

German Field Line Communication equipment of WW 2



Funksammler Publications

Erdsprech Gerät

Development and Description

One disadvantage of field telephone connections is the cable can easily be damaged by artillery fire. This was a common occurrence in forward areas, requiring a dangerous trip by a repair crew to find and repair the break in the cable. Until repaired, no connection could be made with normal field telephones.



Figure 50: Erdsprechgerät

From the telephone interception experience in the First World War, it was learned that telephone conversations could be picked up amplifying the currents flowing through the earth. The same principle can be used to bridge breaks in telephone lines. Instead of amplifying the received signal (as is used in interception equipment), the *Erdsprechgerät* boosts the telephone signal into

the telephone wire by a factor 200, creating enough signal to bridge a gap of up to 5 meters in the telephone cable. Alternatively, the *Erdsprechgerät* could be used on long lines or lines with a high attenuation, where normal *FF 33* telephones could no longer work.



Figure 51: Erdsprechgerät storage in lid for headset and microphone

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Instead of a battery to power the microphone, the *Erdsprechgerät* uses a DC generator to generate about 14 Volts microphone voltage which is fed to a powerful microphone. The speech signal of high amplitude is injected into the broken line via a matching transformer. On the other side, a sensitive headset is used to receive the signals. The matching transformer with three settings can be used to optimise the signal

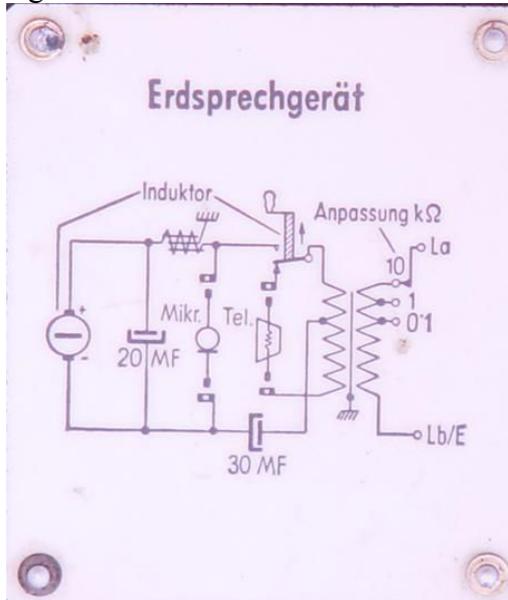


Figure 52: Erdsprechgerät schematic

operation practices than normal field telephones. With the *Erdsprechgerät*, the generator handle has to be turned continuously during operation. One disadvantage of the *Erdsprechgerät* is that it can relatively easily be overheard by the enemy, so "*Feind hört mit!*".

An earth pin and a 20 m length of single core telephone cable complete the *Erdsprechgerät* set.

To distinguish the *Erdsprechgerät* from a normal *FF 33* the side of the unit and the writing tab are clearly marked "*Erdsprechgerät*" and on early versions, a white band is painted on the housing.

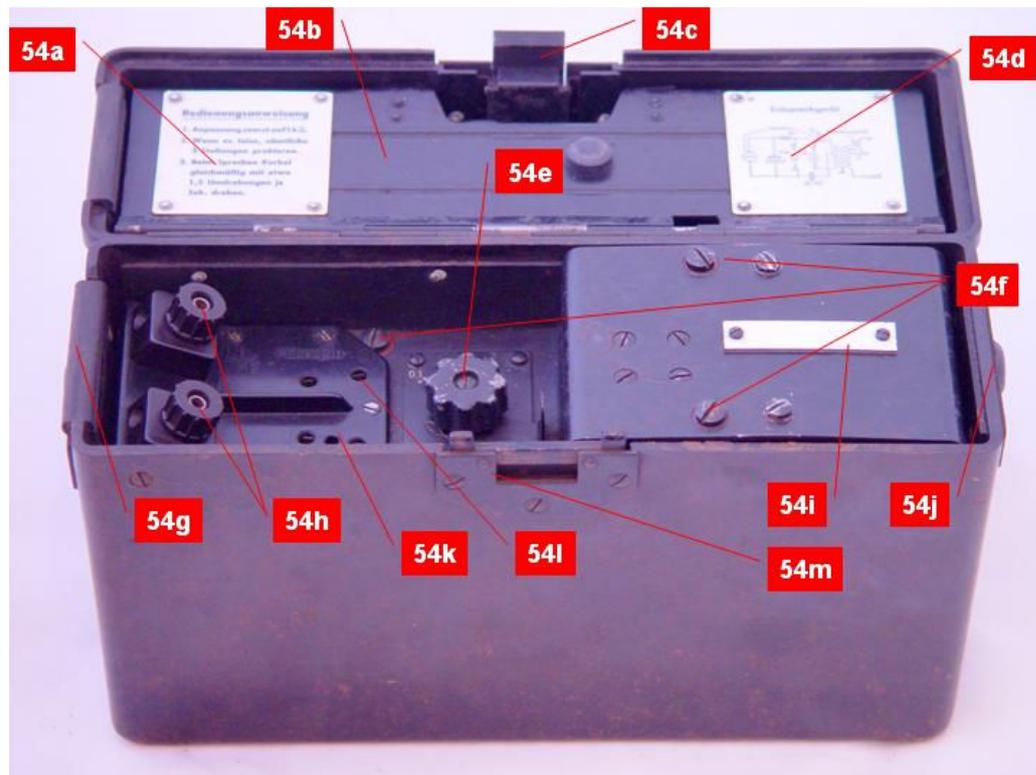
The control panel was different from the normal field telephone with connection jacks for the cable (marked "La" and "Lb/E" as with the *FF 33*), connection jacks for microphone and headset and a matching switch. Instead of a handset, a separate microphone and headset were used, which could be stored in the lid of the housing. The *Erdsprechgerät* does not have a ringing generator nor bell, requiring different



Figure 53: Erdsprechgerät control panel

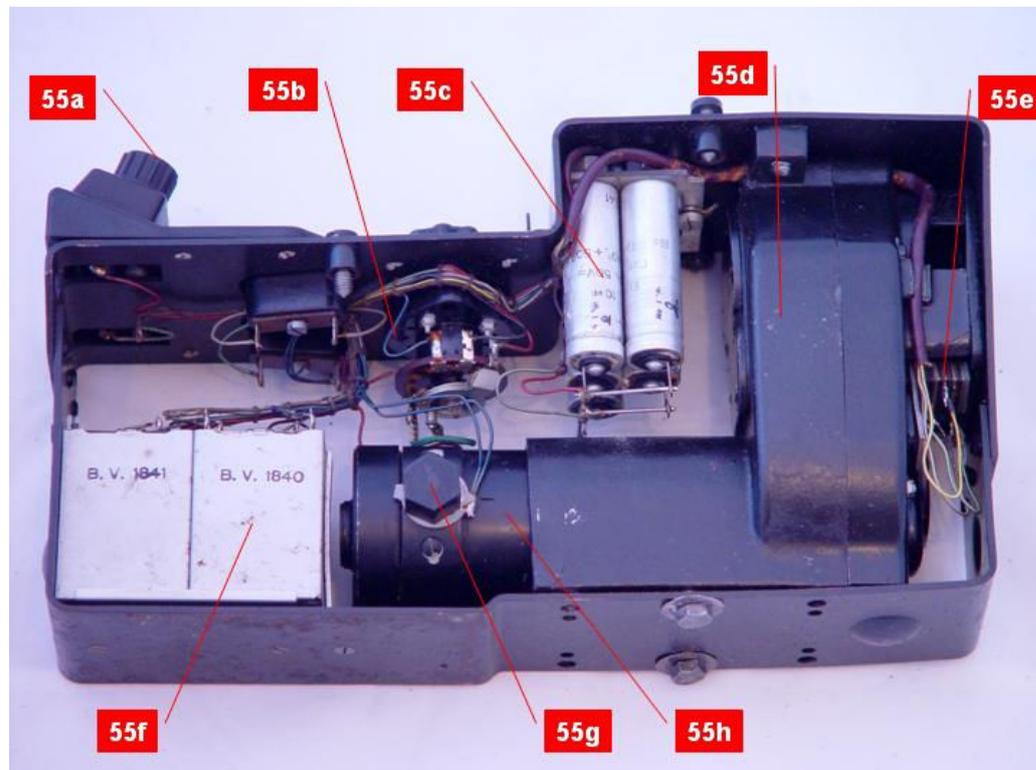
Construction

Figure 54: Erdsprechgerät top view



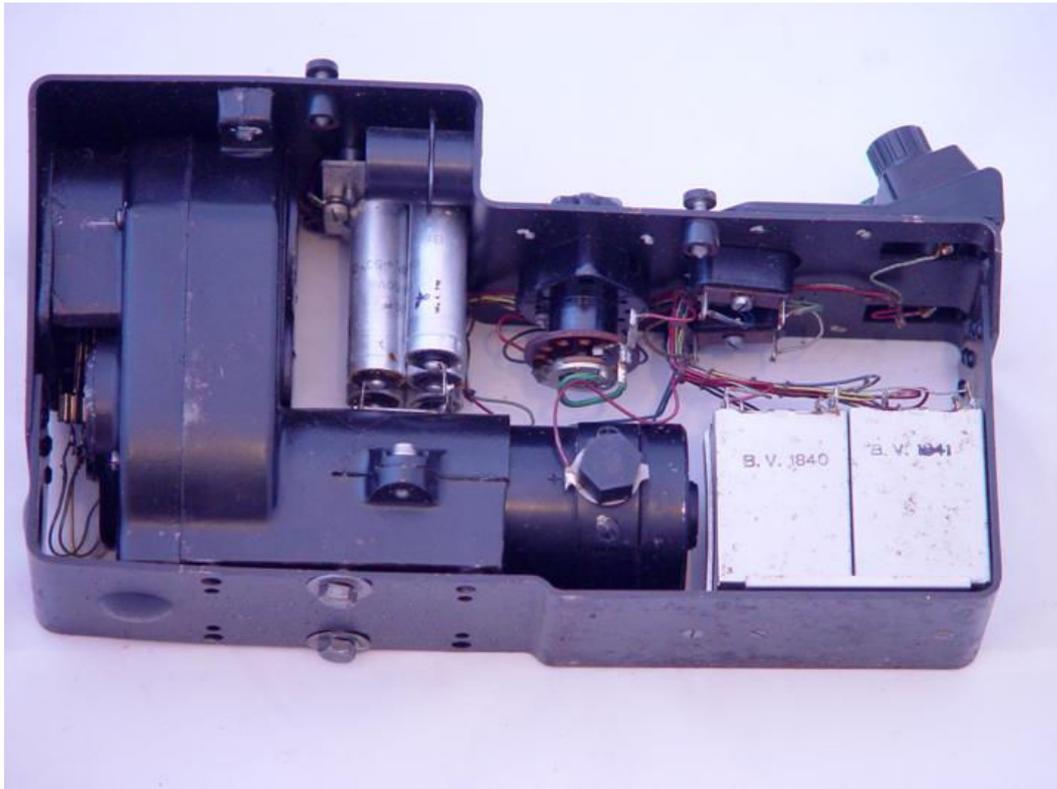
- | | | |
|--|-------------------------------|---------------------------|
| 54a Operating instructions | 54e Matching switch | 54j carrying belt slot |
| 54b Lid to Headset storage compartment | 54f Lock screws | 54k Headset connection |
| 54c Upper lock | 54g Cable transit rubber | 54l Microphone connection |
| 54d Schematic | 54h Line connection terminals | 54m Bottom lock |
| | 54i Small writing tab | |

Figure 55: Erdsprechgerät inside view



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|-------------------------------|--------------------------|-------------------------|
| 55a Line connection terminals | 55d Generator gearbox | 55g Generator brush cap |
| 55b Matching switch contacts | 55e Generator contacts | 55h Generator |
| 55c Capacitors | 55f Matching transformer | |

Figure 56: Erdsprechgerät internal view



see view 1 for components

Figure 57: Erdsprechgerät headset and microphone



57a Headset plug
57b Microphone plug
57c Microphone

57d Headset headband
57e Headset "Dfh.g"

57f Headset adjustable
chinstrap

Operation

To create a connection, two *Erdsprechgeräte* complete with headsets and microphones, two earth pins and 2 lengths of 20 meter single core telephone wire are required. It is assumed that a standard field telephone connection with a single wire and earth pins is already in existence and that the wire has been broken with both ends lying in or on the ground with a gap of up to 5 meters. If a broken two-wire telephone connection has to be bridged, the two wires are connected in parallel to the *Erdsprechgerät*.



Figure 58: Erdsprechgerät with generator crank, headset and microphone connected

- Place the earth pin about 10 meters from the *Erdsprechgerät* and connect to the “Lb/E” connection of the *Erdsprechgerät* using a suitable length of single core cable. If the operating position is surrounded by barbed wire, make sure the earth pin is placed about 10 meters outside the barbed wire enclosure.
- Prepare another short length of wire to connect the “La” terminal of the *Erdsprechgerät* to the telephone wires. About 20 cm of the cable insulation is stripped, so that it can quickly be connected to the terminals of the telephone line or lines.
- Connect the generator handle to the generator through the hole in the side of the casing.

When the normal telephone connection is broken due to the effects of enemy artillery fire, immediately switch over to the *Erdsprechgerät* connection:

- Connect the prepared “La” wire to the telephone wire; in case of a two-wire connection, connect the prepared “La” wire to both telephone wires in parallel.

To operate the *Erdsprechgerät*, two men are usually required: one to turn the generator and another to speak and listen and take notes. The unit can be operated by a single person in emergencies, with one hand used to crank the generator and the other to hold the microphone to the mouth.

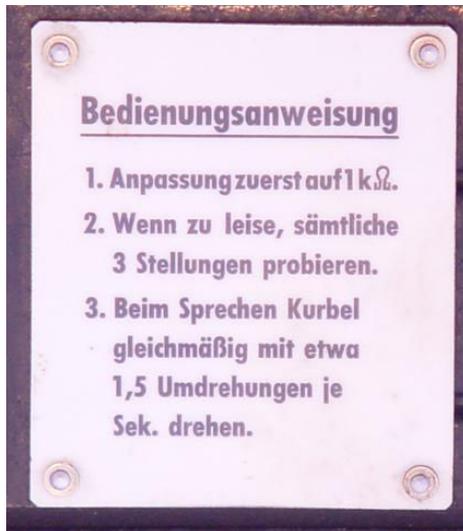


Figure 59: *Erdsprechgerät* operating instructions

To speak, turn the generator with a constant 1 – 1.5 turns per second. The microphone is to be held no more than 2 cm away from the mouth.

To listen, the headset is to be worn by the operator. Release the generator crank (this allows the generator switch contact to switch on the headset). Initially set the matching switch to the “1” position. Once a signal is received, the alternative positions should be tried to find the position which gives the loudest reception.

Only one station can speak at the time while the other should be listening, so the two stations will have to agree operating practices beforehand, for example that station A always calls station B first. Since it is also not possible

to “ring” the other station, fixed operating times should be agreed.

After the normal telephone line is interrupted and the *Erdsprechgerät* is connected, station A will start calling station B by turning the handle 1 -1.5 times per second and for example calls: “Here station A, here station A, station B please come in, over, over....”. After this station A will listen for a reply. If no reply is received after two minutes, the matching switch is to be tried on another setting and the calling procedure repeated.

After station B has received the call, it will start turning the generator crank and will for example reply: “Here station B, here station B, I read you bad/good/load and clear. Best reception is at position 1 or 10, do you read station A? Over, over....”



Figure 60: *Erdsprechgerät* ready for use

When the connection has been established, normal conversation can resume. Because the signal is less secure than even normal telephone connections, secure communication protocol should be used by using codenames etc. “*Feind hört mit!*”.