

Using T_EX 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 L^AT_EX 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 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_EX 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
```

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

²If 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 (all preceded by <code>Computer Modern</code>)	Example
<code>sfrm1000.pfb</code>	Roman	Example
<code>sfbx1000.pfb</code>	Bold Extended	Example
<code>sfti1000.pfb</code>	Italic	<i>Example</i>
<code>sfbi1000.pfb</code>	Bold Extended Italic	<i>Example</i>
<code>sfs11000.pfb</code>	Slanted	<i>Example</i>
<code>sfbl1000.pfb</code>	Bold Extended Slanted	<i>Example</i>
<code>sfcc1000.pfb</code>	Caps and Small Caps	EXAMPLE
<code>sfss1000.pfb</code>	Sans Serif	Example
<code>sfsi1000.pfb</code>	Sans Serif Slanted	<i>Example</i>
<code>sfsx1000.pfb</code>	Sans Serif Bold Extended	Example
<code>sfso1000.pfb</code>	Sans Serif Bold Extended Slanted	<i>Example</i>
<code>sftt1000.pfb</code>	Typewriter	Example
<code>sfit1000.pfb</code>	Typewriter Italic	<i>Example</i>
<code>sfst1000.pfb</code>	Typewriter Slanted	<i>Example</i>
<code>sftc1000.pfb</code>	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	CMT10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMST10	LAS10	CMEX10-Baseline	Oct	Dec
<code>\000, \241</code>	Γ	Γ	Γ	Γ	Γ	Γ	\cdot	Γ	$-$			<code>(\000, \241</code>	0, 161
<code>\001, \242</code>	Δ	Δ	Δ	Δ	Δ	Δ	\downarrow	Δ	\cdot	Δ	)	<code>\001, \242</code>	1, 162
<code>\002, \243</code>	Θ	Θ	Θ	Θ	Θ	Θ	α	Θ	\times	Δ	[	<code>\002, \243</code>	2, 163
<code>\003, \244</code>	Λ	Λ	Λ	Λ	Λ	Λ	β	Λ	$*$	∇]	<code>\003, \244</code>	3, 164
<code>\004, \245</code>	Ξ	Ξ	Ξ	Ξ	Ξ	Ξ	\wedge	Ξ	\div	∇	[<code>\004, \245</code>	4, 165
<code>\005, \246</code>	Π	Π	Π	Π	Π	Π	\neg	Π	\diamond		]	<code>\005, \246</code>	5, 166
<code>\006, \247</code>	Σ	Σ	Σ	Σ	Σ	Σ	ϵ	Σ	\pm		[	<code>\006, \247</code>	6, 167
<code>\007, \250</code>	Υ	Υ	Υ	Υ	Υ	Υ	π	Υ	\mp		]	<code>\007, \250</code>	7, 168
<code>\010, \251</code>	Φ	Φ	Φ	Φ	Φ	Φ	λ	Φ	\oplus		{	<code>\010, \251</code>	8, 169

Oct	CMR10	CMTH10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMSY10	LASY10	CMEX10-Baseline	Oct	Dec
\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	i	δ	ffi	ffi	⊖	π	◦		/	\016, \261	14, 177
\017, \262	ffl	ffl	ι	ε	ffl	ffl	∂	π	•		\	\017, \262	15, 178
\020, \263	ı	ı	ı	ζ	ı	ı	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	ς	ς	ς	ξ	ς	ς	ı	ς	ς	ς	}	\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	λ		}	\036, \301	30, 193
\037, \302	Ø	Ø	Ø	χ	Ø	Ø	∨	Ø	Υ		}	\037, \302	31, 194
\040, \303	ˆ	ˆ	ˆ	ψ	ˆ	ˆ	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	&	ℳ	&	ς	ℳ	&	&	&	↘		}	\046	38
\047	,	,	,	φ	,	,	,	,	ℓ		}	\047	39
\050	(	(	(	⌞	(	(	(	(	⇐	<	}	\050	40
\051	)	)	)	⌟	)	)	)	)	⇒	>	}	\051	41
\052	*	*	*	⌠	*	*	*	*	⇑	^	}	\052	42
\053	+	+	+	→	+	+	+	+	⇓	˘	}	\053	43
\054	,	,	,	˘	,	,	,	,	⇔		}	\054	44
\055	-	-	-	˘	-	-	-	-	↗		}	\055	45
\056	.	.	.	▷	.	.	.	.	↘		}	\056	46
\057	/	/	/	◁	/	/	/	/	∝		}	\057	47

	CMEX10-Baseline												
Oct	CMR10	CMTH10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMSY10	LASY10		Oct	Dec
\060	0	0	0	0	0	0	0	0	'	U	/	\060	48
\061	1	1	1	1	1	1	1	1	∞	\boxtimes	\	\061	49
\062	2	2	2	2	2	2	2	2	\in	\square	[	\062	50
\063	3	3	3	3	3	3	3	3	\ni	\diamond	]	\063	51
\064	4	4	4	4	4	4	4	4	\triangle		|	\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	\forall		/	\070	56
\071	9	9	9	9	9	9	9	9	\exists		)	\071	57
\072	:	:	:	.	:	:	:	:	\neg	\sim	)	\072	58
\073	;	;	;	,	;	;	;	;	\emptyset	\leadsto	)	\073	59
\074	i	i	<	<	i	i	<	i	\Re	\sqsubset	}	\074	60
\075	=	=	=	/	=	=	=	=	\Im	\sqsupset	}	\075	61
\076	i	i	>	>	i	i	>	i	\top		}	\076	62
\077	?	?	?	*	?	?	?	?	\perp		|	\077	63
\100	@	@	@	∂	@	@	@	@	\aleph		/	\100	64
\101	A	A	A	A	A	A	A	A	\mathcal{A}		)	\101	65
\102	B	B	B	B	B	B	B	B	\mathcal{B}		|	\102	66
\103	C	C	C	C	C	C	C	C	\mathcal{C}		|	\103	67
\104	D	D	D	D	D	D	D	D	\mathcal{D}		<	\104	68
\105	E	E	E	E	E	E	E	E	\mathcal{E}		>	\105	69
\106	F	F	F	F	F	F	F	F	\mathcal{F}		\sqcup	\106	70
\107	G	G	G	G	G	G	G	G	\mathcal{G}		\sqcup	\107	71
\110	H	H	H	H	H	H	H	H	\mathcal{H}		\S	\110	72
\111	I	I	I	I	I	I	I	I	\mathcal{I}		\S	\111	73
\112	J	J	J	J	J	J	J	J	\mathcal{J}		\odot	\112	74
\113	K	K	K	K	K	K	K	K	\mathcal{K}		\odot	\113	75
\114	L	L	L	L	L	L	L	L	\mathcal{L}		\oplus	\114	76
\115	M	M	M	M	M	M	M	M	\mathcal{M}		\oplus	\115	77
\116	N	N	N	N	N	N	N	N	\mathcal{N}		\otimes	\116	78
\117	O	O	O	O	O	O	O	O	\mathcal{O}		\otimes	\117	79
\120	P	P	P	P	P	P	P	P	\mathcal{P}		Σ	\120	80
\121	Q	Q	Q	Q	Q	Q	Q	Q	\mathcal{Q}		Π	\121	81
\122	R	R	R	R	R	R	R	R	\mathcal{R}		\int	\122	82
\123	S	S	S	S	S	S	S	S	\mathcal{S}		\cup	\123	83
\124	T	T	T	T	T	T	T	T	\mathcal{T}		\cap	\124	84
\125	U	U	U	U	U	U	U	U	\mathcal{U}		\uplus	\125	85
\126	V	V	V	V	V	V	V	V	\mathcal{V}		\wedge	\126	86

	CMR10	CMTH10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMSY10	LASY10	CMEX10-Baseline				
Oct												Oct		Dec	
\127	W	W	w	W	W	W	w	W	W		∇	\127		87	
\130	X	X	x	X	X	X	x	X	X		Σ	\130		88	
\131	Y	Y	Y	Y	Y	Y	Y	Y	Y		Π	\131		89	
\132	Z	Z	Z	Z	Z	Z	Z	Z	Z		∫	\132		90	
\133	[	[	[	b	[	[	[	[	U		U	\133		91	
\134	“	“	\	h	“	“	\	“	U		U	\134		92	
\135	]	/	]	#	]	]	]	]	⊕		⊕	\135		93	
\136	^	^	^	(	^	^	^	^	^		^	\136		94	
\137	.	.	.	)	.	.	.	.	^		^	\137		95	
\140	‘	‘	‘	ℓ	‘	‘	‘	‘	∇		∇	\140		96	
\141	a	a	a	a	a	a	a	a	⊥		Π	\141		97	
\142	b	b	b	b	b	b	b	b	⊥		⊥	\142		98	
\143	c	c	c	c	c	c	c	c	⊥		⊥	\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	f	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	⊂			\150		104	
\151	i	i	i	i	i	i	i	i	⊃			\151		105	
\152	j	j	j	j	j	j	j	j	|			\152		106	
\153	k	k	k	k	k	k	k	k	||			\153		107	
\154	l	l	l	l	l	l	l	l	↕			\154		108	
\155	m	m	m	m	m	m	m	m	↕			\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	Π		√	\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	‡		ˆ	\172		122	
\173	—	—	{	ι	—	—	{	—	¶		ˆ	\173		123	
\174	—	—	|	j	—	—	|	—	♣		ˆ	\174		124	
\175	”	”	}	⋈	”	”	}	”	◇		ˆ	\175		125	

Oct	CMR10	CMTH10	CMTT10	CMMI10	CMU10	CMSS10	CMTEX10	CMFF10	CMSY10	LASY10	CMEX10-Baseline	Oct	Dec
\176	~	~	~	~	~	~	~	~	♡		↗	\176	126
\177, \304	:	:	:	)	:	:	∫	:	♠		↘	\177, \304	127, 196
