

The Symbol Font `wasy`

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The font `wasy` contains all `lasy` characters, and a lot more symbols. New characters were modified from the `mf` files of the standard `TeX` fonts, and many were designed from scratch. Metafont sources for 5–10pt and a bold 10pt font are available.

An extension to PLAIN-`TeX` for using the fonts is included in the file `wasyfont.tex`. This can probably be used in `LATEX` documents, but a new `LATEX` format with the bindings already included and with `wasy` replacing the `lasy` font would be the superior solution. This version includes all `lasy` characters at the proper codes (causing some incompatibilities with version 1 of `wasy`) to make such a procedure easy. The file `wasyfont.2` contains substitutes for some macros of `wasyfont.tex` to be used at installations, that do not support the `wasy` fonts.

A list of characters with their bindings in `wasyfont.tex` follows. Some macros are actually compositions of several characters useful in the given context. Macros using symbols which are already available from standard `TeX` fonts are also included; these are marked with `*`.

general symbols

<code>\male</code>	♂	<code>\female</code>	♀
<code>\currency</code>	⌘	<code>\cent</code>	¢
<code>\lozenge</code>	⌘	<code>\kreuz</code>	✝
<code>\smiley</code>	☺	<code>\blacksmiley</code>	☹
<code>\frownie</code>	☹	<code>\sun</code>	☼
<code>\checked</code>	✓	<code>\brokenvert</code>	‡
<code>\diameter</code>	∅	<code>\invdiameter</code>	∅
<code>\phone</code>	☎	<code>\recorder</code>	Ⓛ
<code>\clock</code>	⌚	<code>\permil</code>	‰
<code>\bell</code>	🔔	<code>\ataribox</code>	Ⓛ
<code>\pointer</code>	☞	<code>\lightning</code>	⚡
<code>\agem0</code>	U		

diagrams

<code>\photon</code>	~~~~~	<code>\gluon</code>	⊗⊗⊗⊗
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music notes

<code>\eighthnote</code>	♪	<code>\quarternote</code>	♩
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`\halfnote` ♩ `\fullnote` ◦
`\twonotes` ♪

electrical engineering

`\AC` ~ `\HF` ≈
`\VHF` ≅

APL

<code>\APLup</code>	△	<code>\APLdown</code>	▽
<code>\APLbox</code>	□	<code>\APLinv</code>	⊠
<code>\APLleftarrowbox</code>	←	<code>\APLrightarrowbox</code>	→
<code>\APLuparrowbox</code>	↑	<code>\APLdownarrowbox</code>	↓
<code>\APLinput</code>	□	<code>\APLminus*</code>	−
<code>\APLlog</code>	⊗	<code>\APLstar</code>	*
<code>\APLvert*</code>		<code>\APLvert{\APLdown}</code>	∇
<code>\APLnot*</code>	~	<code>\APLnot{\APLdown}</code>	∇
<code>\APLnot{\land}</code>	∧	<code>\APLnot{\lor}</code>	∨
<code>\APLcirc*</code>	○	<code>\APLcirc{\bot}</code>	⊙
<code>\notbackslash*</code>	∖	<code>\notslash*</code>	/
<code>\APLcomment</code>	Ⓐ		

astronomy

<code>\ascnode</code>	♁	<code>\descnode</code>	♂
<code>\vernal</code>	♈	<code>\astrosun*</code>	☉
<code>\newmoon</code>	●	<code>\fullmoon</code>	○
<code>\leftmoon</code>	☾	<code>\rightmoon</code>	☽
<code>\mercury</code>	♿	<code>\venus</code>	♀
<code>\mars</code>	♂	<code>\jupiter</code>	♃
<code>\saturn</code>	♄	<code>\uranus</code>	♅
<code>\neptune</code>	♆	<code>\pluto</code>	♇
<code>\earth</code>	♁		

astrological symbols and zodiacal symbols

<code>\conjunction</code>	♌	<code>\opposition</code>	♍
<code>\aries</code>	♈	<code>\libra</code>	♎
<code>\taurus</code>	♉	<code>\scorpio</code>	♏
<code>\gemini</code>	♊	<code>\sagittarius</code>	♐
<code>\cancer</code>	♋	<code>\capricornus</code>	♑
<code>\leo</code>	♌	<code>\aquarius</code>	♒
<code>\virgo</code>	♍	<code>\pisces</code>	♓

geometrical shapes

<code>\hexstar</code>	✳	<code>\varhexstar</code>	✳
<code>\davidstar</code>	☆	<code>\APLstar</code>	✳
<code>\Circle</code>	○	<code>\CIRCLE</code>	●
<code>\Leftcircle</code>	◐	<code>\LEFTCIRCLE</code>	◐
<code>\Rightcircle</code>	◑	<code>\RIGHTCIRCLE</code>	◑
<code>\LEFTcircle</code>	◐	<code>\RIGHTcircle</code>	◑
<code>\LEFTarrow</code>	◀	<code>\RIGHTarrow</code>	▶
<code>\UParrow</code>	▲	<code>\DOWNarrow</code>	▼
<code>\Box</code>	□	<code>\APLbox</code>	□
<code>\XBox</code>	⊠	<code>\Bowtie</code>	⊠
<code>\Diamond</code>	◇	<code>\octagon</code>	⬡
<code>\hexagon</code>	⬡	<code>\varhexagon</code>	⬡
<code>\pentagon</code>	⬠		

general math & physics

<code>\varangle</code>	∠	<code>\$_\invneg\$</code>	⊖
<code>\leftturn</code>	↶	<code>\rightturn</code>	↷
<code>\diameter</code>	∅	<code>\therefore</code>	∴

math operators

<code>\$_\ocircle b</code>	$a \circ b$	<code>\$_\logof b</code>	$a \otimes b$
<code>\$_\oplus^* b</code>	$a \oplus b$	<code>\$_\otimes^* b</code>	$a \otimes b$
<code>\$_\le^* b</code>	$a \leq b$	<code>\$_\ge^* b</code>	$a \geq b$
<code>\$_\apprle b</code>	$a \lesssim b$	<code>\$_\apprge b</code>	$a \gtrsim b$
<code>\$_\lhd b</code>	$a \triangleleft b$	<code>\$_\rhd b</code>	$a \triangleright b$
<code>\$_\unlhd b</code>	$a \trianglelefteq b$	<code>\$_\unrhd b</code>	$a \trianglerighteq b$
<code>\$_\LHD b</code>	$a \blacktriangleleft b$	<code>\$_\RHD b</code>	$a \blacktriangleright b$
<code>\$_\sqsubset b</code>	$a \sqsubset b$	<code>\$_\sqsupset b</code>	$a \sqsupset b$
<code>\$_\sqsubseteq^* b</code>	$a \sqsubseteq b$	<code>\$_\sqsupseteq^* b</code>	$a \sqsupseteq b$
<code>\$_\propto^* b</code>	$a \propto b$	<code>\$_\varpropto b</code>	$a \propto b$
<code>\$_\leadsto b</code>	$a \rightsquigarrow b$		

integrals (text style)

<code>\$_\varint_a^b f(x)dx</code>	$\int_a^b f(x)dx$	<code>\$_\iint_a^b f(x)dx</code>	$\iint_a^b f(x)dx$
<code>\$_\iiint_a^b f(x)dx</code>	$\iiint_a^b f(x)dx$	<code>\$_\varoint_a^b f(x)dx</code>	$\oint_a^b f(x)dx$
<code>\$_\oiint_a^b f(x)dx</code>	$\oiint_a^b f(x)dx$		

integrals (display style)

$$\int \iint \iiint \oint \oiint$$

With the control sequence `\newpropto` you can change the proportional sign to the thin wasy symbol (\propto), which is more distinct from alpha (α) than the default symbol (\propto).

With the control sequence `\newint` you can change the T_EX integrals from \int, \oint to the vertical ones \int, \oint , in display:

$$\int_a^b \rightarrow \int_a^b, \quad \oint_C \rightarrow \oint_C$$

There are also a few letters in roman style added (although these and some symbols as \mathcal{U}, \mathcal{V} should be in a separate font, to be created in different styles like italic, sans serif etc. – the `wasychr.mf` source is prepared for that.

```
\thorn  þ      \Thorn  Þ
\dh     ð      \Dh*   Ð
\inve   ə      \openo  ɔ
```

Examples

“We provide the ♪♪, you provide the ☺”

The planets ($\odot \rightarrow$ outer space): ☿ ♀ ♂ ♂ asteroids ♃ ♅ ♂ ☿ ♁.

special characters on IBM PC's: ☺, ☹, ♥, ♦, ♣, ♠, ●, ○, ♂, ♀, ♪, ♫, ☼, ►, ◄, ⇕, !!, ¶, §, ==, ⇕, ↑, ↓, →, ←, ▲, ▼, †, ‡, ⋮, ...

special characters on Atari ST's: ♪, ♫, ✓, ⊕, ♣, ♪, ə, †, ‡, ⋮, ...

tube dimensions: $\varnothing 5 \text{ mm}, d = 0.5 \text{ mm}, l = 50 \text{ mm}$

display math:

$$\sphericalangle(\vec{a}, \vec{b}) = 30^\circ$$

$$\prod_{x \leq 5} a_x \otimes b_x \simeq \int_{x \geq 5} a \circ b \, dx \quad (\text{nonsense.1})$$

$$\text{Gauss' law: } \iiint_V \nabla \mathbf{F}(\mathbf{x}) \, d^3x = \iint_{S(V)} \mathbf{F}(\mathbf{x}) \, d\mathbf{a}$$

$$\text{Stokes' law: } \iint_A [\nabla \times \mathbf{F}(\mathbf{x})] \, d\mathbf{a} = \oint_{C(A)} \mathbf{F}(\mathbf{x}) \, d\mathbf{l}$$

APL Program:

`U ← -1 + G ← 2 × I N ← □` ♠ generate vectors of odd and even numbers

APL keyboard layout:

1	2	3	4	5	6	7	8	9	0	+	×	◇
Q	W	E	R	T	Y	U	I	O	P	←	→	

A S D F G H J K L [] #
 † Z X C V B N M , . /
 .. - < ≤ = ≥ > ≠ ∨ ∧ - ÷ \$
 ? ω ε ρ ~ ↑ ↓ √ ∘ * { }
 α ∫ ∫ ∩ ∪ ⊥ ∟ ∣ ; : \
 I √ ∇ ∆ ∅ ⊖ ⊕ ∞ ∞ ! ∞ ∞
 Q W E R T Y U I O P ∞ ∞
 A S D F G H J K L ∞ ∞
 Δ Z X C V B N M ∞ ∞

⊗
 ↑ ↓

simple phonetic notation: corner [ˈkɔːnə], this [ðis], thrash [θræʃ]

check the appropriate box like this ☒ or that ☑:

- I need the **wasy** fonts
- I don't need the **wasy** fonts

Font Table

wasy:

00 = Δ	01 = ◁	02 = ≍	03 = ▷	04 = ≎	05 = ∴	06 = ∅	07 = 🗿
08 = ✓	09 = ⇨	0A = ♣	0B = ♪	0C = ♫	0D = ♬	0E = ∘	0F = ♫
10 = ◀	11 = ▶	12 = ⚡	13 = Ω	14 = ∪	15 = ∩	16 = ⊕	17 = ∩
18 = ∟	19 = ♀	1A = ♂	1B = ∩	1C = ⊕	1D = ∞	1E = ∞	1F = ∅
20 = ●	21 = ☺	22 = ☻	23 = ○	24 = ☾	25 = ☽	26 = ☼	27 = ♀
28 = <	29 = >	2A = ^	2B = v	2C = ☺	2D = ☻	2E = ☼	2F = ☺
30 = ∪	31 = ∩	32 = □	33 = ◇	34 = ☒	35 = ☑	36 = ✖	37 = ◊
38 = ○	39 = ◊	3A = ~	3B = ~→	3C = □	3D = □	3E = ≍	3F = ≎
40 = ≈	41 = *	42 = *	43 = ☆	44 = ◇	45 = *	46 = ∇	47 = ◐
48 = ◐	49 = ◑	4A = ◒	4B = ▲	4C = ▼	4D = §	4E = €	4F = 3
50 = γ	51 = √	52 = √	53 = ⌘	54 = f	55 = ə	56 = ♂	57 = ♂
58 = 4	59 = h	5A = ♂	5B = ♀	5C = ♀	5D = ♂	5E = ∩	5F = ∅
60 = ∞	61 = ∞	62 = ∞	63 = ∞	64 = ∞	65 = ∞	66 = ∩	67 = ∅
68 = ‰	69 = p	6A = P	6B = ð	6C = ɔ	6D = ∞	6E = ↑	6F = ↓
70 = ∞	71 = ∞	72 = ∫	73 = ∫	74 = ∫	75 = ∫	76 = ∫	77 = ∫
78 = ∫	79 = ∫	7A = ∫	7B = ∫	7C = ∫	7D = ∫	7E = ∫	7F = ∞

wasyb:

00 = Δ	01 = \triangleleft	02 = \trianglelefteq	03 = \triangleright	04 = \trianglerighteq	05 = \therefore	06 = \oslash	07 = \heartsuit
08 = \surd	09 = \rightrightarrows	0A = \spadesuit	0B = \clubsuit	0C = \heartsuit	0D = \heartsuit	0E = \circ	0F = \clubsuit
10 = \blacktriangleleft	11 = \blacktriangleright	12 = \blacklightning	13 = \mathcal{R}	14 = \mathcal{U}	15 = \mathcal{Q}	16 = \otimes	17 = Υ
18 = \lrcorner	19 = \mathfrak{f}	1A = \mathfrak{m}	1B = \mathfrak{d}	1C = \odot	1D = ∞	1E = \mathfrak{A}	1F = \mathfrak{B}
20 = \bullet	21 = \circlearrowright	22 = \circlearrowleft	23 = \bigcirc	24 = \mathcal{C}	25 = \mathcal{D}	26 = δ	27 = \mathfrak{f}
28 = \lessdot	29 = \gtrdot	2A = $\hat{}$	2B = $\check{}$	2C = \odot	2D = \odot	2E = \star	2F = \odot
30 = \mathcal{U}	31 = \boxtimes	32 = \square	33 = \diamond	34 = \boxtimes	35 = \mathfrak{H}	36 = \mathfrak{K}	37 = \square
38 = \bigcirc	39 = \square	3A = \sim	3B = \rightsquigarrow	3C = \square	3D = \square	3E = \lesssim	3F = \gtrsim
40 = \approx	41 = \mathfrak{K}	42 = \mathfrak{M}	43 = \mathfrak{S}	44 = \square	45 = \mathfrak{K}	46 = ∇	47 = \blacktriangle
48 = \blacktriangle	49 = \mathcal{D}	4A = \mathcal{D}	4B = \blacktriangle	4C = \blacktriangledown	4D = \mathfrak{S}	4E = \mathfrak{E}	4F = \mathfrak{Z}
50 = \mathfrak{Y}	51 = \mathfrak{C}	52 = \mathfrak{V}	53 = \mathfrak{H}	54 = \mathfrak{f}	55 = \mathfrak{a}	56 = \mathfrak{c}	57 = ∞
58 = \mathfrak{Z}	59 = \mathfrak{h}	5A = \mathfrak{d}	5B = \mathfrak{F}	5C = \mathcal{P}	5D = \mathfrak{C}	5E = \mathfrak{H}	5F = \mathfrak{G}
60 = \mathfrak{M}	61 = \mathfrak{h}	62 = \mathfrak{M}	63 = \mathfrak{X}	64 = \mathfrak{C}	65 = \approx	66 = \mathfrak{H}	67 = \mathfrak{C}
68 = \mathfrak{O}	69 = \mathfrak{b}	6A = \mathfrak{D}	6B = \mathfrak{d}	6C = \mathfrak{c}	6D = \mathfrak{M}	6E = \mathfrak{H}	6F = \mathfrak{D}
70 = \mathfrak{E}	71 = \mathfrak{E}	72 = \int	73 = \iint	74 = \iiint	75 = \mathfrak{F}	76 = \mathfrak{H}	77 = \int
78 = \iint	79 = \iiint	7A = \mathfrak{F}	7B = \mathfrak{H}	7C = \mathfrak{I}	7D = \mathfrak{H}	7E = \square	7F = \mathfrak{A}

Changes since version 1.0

version 1.1:

`\varangle` has been centered at the math axis

version 2.0:

new: letters $\mathfrak{D}, \mathfrak{b}, \mathfrak{d}, \mathfrak{a}, \mathfrak{c}, \mathfrak{U}$

new astrological and zodiacal symbols

new symbols permil, cent, ataribox

now the full set of `lasy` is included; for this purpose 9 characters (\odot , \bullet , \ominus , \star , \mathfrak{Z} , \mathfrak{h} , \mathfrak{d} , \mathfrak{F} , \mathcal{P}) have **changed code!**

`wasyb10` font for bold math added