

# fontch

Macros for changing fonts and sizes in plain T<sub>E</sub>X

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## Description

This package allows, in plain T<sub>E</sub>X, to change with a single command the size of all fonts that are used for text input and math input. Main text fonts of sizes 8, 10, 12, 14, 20 and 24 points are available. Fonts of sizes 5, 6, 7 and 9 points are used in subscripts and subscripts of subscripts of other main sizes. In addition fontch gives support to:

- Boldface math-italic and boldface math symbols,
- T1 Latin Modern fonts,
- TS1 companion symbol fonts.
- AMS fonts for boldface math,
- Double Stroke fonts for blackboard bold symbols

## Requirements

No special requirements are needed for using the original OT1 Computer Modern fonts.

- In order to use the options for T1 Latin Modern fonts and the companion TS1 symbol fonts, you need to have installed the Latin Modern fonts of version 1.000 or larger. Older versions of LM fonts, where the cork encoded fonts had names as cork-lmr10 (instead of ec-lmr10) are compatible only with fontch-2.0. You can find the old package in  
CTAN:/tex-archive/obsolete/macros/plain/contrib/fontch20.tar.gz
- In order to use the option for boldface math symbols you need to have the AMS fonts installed.
- In order to use the option for blackboard bold symbols you need to have the Double Stroke fonts installed.

## Components

The fontch V2.2 package is composed of the following files:

README	– text file with this same information
fontch.tex	– main macros
bsymbols.tex	– macros for boldface symbols
TS1mac.texr	– macros for the TS1 companion symbols
DSmac.tex	– auxiliary file for the DStroke option
fontch.pdf	– manual of fontch
fontch_doc.tex	– source of manual

## Installation

You have only to put the macro files fontch.tex, bsymbols.tex, TS1mac.tex and DSmac.tex in any sensible place inside the texmf tree, like

```
.../texmf/tex/plain/fontch/
```

It is also commendable to put the files README and fontch.pdf in a proper place such as

```
.../texmf/doc/plain/fontch/
```

## Usage

For using fontch.tex with the original TeX OT1 fonts (Computer Modern) just put at the beginning of the document:

```
\input fontch.tex
```

The file `bsymbols.tex` provides macro definitions for boldface versions of math symbols. For using it just input the file where you need it.

The `fontch` package has four options for handling different kinds of fonts:

<code>LMTone</code>	for Latin Modern T1 fonts.
<code>LMTSone</code>	for the TS1 companion symbol font.
<code>AMSfont</code>	for AMS fonts used for boldface math.
<code>DStroke</code>	for Doublestroke fonts providing blackboard-boldface symbols.

The four options are independent. They are activated by setting the corresponding variable before calling `fontch.tex`. For example for activating all the four options and using the macros for bold math put at the beginning of the document:

```
\let\AMSfont\relax
\let\DStroke\relax
\let\LMTone\relax
\let\LMTSone\relax
\input fontch.tex
\input bsymbols.tex
```

## General Commands

Here we treat those features of `fontch` that are common to all options. First we have to say that there is one modification of the standard behavior of plain  $\TeX$ . Plain  $\TeX$  defines for the font #3 the same font (`tenex`) for text, script and scriptscript. That is awful. The `fontch` package uses `sevenex` for script and `fiveex` for scriptscript, as  $\TeX$  does for the other fonts.

The package `fontch` defines the following commands valid for any option.

Commands for changing font size:

<code>\eightpoint</code>	– Change to small type
<code>\tenpoint</code>	– Change to normal type
<code>\twelvepoint</code>	– Change to large type
<code>\fourteenpoint</code>	– Change to very large type
<code>\twentypoint</code>	– Change to huge type
<code>\twentyfourpoint</code>	– Change to immense type

Commands for changing family, most of them already in plain  $\TeX$ :

<code>\rm</code>	– Roman
<code>\sl</code>	– Slanted
<code>\it</code>	– Italic
<code>\bf</code>	– Boldface
<code>\tt</code>	– Teletype
<code>\sf</code>	– Sans Serif (new)
<code>\sc</code>	– Small Caps
<code>\cal</code>	– Calligraphic
<code>\mit</code>	– Math Italic
<code>\mb</code>	– Math Boldface (new)
<code>\bcal</code>	– Boldface calligraphic (new)
<code>\oldstyle</code>	– Old style digits
<code>\boldstyle</code>	– Boldface old style digits (new)
<code>\setmathbold</code>	– Set families 1 and 2 to <code>cmmib</code> and <code>cmmbsy</code> (new)
<code>\unsetmathbold</code>	– Reset families 1 and 2 to <code>cmmi</code> and <code>cmmsy</code> (new)

Command for changing line spacing:

<code>\doublespace</code>	– Double space for ten and twelve points
---------------------------	--

The scope of these commands is the group defined by the braces. The commands for changing size are active until a new changing size command is given. The initial size is `tenpoint` and the initial family is `roman`. The commands for changing family are active until a new changing family command is given. The changing size commands reset the family to `\rm` and the double space to single space.

Since the changing size commands modify the parameters that control the spacing between lines and between words, unpredictable results are obtained if they are given in the middle of a paragraph. Nevertheless

inside a paragraph it is still possible to use the T<sub>E</sub>X font commands of the form `\size+family`, where *size* is one from five, six, seven, eight, nine, ten, twelve, fourteen, twenty or twentyfour and *family* is one from rm, sl, it, bf, tt, ss or csc (e.g. `\twelvess`). Here ss represents the sans serif family and csc the small caps family.

For example the following text

```
\eightpoint
This well known formula of physics is due to {\it Newton}
$$ \vec F = m \vec a $$
```

```
\twentyfourpoint
This well known formula of physics is due to {\it Newton}
$$ \vec F = m \vec a $$
```

```
\fourteenpoint
Many books use boldface letters instead of arrows for indicating vectors,
$$ {\mb F} = m {\mb a} $$
```

yields:

This well known formula of physics is due to *Newton*

$$\vec{F} = m\vec{a}$$

This well known formula of physics is due to  
*Newton*

$$\vec{F} = m\vec{a}$$

Many books use boldface letters instead of arrows for indicating vectors,

$$\mathbf{F} = m\mathbf{a}$$

Another example using the sans serif family,

```
The orthogonal matrix {\sf A} satisfies the relation
$$ {\sf A}^t {\sf A} = \mathbf{I} $$
```

yields

The orthogonal matrix A satisfies the relation

$$A^t A = I$$

## AMS fonts

Only the cmcs, cmmib, cmbsy and cmex AMS fonts are supported. These are used for small caps and for boldface math-italic and boldface greek symbols. The other AMS fonts like the Euler, Cyrillic and extra symbols are not supported.

## Boldface math

There are two main uses of boldface math. One case is the use of isolated boldface characters or symbols inside a formula. For this case fontch provides bold versions of math symbols and the macro `\mb` for bold math-italic characters. The plain T<sub>E</sub>X macro `\bf` yields roman-bold characters in math mode. The name of the bold version of a math symbol is obtained adding the prefix `\bf` to the name of the normal symbol. For example a boldface italic “a” (***a***) is `{\mb a}`, a boldface roman “P” (**P**) is `{\bf P}`, a boldface  $\sigma$  ( **$\sigma$** ) is `\bfsigma`, a boldface `\iff` ( $\iff$ ) is `\bfiff`.

The other case is when one wants to write a complete formula in boldface, for example inside a title. For this case fontch has the macro `\setmathbold` that changes the font families 1 (cmmi) and 2 (cmsy) to the

bold versions cmmib and cmmsy. The macro `\unsetmathbold` resets the families 1 and 2 to their original values. These macros should be put before and after the formula.

Usually the macro `\setmathbold` does not change the whole formula to boldface. This is due to the fact that in math mode some symbols come from family #0 (cmr) or #3 (cmex) such as “+” or `\int`. Fontch provides macros for the symbols that come from family #0, For example the bold version of “(” is `\bflparen`.

Math symbols of family #3 (cmex) do not have bold versions. In particular `\int`, `\sum` and `\prod`. Nevertheless `\smallint` is of cmsy and does have a bold version.

The macros for boldface math symbols are defined in the file `bsymbols.tex`. The macros for the bold version of symbols that don’t have a keyword are

<code>\bfexcl</code>	!
<code>\bflparen</code>	(
<code>\bfrparen</code>	)
<code>\bfplus</code>	+
<code>\bfcomma</code>	,
<code>\bfcolon</code>	:
<code>\bfsemicolon</code>	;
<code>\bfequal</code>	=
<code>\bflbraket</code>	[
<code>\bfrbraket</code>	]
<code>\bflt</code>	<
<code>\bfslash</code>	/
<code>\bfgt</code>	>
<code>\bfminus</code>	-
<code>\bfvert</code>	

For example the following text

```
\twelvepoint
\centerline{\bf Newton’s Sencod Law, \setmathbold $\vec F\bfequal m \vec a$
\unsetmathbold}
```

yields

$$\text{Newton’s Second Law, } \vec{F} = m\vec{a}$$

## Double Stroke option

The `DStroke` option loads the Double Stroke fonts, that provide blackboard-boldface capital letters. Only the roman Double Stroke font is supported. The sans serif version is not supported. There is only a command associated to this option

`\ds` – Double Stroke

For example

```
$$ {\ds N}\subset {\ds Z}\subset {\ds Q}\subset {\ds R}\subset {\ds C} $$
```

yields

$$\mathbb{N} \subset \mathbb{Z} \subset \mathbb{Q} \subset \mathbb{R} \subset \mathbb{C}$$

## T1 encoded Latin Modern fonts

The `LMTone` option loads the T1 encoded Latin Modern fonts, which are used for text input. Math input is still done with the CM OT1 fonts. Using the translation files `il1-t1.tcx` or `il2-t1.tcx` it is possible to write a latin1 or latin2 encoded `.tex` file, without bothering about accents and special characters. This is not only more convenient for writing the file, but usually it is also required for a proper behavior of the hyphenation procedures. For example

```
%& -translate-file=il1-t1.tcx
\let\LMTone\relax
\input fontch.tex
```

¡Esto está escrito en español! ¿no es cómodo?

yields

¡Esto está escrito en español! ¿no es cómodo?

## Commands of the LM T1 option

The LMTone option of fontch redefines the following plain T<sub>E</sub>X commands: `\i`, `\j`, `\ae`, `\AE`, `\oe`, `\OE`, `\o`, `\O`, `\ss`, `\SS`, `\aa`, `\AA`, `\l`, `\L`, `\Gamma`, `\Delta`, `\Theta`, `\Lambda`, `\Xi`, `\Pi`, `\Phi`, `\Sigma`, `\Upsilon`, `\Psi`, `\Omega`, `\hbar`.

Fontch defines new T1 commands for non-latin1 characters

<code>\lh</code>	I	
<code>\Lh</code>	L	
<code>\dh</code>	d	
<code>\th</code>	t	
<code>\dbar</code>	đ	
<code>\Edh</code>	Đ	
<code>\edh</code>	đ	
<code>\ij</code>	ij	
<code>\IJ</code>	IJ	
<code>\nj</code>	ñ	
<code>\NJ</code>	Ñ	
<code>\thorn</code>	þ	
<code>\Thorn</code>	Þ	
<code>\smallzero</code>	o	
<code>\lguille</code>	<	(don't appear in ill-t1.tcx)
<code>\rguille</code>	>	(don't appear in ill-t1.tcx)
<code>\vispace</code>	□	

The following plain T<sub>E</sub>X text accents are redefined:

`\``, `\´`, `\^`, `\~`, `\¨`, `\H`, `\v`, `\u`, `\=`, `\.`, `\b`, `\c`

The following plain T<sub>E</sub>X math-accents are redefined:

`\acute`, `\grave`, `\ddot`, `\tilde`, `\bar`, `\breve`, `\check`, `\hat`, `\dot`.

New T1 text accents re defined:

<code>\r</code>	– ring accent
<code>\k</code>	– ogonek

Finally a new T1 math-accent is defined

`\ring`

## Commands of the LM T<sub>S</sub>1 option

The T<sub>S</sub>1 option defines a macro for accessing the T<sub>S</sub>1 symbols by their position in the table,

`\tcchar{#1}` – Character of T<sub>S</sub>1 table

Some plain T<sub>E</sub>X commands are redefined:

<code>\t{#1}</code>	– tie-after-accent
<code>\P</code>	¶
<code>\S</code>	§
<code>\dag</code>	†
<code>\ddag</code>	‡
<code>\copyright</code>	©

There is a macro for most of the T<sub>S</sub>1 symbols, Some are text versions of symbols of the math mode. The macros are in increasing charcode order:

<code>\arrowl</code>	←
<code>\arrowr</code>	→
<code>\blank</code>	␣
<code>\dollar</code>	\$
<code>\caster</code>	*
<code>\sequals</code>	=
<code>\anglel</code>	<
<code>\angler</code>	>

<code>\mho</code>	Ω
<code>\bigcircle</code>	○
<code>\Ohm</code>	Ω
<code>\bbracketl</code>	⌈
<code>\bbracketr</code>	⌋
<code>\arrowu</code>	↑
<code>\arowd</code>	↓
<code>\textstar</code>	*
<code>\born</code>	∅
<code>\died</code>	†
<code>\leaf</code>	♻️
<code>\married</code>	∞
<code>\music</code>	♪
<code>\doublevert</code>	∥
<code>\perthousand</code>	‰
<code>\bull</code>	•
<code>\centigrade</code>	°C
<code>\olddollar</code>	\$
<code>\oldcent</code>	¢
<code>\florin</code>	f
<code>\Colon</code>	Ⓒ
<code>\won</code>	₩
<code>\naira</code>	₦
<code>\guarani</code>	₧
<code>\peso</code>	₪
<code>\lira</code>	₺
<code>\recipe</code>	℞
<code>\interrobang</code>	‡
<code>\gnaborretni</code>	Ⱬ
<code>\dong</code>	₫
<code>\TM</code>	™
<code>\pertenth</code>	‱
<code>\npilcrow</code>	¶
<code>\baht</code>	฿
<code>\numero</code>	№
<code>\abzueglich</code>	℥
<code>\aestimated</code>	€
<code>\openbull</code>	◦
<code>\SM</code>	SM
<code>\qbrackl</code>	{
<code>\qbrackr</code>	}
<code>\cent</code>	¢
<code>\sterling</code>	£
<code>\currency</code>	₪
<code>\yen</code>	¥
<code>\brokenvert</code>	⌋
<code>\feminine</code>	♀
<code>\copyleft</code>	©
<code>\lognot</code>	¬
<code>\circledP</code>	Ⓟ
<code>\registered</code>	®
<code>\degree</code>	°
<code>\plusminus</code>	±
<code>\twoup</code>	²

<code>\threeup</code>	3
<code>\micro</code>	$\mu$
<code>\centereddot</code>	$\cdot$
<code>\reference</code>	$\ast$
<code>\oneup</code>	1
<code>\masculine</code>	$\circ$
<code>\root</code>	$\sqrt{\quad}$
<code>\onequarter</code>	$\frac{1}{4}$
<code>\onehalf</code>	$\frac{1}{2}$
<code>\threequarters</code>	$\frac{3}{4}$
<code>\euro</code>	€
<code>\texttimes</code>	×

## History

### *Modifications from version 2.1*

Version 2.2 is a minor correction version. Some minor corrections of the README file. The main change is the inclusion of the `fontch.pdf` documentation file.

### *Modifications from version 2.0*

Version 2.1 is a minor bug correction version. The main change is the change in the name of the cork-encoded LM font files to the new naming conventions (cork-lmr10 -> ec-lmr10, etc.). Fontch-2.1 is compatible with LM-1.000 or newer versions. Older versions of LM fonts are not compatible.

### *Modifications from version 1.3*

Version 2.0 is a mayor revision. There are many improvements such as

- Proper handling of smallcaps
- Support for bold-math
- Support for AMS fonts
- Support for blackboard boldface
- Correction of bugs and scaling.

## Bugs

Comments and bugs reports are welcome at [rmedina@ivic.gob.ve](mailto:rmedina@ivic.gob.ve).

## Copyright

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