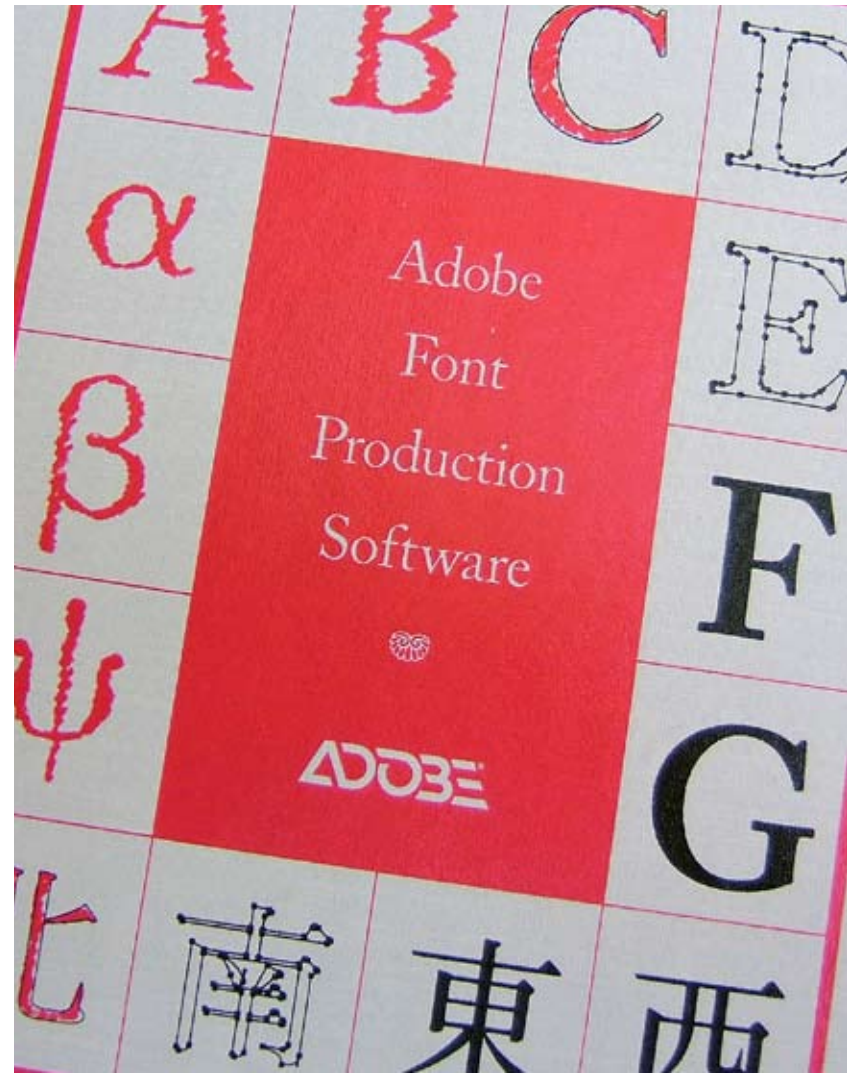


Font production at Adobe

Miguel Sousa

Typeface Designer
& Font Developer

27 April 2007



Why? How? What's wrong?

Font developer A

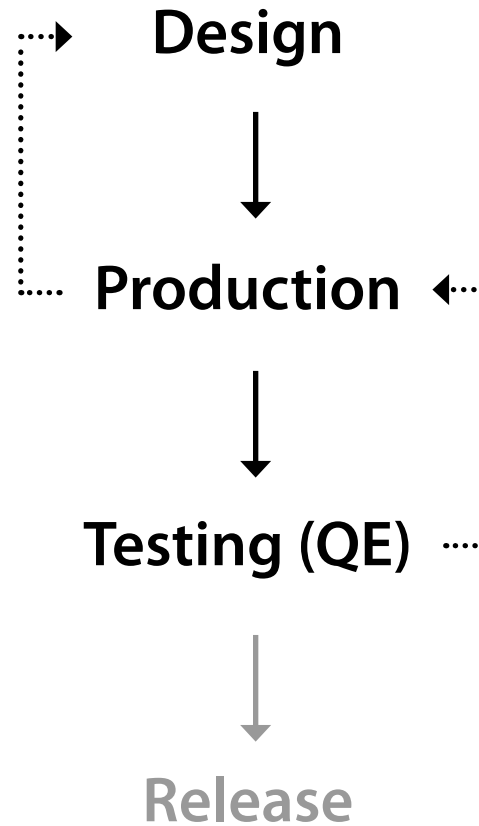
I have setup my fonts just like Minion, but when I generate OTFs they don't work correctly. What am I doing wrong?

Font developer B

I can't get a family of 8 fonts to arrange correctly in the font menu. And two of them don't even show up. It's driving me crazy. HELP!

This presentation, and the following — *State-of-the-art font QE* —, aim to answer these questions. Font development is **not** a trivial activity, but at Adobe we don't use any trade secret processes, and the tools for producing sound fonts are all publicly available.

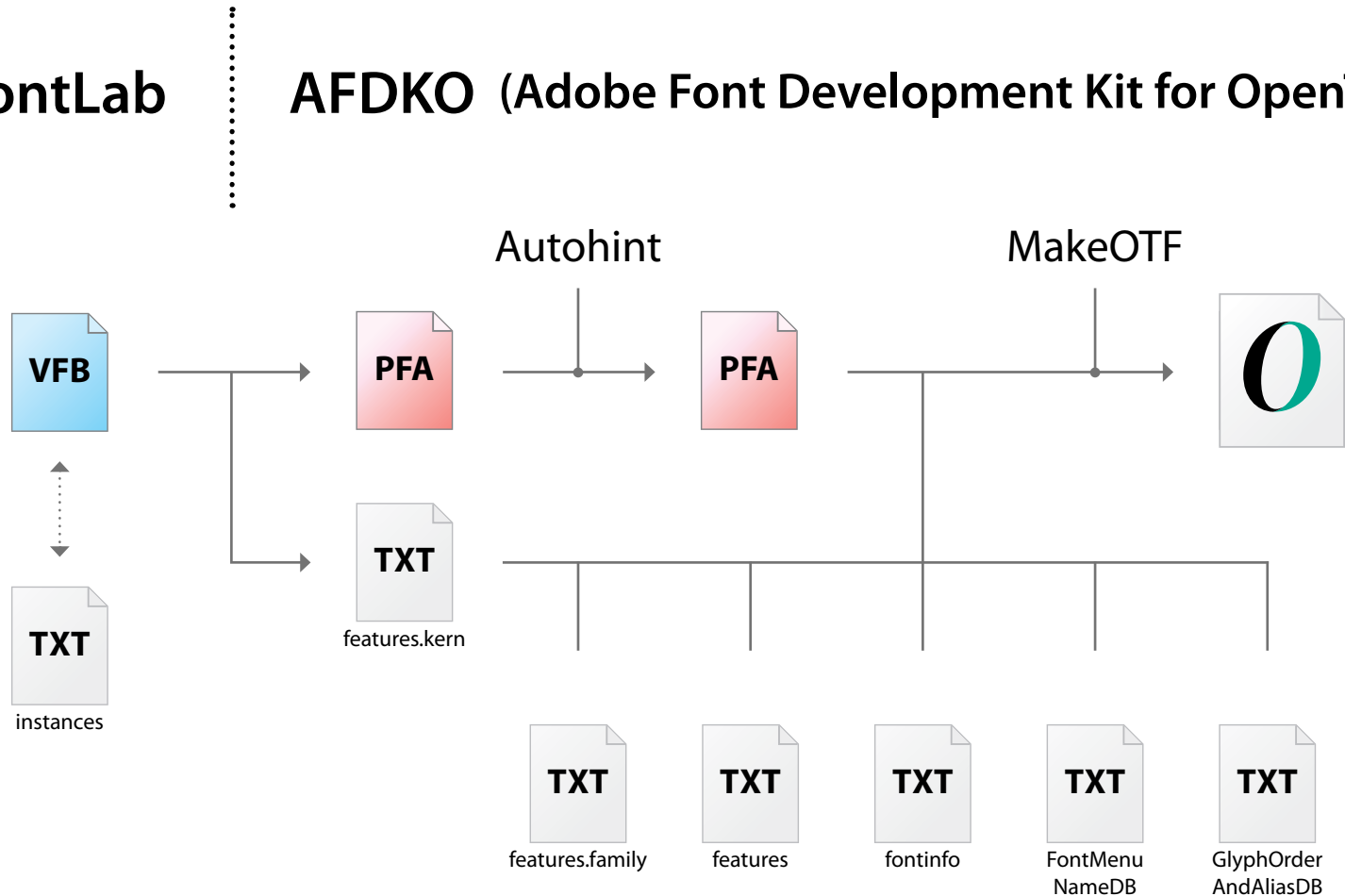
Font Development at Adobe



Font Production at Adobe (Western fonts)

FontLab

AFDKO (Adobe Font Development Kit for OpenType)



Files' description

VFB (usually Multiple Master)

In addition to the glyphs, it contains:

- Kerning
- Kerning classes
- Font level hints ("Zones", Stems, BlueScale, BlueShift, BlueFuzz, ForceBold)
- Basic names (Family Name, Weight, PS Font Name, Full Name)
- Copyright and Notice
- Italic angle, Underline, Thickness

Glyphs have "user-friendly" names, no hints, and no Unicode values.

Type 1 Unique ID and Type 1 XUID fields should be empty.

PFA

Type 1 font generated from an instance of the VFB file.

Needs to be created with:

- StandardEncoding
- All composite glyphs decomposed

Files' description (cont.)

instances

Text file containing names and values for generating PFA files with a FontLab macro.

#FamilyName	FontName(PSName)	FullName	Weight	AxisValues	isBold
Minion Pro	MinionPro-Capt	Minion Pro Caption	Regular	(354,592,8)	0
Minion Pro	MinionPro-Regular	Minion Pro Regular	Regular	(354,592,11)	0
Minion Pro	MinionPro-Subh	Minion Pro Subhead	Regular	(354,595,19)	0
Minion Pro	MinionPro-Disp	Minion Pro Display	Regular	(354,597,72)	0
Minion Pro	MinionPro-CnCapt	Minion Pro Condensed Caption	Regular	(354,502,8)	0
Minion Pro	MinionPro-Cn	Minion Pro Condensed	Regular	(354,502,11)	0
Minion Pro	MinionPro-CnSubh	Minion Pro Condensed Subhead	Regular	(354,478,19)	0
Minion Pro	MinionPro-CnDisp	Minion Pro Condensed Display	Regular	(354,454,72)	0
Minion Pro	MinionPro-BoldCapt	Minion Pro Bold Caption	Bold	(620,592,8)	1
Minion Pro	MinionPro-Bold	Minion Pro Bold	Bold	(620,592,11)	1
Minion Pro	MinionPro-BoldSubh	Minion Pro Bold Subhead	Bold	(620,595,19)	1
Minion Pro	MinionPro-BoldDisp	Minion Pro Bold Display	Bold	(620,597,72)	1
Minion Pro	MinionPro-BoldCnCapt	Minion Pro Bold Condensed Caption	Bold	(620,502,8)	1
Minion Pro	MinionPro-BoldCn	Minion Pro Bold Condensed	Bold	(620,502,11)	1
Minion Pro	MinionPro-BoldCnSubh	Minion Pro Bold Condensed Subhead	Bold	(620,478,19)	1
Minion Pro	MinionPro-BoldCnDisp	Minion Pro Bold Condensed Display	Bold	(620,450,72)	1

Files' description (cont.)

features.kern

Text file containing all the kerning data: kerning classes, singleton pairs, kerning exceptions, class kerning pairs and subtable breaks.

```
@ACYR_SC_RIGHT_CYR = [acyr.sc Acyr.sc el.sc El.sc lje.sc Lje.sc];
@PHI_SC_LEFT_GRK = [phi.sc Phi.sc phi.scalt];
@R_LC_LEFT_LAT = [r racute rcaron rcommaaccent];

pos B v -25;
pos Beta Psi -34;
pos Beta Sigma -36;

enum pos @GAMMA_UC_LEFT_GRK @EXC_GROUPA2_LC_RIGHT_GRK -114;
enum pos @PSI_UC_LEFT_GRK @EXC_GROUPA3_LC_RIGHT_GRK -113;
enum pos @TAU_UC_LEFT_GRK @EXC_EPSILON1_LC_RIGHT_GRK -59;

pos @A_UC_LEFT_LAT @T_UC_RIGHT_LAT -61;
pos @STRAIGHT_UC_LEFT_LAT @U_LC_RIGHT_LAT -31;

subtable;

pos @DELTA_UC_LEFT_GRK @ALPHA_UC_RIGHT_GRK 29;
pos @ALPHA_LC_LEFT_GRK @PSI_LC_RIGHT_GRK -9;
```

Files' description (cont.)

features.family

Text file containing OpenType classes, lookups and features common to all the fonts in the family.

```
@LETTERS_UC_LAT = [A B C D E F G H I J K L M N O P Q R S T U V W X Y Z];
@LETTERS_UC = [@LETTERS_UC_LAT @LETTERS_UC_GRK @LETTERS_UC_CYR];
@FIG_TAB_LINING = [zero one two three four five six seven eight nine];

languagesystem DFLT dflt;
languagesystem cyrl dflt;
  languagesystem cyrl SRB;

feature aalt {
  feature locl;
  feature ccmp;
  sub caron by caron.alt;
} aalt;

feature dnom {
  sub @FIG_TAB_LINING by @FIG_DENOMINATOR;
  sub @PUNCT_DEFAULT by @PUNCT_DENOMINATOR;
} dnom;
```

Files' description (cont.)

features

Text file containing OpenType features and tables specific to each font. It's the backbone link for all the feature.* files, and will override the default values calculated by MakeOTF.

```
table head { FontRevision 1.008; } head;

include (../features.family)

feature kern { include (features.kern) } kern;

feature size { parameters 18.0 0; } size; # design size, subfamily

table OS/2 {
    CapHeight 651;
    XHeight 438;
    TypoAscender 727;    # top of ascenders
    TypoDescender -273; # TypoAscender-UPM
    WeightClass 700;    # Bold
    WidthClass 5;       # Medium (normal)
    Vendor "ADBE";
    FSType 8;           # Editable embedding
    Panose 2 4 7 3 6 2 1 2 2 3;
} OS/2;
```

Files' description (cont.)

fontinfo

Text file holding keywords for setting Bold and/or Italic styles, and other OS/2 values.

```
IsItalicStyle    false
IsBoldStyle      true

PreferOS/2TypoMetrics    true
IsOS/2WidthWeighthSlopeOnly  false
IsOS/2OBLIQUE            false
```

Files' description (cont.)

FontMenuNameDB

Text file which provides the menu names for all the fonts in the family.

```
[MinionPro-Regular]
f=Minion Pro
s=Regular
c=Minion Pro
c=1,Minion Pro
```

```
[PostScriptName]
f=FamilyName
s=StyleName
c=Windows_Compatible_MenuName
c=1,Macintosh_Compatible_MenuName
```

```
[MinionPro-SemiboldIt]
f=Minion Pro
s=Semibold Italic
c=Minion Pro SmBd
c=1,Minion Pro SmBd Ital
```

```
[MinionPro-MediumCnSubh]
f=Minion Pro
s=Medium Cond Subhead
c=Minion Pro Med Cond Subh
c=1,Minion Pro Med Cond Subh
```

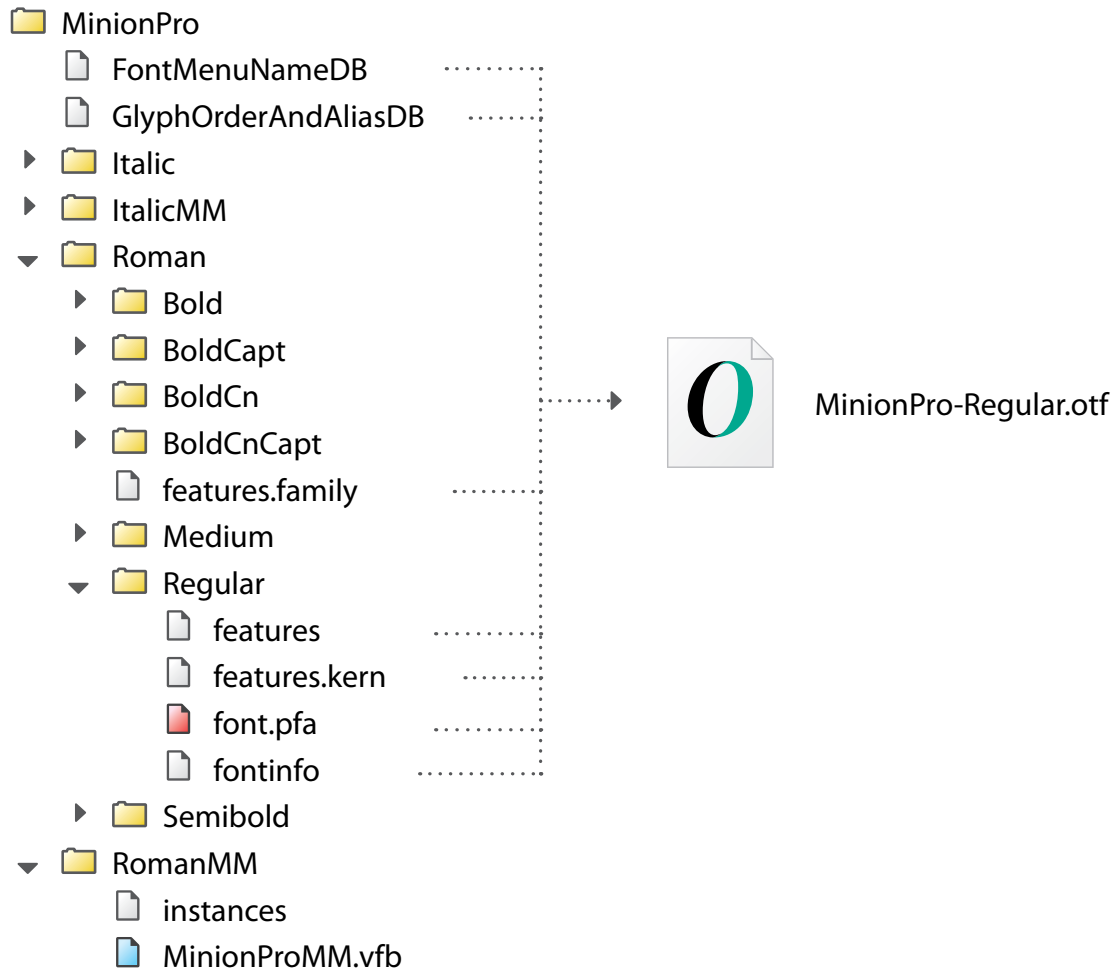
Files' description (cont.)

GlyphOrderAndAliasDB

Text file that serves three purposes: establishes the glyph ID order in the font, serves as source for final glyph names, and provides Unicode values for the glyphs.

#Final name	Production name	Unicode
.notdef	.notdef	
space	space	
exclam	exclam	
quotedbl	quotedbl	
peseta	peseta	
peseta.alt	peseta.alt	uniE153
a.sc	a.sc	uniF761
b.sc	b.sc	uniF762
c.sc	c.sc	uniF763
five.superior	five.superior	uni2075
six.superior	six.superior	uni2076
seven.superior	seven.superior	uni2077
uni1FBB	Alphaacute	
uni1F0D	Alphaasperacute	
uni1F9C.alt	Etaiotasublenisacute.alt	uniE168
uni1F9A.alt	Etaiotasublenisgrave.alt	uniE166
afii10017	A.cyr	uni0410
afii10018	Be	uni0411

Typical font family directory



Command line instructions

Autohint

```
autohint -a font.pfa
```

This command will hint all glyphs (-a) in the font (font.pfa). Several messages may be output to the window, reporting outline “near-misses”. The glyphs’ rasterization can be improved, by editing the outlines and making the changes suggested. To run the Autohint in “quiet” mode, use the switch -q in addition to other switches.

MakeOTF

```
makeotf -r
```

This command will build an OpenType CFF font in release mode (-r). Since no other options are provided, MakeOTF will use default filenames and their locations as the input files – *font.pfa*, *features*, *fontinfo*, *FontMenuNameDB* and *GlyphOrderAndAliasDB*.

FontLab + AFDKO demo

Related links

AFDKO (Adobe Font Development Kit for OpenType)

- http://partners.adobe.com/public/developer/opentype/afdko/topic_overview.html

FontLab Studio

- <http://www.fontlab.com/font-editor/fontlab-studio/>

OpenType Feature File Specification

- http://partners.adobe.com/public/developer/opentype/afdko/topic_feature_file_syntax.html

OS/2 table

- <http://www.microsoft.com/typography/otspec/os2.htm>

All AFDKO tools are cross-platform (Macintosh and Windows), and work with CJK fonts. The package contains several other tools not covered by this presentation, some of which are specific to CJK font development.

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