
The Semaphore Alphabet

Vít Zýka

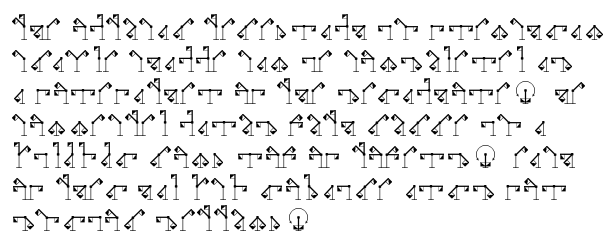
History

If a captain wanted to give a passing ship some navigation information, a message about an emergency, or a report about countries visited, he used to send a specialist in signalling to a good visible place. This person took two red-yellow flags, one in each hand, and sent a message using agreed flag configurations. One of seven possible positions for each arm meant a message character. Words and sentences were separated for better understanding by waving the flags once or twice in a circle, respectively. This enabled transmission of more general text than by the widely used signal flags (where a flag has a predetermined meaning of a word or a whole sentence), and is faster than using the Morse alphabet. Among the necessary skills of the receiver was surely

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(aside from excellent reading — which was not usual considering the level of sailors’ literacy) hawk eyes. To distinguish the flag position up to a distance of 7 kilometers on a swaying ship was very difficult.

Semaphore was limited to visible transmission only. With the development of electrical communication, the Morse alphabet superseded it for the majority of applications. Try to send a semaphore character by telegraph! It is not impossible, but the effective result is far inferior to the result achieved nowadays in the time of computers and Internet. While semaphore helped the captain to send and receive news, nowadays using this alphabet will probably make communication more difficult. Consider this:






(The optical telegraph ... symbol setting.)

The contemporary semaphore alphabet was suggested by an English Army colonel in 1822. But it was used for only a very short time in Britain. More use was made of it by the U.S. Navy during the Civil War.

The Alphabet Code

Seven positions of arms together give a combination of 28 signs. The basic alphabet set, which contains 26 characters, is split into six groups, called circles, in nearly alphabetical order. A circle is a group of signs for which the flag in the right hand has the same position.

There is no space in the code for digits, so they are signalled as the first alphabetic characters, but in front of the first digit is placed the sign ‘digit beginning’ , and following the last digit ‘digit ending’ . The second special sign for which there is a free space in the code is the sign of a ‘mistake’ . Its function is similar to the backspace key. The other signs, e.g. punctuation, are not contained in the semaphore and have to be communicated by words.

Alphabet Usage

The font ‘semaf’ was created by METAFONT. It consists of four shapes in three variants; see table. You can easily add a new font variant if you know METAFONT at a basic level. The only thing you need to do is set the font. You will not see some special characters in output — only the upper- and









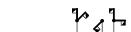


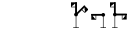


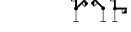


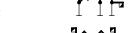


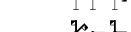


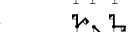


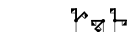


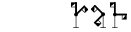

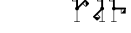





lowercase letters, digits, space, period, and two special semaphore signs are included. If you need e.g. ‘!’, you should define:

```
\def\!{} \catcode\!=13
\def!{ exclamation mark }
% or \def!{{\tenrm \!}}
% or in LaTeX: \def!{{\normalfont \!}}
```

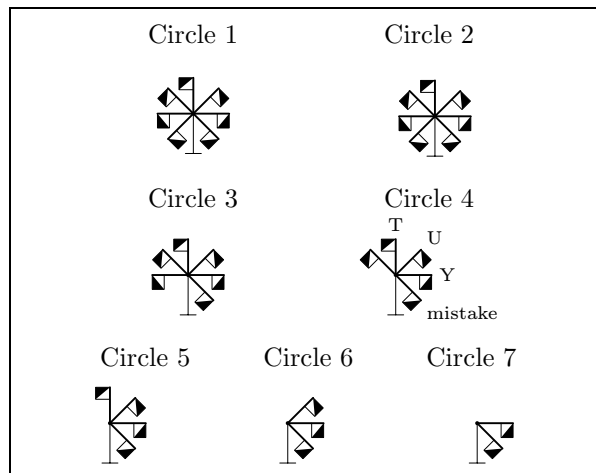
To include the semaphore font you can use the pre-prepared files `semaf.tex` or `semaf.fd` for plain \TeX or $\LaTeX 2_{\epsilon}$ users, respectively. The font covers the IL2 coding table (`il2semaf.fd`) that doesn’t differ from Knuth’s OT1 coding in the seven low bits.

A concept of generalized ligatures enables an elegant solution of the digit typesetting. Beginning and ending digit signs are therefore included automatically, even without the need to write macros.

Semaphore Alphabet Code

A		O		W	
B		P		X	
C		Q		1	
D		R		2	
E		S		3	
F		T		4	
G		U		5	
H		Y		6	
I		J		7	
K		V		8	
L				9	
M		Z		0	
N				mistake	

Semaphore Logical Arrangement



Semaphore Font Variants

Variant		Roman r	Bold bf
Pillar	smf	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮
Empty	smfe	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮
Person	smfp	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮
Variant		Monospace tt	Slanted sl
Pillar	smf	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮
Empty	smfe	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮
Person	smfp	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮	⋮ ⌒ ⋮ ⋮ ⌒ ⋮ ⋮

The most important criterion of a good font is its legibility. It is true that this is too low in the case of the semaphore. In spite of this there is at least one area of usage: semaphore was incorporated into scout-life for boys and girls, together with its romantic background of sailors, to improve memory, perceptions, and coordination.

The font is available from CTAN and at:

<http://cmp.felk.cvut.cz/~zyka/zykatex.html>

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