

File

TB SIG E7

WAR DEPARTMENT TECHNICAL BULLETIN

RADIO OPN SEC 568th SIG

GERMAN RADIO SET

Fusprech.a

WAR DEPARTMENT

17 MARCH 1944

RESTRICTED

WAR DEPARTMENT,
WASHINGTON 25, D. C., 17 March 1944.

TB SIG E7, German Radio Set Fusp rech.a, is published for the
information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION:

IC and H 3, 5, 6, 7, 11, 19(6); IC 4(6).

(For explanation of symbols see FM 21-6.)

WARNING!

THE GERMANS ARE EXPERTS
IN THE USE OF BOOBY TRAPS!
TURNING A DIAL OR SWITCH
MAY DETONATE THE EXPLO-
SIVE. DO NOT HANDLE OR
EXAMINE THEIR EQUIPMENT
UNTIL IT HAS BEEN CLEARED
BY DESIGNATED PERSONNEL!

LOOK OUT!

DESTRUCTION NOTICE

DESTROY THIS SET COMPLETELY! THIS IS VITALLY IMPORTANT!

WHY — THIS IS THE ENEMY'S OWN EQUIPMENT! HE IS ALREADY FAMILIAR WITH ITS OPERATION. HE HAS ADEQUATE SUPPLIES OF REPLACEMENT PARTS. DON'T LET THIS SET FALL INTO HIS HANDS!

WHEN — When ordered to do so by your commander.

HOW —

1. Smash — Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools, etc.
2. Cut — Use axes, handaxes, machetes, etc.
3. Burn — Use gasoline, kerosene, oil, flame throwers, incendiary grenades, etc.
4. Explosives — Use firearms, grenades, TNT, etc.
5. Disposal — Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.

WHAT —

1. Smash — Tubes, capacitors, coils, keys, headsets, microphones, panels, frames, antenna mast sections, and other electrical parts.
2. Cut — All cables, wiring, and cords.
3. Burn — Diagrams, charts, instruction books, wire.
4. Bury or scatter — Any or all of the above pieces after destroying them.

DESTROY EVERYTHING!

RESTRICTED

GERMAN RADIO SET

Fusprech.a

1. DESCRIPTION.

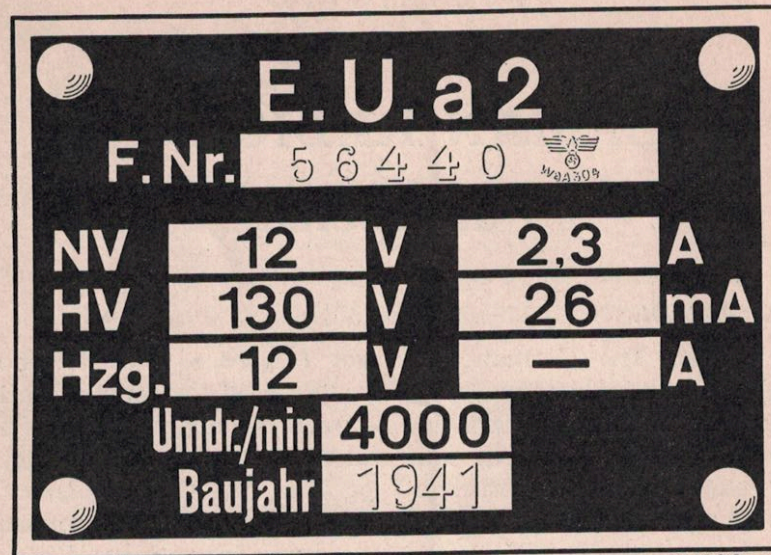
a. **The Set.** The German radio set **Fusprech.a** (radiotelephone model a)* is a high-frequency transceiver used for communication between reconnaissance cars, and between reconnaissance cars and reconnaissance tanks. (The unit will hereafter be referred to as "the **Fusprech**," "the transceiver," or "the set.") The **Fusprech** is used only for voice communication, and is also capable of transmitting a tone signal for calling other operators. It can be used in nets with American amplitude-modulated radio sets within the frequency and distance range. The set is contained in a metal case provided with a leather carrying strap. It is a very compact unit employing seven tubes, all of which are used when the set functions as a receiver, and three of which are used when the set functions as a transmitter. The nameplate of the **Fusprech** is shown in figure 1.



Figure 1. Nameplate of German radio set **Fusprech.a**.

b. **Power Supply.** Power is supplied by the vehicular storage battery through the dynamotors **E.U.a** (receiver dynamotor model a), **E.U.a2** (receiver dynamotor model a2), **S.E.U.a** (transmitter-receiver dynamotor model a), or any other dynamotor unit having

* Whenever German words appear in this bulletin, the American military equivalents follow in parentheses.



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Figure 2. Nameplate of German dynamotor E.U.a2.

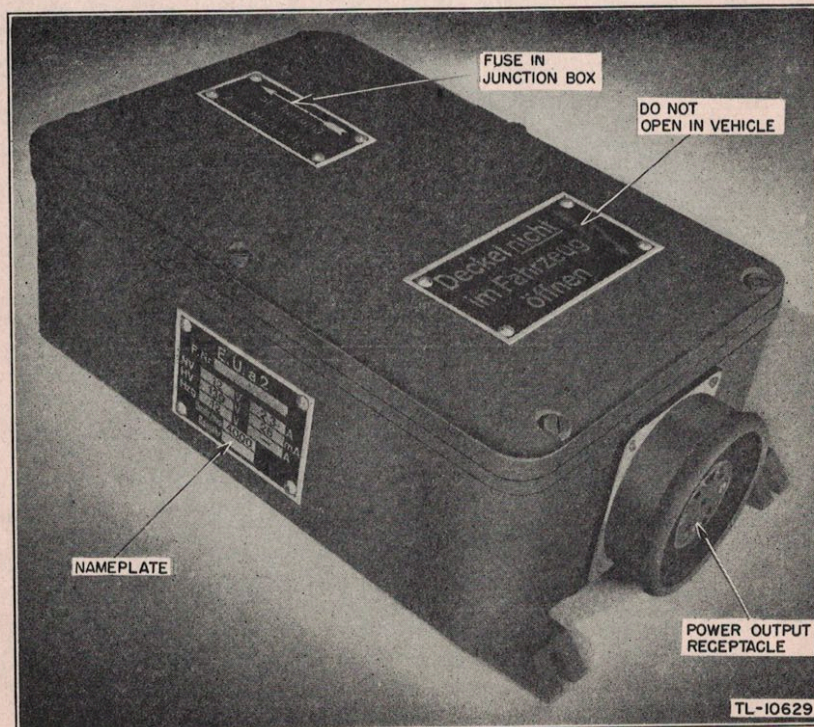


Figure 3. German dynamotor E.U.a2.

the necessary power output. The nameplate of dynamotor **E.U.a2** is shown in figure 2. These units are very similar in construction and differ chiefly in minor operating characteristics and output capabilities. They are contained in rugged cases of cast lightweight alloy construction. Dynamotor **E.U.a2** is shown in figure 3.

(1) Dynamotors **E.U.a2** and **E.U.a** are provided with a two-terminal input receptacle at one end of the case, and a five-connector output receptacle at the other end. The **E.U.a2** contains a starting relay which is used for connecting the input voltage to the dynamotor. The starting relay is operated when the **Aus-Ein** (off-on) switch on the set is placed in the **Ein** (on) position. The number 3 contact in the power receptacles and plugs is used to supply the necessary operating voltage. The dynamotor **E.U.a** does not contain a starting relay, but input voltage is conducted through the same path as the relay-energizing voltage described above. For circuit identification, a schematic diagram is mounted inside the dynamotor cover.

(2) Dynamotor **S.E.U.a** is similar to dynamotors **E.U.a2** and **E.U.a** in operation and construction, except that at one end of the case there is a two-terminal input receptacle and a five-connector output receptacle. The output capabilities of the dynamotor **S.E.U.a** are greater than those of dynamotors **E.U.a2** and **E.U.a**, and it can therefore be used to operate a receiver or small transmitter whose requirements are within the ratings.

2. PERFORMANCE DATA. The table below lists the performance data of the transceiver.

PERFORMANCE DATA

Frequency range:

Transmitting or receiving	24.1 to 25.0 mc
Types of signals emitted	tone for signaling, and voice
Types of signals which can be received	tone, voice
Type of modulation	amplitude
Method of modulation	grid
Preset frequencies	none
Antenna type	rod, 6½ ft in length
Distance range	3½ miles, approximately
Dial graduation	10 numbered channels

Dial No.	Frequency
101	24.1 mc
102	24.2 mc
103	24.3 mc
104	24.4 mc
105	24.5 mc
106	24.6 mc
107	24.7 mc
108	24.8 mc
109	24.9 mc
110	25.0 mc

PERFORMANCE DATA (contd)

Type of transmitter	master oscillator-power amplifier (MOPA)	
Type of receiver	superheterodyne	
Number of tubes	7 (as listed below)	
	<u>Type of tube</u>	<u>Receiving function</u> <u>Transmitting function</u>
	1 RV12P2000	mixer
	1 RV12P2000	h-f oscillator master oscillator
	1 RV12P2000	1st i-f amplifier
	1 RV12P2000	2d i-f amplifier
	1 RV12P2000	detector
	1 RV12P2000	1st a-f amplifier modulator and tone oscillator
	1 RL12P10	a-f output power amplifier
Intermediate frequency	1.5 mc, approximately	
H-f oscillator frequency	1.5 mc below signal frequency	
Sidetone in set	none	
Zero beat transmitter with receiver	impossible	
Power output	8 watts	
Power supply	12-volt vehicular storage battery	
Power requirements:		
	Filaments	12 volts, 1 amp, approximately
	Plates	130 volts 25 ma, to 180 volts 85 ma, approximately
Current drain from 12-volt battery	5.5 amps, approximately	

3. INSTALLATION.

a. Location. Mount the transceiver and dynamotor securely in suitable mounting racks. If racks are not provided in the vehicle, firm supports for the equipment will have to be constructed.

b. Cording.

CAUTION: Before making any connections, be sure the control marked **Aus-Ein** (off-on) is in the **Aus** (off) position.

(1) Connect battery lead to the 12-volt input terminals of the dynamotor and the 12-volt storage battery, inserting a 15-ampere fuse in the positive lead.

(2) Connect the power cable to the power input receptacle on the lower left of the front panel of the transceiver and to the power output receptacle on the dynamotor, as shown in figure 4.

(3) Connect the antenna cable to the jack marked **Ant.** (antenna). Ground the jack marked **G.** (counterpoise) to the chassis of the vehicle (figs. 4 and 5). If coaxial cable is available, connect the

center conductor to the jack marked **Ant.** (antenna) and the shield to the jack marked **G.** (counterpoise). Ground the shield to the chassis of the vehicle.

(4) Plug the microphone lead into the jack labeled **Mikrofon** (microphone). Any single-button carbon microphone which will plug into the jack is satisfactory.

(5) Plug the loudspeaker into the jack marked **Lautsprecher** (loudspeaker), making sure that the jack cover marked **Fernhörer** (headset) covers the headset jack. The loudspeaker will not function if the headset-jack cover is open. If headset operation is desirable, uncover the headset jack and plug in the headset. Any headset with a suitable plug will do. The set is now ready for operation.

4. OPERATION. After the set is installed (par. 3), it is placed in operation as follows:

a. Turn the main switch and volume control marked **Aus-Ein** (off-on), to the **Ein** (on) position. Allow about 60 seconds for the tubes to warm up.

b. Turn the dial lock, marked **Los** (unlocked) and **Fest** (locked), to the **Los** (unlocked) position as shown in figure 5. Select the desired frequency by means of the control marked **Frequenzeinstellung** (tuning control). Lock the tuning control by turning the dial lock to **Fest** (locked).

c. Open the antenna-trimmer covers marked **E.-Ant.Anpass.-S.** (receiver and transmitter antenna trimmers). Press the switch on the microphone, and with a screwdriver adjust the antenna trimmer marked **S.** (transmitter) for maximum reading on the meter marked **Ant.-Strom** (antenna current).

NOTE: Pressing the microphone switch puts the transmitter carrier on the air. When the button is released, the set functions as a receiver.

d. With either the loudspeaker or the headset plugged in, adjust the antenna trimmer marked **E.** (receiver) for maximum signal strength in the loudspeaker or headset.

e. To transmit, press the microphone switch and speak into the microphone.

f. When receiving, control the volume of the signal in the headset with the control marked **Aus-Ein** (off-on).

g. To call another operator, press the microphone switch and the button on the front panel of the transceiver labeled **Ruf** (call). Pressing the microphone switch puts the carrier on the air, and pressing the call button causes the tone oscillator to oscillate and

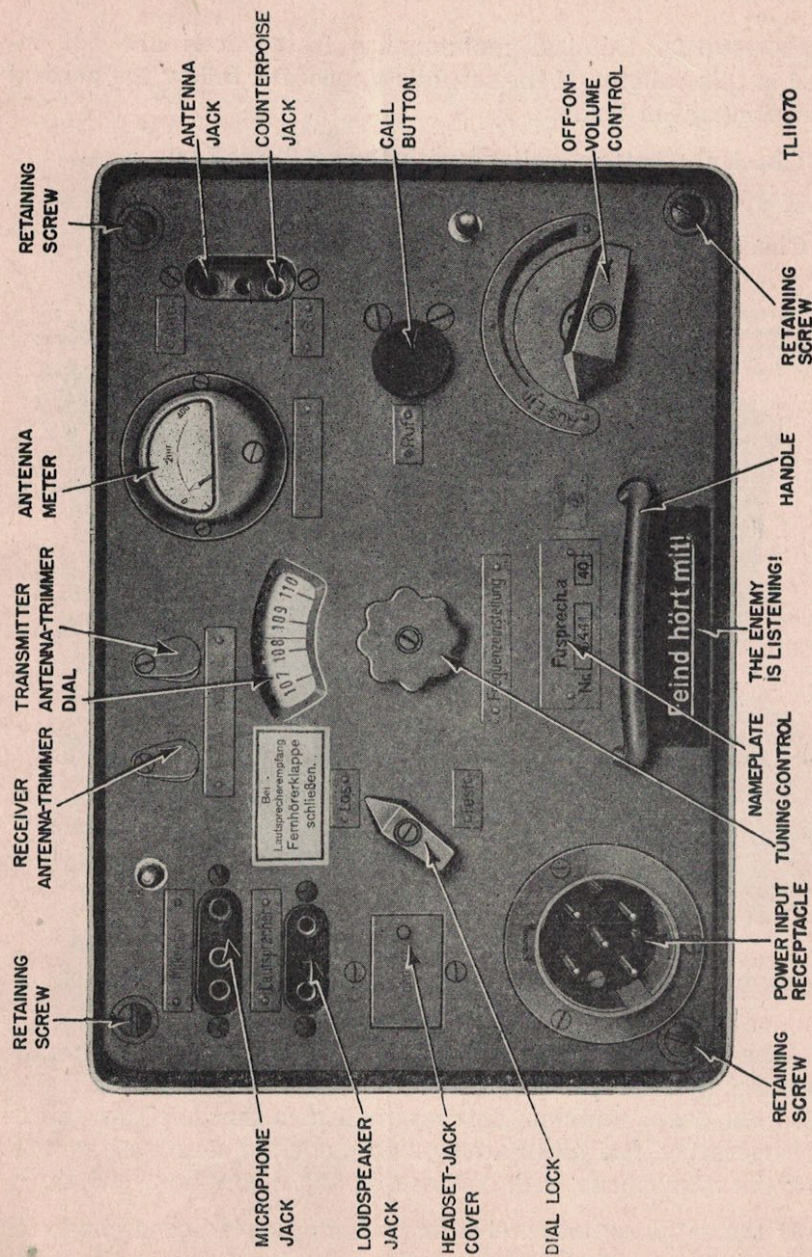


Figure 5. German radio set Fusprech.a, front view.

tone-modulate the transmitted signal. These operations cause a loud howl to be produced in the loudspeakers of the sets receiving this signal.

5. MAINTENANCE. Detailed maintenance instructions are not included in this bulletin. If the set fails to operate, follow the general instructions given below:

- a. Check the battery voltage with the set turned on.
- b. If dynamotor does not run, check fuse.
- c. Check all cords, plugs, and connections.

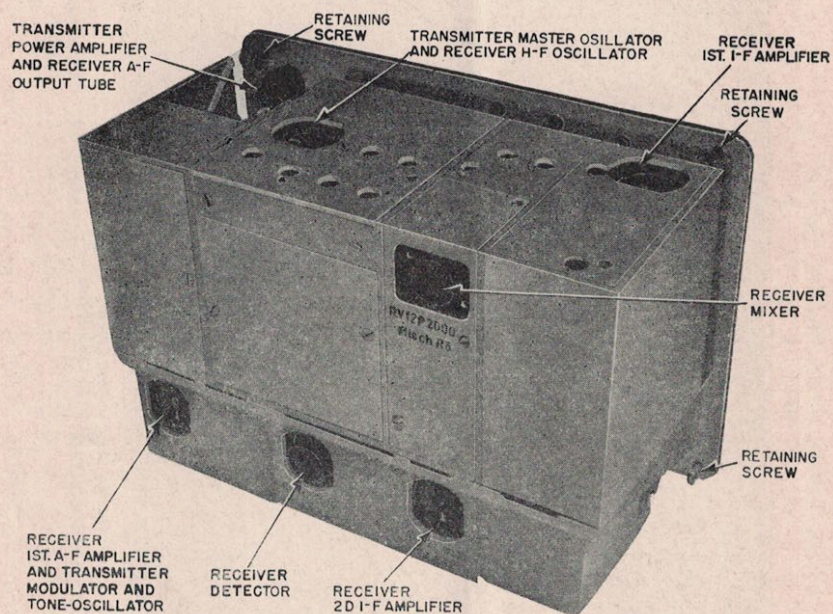


Figure 6. Chassis of German radio set Fusprech.a, top and rear view.

d. When the set is receiving, all the tubes are in operation. Therefore, if the receiver is functioning properly and the meter labeled **Ant.-Strom** (antenna current) indicates that the transmitter is not operating, the tubes are probably not the source of trouble. Check the microphone lead, connectors, and microphone switch.

e. If the set does not receive or transmit, replace and check for operation after each replacement, the following tubes in the order given: power amplifier, master oscillator, and modulator. If the set still does not transmit, the trouble is not in the tubes. If trans-

mitter operation is normal and reception is impossible, see paragraph 5g below.

f. To change the tubes remove the set from the case. Loosen the four retaining screws on the front panel of the set (fig. 5). Each retaining screw is encircled with a red ring. Then pull the set from the case. Figure 6 is a top rear view of the set with the case removed, and shows the position and function of all the tubes.

g. If the antenna meter indicates that the transmitter is functioning properly, and the receiver is inoperative, replace the following tubes in the order given: detector, 2d i-f amplifier, 1st i-f amplifier, and mixer.

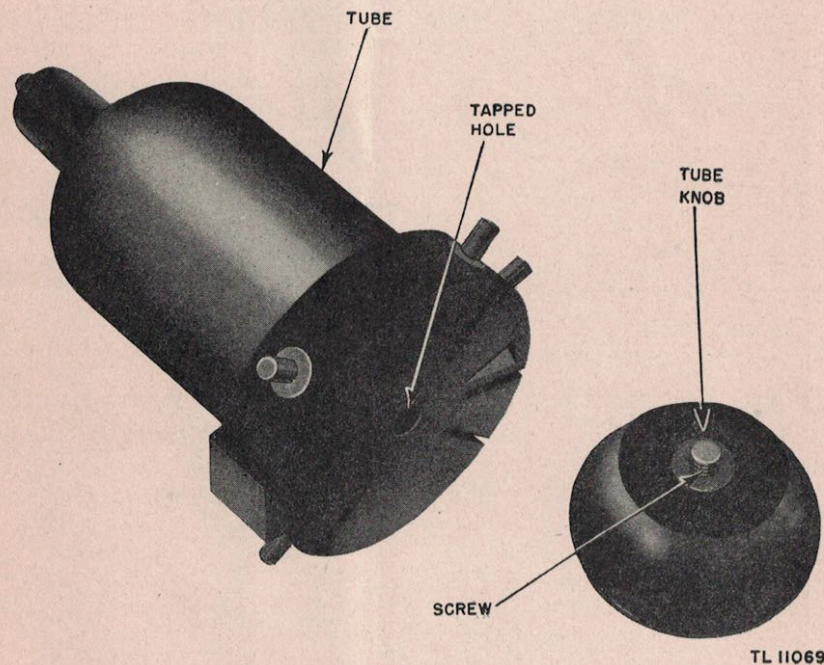


Figure 7. German radio tube type RV12P2000 used in German radio set FuspRech.a.

h. To remove any tube not having a knob, unscrew a knob from another tube and screw it into the hole in the base of the tube to be removed (fig. 7). Be sure that no knobs are left on any of the tubes on the top of the chassis when the chassis is replaced in its case.

i. If the simple procedures outlined above do not make the set operate, send it back to a signal depot. The components may be used to repair other sets. WE CAN USE THE GERMAN PARTS TO REPAIR OUR OWN AS WELL AS GERMAN SETS.

6. GLOSSARY OF TERMS. The German terms on the set and their American military equivalents are as follows:

<u>German</u>	<u>American</u>
Ant., Antenne	antenna
Ant. Anpass	antenna trimmer
Ant.-Strom	antenna current
Aus	off
Baujahr	year of manufacture
Bei Lautsprecherempfang Fernhörerklappe schließen	Close headset-jack cover when using loudspeaker
Deckel nicht im Fahrzeug öffnen	Do not open in vehicle
Ein	on
E., Empfänger	receiver
F.Nr.	serial number
Feind hört mit!	The enemy is listening!
Fernhörer	headset
Fest	locked
Frequenzeinstellung	tuning control
Fusprech., Funksprecher	radiotelephone
G., Gegengewicht	counterpoise
Gleichr. Rö., Gleichrichter Röhre	rectifier tube, detector
HV, Hoch Voltspannung	high voltage
Hzg., Heizung	filament voltage
Lautsprecher	loudspeaker
Leistungs Rö., Leistungs Röhre	power-amplifier tube
Los	unlocked
Mikrofon	microphone
Misch Rö., Misch Röhre	mixer tube
N.F. oder Mod. u. Ruf Rö., Nieder- frequenz oder Modulation und Ruf Röhre	a-f amplifier or modulator and tone-oscillator (call tube)
NV, Nieder Voltspannung	low voltage
Oszill. Rö., Oszillator Röhre	oscillator tube
Ruf	call
S., Sender	transmitter
Sicherung im Anschlußkasten	fuse in junction box
Umdr./min, Umdrehungen/minute	revolutions per minute
Z. F. Rö., Zwischenfrequenz Röhre	i-f amplifier tube