# Expanded Times Roman Fonts As Used in *Journal d'Analyse Mathématique*

Boris Veytsman*

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**Abstract**

This package provides LaTeX support for expanded Times Roman font, which has been used by *Journal d'Analyse Mathématique* for many years. Mathematics support is based on *Belleek* fonts.

## Contents



## 1 Introduction

For about a decade *Journal d'Analyse Mathématique* (`http://www.ma.huji.ac.il/jdm/`) used a set of fonts based on the well known Times Roman family[1]. The fonts were slightly expanded in the $x$ direction. This small change gave the journal its unique look and feel. The fonts worked for many years. However, over this time a number of problems turned up:

*`borisv@lk.net`, `boris@varphi.com`

[1] It is now difficult to say who designed these fonts initially. Dov Goldstein supported the fonts for a number of years.

1. The fonts were originally created for `dvips` and included some PostScript trickery (for example, in dotless $\jmath$). This made their use with `pdftex` difficult.

2. The fonts included only `OT1` encoding.

3. The math was based on the combination of Times Roman *and* Computer Modern for the symbols absent in Times Roman. These fonts do not mesh well. Later the journal tried to use just Computer Modern math throughout, which still contrasted with the body text.

4. It was considered beneficial to give the authors the option of prepare their papers with the journal fonts, and the package lacked documentation and installation instruction.

At last *Magnes Press,* the publisher of *Journal d'Analyse Mathématique,* commissioned the overhaul of the journal TEX styles. This package is a part of the effort.

We recreate the fonts from scratch. The mathematics is based on Belleek fonts [1], expanded to match the body. The text fonts are provided in `OT1` and `T1` encoding.

The package works both with the `pdflatex` route and the `latex`*to*`dvips` route. The files `textsample.pdf`, `mathsample.pdf` and `textsample_ps.pdf`, `mathsample_ps.pdf` provide the sample of output for these two routes.

# 2 User Guide

## 2.1 Installation

You need Belleek fonts [1] and (optionally) Math Design fonts [2]. They are now a part of most modern distributions. If you do not have them, just download them from CTAN.

Download the file `http://ctan.tug.org/install/fonts/psfonts/public/jamstimes.tds.zip` and unzip it in the `$TEXMF` directory. For TEXLive it is probably `/usr/local/texlive/texmf-local`, or `/usr/local/share/texmf-local`, or `~/texmf`, or `C:\ProgramFiles\texlive\texmf-local`, etc. For MikTEX it is probably `C:\miktex\texmf` or `C:\miktex\localtexmf`. Run `texhash` to update the database of file names.

Now you need to add the map file `jtm.map` to the configuration files of `dvips` and `pdftex`. This again depends on your distribution. For TEXLive you create a file `$TEXMF/updmap.d/50jtm.cfg` with just the line

```
Map jtm.map
```

and then run `texhash` and `updmap`. If you use Debian or Ubuntu, the system-wide `updmap.d` directory is located in `/etc`, and you need to create the file `jtm.list` in `/var/lib/tex-common/fontmap-cfg/whitnca.list` with the line

```
50jtm
```

If you use MikTEX2.6, run

```
initexmf --edit-config-file updmap
```

Add to the config file

```
Map jtm.map
```

save, exit and run `updmap`.

If you use MikTEX2.5 or earlier, edit `localtexmf\web2c\updmap.cfg`, adding the line

```
Map jtm.map
```

and run `updmap`.

Refer to your distribution documentation for the details.

An interesting question: it is possible to use the package with the commercial MathTime™ fonts from PCTEX (`http://www.pctex.com/`)? I think that the answer is positive, but since I do not have these fonts, I have not tested this setup. If you have them, just change the lines in the file `jtm.map` to refer to the proper fonts. Note that these fonts have some options (bold math, heavy math) not supported by the package.

## 2.2 Usage

If your installation have been successful, add the line

`\usepackage[`⟨*options*⟩`]{`⟨*jamtimes*⟩`}`

to the preamble of your document. Note that this package changes both math and text fonts.

The package provides a number of options. The default values of the options correspond to the practice of *Journal d'Analyse Mathématique*. You can try to change them to get a different look and feel.

*option* `scaled`

The package has the option `scaled=...`. The fonts are uniformly scaled according to the numerical value of the option. By default the fonts are scaled 5%, as if the setting `scaled=1.05` is in effect. If you do not want to scale the fonts at all, just call the package with the option `scaled=1`.

*options* `sffamily` `ttfamily`

By default the package uses Helvetica as the sans serif font and Courier as the monospaced font. This default can be changed with the options `sffamily=...` (the default value is `phv`) and `ttfamily=...` (the default value is `pcr`).

*option* `sfscaled`

If the sans serif family is Helvetica, the package provides an additional options `sfscaled=...`. It sets the scaling of the sans serif fonts. By default it is 0.94: this provides a good mesh with 5% scaled Times fonts.

Table 1: Fonts Provided by the Package. `EE` corresponds to font encoding (see [3]).

| NFSS Code | Fontname Name | Comments |
|---|---|---|
| *c, n* | `jtmrEEc` | Times Roman, compressed 20% |
| *m, n* | `jtmrEEe` | Times Roman, expanded 5% |
| *m, it* | `jtmriEEe` | Times Roman Italic, expanded 5% |
| *m, sl* | `jtmroEEe` | (fake) Times Roman Oblique, expanded 5% |
| *m, sc* | `jtmrcEEe` | (fake) Small Caps Times Roman, expanded 5% |
| *b, n* | `ptmbEE`[a] | Times Bold |
| *b, it* | `ptmbiEE`[a] | Times Bold Italic |
| *b, sl* | `ptmboEE`[a] | (fake) Times Bold Oblique |
| *b, sc* | `ptmbcEE`[a] | (fake) small caps Times Bold |
| *x, n* | `jtmrEEw` | Times Roman, expanded 25% |
| *x, it* | `jtmriEEw` | Times Roman Italic, expanded 25% |
| *x, sl* | `jtmroEEw` | (fake) Times Roman Oblique, expanded 25% |
| *x, sc* | `jtmrcEEw` | (fake) Small Caps Times Roman, expanded 25% |
| *bx, n* | `jtmbEEv` | Times Bold, expanded 15% |
| *bx, it* | `jtmbiEEv` | Times Bold Italic, expanded 15% |
| *bx, sl* | `jtmboEEv` | (fake) Times Bold Oblique, expanded 15% |
| *bx, sc* | `jtmbcEEv` | (fake) small caps Times Bold, expanded 15% |

[a]These fonts coincide with the standard Times fonts

*option* `amsfontsscaled`

The package automatically loads amsfonts, including Euler Script, and Euler Fraktur fonts. The option `amsfontsscaled=...` provides a way to change the scaling of these fonts. By default they are scaled 5%, just as the body and main math fonts.

The package provides the fonts listed in Table 1. Note that the expansion mentioned there always means expansion along the horizontal axis *in addition* to the scaling set by the package options.

`\bfdefault`

Another notable detail is that usually LaTeX sets `\bfdefault` to be `bx` (bold extended), and most font packages substitute it to `b` (bold). Our fonts have both bold and bold extended fonts, and by default use bold extended fonts for `\bfdefault`. If you want to use bold extended fonts instead, just say

```
\renewcommand{\bdefault}{b}
```

# 3 Implementation

## 3.1 Identification

We start with the declaration who we are. Most `.dtx` files put driver code in a separate driver file `.drv`. We roll this code into the main file, and use the pseudo-guard `<gobble>` for it.

```
⟨style⟩\NeedsTeXFormat{LaTeX2e}
⟨*gobble⟩
\ProvidesFile{jamtimes.dtx}
⟨/gobble⟩
⟨style⟩\ProvidesClass{jamtimes}
⟨drv⟩\ProvidesFile{drv.tex}
⟨map⟩\ProvidesFile{map.tex}
⟨jamomlhax⟩\ProvidesMtxPackage{jamomlhax.mtx}
⟨*style | drv | map⟩
[2010/11/09 v1.12 Expanded Times Fonts (Journal d'Analyse Mathematique)]
⟨/style | drv | map⟩
```

And the driver code:

```
⟨*gobble⟩
\documentclass{ltxdoc}
\usepackage{booktabs}
\usepackage[tableposition=top]{caption}
\usepackage{url}
\usepackage[breaklinks,colorlinks,linkcolor=black,citecolor=black,
            pagecolor=black,urlcolor=black,hyperindex=false]{hyperref}
\PageIndex
\CodelineIndex
\RecordChanges
\EnableCrossrefs
\begin{document}
  \DocInput{jamtimes.dtx}
\end{document}
⟨/gobble⟩
```

## 3.2 Fontinst Driver

This follows [4].

First, the preamble

```
⟨*drv⟩
\input fontinst.sty
```

Definition of the parameters

```
\setint{slant}{167}
\setint{smallcapsscale}{750}
\setint{compressedscale}{800}
\setint{extendedscale}{1050}
\setint{extraextendedscale}{1150}
\setint{widescale}{1250}
```

Starting recording transforms:

```
\recordtransforms{rec.tex}
```

Scale all text fonts in the `8r` encoding. Interesting enough, Dov preferred medium fonts to be extended comparing to the bold ones. We preserve this choice.

```
\transformfont{jtmr8rc}{\xscalefont{\int{compressedscale}}%
  \reencodefont{8r}{\fromafm{ptmr8a}}}
\transformfont{jtmr8re}{\xscalefont{\int{extendedscale}}%
  \reencodefont{8r}{\fromafm{ptmr8a}}}
\transformfont{jtmri8re}{\xscalefont{\int{extendedscale}}%
  \reencodefont{8r}{\fromafm{ptmri8a}}}
\transformfont{jtmro8re}{\slantfont{\int{slant}}%
  \fromany{jtmr8re}}
\transformfont{jtmr8rw}{\xscalefont{\int{widescale}}%
  \reencodefont{8r}{\fromafm{ptmr8a}}}
\transformfont{jtmri8rw}{\xscalefont{\int{widescale}}%
  \reencodefont{8r}{\fromafm{ptmri8a}}}
\transformfont{jtmro8rw}{\slantfont{\int{slant}}%
  \fromany{jtmr8rw}}
\transformfont{jtmb8rv}{\xscalefont{\int{extraextendedscale}}%
  \reencodefont{8r}{\fromafm{ptmb8a}}}
\transformfont{jtmbi8rv}{\xscalefont{\int{extraextendedscale}}%
  \reencodefont{8r}{\fromafm{ptmbi8a}}}
\transformfont{jtmbo8rv}{\slantfont{\int{slant}}%
  \fromany{jtmb8rv}}
```

Same with math fonts. Note that Dov wanted medium weight mathematical fonts *not* extended. We reverse this decision. Note that `rblmi` does not have non-Greek letters, so we call its encoding `7z` instead of `7m`

```
%\transformfont{jtmr7voe}{\fromafm{blex}}
\transformfont{jtmr7yoe}{\xscalefont{\int{extendedscale}}\fromafm{blsy}}
\transformfont{jtmri7ze}{\xscalefont{\int{extendedscale}}\fromafm{rblmi}}
```

There is no hook in `fontinst.sty` for writing our own preamble to `.fd` file. However, we need to add scaling commands to the preamble. OK, we will patch fontinst:

```
\fontinstcc
\def\fd_family#1#2#3{
   \a_toks{#3}
   \edef\lowercase_file{\lowercase{
     \edef\noexpand\lowercase_file{#1#2.fd}}}
   \lowercase_file
   \open_out{\lowercase_file}
   \out_line{\percent_char~Filename:~\lowercase_file}
   \out_line{\percent_char~Created~by:~tex~\jobname}
   \out_line{\percent_char~Created~using~fontinst~v\fontinstversion}
   \out_line{}
   \out_line{\percent_char~THIS~FILE~SHOULD~BE~PUT~IN~A~TEX~INPUTS~
      DIRECTORY}
   \out_line{}
```

```
   \out_line{\string\ProvidesFile{\lowercase_file}}
   \out_lline{[
      \the\year/
      \ifnum10>\month0\fi\the\month/
      \ifnum10>\day0\fi\the\day\space
      Fontinst~v\fontinstversion\space
      font~definitions~for~#1/#2.
   ]}
   \out_line{}
```

Here is our patch:

```
   \out_line{\string\expandafter\string\ifx\string\csname\space
     Jtms@scale\string\endcsname\string\relax}
   \out_line{\space\string\let\string\Jtms@@scale\string\@empty}
   \out_line{\string\else}
   \out_line{\space\string\edef\string\Jtms@@scale\left_brace_char
       s*[\string\csname\space Jtms@scale\string\endcsname]
       \right_brace_char\percent_char}
   \out_line{\string\fi\percent_char}
   \out_line{}
```

End of the patch.

```
   \out_line{\string\DeclareFontFamily{#1}{#2}{\the\a_toks}}
   {
      \csname #1-#2\endcsname
      \out_line{}
      \let\do_shape=\substitute_shape
      \csname #1-#2\endcsname
      \let\do_shape=\remove_shape
      \csname #1-#2\endcsname
   }
   \x_cs\g_let{#1-#2}\x_relax
   \out_line{}
   \out_line{\string\endinput}
   \close_out{Font~definitions}
}
\normalcc
```

Now we are ready to install fonts. Note that bold fonts here are not extended, so we use standard Times fonts for bold.

First, `OT1`:

```
\installfonts
\installfamily{OT1}{jtm}{\skewchar\font=127}
\installfont{jtmr7tc}{jtmr8rc,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{c}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmr7te}{jtmr8re,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{m}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmri7te}{jtmri8re,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{m}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmro7te}{jtmro8re,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{m}{sl}{
  <->\string\Jtms@@scale}
```

```
\installfont{jtmrc7te}{jtmr8re,jtmri7ze,newlatin,jamot1hax}{ot1c}{OT1}{jtm}{m}{sc}{
  <->\string\Jtms@@scale}
\installfontas{ptmb7t}{OT1}{jtm}{b}{n}{
  <->\string\Jtms@@scale}
\installfontas{ptmbi7t}{OT1}{jtm}{b}{it}{
  <->\string\Jtms@@scale}
\installfontas{ptmbo7t}{OT1}{jtm}{b}{sl}{
  <->\string\Jtms@@scale}
\installfontas{ptmbc7t}{OT1}{jtm}{b}{sc}{
  <->\string\Jtms@@scale}
\installfont{jtmr7tw}{jtmr8rw,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{x}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmri7tw}{jtmri8rw,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{x}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmro7tw}{jtmro8rw,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{x}{sl}{
  <->\string\Jtms@@scale}
\installfont{jtmrc7tw}{jtmr8rw,jtmri7ze,newlatin,jamot1hax}{ot1c}{OT1}{jtm}{x}{sc}{
  <->\string\Jtms@@scale}
\installfont{jtmb7tv}{jtmb8rv,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{bx}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmbi7tv}{jtmbi8rv,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{bx}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmbo7tv}{jtmbo8rv,jtmri7ze,newlatin,jamot1hax}{ot1}{OT1}{jtm}{bx}{sl}{
  <->\string\Jtms@@scale}
\installfont{jtmbc7tv}{jtmb8rv,jtmri7ze,newlatin,jamot1hax}{ot1c}{OT1}{jtm}{bx}{sc}{
  <->\string\Jtms@@scale}
```

Then `T1`

```
\installfamily{T1}{jtm}{}
\installfont{jtmr8tc}{jtmr8rc,jtmri7ze,newlatin}{t1}{T1}{jtm}{c}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmr8te}{jtmr8re,jtmri7ze,newlatin,jtmri7ze}{t1}{T1}{jtm}{m}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmri8te}{jtmri8re,jtmri7ze,newlatin,jtmri7ze}{t1}{T1}{jtm}{m}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmro8te}{jtmro8re,jtmri7ze,newlatin}{t1}{T1}{jtm}{m}{sl}{
  <->\string\Jtms@@scale}
\installfont{jtmrc8te}{jtmr8re,jtmri7ze,newlatin}{t1c}{T1}{jtm}{m}{sc}{
  <->\string\Jtms@@scale}
\installfontas{ptmb8t}{T1}{jtm}{b}{n}{
  <->\string\Jtms@@scale}
\installfontas{ptmbi8t}{T1}{jtm}{b}{it}{
  <->\string\Jtms@@scale}
\installfontas{ptmbo8t}{T1}{jtm}{b}{sl}{
  <->\string\Jtms@@scale}
\installfontas{ptmbc8t}{T1}{jtm}{b}{sc}{
  <->\string\Jtms@@scale}
\installfont{jtmr8tw}{jtmr8rw,jtmri7ze,newlatin}{t1}{T1}{jtm}{x}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmri8tw}{jtmri8rw,jtmri7ze,newlatin}{t1}{T1}{jtm}{x}{it}{
```

```
  <->\string\Jtms@@scale}
\installfont{jtmro8tw}{jtmro8rw,jtmri7ze,newlatin}{t1}{T1}{jtm}{x}{sl}{
  <->\string\Jtms@@scale}
\installfont{jtmrc8tw}{jtmr8rw,jtmri7ze,newlatin}{t1c}{T1}{jtm}{x}{sc}{
  <->\string\Jtms@@scale}
\installfont{jtmb8tv}{jtmb8rv,jtmri7ze,newlatin}{t1}{T1}{jtm}{bx}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmbi8tv}{jtmbi8rv,jtmri7ze,newlatin}{t1}{T1}{jtm}{bx}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmbo8tv}{jtmbo8rv,jtmri7ze,newlatin}{t1}{T1}{jtm}{bx}{sl}{
  <->\string\Jtms@@scale}
\installfont{jtmbc8tv}{jtmb8rv,jtmri7ze,newlatin}{t1c}{T1}{jtm}{bx}{sc}{
  <->\string\Jtms@@scale}
```

Then `TS1`. We do not fake small caps here, so `textcomp` can take (faked) `\texteuro` from normal fonts.

```
\installfamily{TS1}{jtm}{}
\installfont{jtmr8cc}{jtmr8rc,textcomp}{ts1}{TS1}{jtm}{c}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmr8ce}{jtmr8re,textcomp,jtmri7ze}{ts1}{TS1}{jtm}{m}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmri8ce}{jtmri8re,textcomp,jtmri7ze}{ts1}{TS1}{jtm}{m}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmro8ce}{jtmro8re,textcomp}{ts1}{TS1}{jtm}{m}{sl}{
  <->\string\Jtms@@scale}
%\installfont{jtmrc8te}{TS1}{jtm}{m}{sc}{
%  <->\string\Jtms@@scale}
\installfontas{ptmb8c}{TS1}{jtm}{b}{n}{
  <->\string\Jtms@@scale}
\installfontas{ptmbi8c}{TS1}{jtm}{b}{it}{
  <->\string\Jtms@@scale}
\installfontas{ptmbo8c}{TS1}{jtm}{b}{sl}{
  <->\string\Jtms@@scale}
%\installfontas{ptmbc8t}{TS1}{jtm}{b}{sc}{
%  <->\string\Jtms@@scale}
\installfont{jtmr8cw}{jtmr8rw,textcomp}{ts1}{TS1}{jtm}{x}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmri8cw}{jtmri8rw,textcomp}{ts1}{TS1}{jtm}{x}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmro8cw}{jtmro8rw,textcomp}{ts1}{TS1}{jtm}{x}{sl}{
  <->\string\Jtms@@scale}
%\installfontas{jtmrc8tw}{TS1}{jtm}{x}{sc}{
%  <->\string\Jtms@@scale}
\installfont{jtmb8cv}{jtmb8rv,textcomp}{ts1}{TS1}{jtm}{bx}{n}{
  <->\string\Jtms@@scale}
\installfont{jtmbi8cv}{jtmbi8rv,textcomp}{ts1}{TS1}{jtm}{bx}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmbo8cv}{jtmbo8rv,textcomp}{ts1}{TS1}{jtm}{bx}{sl}{
  <->\string\Jtms@@scale}
%\installfontas{jtmbc8tv}{TS1}{jtm}{bx}{sc}{
```

```
% <->\string\Jtms@@scale}
```

Now math fonts. We add italics to the OML fonts. Since there are some fonts missing in the Beleek smybols fonts, we reset them and take fake fonts from Computer Modern

```
\installfamily{OML}{jtm}{\skewchar\font=127}
\installfont{jtmri7me}{jtmri7ze,jtmri7te,cmmi10,jamomlhax}{oml}{OML}{jtm}{m}{it}{
  <->\string\Jtms@@scale}
\installfont{jtmbi7me}{jtmbi7tv,jtmri7ze,cmmib10,jamomlhax}{oml}{OML}{jtm}{bx}{it}{
  <->\string\Jtms@@scale}
\installfamily{OMS}{jtm}{\skewchar\font=48}
\installfont{jtmr7ye}{jtmr7yoe,cmsy10}{oms}{OMS}{jtm}{m}{n}{
  <->\string\Jtms@@scale}
```

And the end:

```
\endinstallfonts
\endrecordtransforms
\bye
```
⟨/drv⟩

## 3.3 Fontmap Generation

This is a standard procedure [4]. We use URW Times files, because pdftex cannot extend fonts unless they are embedded.

⟨∗map⟩
```
\input finstmsc.sty
\resetstr{PSfontsuffix}{.pfb}
\specifypsfont{Times-Roman}{\download{utmr8a.pfb}}
\specifypsfont{Times-Italic}{\download{utmri8a.pfb}}
\specifypsfont{Times-Bold}{\download{utmb8a.pfb}}
\specifypsfont{Times-BoldItalic}{\download{utmbi8a.pfb}}
%\etxtoenc{omx}{texmext}
%\enctoetx{texmext}{omx}
\adddriver{dvips}{jtm.map}
\input rec.tex
\donedrivers
\bye
```
⟨/map⟩

## 3.4 Style File

First, define all options:

⟨∗style⟩
```
\RequirePackage{xkeyval}
\DeclareOptionX{scaled}{\gdef\Jtms@scale{#1}}
\DeclareOptionX{sfscaled}{\gdef\Hv@scale{#1}}
\DeclareOptionX{amsfontsscaled}{\gdef\AmsFonts@scale{#1}}
\DeclareOptionX{sffamily}{\gdef\sfdefault{#1}}
\DeclareOptionX{ttfamily}{\gdef\ttdefault{#1}}
```

```
\ExecuteOptionsX{scaled=1.05,sfscaled=0.94,amsfontsscaled=1.05,sffamily=phv,%
  ttfamily=pcr}
\ProcessOptionsX
\edef\AmsFonts@@scale{*[\csname AmsFonts@scale\endcsname]}
```

Now we make `jtm` the text default.

```
\def\rmdefault{jtm}
```

Math is more complex. We follow mostly [5]. Note that `blex` font is broken, so we use math design font `cmex` for large symbols.

```
\DeclareSymbolFont{operators}       {OT1}{jtm}{m}{n}
\DeclareSymbolFont{letters}         {OML}{jtm}{m}{it}
\DeclareSymbolFont{symbols}         {OMS}{jtm}{m}{n}
\DeclareSymbolFont{largesymbols}    {OMX}{cmex}{m}{n}
\SetSymbolFont{operators}{bold}     {OT1}{jtm}{bx}{n}
\SetSymbolFont{letters}{bold}       {OML}{jtm}{bx}{it}
\SetMathAlphabet{\mathrm}{normal}{OT1}{\rmdefault}{m}{n}
\SetMathAlphabet{\mathbf}{normal}{OT1}{\rmdefault}{b}{n}
\SetMathAlphabet{\mathit}{normal}{OT1}{\rmdefault}{m}{it}
\SetMathAlphabet{\mathsf}{normal}{OT1}{\sfdefault}{m}{n}
\SetMathAlphabet{\mathtt}{normal}{OT1}{\ttdefault}{m}{n}
\DeclareMathAlphabet{\mathbold}   {OT1}{jtm}{bx}{it}
\DeclareMathSymbol{\nabla}{\mathord}{symbols}{114}
\DeclareMathSymbol{\Gamma}{\mathalpha}{operators}{0}
\DeclareMathSymbol{\Delta}{\mathalpha}{operators}{1}
\DeclareMathSymbol{\Theta}{\mathalpha}{operators}{2}
\DeclareMathSymbol{\Lambda}{\mathalpha}{operators}{3}
\DeclareMathSymbol{\Xi}{\mathalpha}{operators}{4}
\DeclareMathSymbol{\Pi}{\mathalpha}{operators}{5}
\DeclareMathSymbol{\Sigma}{\mathalpha}{operators}{6}
\DeclareMathSymbol{\Upsilon}{\mathalpha}{operators}{7}
\DeclareMathSymbol{\Phi}{\mathalpha}{operators}{8}
\DeclareMathSymbol{\Psi}{\mathalpha}{operators}{9}
\DeclareMathSymbol{\Omega}{\mathalpha}{operators}{10}
```

We change the scale of amsfonts:

```
\RequirePackage{eucal,amsfonts}
\DeclareFontFamily{U}{msa}{}
\DeclareFontShape{U}{msa}{m}{n}{%
  <5><6><7><8><9>  gen\AmsFonts@@scale msam%
  <10><10.95><12><14.4><17.28><20.74><24.88> s\AmsFonts@@scale msam10%
  }{}
\DeclareFontFamily{U}{msb}{}
\DeclareFontShape{U}{msb}{m}{n}{%
  <5><6><7><8><9>gen\AmsFonts@@scale msbm%
  <10><10.95><12><14.4><17.28><20.74><24.88>s\AmsFonts@@scale msbm10%
  }{}
\DeclareFontFamily{U}{euf}{}
\DeclareFontShape{U}{euf}{m}{n}{%
  <5><6><7><8><9>gen\AmsFonts@@scale eufm%
  <10><10.95><12><14.4><17.28><20.74><24.88>s\AmsFonts@@scale eufm10%
```

```
  }{}
\DeclareFontShape{U}{euf}{b}{n}{%
  <5><6><7><8><9>gen\AmsFonts@@scale eufb%
  <10><10.95><12><14.4><17.28><20.74><24.88>s\AmsFonts@@scale eufb10%
  }{}
\DeclareFontFamily{U}{euex}{}
\DeclareFontShape{U}{euex}{m}{n}{%
  <5-8>sfixed\AmsFonts@@scale euex7<8><9>gen\AmsFonts@@scale euex%
  <10><10.95><12><14.4><17.28><20.74><24.88>s\AmsFonts@@scale euex10%
  }{}
\DeclareFontFamily{U}{eus}{\skewchar\font'60}
\DeclareFontShape{U}{eus}{m}{n}{%
  <5><6><7><8><9>gen\AmsFonts@@scale eusm%
  <10><10.95><12><14.4><17.28><20.74><24.88>s\AmsFonts@@scale eusm10%
  }{}
\DeclareFontShape{U}{eus}{b}{n}{%
  <5><6><7><8><9>gen\AmsFonts@@scale eusb%
  <10><10.95><12><14.4><17.28><20.74><24.88>s\AmsFonts@@scale eusb10%
  }{}
```

\hbar Redefine \hbar, so it is like $h$ (amsmath defines a different shape). The trick is from [6]

```
\DeclareRobustCommand\hbar{{%
 \dimen@.04em%
 \dimen@ii.06em%
 \def\@tempa##1##2{{%
   \lower##1\dimen@\rlap{\kern##1\dimen@ii\the##2 0\char22}}}%
 \mathchoice\@tempa\@ne\textfont
            \@tempa\@ne\textfont
            \@tempa\defaultscriptratio\scriptfont
            \@tempa\defaultscriptscriptratio\scriptscriptfont
  h}}
```

⟨/style⟩

## 3.5 Some Auxiliary Files

In the OT1 encoding we want upcase Greek

```
⟨*jamot1hax⟩
\relax

Upcase Greek for OT1

\metrics

% Moved equal sign
\resetglyph{equal}
\movert{130}
\glyph{equal}{1000}
```

```
\resetwidth{\add{\width{equal}}{120}}
\endsetglyph


\unsetglyph{Gamma}
\setglyph{Gamma}
\glyph{Gamma1}{1000}
\endsetglyph
\unsetglyph{Delta}
\setglyph{Delta}
\glyph{Delta1}{1000}
\endsetglyph
\unsetglyph{Theta}
\setglyph{Theta}
\glyph{Theta1}{1000}
\endsetglyph
\unsetglyph{Theta}
\setglyph{Theta}
\glyph{Theta1}{1000}
\endsetglyph
\unsetglyph{Lambda}
\setglyph{Lambda}
\glyph{Lambda1}{1000}
\endsetglyph
\unsetglyph{Xi}
\setglyph{Xi}
\glyph{Xi1}{1000}
\endsetglyph
\unsetglyph{Pi}
\setglyph{Pi}
\glyph{Pi1}{1000}
\endsetglyph
\unsetglyph{Sigma}
\setglyph{Sigma}
\glyph{Sigma1}{1000}
\endsetglyph
\unsetglyph{Upsilon}
\setglyph{Upsilon}
\glyph{Upsilon1}{1000}
\endsetglyph
\unsetglyph{Phi}
\setglyph{Phi}
\glyph{Phi1}{1000}
\endsetglyph
\unsetglyph{Psi}
\setglyph{Psi}
\glyph{Psi1}{1000}
\endsetglyph
\unsetglyph{Omega}
\setglyph{Omega}
```

```
\glyph{Omega1}{1000}
\endsetglyph


\endmetrics
```
⟨/jamot1hax⟩

This main idea is taken from [7]. We changed the parameters, of course.

⟨∗jamomlhax⟩
```
\relax

These hacks help adjust the positioning of accents on italic
characters and some sidebearings

\metrics

% Expanding a little J
\resetglyph{J}
\movert{70}
\glyph{J}{1000}
\resetwidth{\add{\width{J}}{50}}
\endsetglyph


% Expanding a little j
\resetglyph{j}
\movert{170}
\glyph{j}{1000}
\resetwidth{\add{\width{j}}{200}}
\endsetglyph


% Expanding a little f
\resetglyph{f}
\movert{150}
\glyph{f}{1000}
\resetwidth{\add{\width{f}}{200}}
\endsetglyph


% Expanding a little l
\resetglyph{l}
\movert{50}
\glyph{l}{1000}
\resetwidth{\add{\width{l}}{50}}
\endsetglyph


% Expanding a little m
\resetglyph{m}
```

```
\glyph{m}{1000}
\resetwidth{\add{\width{m}}{50}}
\endsetglyph
\endsetglyph
\endsetglyph
\endsetglyph
% Adding italic correction
\setcommand\additalic#1#2{\resetglyph{#1}\glyph{#1}{1000}\resetitalic{\add{\italic{#1}}{#2}}\en
\additalic{B}{75}
\additalic{C}{50}
\additalic{D}{75}
\additalic{E}{75}
\additalic{F}{75}
\additalic{G}{50}
\additalic{H}{75}
\additalic{I}{50}
\additalic{J}{50}
\additalic{K}{75}
\additalic{M}{75}
\additalic{N}{75}
\additalic{O}{25}
\additalic{P}{25}
\additalic{Q}{25}
\additalic{R}{25}
\additalic{S}{50}
\additalic{T}{75}
\additalic{U}{50}
\additalic{V}{50}
\additalic{W}{50}
\additalic{X}{50}
\additalic{Y}{50}
\additalic{Z}{50}
\additalic{a}{25}
\additalic{d}{75}
\additalic{i}{75}
\additalic{j}{75}
\additalic{k}{25}
\additalic{l}{50}
\additalic{r}{50}
\additalic{v}{-300}
\additalic{beta}{50}
\additalic{delta}{75}
\additalic{zeta}{50}
\additalic{theta}{50}
\additalic{xi}{50}
```

```
\additalic{phi}{50}


% \skewkern sets a skewchar kern, assuming that tie is the skewchar.
\setcommand\skewkern#1#2{\resetkern{#1}{tie}{#2}}


% We need to check that tie is defined
\ifisglyph{tie}\then\else\setglyph{tie}\endsetglyph\fi


\skewkern{A}{75}
\skewkern{B}{70}
\skewkern{C}{100}
\skewkern{D}{50}
\skewkern{E}{75}
\skewkern{F}{75}
\skewkern{G}{100}
\skewkern{H}{50}
\skewkern{I}{100}
\skewkern{J}{120}
\skewkern{K}{75}
\skewkern{M}{25}
\skewkern{N}{50}
\skewkern{O}{100}
\skewkern{P}{100}
\skewkern{Q}{100}
\skewkern{R}{100}
\skewkern{S}{100}
\skewkern{T}{50}
\skewkern{U}{50}
\skewkern{V}{50}
\skewkern{W}{50}
\skewkern{X}{50}
\skewkern{Y}{50}
\skewkern{Z}{50}
\skewkern{a}{75}
\skewkern{c}{75}
\skewkern{d}{100}
\skewkern{e}{75}
\skewkern{f}{140}
\skewkern{g}{75}
\skewkern{i}{75}
\skewkern{j}{120}
\skewkern{l}{100}
\skewkern{m}{40}
\skewkern{n}{50}
\skewkern{o}{75}
\skewkern{p}{75}
\skewkern{q}{75}
```

```
\skewkern{r}{50}
\skewkern{s}{80}
\skewkern{t}{50}
\skewkern{u}{75}
\skewkern{v}{-80}
\skewkern{w}{75}
\skewkern{x}{50}
\skewkern{y}{50}
\skewkern{z}{50}
\skewkern{dotlessi}{50}
\skewkern{dotlessj}{120}
\skewkern{Gamma}{100}
\skewkern{Delta}{200}
\skewkern{Theta}{100}
\skewkern{Lambda}{200}
\skewkern{Xi}{125}
\skewkern{Pi}{100}
\skewkern{Sigma}{100}
\skewkern{Upsilon}{100}
\skewkern{Phi}{100}
\skewkern{Psi}{50}
\skewkern{Omega}{100}
%\skewkern{alpha}{50}
\skewkern{beta}{75}
\skewkern{gamma}{25}
\skewkern{delta}{100}
\skewkern{epsilon1}{75}
\skewkern{zeta}{50}
\skewkern{eta}{25}
\skewkern{theta}{50}
%\skewkern{iota}{50}
%\skewkern{kappa}{50}
%\skewkern{lambda}{50}
\skewkern{mu}{35}
%\skewkern{nu}{50}
\skewkern{xi}{75}
%\skewkern{pi}{50}
\skewkern{rho}{75}
\skewkern{sigma}{25}
\skewkern{tau}{25}
% \skewkern{upsilon}{-25}
\skewkern{phi}{125}
\skewkern{chi}{50}
\skewkern{psi}{50}
\skewkern{omega}{25}
\skewkern{epsilon}{50}
%\skewkern{theta1}{50}
%\skewkern{omega1}{50}
\skewkern{rho1}{50}
%\skewkern{sigma1}{75}
```

```
\skewkern{lscript}{75}
\skewkern{weierstrass}{60}


\endmetrics
⟨/jamomlhax⟩
```

**Acknowledgements** This package was commissioned by *Magnes Press,* `http://www.magnespress.co.il`. I am greatly indebted to Eva Goldman for the patient testing of the fonts.

# References

[1] Richard Kinch. *Free replacement for basic MathTime fonts*, August 1998. `http://www.ctan.org/tex-archive/fonts/belleek/`.

[2] Paul Pichaureau. *The Math Design Fonts*, April 2005. `http://www.ctan.org/tex-archive/fonts/mathdesign/`.

[3] Karl Berry. *Fontname. Filenames For TEX Fonts*, September 2005. `http://www.ctan.tug.org/tex-archive/info/fontname`.

[4] Philipp Lehman. *The Font Installation Guide*, December 2004. `http://www.ctan.org/tex-archive/info/Type1fonts/fontinstallationguide`.

[5] Alan Hoenig. *TEX Unbound: LATEX and TEX Strategies for Fonts, Graphics, and More*. Oxford University Press, USA, 1998.

[6] Walter Schmidt. *Using Common PostScript Fonts With LATEX. PSNFSS Version 9.2*, September 2004. `http://ctan.tug.org/tex-archive/macros/latex/required/psnfss`.

[7] Alan Hoenig. *The MathInst Package (version 1.0): New Math Fonts for TEX*, August 1998. `http://mirrors.ctan.org/fonts//utilities/mathinst/`.

# Change History

# Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.