The Symbol Font `wasy`

Roland Waldi

Institut für Experimentelle Kernphysik
Universität Karlsruhe
Physikhochhaus, P.O.Box 6980
D-7500 Karlsruhe, Fed. Rep. Germany

Version 2.0 – September 1992

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 superiour 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

\male	♂	\female	♀
\currency	¤	\cent	¢
\lozenge	⌑	\kreuz	✠
\smiley	☺	\blacksmiley	☻
\frownie	☹	\sun	☼
\checked	✓	\brokenvert	¦
\diameter	⌀	\invdiameter	⌀
\phone	☎	\recorder	℘
\clock	☐	\permil	‰
\bell	🔔	\ataribox	▨
\pointer	⇨	\lightning	⚡
\agemO	↻		

diagrams

\photon	∿∿∿	\gluon	⟿⟿⟿

music notes

\eighthnote	♪	\quarternote	♩

\halfnote	♩	\fullnote	◦
\twonotes	♫		

electrical engineering

\AC	∼	\HF	≈
\VHF	≋		

APL

\APLup	△	\APLdown	▽
\APLbox	□	\APLinv	⌹
\APLleftarrowbox	⍇	\APLrightarrowbox	⍈
\APLuparrowbox	⍐	\APLdownarrowbox	⍗
\APLinput	⍞	\APLminus*	⁻
\APLlog	⍟	\APLstar	⋆
\APLvert*			\APLvert{\APLdown}	⍌
\APLnot*	∼	\APLnot{\APLdown}	⍊
\APLnot{\land}	⍲	\APLnot{\lor}	⍱
\APLcirc*	∘	\APLcirc{\bot}	⌽
\notbackslash*	⍀	\notslash*	⌿
\APLcomment	⍝		

astronomy

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

astrological symbols and zodiacal symbols

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

geometrical shapes

\hexstar	✳	\varhexstar	✳
\davidsstar	✡	\APLstar	✶
\Circle	○	\CIRCLE	●
\Leftcircle	◖	\LEFTCIRCLE	◖
\Rightcircle	◗	\RIGHTCIRCLE	◗
\LEFTcircle	◑	\RIGHTcircle	◐
\LEFTarrow	◀	\RIGHTarrow	▶
\UParrow	▲	\DOWNarrow	▼
\Box	□	\APLbox	▢
\XBox	⊠	\Bowtie	⋈
\Diamond	◇	\octagon	⬡
\hexagon	⬡	\varhexagon	⬡
\pentagon	⬠		

general math & physics

\varangle	⦡	$\invneg$	⌐
\leftturn	↺	\rightturn	↻
\diameter	⌀	\therefore	∴

math operators

$a\ocircle b$	$a \bigcirc b$	$a\logof b$	$a \circledast b$
$a\oplus^* b$	$a \oplus b$	$a\otimes^* b$	$a \otimes b$
$a\le^* b$	$a \le b$	$a\ge^* b$	$a \ge b$
$a\apprle b$	$a \lesssim b$	$a\apprge b$	$a \gtrsim b$
$a\lhd b$	$a \lhd b$	$a\rhd b$	$a \rhd b$
$a\unlhd b$	$a \unlhd b$	$a\unrhd b$	$a \unrhd b$
$a\LHD b$	$a \blacktriangleleft b$	$a\RHD b$	$a \blacktriangleright b$
$a\sqsubset b$	$a \sqsubset b$	$a\sqsupset b$	$a \sqsupset b$
$a\sqsubseteq^* b$	$a \sqsubseteq b$	$a\sqsupseteq^* b$	$a \sqsupseteq b$
$a\propto^* b$	$a \propto b$	$a\varpropto b$	$a \propto b$
$a\leadsto b$	$a \leadsto b$		

integrals (text style)

$\varint_a^b f(x)dx$	$\int_a^b f(x)dx$	$\iint_a^b f(x)dx$	$\iint_a^b f(x)dx$
$\iiint_a^b f(x)dx$	$\iiint_a^b f(x)dx$	$\varoint_a^b f(x)dx$	$\oint_a^b f(x)dx$
$\oiint_a^b f(x)dx$	$\oiint_a^b f(x)dx$		

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) then the default symbol ($\propto$).

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

$$\int_a^b \to \int_a^b, \qquad \oint_C \to \oint_C$$

There are also a few letters in roman style added (although these and some symbols as $\mho$, ‰ 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`*	Đ
`\inve`	ə	`\openo`	ɔ

Examples

"We provide the ♪♫, you provide the ☺"

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

special characters on IBM PC's: ☺, ☻, ♡, ◇, ♣, ♠, •, ○, ♂, ♀, ♪, ♫, ☼, ▶, ◀, ↕, ‼, ¶, §, ▬, ↨, ↑, ↓, →, ←, ▲, ▼, ¦, ⌐, ¬, . . .

special characters on Atari ST's: ⇨, 𝄽, ✓, ☻, ♠, ♪, ə, ⌐, ¬, $\oint$, . . .

tube dimensions: ⌀5 mm, $d = 0.5$ mm, $l = 50$ mm

display math:
$$\sphericalangle(\vec{a}, \vec{b}) = 30°$$

$$\prod_{x \lesssim 5} a_x \otimes b_x \simeq \int_{x \gtrsim 5} a \bigcirc b \, \mathrm{d}x \qquad \text{(nonsense.1)}$$

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

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

APL Program:
$$U \leftarrow {}^{-}1 + G \leftarrow 2 \times \iota N \leftarrow \square \qquad ⍝ \quad \text{generate vectors of odd and even numbers}$$

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 ∼ ↑ ↓ ι ○ ⋆ { }

α ⌈ ⌊ ˍ ∇ △ ∘ ' □ ( ) ∼

⊣ ⊂ ⊃ ∩ ∪ ⊥ ⊤ | ; : \

I ⍢ ⍢ ⋔ ⌽ ⍉ ⊖ ⊗ ⋎ ⋏ ! ⊡ ⌐

Q̲ W̲ E̲ R̲ T̲ Y̲ U̲ I̲ O̲ P̲ ⊟ ⊟

A̲ S̲ D̲ F̲ G̲ H̲ J̲ K̲ L̲ ⌽ ⊤ ˌ

△̲ Z̲ X̲ C̲ V̲ B̲ N̲ M̲ ʁ ⅄ ≠

⊗
⇑ ⇓

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 = △	01 = ◁	02 = ⊴	03 = ▷	04 = ⊵	05 = ∴	06 = ℘	07 = ☎
08 = ✓	09 = ⇨	0A = ♠	0B = ♪	0C = ♩	0D = ♪	0E = ∘	0F = ♫
10 = ◀	11 = ▶	12 = ⚡	13 = ♌	14 = ♉	15 = ⚹	16 = ⊕	17 = ♈
18 = ⌐	19 = ♀	1A = ♂	1B = ♃	1C = ♁	1D = ∝	1E = ⚺	1F = ∅
20 = ●	21 = ↻	22 = ↺	23 = ○	24 = ☾	25 = ☽	26 = ♄	27 = ☿
28 = ‹	29 = ›	2A = ‿	2B = ⌣	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 = ʒ
50 = ɤ	51 = ⌒	52 = ˋ	53 = ⌘	54 = ʃ	55 = ə	56 = ♂	57 = ♐
58 = ♃	59 = ♄	5A = ♁	5B = ♅	5C = ♇	5D = ♉	5E = ♊	5F = ♋
60 = ♍	61 = ♎	62 = ♏	63 = ♐	64 = ♑	65 = ♒	66 = ♓	67 = ¢
68 = ‰	69 = þ	6A = Þ	6B = ð	6C = ɔ	6D = ◈	6E = ⇑	6F = ⇓
70 = ⊟	71 = ⊟	72 = ∫	73 = ∬	74 = ∭	75 = ∮	76 = ∯	77 = ∫
78 = ∬	79 = ∭	7A = ∮	7B = ∯	7C = ¦	7D = ⌐	7E = □	7F = ʁ

5

`wasyb:`

00 = △ 01 = ◁ 02 = ⊴ 03 = ▷ 04 = ⊵ 05 = ∴ 06 = ℘ 07 = ☎
08 = ✓ 09 = ⇨ 0A = ♠ 0B = ♪ 0C = ♩ 0D = ♩ 0E = ₒ 0F = ♫
10 = ◀ 11 = ▶ 12 = ↯ 13 = ♌ 14 = ♒ 15 = ⚆ 16 = ⊗ 17 = ♈
18 = ⌐ 19 = ♀ 1A = ♂ 1B = ☿ 1C = ♁ 1D = ∝ 1E = ⋠ 1F = ∅
20 = ● 21 = ↺ 22 = ↻ 23 = ○ 24 = ☾ 25 = ☽ 26 = ♃ 27 = ☿
28 = ‹ 29 = › 2A = ˆ 2B = �‿ 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 = ʒ
50 = γ 51 = ⌒ 52 = ˋ 53 = ⌘ 54 = ſ 55 = ə 56 = ♂ 57 = ♂
58 = ♃ 59 = ♄ 5A = ♌ 5B = ♅ 5C = ♇ 5D = ♉ 5E = ♊ 5F = ♋
60 = ♍ 61 = ♎ 62 = ♏ 63 = ♐ 64 = ♑ 65 = ♒ 66 = ♓ 67 = ¢
68 = ‰ 69 = þ 6A = Þ 6B = ð 6C = ɔ 6D = ◆ 6E = ⊞ 6F = ⊟
70 = ⊟ 71 = ⊟ 72 = ∫ 73 = ∬ 74 = ∭ 75 = ∮ 76 = ∰ 77 = ∫

78 = ∬ 79 = ∭ 7A = ∮ 7B = ∰ 7C = ¦ 7D = ⌍ 7E = □ 7F = Ⴕ

Changes since version 1.0

version 1.1:

\varangle has been centered at the math axis

version 2.0:

new: letters Þ,þ,ð,ə,ɔ,Ʊ

new astrological and zodiacal symbols

new symbols permil, cent, ataribox

now the full set of lasy is included; for this purpose 9 characters (☺, ☻, ☉, ☼, ♃, ♄, ♌, ☿, ♇) have **changed code**!

wasyb10 font for bold math added