

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:

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

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

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

$$\text{Stokes' law: } \iint_A [\nabla \times \mathbf{F}(\mathbf{x})] da = \oint_{C(A)} \mathbf{F}(\mathbf{x}) dl$$

APL Program:

`U ← -1 + G ← 2 × lN ← □` ♠ 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 [] #
 T 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 =
50 = ∂	51 = ∂	52 = ∂	53 =	54 =	55 = ∅	56 = ∅	57 = ♂
58 = ♃	59 = ♃	5A = ♂	5B = ♃	5C = ♃	5D = ∅	5E = ∩	5F = ∅
60 = ∞	61 = ∞	62 = ∞	63 = ∞	64 = ∞	65 = ≈	66 = ∩	67 = ∅
68 = ‰	69 = ∫	6A = ∫	6B = ∅	6C = ∅	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 = \circ	07 = \heartsuit
08 = \checkmark	09 = \rightleftarrows	0A = \clubsuit	0B = \spadesuit	0C = \heartsuit	0D = \heartsuit	0E = \circ	0F = \heartsuit
10 = \blacktriangleleft	11 = \blacktriangleright	12 = \blacklightning	13 = \mathcal{R}	14 = \mathcal{U}	15 = \mathcal{Q}	16 = \otimes	17 = Υ
18 = \ulcorner	19 = \female	1A = \male	1B = \mathcal{A}	1C = \odot	1D = \propto	1E = \mathcal{A}	1F = \emptyset
20 = \bullet	21 = \circlearrowright	22 = \circlearrowleft	23 = \circ	24 = \mathcal{C}	25 = \mathcal{D}	26 = δ	27 = \mathcal{A}
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 = \mathcal{A}	36 = \mathcal{A}	37 = \square
38 = \square	39 = \square	3A = \sim	3B = \rightsquigarrow	3C = \square	3D = \square	3E = \lesssim	3F = \gtrsim
40 = \approx	41 = \mathcal{A}	42 = \mathcal{A}	43 = \mathcal{A}	44 = \square	45 = \mathcal{A}	46 = ∇	47 = \blacktriangle
48 = \blacktriangle	49 = \mathcal{D}	4A = \mathcal{D}	4B = \blacktriangle	4C = \blacktriangledown	4D =	4E =	4F =
50 = \mathcal{A}	51 = \mathcal{A}	52 = \mathcal{A}	53 =	54 =	55 = \mathcal{A}	56 = \mathcal{A}	57 = ∞
58 = \mathcal{A}	59 = \mathcal{A}	5A = \mathcal{A}	5B = \mathcal{A}	5C = \mathcal{A}	5D = \mathcal{A}	5E = \mathcal{A}	5F = \mathcal{A}
60 = \mathcal{A}	61 = \mathcal{A}	62 = \mathcal{A}	63 = \mathcal{A}	64 = \mathcal{A}	65 = \mathcal{A}	66 = \mathcal{A}	67 = \mathcal{A}
68 = $\%$	69 = \mathcal{A}	6A = \mathcal{A}	6B = \mathcal{A}	6C = \mathcal{A}	6D = \mathcal{A}	6E = \mathcal{A}	6F = \mathcal{A}
70 = \mathcal{A}	71 = \mathcal{A}	72 = \int	73 = \iint	74 = \iiint	75 = \mathcal{A}	76 = \mathcal{A}	77 = \int
78 = \iint	79 = \iiint	7A = \mathcal{A}	7B = \mathcal{A}	7C = \mathcal{A}	7D = \mathcal{A}	7E = \mathcal{A}	7F = \mathcal{A}

Changes since version 1.0

version 1.1:

`\varangle` has been centered at the math axis

version 2.0:

new: letters $\mathcal{D}, \mathcal{b}, \mathcal{d}, \mathcal{e}, \mathcal{c}, \mathcal{U}$

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 , \odot , \star , \mathcal{A} , \mathcal{h} , \mathcal{d} , \mathcal{F} , \mathcal{E}) have **changed code!**

`wasyb10` font for bold math added