Station clocks (Funkeruhren)

Introduction

Correct timekeeping is an essential part of smooth communication. Timing of transmissions, identification of messages by time stamping, switching of cyphers all depended on proper synchronization of communication stations.

Figure 64: A selection of station clocks from various manufacturers

In 1934 the Reichheer contracted Junghans based in Schramberg to produce the first duty clocks for use in radio stations, they are known as "Betreibsuhren", "Stationsuhren" or by current collectors as "Funkeruhren". As the army grew, around 1937 other manufacturers became involved in the production of Funkeruhren: Kienzle, Tobias Beaurle & Söhne, both based in Schwenningen and Köhler & Co. based in Laufamholz. Funkeruhren were produced for the Heer, Luftwaffe and Kriegsmarine. This mix of clients and manufacturers led to the existence of many different variations of the Funkeruhr.

Basic description of the Funkeruhr

The Funkeruhr is a mechanical timepiece with a 8 day winding mechanism. The clock has a 6 cm diameter face with centrally placed hour and minute hand. A separate second hand is placed at the 6 o'clock position, one centimeter from the centre. The hours are marked in Arabic numerals.

Figure 65: Basic layout of the Funkeruhr face

The clock is placed in a hinged housing which in turn is screwed into a wooden base measuring 105 x 40 x 130 mm. The clock can be swung out of the housing, revealing the back of the clock giving access to the winding and time adjustment wheels and in some cases the speed adjustment.
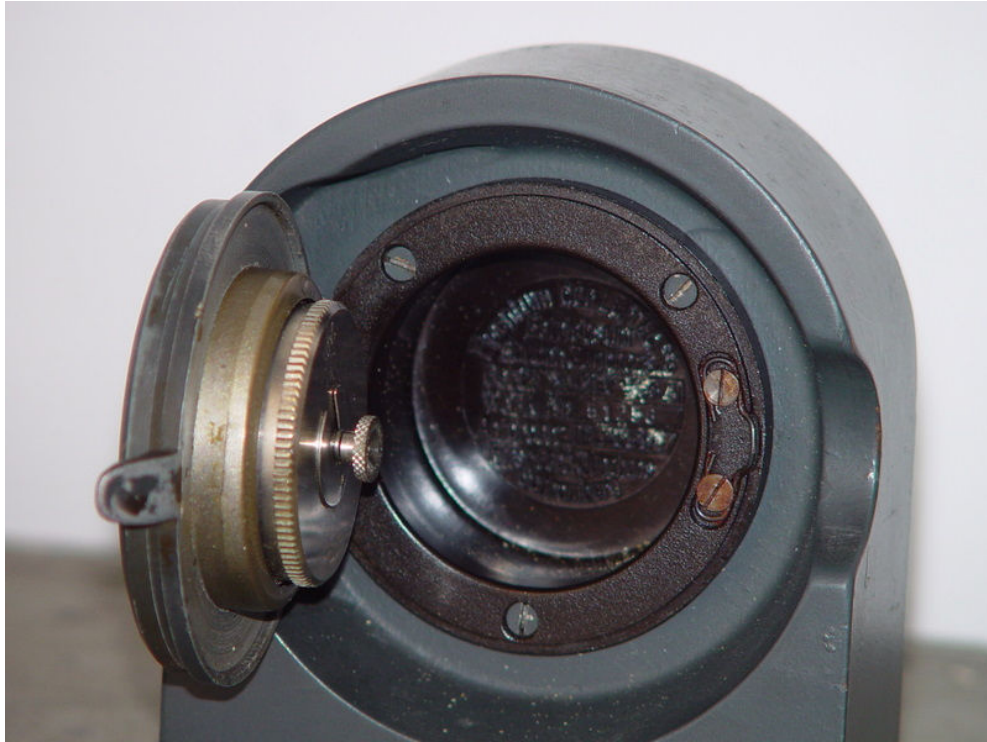
Figure 66: Clock opened for winding or time adjustment. Various markings can be seen on the inside casing

The inside of the housing usually contains maker marks, ownership and serial number of the clock. The wooden base has two metal strips screwed to the underside which can be swung out to increase the stability of the clock.

Figure 67: The two metal feet that could be extended to add stability

A round metal plate is screwed to the back of the base which allows the clock to be hung on a screw on a wall.

Figure 68: Metal plate on the back of the clock. The slotted hole allowed the clock to be hung on a wall

On early clocks the wooden housing was lacqöred in natural colour, at the outbreak of war the base was often painted grey.

Figure 69: Comparison of an pre-war (l) and late war (r) Junghans Funkeruhr.

Variations by Junghans

Junghans was the earliest manufacturer of the Funkeruhr and produced a number of variations from 1934 until the end of the war. Junghans produced for the Heer, Luftwaffe and Kreigsmarine. Early clocks used chromed or nickel plated housing and metal components while on later clocks the metal was painted grey. Junghans clocks do not have an accessible speed adjustment, the clock has to be removed from it's housing if the speed needs to be adjusted.

The first Junghans example is a 1936 example made for the Luftwaffe. On the face it is marked "Junghans" as well as "Fl 25591".

Figure 70: Pre-war Luftwaffe Junghans marked Fl. 25591

The rim of the clock, as well as the metal components on the base are chromed.

Figure 71: The inside housing revealing a 1936 date and serial number 77

The inside of the housing is marked with "Eigentum der Luftwaffe", the Junghans logo and "1936", "FL 25591" and the serial number 77. The housing of the movement is made of more substantially made then on later clocks. The wooden base is lacqöred natural wood.

Figure 72: Chromed metal backplate and clear laqöred housing

The second Junghans example is a 1939 example made for the Heer. The highly polished chrome finish of the metal components has given way to a matt finish. The housing of the movement has become less substantial.

Figure 73: Pre-war army Junghans Funnkeruhr

The face of the clock is still signed "Junghans", but this being a Heer clock, the FL number has been omitted. In all other aspects the face is the same as the earlier example. The inside of the housing is marked with "Heereseigentum", 1939, the Junghans logo and the serial number "1563".

Figure 74: The inside casing revealing the 1939 date and 1563 serial number

The wooden base is lacqöred natural wood, the bottom is marked with a Waffenambt stamp.

Figure 75: Clearly laqöred housing and duller metal parts

The third Junghans example is a mid war example made for the Luftwaffe. The face and the hands of the clock have become less ornate and clearer. The Arabic numbers are slightly smaller than on earlier clocks.

Figure 76: Mid to late war Luftwaffe Junghans Funkeruhr

The housing of the movement is made of a inferior alloy with the back of the housing being made out of Bakelite. The rim of the housing is now painted grey. The inside of the housing is marked "Eigentum der Luftwaffe", "Betriebsuhr bauart Junghans", "Gerät nr 127 – 558A", "Werk nr 51258" (serial number), "Anforderzahl FL 25591" and "Herst. Gebr. Junghans Schramberg". On top of all this a BAL stamp has been placed.
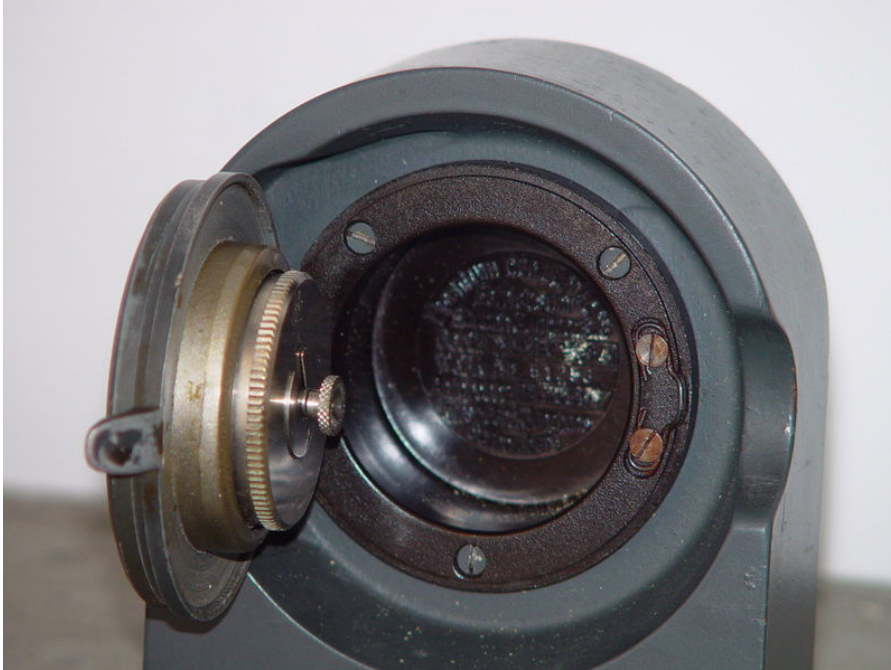
Figure 77: Inside bakelite casing revealing full Luftwaffe numbering information

The wooden base and all metal components have been spayed Luftwaffe grey.

Figure 78: Back of the clock showing the grey paintend housing and metal parts

Variations by Kienzle

Kienzle seems to have exclusively produced clocks for the Heer. The first example has all the hallmarks of a pre-war clock, yet bears a 1944 date on the outer casing.

Figure 79: Early model army Kienzle Funkeruhr

The rim of the movement housing and the back of the housing are made of a zinc alloy. The rim seems to have been covered in clear lacqör making it look slightly yellowish. This inner housing is marked on the ring with "Heereseigentum", "Kienzle", serial number "2407" and the year "1944". The movement of the Kienzle clocks is more substantial than contemporary Junghans clocks. The speed adjustment is accessible on the side of the movement housing near the swivel.

Figure 80: Inner casing revealing the 1944 date and serial number and the army property statement

The bottom of the clock is marked with a Waffenamt stamp, the matel parts appear to be parkerised.

The second example follows the clockface design of the late war Junghans clocks but the movement is identical to the clock shown previously

Figure 81: Late model army Kienzly Funkeruhr

This inner housing is marked on the ring with "Heereseigentum", "Kienzle", serial number "529" and the year "1944". The housing is largely identical to the Junghans examples, painted grey (Heer clocks had a slightly more green grey colour than the Luftwaffe examples). The metal parts are painted black. The bottom of the base is marked with a Waffenamt stamp.

Figure 82: Late model Kienzly revealing serial number and army property statement

Variations Tobias Bäurle & Söhne

Tobias Bäurle & Söhne (TBS) is one of the rarer of the manufacturers and the construction of the movement and the housing differs significantly from the others. Interestingly, TBS gained the contract for manufacturing station clocks for the Bundeswehr after the war, so caution is required by the collector when purchasing a TBS Funkeruhr.

The first TBS example described here is an early model from 1940. The numberals on the face are a squarer font, together with the substantial hands give the TBS a distinctive, chunky look. (In practice this makes the TBS the easiest to read type from a distance). The numerals are painted over with luminous paint. The movement housing is made from pressed sheet metal, painted black.

Figure 83: Early TBS Funkeruhr

The movement is connected to a bakelite ring (rather than a cup shaped housing as with the other manufacturers) screwed to the wooden base. Since there is no inner housing, the manufacturing logo, year "1940" and serial number "134" are marked on the winding wheel. The bakelite ring is marked with "Heereseigentum" and "T.B.&S". All metal parts of are painted gloss black. The housing is lacqöred in natural wood. The housing differs from that of other manufacturers in that a recess has been carved on the left side to enable the clock to swing open. This was necessitated dö to the housing to be slightly larger in diameter.

Figure 84: Opened clock revealing the bakelite ring containing serial number and army property statement. Note the time adjusting wheel on the side of the clock facing the viewer.

The second TBS is a later 1943 dated example. Production had been improved slightly. Even though the clockface is the same, luminous paint has been applied to dots next to the numerals, speeding up production somewhat. The movement housing is no longer painted black, but galvenised.

Figure 85: Late model TBS Funkeruhr

The bakelite inner ring found on earlier models must have been a weak point (it was broken and repaired on the earlier model shown above) and this was replaced by an alloy casting. The time adjustment moved from the side to the back of the clock. This necessitated a redesigned inner metal housing.

Figure 86: Opened clock revealing the metal ring containing serial number, year and army property statement. A Waffenamt stamp can be seen on the inner housing

The housing is now painted grey with galvanized metal parts.

Variations by Köhler & Co

The Köhler & Co example described here is from 1940. The face and hands are similar to early Junghans clocks, but with larger round Arabic numbering. The bezel is also similar to Junghans, but the housing of the movement is made out of stamped sheet metal.

Figure 87: Köhler & Co Funkeruhr

The housing has a dull silver surface treatment. The back of the housing is marked with "Heereseigentum", "1940" and serial number "3736".

Figure 88: Opened clock reveal the serial number and Army property statement

An ink waffenambt stamp has been placed centrally in the back of the housing. The clock is also marked on the outer rim of the back of the movement. The stamp consists of another Waffenambt stamp, "L – KU" and the date "9 / 40".

Figure 89: Additional markings found on the back of the movement

The wooden base is lacqöred natural wood, the metal parts have a dull silver finish.

Figure 90: Back of the clock showing the clear laqöred wood and galvanised metal parts

Other timepieces used by communication troops

Other timepieces, particularly the "Dienstuhr" were also used by the communication troops. The Dienstuhr, available as pocket- or wrist watch would be issöd to e.g. Tornister Funktrupps. Some early receivers like the EP 2 had a specific hook and padded backing to mount a Dienstuhr. This type of mounting is not widespread and is not seen on later radios.

Figure 91: EP2 radio direction finder with hook and cushion for an Army "Dienstuhr"

Funkeruhr accessories

The Funkeruhr, being a relatively delicate piece of equipment, had to be handled with care during transport and use. A leather carrying case was manufactured to transport the Funkeruhr. The carrying case was purely a protective casing, with a single closing strap on the side and felt padding to on the base firmly holding the clock in place while in the closed container.

Figure 92: Leather Funkeruhr carrying pouch

A 1937 example of the first type case is marked with "Göttcher & Renner", "Nörnberg – O.", "1937 and Waffenambt stamp. A slightly later example is marked "dla", "40" and a Waffenambt stamp. The second type example is marked "Karl F. Hartmann", "Berlin" without date or Waffenambt marking (most likely this was a Luftwaffe example).

**Figure 93: Carrying pouch showing the snug fit of the Funkeruhr**

A second type, made from a converted pouch for a pre war field telephone dialer pouch has also been encountered. This pouch has a belt loop stitched to the back allowing the clock to be carried on the belt. It is not clear if this was an official or a field expedient modification.

**Figure 94: Dialling unit pouch modified to carry a Funkeruhr**

This type example is marked "Karl F. Hartmann", "Berlin" without date or Waffenambt marking.

Some larger radio installations, such as the FU 9 SE 5 (Torn. E and 5 W.S.) would transport the clock in a special slot in the Zubehör box Fu 21. The clock would slide into a felt covered slot, firmly held in place by the closed lid of the box.
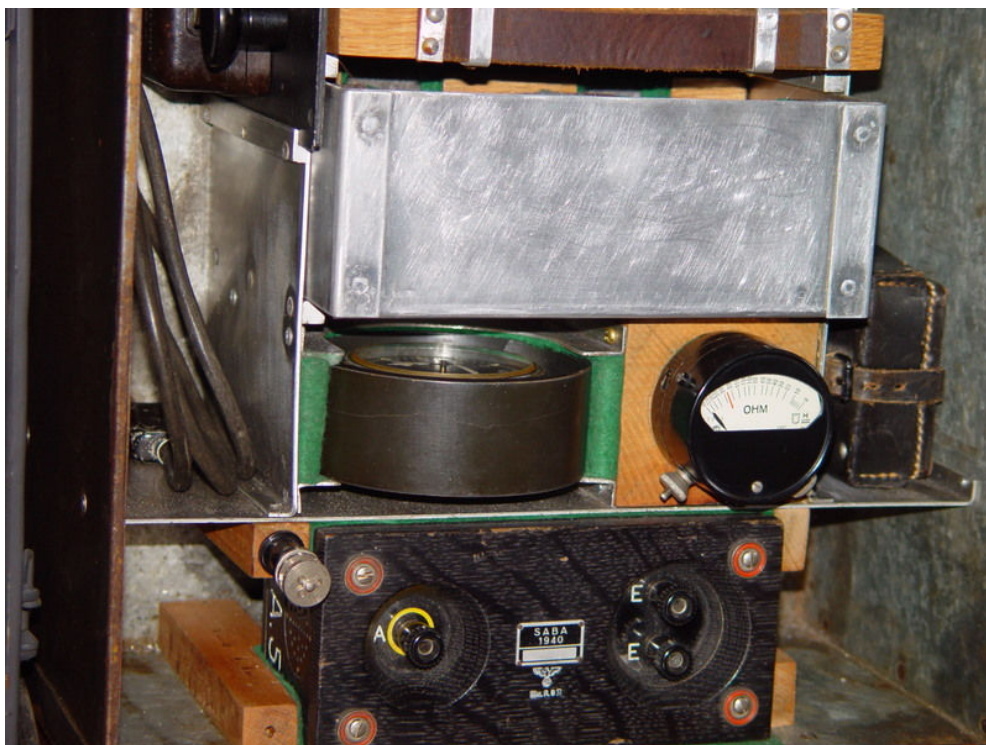
Figure 95: Storage of the Funkeruhr in the Transportkasten Fu 21 box

In vehicles, the clock was held in place by a special mounting. The mounting could be screwed to the wall or radio frame, a screwed clamp could be tightened to hold the clock securely in the mounting. It is shaped so that the clock can be opened without the need to remove the clock from the vehicle mount.
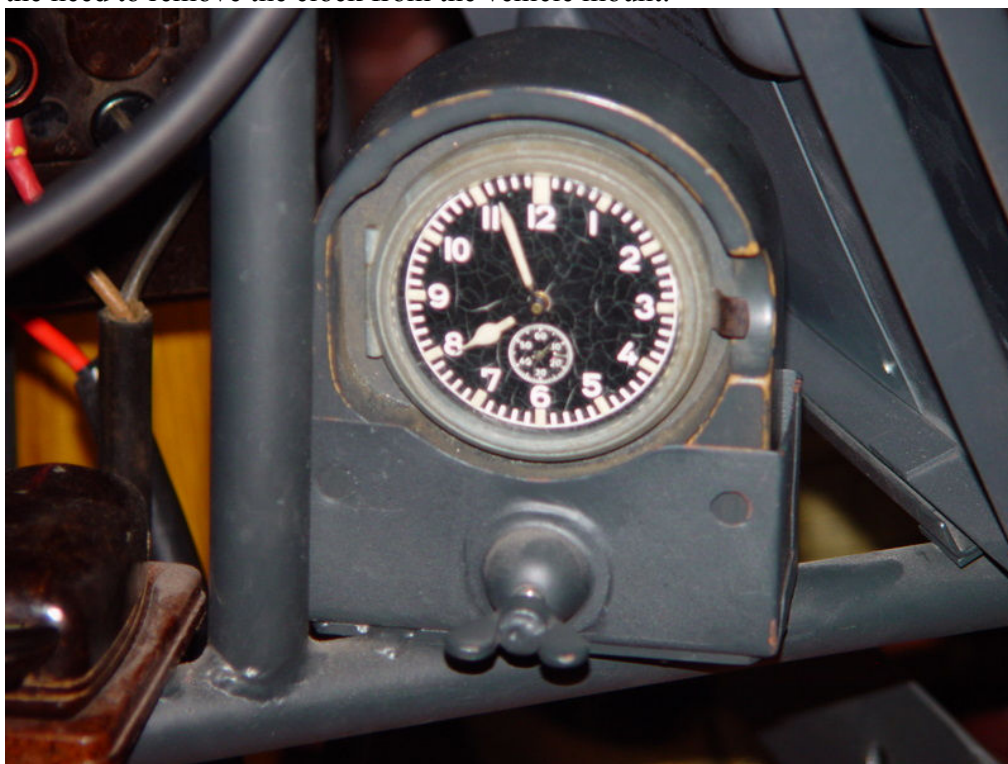
Figure 96: Station clock in vehicle mount. The clock can be secured by tightening the wingnut

Synchronisation of time

Radio played a role in the synchronization of clocks on different locations. The Kriegsmarine was transmitting a specific timing pulses on set freqöncies at 01:00 and 13:00 Middle European Time. Ships clocks, but also Funkeruhren of all stations listening in could be synchronized to this signal.
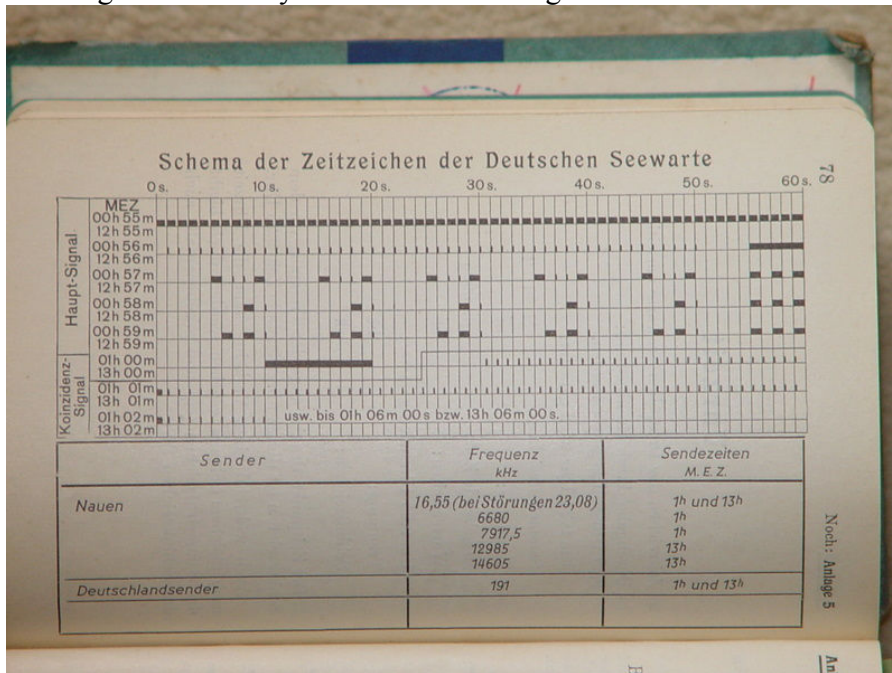

Figure 97: Radio freqöncies and signals used for time synchronisation

As an alternative, the time could be synchronised through a manual signal. The timer would start transmitting at 09:24 and would call all stations with "cq cq cq" followed by "bt" (separation sign), "qtr 0925" and "eb" (waiting sign). At exactly 0925 he would signal "bt" followed by "sk" (close transmission).
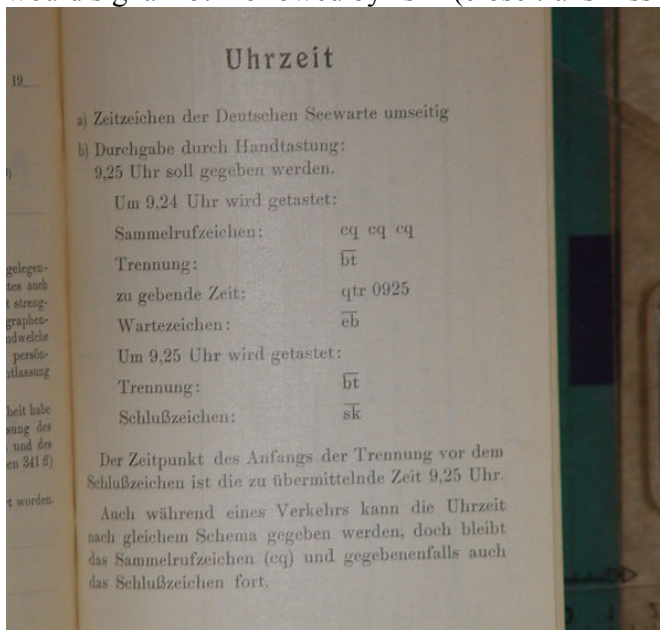

Figure 98: Alternative procedure for time synchronisation of radio station clocks