

INSTRUCTION

Sailor

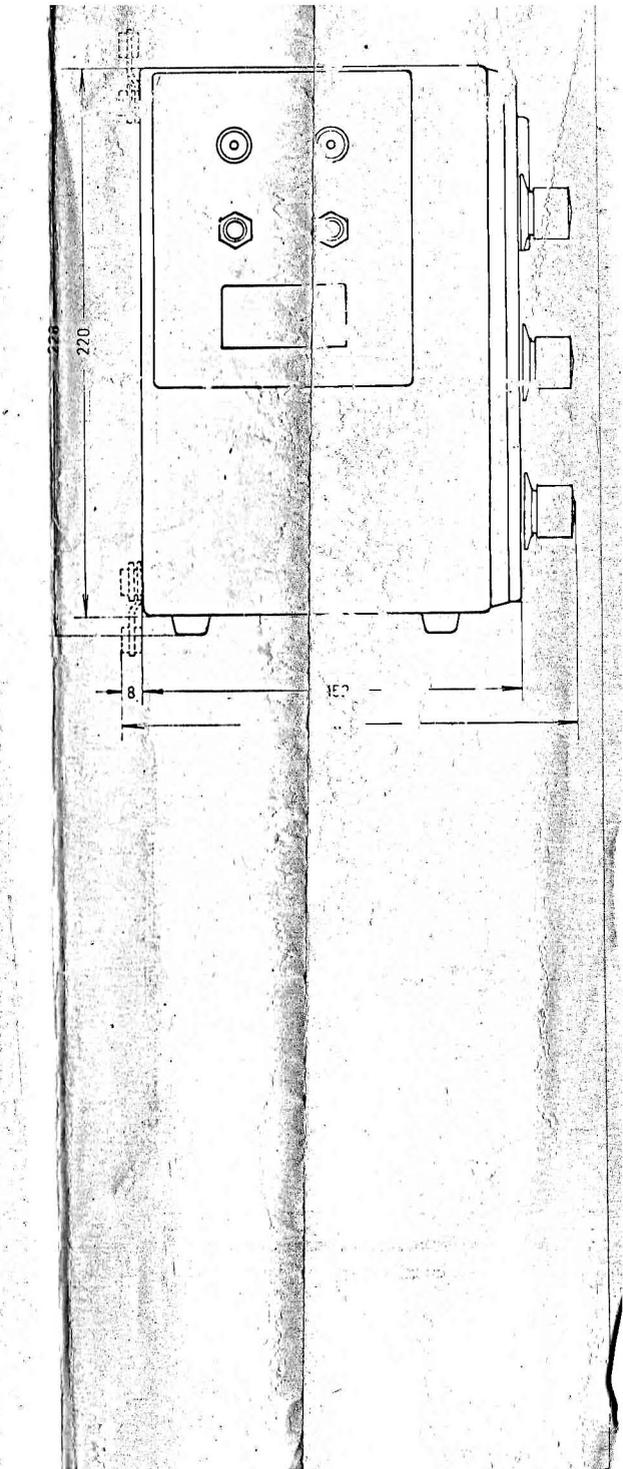
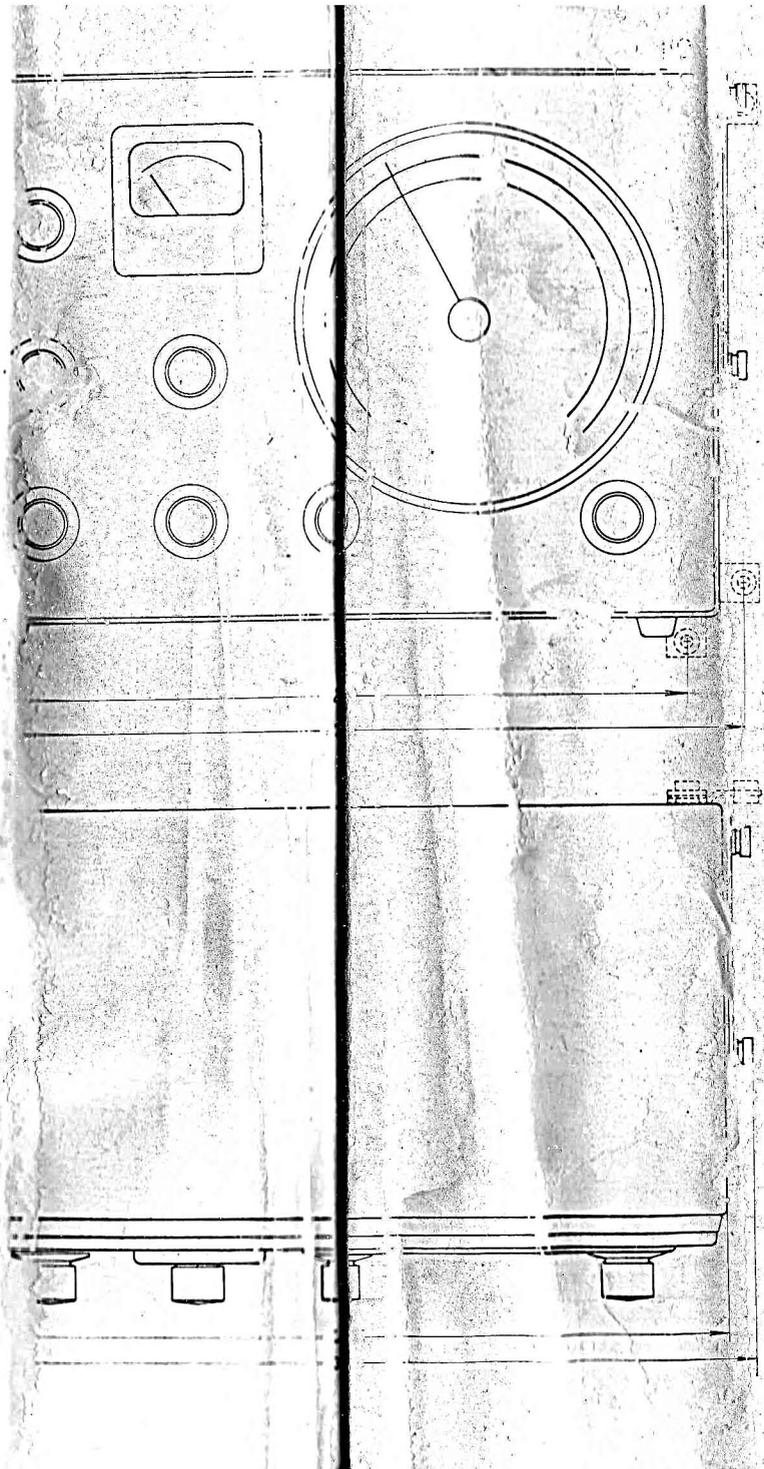
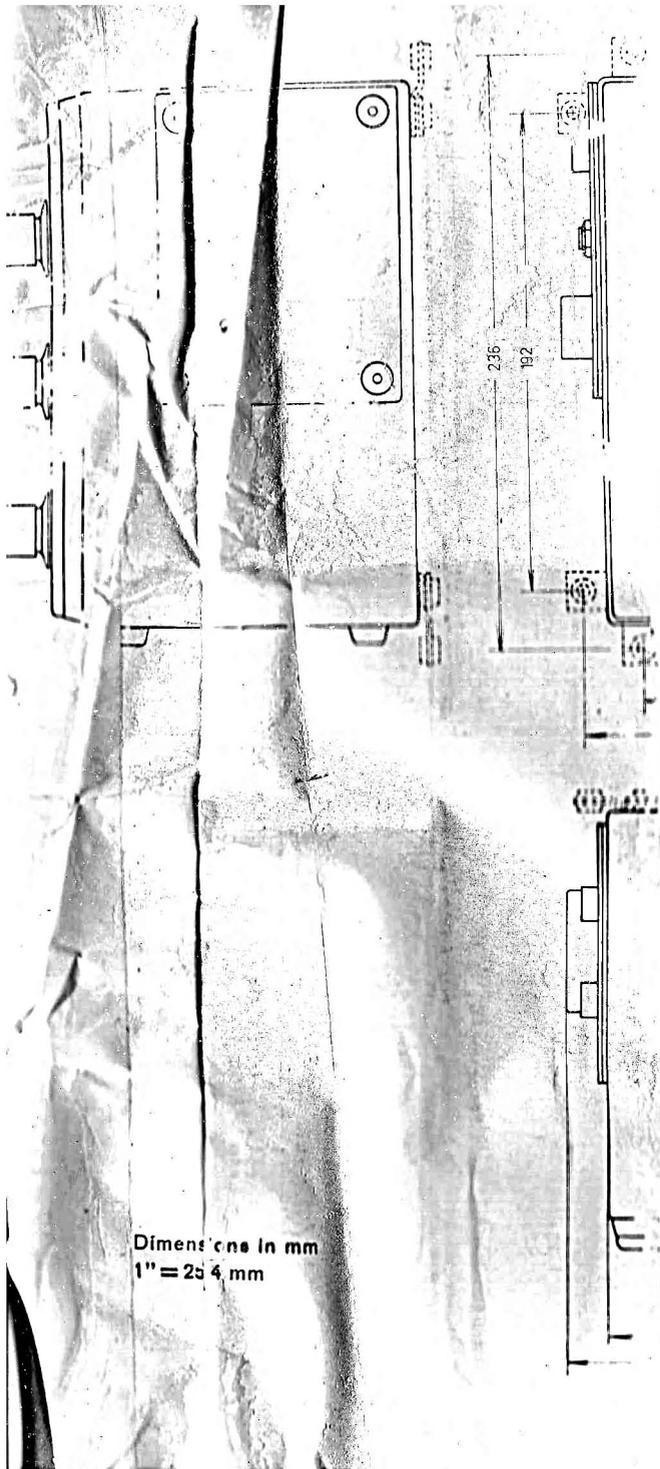
TYPE SET

1/2 S. P. RADIO
AALBORG - DENMARK



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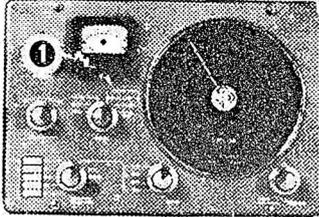
Dimensions in mm
1" = 25.4 mm

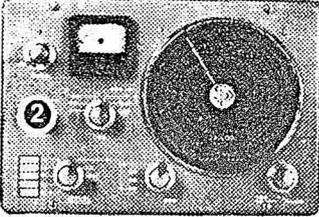
A. Operating the SAILOR Type 66T

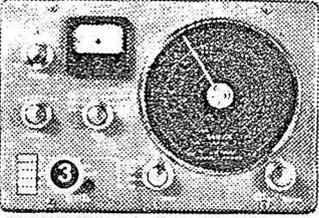
Figures in brackets refer to the illustration on this page

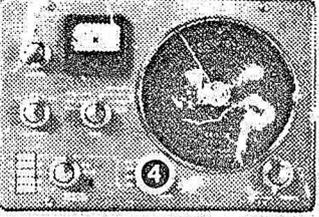
I. General Broadcasting:

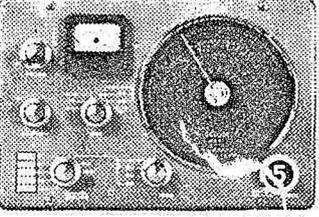
- 1** Switch on the receiver by turning the volume control.

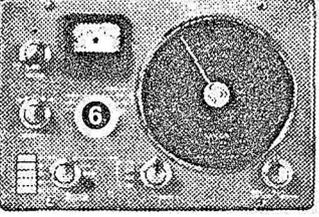

- 2** Set the sensitivity control at maximum.


- 3** Set the channel selector against the marking pointing towards the band switch.


- 4** Set the band switch for the desired band.


- 5** Set the dial pointer at the desired station.


- 6** Set the tone switch at HIGH. This is the setting normally used for reception.



When the desired station is located re-tune for maximum meter deflection.

When listening to a very strong signal, which will produce a large meter deflection, sensitivity control (2) should be backed off until the meter deflection is below 8.

Volume is adjusted with volume control (1). If severe interference from adjacent stations is encountered, reception may be improved by setting tone switch (6) at LOW (accentuated low-note response) or at FILTER.

II. Fixed Frequencies:

For listening on one of the receiver's five fixed channels, the channel selector (3) should simply be turned to the desired channel. The crystal frequency was selected when the receiver was installed; it is written on the plate to the left of the channel selector knob.

By turning channel selector (3) to a fixed channel, controls (4) and (5) are made inoperative.

III. Telegraphy and Consol Signals:

Tune in as described under I.

Set tone switch (6) at FILTER WITH BFO. Volume control (1) and sensitivity control (2) should now be readjusted, choosing that particular combination of the two settings which will provide best low-noise reception in the situation in question.

Adjust tuning control (5) for maximum loudspeaker volume.

Consol signals: Set volume control (1) at maximum. Adjust sensitivity control (2) for convenient meter deflection (approx. 5 at constant tone).

IV. Taking Bearings:

1. Tune in the station or radio beacon proceeding as described under I.
2. Turn channel selector (3) to D.F.
3. Set the D.F. unit to the band in which the station operates, and tune the D.F. unit for maximum signal.

4. Set tone switch (6) at FILTER WITH BFO.
5. Advance volume control (1) and adjust sensitivity control (2) for convenient signal strength (meter reading should not exceed 8).
6. Rotate D.F. loop for minimum D.F. signal. Minimum D.F. signal is indicated by minimum response in the headphones or loudspeaker, or by minimum deflection. If the meter deflection goes towards zero, sensitivity control (2) should be advanced.
7. For sense determination, set sensitivity control (2) so that a convenient meter deflection is obtained after the D.F. unit has been rotated 90 degrees (clockwise) away from the setting at which minimum D.F. signal was obtained. Turn channel selector (3) to SENSE. If the meter deflection increases, the direction is correct. If the deflection decreases, the direction should be corrected by 180 degrees. The channel selector should be in the SENSE position while you read the sense deflection.

Operation of the D.F. units is described in detail in Chapter C.

V. Checking the battery:

Switch on receiver, (1).

Set tone switch (6) at BATT. TEST.

Then, if the receiver is operating from the internal battery the meter will indicate the battery voltage.

If the receiver is operating from an external power supply, the meter should read 9 volts.

CAUTION: Do not leave an exhausted battery in the battery box. Doing so may cause serious damage to the interior parts of the receiver.

D. Installing the SAILOR Type 66T

I. Wire Aerial and Earth:

The wire aerial plugs into the socket marked AERIAL. It should consist of ten to twenty metres of wire as high and in the clear as possible. Use good-quality coaxial cable for the lead-down. 75-ohm cable for short aerials and 150-ohm cable for long aerials. It is important that the lead-down is as short as possible and that it is not laid near other electric cables. All joints should be made by soldering.

The earth wire, insulated copper cable not less than 2.5 sq.mm thick, should be connected to the hull (in iron vessels), keel bolt, or engine base; or (in wooden vessels), to a metal plate, not less than one square metre in size, on the outside of the hull below the water line. The earth wire should be as short as possible. A good earth connection is of decisive importance for low-noise reception and a sharp D.F. minimum.

See also our special information sheets on aerial installation. A complete range of Sailor aerial installation equipment is available, including tensile-tested bottle screws, lead-in insulators, and elastic neoprene insulators.

II. Inserting Crystals and Aligning the Channels:

1. Five receiving frequencies may be selected anywhere in the range 1500 kc/s to 4200 kc/s.
2. The crystal frequency should be 470 kc/s higher than the desired receiving frequency (the signal frequency).
3. When a crystal is inserted, or replaced, in a fixed channel, it will be necessary to align that channel. For the signal frequencies in the range 1500 kc/s to 2000 kc/s fit two 220 pF capacitors, and for signal frequencies in the range 2000 kc/s to 2900 kc/s fit two 100 pF capacitors. For signal frequencies in the range 2900 kc/s to 4200 kc/s no capacitors are required.

Aligning a Fixed Channel:

If the signal frequency is in the ranges 1500 kc/s to 2000 kc/s or 2000 kc/s to 2900 kc/s the two capacitors, designated CX, should be soldered on to the two sets of soldering rivets designated by the channel letter, on the 1st RF and 2nd RF panels, respectively. Align the iron cores for the channel in question, with an RF generator connected to the aerial input. Set the

generator frequency at the receiving frequency in question and align for maximum deflection on the receiver meter. After alignment, the iron cores should be locked by means of a small quantity of lacquer.

NOTE: Never touch the intermediate-frequency alignment unless proper measuring equipment is available (see Chapter E). The intermediate frequency is aligned with very close tolerances.

Example of alignment of a fixed channel in SAILOR 66T

Channel A is to be aligned for reception on 2182 kc/s.

1. The crystal frequency is $2182 + 470 \text{ kc/s} = 2652 \text{ kc/s}$.
A 2652 kc/s crystal is plugged in at A on the crystal panel.
2. 2182 kc/s is in range 2000–2900 kc/s.
Consequently two 100 pF capacitors are soldered into position at the points marked A on the 1st and 2nd RF panels, respectively.
3. A signal at 2182 kc/s is applied through the receiver's aerial socket, with the receiver set on channel A. The iron cores of channel A (see parts layout on page 26) are aligned for maximum deflection on the receiver meter.
4. The cores locked by means of lacquer.

III. Direction Finding Aerial:

The D.F. aerial plugs into the socket marked D.F. AERIAL. Input impedance is 1 k ohms. The D.F. aerial should be as high and as clear as possible. In wooden vessels, direction finding can be carried out below deck. In iron vessels, direction finding can only be carried out above deck and above deck-house level.

If stays, masts, etc. can form closed loops, insulators must be inserted at suitable points so that such closed loops are broken.

Other aeriels, if any, on board must be arranged so that they can be isolated (*not* earthed).

Both the wire aerial and the D.F. aerial are used for sense determination. When installing the receiver, the sense control (accessible behind the plastic plug immediately to the right of the channel selector) should be adjusted for most clearly defined sense deflection, as follows:

Tune in a radio beacon of medium signal strength as described under Chapter A, Section 4, and rotate the direction finder, as described, 90 degrees anti-clockwise from the D.F. minimum. Turn the receiver's channel selector from D.F. to SENSE and adjust the sense control so that the meter deflection is slightly higher than that obtained in the D.F. position. Then rotate the direction finder 90 degrees clockwise from the D.F. minimum. On switching from D.F. to SENSE, the meter deflection should fall slightly. Repeat these switching operations a few times while readjusting the sense control so that the most clearly defined difference between deflections is obtained on the meter.

IV. External Power Supply, Fuses:

An external power supply and earth should be connected to the terminals marked EXT. POWER. Be sure to observe correct polarity in making the connections.

The receiver may be switched for operation from 12-, 24-, and 32-volt mains. Switching is performed with the voltage selector, which becomes accessible on removal of the receiver's battery box (BATTERY BOX). The voltage selector is located to the left of the battery box, and is operated with a screwdriver or coin, etc. Over the voltage selector a supply switch is located. This switch is placed on EXT. Never change the voltage when the receiver is switched on.

A current of approx. 0.4 amp. is required by the receiver. Two 0.8 amp. fuses are provided; these become accessible on removal of the cover carrying the power and aerial connectors.

It is necessary, when installing the receiver, to provide effective suppression of noise generated by any ignition systems, dynamos, and electric motors on board. This noise suppression must be kept effective at all times if full benefit of the receiver is to be obtained.

V. Internal Power Supply:

The internal battery is located behind the cover marked BATTERY BOX. For replacement use six 1.5-volt Ever Ready Size D dry cells, or cells of a similar type.

Be sure to observe correct polarity (see sketch on cover) and to reassemble the battery box correctly (see colour marks on ends of box).

If the receiver is to be operated from the built-in batteries it is necessary to check, before putting the battery box back in place, that the supply switch is in the BATT. position. Never change the voltage when the receiver is switched on!

With the tone switch in the BATT. TEST position and the receiver operating, the voltage of the internal battery can be read on the receiver meter. Batteries should be replaced if the voltage is below 7 volts.

CAUTION: Never leave a spent battery in the battery box. Battery liquid will flow out and ruin the electrical components of the receiver.

VI. Loudspeaker and Headphones:

Loudspeaker and/or headphones plug into the socket marked SPEAKER and PHONES. Output impedance is 3.2 ohms.

E. Service Information

I. Technical Data:

1. Bands:

Long-wave band	LW	150– 285 kc/s.
Navigation band	NW	255– 425 kc/s
Medium-wave band	MW	525–1600 kc/s
Short-wave band	SW	1600–4200 kc/s.
2. Intermediate frequency:
470 kc/s.
3. A.V.C.:
An increase in RF input voltage from 31 μ V to 100 mV will increase the output voltage by less than 10 dB.
4. Sensitivity:
50 mW output in the SW band for less than 3 μ V
(modulation: 30% – 400 c/s).
5. Signal-to-noise ratio:
10 dB signal-to-noise ratio (modulation: 30% – 400 c/s).
320 kc/s with I.E.C. dummy aerial: 10 μ V.
1 Mc/s with I.E.C. dummy aerial: 10 μ V.
2.2 Mc/s, generator impedance 25 ohms: 1 μ V.
6. Image suppression:
Better than 50 dB (2.2 Mc/s).
7. Selectivity:
IF bandwidth: 6.5 kc/s.
8. AF characteristic:
6 dB from 100 c/s to 3000 c/s.
With filter: 6 dB bandwidth 300 c/s.
9. Power output:
Max. 1.8 watts on internal power supply.
1.5 watts on 24-volt power supply.
10. Current drain:
Internal power supply: 0.04–0.15 amp.
External power supply: 0.4 amp.
11. Weight:
Approx. 8 kg (17.6 lbs).

II. Alignment Procedure

1. *Intermediate frequency:*

All IF alignment points are sealed at the factory and should not be touched unless repairs have made realignment necessary.

- 1.1. Connect a sweep generator to the points marked (H) in the mixer through 2 pcs. 10 kohm resistors. Also connect a marker generator and set it to 470 kc/s.
- 1.2. Connect an oscilloscope to the AF side of the detector.
- 1.3. Set the receiver at 1500 kc/s in the MW band.
- 1.4. Align the IF transformers for maximum response and symmetrical curve form around the marker point. Maximum permissible deviation is + 200 c/s.
- 1.5. Remove the marker generator and connect a test lead between point P on the IF panel and point Q on the AF panel. (See section VI: Locating of Components).
- 1.6. The BFO will now produce a beat with the IF curve. Adjust the core of coil 1308 (AF panel) so that the beat will be on 469 kc/s.
- 1.7. Adjust, with trimmer capacitor C77, the BFO output level so that the receiver meter reads 3.
- 1.8. All cores and trimmers are locked by means of lacquer.

2. *Signal circuits:*

- 2.1. Connect a signal generator at the receiver's aerial socket. The generator impedance should be less than 75 ohms on SW. On LW, NW, and MW the signal should be applied through a dummy aerial as prescribed by the I.E.C. standard. Connect a speaker at the receiver's loudspeaker socket for monitoring.
- 2.2. Align the oscillator circuit, 1st RF circuit, and 2nd RF circuit, in that order. Tune for maximum receiver meter deflection. The signal level should be so low that the meter reading does not exceed 5.
The sensitivity control should be at max.

2.3. Alignment data:

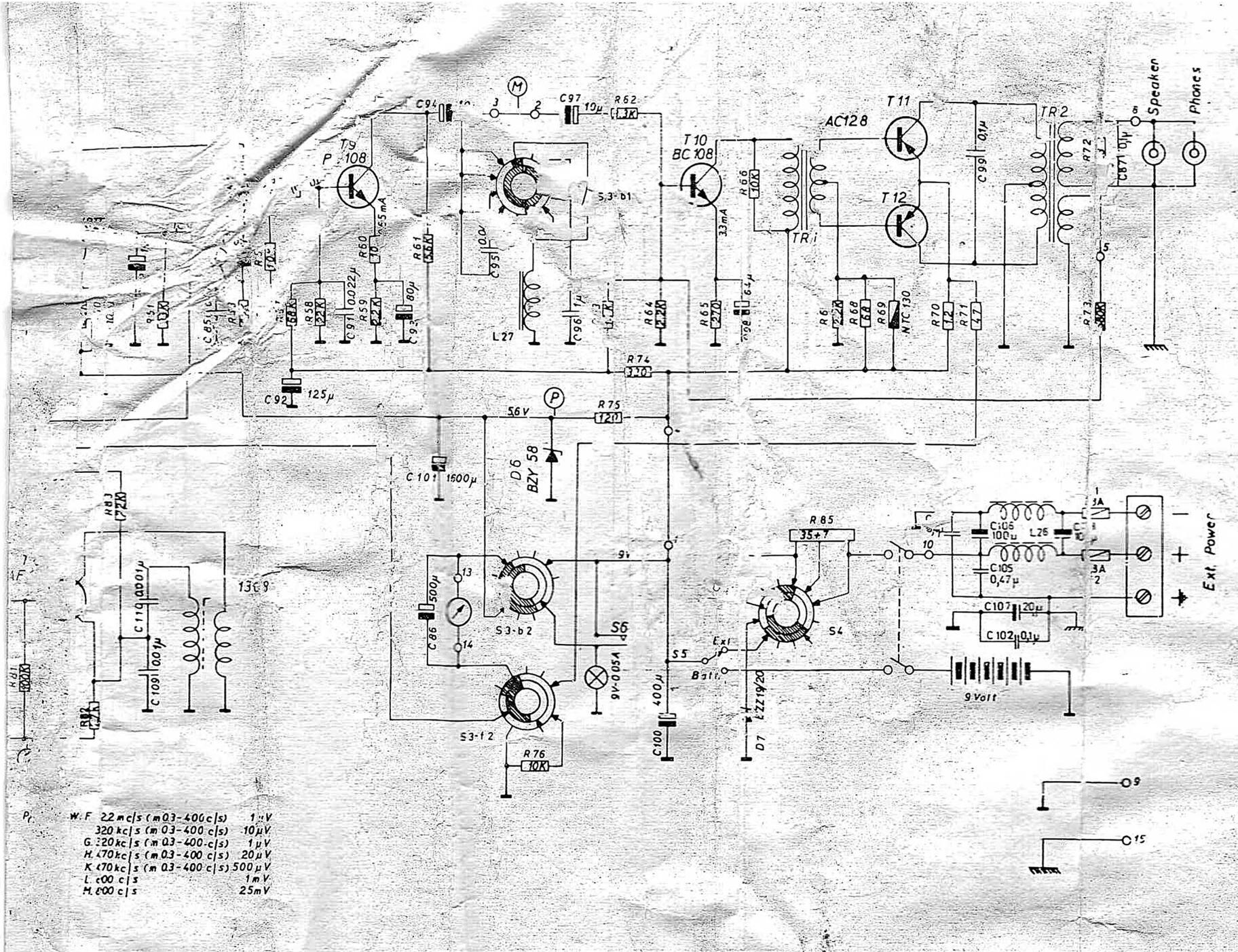
Band	Frequency	Alignment Point
LW	170 kc/s	L2 L1 L11
	270 kc/s	C12 C11
NW	270 kc/s	L9 L7 L8
	400 kc/s	C9 C8
MW	600 kc/s	L6 L4 L5
	1400 kc/s	C6 C4 C5
SW	1800 kc/s	L3 L1 L2
	3600 kc/s	C3 C1 C2
Channel A		L23 L24
Channel B		L21 L22
Channel C		L19 L20
Channel D		L17 L18
Channel E		L15 L16

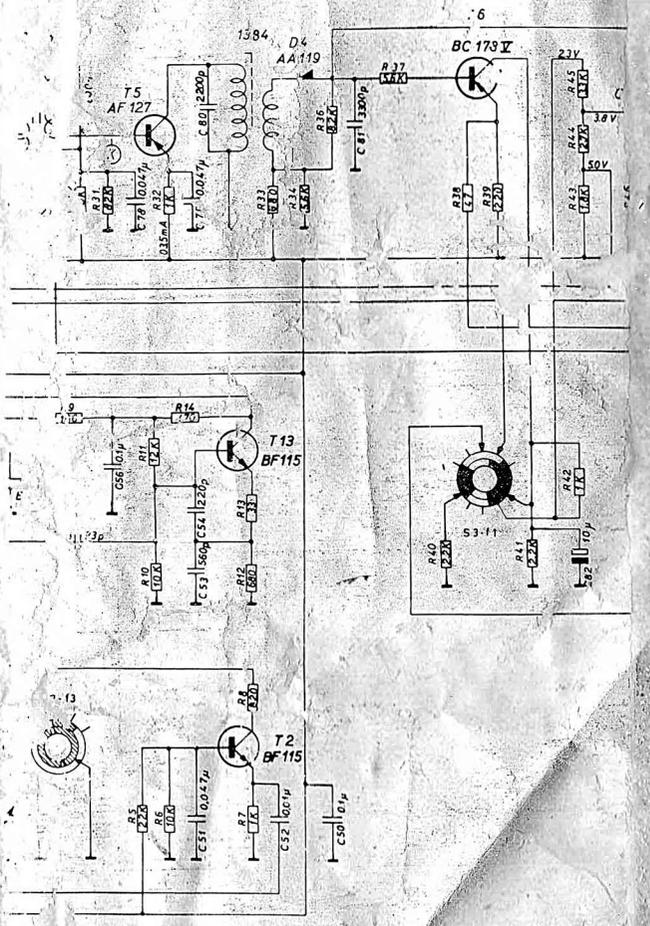
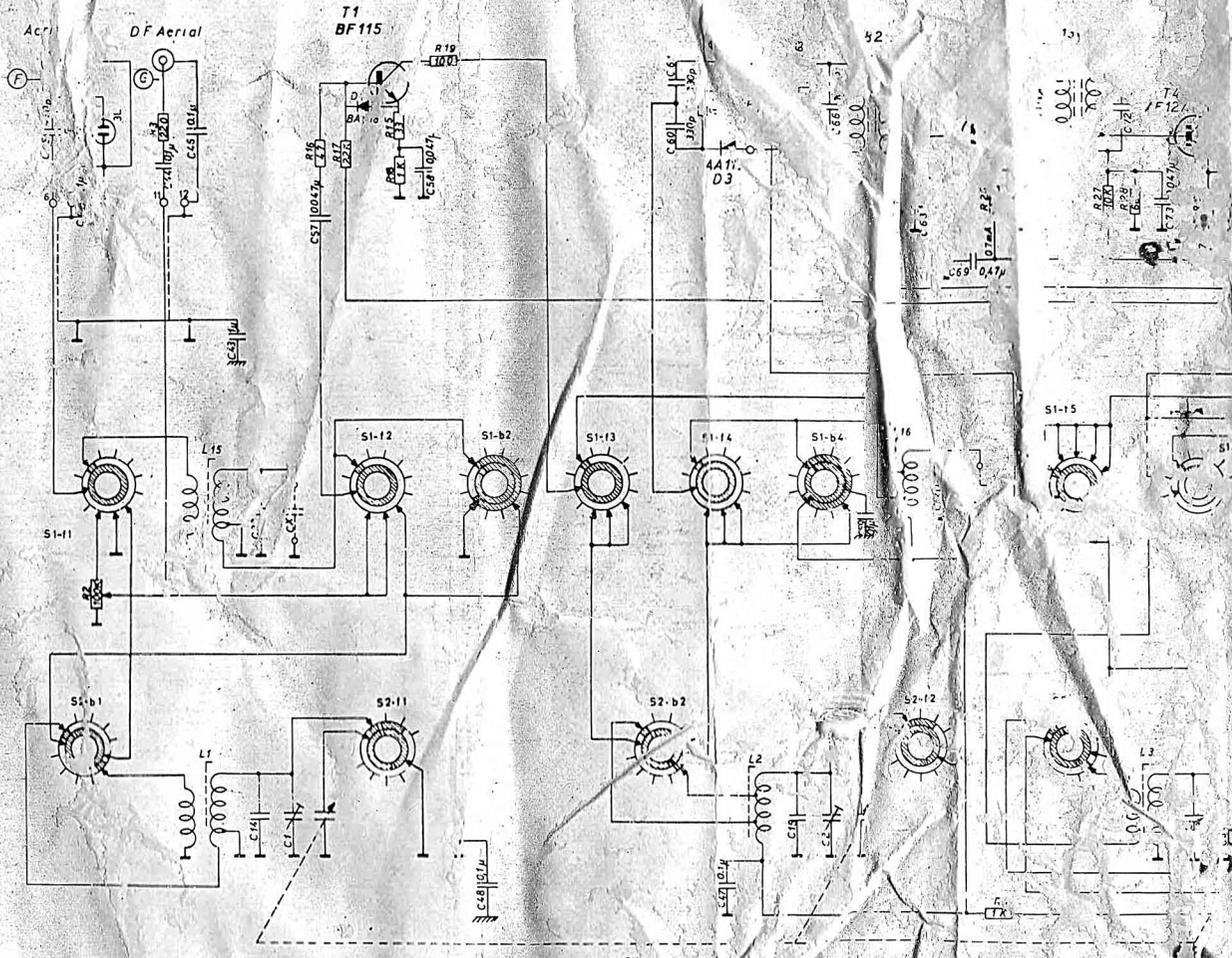
2.4. All cores and trimmers are locked by means of lacquer.

3. Sensitivities:

3.1. To facilitate checking, characteristic values of DC voltages and currents are listed on the circuit diagram. These values should be obtained with no signal applied to the receiver and with the sensitivity control at maximum.

3.2. The sensitivity of the receiver may be checked with a signal generator connected at those points in the receiver which are designated by letters. The values listed on the diagram are typical values with the volume and sensitivity controls at maximum. They must be applied in order to obtain a power output of 50 mW into a 3.2-ohm load.





All switches are viewed from knob-side in the extra section of the manual.
 Tuned circuits are shown only for the SW-band.

Dette diagram omfatter SAILOR 66T serier D, E, F, G, H, J, K og L.
 This diagram refers to SAILOR 66T series D, E, F, G, H, J, K og L.
 Dieses Schaltbild gilt für SAILOR 66T Serien D, E, F, G, H, J, K og L.
 Ce schéma concerne les modèles 66T des séries D, E, F, G, H, J, K og L.
 Et diagram for SAILOR 66T serier D, E, F, G, H, J, K og L.