

Welcome

To Advance through Presentation
Use Page Up and Page Down Keys



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Maintaining and Extending Fonts



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Maintaining and Extending Fonts

Peter Lofting

Apple Fonts Group

Why You Are Here

- To learn to check and fix your fonts
 - New tools on <http://fonts.apple.com>
- To learn to take advantage of new features of the OS in your font designs
 - Unicode support
- To learn of future directions
 - Text-based font sources



Apple Type Services

for

UnicodeTM Imaging



Why We Are Here

- Type is the most important element of any UI
 - People say it with words
- Type is a high visibility component
 - Bugs are high visibility too
- Core OS components, yet mostly third-party
 - We depend on you
- OS technology is continually evolving
 - We need to keep you up to date



Fonts Are Powerful

- Your fonts will work everywhere
 - Mac OS 8
 - Mac OS X
- Support for multiple font formats in sfnt wrapper
 - TrueType (Mac and Windows)
 - PostScript
 - OpenType...and more



Why Are Fonts Hard?

- Behavior depends on many pieces
 - Font data
 - Scaler
 - Line layout processing
 - Application
 - Printer driver



Visit Our Web Site

<http://fonts.apple.com>

- Free font tools
- Step-by-step recipes
- TrueType specification document
- White papers
- Reference data sets
- Links to more useful information



Check Your Fonts

FontValidator 2.0

- Diagnostic tool for fonts
- 800+ tests on sfnt, FOND and NFNT
 - Errors, warnings, information
- Save reports to disk as text files
- Send any broken fonts that Font Validator doesn't catch to applefonts@apple.com



Why Check Fonts?

- Fonts are real programs
 - Buggy fonts can cause unexpected side effects and interactions
 - Catch problems before they happen
- Future releases of the OS and/or applications may be stricter about:
 - 'post' table names (postnames)
 - Embedding bits
 - Checksums





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Demo

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Essential Font Anatomy

The core structure...

Postnames and cmap

Characters Vs. Glyphs

Data mappings

0x41

U+0041

Display behavior

A A

A A



Characters Vs. Glyphs

Data
Characters
Code points
Content
Spelling
Sorting
Digital

Display
Glyphs
Postnames
Form
Appearance
Analog
Spatial



'post' Table

	Index	Name
"	180	quotedblleft
"	181	quotedblright
'	182	quoteleft
'	183	quoteright
÷	184	divide
◊	185	lozenge
ÿ	186	ydieresis
Ÿ	187	Ydieresis
/	188	fraction
€	189	Euro
¡	190	guilsinglleft
¡	191	guilsinglright
fi	192	fi
fl	193	fl
‡	194	daggerdbl
.	195	periodcentered
,	196	quotesinglbase
"	197	quotedblbase
‰	198	perthousand
Â	199	Acircumflex

glyph
ID

postname

Eur



'cmap' Tables

Character Code	Glyph Index
Ÿ 0xD9	187
Ŷ 0xDA	188
€ 0xDB	189
Ÿ 0xDC	190
Ŷ 0xDD	191
fi 0xDE	192

MacRoman

Index	Name
Ÿ 186	ydieresis
Ŷ 187	Ydieresis
/ 188	fraction
€ 189	Euro
Ÿ 190	guilingleft
Ŷ 191	guilingright
fi 192	fi

glyph ID

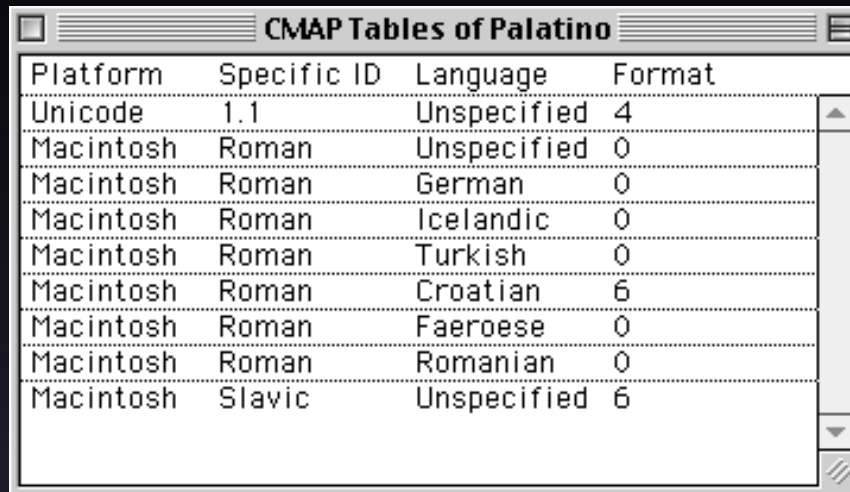
Character Code	Glyph Index
/ 0x2044	188
ƒ 0x20A3	247
€ 0x20AC	189
™ 0x2122	140
Ω 0x2126	159
ø 0x2202	152

Unicode



'cmap' Tables

- Multiple 'cmap' tables in a font
- 8-bit MacRoman and variant encodings
- 16-bit Unicode encoding

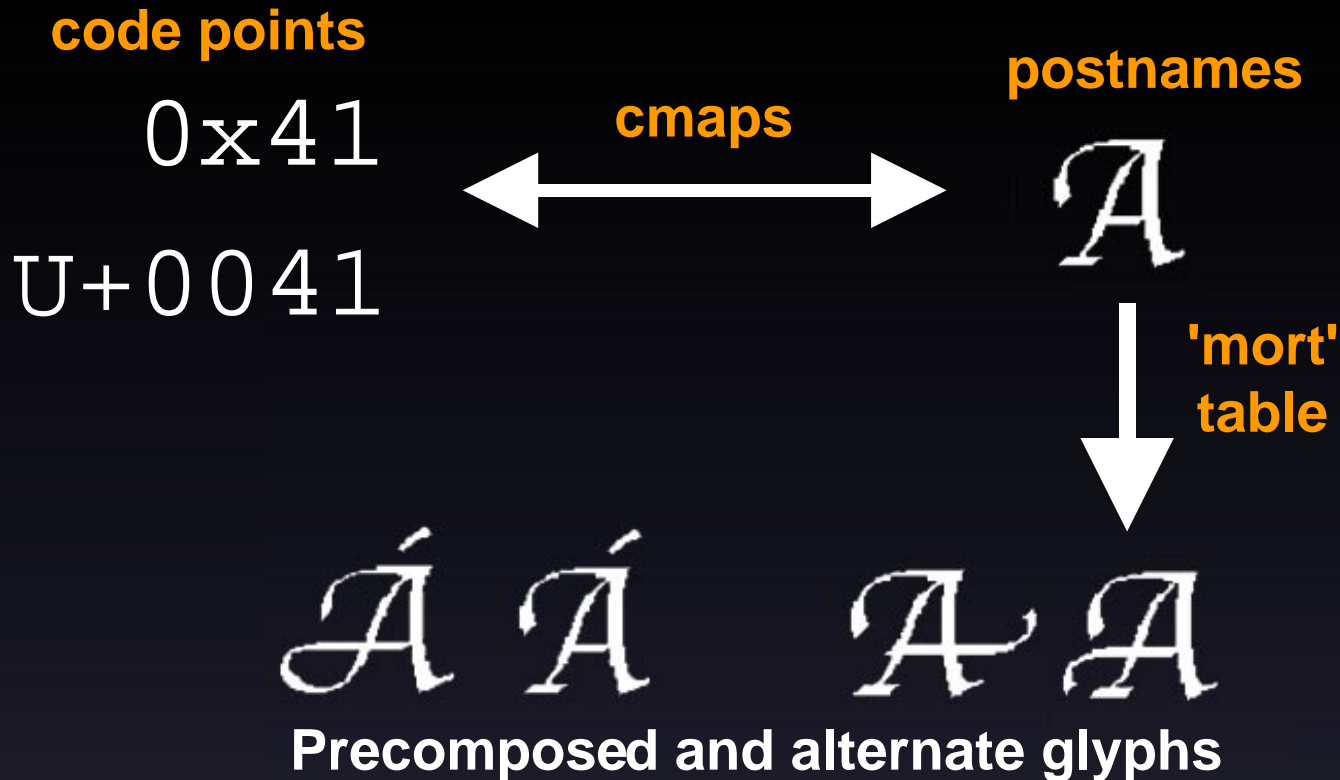


The screenshot shows a window titled "CMap Tables of Palatino" with a table listing various cmap table entries. The table has four columns: Platform, Specific ID, Language, and Format. The entries include Unicode 1.1 (Format 4) and several Macintosh Roman entries for different languages like German, Icelandic, Turkish, Croatian, Faeroese, and Romanian (all Format 0), plus a Slavic entry (Format 6).

Platform	Specific ID	Language	Format
Unicode	1.1	Unspecified	4
Macintosh	Roman	Unspecified	0
Macintosh	Roman	German	0
Macintosh	Roman	Icelandic	0
Macintosh	Roman	Turkish	0
Macintosh	Roman	Croatian	6
Macintosh	Roman	Faeroese	0
Macintosh	Roman	Romanian	0
Macintosh	Slavic	Unspecified	6



Alternative Glyphs





Essential Font Maintenance

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Maintain Your Fonts

- Postname maintenance
- Character mappings
 - Mac OS cmap (for QD Text)
 - Unicode cmap (for ATSUI)
- FOND maintenance (glue for QD Text)
- Metrics reconciliation



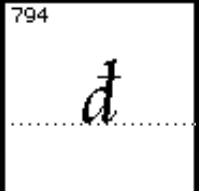
Postname Maintenance

- Printer driver uses postnames
- Acrobat Distiller text support uses postnames
- AAT Font Tool needs them to make cmap
- Edit with Dump/Fuse POST
 - Reference lists of postnames on Apple and Adobe web sites



European Postnames

- Variant postnames (synonyms)
 - E.g. “Dbar”, “Dmacron”, “Dcroat”
 - Publish your postnames
- Alternate glyphs
 - Update all related postnames,
e.g. “D**macron**altone” to “D**croat**altone”
- Use standard names where possible



Non-European Postnames

- East Asia
 - Postnames are essentially reverse cmaps
- Rest of world
 - Glyph names are not standardized
- Use names based on Unicode code point, e.g. “post4_0124”, “uniA039”



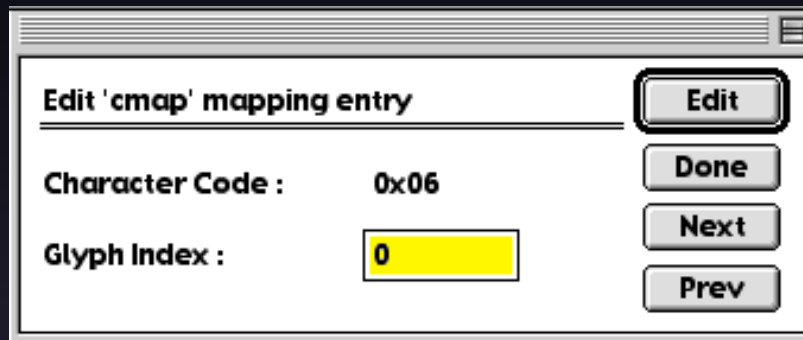
Postname References

- Apple postnames
- Adobe standard PostScript name list
- Adobe glyph naming guidelines
- Descriptive postnames
 - Non-Unicode glyphs
 - Internal production names
- Data and links on <http://fonts.apple.com>



Cmap Maintenance

- Created automatically by AAT Font Tool
- Edit in text with DumpCMAP and FuseCMAP
- Edit in the font with TrueEdit



FOND Maintenance

- FOND is the glue for QuickDraw Text
- FOND controls printer driver behavior
- Read Apple Technotes [1140](#) and [1146](#)
 - <http://developer.apple.com/technotes/>
- Edit in text with DumpFOND and FuseFOND
- Edit some parts with ResEdit or Resorcerer



Metrics Maintenance

- Reconcile metrics in different places in font
 - WYSIWYG
 - Screen and printing consistency
 - Cross-platform
 - Windows and OpenType applications
 - See <http://fonts.apple.com>





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Font Enhancements

Why Enhance Fonts?

- Unicode support
 - Industry standard
 - Expanded character repertoire
 - Worldwide language support
- Proper localized glyph selection in East Asian languages
- ATSUI and MLTE apps give easy access to advanced font features and variations



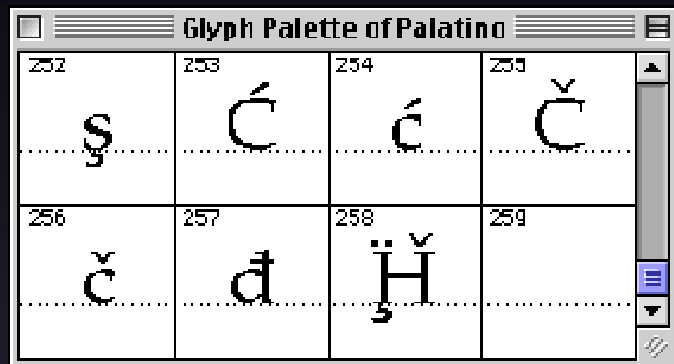
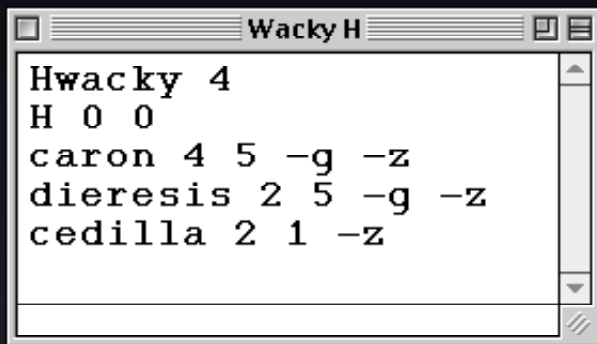
Kerning

- Classic kern pair tables
- Class-based kerning (compact pairs)
- Contextual (state-based)
- Vertical, e.g. (bug) (BUG)
- Tools
 - DumpKERN and FuseKERN
 - AAT Font Tool (justification)



Glyph Compositing

- Extend your font to include all accented letters
- Compose glyphs from existing components
- Use an “add list” with AAT Font Tool
- Make fine position adjustments with Slider



Contextual Forms

fist

fist

view

view

Actual fractions:

$$\frac{2}{5} + \frac{1}{6} = \frac{17}{30}$$



Unicode Characters

- Accented letters exist in both precomposed and combining forms in Unicode data
- HFS+ filenames are combining Unicode
- Add 'mort' tables to compose for display
- Use UniMIFfer and AAT Font Tool

U + ◌̈ + ◌̈̆ → Ü

U+0055 U+0308 U+030C





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Font Tools

<http://fonts.apple.com>

Font Tool Releases

UPDATED

- Font Validator 2.0
- Dump & Fuse tools
- SbitEditor
- AAT Font Tool
- TrueEdit

NEW

- TypeWriter
- Font Summarizer
- Font Ruler
- ChecksumFixer
- DumpNFNT
- FusePOST
- Font Imaging Library
- Dump/FuseKERN
- UniMIFfer



Dump and Fuse Pairs

- **Dumps** a specific table or resource to a text file
- **Fuses** it back into the font
- Dump/Fuse table support includes:
 - Postnames
 - Cmaps
 - Kerning (pair, class, and state)



Editing Tools

- TrueEdit
 - General table editor
 - Most tables have visual editing interfaces
 - Any table can be edited in hex
 - Provides a glyph palette for printing
- SbitEditor
 - Bitmap editor for sbit fonts
(embedded bitmaps in TrueType fonts)



AAT Font Tool

- Automatically adds important data
 - Cmaps for Mac OS and Unicode
 - Default features and properties
- Depends on postnames
- Uses text input files for compiling tables
 - Morph Input File (MIF)
 - Justification Input File (JIF)
 - Kerning Input File (KIF), soon



QA Tools

- FontSummarizer
 - Provides a batch text dump of essential font information
- FontRuler
 - Measures actual text metrics from OS
 - Works with text input files
- And much more...



Font Imaging Library

- For font tool developers to link against
- Free distribution license
- Gives font tools easy access to glyphs exactly as drawn by the OS
- Gives grid-fitted bitmaps for all scalers on OS
 - TrueType, Type 1, and other scalers, e.g. stroke-based



Text-Based Sources

- Text is the ultimate tool interface
- Breaks visual tool bottleneck
- Source control benefits
 - Comments, version histories, diffs
- Platform-independent
- High level font definition language
- Compile to different formats



TypeWriter

- Generic table dumper/fuser
- Can dump any sfnt table, including Windows and OpenType tables
- User-definable table plug-ins
- Industry collaboration via mail list



Communication

<http://fonts.apple.com>

applefonts@apple.com





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Roadmap

**Supporting
Unicode Text**

Hall C
Tues., 1:00pm

**Font Management for
Applications**

Hall C
Tues., 2:30pm

**International
Technologies
Feedback Forum**

Hall J2
Wed., 10:15am

**International
Technologies Lunch**

Hall 3
Wed., 11:30am

Core Foundation Overview

Hall 2
Wed., 1:00pm





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Q&A



Think different.TM



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