

# Using T<sub>E</sub>X Fonts in the Gnuplot Postscript Terminal

Harald Harders, [h.harders@tu-bs.de](mailto:h.harders@tu-bs.de)

2003-03-03

The Postscript terminal can embed Postscript Type 1 fonts (with extensions `.pfa` and `.pfb`) and TrueType fonts (extension `.ttf`)<sup>1</sup> using the command

```
set terminal postscript fontfile '<filename>'
```

The `fontfile` option can be used multiple times. See the sections *set terminal postscript* and *set fontpath* in the Gnuplot documentation for further description.

The embedded font can be used by

```
set terminal postscript '<fontname>' <size>
```

or in postscript enhanced terminal as following example:

```
set xlabel '{/CMMI10 x}'
```

Among other things, the font embedding is useful for generating plots to be included in L<sup>A</sup>T<sub>E</sub>X documents. For normal text, the *cm-super* Postscript Type 1 fonts are a good choice. They are available from CTAN servers, e.g.

```
ftp://ftp.dante.de/tex-archive/fonts/ps-type1/cm-super/
```

The normal upright font with serifes is defined in `sfrm1000.pfb`, and the font name is `SFRM1000`<sup>2</sup> (The 1000 means that this font is designed for 10pt). Replace the `rm` by `it`, `bx` or other combinations in both the file name and the font name (here, in uppercase letters) in order to get other font shapes. The encoding of these fonts is ordinary and thus is not described here. Table 1 shows some examples of fonts contained in the *cm-super* font bundle.

For mathematics the Type 1 versions of the Computer Modern fonts are useful. They should be installed in most T<sub>E</sub>X implementations and are also available from CTAN servers, e.g.

```
ftp://ftp.dante.de/tex-archive/fonts/cm/ps-type1/bluesky/pfb/
```

Here, the font name is the base of the file name in uppercase letters, e.g. the file `cmmi10.pfb` contains the font `CMMI10`. Since the encoding of these fonts is strange, a table containing all characters for some fonts follows. The font `CMEX10` contains large symbols for mathematics. They overlap sometimes in the table. Since the baseline of the `CMEX10` font is at the top of the signs, Gnuplot defines a font `CMEX10-Baseline` with a different baseline if `CMEX10` is embedded (normally by using `fontfile 'cmex10.pfb'`). In contrast to the other fonts, `CMEX10` is only available in the design size 10pt.

You can access all characters of the fonts by typing their octal code. To get a ♥ symbol, you may type:

```
set label '{/CMSY10 \176}' at graph 0.5,0.5
```

---

<sup>1</sup>If `.pfb` and `.ttf` fonts really can be embedded depends on your gnuplot installation: It needs to be able to handle pipes.

<sup>2</sup>If you have an old version of the *cm-super* font, prior 2001-10-14, the font name is in lowercase letters: `sfrm1000`. You should update to a new version.

Table 1: Some fonts in the cm-super font bundle (for a designsizes of 10pt)

| File name    | Full font name<br>(all preceded by <b>Computer Modern</b> ) | Example               |
|--------------|---|-----------------------|
| sfrm1000.pfb | Roman   | Example               |
| sfbx1000.pfb | Bold Extended   | <b>Example</b>        |
| sfti1000.pfb | Italic  | <i>Example</i>        |
| sfbi1000.pfb | Bold Extended Italic  | <b><i>Example</i></b> |
| sfsi1000.pfb | Slanted   | <i>Example</i>        |
| sfbl1000.pfb | Bold Extended Slanted                                       | <b><i>Example</i></b> |
| sfcc1000.pfb | Caps and Small Caps   | <b>EXAMPLE</b>        |
| sfss1000.pfb | Sans Serif  | Example               |
| sfsi1000.pfb | Sans Serif Slanted  | <i>Example</i>        |
| sfsx1000.pfb | Sans Serif Bold Extended                                    | <b>Example</b>        |
| sfso1000.pfb | Sans Serif Bold Extended Slanted                            | <b><i>Example</i></b> |
| sftt1000.pfb | Typewriter  | Example               |
| sfit1000.pfb | Typewriter Italic   | <i>Example</i>        |
| sfst1000.pfb | Typewriter Slanted  | <i>Example</i>        |
| sftc1000.pfb | Typewriter Caps and Small Caps                              | <b>EXAMPLE</b>        |

Since characters with an octal number below `\040` can't be displayed by some postscript interpreters, these characters are repeated in the Computer Modern Fonts with a larger code. Thus, you should use the larger number, where two octal numbers are given (e.g. `\000, \241`). For example, you better use

```
set xlabel '{/CMR10 \242}'
```

than

```
set xlabel '{/CMR10 \001}'
```

to get an upright uppercase Delta  $\Delta$ .

| Oct        | CMR10 | CMT10 | CMTT10 | CMMI10 | CMU10 | CMSS10 | CMTEX10 | CMFF10 | CMSY10 | LASY10 | CMEX10-Baseline | Oct        | Dec    |
|------------|-------|-------|--------|--------|-------|--------|---------|--------|--------|--------|-----------------|------------|--------|
| \000, \241 | Γ     | Γ     | Γ      | Γ      | Γ     | Γ      | ·       | Γ      | —      |        | (               | \000, \241 | 0, 161 |
| \001, \242 | Δ     | Δ     | Δ      | Δ      | Δ     | Δ      | ↓       | Δ      | ·      | Δ      | )               | \001, \242 | 1, 162 |
| \002, \243 | Θ     | Θ     | Θ      | Θ      | Θ     | Θ      | α       | Θ      | ×      | Δ      | [               | \002, \243 | 2, 163 |
| \003, \244 | Λ     | Λ     | Λ      | Λ      | Λ     | Λ      | β       | Λ      | *      | ▽      | ]               | \003, \244 | 3, 164 |
| \004, \245 | Ξ     | Ξ     | Ξ      | Ξ      | Ξ     | Ξ      | Λ       | Ξ      | ÷      | ▽      | [               | \004, \245 | 4, 165 |
| \005, \246 | Π     | Π     | Π      | Π      | Π     | Π      | ¬       | Π      | ◇      |        | ]               | \005, \246 | 5, 166 |
| \006, \247 | Σ     | Σ     | Σ      | Σ      | Σ     | Σ      | €       | Σ      | ±      |        | [               | \006, \247 | 6, 167 |
| \007, \250 | Υ     | Υ     | Υ      | Υ      | Υ     | Υ      | π       | Υ      | ≠      |        | ]               | \007, \250 | 7, 168 |

| Oct        | CMR10 | CMTH10 | CMTT10 | CMMI10 | CMU10 | CMSS10 | CMTEX10 | CMFF10 | CMSY10 | LASY10 | CMEX10-Baseline | Oct        | Dec     |
|------------|-------|--------|--------|--------|-------|--------|---------|--------|--------|--------|-----------------|------------|---------|
| \010, \251 | Φ     | Φ      | Φ      | Φ      | Φ     | Φ      | λ       | Φ      | ⊕      |        | {               | \010, \251 | 8, 169  |
| \011, \252 | Ψ     | Ψ      | Ψ      | Ψ      | Ψ     | Ψ      | γ       | ψ      | ⊖      |        | }               | \011, \252 | 9, 170  |
| \012, \255 | Ω     | Ω      | Ω      | Ω      | Ω     | Ω      | δ       | Ω      | ⊗      |        | <               | \012, \255 | 10, 173 |
| \013, \256 | ff    | ff     | ↑      | α      | ff    | ff     | ↑       | π      | ⊗      |        | >               | \013, \256 | 11, 174 |
| \014, \257 | fi    | fi     | ↓      | β      | fi    | fi     | ±       | π      | ⊙      |        |                 | \014, \257 | 12, 175 |
| \015, \260 | fl    | fl     | '      | γ      | fl    | fl     | ⊖       | π      | ○      |        |                 | \015, \260 | 13, 176 |
| \016, \261 | ffi   | ffi    | ı      | δ      | ffi   | ffi    | ⊖       | π      | ◦      |        | /               | \016, \261 | 14, 177 |
| \017, \262 | ffl   | ffl    | ˆ      | ε      | ffl   | ffl    | ∂       | π      | •      |        | \               | \017, \262 | 15, 178 |
| \020, \263 | ı     | ı      | ı      | ζ      | ı     | ı      | ı       | ı      | ×      |        | (               | \020, \263 | 16, 179 |
| \021, \264 | J     | J      | J      | η      | J     | J      | ı       | J      | ≡      |        | )               | \021, \264 | 17, 180 |
| \022, \265 | '     | '      | '      | θ      | '     | '      | ı       | '      | ı      |        | (               | \022, \265 | 18, 181 |
| \023, \266 | '     | '      | '      | ι      | '     | '      | ı       | '      | ı      |        | )               | \023, \266 | 19, 182 |
| \024, \267 | '     | '      | '      | κ      | '     | '      | ı       | '      | ı      |        | )               | \024, \267 | 20, 183 |
| \025, \270 | '     | '      | '      | λ      | '     | '      | ı       | '      | ı      |        | }               | \025, \270 | 21, 184 |
| \026, \271 | '     | '      | '      | μ      | '     | '      | ı       | '      | ı      |        | }               | \026, \271 | 22, 185 |
| \027, \272 | ◦     | ◦      | ◦      | ν      | ◦     | ◦      | ı       | '      | ı      |        | }               | \027, \272 | 23, 186 |
| \030, \273 | ˆ     | ˆ      | ˆ      | ξ      | ˆ     | ˆ      | ı       | ˆ      | ı      |        | }               | \030, \273 | 24, 187 |
| \031, \274 | ß     | ß      | ß      | π      | ß     | ß      | ı       | ß      | ≈      |        | }               | \031, \274 | 25, 188 |
| \032, \275 | æ     | æ      | æ      | ρ      | æ     | æ      | ≠       | æ      | ∩      |        | }               | \032, \275 | 26, 189 |
| \033, \276 | œ     | œ      | œ      | σ      | œ     | œ      | ◊       | œ      | ∪      |        | }               | \033, \276 | 27, 190 |
| \034, \277 | ø     | ø      | ø      | τ      | ø     | ø      | ≤       | ø      | ≪      |        | }               | \034, \277 | 28, 191 |
| \035, \300 | Æ     | Æ      | Æ      | υ      | Æ     | Æ      | ≥       | Æ      | ≫      |        | }               | \035, \300 | 29, 192 |
| \036, \301 | Œ     | Œ      | Œ      | φ      | Œ     | Œ      | ≡       | Œ      | ↗      |        | }               | \036, \301 | 30, 193 |
| \037, \302 | Ø     | Ø      | Ø      | χ      | Ø     | Ø      | ∨       | Ø      | ↘      |        | }               | \037, \302 | 31, 194 |
| \040, \303 | ˆ     | ˆ      | ˆ      | ψ      | ˆ     | ˆ      | '       | '      | ↑      |        | }               | \040, \303 | 32, 195 |
| \041       | !     | !      | !      | ω      | !     | !      | !       | !      | →      |        | }               | \041       | 33      |
| \042       | ”     | ”      | ”      | ε      | ”     | ”      | ”       | ”      | ↑      |        | }               | \042       | 34      |
| \043       | #     | #      | #      | ∂      | #     | #      | #       | #      | ↓      |        | }               | \043       | 35      |
| \044       | \$    | £      | \$     | ⌘      | £     | \$     | \$      | \$     | ↔      |        | }               | \044       | 36      |
| \045       | %     | %      | %      | ℓ      | %     | %      | %       | %      | ↗      |        | }               | \045       | 37      |
| \046       | &     | €      | &      | ς      | €     | &      | &       | &      | ↘      |        | }               | \046       | 38      |
| \047       | ,     | ,      | ,      | φ      | ,     | ,      | ,       | ,      | ℓ      |        | }               | \047       | 39      |
| \050       | (     | (      | (      | ⌞      | (     | (      | (       | (      | ⇐      | <      | }               | \050       | 40      |
| \051       | )     | )      | )      | ⌞      | )     | )      | )       | )      | ⇒      | >      | }               | \051       | 41      |
| \052       | *     | *      | *      | ⌞      | *     | *      | *       | *      | ⇐      | ^      | }               | \052       | 42      |
| \053       | +     | +      | +      | →      | +     | +      | +       | +      | ⇐      | <      | }               | \053       | 43      |
| \054       | ,     | ,      | ,      | ˆ      | ,     | ,      | ,       | ,      | ⇐      |        | }               | \054       | 44      |
| \055       | -     | -      | -      | ˆ      | -     | -      | -       | -      | ↗      |        | }               | \055       | 45      |
| \056       | .     | .      | .      | ▷      | .     | .      | .       | .      | ↘      |        | }               | \056       | 46      |

| Oct  | CMR10 | CMTH10 | CMTT10 | CMMI10 | CMU10 | CMSS10 | CMTEX10 | CMFF10 | CMSY10 | LASY10 | CMEX10-Baseline | Oct  | Dec |
|------|-------|--------|--------|--------|-------|--------|---------|--------|--------|--------|-----------------|------|-----|
| \057 | /     | /      | /      | ◁      | /     | /      | /       | /      | ∞      | ∪      | \               | \057 | 47  |
| \060 | 0     | 0      | 0      | o      | 0     | 0      | 0       | 0      | ′      | ∩      | /               | \060 | 48  |
| \061 | 1     | 1      | 1      | 1      | 1     | 1      | 1       | 1      | ∞      | ⊗      | \               | \061 | 49  |
| \062 | 2     | 2      | 2      | 2      | 2     | 2      | 2       | 2      | ∈      | □      | ⌈               | \062 | 50  |
| \063 | 3     | 3      | 3      | 3      | 3     | 3      | 3       | 3      | ∋      | ◇      | ⌋               | \063 | 51  |
| \064 | 4     | 4      | 4      | 4      | 4     | 4      | 4       | 4      | △      |        | ⌋               | \064 | 52  |
| \065 | 5     | 5      | 5      | 5      | 5     | 5      | 5       | 5      | ▽      |        | ⌋               | \065 | 53  |
| \066 | 6     | 6      | 6      | 6      | 6     | 6      | 6       | 6      | /      |        | ⌋               | \066 | 54  |
| \067 | 7     | 7      | 7      | 7      | 7     | 7      | 7       | 7      | ′      |        | ⌋               | \067 | 55  |
| \070 | 8     | 8      | 8      | 8      | 8     | 8      | 8       | 8      | ∀      |        | ⌋               | \070 | 56  |
| \071 | 9     | 9      | 9      | 9      | 9     | 9      | 9       | 9      | ∃      |        | ⌋               | \071 | 57  |
| \072 | :     | :      | :      | .      | :     | :      | :       | :      | ⌊      | ~      | ⌋               | \072 | 58  |
| \073 | ;     | ;      | ;      | ,      | ;     | ;      | ;       | ;      | ∅      | ~      | ⌋               | \073 | 59  |
| \074 | i     | i      | <      | <      | i     | i      | <       | i      | ℜ      | □      | ⌋               | \074 | 60  |
| \075 | =     | =      | =      | /      | =     | =      | =       | =      | ℑ      | □      | ⌋               | \075 | 61  |
| \076 | ı     | ı      | >      | >      | ı     | ı      | >       | ı      | ⊤      |        | ⌋               | \076 | 62  |
| \077 | ?     | ?      | ?      | ★      | ?     | ?      | ?       | ?      | ⊥      |        | ⌋               | \077 | 63  |
| \100 | @     | @      | @      | ∂      | @     | @      | @       | @      | ℵ      |        | ⌋               | \100 | 64  |
| \101 | A     | A      | A      | A      | A     | A      | A       | A      | ℳ      |        | ⌋               | \101 | 65  |
| \102 | B     | B      | B      | B      | B     | B      | B       | B      | ℬ      |        | ⌋               | \102 | 66  |
| \103 | C     | C      | C      | C      | C     | C      | C       | C      | ℭ      |        | ⌋               | \103 | 67  |
| \104 | D     | D      | D      | D      | D     | D      | D       | D      | ℰ      |        | ⌋               | \104 | 68  |
| \105 | E     | E      | E      | E      | E     | E      | E       | E      | ℰ      |        | ⌋               | \105 | 69  |
| \106 | F     | F      | F      | F      | F     | F      | F       | F      | ℱ      |        | ⌋               | \106 | 70  |
| \107 | G     | G      | G      | G      | G     | G      | G       | G      | ℳ      |        | ⌋               | \107 | 71  |
| \110 | H     | H      | H      | H      | H     | H      | H       | H      | ℋ      |        | ⌋               | \110 | 72  |
| \111 | I     | I      | I      | I      | I     | I      | I       | I      | ℐ      |        | ⌋               | \111 | 73  |
| \112 | J     | J      | J      | J      | J     | J      | J       | J      | ℐ      |        | ⌋               | \112 | 74  |
| \113 | K     | K      | K      | K      | K     | K      | K       | K      | ℳ      |        | ⌋               | \113 | 75  |
| \114 | L     | L      | L      | L      | L     | L      | L       | L      | ℳ      |        | ⌋               | \114 | 76  |
| \115 | M     | M      | M      | M      | M     | M      | M       | M      | ℳ      |        | ⌋               | \115 | 77  |
| \116 | N     | N      | N      | N      | N     | N      | N       | N      | ℳ      |        | ⌋               | \116 | 78  |
| \117 | O     | O      | O      | O      | O     | O      | O       | O      | ℳ      |        | ⌋               | \117 | 79  |
| \120 | P     | P      | P      | P      | P     | P      | P       | P      | ℳ      |        | ⌋               | \120 | 80  |
| \121 | Q     | Q      | Q      | Q      | Q     | Q      | Q       | Q      | ℳ      |        | ⌋               | \121 | 81  |
| \122 | R     | R      | R      | R      | R     | R      | R       | R      | ℳ      |        | ⌋               | \122 | 82  |
| \123 | S     | S      | S      | S      | S     | S      | S       | S      | ℳ      |        | ⌋               | \123 | 83  |
| \124 | T     | T      | T      | T      | T     | T      | T       | T      | ℳ      |        | ⌋               | \124 | 84  |
| \125 | U     | U      | U      | U      | U     | U      | U       | U      | ℳ      |        | ⌋               | \125 | 85  |

|      | CMEX10-Baseline |        |        |        |       |        |         |        |        |        |              |          |
|------|-----------------|--------|--------|--------|-------|--------|---------|--------|--------|--------|--------------|----------|
| Oct  | CMR10           | CMTH10 | CMTT10 | CMMI10 | CMU10 | CMSS10 | CMTEX10 | CMFF10 | CMSY10 | LASY10 | Oct          | Dec      |
| \126 | V               | V      | v      | V      | V     | V      | v       | V      | V      |        | $\wedge$     | \126 86  |
| \127 | W               | W      | w      | W      | W     | W      | w       | W      | W      | $\vee$ |              | \127 87  |
| \130 | X               | X      | x      | X      | X     | X      | x       | X      | X      |        | $\Sigma$     | \130 88  |
| \131 | Y               | Y      | Y      | Y      | Y     | Y      | Y       | Y      | Y      |        | $\Pi$        | \131 89  |
| \132 | Z               | Z      | Z      | Z      | Z     | Z      | Z       | Z      | Z      |        | $\int$       | \132 90  |
| \133 | [               | [      | [      | b      | [     | [      | [       | [      | U      |        | $\cup$       | \133 91  |
| \134 | “               | “      | \      | b      | “     | “      | \       | “      | U      |        | $\cap$       | \134 92  |
| \135 | ]               | /      | ]      | #      | ]     | ]      | ]       | ]      | ⊕      |        | $\oplus$     | \135 93  |
| \136 | ^               | ^      | ^      | (      | ^     | ^      | ^       | ^      | ^      |        | $\wedge$     | \136 94  |
| \137 | .               | .      | .      | )      | .     | .      | .       | .      | ^      |        | $\vee$       | \137 95  |
| \140 | ‘               | ‘      | ‘      | ℓ      | ‘     | ‘      | ‘       | ‘      | ⊥      |        | $\Pi$        | \140 96  |
| \141 | a               | a      | a      | a      | a     | a      | a       | a      | ⊥      |        | $\Pi$        | \141 97  |
| \142 | b               | b      | b      | b      | b     | b      | b       | b      | ⊥      |        | $\wedge$     | \142 98  |
| \143 | c               | c      | c      | c      | c     | c      | c       | c      | ⊥      |        | $\wedge$     | \143 99  |
| \144 | d               | d      | d      | d      | d     | d      | d       | d      | ⊥      |        | $\sim$       | \144 100 |
| \145 | e               | e      | e      | e      | e     | e      | e       | e      | ⊥      |        | $\sim$       | \145 101 |
| \146 | f               | f      | f      | f      | f     | f      | f       | f      | {      |        | $\sim$       | \146 102 |
| \147 | g               | g      | g      | g      | g     | g      | g       | g      | }      |        |              | \147 103 |
| \150 | h               | h      | h      | h      | h     | h      | h       | h      | <      |        | $\lceil$     | \150 104 |
| \151 | i               | i      | i      | i      | i     | i      | i       | i      | >      |        | $\lceil$     | \151 105 |
| \152 | j               | j      | j      | j      | j     | j      | j       | j      |        |        | $\lceil$     | \152 106 |
| \153 | k               | k      | k      | k      | k     | k      | k       | k      |        |        | $\lceil$     | \153 107 |
| \154 | l               | l      | l      | l      | l     | l      | l       | l      | ↕      |        | $\lceil$     | \154 108 |
| \155 | m               | m      | m      | m      | m     | m      | m       | m      | ↕      |        | $\lceil$     | \155 109 |
| \156 | n               | n      | n      | n      | n     | n      | n       | n      | \      |        | $\{$         | \156 110 |
| \157 | o               | o      | o      | o      | o     | o      | o       | o      | ?      |        | $\{$         | \157 111 |
| \160 | p               | p      | p      | p      | p     | p      | p       | p      | √      |        | $\checkmark$ | \160 112 |
| \161 | q               | q      | q      | q      | q     | q      | q       | q      | Π      |        | $\checkmark$ | \161 113 |
| \162 | r               | r      | r      | r      | r     | r      | r       | r      | ∇      |        | $\checkmark$ | \162 114 |
| \163 | s               | s      | s      | s      | s     | s      | s       | s      | ∫      |        | $\checkmark$ | \163 115 |
| \164 | t               | t      | t      | t      | t     | t      | t       | t      | ⊥      |        | $\checkmark$ | \164 116 |
| \165 | u               | u      | u      | u      | u     | u      | u       | u      | ⊥      |        | $\checkmark$ | \165 117 |
| \166 | v               | v      | v      | v      | v     | v      | v       | v      | ⊥      |        | $\checkmark$ | \166 118 |
| \167 | w               | w      | w      | w      | w     | w      | w       | w      | ⊥      |        | $\checkmark$ | \167 119 |
| \170 | x               | x      | x      | x      | x     | x      | x       | x      | §      |        | ↑            | \170 120 |
| \171 | y               | y      | y      | y      | y     | y      | y       | y      | †      |        | ↓            | \171 121 |
| \172 | z               | z      | z      | z      | z     | z      | z       | z      | ‡      |        | ˆ            | \172 122 |
| \173 | —               | —      | {      | ?      | —     | —      | {       | —      | ¶      |        | ˆ            | \173 123 |
| \174 | —               | —      |        | j      | —     | —      |         | —      | ♣      |        | ˆ            | \174 124 |

---

| Oct        | CMR10 | CMTH10 | CMTT10 | CMMI10 | CMU10 | CMSS10 | CMTEX10 | CMFF10 | CMSY10 | LASY10 | CMEX10-Baseline | Oct        | Dec      |
|------------|-------|--------|--------|--------|-------|--------|---------|--------|--------|--------|-----------------|------------|----------|
| \175       | "     | "      | ⌋      | Ⓢ      | "     | "      | ⌋       | "      | ◇      |        | ↖               | \175       | 125      |
| \176       | ˜     | ˜      | ˜      | ↓      | ˜     | ˜      | ˜       | ˜      | ♡      |        | ↗               | \176       | 126      |
| \177, \304 | ˙     | ˙      | ˙      | )      | ˙     | ˙      | ∫       | ˙      | ♠      |        | ↘               | \177, \304 | 127, 196 |

---