Appendix A
Installation Procedures for AMSFonts 2.2d

A.1. Introduction

"AMSFonts" is a collection of fonts that supplement the basic Computer Modern fonts, for use with the TEX typesetting system. These fonts were originally intended for use with the AMS-TEX or AMS-LATEX macro packages, but they can also be used with plain TEX or LATEX, independently of the AMS formatting packages.

AMSFonts can be used with any full implementation of TEX. Many TEX distributions include the AMSFonts; check the documentation that came with the TEX distribution you are using. When a new version of AMSFonts is released, all distributors are notified, so if your TEX system is up to date, it is likely that you don't need to do anything at all.

Most current TEX installations are organized according to the TEX Directory Structure (TDS). This is a tree structure whose root is identified as something like `/usr/local/share/texmf` or `c:\sw\texmf`. In the following instructions, we will use the name `TEXMF` to identify the root directory of a TDS or similar structure. (For detailed documentation of the TDS, see the report at

`http://www.ctan.org/tex-archive/tds/standard/tds/`

for a browsable version, or the file `tds.pdf` in the same area if you prefer a copy formatted for printing.)

When installing a new release of the AMSFonts, you may want to first back up your old version, if you have existing documents that use it. Although new releases are intended to be backward compatible, a backup provides insurance in case something goes wrong.

A.2. Location of AMSFonts files in a TDS tree

Files in the AMSFonts distribution fall into several categories: `.tfm` (metric) files, macro files for use with TEX, source files, documentation, and raster image (`.pk`) files. The following list shows the files in the current distribution, along with their recommended locations in a TDS tree.

```
TEXMF/
  fonts/source/
    ams/
      README
      amsfonts.lst
      cmextra/
        cmbsy*.mf     (5 files)
        cmcsc*.mf     (2 files)
        cmex*.mf      (3 files)
        cmmib*.mf     (5 files)
```

```
    cyrillic/                       cyr-alt/
      cyr*.mf      (9 files)          README
      serb*.mf     (2 files)          wkcy*.vpl     (5 files)
      wncy*.mf     (22 files)         wlcy*.vpl     (5 files)
                                      wvcy*.vpl     (5 files)
    euler/                          symbols/
      ebigop.mf                       amsy*.mf      (2 files)
      eubase.mf                       *symbols.mf   (2 files)
      euex*.mf     (4 files)          msam*.mf      (6 files)
      eufb*.mf     (7 files)          msbm*.mf      (6 files)
      eufm*.mf     (7 files)          xb*.mf        (3 files)
      eurb*.mf     (7 files)
      eurm*.mf     (7 files)
      eusb*.mf     (7 files)
      eusm*.mf     (7 files)
  public/misc/
    dummy.mf
fonts/pk/
    ⟨device resolution⟩/         (not included in bundled collection)
fonts/tfm/
  ams/
    cmextra/
    cyrillic/
    euler/
    symbols/
  public/misc/
    dummy.tfm
tex/latex/amsfonts/
  amsdtx.cls                        eucal.sty
  amsfonts.sty                      eufrak.sty
  amssymb.sty                       euscript.sty
  cmmib7.sty                        ueu*.fd      (8 files)
                                    ums*.fd      (4 files)
tex/plain/amsfonts/               doc/ams/amsfonts/
  amssym.def                        amsfndoc.ps
  amssym.tex                        amsfonts.bug
  cyracc.def                        amsfonts.faq
source/fonts/amsfonts/            source/latex/amsfonts/
  amsfndoc.tex                      amsfonts.dtx
  amsfndoc.def                      amsfonts.fdd
  amsfndoc.cyr                      amsfonts.ins
  amsfndoc.fnt                      amssymb.dtx
  amsfndoc.ins                      cmmib57.dtx
                                    eufrak.dtx
                                    euscript.dtx
```

The AMSFonts distribution can be retrieved in bundled form from the AMS web site, e.g., as a `.zip`, `.tar` or `.hqx` file. In this form, the files are already arranged according to the TDS structure. The `.pk` files are not included in the main bundle; they are bundled separately, by output device resolution or by platform. To install the main bundle, place the bundled file into a convenient directory and unpack it using the `TEXMF` directory as the "Extract to" target. Some examples:

WinZip:	Click on "Extract" and then in the "Extract to" box, enter `\sw\texmf` (or whatever `TEXMF` is on your system)
gzip:	`gzip -dc amsfonts-all-but-pk-files.tgz | (cd TEXMF; tar xvf -)`
unzip:	`unzip amsfonts-all-but-pk-files.zip -d TEXMF`

The bundled file may be deleted after unpacking.

A.3. Installing the .pk files

Many modern TeX installations incorporate a feature called MakeTeXPk that creates a `.pk` file only when it has actually been requested by a job. Check the documentation that came with your system; if MakeTeXPk is available, you may choose to omit installing any `.pk` files, but let the system generate them on demand.

Alternatively, if you are using a PostScript output device, you will probably want to use Postscript (Type 1) outline files rather than `.pk` files. Type 1 versions of the AMSFonts are available separately from the AMS web site,

`http://www.ams.org/tex/amsfonts.html`

The fonts in the Type 1 collection do not include all sizes; for details, see the appropriate section of the *AMSFonts 2.2d User's Guide* and the documentation that comes with the collection.

If you do decide you want to install the `.pk` files from the AMS server, consult the TDS tree shown above to identify the proper location.

The amount of disk space required for installation of the AMSFonts depends on the resolution of your output device and on which families of fonts you choose to install. There are five families of fonts, and you may choose to install any or all of these families. Also, you may choose to install all magnifications or only magnifications 100%, 109.5% and 120% (TeX magsteps 0, $\frac{1}{2}$ and 1). For a more complete description of these families and magnifications, please see the appropriate sections of the *AMSFonts 2.2d User's Guide*.

The following table lists all the families and the disk space required for their installation. Before you begin the installation, decide which fonts and which magnifications you will choose, and make sure that you have enough disk space available.

Approximate Disk Space Required for AMSFonts Installation

		Extra CM	Euler Fraktur	Other Euler	Extra Symbols	Cyrillic	All Fonts
118dpi	100% thru 120%	200K	150K	350K	150K	250K	1100K
	all mags	550K	350K	850K	450K	750K	2950K
180dpi	100% thru 120%	250K	150K	350K	200K	300K	1250K
	all mags	750K	450K	950K	650K	1000K	3800K
240dpi	100% thru 120%	300K	150K	350K	250K	400K	1450K
	all mags	900K	500K	1000K	800K	1200K	4400K
300dpi	100% thru 120%	350K	200K	450K	350K	500K	1850K
	all mags	1100K	700K	1300K	1000K	1500K	5600K
400dpi	100% thru 120%	450K	250K	500K	400K	550K	2150K
	all mags	1450K	825K	1625K	1250K	1850K	7000K
600dpi	100% thru 120%	650K	325K	600K	500K	725K	2800K
	all mags	2000K	1150K	2150K	1750K	2650K	9700K

A.4. What if your TeX system isn't in a TDS tree?

If your TeX system is arranged in some other way, you must consult the user documentation for guidance. The hints that follow are just that—hints. If your TeX system documentation recommends something different, you should follow that procedure.

We recommend placing AMSFonts files into distinct subdirectories or folders, to simplify installation of future versions.

First, determine where TeX will look for its files. The AMSFonts collection contains not only fonts, but also support for their use with plain TeX and LaTeX. Look first for files listed in the tree above; if you find them, you should simply install the new versions in the same areas. If you don't find them, some more specific hints follow.

To install plain TeX support files, look on your system for the file `plain.tex`; the files listed above under `tex/plain/amsfonts/` should go into (a subarea of) that area.

To install LaTeX support files, look for the file `article.sty`; the files listed above under `tex/latex/amsfonts/` should go into (a subarea of) that area.

To install the `.tfm` files, look for the file `cmr10.tfm`.

Raster image files may or may not have `pk` in the file extension, depending on the system. These files are used by the output device drivers, not by TeX itself. Consult the documentation for your drivers to see where they look for `.pk` files. In the AMSFonts distribution, the directories are labeled `\amsfonts\dpiXXX`, where `XXX` is the resolution of the output device multiplied by the magnification (for example, for a 300dpi printer, `XXX` would be `300` for a font at 100% or `360` for a font at 120%). Unix users will have to rename the `.pk` files in each directory to the extension `.XXXpk`, where `XXX` is the number in the directory `dpiXXX` in which the file is located. Once all the files have been renamed, they can be placed all together in the directory where your drivers will find them.

A.5. Font definition files for LaTeX

Warning: If your version of LaTeX 2_ε is earlier than December 1996, *and* if your operating system and TeX implementation both refer to filenames in a case-sensitive manner, the `.fd` files you need are not included in the bundled AMSFonts distribution; you will need to retrieve them explicitly from the AMS FTP server, at

`ftp://ftp.ams.org/pub/tex/amsfonts/latex/obsolete/`

This warning may apply to users of Unix systems; it does not generally apply to users of Windows or DOS.

A better option, which we recommend strongly, is to update your version of LaTeX; the case-sensitive `.fd` filenames were made obsolete with the December 1996 release of LaTeX, so if you are still using an older version, it is overdue for update.

A.6. Additional note for all users of AMSFonts

The device driver with which you are using these fonts may have a font table that needs to be updated in order for the driver to recognize the fonts. In order to use AMSFonts with any software that uses such a table, you must enter the names of each of the fonts in the AMSFonts package and the effective resolutions at which you have them installed. The file `amsfonts.lst`, which appears at the same level in the TDS tree as the `README` file, contains a list of all of the font names and all of the resolutions contained in the distribution. You may have to alter the format of this file to make it conform to your driver's needs or to reflect installation of only some of the fonts, but it provides you with the necessary data. See the documentation for your device driver to see what format is required. If your device driver does not depend on such a table, this step is not necessary.

A.7. Note for users of *Textures* on Macintosh

The AMSFonts distribution for *Textures* is different from what has been described above; the fonts are distributed in several different suitcase files rather than in a TDS tree. This distribution is bundled in the file

`/pub/macintosh/amsfonts2-2.hqx`

which is available from the AMS FTP server or web site.

Appendix B
Using the PostScript (Type 1) AMSFonts

The AMSFonts were reimplemented in Type 1 outline form jointly by Blue Sky Research and Y&Y, and made freely available for general use through a consortium of scientific publishers. These Type 1 fonts are not part of the main AMSFonts distribution, but are available separately from the AMS web site:

`http://www.ams.org/tex/type1-fonts.html`

The web page contains a more detailed history of these fonts than is given here.

This collection can also be found on CTAN (the Comprehensive TeX Archive Network), at

`http://www.ctan.org/tex-archive/amsfonts/ps-type1/`

The CTAN entry is mirrored directly from the AMS server.

The symbols and fonts of mathematical alphabets in the Type 1 collection are provided only in sizes 5, 7, and 10 point, with additional sizes produced by interpolation. To accommodate this reduced set of sizes, a “PS AMS fonts” option is provided with both LaTeX and AMS-TeX; see the relevant sections of this guide for details. Papers and monographs submitted to the AMS for publication are required to use this option.

> **Warning:** Adding the “PS AMS fonts” option to an existing file may result in changed line and page breaks, owing to the fact that sizes 6, 8, and 9 are produced by interpolation.

The Type 1 cyrillic fonts are provided only in 10 point. The “PS AMS fonts” option does not apply to cyrillic at the present time.

Some output device drivers (e.g., `dvips`) require a “map” file to identify Type 1 fonts; for details, see the documentation for your device driver.

If you are using the Type 1 AMSFonts, you may wish to rename the `.tfm` files for the intermediate sizes—6, 8, and 9 point for the math fonts and all sizes but 10 point for the cyrillic—so that TeX won’t find them. This will insure that the bitmaps aren’t used inadvertently, or created on demand by systems that use the MakeTeXPk facility.

Appendix C
For further information

The AMSFonts collection was implemented and packaged by the Society's Publications Technical Group. Questions or suggestions for improvements should be directed to that group at the following address:

Publications Technical Group
American Mathematical Society
P. O. Box 6248
Providence, RI 02940

Phone: 800-321-4AMS (4267) or 401-455-4080
Internet: `tech-support@ams.org`

Questions or comments concerning *Textures* can be directed to:

Blue Sky Research
516 Southeast Morrison
Portland, OR 97204

Phone: 800-622-8398 or 503-222-9571
Internet: `help@bluesky.com`

The Internet newsgroup `comp.text.tex` is an excellent source of general information about anything related to TeX, and fonts are no exception. The newsgroup and its archives can be accessed at `http://groups.google.com/`.

The TeX Resources pages at the AMS web site (`http://www.ams.org/tex/`) contain pointers to additional sources of TeX-related information, including answers to Frequently Asked Questions (FAQ).