Using TEX Fonts in the Gnuplot Postscript Terminal

Harald Harders, 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`)[1] 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 LATEX 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`[2] (The `1000` means that this font is designed for 10 pt). 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 TEX 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 10 pt.

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
```

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

[2] 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 designsize of 10 pt)

File name	Full font name (all preceded by `Computer Modern`)	Example
`sfrm1000.pfb`	`Roman`	Example
`sfbx1000.pfb`	`Bold Extended`	**Example**
`sfti1000.pfb`	`Italic`	*Example*
`sfbi1000.pfb`	`Bold Extended Italic`	***Example***
`sfsl1000.pfb`	`Slanted`	*Example*
`sfbl1000.pfb`	`Bold Extended Slanted`	***Example***
`sfcc1000.pfb`	`Caps and Small Caps`	EXAMPLE
`sfss1000.pfb`	`Sans Serif`	Example
`sfsi1000.pfb`	`Sans Serif Slanted`	*Example*
`sfsx1000.pfb`	`Sans Serif Bold Extended`	**Example**
`sfso1000.pfb`	`Sans Serif Bold Extended Slanted`	***Example***
`sftt1000.pfb`	`Typewriter`	`Example`
`sfit1000.pfb`	`Typewriter Italic`	*`Example`*
`sfst1000.pfb`	`Typewriter Slanted`	*`Example`*
`sftc1000.pfb`	`Typewriter Caps and Small Caps`	EXAMPLE

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

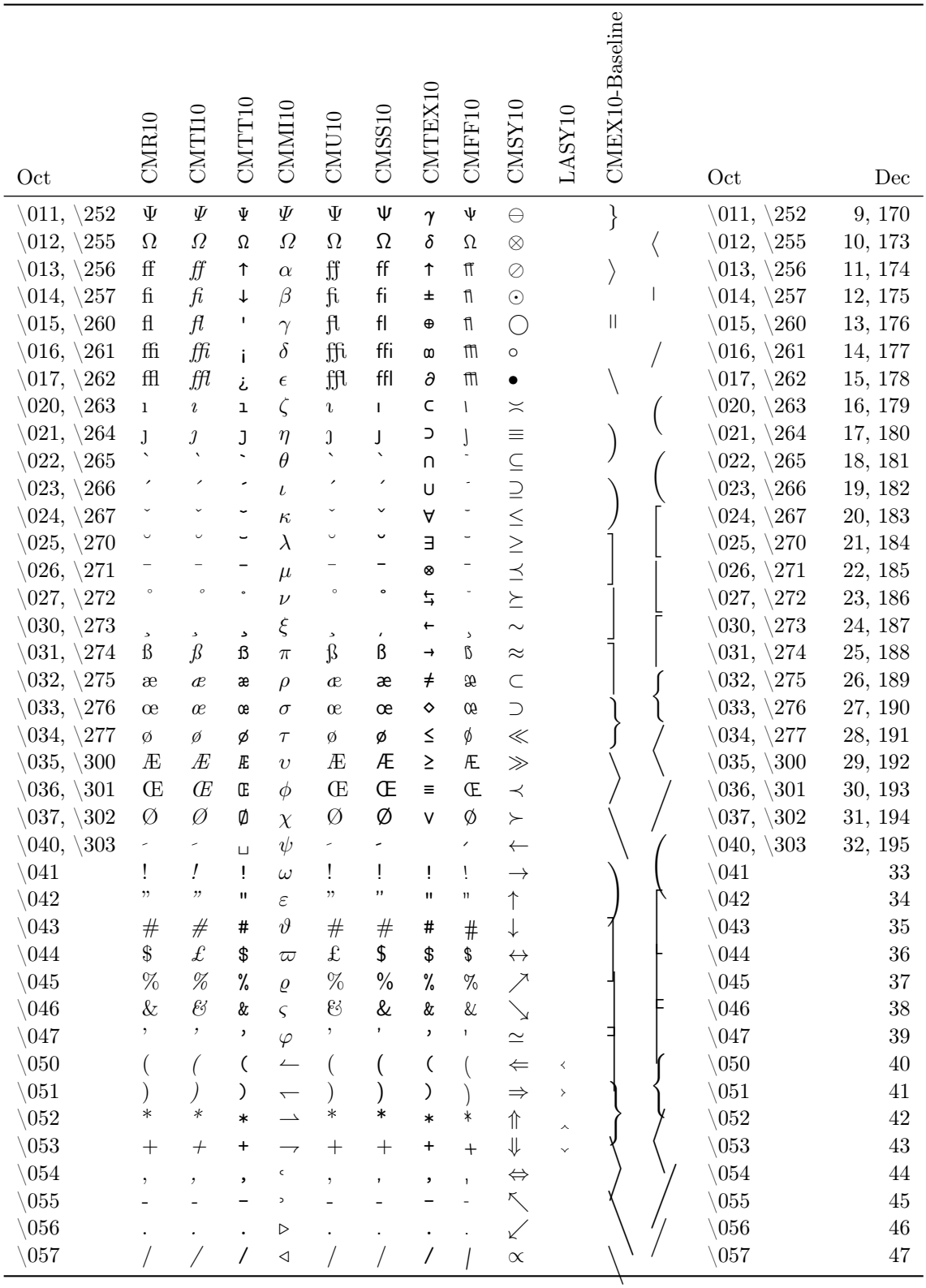
```
set xlabel '{/CMR10 \242}'
```

than

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

to get an upright uppercase Delta Δ.

Oct	CMR10	CMTI10	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	·	◁	)		\001, \242	1, 162
\002, \243	Θ	*Θ*	Θ	*Θ*	Θ	Θ	*α*	Θ	×	◁		[	\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	∧	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
\010, \251	Φ	*Φ*	Φ	*Φ*	Φ	Φ	*λ*	Φ	⊕			{	\010, \251	8, 169


Oct
CMR10
CMTI10
CMTT10
CMMI10
CMU10
CMSS10
CMTEX10
CMFF10
CMSY10
LASY10
CMEX10-Baseline
Oct
Dec
\011, \252
9, 170
\012, \255
10, 173
\013, \256
11, 174
\014, \257
12, 175
\015, \260
13, 176
\016, \261
14, 177
\017, \262
15, 178
\020, \263
16, 179
\021, \264
17, 180
\022, \265
18, 181
\023, \266
19, 182
\024, \267
20, 183
\025, \270
21, 184
\026, \271
22, 185
\027, \272
23, 186
\030, \273
24, 187
\031, \274
25, 188
\032, \275
26, 189
\033, \276
27, 190
\034, \277
28, 191
\035, \300
29, 192
\036, \301
30, 193
\037, \302
31, 194
\040, \303
32, 195
\041
33
\042
34
\043
35
\044
36
\045
37
\046
38
\047
39
\050
40
\051
41
\052
42
\053
43
\054
44
\055
45
\056
46
\057
47

Oct	CMR10	CMTI10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMSY10	LASY10	CMEX10-Baseline		Oct	Dec
\060	0	*0*	0	0	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	¡	*¡*	<	<	¡	¡	<	¡	ℜ	⊏		⎩	\074	60
\075	=	=	=	/	=	=	=	=	ℑ	⊐		⎧	\075	61
\076	¿	*¿*	>	>	¿	¿	>	¿	⊤		⎫	⎪	\076	62
\077	?	*?*	?	⋆	?	?	?	?	⊥		⎪		\077	63
\100	@	*@*	@	∂	@	@	@	@	ℵ			⎭	\100	64
\101	A	*A*	A	*A*	A	A	A	A	*A*		⎭	⎪	\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	*D*			⟨	\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	*G*		⨆		\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	*J*			⊙	\112	74
\113	K	*K*	K	*K*	K	K	K	K	*K*		⊙		\113	75
\114	L	*L*	L	*L*	L	L	L	L	*L*			⊕	\114	76
\115	M	*M*	M	*M*	M	M	M	M	*M*		⊕		\115	77
\116	N	*N*	N	*N*	N	N	N	N	*N*			⊗	\116	78
\117	O	*O*	O	*O*	O	O	O	O	*O*		⊗		\117	79
\120	P	*P*	P	*P*	P	P	P	P	*P*			∑	\120	80
\121	Q	*Q*	Q	*Q*	Q	Q	Q	Q	*Q*		∏		\121	81
\122	R	*R*	R	*R*	R	R	R	R	*R*			∫	\122	82
\123	S	*S*	S	*S*	S	S	S	S	*S*		⋃		\123	83
\124	T	*T*	T	*T*	T	T	T	T	*T*			⋂	\124	84
\125	U	*U*	U	*U*	U	U	U	U	*U*		⊎		\125	85
\126	V	*V*	V	*V*	V	V	V	V	*V*			⋀	\126	86

Oct	CMR10	CMTI10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMSY10	LASY10	CMEX10-Baseline		Oct	Dec
\127	W	*W*	W	*W*	W	W	W	W	$\mathcal{W}$		$\bigvee$	$\sum$	\127	87
\130	X	*X*	X	*X*	X	X	X	X	$\mathcal{X}$		$\prod$	$\int$	\130	88
\131	Y	*Y*	Y	*Y*	Y	Y	Y	Y	$\mathcal{Y}$		$\bigcup$	$\bigcap$	\131	89
\132	Z	*Z*	Z	*Z*	Z	Z	Z	Z	$\mathcal{Z}$		$\biguplus$	$\bigwedge$	\132	90
\133	[	*fi*	[	♭	[	[	[	⌊	$\cup$		$\bigvee$	$\coprod$	\133	91
\134	“	“	\	♮	“	“	\	”	$\supset$		$\coprod$	^	\134	92
\135	]	*fl*	]	♯	]	]	]	⌋	$\uplus$		^		\135	93
\136	^	^	^	‿	^	^	^	^	$\wedge$			~	\136	94
\137	·	·	_	⁀	·	·	_	·	$\vee$		~		\137	95
\140	‘	‘	‘	*ℓ*	‘	‘	‘	‘	$\vdash$			$\frown$	\140	96
\141	a	*a*	a	*a*	a	a	a	a	$\dashv$		$\frown$		\141	97
\142	b	*b*	b	*b*	b	b	b	b	⌊			$\frown$	\142	98
\143	c	*c*	c	*c*	c	c	c	c	⌋		$\frown$		\143	99
\144	d	*d*	d	*d*	d	d	d	d	⌈		~	~	\144	100
\145	e	*e*	e	*e*	e	e	e	e	⌉		~		\145	101
\146	f	*f*	f	*f*	ſ	f	f	f	{			$\{$	\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*	ı	i	i	ı	⟩		$\rceil$		\151	105
\152	j	*j*	j	*j*	j	j	j	j	∣			$\lfloor$	\152	106
\153	k	*k*	k	*k*	k	k	k	k	∥		$\rfloor$		\153	107
\154	l	*l*	l	*l*	l	l	l	l	↕			$\lceil$	\154	108
\155	m	*m*	m	*m*	m	m	m	m	⇕		$\rceil$		\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	√			√	\160	112
\161	q	*q*	q	*q*	q	q	q	q	∐		√		\161	113
\162	r	*r*	r	*r*	r	r	r	r	∇			√	\162	114
\163	s	*s*	s	*s*	s	s	s	s	∫		√	√	\163	115
\164	t	*t*	t	*t*	t	t	t	t	⊔		√	√	\164	116
\165	u	*u*	u	*u*	u	u	u	u	⊓				\165	117
\166	v	*v*	v	*v*	v	v	v	v	⊑			⌜	\166	118
\167	w	*w*	w	*w*	w	w	w	w	⊒		=		\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	‡			‿	\172	122
\173	–	–	{	*ı*	–	–	{	–	¶		‿		\173	123
\174	—	—	|	*ȷ*	—	—	|	—	♣			‿	\174	124
\175	″	″	}	℘	″	″	}	˝	♢		‿		\175	125

Oct	CMR10	CMTI10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMSY10	LASY10	CMEX10-Baseline		Oct	Dec
\176	˜	˜	˜	⇀	˜	˜	˜	˜	♡			⇑	\176	126
\177, \304	¨	¨	¨	⌢	¨	¨	∫	¨	♠		⇓		\177, \304	127, 196