

English signal equipment - The heliograph

Introduction

A heliograph is an optical signaling device which, with the help of a mirror, captures the sun's rays so that it is possible to transmit a signal to a remote receiver using Morse code.



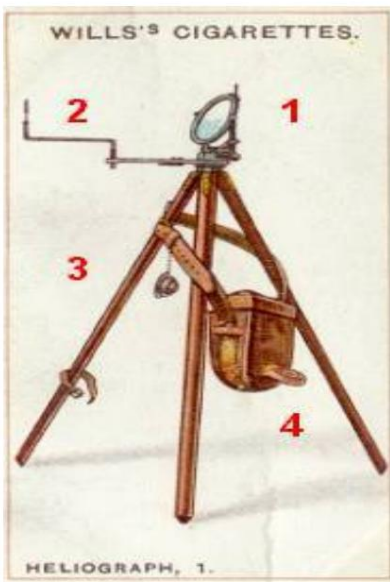
Signallers, 5th Lancers, Field Service Kit.

From the 1870s to the early 1940s, the heliograph was part of the British army and navy's assortment of optical signaling devices, which also consisted of, among other things, signal flags and electric flashing stations.

The instrument's advantages include that it is easy to transport and operate, while the disadvantages include a low degree of signal security - an opponent will easily be able to intercept a message - and the fragility of the mirror itself. Furthermore, it is of course a prerequisite that the sun is in the sky, which limits the use to sunny daytime hours.

Atmospheric conditions determine the distance between the stations, but under favorable conditions the distance can be up to well over 100 km.

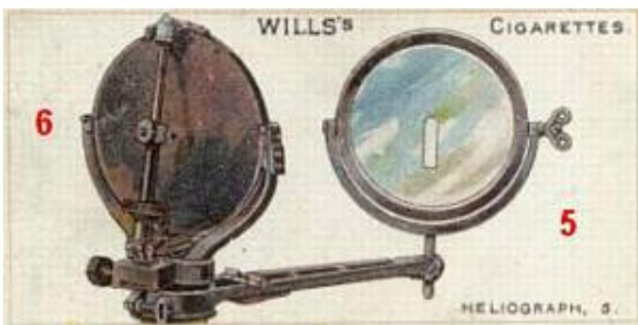
Heliograph



The heliograph consists of:

1. A mirror mounted in a brass holder.
2. An aiming device.
3. A tripod, of wood.

The mirror and sighting device are transported in a leather case (4), which, when the instrument is in use, is hung over the tripod. During transport, the legs of the tripod are held together using a leather strap.



If the sun's rays cannot be captured directly in the mirror, an auxiliary mirror can be fitted.

The drawing on the right shows the back of the mirror and an auxiliary mirror (5). The vertical device behind the mirror is the Morse key (6).







When the heliograph is to be set up, it must stand firmly on the ground and the upper part of the tripod must be horizontal in relation to the ground.

The mirror device itself is then mounted in the screw passage designed for it.

The position should be hidden if possible, but direct observation between sender and recipient has advantages when choosing a position.

The setting of the heliograph is done by the operator either aiming at the receiving station through a hole in the back of the mirror or, as shown on the right, by the operator capturing an image of the receiving station in the mirror.

Once connection is thus achieved, the sending of signals can begin.

On the left is the heliograph with sighting device and on the right is the heliograph with mounted auxiliary mirror.

In both images, the operator operates the Morse key mounted on the back of the heliograph's mirror.

After use, the instrument is packed away.

The operator is here placing the mirror in the leather case, which also contains a spare mirror, as well as the tools necessary for installation.

About the cigarette cards

The cigarette cards that I have used to illustrate the construction and function of the heliograph come from a series - *Signaling Series* - which was published by WD & HO Wills, circa 1930, known among other things from the *Capstan brand*. A large part of the other cards in the series contain the Morse code displayed by means of signal flags. I estimate that the series includes 50 cards.

In connection with the use of cigarette cards as illustrations, I have discussed with Chakoten's webmaster whether, in the spirit of political correctness, it is necessary to also bring a warning about the harmful effects of smoking. However, this has so far not proved necessary, but it may come...

heliograph i brug

Judging by the image material, it seems - naturally enough - that the heliograph was mainly used "in the warm countries" - India, the Middle East and Africa for example. In European conditions, it seems to have been more common with electric flashing stations, which are also known from the Danish army for example - see for example Clipping sheet - Danish soldiers, 1941.

Source 2 states that the heliograph was last used in field conditions at the Battle of Sollum (North Africa) in 1941, but I have not been able to get the information confirmed in other sources.



Heliograph squad of The Royal Northumberland Fusiliers, circa 1910.

The postcard shows the prescribed location of the instrument case, the operator operating the Morse key and the sergeant ready to take notes.

Furthermore, the binoculars that a heliograph team was usually also equipped with are shown. In the first photo of the article, this binocular (in its bag) is seen hanging under the operator's left arm.

The binoculars are placed on two small tripods, which allow for continuous and precise observation towards the sending station.

Finally, the postcard introduces a completely new English word for me - *heliographing*. I don't know if you can also use the word *to heliograph in Danish*, but if so, it expresses exactly what is going on.

The soldiers are wearing the English field uniform Model 1902. The sergeant and the corporal carry two crossed signal flags above their angles, indicating their function as signalmen. The private knows the binoculars

wears a corresponding distinction on the left forearm.

The heliograph as an accessory for tin soldiers

My own interest in the heliograph was sparked when I acquired the postcard shown at the beginning years ago. I think the motif was so exciting that I wanted to display it together with my Britains figures. Unfortunately, Britains never made a big deal out of military signaling devices - there is a set of four scouts that signal using signal flags - but that didn't help me much.

I was therefore pleasantly surprised to discover that a company called Mark Time had produced a heliograph. The set came to light in the 1970s, when a number of companies with greater or lesser success sought to produce so-called *New Toy Soldiers*, which in style were to resemble, for example, Britain's figures. As catalog number 12, Mark Time produced *The Royal Fusiliers (City of London Regiment), Heliograph signallers*, consisting of an officer, a heliograph with operator, a pencil and paper figure and a soldier with a signal flag.

The figures were very poorly modelled, but the heliograph was excellent. I have subsequently succeeded in acquiring a few of these excellent instruments, which has not been entirely easy, as the former *New Toy Soldiers* are almost as rare today as old toy figures.



The picture shows a heliograph team from a cavalry regiment.

Strongly inspired by the postcards that I have shown here, as well as other visual material, I have set up a couple of heliograph teams that form part of my English units in khaki uniforms. In general, I tend to the principle of only collecting original figures, but it may be necessary to make certain exceptions from time to time.

The figures are actually artillerymen, as they come from catalog number 313 - *The Royal Artillery (Gunners)*, but as pewter soldiers they are pretty much universally applicable to show English soldiers of the period. Catalog number 313 was part of the range from 1929 to 1941. Towards the end of the period the headgear was changed to a steel helmet.

The horses originate from catalog number 182 - *11th Hussars, Dismounted with horses*. These figures appeared in 1925 and were with us until the very end in 1966.



My figures are painted from approx. 1935, while the horses are from approx. 1960.

One instrument is not really enough if you want to show the point-to-point connection between two units, so another heliograph team belongs, for example, to the signal squadron in my "cavalry brigade".

The crew is similar to the first picture, but now supplemented by an officer with binoculars. This figure comes from catalog number 1289 - *Gun of The Royal Artillery, with gunners and officer*.

This figure is also from approx. 1935. The set, which was part of Britain's range from 1933 to 1941, contained six gunners (three kneeling and three standing), the officer and a cannon (Britain's version of an 18pdr Mk. IV).



Gurkha with heliograph,
Drawing by Mike Chappel.

Sources

1. *The Royal Corps of Signals* of Laurette Burton, Tempus Publishing Limited, Stroud/Gloucestershire

2002, ISBN 0-7524-2391-6.

2. *British Eight Army Infantry (Desert Rat)* af Tony Hall, ISO Publications, London 1989, ISBN 0-946784-36-1.

3. *Signalling Series*, cigaretkort fra W.D. & H.O. Wills.

The drawing comes from the book *The Gurkhas* by Mike Chappel, Osprey Elite Series No. 49, London 1993, ISBN 1-85532-357-5.

Per Finsted