom OS/2 Help Compiler allows source files to be embedded in other source files. The top-most file is the master file. The *imbed* command (*.im*) is followed by the name of the file to include. This file is then processed as if it were in-line with the document including it.

The ability to include other files makes it possible to break large documents into smaller, more manageable logical chunks.

**Note:** The embedded files cannot contain the `userdoc` and `euserdoc` tags (see "userdoc" on page 35). Only the master document may contain these tags.

The embedded files must be in the current directory or in a directory listed in the `IPFCIMBED` environment variable (see "Environment Variables" on page 5). Otherwise, a full path name must be used.

## 4.5 *nameit*

The `nameit` command creates a text-substitution macro. The `nameit` command takes two parameters ( **symbol** =name and **text** ='string') that can appear in any order.

The **symbol** parameter is the name of the macro. Symbol names were limited to 10 characters (0-9A-Za-z) for the original OS/2 help compiler, but Open Watcom OS/2 Help Compiler does not have this restriction. Note that the `'&'` character is not part of the symbol name, but is used when referencing the symbol.

The **text** parameter defines 'string' as the text to be substituted on each occurrence of `&name.` in the text.

A `.nameit` symbol is used in the same way as an entity reference.

---

# 5 IPF Tag Reference

This section acts as a reference, describing how wipfc implements each tag.

## 5.1 Overview

Tags are the heart of IPF markup and come in four flavors:

1. Tags that appear in the document header. These tags control how the document behaves.
2. Tags that establish blocks. These tags can contain other tags as well as text. List-blocks and tables are special cases in that they can only contain other tags and cannot directly contain text.
3. Tags that are in-line. These tags can contain text or other in-line tags.
4. Formatting tags that can appear anywhere, but are usually in-line.

This diagram classifies each tag and shows which tags can contain which other tags. Tags that are marked as containing 'in-line' can also contain formatting and text.

| Tag Name    | Classification |
|-------------|----------------|
| userdoc     |                |
| title       | (doc header)   |
| docprof     | (doc header)   |
| ctrldef     | (doc header)   |
| pbutton     | (doc header)   |
| ctrl        | (doc header)   |
| ectrldef    | (doc header)   |
| fn          | (block)        |
| block       |                |
| in-line     |                |
| efn         |                |
| h1          | (block)        |
| h2          |                |
| h3          |                |
| h4          |                |
| h5          |                |
| h6          |                |
| acviewport  | (block)        |
| artlink     | (in-line)      |
| link        |                |
| eartlink    |                |
| artwork     | (in-line)      |
| caution     | (block)        |
| in-line     |                |
| ecaution    |                |
| cgraphic    | (block)        |
| in-line     |                |
| ecgraphic   |                |
| color       | (format)       |
| ddf         | (block)        |
| dl          | (list-block)   |
| dthd        | (block)        |
| in-line     |                |
| ddhd        | (block)        |
| in-line     |                |
| dt          | (block)        |
| in-line     |                |
| dd          | (block)        |
| in-line     |                |
| block       |                |
| list-block  |                |
| edl         |                |
| fig         | (block)        |
| in-line     |                |
| figcap      | (block)        |
| text        |                |
| efig        |                |
| font        | (format)       |
| href        | (in-line)      |
| hide        | (format)       |
| block       |                |
| in-line     |                |
| ehide       |                |
| hp1 - hp9   | (format)       |
| block       |                |
| in-line     |                |
| ehp1 - ehp9 |                |

|            |              |
|------------|--------------|
| i1         | (block)      |
| text       |              |
| i2         | (block)      |
| text       |              |
| icmd       | (block)      |
| text       |              |
| isyn       | (block)      |
| text       |              |
| lines      | (block)      |
| in-line    |              |
| elines     |              |
| link       | (in-line)    |
| in-line    |              |
| elink      |              |
| lm         | (format)     |
| note       | (block)      |
| in-line    |              |
| nt         | (block)      |
| in-line    |              |
| block      |              |
| ent        |              |
| ol         | (list-block) |
| li         | (block)      |
| in-line    |              |
| lp         | (block)      |
| in-line    |              |
| list-block |              |
| eol        |              |
| p          | (block)      |
| in-line    |              |
| parml      | (list-block) |
| pt         | (block)      |
| in-line    |              |
| pd         | (block)      |
| in-line    |              |
| list-block |              |
| eparml     |              |
| rm         | (format)     |
| sl         | (list-block) |
| li         | (block)      |
| in-line    |              |
| lp         | (block)      |
| in-line    |              |
| list-block |              |
| esl        |              |
| table      | (block)      |
| row        | (block)      |
| c          | (block)      |
| lines      | (block)      |
| text       |              |
| elines     |              |
| in-line    |              |
| etable     |              |
| ul         | (list-block) |
| li         | (block)      |
| in-line    |              |
| lp         | (block)      |
| in-line    |              |
| list-block |              |

```
eul
warning          (block)
  in-line
ewarning
xmp              (block)
  in-line
exmp
euserdoc
```

## 5.2 Reference

The Open Watcom OS/2 Help Compiler follows the behavior of the IBM OS/2 Help Compiler as documented in the "ipfref.inf" help file. This means that the behavior of the two compilers is very similar but not identical, since the IBM compiler allows certain things that the documentation says it should not. The entry for each tag that follows describes how the Open Watcom OS/2 Help Compiler treats each tag.

### 5.2.1 *acviewport*

*Description:* This tag creates a child window within the current window (page). The contents of this child window is controlled by an application via a dynamic link library.

*Attributes:*

*dll='text'* The name of the dynamic link library containing the code that controls the current viewer window.

*objectname='text'*  
The entry point (function name) in the dll to be called. Case sensitive.

*objectinfo='text'*  
Parameters to be passed to the dll function.

*objectid='text'* An identifier to associate the window with the object.

*vpx=measurement*  
The x origin of the child window. May be absolute, relative, or dynamic. See "Units of Measure" on page 9.

*vpy=measurement*  
The y origin of the child window. May be absolute, relative, or dynamic. See "Units of Measure" on page 9.

*vpcx=measurement*  
The width of the child window. May be absolute, relative, or dynamic. See "Units of Measure" on page 9.

*vpcy=measurement*  
The height of the child window. May be absolute, relative, or dynamic. See "Units of Measure" on page 9.

*Classification:* Block

*May contain:* None

*See also:* "ddf" on page 19

## 5.2.2 artlink

*Description:* The artlink tag is used in conjunction with the artwork tag to define rectangular regions of a bitmap that each act as a hypergraphic link.

*Note* The artlink tag must immediately follow the artwork tag that declares the bit-mapped image, or be included in a file referenced from the artwork tag.

*Classification:* In-line

*May contain:* link

*Closing tag:* The closing eartlink is required.

*See also:* "artwork"

## 5.2.3 artwork

*Description:* The artwork tag declares a bit-mapped image to be included in the help file. Windows and OS/2 BMP files are supported. wipfc looks for images in the directories pointed to by the IPFCARTWORK environment variable (see "Environment Variables" on page 5).

*Attributes:*

*name='filename.ext'*

The name of the bitmap image file. This attribute is required.

*align=left | center | right*

Specifies how the image is to be aligned in the current window. Can be one of left, center, or right.

*linkfile='filename.ext'*

A direct reference to a file containing artlink/eartlink tags and its associated link tags. This allows the image to act as a hyper-graphic link.

*runin*

This flag places the image within the line of text surrounding it. Otherwise, it acts as a block with the text appearing above and below.

*fit*

This flag causes the image to be scaled to fill the window. Note that this may distort the image if the aspect ratio of the window and image differ.

*Classification:* In-line

*May contain:* None

*See also:* "artlink"

### 5.2.4 caution

*Description:* Displays a locale-specific cautionary message ("Caution: " in the en\_US locale) followed on the next line by the contents enclosed by the caution tag block.

*Closing tag:* The closing ecaution is required.

*Attributes:*

*text='message'* Use 'message' instead of 'CAUTION: ' as the introductory text.

*Classification:* Block

*May contain:* Text, Formatting, In-line, Block (except acviewport, fn, h1-h6), List-block

*See also:* "note" on page 30, "nt" on page 30, "warning" on page 35

### 5.2.5 cgraphic

*Description:* Creates a "text graphic." Any text in the cgraphic block will be rendered mono-spaced, and spaces and new-lines will be honored. If the text does not fit within the window, it will be clipped. Although in-line formatting is allowed, mixing bold and normal fonts will throw the spacing off.

*Closing tag:* The closing ecgraphic is required.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "artwork" on page 17, "fig" on page 22, "lines" on page 27

### 5.2.6 color

*Description:* Changes the fore- and background color of the text. The color change remains in effect until another color is specified or the next heading tag (h1 - h6) is reached.

*Attributes:*

*fc=default | black | blue | red | pink | green | cyan | yellow | neutral | brown (a synonym for neutral) | darkgray | darkblue | darkred | darkpink | darkgreen | darkcyan | palegray*  
This sets the foreground color of the text.

*bc=default | black | blue | red | pink | green | cyan | yellow | neutral | brown (a synonym for neutral) | darkgray | darkblue | darkred | darkpink | darkgreen | darkcyan | palegray*  
This sets the background color of the text.

*Classification:* Formatting

*May contain:* Text, Formatting, In-line, Block, List-block



### 5.2.7 ctrl

- Description:* Defines which push-buttons are displayed in the control area, and where. For on-line documents, the default push-buttons are: Previous, Search, Print, Index, Contents, Back, Forward, Tutorial (if a tutorial is present). These are displayed in the control area of the cover window. For help windows, the default buttons are: Previous, Search, Print, Index, Tutorial (if a tutorial is present).
- Attributes:*
- ctrlid=**text* Specifies the id by which this control group can be referenced. Alphanumeric. Duplicate ids are not allowed.
- controls=**'search print index contents esc back forward custom-id'*  
A space-separated list of the ids of the buttons you want to display, in the order to be displayed. If you define your own button (using the pbutton tag), use the id from that tag as the custom-id.
- page* Put the buttons in the control area of a page.
- coverpage* Put the buttons in the control area of the cover (main) page.
- Conditions* The ctrl tag must be enclosed in a ctrldef block, and must follow all pbutton tags
- Classification:* Document Header
- May contain:* None
- See also:* "ctrldef", "pbutton" on page 32

### 5.2.8 ctrldef

- Description:* Defines a control area and its contents. It must follow the docprof tag and precede the first h1 tag.
- Closing tag:* The closing ctrldef is required.
- Classification:* Document Header
- May contain:* pbutton, ctrl
- See also:* "docprof" on page 21, "ctrl", "pbutton" on page 32

### 5.2.9 ddf

- Description:* Display dynamically formatted text in an application-controlled window.
- Attributes:*
- res=**number* The resource id number. Must be between 1 and 64000.

*Classification:* Block

*May contain:* None

*See also:* "acviewport" on page 16

### 5.2.10 dl

*Description:* Begin a definition list (a sequence of terms and their definitions).

*Closing tag:* The closing edl is required.

*Attributes:*

*compact* Omit inserting a blank line between each term-description pair.

*tsize=number* Sets the width of the "term " column (the default is 10).

*break=none | fit | all*

Controls how a description follows a term. If break is set to "none", descriptions are on the same line as the term, even if the length of the term exceeds "tsize" characters. If break is set to "fit", descriptions are placed on the next line only if the length of the term exceeds "tsize" characters. If break is set to "all" descriptions are always placed on the next line.

*Conditions:* The dthd and ddhd tags must occur before any dt and dd tags. Multiple consecutive dt tags are allowed (synonyms), but only one dd tag is allowed for each set of dt tags.

*Classification:* List-block

*May contain:* "dthd", "ddhd", "dt" on page 21, "dd" on page 21, Block, List-block

*See also:* "ol" on page 31, "parml" on page 31, "ul" on page 35, "sl" on page 33

#### 5.2.10.1 dthd

*Description:* The term header for a definition list. It acts as a column title for all term elements.

*Conditions:* Must appear before the first ddhd, dt, or dd tag.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "ddhd"

#### 5.2.10.2 ddhd

*Description:* The definition header for a definition list. It acts as a column title for all definition elements.

*Conditions:* Must appear after a dthd tag and before the first dt or dd tag.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "dthd" on page 20

### 5.2.10.3 dt

*Description:* A term to be defined.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "dd"

### 5.2.10.4 dd

*Description:* A definition of a term.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "dt"

## 5.2.11 docprof

*Description:* Describes the document profile, which includes which (if any) dynamic link libraries to load, what level headers trigger new pages, where controls are displayed. The tag must follow the userdoc tag and (if present) the title tag.

*Attributes:*

*toc=numbers* Controls which heading levels are included in the table of contents. For example, '123' (the default) places headings defined by the h1, h2, and h3 tags in the table of contents. The numbers must be consecutive, beginning with 1.

*dll='text'* Specifies a dll to load. This dll can act as a communication object and alter the behavior of the viewer.

*objectname='text'*  
The dll entry point.

*objectinfo='text'*  
Parameters to pass to the dll.

*ctrlarea=none | coverpage | page | both*  
Specifies where the control area that contains push buttons is located. If 'page' is specified, place the control area on the text window. If 'coverpage' is specified, place the control area on the cover page. If 'both' is specified, place the control are in both locations. If 'none' is specified, suppress the control area.

*Classification:* Document Header

*May contain:* None

### 5.2.12 fig

*Description:* A block of text representing a figure. A proportional font is used, but spaces and line breaks are honored so that the text is layed out as entered. If the text exceeds the current window dimensions, it will be clipped.

*Closing tag:* The closing `efig` is required.

*Classification:* Block

*May contain:* Text, Formatting, In-line, figcap

*See also:* "cgraphic" on page 18, "figcap", "lines" on page 27

### 5.2.13 figcap

*Description:* Specifies the title for a figure. This tag must occur in a `fig/efig` block, either at the beginning or end of the figure. The caption text must be on the same line as the tag, or on the next line.

*Classification:* Block

*May contain:* Text

*See also:* "fig"

### 5.2.14 font

*Description:* Change the font face, size, or encoding for the text in the page (fonts reset at the next header defining a new page).

*Attributes:*

*facename*=*'text'*

Sets the name of the font to use. If set to 'default', resets the font to the default face and size. This attribute is required.

*size*=*HxW*

Sets the height and width of the font. If either value is 0, resets the font to the default face and size. This attribute is required. The 'x' separating the numbers is required.

*codepage*=*number*

Sets the encoding of the displayed text. The value is a 3 digit number.

*Classification:* Formatting

*May contain:* Text, Formatting, In-line, Block, List-block

## 5.2.15 fn

|                        |   |
|------------------------|---|
| <i>Description:</i>    | Defines a pop-up window that acts as a footnote. The window is activated when the user clicks a link.   |
| <i>Closing tag:</i>    | The closing efn is required.  |
| <i>Attributes:</i>     |   |
| <i>id=text</i>         | Specifies a unique alphanumeric identifier used as the target of a link tag. This attribute is required.  |
| <i>Conditions:</i>     | The index tags (i1, i2, icmd, isyn) are not allowed. Footnotes cannot be nested within other footnotes, nor can they contain headings (h1 - h6). The link to a footnote cannot appear in a child window. The text of footnotes is not searchable. |
| <i>Classification:</i> | Block   |
| <i>May contain:</i>    | Text, Formatting, Block (except fn, h1 - h6), List-block  |
| <i>See also:</i>       | "link" on page 28   |

## 5.2.16 h1 - h6

|                          |  |
|--------------------------|--|
| <i>Description:</i>      | A heading tag defines a new page (window), provided the heading level is less than the maximum value set using the docprof tag. The text of the header immediately follows the close of the tag, either on the same or the next line. The attributes of the heading tag can be used to set the properties of the window that displays the page of information. Heading tags must appear in consecutive ascending (but not descending) order. That is, you cannot go from h1 to h3 without an intervening h2, but you can go from h3 to h1. |
| <i>Attributes:</i>       |  |
| <i>res=number</i>        | Specify the resource id of the header. It must be in the range of 1 to 64000. This attribute is required for HLP files.  |
| <i>id=text</i>           | The id of the header. Alphanumeric.  |
| <i>name=text</i>         | The name of the header. Alphanumeric.  |
| <i>global</i>            | If set, this page can be linked to by an external HLP or INF file.   |
| <i>tutorial=text</i>     | Specifies the file name of the tutorial, and adds the tutorial button to the control area.   |
| <i>x=measurement</i>     | The x origin of the window in the parent window. See "Units of Measure" on page 9.   |
| <i>y=measurement</i>     | The y origin of the window in the parent window. See "Units of Measure" on page 9.   |
| <i>width=measurement</i> | The width of the window in the parent window. See "Units of Measure" on page 9.  |

*height=measurement*

The height of the window in the parent window. See "Units of Measure" on page 9.

*Note:*

You cannot mix absolute units with dynamic or relative units when specifying x and width, or y and height.

*group=number*

The group number of the window (1 to 64000). All pages in the same group are displayed in the same window, one replacing the other.

*viewport*

Force the opening of a new window for this page.

*clear*

Close any open windows before opening a new one to display this page.

*titlebar=yes | sysmenu | minmax | both | none*

Set what contents appear in the title bar. The default is 'both'. Useful for secondary windows.

*scroll=horizontal | vertical | both | none (default: both)*

Set which scroll bars appear. The default is 'both'. Useful for secondary windows.

*rules=border | sizeborder | none*

Set the type of border on the window. The default is 'sizeborder'. Useful for secondary windows.

*nosearch*

When searching, do not jump to this secondary window. Instead, jump to the parent window that contains it.

*noprint*

Do not print the contents of a secondary window separately. Print it as part of the parent window contents.

*hide*

Do not include this header in the table of contents.

*toc=numbers*

Controls which heading levels are included in the table of contents. For example, '123' (the default) places headings defined by the h1, h2, and h3 tags in the table of contents. The numbers must be consecutive, beginning with 1. Valid until the end of the file or until the next header with a toc attribute.

*ctrlarea=page|none*

Specifies where the control area that contains push buttons is located. If 'page' is specified, place the control area on the text window. If 'none' is specified, suppress the control area on this page. This overrides the value set in the docprof tag.

*ctrlrefid=text*

An alphanumeric identifier of the set of controls you wish to display.

*Classification:* Block

*May contain:* Text, Formatting, In-line, Block, List-block

*See also:* "fn" on page 23

## 5.2.17 href

*Description:* Link to a heading. The text of the link is "Reference".

*Attributes:*

*res=number* The resource id of the header tag.

*refid=text* The id of the header tag. Alphanumeric.

*Classification:* In-line

*May contain:* None

*See also:* "link" on page 28

## 5.2.18 hide

*Description:* Hide a section of information unless the IPF\_KEYS environment variable contains the correct key.

*Closing tag:* The closing ehide is required.

*Attributes:*

*key='text'* The key that will unhide the enclosed information. Multiple keys can be specified by enclosing each key in single quotes then concatenating them with the plus sign. So, 'key1'+ 'key2'+... wipfc will also accept 'key1+key2+...'

*Conditions:* You cannot nest hide tags within each other. You cannot include a header tag with the 'res' attribute set (in other words, you cannot jump to hidden material). Note that the Open Watcom OS/2 Help Compiler does not check for this error.

*Classification:* Formatting

*May contain:* Text, Formatting, In-line, Block, List-block

## 5.2.19 hp1 - hp9

*Description:* Change the style of the text. The style can be a combination of bold, italic, or underlined, or a color change. hp1 is italic. hp2 is bold. hp3 is bold italic. hp4 is blue. hp5 is underlined. hp6 is underlined italic. hp7 is underlined bold. hp8 is red. hp9 is pink.

*Closing tag:* The closing matching tag is required.

*Conditions* Highlighting tags cannot nest. Note that the Open Watcom OS/2 Help Compiler allows this as an extension, but still issues a warning. In this case the opening and closing tags must match at each nesting level. Also note that nested highlighting tags are not additive: an hp1 (italic) inside hp2 (bold) does not make an hp3 (bold italic).

*Classification:* Formatting

*May contain:* Text, Formatting, In-line, Block, List-block

### 5.2.20 i1

*Description:* Add a primary entry to the index. The text for the entry must be on the same line as the tag and cannot contain other tags.

*Attributes:*

*id=text* A cross-reference for use by a secondary index (i2) tag.

*global* For HLP files, allows this entry to also appear in the global index.

*roots='text'* Specifies a space separated list of root words (as defined by isyn) that act as index entries to specific topics.

*sortkey='key-text'.index-text*  
Specify a string used to sort this entry in the index, and a string to use in its place. In other words, place index-text where key-text would sort in index.

*Conditions* Cannot appear in a footnote (fn/efn block).

*Classification:* Block

*May contain:* Text

*See also:* "i2", "icmd" on page 27, "isyn" on page 27

### 5.2.21 i2

*Description:* Add a secondary entry to the index. The text for the entry must be on the same line as the tag and cannot contain other tags.

*Attributes:*

*refid=text* The id of the primary index entry to which this belongs.

*global* For HLP files, allows this entry to also appear in the global index.

*sortkey='key-text'.index-text*  
Specify a string used to sort this entry in the index, and a string to use in its place. In other words, place index-text where key-text would sort in index.

*Conditions* Cannot appear in a fn/efn footnote. If the global flag is set for the i1 tag, it must be set for the i2 tag.

*Classification:* Block

*May contain:* Text

*See also:* "i1"



### 5.2.22 icmd

- Description:* Show that this page describes a command. The text for the command must be on the same line as the tag and cannot contain other tags. If the page contains information on more than one command, there should be one icmd tag for each documented command.
- Conditions* The icmd tag must directly follow a heading tag, or other index tags (i1, i2 or isyn).
- Classification:* Block
- May contain:* Text
- See also:* "i1" on page 26, "i2" on page 26

### 5.2.23 isyn

- Description:* Create a list of synonyms or variations of a word in a primary index tag (i1). If the user enters one of the words in the isyn list, the corresponding i1 index referencing the root word is returned. The synonyms themselves do not appear in the index. The isyn tag can be placed on any page that contains related i1 tags. The list of synonyms must be on the same line as the tag and cannot contain other tags.
- Attributes:*
- root=text* The root word for which the synonyms apply. This word will also appear in the 'roots' attribute of the i1 tag.
- Classification:* Block
- May contain:* Text
- See also:* "i1" on page 26

### 5.2.24 li

- Description:* Begins a list item. This tag is only valid inside a simple, ordered, or unordered lists.
- Classification:* Block
- May contain:* Text, Formatting, In-line, Block, List-block
- See also:* "ol" on page 31, "sl" on page 33, "ul" on page 35

### 5.2.25 lines

- Description:* Renders the enclosed block in a proportional font, but honoring white space and line breaks to preserve the formatting of the text as it was entered. The text can be left or right aligned, or centered.
- Closing tag:* The closing elines is required.

*Attributes:*

*align*=*left* | *center* | *right*

Left, center, or right align the block of text in the window.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "ce" on page 11, "fig" on page 22, "xmp" on page 36

### 5.2.26 link

*Description:* A link to additional information. Activating the link may jump to a different location in the same or a different document, open a footnote, launch an application, or send a notification to another running process.

*Closing tag:* The closing `elink` is required. Unless the link is contained in an `artlink` tag, or if `reftype` is 'inform'.

*Attributes:*

*reftype*=*hd* | *fn* | *launch* | *inform*

If `reftype` is 'hd', then it links to a heading and the `refid` attribute must be specified. If the heading is in an external file, the database must also be set and the heading must have its 'global' attribute set. If `reftype` is 'fn', the link is to a footnote and the 'refid' attribute must be set. Note that a split window cannot contain a link to a footnote. If `reftype` is 'launch', the link starts the external program specified by the 'object' attribute with parameters specified in the 'data' attribute. If `reftype` is 'inform', the value of the 'res' attribute is sent to the application.

*res=number* The resource id of the header tag.

*refid=text* The id of the header. Alphanumeric.

*database='text'*  
The name of the external INF or HLP file.

*object='text'* The name of a program to execute.

*data='text'* The parameters to pass to program being started.

*auto* Automatically trigger this link when the page that contains it is displayed. Footnotes cannot be opened automatically. The link tag must follow a heading tag before other tags and text.

*viewport* Open a secondary window when the link that refers to it is opened.

*dependent* Make the automatically opened window close when the secondary window that opened it is closed.

|  |  |
|--|--|
| <i>split</i>                                 | Open a secondary window when the link is activated. Note that the primary window can only contain links to secondary windows. Each of the secondary windows must have a different group number if they are to be displayed at the same time.   |
| <i>child</i>                                 | Open the page being linked to as a child of the current page, clipped to fit within the current page. The child is always on top, is closed when the parent is closed, resized when the parent's size is changed. If only the child is minimized, its icon appears within the parent's border. |
| <i>group=number</i>                          | The group number of the window (1 to 64000). All pages in the same group are displayed in the same window, one replacing the other.  |
| <i>vpx=measurement</i>                       | The x origin of the window. See "Units of Measure" on page 9. Not valid for footnotes.   |
| <i>vpy=measurement</i>                       | The y origin of the window. See "Units of Measure" on page 9. Not valid for footnotes.   |
| <i>vpcx=measurement</i>                      | The width of the window. Absolute or dynamic units only. See "Units of Measure" on page 9. Not valid for footnotes.  |
| <i>vpcy=measurement</i>                      | The height of the window. Absolute or dynamic units only. See "Units of Measure" on page 9. Not valid for footnotes.   |
| <i>titlebar=yes sysmenu minmax both none</i> | Set what contents appear in the title bar. The default is 'both'. Useful for secondary windows.  |
| <i>scroll=horizontal vertical both none</i>  | Set which scroll bars appear. The default is 'both'. Useful for secondary windows.   |
| <i>rules=border sizeborder none</i>          | Set the type of border on the window. The default is 'sizeborder'. Useful for secondary windows.   |
| <i>x=number</i>                              | The x origin of the active area of the graphic. Valid only if the link is in an artlink.   |
| <i>y=number</i>                              | The y origin of the active area of the graphic. Valid only if the link is in an artlink.   |
| <i>cx=number</i>                             | The width of the active area of the graphic. Valid only if the link is in an artlink.  |
| <i>cy=number</i>                             | The height of the active area of the graphic. Valid only if the link is in an artlink.   |
| <i>Note:</i>                                 | If the link is to contain an image, the link must be enclosed in an artlink tag block.   |
| <i>Classification:</i>                       | In-line  |
| <i>May contain:</i>                          | Text, Formatting, In-line  |
| <i>See also:</i>                             | "artlink" on page 17, "href" on page 25  |

### 5.2.27 *lm*

*Description:* Sets the left margin. The margin remains in effect until it is reset or until the end of the current page.

*Attributes:*

*margin=number*

The number of character spaces. If the tag appears more than 'margin' character spaces into a line of text, the margin becomes effective on the next line.

*Classification:* Formatting

*May contain:* Text, Formatting, In-line, Block, List-block

*See also:* "rm" on page 33

### 5.2.28 *lp*

*Description:* Add a paragraph to a list. The resulting block of text is indented to the same level as the list text, but is not numbered or bulleted.

*Classification:* Block

*May contain:* Text, Formatting, In-line, Block, List-block

*See also:* "p" on page 31

### 5.2.29 *note*

*Description:* Begins a note. The text that follows the tag (up to the next block-class tag) is used as the text of the note. This text appears after the local-specific phrase ("Note: " in the en\_US locale) and on the same line.

*Attributes:*

*text='text'* Substitute 'text' for the default "Note: " phrase.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "caution" on page 18, "nt", "warning" on page 35

### 5.2.30 *nt*

*Description:* Begins a multi-paragraph note. All of the text in the note left aligns with the first word after the message text. The text begins with a local-specific phrase ("Note: " in the en\_US locale).

*Closing tag:* The closing ent is required.

*Attributes:*

*text='text'* Substitute 'text' for the default "Note: " phrase.

*Classification:* Block

*May contain:* Text, Formatting, In-line, Block, List-block

*See also:* "caution" on page 18, "note" on page 30, "warning" on page 35

### 5.2.31 ol

*Description:* An ordered list (numbers precede each list item). List items begin with the li tag and can be continued in another paragraph (without numbering) by using the lp tag.

*Closing tag:* The closing eol is required.

*Attributes:*

*compact* Do not put blank lines between each list item.

*verycompact* Do not put blank lines between each list item, and do not put blank lines before or after the list. An Open Watcom OS/2 Help Compiler extension.

*Classification:* List-block

*May contain:* Text, Formatting, In-line, Block, List-block

*See also:* "li" on page 27, "lp" on page 30, "sl" on page 33, "ul" on page 35

### 5.2.32 p

*Description:* A paragraph. Each paragraph is preceded by a blank line, and is terminated by the next block-level tag. Text doesn't have to be in a paragraph, but it helps.

*Classification:* Block

*May contain:* Text, Formatting, In-line

### 5.2.33 parml

*Description:* A two-column list of parameters and their definitions, similar to a definition list (dl tag). A pt tag defines the term, and a pd tag defines a definition of the term. Each pt tag must have a pd tag. Multiple consecutive pt tags are allowed (synonyms), but only one pd tag is allowed for each set of pt tags. Other lists and blocks may be nested in a parameter table.

*Attributes:*

*tsize=number* The width of the term column. The default is 10.

*break*=all | fit | none

If break is 'all' then each description is on a line below the term. This is the default. If break is 'fit' then the description is on the same line as the term provided that the width of the term is less than tsize characters. If break is 'none' then the description is on the same line as the term.

*compact* Do not add blank lines between each term/description pair.

*Classification:* List-block

*May contain:* "pt", "pd"

*See also:* "dl" on page 20

### 5.2.33.1 pt

*Description:* The parameter to be described. Multiple pt tags (synonyms) may described by a single pd tag.

*Classification:* List-block

*May contain:* Text, Formatting, In-line, "pd", pt

### 5.2.33.2 pd

*Description:* The description of the parameter.

*Classification:* List-block

*May contain:* Text, Formatting, In-line

*See also:* "pt"

### 5.2.34 pbutton

*Description:* Defines a custom (author-defined) push button.

*Attributes:*

*id*=text An alphanumeric identifier that will be referenced by the ctrl tag when using the button.

*res*=number The resource identifier for the button (returned by window messages). Must be greater 256; values of 256 or less are reserved.

*text*='text' The button text. May include spaces. May not include entity references. Must not conflict with any pre-defined buttons.

*Note:* All pbutton tags must appear inside a ctrldef block and before any ctrl tags.

*Classification:* Document Header

*May contain:* None

*See also:* "ctrl" on page 19, "ctrldef" on page 19

## 5.2.35 *rm*

*Description:* Sets the right margin. The margin remains in effect until it is reset or until the end of the current page.

*Attributes:*

*margin=number*

The number of character spaces. If the tag appears more than 'margin' character spaces into a line of text, the margin becomes effective on the next line.

*Classification:* Formatting

*May contain:* Text, Formatting, In-line, Block, List-block

*See also:* "lm" on page 30

## 5.2.36 *sl*

*Description:* A simple list (neither numbered, nor bulleted). List items begin with the li tag and can be continued in another paragraph (without numbering) by using the lp tag.

*Closing tag:* The closing esl is required.

*Attributes:*

*compact* Do not put blank lines between each list item.

*verycompact* Do not put blank lines between each list item, and do not put blank lines before or after the list. An Open Watcom OS/2 Help Compiler extension.

*Classification:* List-block

*May contain:* Text, Formatting, In-line, Block, List-block

*See also:* "li" on page 27, "lp" on page 30, "ol" on page 31, "ul" on page 35

## 5.2.37 *table*

*Description:* Begins a table. Tables use a mono-spaced font to ensure that the column width are respected. If you change the font (using the font tag) or change make the font bold, the spacing will be thrown off.

*Attributes:*

*cols='number number...'*

Specifies both the width of each column ('number') and the number of columns (the number of 'number's).

*rules=both | horiz | vert | none*

Specify whether the table will have horizontal or vertical rules. If the rule is not drawn, blank space appears in its place. The default is 'both'.

*frame=rule|box|none*

Specifies the frame around the table. If no frame is drawn, blank space appears in its place. The default is 'box'.

*Classification:* Block

*May contain:* "row"

### 5.2.37.1 row

*Description:* A table row. If the number of cells supplied for a row is greater or less than the number specified in the table tag, a warning is generated.

*Classification:* Block

*May contain:* "c"

### 5.2.37.2 c

*Description:* A table cell. If the width of the text exceeds the width of the cell, the text is wrapped. If the length of a single word exceeds the width of the cell, that word will be truncated to the width of the cell.

*Classification:* Block

*May contain:* Text, "color" on page 18, "font" on page 22, "hp1 - hp9" on page 25, "lines" on page 27, "link" on page 28

*Note:* Using the lines tag does not change the font to a proportional spaced font. It simply makes the whitespace and new lines significant so that the cell is formatted as entered. All attributes for the lines tag are ignored.

### 5.2.38 title

*Description:* Sets the title of the help document. The maximum length of the title is 47 characters (including spaces and blanks) and is displayed in a single line. Other than text, the title may contain entity references and nameit expansions.

*Note:* The title tag may only appear in the document header. It cannot appear on individual pages because it applies to the document as a whole.

*Classification:* Document Header

*May contain:* Text



## 5.2.39 ul

- Description:* An unordered list (bullets precede each list item). List items begin with the li tag and can be continued in another paragraph (without numbering) by using the lp tag.
- Closing tag:* The closing eul is required.
- Attributes:*
- compact* Do not put blank lines between each list item.
- verycompact* Do not put blank lines between each list item, and do not put blank lines before or after the list. An Open Watcom OS/2 Help Compiler extension.
- Classification:* List-block
- May contain:* Text, Formatting, In-line, Block, List-block
- See also:* "li" on page 27, "lp" on page 30, "ol" on page 31, "sl" on page 33

## 5.2.40 userdoc

- Description:* Delimit the compilable source text. userdoc must be the first tag in the file. Only comments may precede the userdoc tag. Only comments may follow the terminating euserdoc tag.
- Closing tag:* The closing euserdoc is required.
- Classification:* Block
- May contain:* Everything

## 5.2.41 warning

- Description:* Displays a locale-specific warning message ("Warning: " in the en\_US locale) followed immediately by the contents enclosed by the warning tag block.
- Closing tag:* The closing ewarning is required.
- Attributes:*
- text='message'* Use 'message' instead of 'Warning: ' as the introductory text.
- Classification:* Block
- May contain:* Text, Formatting, In-line, Block (except acviewport, fn, h1-h6), List-block
- See also:* "caution" on page 18, "note" on page 30, "nt" on page 30

## **5.2.42 xmp**

*Description:* Renders the enclosed text in a monospaced font, honoring whitespace and line breaks. In other words, exactly as it is entered. If the width of the text exceeds the width of the window, the text is clipped, not wrapped.

*Closing tag:* The closing `xmp` is required.

*Classification:* Block

*May contain:* Text, Formatting, In-line

*See also:* "cgraphic" on page 18, "lines" on page 27

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# 6 Error Messages

The Open Watcom OS/2 Help Compiler generates four kinds of diagnostic messages: Errors and three levels of warnings. Despite their name, warnings are really errors and indicate that wipfc has produced a file that is probably not exactly the way you wanted.

## 6.1 Errors

Errors are always fatal and cause Open Watcom OS/2 Help Compiler to stop immediately.

***"The length of the file path is too long"***

The maximum length of the file path depends on the operating system. You may need to re-arrange the project's layout on disk.

***"Cannot open file"***

A source file cannot be opened, usually because it doesn't exist. Check the spelling of the file name.

***"Cannot open image file"***

A image file cannot be opened, usually because it doesn't exist. Check the spelling of the file name.

***"Cannot read from file"***

For some reason, reading the file has failed.

***"Cannot write to file"***

For some reason, writing to the file has failed. The disk might be full.

***"Unexpected end of file"***

The source file has unexpectedly ended. This can occur if you have forgotten the euserdoc tag.

***"Text conversion error"***

wipfc uses wide characters internally. All text is converted from multi-byte characters to wide characters when read, and back to multi-byte characters when written. If a character cannot be converted successfully, this error is generated.

***"Syntax error"***

A syntax error has occurred. Usually, this is because an end-of-tag delimiter is missing.

***"Invalid country code or codepage"***

The appropriate file of entity references cannot be found or cannot be read. Usually, this is because the WIPFC environment variable is not setup or is pointing to the wrong place.

***"Invalid language code"***

The appropriate nls file cannot be found or cannot be read. Usually, this is because the WIPFC environment variable is not setup or is pointing to the wrong place.

***"Missing :userdoc or :euserdoc"***

The document is not correctly formed. The userdoc and euserdoc tags are required.

***"Too many unique words--the document is too big"***

A document can contain a maximum of 64000 unique words.

***"The document has no words"***

A document cannot be empty. Add some text.

***"The document has too many pages"***

A document cannot have more than 65535 pages.

***"The document has too many index or icmd entries"***

The document cannot have more than 65535 index entries.

***"The document has no visible table of contents entries"***

At least one of the pages must be visible. Don't hide them all.

***"Cannot open nls configuration file"***

A NLS configuration file cannot be opened. Usually, this is because the WIPFC environment variable is not setup or is pointing to the wrong place.

## 6.2 Level 1 Warnings

Level 1 warnings are the most serious. Unless they are corrected, your help file is not likely to contain information presented as you intended.

***"This command is not defined"***

Commands begin with a '.' in the first column of a row of text. You probably have a line beginning with a period.

***"This tag is not defined"***

You are trying to use a tag that wipfc does not recognize. Try replacing the ':' character with an entity reference.

***"This attribute is not defined for this tag"***

Check the spelling of the attribute, or delete it.

***"Attributes are not allowed for this tag--probably missing . to end the tag"***

This tag has no attributes.

***"The tag, word, or command is not allowed in this context"***

This is usually because the enclosing tag can only contain specific tags or no tags at all.

***"Syntax error in tag"***

There is something wrong within the tag.

***"Ignoring text before the h1 tag"***

Text and most tags cannot appear before the first heading tag.

***"Ignoring text after the euserdoc tag"***

Text and tags cannot appear after the terminating document tag.

***"Heading levels are not in consecutive order"***

The offending heading tag is more than one level greater than the heading that contains it.

***"The required refid attribute is missing"***

A refid or res attribute is required to specify the target of a link or secondary index, but not present.

***"Unable to find the resource identifier for this reference"***

A non-existent resource id is being referenced.

***"The required resource identifier is missing"***

A ddf tag is missing a valid resource identifier.

***"Unable to find the id or name for this reference"***

The referenced id or name does not exist.

***"The required id for this footnote is missing"***

A footnote tag is missing a required id.

***"Ignoring a list item tag that is not part of a list"***

List elements can only appear within a list.

***"The required end the list is missing"***

The list has not been closed.

***"A ddhd tag must be preceded by a dthd tag"***

Definition list header tags must appear in the correct order.

***"A dd tag must be preceded by a dt tag"***

Definition list elements must appear in the correct order.

***"Too many external files have been linked to"***

A maximum of 256 external files can be linked.

***"The required graphics file name is not present"***

You have to specify the name of the bit-mapped graphics file if you expect wipfc to find it.

***"wipfc does not support this graphics file format"***

Only Windows and OS/2 bmp files are supported by wipfc.

***"Cannot hide a header with the res attribute set"***

Either don't hide the header, or remove the res attribute so it can't be a link target.

***"No valid cols have been specified"***

A table needs its column widths specified in advance.

***"The total width of the table is >250 characters"***

The total width of a table (including borders) cannot exceed 250 characters.

***"Ignoring text before c tag"***

Text in a table must be inside of a cell. Put it after the c tag.

***"Ignoring invalid tag in table cell"***

Table cells cannot contain other block-level tags.

***"Text in this table column is too long, truncating"***

If a single word is longer than the table cell is wide, it is truncated.

***"Ignoring extra table columns in this row"***

You have more c tags in the row than you have columns specified in the table tag.

***"Not enough columns have been specified for this row"***

You have fewer c tags in the row than you have columns specified in the table tag.

***"The required elink tag is missing, but has been appended to this column"***

You forgot to close the link, so wipfc has added an elink tag at the end of the cell.

***"This page has too many elements (words, punctuation, etc.)"***

The maximum number of text elements in a single page is 64000.

## 6.3 Level 2 Warnings

Level 2 warnings are less serious.

***"Invalid or missing attribute value"***

A required attribute is either missing, or has an invalid value.

***"Invalid symbol (entity reference or .nameit expansion)"***

The entity reference or nameit macro is not defined. Check the spelling.

***"Invalid tag nesting"***

Text hiding tags and highlighting tags cannot nest with themselves.

***"Footnote cannot be indexed"***

Footnotes cannot have in1, in2, or icmd tags.

***"Too many (> 14) fonts have been used"***

You need to use fewer fonts.

***"Title or index text is too long"***

The length of title text is limited to 47 characters; index text, to 255 characters.

***"Subindexes of a global index must be global, too"***

If an index is global, all of its subindexes must be global, too. Set the 'global' flag.

***"An index entry requires text"***

Text must follow an in1, in2, or icmd tag.

## 6.4 Level 3 Warnings

Level 3 warnings are less serious still.

***"This id or name is already in use"***

If the id or name is the target of a link tag, you're not likely to get to the right place.

***"This res number is already in use"***

If the resource id is the target of a link tag, you're not likely to get to the right place.

***"Redefinition of .nameit symbol"***

A nameit symbol can only be defined once. It cannot be redefined.

***"This synonym set is already defined"***

A synonym set can only be defined once.

***"This synonym set is not defined"***

A synonym set must be defined before it can be used.

***"Control group references an undefined button"***

A push button definition is missing.

***"Cannot mix dynamic and absolute units"***

Absolute and relative units cannot be used at the same time.

***"Footnotes cannot be opened automatically"***

Footnotes are special.

***"Footnote cannot be opened from a split window"***

Footnotes are special.

***"Missing res number in a .HLP file"***

HLP files headers are required have res numbers. INF files are not unless they are being concatenated. HLP files appear to work fine without them as long as they aren't concatenated and don't use global links.





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## 7 *IPF Symbols*

Special symbols can be incorporated into OS/2 help file by using entity references in the form of &symbol-name. Each entity reference begins with the '&' character and ends with the '.' character. New symbols can be created by using the nameit command (see "nameit" on page 12), but each language encoding has a pre-defined set of symbols associated with it. For the en\_US locale (and other locales using the IBM 850 code page), the predefined symbols are as follows (symbols that cannot appear in this document are left blank):

| Char | Hex value | Unicode code point | Entity name | Description                  |
|------|-----------|--------------------|-------------|------------------------------|
|      | 0x10      | \u25BA             | rarrow      | Black right-pointing pointer |
|      | 0x10      | \u25BA             | rahead      | Black right-pointing pointer |
|      | 0x11      | \u25C4             | lahead      | Black left-pointing pointer  |
|      | 0x11      | \u25C4             | larrow      | Black left-pointing pointer  |
|      | 0x18      | \u25B2             | uarrow      | Black up-pointing triangle   |
|      | 0x19      | \u25BC             | darrow      | Black down-pointing triangle |
|      | 0x20      | \u0020             | rbl         | Required blank               |
| !    | 0x21      | \u0021             | xclm        | Exclamation mark             |
| !    | 0x21      | \u0021             | xclam       | Exclamation mark             |
| "    | 0x22      | \u201D             | odq         | Left double quotation mark   |
| "    | 0x22      | \u201C             | cdq         | Right double quotation mark  |
| #    | 0x23      | \u0023             | numsign     | Number sign                  |
| \$   | 0x24      | \u0024             | dollar      | Dollar sign                  |
| %    | 0x25      | \u0025             | percent     | Percent sign                 |
| &    | 0x26      | \u0026             | amp         | Ampersand                    |
| '    | 0x27      | \u0027             | apos        | Apostrophe                   |
| `    | 0x60      | \u2018             | osq         | Left single quotation mark   |
| '    | 0x27      | \u2019             | csq         | right single quotation mark  |
| `    | 0x60      | \u0060             | grave       | Grave accent                 |
| (    | 0x28      | \u0028             | lpar        | Left parenthesis             |
| (    | 0x28      | \u0028             | lparen      | Left parenthesis             |
| )    | 0x29      | \u0029             | rpar        | Right parenthesis            |
| )    | 0x29      | \u0029             | rparen      | right parenthesis            |
| *    | 0x2A      | \u002A             | asterisk    | Asterisk                     |
| +    | 0x2B      | \u002B             | plus        | Plus sign                    |
| ,    | 0x2C      | \u002C             | comma       | Comma                        |
| -    | 0x2D      | \u002D             | dash        | Hyphen-minus                 |
| -    | 0x2D      | \u002D             | emdash      | Hyphen-minus                 |
| -    | 0x2D      | \u002D             | mdash       | Hyphen-minus                 |
| -    | 0x2D      | \u002D             | endash      | Hyphen-minus                 |
| -    | 0x2D      | \u002D             | ndash       | Hyphen-minus                 |
| -    | 0x2D      | \u002D             | hyphen      | Hyphen-minus                 |
| -    | 0x2D      | \u002D             | minus       | Hyphen-minus                 |
| .    | 0x2E      | \u002E             | period      | Full stop                    |
| .    | 0x2E      | \u002E             | per         | Full stop                    |
| /    | 0x2F      | \u002F             | slash       | Solidus                      |
| /    | 0x2F      | \u002F             | slr         | Solidus                      |
| :    | 0x3A      | \u003A             | colon       | Colon                        |
| ;    | 0x3B      | \u003B             | semi        | Semicolon                    |
| <    | 0x3C      | \u003C             | lt          | Less-than sign               |
| <    | 0x3C      | \u003C             | ltsym       | Less-than sign               |
| =    | 0x3D      | \u003D             | eq          | Equals sign                  |
| =    | 0x3D      | \u003D             | equals      | Equals sign                  |
| =    | 0x3D      | \u003D             | eqsym       | Equals sign                  |
| >    | 0x3E      | \u003E             | gt          | Greater-than sign            |
| >    | 0x3E      | \u003E             | gtsym       | Greater-than sign            |
| @    | 0x40      | \u0040             | atsign      | Commercial at                |
| [    | 0x5B      | \u005B             | lbracket    | Left square bracket          |
| [    | 0x5B      | \u005B             | lbrk        | Left square bracket          |
| \    | 0x5C      | \u005C             | bslash      | Reverse solidus              |
| \    | 0x5C      | \u005C             | bsl         | Reverse solidus              |
| ]    | 0x5D      | \u005D             | rbracket    | Right square bracket         |
| ]    | 0x5D      | \u005D             | rbrk        | Right square bracket         |
| ^    | 0x5E      | \u005E             | caret       | Circumflex accent            |

|            |      |        |           |                             |
|------------|------|--------|-----------|-----------------------------|
| ^          | 0x5E | \u005E | and       | Circumflex accent           |
| _          | 0x5F | \u005F | us        | Low line                    |
| {          | 0x7B | \u007B | lbrace    | Left curly bracket          |
| {          | 0x7B | \u007B | lbrc      | Left curly bracket          |
|            | 0x7C | \u00A6 | splitvbar | Split vertical bar          |
|            | 0x7C | \u007C | vbar      | Vertical bar                |
|            | 0x7C | \u007C | lor       | Vertical bar                |
| }          | 0x7D | \u007D | rbrace    | Right curly bracket         |
| }          | 0x7D | \u007D | rbrc      | Right curly bracket         |
| ~          | 0x7E | \u007E | tilde     | Tilde                       |
| ~          | 0x7E | \u007E | similar   | Tilde                       |
|            | 0x7F | \u2302 | house     | House                       |
|            | 0x80 | \u00C7 | Cc        | Latin capital letter C with |
| cedilla    |      |        |           |                             |
|            | 0x81 | \u00FC | ue        | Latin small letter U with   |
| diaeresis  |      |        |           |                             |
|            | 0x82 | \u00E9 | ea        | Latin small letter E with   |
| acute      |      |        |           |                             |
|            | 0x83 | \u00E2 | ac        | Latin small letter A with   |
| circumflex |      |        |           |                             |
|            | 0x84 | \u00E4 | ae        | Latin small letter A with   |
| diaeresis  |      |        |           |                             |
|            | 0x85 | \u00E0 | ag        | Latin small letter A with   |
| grave      |      |        |           |                             |
|            | 0x86 | \u00E5 | ao        | Latin small letter A with   |
| ring above |      |        |           |                             |
|            | 0x87 | \u00E7 | cc        | Latin small letter C with   |
| cedilla    |      |        |           |                             |
|            | 0x88 | \u00EA | ec        | Latin small letter E with   |
| circumflex |      |        |           |                             |
|            | 0x89 | \u00EB | ee        | Latin small letter E with   |
| diaeresis  |      |        |           |                             |
|            | 0x8A | \u00E8 | eg        | Latin small letter E with   |
| grave      |      |        |           |                             |
|            | 0x8B | \u00EF | ie        | Latin small letter I with   |
| diaeresis  |      |        |           |                             |
|            | 0x8C | \u00EE | ic        | Latin small letter I with   |
| circumflex |      |        |           |                             |
|            | 0x8D | \u00EC | ig        | Latin small letter I with   |
| grave      |      |        |           |                             |
|            | 0x8E | \u00C4 | Ae        | Latin capital letter A with |
| diaeresis  |      |        |           |                             |
|            | 0x8F | \u00C5 | Ao        | Latin capital letter A with |
| ring above |      |        |           |                             |
|            | 0x8F | \u00C5 | angstrom  | Latin capital letter A with |
| ring above |      |        |           |                             |
|            | 0x90 | \u00C9 | Ea        | Latin capital letter E with |
| acute      |      |        |           |                             |
|            | 0x91 | \u00E6 | aelig     | Latin small letter Ae       |
|            | 0x92 | \u00C6 | AElig     | Latin capital letter Ae     |
|            | 0x93 | \u00F4 | oc        | Latin small letter O with   |
| circumflex |      |        |           |                             |
|            | 0x94 | \u00F6 | oe        | Latin small letter O with   |
| diaeresis  |      |        |           |                             |
|            | 0x95 | \u00F2 | og        | Latin small letter O with   |
| grave      |      |        |           |                             |
|            | 0x96 | \u00FB | uc        | Latin small letter U with   |
| circumflex |      |        |           |                             |
|            | 0x97 | \u00F9 | ug        | Latin small letter U with   |

|                 |      |        |           |                              |
|-----------------|------|--------|-----------|------------------------------|
| grave           |      |        |           |                              |
|                 | 0x98 | \u00FF | ye        | Latin small letter Y with    |
| diaeresis       |      |        |           |                              |
|                 | 0x99 | \u00D6 | Oe        | Latin capital letter O with  |
| diaeresis       |      |        |           |                              |
|                 | 0x9A | \u00DC | Ue        | Latin capital letter U with  |
| diaeresis       |      |        |           |                              |
|                 | 0x9B | \u00A2 | cent      | Cent sign                    |
|                 | 0x9C | \u00A3 | lsterling | Pound sign                   |
|                 | 0x9D | \u00A5 | yen       | Yen sign                     |
|                 | 0x9F | \u0192 | fnof      | Latin small letter F with    |
| hook            |      |        |           |                              |
|                 | 0xA0 | \u00E1 | aa        | Latin small letter A with    |
| acute           |      |        |           |                              |
| í               | 0xA1 | \u00ED | ia        | Latin small letter I with    |
| acute           |      |        |           |                              |
| ç               | 0xA2 | \u00F3 | oa        | Latin small letter O with    |
| acute           |      |        |           |                              |
| £               | 0xA3 | \u00FA | ua        | Latin small letter U with    |
| acute           |      |        |           |                              |
| /               | 0xA4 | \u00F1 | nt        | Latin small letter N with    |
| tilde           |      |        |           |                              |
| ¥               | 0xA5 | \u00D1 | Nt        | Latin capital letter N with  |
| tilde           |      |        |           |                              |
| f               | 0xA6 | \u00AA | aus       | Feminine ordinal indicator   |
| \$              | 0xA7 | \u00BA | ous       | Masculine ordinal indicator  |
| ¤               | 0xA8 | \u00BF | invq      | Inverted question mark       |
| '               | 0xA9 | \u2310 | lnotrev   | Reversed not sign            |
| "               | 0xAA | \u00AC | lnot      | Not sign                     |
| "               | 0xAA | \u00AC | notsym    | Not sign                     |
| «               | 0xAB | \u00BD | frac12    | Vulgar fraction one half     |
| <               | 0xAC | \u00BC | frac14    | Vulgar fraction one quarter  |
| >               | 0xAD | \u00A1 | inve      | Inverted exclamation mark    |
| fi              | 0xAE | \u00AB | odqf      | Left-pointing double angle   |
| quotation mark  |      |        |           |                              |
| •               | 0xAF | \u00BB | cdqf      | Right-pointing double angle  |
| quotation mark  |      |        |           |                              |
|                 | 0xB0 | \u2591 | box14     | Light shade                  |
| –               | 0xB1 | \u2592 | box12     | Medium shade                 |
| †               | 0xB2 | \u2593 | box34     | Dark shade                   |
| ‡               | 0xB3 | \u2502 | bxv       | Box drawings light vertical  |
| •               | 0xB4 | \u2524 | bxri      | Box drawings light vertical  |
| and left        |      |        |           |                              |
| •               | 0xB4 | \u2524 | bxrj      | Box drawings light vertical  |
| and left        |      |        |           |                              |
|                 | 0xB5 | \u2561 | bx1012    | Box drawings vertical single |
| and left double |      |        |           |                              |
| ¶               | 0xB6 | \u2562 | bx2021    | Box drawings vertical double |
| and left single |      |        |           |                              |
| •               | 0xB7 | \u2556 | bx0021    | Box drawings down double and |
| left single     |      |        |           |                              |
| ,               | 0xB8 | \u2555 | bx0012    | Box drawings down single and |
| left double     |      |        |           |                              |
|                 | 0xB9 | \u2563 | bx2022    | Box drawings double vertical |
| and left        |      |        |           |                              |
| "               | 0xBA | \u2551 | bx2020    | Box drawings double vertical |
| »               | 0xBB | \u2557 | bx0022    | Box drawings double down and |
| left            |      |        |           |                              |
| ...             | 0xBC | \u255D | bx2002    | Box drawings double up and   |

|                   |      |        |        |                              |
|-------------------|------|--------|--------|------------------------------|
| left              |      |        |        |                              |
| %                 | 0xBD | \u255C | bx2001 | Box drawings up double and   |
| left single       | 0xBE | \u255B | bx1002 | Box drawings up single and   |
| left double       |      |        |        |                              |
| —                 | 0xBF | \u2510 | bxur   | Box drawings light down and  |
| left              |      |        |        |                              |
|                   | 0xC0 | \u2514 | bxll   | Box drawings light up and    |
| right             |      |        |        |                              |
| `                 | 0xC1 | \u2534 | bxas   | Box drawings light up and    |
| horizontal        |      |        |        |                              |
| `                 | 0xC1 | \u2534 | bxbj   | Box drawings light up and    |
| horizontal        |      |        |        |                              |
| `                 | 0xC2 | \u252C | bxde   | Box drawings light down and  |
| horizontal        |      |        |        |                              |
| `                 | 0xC2 | \u252C | bxtj   | Box drawings light down and  |
| horizontal        |      |        |        |                              |
| ^                 | 0xC3 | \u251C | bxle   | Box drawings light vertical  |
| and right         |      |        |        |                              |
| ^                 | 0xC3 | \u251C | bxlj   | Box drawings light vertical  |
| and right         |      |        |        |                              |
| ~                 | 0xC4 | \u2500 | bxh    | Box drawings light           |
| horizontal        |      |        |        |                              |
| -                 | 0xC5 | \u253C | bxcr   | Box drawings light vertical  |
| and horizontal    |      |        |        |                              |
| -                 | 0xC5 | \u253C | bxcj   | Box drawings light vertical  |
| and horizontal    |      |        |        |                              |
| ~                 | 0xC6 | \u255E | bx1210 | Box drawings vertical single |
| and right double  |      |        |        |                              |
| ·                 | 0xC7 | \u255F | bx2120 | Box drawings vertical double |
| and right single  |      |        |        |                              |
| ..                | 0xC8 | \u255A | bx2200 | Box drawings double up and   |
| right             |      |        |        |                              |
|                   | 0xC9 | \u2554 | bx0220 | Box drawings double down and |
| right             |      |        |        |                              |
| °                 | 0xCA | \u2569 | bx2202 | Box drawings double up and   |
| horizontal        |      |        |        |                              |
| ,                 | 0xCB | \u2566 | bx0222 | Box drawings double down and |
| horizontal        |      |        |        |                              |
|                   | 0xCC | \u2560 | bx2220 | Box drawings double vertical |
| and right         |      |        |        |                              |
| “                 | 0xCD | \u2550 | bx0202 | Box drawings double          |
| horizontal        |      |        |        |                              |
| `                 | 0xCE | \u256C | bx2222 | Box drawings double vertical |
| and horizontal    |      |        |        |                              |
| ~                 | 0xCF | \u2567 | bx1202 | Box drawings up single and   |
| horizontal double |      |        |        |                              |
| —                 | 0xD0 | \u2568 | bx1201 | Box drawings up double and   |
| horizontal single |      |        |        |                              |
|                   | 0xD1 | \u2564 | bx0212 | Box drawings down single and |
| horizontal double |      |        |        |                              |
|                   | 0xD2 | \u2565 | bx0121 | Box drawings down double and |
| horizontal single |      |        |        |                              |
|                   | 0xD3 | \u2559 | bx2100 | Box drawings up double and   |
| right single      |      |        |        |                              |
|                   | 0xD4 | \u2558 | bx1200 | Box drawings up single and   |
| right double      |      |        |        |                              |
|                   | 0xD5 | \u2552 | bx0210 | Box drawings down single and |
| right double      |      |        |        |                              |

|                       |      |        |           |                              |
|-----------------------|------|--------|-----------|------------------------------|
|                       | 0xD6 | \u2553 | bx0120    | Box drawings down double and |
| right single          | 0xD7 | \u256B | bx2121    | Box drawings vertical double |
| and horizontal single | 0xD8 | \u256A | bx1212    | Box drawings vertical single |
| and horizontal double | 0xD9 | \u2518 | bxlr      | Box drawings light up and    |
| left                  | 0xDA | \u250C | bxul      | Box drawings light down and  |
| right                 | 0xDB | \u2588 | BOX       | Box drawings Full block      |
|                       | 0xDC | \u2584 | BOXBOT    | Box drawings Lower half      |
| block                 | 0xDD | \u258C | BOXLEFT   | Box drawings Left half block |
|                       | 0xDE | \u2590 | BOXRIGHT  | Box drawings Right half      |
| block                 | 0xDF | \u2580 | BOXTOP    | Box drawings Upper half      |
| block                 | 0xE0 | \u03B1 | alpha     | Greek small letter alpha     |
| A                     | 0x41 | \u0391 | Alpha     | Greek capital letter alpha   |
| Æ                     | 0xE1 | \u00DF | Beta      | Latin small letter sharp s   |
|                       | 0xE2 | \u0393 | Gamma     | Greek capital letter gamma   |
| a                     | 0xE3 | \u03C0 | pi        | Greek small letter pi        |
|                       | 0xE4 | \u03A3 | Sigma     | Greek capital letter sigma   |
|                       | 0xE5 | \u03C3 | sigma     | Greek small letter sigma     |
|                       | 0xE6 | \u00B4 | mu        | Micro sign                   |
|                       | 0xE7 | \u03C4 | tau       | Greek small letter tau       |
|                       | 0xE8 | \u03A6 | Phi       | Greek capital letter phi     |
| Ø                     | 0xE9 | \u0398 | Theta     | Greek capital letter theta   |
|                       | 0xEA | \u03A9 | Omega     | Greek capital letter omega   |
| ◦                     | 0xEB | \u03B4 | delta     | Greek small letter delta     |
|                       | 0xEC | \u221E | infinity  | Infinity                     |
|                       | 0xED | \u03C6 | phi       | Greek small letter phi       |
|                       | 0xEE | \u03B5 | epsilon   | Greek small letter epsilon   |
|                       | 0xEF | \u2229 | intersect | Intersection                 |
|                       | 0xF0 | \u2261 | identical | Identical to                 |
| æ                     | 0xF1 | \u00B1 | plusmin   | Plus-minus sign              |
| æ                     | 0xF1 | \u00B1 | pm        | Plus-minus sign              |
|                       | 0xF2 | \u2265 | ge        | Greater-than or equal to     |
|                       | 0xF2 | \u2265 | gesym     | Greater-than or equal to     |
|                       | 0xF3 | \u2264 | le        | Less-than or equal to        |
|                       | 0xF3 | \u2264 | lesym     | Less-than or equal to        |
|                       | 0xF4 | \u2320 | inttop    | Top half integral            |
| 1                     | 0xF5 | \u2321 | intbot    | Bottom half integral         |
|                       | 0xF6 | \u00F7 | divide    | Division sign                |
|                       | 0xF7 | \u2248 | nearly    | Almost equal to              |
| ±                     | 0xF8 | \u00B0 | degree    | Degree sign                  |
| ±                     | 0xF8 | \u00B0 | deg       | Degree sign                  |
| ø                     | 0xF9 | \u2219 | bullet    | Bullet operator              |
| œ                     | 0xFA | \u00B7 | dot       | Middle dot                   |
| ß                     | 0xFB | \u221A | sqrt      | Square root                  |
|                       | 0xFC | \u207F | supn      | Superscript Latin small      |
| letter n              | 0xFD | \u00B2 | sup2      | Superscript 2                |
|                       | 0xFE | \u25A0 | sqbul     | Black square                 |



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