Summary of Metafont Fonts Available [1]

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This report includes all known fonts available in metafont format, whether public domain or not. Archive sites for ftp are listed where known. There is also a BITNET archive at `LISTSERV@UBVM.CC.BUFFALO.EDU`.

I also included some notes on how to use the fonts, in the (probably vain) hope of avoiding a deluge of questions on the net. Note that I cannot give instructions for specific packages, and I cannot answer questions about specific printers. I have included some information about TeX and troff, but I can't go into more much more detail over the net (i.e. I am not offering to provide detailed technical support).

1   About Metafont

METAFONT is a programming language for describing fonts. It was written by Donald Knuth and is documented in Computers & Typesetting/C: The METAFONT book Knuth, Donald E. Addison Wesley, 1986 ISBN 0-201-13445-4, or 0-201-13444-6 (soft cover) Library access: Z250.8.M46K58, or 686.2'24, or 85-28675.

A font written in METAFONT is actually a computer program which, when run, will generate a bitmap ('raster') for a given typeface at a given size, for some particular device.

2   What you need in order to use the fonts

You cannot print the METAFONT files directly (unless you want a listing of the program, that is). Instead, you must generate a bitmap font and use that to print something. If you have TeX or troff, the process for doing this is outlined below. This is not meant to be compete documentation, though, but simply enough to get you started.

If you want to use a font generated by METAFONT on an HP LaserJet, for example, you must follow this general procedure:

- Generate the bitmap font with METAFONT. This will produce a file called (for example) "myfont10.300gf".
- Convert this to a pk format file – the pk format is much more compact, and is used by most software in preference to gf files. You can use gftopk (which comes with METAFONT, or in a package called mfware).

```
$ gftopk myfont10.300gf
$
```

This produces myfont10.300pk

- Convert the pk-format font into one suitable for your printer. For an HP, there are several utilities – the one I use is called pk2sfp:

```
$ pk2sfp myfont10.300pk >
                myfont10.300sfp
```

You will have to find this program. If you are using TeX you do not need it, though – see "Converting between font formats" below.

- Download the font to the printer. You will need to do more than simply send the file to the printer. For example, on the HP you must send an escape sequence like ESC*c100D to tell the printer there's a font coming, and that it's going to be font number 100. You then send the font, and then in the rest of the job say something like ESC*c100ESC*c4FESC (100X to tell the printer you've finished, and to start using the font. (ESC in these examples stands for the ASCII Escape, chracter 033 octal, 27 in decimal). All of this must be in the same print job.

Doing this without going insane involves setting up macros or shell-scripts to automate it for you.

3   How to use Metafont fonts with TeX

In addition to generating a 'gf' file, METAFONT will also generate a '.tfm' file. You will need to put the

---

tfm file into your TEX font directory – for example, /usr/local/tex/fonts. You will need to put either the gf or the pk file there too – probably the pk file. Some dvi drivers need the font to be listed in a description file, too – the name and location of this seems to vary wildly from site to site, but FONTDESC is not unlikely. Chris Torek's 'mctex' package includes some drivers that need this.

For testing, you might be able to say something like $ TEXFONTS="/users/lee/fonts:/usr/local/lib/tex/fonts"; export TEXFONTS to get TEX to look in more than one directory – see your local TEX guide.

When you have installed the font, you can use it from TEX directly in the usual way. For most fonts, the filename is the same as the font name, so, for example, ccr10.300pk contains the bitmaps for a font called ccr at size 10pt. You can look at the METAFONT source for a given font to determine the name of the font, and you might also be able to cheat by editing the font description file FONTDESC.

Using other fonts with LATEX generally requires more work.

4　How to use Metafont fonts with Troff

If, when you run troff, you get the message 'typesetter busy', you have the original Ossanna-troff, also called otroff. Chris Lewis has a package which will let you use TEX fonts with troff – it's called psroff, and comes with documentation.

ftp: gatekeeper.dec.com (16.1.0.2)
pub/misc/psroff-2.0.tar.Z
ftp: cs.toronto.edu [128.100.1.65]
pub/psroff.tar.Z

If, when you run troff, you get something like this:

```
        x T 300
        x res 300 1 1
```

you have ditroff. This is sometimes called titroff or psroff. In this case, you will probably need to do the following:
1. convert the font to your printer's format
2. generate a width table for the font
3. add the font to the DESC file for the appropriate device
4. arrange for troff to download the font
5. tell troff about the font by running 'makedev DESC' in the right place.

If, when you run troff, you get something like this:

```
 X hp(SCM)(CM)(AF)(AD) 300 1 1
 Y P default letter 2550 3300 0 0 90 90
                               2460 3210
```

you have sqtroff, change (4) onwards to:

4. put the font in the appropriate raster directory
5. tell sqtroff about the font by running 'sqmakedev DESC'

　　or 'sqinstall'.

In each case, you should be able to get help from your vendor.

Note that Chris Lewis' psroff package has software to make width tables for troff from pk files.

5　Converting between font formats

Conversions to and from pbm and pk format were posted to comp.text.tex and to alt.sources on the 9th of August, 1990 by Angus Duggan (ajcd@cs.ed.ac.uk). The program is pbmtopk, and there are also at least two patches.

Chris Lewis' psroff package includes a program to go from pk both to the HP LaserJet and to PostScript.

John McClain (ophelp@tamvenus.bitnet) has some conversion programs for various graphics formats to/and from pk files.

CAPTURE turns HPGL files into PK format (a PC program, $130 from Micro Programs Inc., 251 Jackson Ave., Syosset, NY 11791

Metaplot can take pen-plotter files and prouce metafont files wilcox@cis.ohio-state.edu

6　Where to get bitmap versions of the fonts

There are archives containing the bitmaps of many of these fonts at various sizes and resolutions. The fonts must have been generated for the correct print engine: e.g. write-white or write-black. The archives generally hold only the sizes used by TEX. These are 'magstep' sizes, and are not exact point sizes. It is probably better to generate them from the METAFONT sources yourself if you can.

The best place to look for raster fonts is almost certainly
　　mims-iris.waterloo.edu (129.97.129.116)
This probably has all the HP fonts in the world.... some others are:
　　ctrsci.math.utah.edu (128.110.198.1)
　　science.utah.edu (128.110.192.2)
　　ymir.claremont.edu (134.173.4.23)

The occasional posting of ftp sites to comp.misc and comp.archives lists these and several other sites.

Getting fonts by FTP and Mail:

If you are using ftp, you will need either the name of the host or the Internet number. For example, to connect to ymir, listed as
ftp: ymir.claremont.edu [134.173.4.23] you will need to type something like

```
    ftp ymir.claremont.edu
```
If that doesn't work, try using the number:
```
    ftp 134.173.4.23
```

If that doesn't work, on Unix systems you can use nslookup (it's usually /usr/etc/nslookup) to find the host number – it might have changed. Type the entire host name, and after a few seconds nslookup will give you the address.

Once you have connected, you will need to go to the appropriate directory, lists its contents, and retrieve the files.

Most of the machines listed here run Unix, and you use "ls" and "cd" to list files and to change directories. Ymir runs VMS, and you will have to put square brackets around directory names, like [this].

Remember that although METAFONT sources are text files, pk fonts are not ASCII, and you will have to use binary mode for them. In general, use text mode for README files and *.mf files, and binary mode for other font files. Files ending in .Z are compressed binary files – you will need to use binary mode, and then uncompress the files when you get them.

You can get files from ymir by sending mail messages to `mailserv@ymir.claremont.edu`

For example,
```
    send [tex.mf.misc]cmapl10.mf
```
will get the file cmapl10.mf from the directory "tex.mf.misc". You can only get text files in this way.

7   Fonts

7.1   AMS (see under Euler)

The American Mathematical Society has adopted TEX, and has had some fonts designed especially by Herman Zapf. These are known as the Euler fonts, and are described below. The METAFONT sources are now available by ftp.

NOTE that you should build these using virmf, or at least with a version of METAFONT that does not have cmbase pre-loaded. You may also get errors reported when building some of the smaller sizes – simply press return.

There are
1. AMS Euler – a calligraphic font. This is not suitable as it stands for text use in TEX, because it has a non-standard encoding.
2. AMS extra maths symbols
3. AMS computer modern extensions
4. AMS Cyrillic (this is the same as University of Washington Cyrillic)

There is also some documentation.

You can get them from the ams or from ymir: ftp: e-math.ams.com [130.44.1.100] /ams/amsfonts/sources

ftp: ymir.claremont.edu (134.173.4.23)

7.2   APL (A Programming Language)

ftp: ymir.claremont.edu (134.173.4.23):
cd SOFTWARE:[anonymous.tex.misc]
ftp: (the file is cmapl10.mf). Associated macros and documentation
ftp: are in SOFTWARE:[anonymous:tex:periodicals.tugboat] and also
ftp: [anonymous.tex.inputs.plain-contrib] in files apldef.tex,
ftp: aplstyle.tex, and aplverb.tex.

ftp: power.eee.ndsu.nodak.edu (134.129.123.1)
apl-tex-font/27-Jul-90

7.3   Babel – language support

The Babel archive at ymir.claremont.edu contains:
- **Greek Fonts:**
  Brian Hamilton Kelly's cmgr family
  Sylvio Levy's gr family [modern and classical]
  Yannis Haramboulos' rgr family
- **Hebrew fonts:**
  REDIS (a thin-looking sans serif)
  burkis (coming in January??)
- **Icelandic**
  Icelandic Modern (this is Computer Modern with extensions)
- **Russian (Cyrillic)**
  IFVE's cmc family
  U Washington's wncyr family
  Bashkiren/Mongolian (not sure if this is there yet)
- **Turkish**
  Turkish Modern (this is Computer Modern with extensions)

ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.babel]

7.4   Chess

Some chess typesetting macros were posted to comp.text.tex on July 31, 1990. The chess fonts are available for ftp from ymir.

ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.misc]

7.5   Chinese

ChTEX is a set of macros and fonts for typesetting Chinese under TEX. It only supports PostScript, and requires a modivied dvi2ps. You write your article with PinYin.

ftp: 192.12.216.114 (name: chiris.stevens-tech.edu)
ftp: note that the usercode is "ftp", not "anonymous".
Included are source, fonts, VMS binary for 5.2, DOS binary, etc.

7.6 Bar Code

Dimitri Vulis's barcode font
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.7 Committee

This was produced during a workshop tutorial given by
Donald Knuth. This is said (by Don Hosek, whom I trust
in such things) to be hard-wired for the APS typesetter...
It is described in Tugboat Vol. 5 No. 2 (Nov. 84).

ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf.misc]
ftp: files are font1.mf and font1base.mf

7.8 Computer Modern

Computer Modern is Donald Knuth's font family used
for his later 'Art of Computer Programming' books. It
contains

> cmr – computer modern roman
> cmmi – computer modern maths italic
> cmti – computer modern text italic
> cmb – computer modern bold
> cmss – computer modern sans serif
> cmtt – computer modern typewriter
> cmvtt – computer modern variable-spaced
>   typewriter

and several variations on each of the above (e.g. bold
extended...). There are also some experimental fonts,
such as cmff, a 'funny' font, and cmfib, a font based on
Fibonacci numbers.

These are all included in a standard TeX distribution,
although I only know of one site archiving the META-
FONT files seperately. The official TeX distribution site
is labrea.stanford.edu:

ftp: labrea.stanford.edu [36.8.0.47]
cd pub/tex/cm
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf.standard]

Many TeX ftp archive sites also give access to the bit-
maps (pk files), although you usually have to get them
all at once.

There is also a reparameterised version of CM by John
Sauter, which makes it easy to generate fonts at desired
sizes– this is especially useful for non-TeX users.

ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf.sauter] See also: Babel, Sauter

There are some more Computer Modern variants stored
at ymir; these include parameters for generating cm fonts
at sizes 14, 18, 24 and 36pt. ftp: ymir.claremont.edu
(134.173.4.23):
cd [anonymous.tex.mf.variants]

There is also a Pica typewriter font – italic and bold
come out with straight and wavy underlines (respec-
tively), however. This is in ftp: ymir.claremont.edu
(134.173.4.23):
cd [anonymous.tex.mf.pica]

Versions of these fonts suitable for use with an X Win-
dows previewer (xtex and SeeTeX) are available from
ftp: foobar.colorado.edu pub/SeeTeX

7.9 Concrete

This font was designed for Donald Knuth's Concrete
Mathematics book. It looks a little like a cross between
American Typewriter and Computer Modern Roman.
There are Roman and Italic faces.

ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.10 Cyrillic

There are several Cyrillic (Russion-Alphabet) fonts:
- Tom Ridgeway's Cyrillic fonts
  [BITNET: LISTSERV@UBVM.CC.BUFFALO.EDU]
- WN-Cyrillic
  ftp: june.cs.washington.edu (128.95.1.4)

There is a mailing list, rustex-l, for discussion of
typesetting Cyrilic-based languages. To subscribe,
send mail to listserv@ubvm.bitnet containing the text
SUBSCRIBE RUSTEX-L <your name here> or
send mail to
Dimitri Vulis,
DLV%CUNYVMS1.BITNET@cunyvm.cuny.edu

7.11 Duerer

Based on the 16th Century drawings of Albrecht Duerer
– see, for example, his "The Painter's Manual" publis-
hed in Fac Simile by Abaris Books. Upper case only.
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf.duerer]

7.12 Devanagari

(this is a font for use with Sanskrit)
Created by Frans Velthuis in 1987/88 and is available
from him
(Velthuis%hgrrug5.earn@cunyvm.cunyvm.edu)   for
a   small   charge.   Another   address   is
"velthuis@hgrrug5.bitnet".

> F.J. Velthuis,
> Nyensteinheerd 267
> 9736 TV Groningen
> The Netherlands

7.13 Dingbats

By Doug Henderson.
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.14　Euler

These were designed by Herman Zapf for the American Mathematical Society. See AMS.

The fonts are Fraktur, Script, Upright Italic, Math extension. (see TUGboat Vol. 10 No. 1)

7.15　Greek

Sylvio Levy's Greek font.
ftp: xydeco.siemens.com (129.73.1.101) – greek*
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.babel.greek.levy] (But Don Hosek tells me this is really Brian Hamilton Kelly's Greek font)

Also the Sylvio Levy 'gr' greek family, for both Modern and Classical Greek. This includes roman, typewriter and bold, plus TEX macros.

Brian Hamilton Kelly's cmgr family
Yannis Haramboulos' rgr family

ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.babel.greek]

See also Babel.

7.16　Hebrew

There is a sans-serif Hebrew font called REDIS available from ymir. It comes in three faces, including italic (slanting to the right, of course).
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.17　Helvetica

Produced by the Metafoundry and sold commercially. Unfortunately they do not distribute the METAFONT sources, so they are not really very useful in this file ...

The Metafounndry,
　　OCLC Inc., MC 485
　　6565 Frantz Road
　　Dublin, OH 43017
　　USA
　　+1 614 764-6087

7.18　Hershey

The Hershey fonts were designed for use by plotters, and published in 1972. These fonts are of relatively low typographic quality, but are useful on devices with lower resolution.

ftp: cs.uoregon.edu [128.223.4.13]
(but these are not in METAFONT – does anyone know where to get the METAFONT versions?)

7.19　International Phonetic Alphabet

Used by linguists, and also in some dictionaries. It's designed to go with Computer Modern. From WSU.
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.20　Music

MuTEX is a basic music package for TEX. It seems to be the same as mtex, but with documentation in English rather than (or as well as) German.

ftp: stolaf.edu [130.71.128.1]
/pub/MuTeX.tar.Z /pub/MuTeX_doc.Z
ftp: suned.zoo.cs.yale.edu [128.36.21]
ftp: cs.ubc.edu [128.189.97.5]
src/MuTeX/MuTeX.tar.Z (slow)
ftp: wuarchive.wustl.edu: /mirrors/msdos/tex/mutex.arc
ftp: ymir.claremont.edu [134.173.4.23]:
cd [anonymous.tex.musix.mutex]

In Europe,
ftp: sol.cs.ruu.nl [131.211.80.5] in subdirectory pub/TEX
ftp: mtex.tar.Z (sources, including METAFONT sources and documentation)
ftp: mtexfonts.tar.Z (300dpi pk files) These are also available in Europe by mail-server. Send mail to mail-server@cs.ruu.nl with HELP in the subject and the body and probably the .signature as well :-)

7.21　OCR (Optical Character Recognition)

OCR A (this is not the font for printing on cheques)
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.22　Oriya

Sabita Panigrahi is working on Oriya (one of the modern Indian scripts), but this is not yet available.

7.23　Pandora

This is a little like Palatino, annd includes a sans-serif variant. It is not yet of production quality, unfortunately.

ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.24　Pica

There is also a Pica typewriter font – italic and bold come out with straight and wavy underlines (respectively), however. This is in ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf.pica]

7.25   Pointing Hands

Various manual extremities, designed by Georgia Tobin
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.26   Punk

A punK hAndWritten fOnT...
For writing on walls, perhaps. The lower case is simply
a smaller version of the upper case.
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.27   Sanskrit

(see Fonts: Devanagari)

7.28   Sauter

This is a rework of Computer Modern. The outlines are
the same, as far as I know, but it is much easier to gene-
rate the various fonts.
By John Sauter.
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.mf]

7.29   Tengwar

There are at least two Tengwar fonts, Mike Urban's:
ftp: ymir.claremont.edu (134.173.4.23):

cd [anonymous.tex.mf.tengwar]

Julian Bradfield <jcb@lfcs.edinburgh.ac.uk>
also has both Tengwar and a prototype version of Cirth
runes. Email only, although I have a copy and can mail
them to you if you can't reach Julian. I prefer Juli-
an's Tengwar, I think, but I am not an expert on Tolkien
fonts...

7.30   Thai

There are at least two Thai fonts around. The rmit
font is a little tricky to make, as it needs to be in a
directory called "thai2", because it refers to files called
"../thai2/name".
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.babel.thai.rmit]
ftp: ymir.claremont.edu (134.173.4.23):
cd [anonymous.tex.babel.thai.usl]

7.31   Vietnamese

ftp: blackbox.hacc.washington.edu [128.95.200.1]
cd /pub/testviet

This test package includes tfm and pk fonts at 10 point
roman and italic. I understand that you need TEX 3.0 or
later to use this, and drivers that cope with fonts contai-
ning more than 128 characters.