Sailor

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INSTRUKTIONSBOG FOR
SAILOR T128

INSTRUCTION BOOK FOR
SAILOR T128

INSTRUKTIONSBUCH FÜR
SAILOR T128

INSTRUCTIONS POUR
SAILOR T128

INSTRUCCIONES PARA
SAILOR T128

A/S S. P. RADIO · AALBORG · DENMARK

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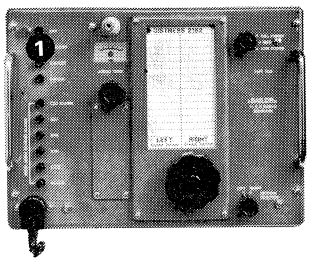
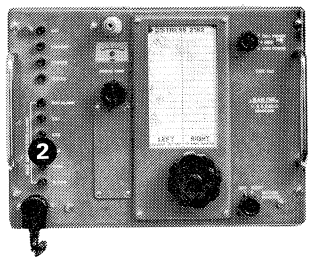


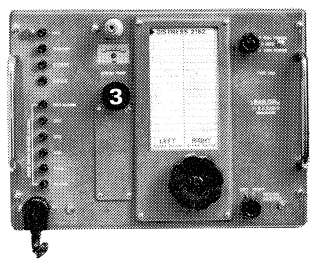
1

Push Bottons switching between the functions OFF – STAND-BY – SIMPLEX – DUPLEX.



2

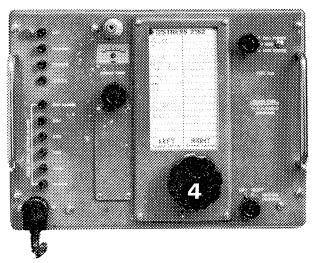
Push Buttons switching between the functions TEST ALARM – A_3J (SSB) – A_3A – A_3H (AM) – TUNE – ALARM (distress signal).



3

Aerial tune

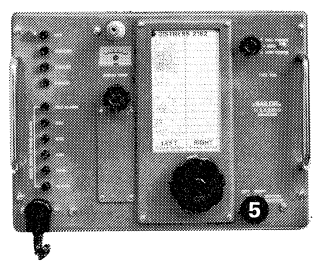
for tuning of Aerial. Turn knob while pressing the button TUNE for max. deflection on the meter at the front panel of transmitter.



4

Channel selector

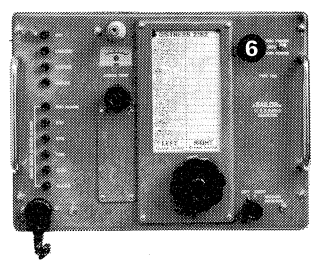
to be set for the required line on the frequency table.



5

Section selector

to be set for the required column on the frequency table.



6

Power reduction

normally to be set to position FULL. In some situations the positions MED. or LOW are used, by which means the output of the transmitter is reduced.

II. Telephony

1. Press button STAND-BY.
2. By means of CHANNEL SELECTOR and SECTION SELECTOR select the required frequency.
3. Press button SIMPLEX or DUPLEX (wait at least 30 seconds after activating STAND-BY button).
4. Set POWER to position FULL.
5. With button TUNE pressed turn knob AERIAL TUNE to max. deflection on the meter.
6. Select transmitting mode by pressing one of the buttons A3A, A3J or A3H (A3J = SSB: A3H = AM).
7. Take the handset off its holder. Both for SIMPLEX and for DUPLEX operation the transmitter will only be operative, when the handset switch is pressed in.

III. Distress call

1. Press button STAND-BY.
2. Turn CHANNEL SELECTOR fully anticlockwise (pointer on 2182 DISTRESS).
3. Press button SIMPLEX (wait at least 30 seconds after the STAND-BY button was activated).
4. Press the two buttons TEST ALARM and SEND ALARM *simultaneously* and keep them pressed for abt. 30 seconds (after 45 seconds the distress signal will automatically be interrupted).
5. Release buttons TEST ALARM and SEND ALARM.
6. Remove the handset from its holder, press the handset switch and send distress call (mayday, mayday etc.).
   The autoalarm can be tested accustically in the handset by pressing the TEST ALARM button (*not* the SEND ALARM button, as the distress signal would then be transmitted).

B Installation

I. Preparation

Before installation it should be ascertained that the correct power supply corresponding to the voltage of the main supply line of the vessel has ben delivered, just as it should be ascertained that the transmitter has been adjusted for the correct voltage. (See under **IV in this section, fig. 4 and PA print**).
The desired crystals are inserted and the driver and the pi-circuit of the transmitter are tuned-up as described in section C.

II. Removing transmitter from its case

To take the transmitter out of its case remove the 4 distinctly marked screws at the front panel edge of the transmitter, after which the transmitter can be pulled out. The multiconnectors at the back of the transmitter are removed. The earth connections removed from the bottom of the case. Finally the cords at the side plates are removed, and the transmitter is taken out of the case.

III. Mounting of transmitter case on bulkhead

The transmitter case is fastened to the bulkhead by means of 4 through-bolts through the back of the case. The diameter of the bolts should be at least $^1/_4$" (6MG).
See fig.s 10 and 11 at the end of this manual.

IV. Power supply unit and mounting of same

The power supply unit can be mounted either seperately or at the side of the transmitter.
If the power supply unit is assembled with the transmitter, the power supply unit + transmitter will be of the same width as the receivers R105 and R106.

Power supply units are available for the following voltages:

12 V DC	Type N178
24 V DC	Type N179
220/110 VAC	Type N180

When changing from one type power supply unit to another the transmitter must be adjusted internally, this is illustrated in fig. 4 and PA Print. After this the quiescent current of the tubes must be adjusted, and the procedure to follow described in Section G under II: PA Section.

All power supply units are of identical external dimensions.
The external dimensions of the power supply units and mounting of them either separately or assembled with the transmitter will be apparent from fig.s 12 and 14.
Electrically, the power supply unit is assembled with the transmitter by means of one multi-cable 2 meters long, secured to the power supply unit at one end. The other end being provided with a multi-socket, which is to be connected to the multi-connector at the back of the transmitter.
The multi-cable may, under certain circumstances be lengthened by means of a SAILOR intermediarry cable type H182.
The main supply line of the vessel is connected to the power supply unit at the terminal strip in the back of the power supply case.

V. Assembling of transmitter and receiver

The transmitter can be assembled with any of the SAILOR SSB receivers by means of the installation kit accompanying each transmitter.
The fig.s 13 and 14 at the end of this manual show, how this is done.
If so desired the transmitter and receiver can be mounted separately. In that case, refer to the instruction manual for the receiver concerned.
Electrically the receiver and the transmitter are connected by means of a multi-cable, which is secured to the transmitter at one end. The other end of the cable is provided with a multi-plug, which fits the multi-socket on the rear side of the receiver.
The multi-cable may, if necessary, be lengthened by means of a SAILOR intermediary cable type E181.

VI. Aerials

Wherever possible the set should have receiver aerial and transmitter aerial mounted separately. The transmitter aerial should be either a wire aerial of 8–20 m length or a whip aerial of minimum 8 m length, placed in as high and as free a position as

possible. All connections should be made by soldering or by means of a reliable cable clamp. Good insulators must be used at both ends. (The transmitter aerial is to be connected to the stand-off insulator at the front panel of the transmitter). The down-lead of the transmitter aerial is normally not screened, but if need be, a coaxial cable of up to 2 m and of good quality (RG8U) can be used. (The screen is connected to the screw to the left of the aerial connector at the front panel of the transmitter).
For the receiver aerial the same holds good as for the transmitter aerial, however, here aerial lengths down to 4 m can be tolerated as far as the whip aerial is concerned. The receiver aerial is connected to the coaxial connector at the back of the receiver. (Remember the tuning of the receiver aerial. See instruction manual for receivers).
If circumstances do not permit the installation of 2 aerials, the receiver may be connected to the transmitter aerial, in which case the aerial cable, which is secured to the back of the transmitter, is connected to the coaxial connector of the receiver.

VII. Earth connection

The earth strip must be connected to the terminal at the bottom of the case.
For earth connection use copper band of min. 0,5×50 mm, which, in iron vessels, must be bonded to the hull of the vessel, and in wooden or glasfiber vessels, to a metal plate of at least 1 sqm fixed to the outer side of the hull below water-line. In sailing vessels with external ballast keel, the earth wire can be connected to a keel bolt, and the keel of the vessel will act as an »earth«. The earth band must be as short as possible and must be directly bonded to the earth plate, ballast keel or iron hull.

C. Tuning

I. Explaining the terminology used in this section

Main channel:

The 16 channel positions on the left crystal section are called the main channels of the transmitter.
The main channels of the transmitter are marked A–Q inclusive. These letters are printed both on the frequency table and also on the tuning facilities corresponding to each individual main channel (See fig. 1.)

Neighbour channel:

On the right crystal section there are a further 15 channel positions i. e., one to pair with each main channel, except for channel A (2182).
These 15 channels are callen neighbour channels.
As a main channel and a neighbour channel on the same line are sharing tuning facilities, the neighbour channel may only deviate ± 15 kc from the main channel in the range 1,6–2,6 mc and ± 30 kc in the range 2,6–4,2 mc.
Insertion of crystals in neighbour channels will not be possible until the main channel has been tuned as described under III in section C.
If the main channel has been tuned, the insertion of crystals in the neighbour channel is to be made as described under V in section C.

As the tuning of neighbour channels is less time-consuming that the same procedure for main channels, it will always be worth while, when inserting crystals into new channels, first to find out, whether there is a vacant neighbour channel, the main channel of which has been tuned for a frequency deviation that is within the allowable range.

Transmitting frequency

The transmitting frequency is the frequency written on the frequency table.

Crystal frequency

As the generator frequency of the transmitter is 600 kc, the frequency of the crystal is 600 kc higher than the transmitting frequency.

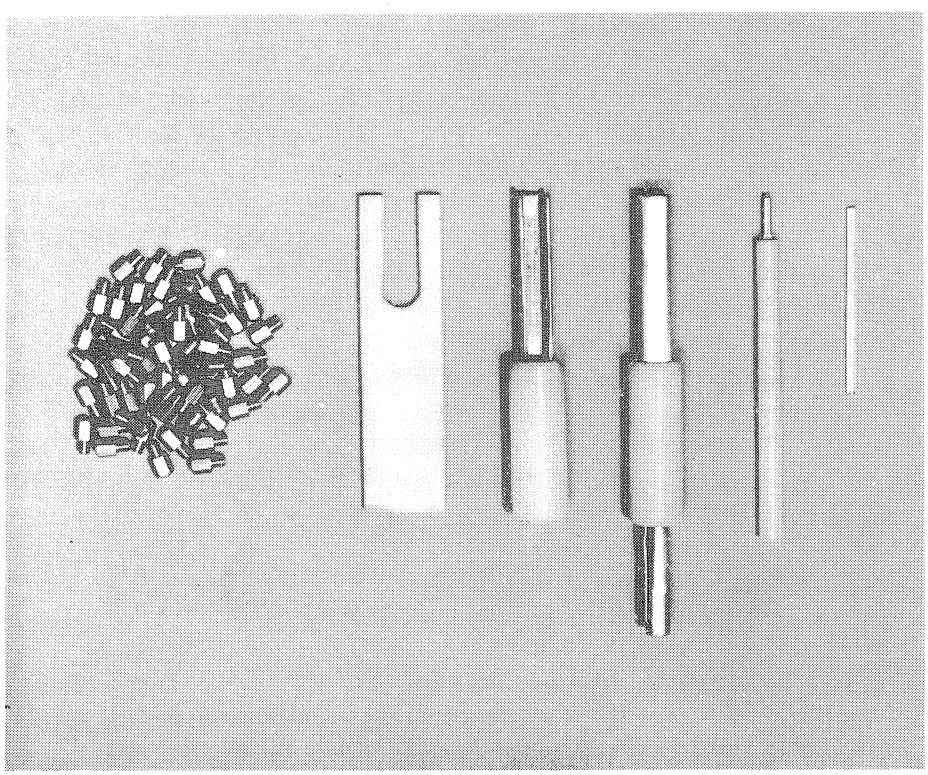
II. Necessary instruments and tools

Counter:

Frequency range: min 5 Mhz
Sensitivity: min. 1V pp
Accuracy: better than 1 p.p.m.

SAILOR trimming kit (accompanying the transmitter) comprising:

Contact screws.
1 pc. Nylon fork for locking of the TUNE knob.
1 pc. trimming stick for contact drum.
1 pc. combined trimming stick and box spanner for contact screws.
1 pc. insulated trimming key for crystal trimmers and driver tuning.
Locking pin (insulated) for SAFETY SWITCH.



III. Tuning-up main channels

Insertion of crystals and tuning of driver and pi-circuit

(Can be made on board the vessel or in the workshop).

If the transmitter has been equipped with crystals at the factory, it will be ready tuned. In this case proceed directly to IV of this section C.

1. Remove the transmitter from its case as described under II of section B.
2. Dismount the aerial and put the SAFETY SWITCH (see fig. 1) out of function by depressing switch arm and inserting the plastic locking pin (supplied).
3. Remove the crystal cover at the right side of the transmitter.
4. Select the letter on the frequency table, which the crystal is to be allocated, and insert the crystal into the corresponding holder in the oscillator. (Crystal frequency = transmitting frequency + 600 kc).
5. Write the *transmitting frequency* on the frequency table.
6. On the driver print there are 32 short-circuiting links – 2 for each channel.
   If the transmitting frequency (fx – 600 kc) is lower than 2,6 mc, the corresponding short-circuiting link must be intact, whereas, if the transmitting frequency is higher than 2,6 mc, it must be cut.
   The short-circuiting links are located as shown in fig. 1.
7. Replace the crystal cover.
8. Set POWER REDUCTION on FULL POWER.
9. Set switch S1002 into position PRE DRIVE (not FINAL DRIVE).
10. The two iron cores in the driver, corresponding to the actual channel being set up, are adjusted, with the button TUNE pressed, until the TEST METER shows max. deflection. In order to avoid tuning the transmitter to the image frequency (fx + 600 kc) the iron cores must be turned completely down, before they are turned slowly out to maximum (if there are two maxima, the innermost is the correct one). If the meter deflection is too high, it can be lowered by means of the potentiometer as described below (para. 11).
11. On the right side of the transmitter there are 16 potentiometers – one for each channel. The potentiometer for the relevant channel is adjusted, until the pointer on the TEST METER reads 10 on the right half of the dial, when the TUNE knob is pressed.
12. Connect counter to the white terminal on the base chassis of driver tube (see fig. 1), press button A3H and key the transmitter by means of the handset key.
13. Adjust (by means of the insulated trimming stick through the perforations of the crystal cover) the relevant crystal trimmer, until the counter shows the same frequency as the frequency table.
14. The first step to take in the tuning-up of the pi-circuit is to set S1002 into position Ik_1, and the POWER REDUCTION to LOW POWER.
15. Put the metal screws (supplied) into the holes 16, 17 and 18 in the right contact drum of the transmitter as shown in the table below:

Transmitting frequency:	Screws in holes no.:
1,6–2,6 mc	16, 17 and 18
2,6–4,2 mc	none

16. Establish contact between the contact drum and contact 13 by pressing the U-shaped metal end of the trimming stick between contact and drum (the open part of the U to be facing the drum).
17. Start the transmitter (press on SIMPLEX) and fix TUNE button in pressed position, by wedging the nylon fork supplied, between the collar of the button and the *back* of front panel.
18. Activate by means of the other trimming stick the contacts from 1 to 11 inclusive, one at a time until the contact giving smallest deflection on the TEST METER has been found; leave the trimming stick in the contact.

19. Move the trimming stick in contact 13 to that of the contacts between 11 to 15, inclusive, which gives smallest deflection on the TEST METER.
20. Stop the transmitter (press STAND-BY) and put screws into the holes of the channel selector drum corresponding to the selected channel letter and the contact no.s found above.
21. Set POWER REDUCTION on FULL and start the transmitter (SIMPLEX) on the trimmed-up channel, read deflection on TEST METER (Ik_1) and stop the transmitter (STAND BY).

If the indicated value is 55 mA or less (full deflection 100 mA) the tuning of the pi-circuit is finished. If the deflection exceeds 55 mA the proceedure at (a) below, should be followed, if however, this causes an increased deflection, then go on to follow the proceedure outlined in paragraph (b).

a. Start the transmitter (max. 30 seconds) and ascertain by means of a trimming stick, whether the meter deflection can be lowered by short-circuiting one of the contacts between the two contacts already found. If it can, put a screw into the contact giving the smallest meter deflection and the trimming is completed.
b. If the screw for the contacts 11–15 is located in one of the contacts 12, 13, 14 or 15, it should be moved one step down (e.g. from 12 to 11). If however the screw is located in 11, it should be moved to 15, and the screw in the contacts 1–11 should be moved one step up (e.g. from 5 to 6).
   Then repeat the procedure in paragraph (a).
   (Should it prove to be difficult to bring Ik_1 inside the tolerance 45–55 mA, the quiescent current in the two PA-tubes should be measured and, if need be, adjusted. The procedure to follow is explained in section G II).

IV. Adjustment of AERIAL TUNE, LOAD and FINAL DRIVE
All channels except channel A (2182)

For adjustment of channel A (2182) refer to paragraph 7.
(The adjustment only relates to main channels and can be made on board the vessel – no counter is needed).

1. Remove the transmitter from its case leaving it suspended on the two cords (see section B II) with mounted aerial, earth strip and power supply cable.
2. Put the SAFETY SWITCH out of function by depressing the switch arm and inserting the locking pin (ϕ2 insulated).
3. Press button SIMPLEX, set S1002 to position LOAD (see fig. 1) and POWER REDUCTION to FULL.
4. Place contact screws into positions 29 and 36 of the left contact drum of the transmitter.
5. Set the transmitter on the desired main channel and make contact between the contact drum and contact 24 and 34 by wedging the U-shaped metal ends of the 2 trimming sticks between the contacts and the drum (the open part of the U to be facing the drum).
6. Keep TUNE knob depressed and tune for max. aerial current by means of the AERIAL TUNE knob. If no max. deflection is found inside the variation limits of the knob, move trimming stick in contact 34 to one of the contacts 32, 33 or 35, until max. deflection has been obtained.
   Should it be still impossible to find any maximum when following the above mentioned procedure, move the contact screw 29 to 30 (aerial capaciter coupled in) and repeat points 5 and 6.
   If it should still be impossible to obtain maximum, the aerial is too long.

7. The procedure for tuning channel A (2182) is similar, except that
   (a) the contact screws are placed in positions 29 and 31 instead of positions 29 and 36 (in paragraph 4),
   (b) the maximum aerial current is obtained in this case by tuning the variometer by means of the slotted axle which is accessable after removing the rectangular cover on the front plate below the aerial tune knob.
8. By moving the trimming stick in contact 24 to one of the contacts 19–28 inclusive, the deflection on the TEST METER is brought to the right of, but as near to the Zero-line as possible, when the aerial current is very carefully tuned for max. (TUNE knob depressed).
9. Put screws into the contact position thus found, one in the contacts 19–28 inclusive, and one in the contacts 32–35 inclusive.
10. Set S1002 to position FINAL DRIVE (POWER REDUCTION still on FULL).
11. At the right side of the transmitter there are 16 potentiometers – one for each *main channel.*
    With the TUNE knob depressed and the aerial current tuned for maximum, the potentiometer for the relevant main channel is adjusted, until the pointer on the TEST METER reads 1–4 (right half of dial).
12. After having followed the above procedure for all main channels, S1002 is set to position TRANSMIT, and the transmitter is mounted in the case and all channels are tested. Before mounting the cover below the AERIAL TUNE knob, tune the aerial current for channel A (2182) carefully to maximum.

V. Tuning-up neighbour-channels

(can be made on board the vessel or in the workshop).

1. Read section C, I
2. Take the transmitter out of its case as described in section B, II.
3. Write the transmitting frequency on the neighbour channel position on the frequency table.
4. Dismount the crystal cover on the right side of the transmitter, insert the crystal in the relevant position and mount the cover again.
5. Put the SAFETY SWITCH out of function by depressing the switch arm and inserting the locking pin (ϕ2 insulated).
6. Set S1002 to position PRE DRIVE, depress the buttons SIMPLEX and A3H and and connect the counter to the white terminal on the base-chassis of the driver tube (see fig. 1).
7. Key the transmitter by means of the handset key and adjust by means of the insulated trimming stick through the perforations of the crystal cover the relevant crystal trimmer, until the counter shows the same frequency as the frequency table.
8. Set S1002 to TRANSMIT, mount the transmitter in the case and test the channel.

D. Test meter

With the TEST METER of the transmitter and the TEST METER switch S1002 (for locating see fig. 1) the following are measured with reference to the position on S1002.

Position 1 PRE DRIVE:

The RF-voltage on the grid of the PA-tubes. (In this position the screen grid voltage will automatically be cut).

Position 2 Vg_1:
Neg. grid bias. Full deflection 100 V.
Position 3 + 18 V:
Voltage to the small signal circuits. Full deflection 20 V.
Position 4 Load:
The RF-voltages on the anodes and the control grids of the PA-tubes are compared in such a way that the tubes are correctly loaded, when the pointer on the meter reads 0.
Position 5 Final Drive:
In this position the meter will show deflection, when the grid voltages of one of the tubes becomes positive with respect to earth.
Position 6 Vg_2:
The screen grid voltage of the PA-tubes and the anode voltage to the driver tube. Full deflection 500 V.
Position 7 Va:
The anode voltage of the PA-tubes. Full deflection 1000 V.
Position 8 Ik_1:
The cathode current in PA-tube 1. Full deflection 100 mA.
Position 9 Ik_2:
The cathode current in PA-tube 2. Full deflection 100 mA.
Position 10 Ik_3:
The cathode current in PA-tube 3. Full deflection 100 mA.
The switch (S1002) must always be left in position 10 (Ik_3), before the transmitter is put into its case.

E. Aerial meter

This is the meter at the front panel of the transmitter, by means of which the aerial current is measured.

F. Technical data

Output: on all transmitting modes into aerial.

Output power at nominal voltage (26,5 V DC).

Frequency / Aerial	1.6 MHz	2 MHz	3 MHz	4 MHz
Long aerial 50 ohm	250 W PEP	250 W PEP	250 W PEP	250 W PEP
Short aerial 10 ohm 250 pF	190 W PEP	210 W PEP	230 W PEP	235 W PEP

Modulation 350–2700 Hz with Compressor.
Frequencies: 31 crystal controlled frequencies between 1.6–4.2 MHz.
Frequency Stability: short term: better than 20 Hz – long term: better than 100 Hz.
Two-Tone-Alarm: 1300 and 2200 Hz. Delay 45 Sec.
Power Consumption at 26.5 V DC: Stand by: 1.6A. Operation: 11A (normal speech).
Power Consumption at 13.5 V DC: Stand by: 3.2A. Operation: 20A (normal speech).
Power Consumption at 220 V AC: Stand by: 0.3A. Operation: 1.5A (normal speech).
Power Consumption at 110 V AC: Stand by: 0.5A. Operation: 3A (normal speech).

G. Service

The transmitter SAILOR T128 is built-up in such a way that practically all circuits are accessible directly.
In order to further facilitate possible service operations, the entire transmitter is built-up of modules.

I. Small Signal Section: (fig. 4)

This section of the transmitter is located at the left side of the transmitter. The section is built-up of the following units:

BASE PRINT:
The base print of the section is mounted directly on the left side chassis of the transmitter. The switching circuitry of the transmitter is etched directly on to the base print. Also on the base print the push button switches (S1101 and S1102), the relay RE1101 of the transmitter, the cable connections to receiver and handset connector and connectors to the detachable modules are mounted.

SSB generator

AF amplifier

Alarm signal generator:

These 3 units can easily be dismounted separately, when the screws marked * on fig. 4 are unscrewed.
When the 3 modules, which are placed on the base print, have been dismounted, the base print can be dismounted in the following way:

1. Unsolder the wires on SAFETY SWITCH (see fig. 2).
2. Unsolder the connection between RE1101 and aerial transformer and aerial coil (see fig. 2).
3. Unscrew the screws on the base print, which are marked with paint.
4. Ease the base print out.

II. PA-Section

This section is accessible from the rear side of the transmitter. The location of the various parts is shown in fig. 6.
Changing PA-tubes:
After changing the PA-tubes or when changing power supply unit, the quiescent current in the PA-tubes must ALWAYS be adjusted as follows:

This adjustment must take place with full voltage on the main supply line of the vessel (generator running) or, if the adjustment is made in the workshop, at the nominal supply voltage + 10 %. For adjustment follow the below procedure:

1. Turn the potentiometers P603, P605 and P606 (see fig. 6) fully anticlockwise.
2. Set the transmitter to a channel without crystal (if no such channel available, remove the crystal).
3. Press buttons SIMPLEX and A_3J and set S1002 (see fig. 1) into position Ik_1.
4. Key the transmitter by means of the handset key and adjust the cathode current in tube no. 1 by means of the potentiometer P603 until the TEST METER reads 35 mA (full deflection 100 mA).
5. Turn S102 to position Ik_2 and adjust by means of the potentiometer P605 the cathode current in tube no. 2, until TEST METER reads 35 mA.
6. Turn S1002 to position Ik_3 and adjust by means of potentiometer P606 cathode current in tube no. 3, until TEST METER reads 35 mA.
7. If new tubes are concerned, the transmitter must be left keyed for 15–30 min., after which the points 4, 5 and 6 above are repeated.

NOTE – The potentiometer P604 must never be touched, as it has been adjusted at the factory so that all transmitters are loading the negative grid voltage of the power supply alike.

If, owing to repairs, etc. an adjustment of P 604 should be necessary, the following procedure must be adapted:

1. Dismount the tubes and the female plug from the power supply.
2. Set S1002 to Transmit.
3. Adjust P604, until the resistance between pin 10 and 1 of the multi-connector at the back of the transmitter is 14 K ohm $\pm$ 1 %.

III. Oscillator, Mixer and Crystal unit

The crystal print of the transmitter with its associated switches (S201, S202 and S203), the crystal oscillator and mixer print, and the switch S1001 are assembled as one unit. This unit, which is located at the bottom of the right side of the transmitter, is dismounted in the following way:

1. Dismount the SECTION SELECTOR knob.
2. Dismount the crystal cover and unscrew the 6 screws marked * on fig. 5.
3. Pull out the unit, only so far that the shaft of the SECTION SELECTOR is free of the front panel.
   Now the unit can be swung out without the wires having to be dismounted.

IV. Driver unit

The driver unit print of the transmitter and it's associated switches (S501 and S502) are assembled as one unit.
This unit, which is located at the top on the right side of the transmitter, is dismounted in the following way:

1. Dismount the shaft stop marked *** on fig. 6 and pull the switch shaft, which is of a rectangular cross section, sufficiently far back that it comes free of the switches of the driver print.
2. Unscrew the 4 screws marked ** on fig 5. Now the unit can be cased out without any wires having to be dismounted.

V. Drive level unit

The drive level print and the switches belonging to it (S503 and S504) are assembled as one unit.

This unit is dismounted in the following way:

1. Dismount driver unit as described under IV.
2. Unscrew the two screws marked *** on fig. 5.
3. Pull the unit perpendicularly out, until it comes free of the two long stays, and then backwards, until the long, round switch shaft S503 comes free of the front panel.

VI. Coil section

The coil section is associated with the components, located in the space bounded by the left and right side chassis and the PA-chassis and the intermediate plate (the plate behind the front panel).

The most important components in this section are: PA-coil (L701 and L702), aerial coil L704, capacitors C701-C714 inclusive (assembled as one stack-capacitor), aerial capacitor C716 and the aerial current meter with it's transformer. Further, the contact drums with their respective contact panels are located in this section.

All the components are fastened to the intermediate plate by means of screws.

The location of the components is shown in fig.s 2 and 3.

H. Description of transmitter circuits

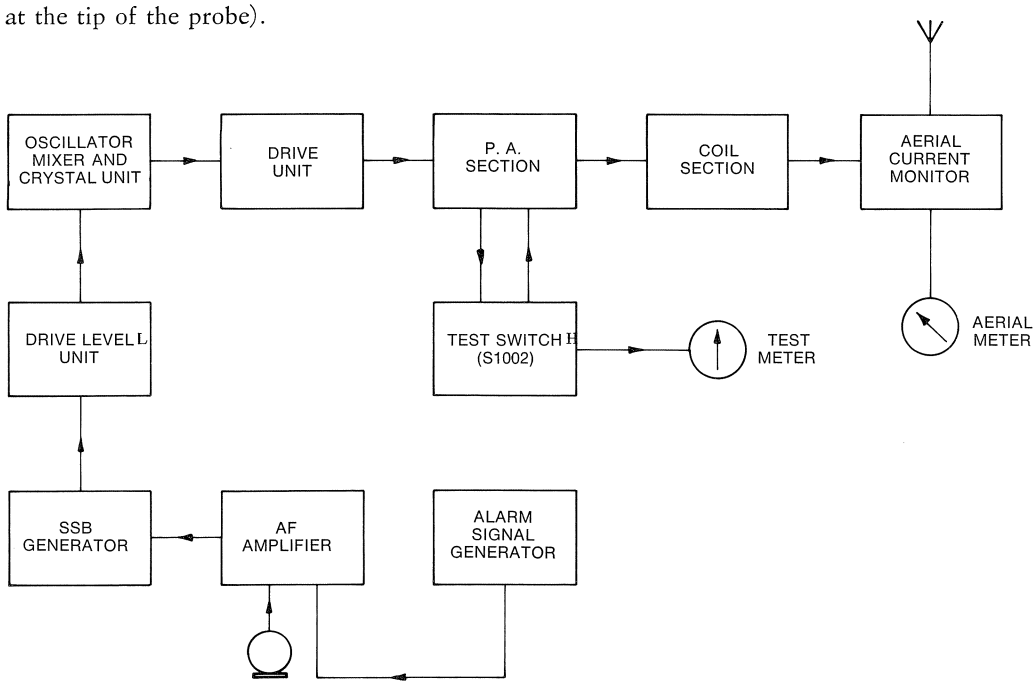
General Description

SAILOR T128 is fully transistorized in all small signal circuits. The power amplifier and the driver circuit are equipped with vacuum-tubes.

SAILOR T128 is, to a great extent constructed of detachable modules, and this modular construction will be followed in the specification on the individual circuits.

In the table, typical voltage values on the active devices are indicated.

All voltages are measured by a vacuum tube voltmeter with a resistance at the tip of the test probe of min. 47 kOhm. (Vacuum tube voltmeters are often suitable for 1 MOhm at the tip of the probe).



SSB Generator

In this module all the kinds of signal, which the equipment is designed to transmit, are generated.

The unit contains a 600 kHz crystal oscillator, 600 kHz amplifier, balanced modulator, sidebandfilter (LSB), first SSB amplifier, circuit for reinsertion of carrier, second SSB amplifier and SSB output amplifier.

T305 together with X301 function as the 600 kHz oscillator of the Pierce Colpitts type. T306 amplifies and filters the aforementioned signal, which is supplied to the balanced modulator via C327.

The balanced modulator is built up around an integrated circuit, IC301, containing 4 diodes. The amplified microphone signal is also supplied to the integrated circuit, and thus a double-sideband signal is created. The carrier suppression i.e. the suppression of the incoming 600 kHz signal is extremely great and does not depend on the temperature owing to the matching of the four diodes in the integrated circuit. The output signal is therefore only composed of an upper and a lower side-band, of which only the lower side-band passes through the crystal filter FL 301.

From the side-band filter the SSB signal is passed via FIRST SSB AMPLIFIER T307, then supplied to the amplitude control P305, via R352. At the same time, in position A3A and A3H and at distress calls, a certain amount of carrier (600 kHz) i supplied to the amplitude control P305 via R354.

The combined signal is amplified once more in the SECOND SSB AMPLIFIER T309 and in the SSB OUTPUT AMPLIFIER T310.

The carrier reinsertion is switched by means of switching diodes, which again are brought into conduction of cut off condition by means of DC control voltages.

The carrier signal is taken from the 600 kHz crystal oscillator and carried through the amplitude control P301 to the voltage divider of R310 and R309.

In position A3H the diode D304 conducts and the carrier signal is carried via C309 and C310 to the emitter follower T302.

In position A3A D305 conducts and the carrier signal, which is now taken across R309 is carried via C308 and C 310 to T302.

In position A3J D306 conducts and short-circuits the input of T302 to ground via C311 and C310 in order to obtain maximum carrier suppression.

The function of T301 will be described in the section »AUTOMATIC 2182 kHz«.

Audio Amplifier — Compressor — Test Tone generator

The function of this unit is to generate and process all the AF-signals used in normal operation. The microphone signal is transformed by TR401 and carried via R410 to FET transistor T401, an electronically variable resistor (attenuator). The amount of attenuation performed by R410 and T401 is controlled by the voltage applied to the gate of FET transistor T401.

T401 is biased in the off condition by 5,1 V from zeenerdiode D401 with no control voltage applied to the gate, and under these conditions no attenuation occurs. With a control voltage of 5,1 V applied to the gate, maximum attenuation occurs.

The electronically controlled attenuator is used to keep the output across the FET transistor T401 constant independant of speech volume, so performing a compressor action.

The control voltage already mentioned is derived from the very same signal, across the FET transistor T401, after amplification by T403 and T404. The output is taken across R418 and fed to the level detector system consisting of T411, D403 and D404.

As soon as the applied voltage to the base of T411, becomes sufficiently low (about 4,7 V) the collector current in transistor T411 cuts off, due to the normally forward biased diode, D403, reversing.

This means that transistor T410, normally saturated by the collector current of T411 cuts off, leading to saturation of T 405 with the result that capacitor C424 charges very quickly.
The voltage across C424 slowly discharges via R437 and the filter circuit R412 and C410, and is applied to the gate of the previously mentioned FET transistor T401 via R413.
Presence of the control voltage causes the attenuation to increase until the collector current in transistor T411 is no longer cut off, and a balanced condition exsists. The amplified and compressed microphone signal then passes through to an AF filter driven by T412 and T413 removing signals which are insignificant for clarity. The AF-signal from the filter is carried to he fixed voltage divider R424, R425 and R426. The AF-voltages from the aforementioned voltage divider are adapted to the various kinds of signals. The coupling-in of the proper voltage level will take place by means of switching diodes D406, D407 and D408 which are switched by the same control voltages as described in the section »SSB-Generator«.
The test-tone-generator is a two-tone-generator operating at the frequencies 2400 Hz and 1200 Hz. The multivibrator, composed of T408 and T409, is oscillating at 2400 Hz, and in the integrated circuit IC401 this frequency is devided to 1200 Hz, which can be observed on pin 8.
T407 functions as emitter follower, and the 2400 Hz signal is carried from here via R430 to the output transistor T406. The 1200 Hz signal is also carried to T406 via R429 and is mixed with the 2400 Hz signal. The mixed signal is supplied to the microphone transformer during tuning of the transmitter and owing to the presence of the AF-filter. sinewave shaped tones are secured, as the two-tone-generator itself delivers square wave voltages.

Alarm Signal Generator

This module has the task of modulating the transmitter with the standardized »Distress« signal. This signal is composed to two tones 1300 Hz and 2200 Hz. The switching between those to tones takes place at intervals of 0,25 sec. The transmittion of this signal is automatically stopped after 45 sec. or manually before the expiration of said period.
The transistor T903 operates as a 1300 Hz oscillator and T902 as 2200 Hz oscillator. The switching period between the two tones is determined by T901, which is a unijunction transistor giving a shift pulse to the integrated circuit IC901, which operates as a FLIP-FLOP in such a manner that the output signals on pin 6 and pin 8 are shifting from +6V to 0V and back each time, when T901 gives a shift pulse.
In addition the voltage on pin 6 is +6V, when the voltage in pin 8 is 0V and vice-versa. In this way the gate diode D902 is brought into conduction, when pin 6 reaches the value 0V, which has the effect that D901 is cut off and only the 2200 Hz signal is led out to T904. At the next shift pulse the 1300 Hz signal is supplied to T904.
T904 is operating as power amplifier and is delivering the signal to both microtelephone and clipper.
Start and stop of the ALARM SIGNAL GENERATOR takes place by means of the silicon controlled rectifier D904 and the transistors T905 and T906.
When +24V is supplied to the print via function switch, T905 in series with R919 and R926 starts conducting and the ALARM SIGNAL GENERATOR operates.
The unijunction transistor T906 is operating as a 45 sec. generator i.e. after about 45 sec. T906 supplies a trigger pulse to D904, which hereby conducts and short-circuit the base lead to T905 to ground and this transistor cuts off the current to the ALARM SIGNAL GENERATOR. This conduction continues until the connection of the function switch is cancelled.

Silicon controlled rectifiers are of such a nature that a short trigger pulse to the gate makes the anode cathode substrate conduct continously, if the current in the anode substrate is greater than a given current, the so called holding current. Switching-off of the conduction state can only be achieved by decreasing the current to a value below that of the holding current through the anode cathode.
For 12 V operation R919 is shorted out.

Power reduction – drive level

The POWER REDUCTION switch (S503) has three positions with 4 dB steps, L-insertion loss pad structure.
This L-insertion loss pad is loaded by the DRIVE LEVEL potentiometers P501 to P516. These potentiometers are coupled in by means of the switch S504, which is ganged to the CHANNEL SELECTOR.
Power reduction and drive level are inserted between the SSB generator and the SSB input to the mixer.
The power reduction facility is inactive in position 2182 DISTRESS.

Power amplifier

The power amplifier, which is composed of 3 tetrodes coupled in parallel, operates as an amplifier in class AB_1.
The anode load consists of a tuned pi-circuit. As this pi-circuit must be operated at frequencies from 1,6 mc to 4,2 mc, the tuning capacitors and coils are programmed by contacts ganged to the CHANNEL SELECTOR.
The output capacitor in the pi-circuit is split into sections in order to obtain proper load into aerial, which is tuned to resonnance by means of the variometer L704 and possibly C716. The coupling-in on the variometer steps, and the sectionalized output capacitor, are also controlled by the contact programme. When changing PA-tubes and power supply, the quiescent current of the PA-tubes must be adjusted.
The procedure to follow is specified in section G, II.

Crystal section

The coupling-in of the individual crystal and it's associated trimmers and capacitor takes place by means of the switches S201 and S202, which are mechanically ganged to the CHANNEL SELECTOR. The switching between main channel and neighbour channel is made by means of the switch S203 SECTION SELECTOR.
In position 2182 DISTRESS S203 is put out of function, so that 2182 is transmitted, no matter in which position S203 is standing.

Crystal oscillator and mixer

This unit has the function, of generating the crystal frequency, and of mixing this with the 600 kc signal to obtain the transmitting frequency. The crystal frequencies are placed 600 kHz above the signal frequency, so that the upper side-band (USB) is transmitted, the 600 kHz signal being a lower side-band (LSB) signal.
The transistor T101 is acting as PIERCE COLPITTS oscillator.
The signal from the base of T101 is carried partly to the output amplifier T103 (emitter follower) and partly to the base of T102, which changes the DC operation point of

T101, the oscillator signal being rectified in the base emitter substrate of T102. The rectified voltage is amplified in T102, and the operational point of the oscillator is influenced through R105 in such manner that a constant amplitude of the oscillator signal is obtained.
The mixer is equipped with an integrated circuit IC101. This integrated circuit is a balanced modulator, which, through the transformer TR102, only delivers the sum- and differencefrequencies between the two input signals, i.e. the 600 kc SSB signal and the signal from the crystal section are suppressed on the output. As the signal from the crystal section is placed in the range 2,2 mc to 4,8 mc, maximum suppression is desirable, and a fine adjustment by means of P101 provides for this.
The output of the mixer is tuned by means of tuned circuits in common with the driver circuit.

SWITCHES AND RELAY CIRCUIT

Channel selector

This switch is operated by the operator when changing from one line to another on the frequency table. By means of a mechanical coupling (chain drive) the switches in the coil section, oscillator, mixer and crystal unit, driver unit and drive level unit are connected, so that when switching from one channel to another the following things will happen:
S201 and S202 switch to the two new crystal positions.
S1001 in position DISTRESS, switch in such manner that the transmitter will always be ready to transmit A3H, no matter how the push buttons A3J, A3A and A3H are operated.
S504 switches the drive level potentiometer and bypasses POWER REDUCTION in position 2182.
S501 and S502 switch to a new set of coils in the driver section.
Right contact drum tunes the pi-circuit for the new frequency.
Left contact drum adapts the transmitter for the new aerial impedance and in position 2182 switches to the preadjusted part of the aerial coil.

Section selector (S 203)

switches between main channel and neighbour channel.

Power reduction (S 503)

see section H.

S 1002

see section D: TEST METER.

Push buttons OFF, STAND-BY, SIMPLEX, DUPLEX (S 1101)

This switch has the following functions:

1. Switches the filament voltage so that the tubes will have full filament voltage in the positions SIMPLEX and DUPLEX, reduced filament voltage in position STAND-BY and no filament voltage in position OFF.
2. Switches the connection to the loudspeaker, so that in position DUPLEX the loud-speaker will not be connected, whereas it will be connected in the other positions, except when the transmitter is keyed.
3. Leads voltage to the small signal circuits (12 V DC or 24 V DC) in the positions SIMPLEX and DUPLEX.

Push buttons TEST ALARM, A3J, A3A, A3H, TUNE, ALARM

This switch is split up into 4 sections called A, B, C and D (see main diagram and photo BASE PRINT at the back of this manual).

SECTION A

Prevents unintentional transmission of the distress signal.

SECTION B

Prevents the transmitter from being keyed by means of the handset key or the TUNE knob, when TEST ALARM is activated.

Switches AF input to AF amplifier so that, when the TEST ALARM and ALARM buttons are pressed simultaneously, the amplifier will receive AF from the distress tone generator, when the TUNE button is pressed the amplifier will receive AF from the two-tone-generator, and, when the A3J, A3A or A3H button is pressed the amplifier will receive AF from the handset.

SECTION C

The contact furthest to the left in the diagram, switches, together with a corresponding contact in section D, the handset so that the handset will receive AF from the distress tone generator, when the TEST ALARM control is activated; switches control voltage to the SSB generator in such a manner that the transmitter will transmit A3J, when one of the buttons A3J or TUNE is activated, A3A when the A3A button is activated and A3H when one of the buttons A3H or ALARM is activated.

As to the automatic selection of A3H in position DISTRESS on the frequency table, see automatic 2182 DISTRESS at the end of this section.

SECTION D

Selects the starting criterion for the transmitter, so that, when one of the buttons A3J, A3A or A3H is pressed, the transmitter is keyed by means of the handset key, whereas, when either the TUNE button or both buttons TEST ALARM and ALARM are pressed, the transmitter is automatically keyed.

In position 2182 the two wires marked »mode interlock over-ride« are short-circuited by S1001, and the transmitter can be keyed by means of the handset key, even through none of the buttons are pressed. As to the contact furthest to the left in the diagram please see section C.

RE1101 – is the only relay located in the transmitter.

When the relay is activated (i.e. the transmitter is keyed) the following things will happen:

1. The aerial will be switched from receiver to transmitter. (Only in SIMPLEX installations).
2. In position SIMPLEX, AF will be out off from the receiver.
3. The power supply to the receiver is switched off, when the SIMPLEX button is pressed.
4. 12 or 24 V is supplied to the power supply unit via the wire »start power supply«.

Automatic 2182 kc distress (see main diagram)

When the CHANNEL SELECTOR is set into position DISTRESS 2182 kc, some internal coupling will take place, so that the transmitter will be ready for operation without any further settings.

The transistor T301 in the SSB GENERATOR is, during normal operation, constantly conducting and leads +18V out to be used for control voltages to the shift diodes in the SSB GENERATOR and the AUDIO AMPLIFIER.

When the CHANNEL SELECTOR is in position 2182, +18V is supplied to the base of T301 through the diode D303, and T301 is blocking.
Through the diode D302 control voltage is supplied to the SSB GENERATOR and the AUDIO AMPLIFIER, so that they will be in position A3H irrespective of the position of the push buttons.
The programmed contacts engage a pre-adjusted variometer, so that the aerial tuning knob will be inoperative.
In position 2182 POWER REDUCTION (S503) is inoperative, so that the transmitter will always transmit full output, likewise the SECTION SELECTOR switch (S203) is inoperative.

Circuit-description for power supply units

I. Introduction.

The three power supply units N178, N179 and N180 are constructed in such a way that this installation together with a properly adjusted transmitter T128/T124 is straight forward provided that the following procedure is observed:

a) The voltage wiring inside the transmitter must be checked, it must conform with the supply voltage of the vessel and the type of power supply.
The voltage wiring is the same for 24 V (N179) and for 220/110 V AC (N180).
For further information please see fig. 4 and PA Print, which shows all necessary details.

b) Before tuning-up the transmitter check the quiescent current on the PA-tubes after the transmitter has been on SIMPLEX for 15–30 min. (the filament of the tubes to be fully heated). For the procedure to be followed please see section G, paragraph II PA-section, and section B, paragraph IV.
Output voltages of the power units to the transmitter are as follows:
1) 900 V anode voltage to PA-tubes.
2) 300 V screen grid voltage to PA-tubes and anode voltage to driver.
3) – 84 V negative grid bias.
4) Filament voltage to transmitter:
a) 12 V in the case of power supply N178.
b) 24 V in the case of power supply N179 and N180.
NOTE that the power supply to the receiver is either 12 V or 24 V by ALL types of power supply units for T128/T124, also as far as the 220/110 V AC unit is concerned.

All the above mentioned voltages have been measured at the nominal supply voltage and with the TUNE button pressed. The channel selector being set to a channel without crystal.

II. Circuit-description for the 12 V DC power supply unit type N178

This DC-DC converter, working on the two-transformer-principle, is equipped with two power transistors T1201, the bases of which are controlled by the transformer TR1202, which in its turn receives its signal from the power transformer TR1201. The circuit is oscillating at a frequency of abt. 350 Hz, and in order to prevent emission of harmonics, and to protect the transistor against incoming transients from the supply line, the circuit is provided with a filter arrangement comprising L1201, C1209 and C1220.

The circuit around the relays RE1201 and RE1202 is the starting circuit and functions in the following way:

When the transmitter is keyed, + 12 V appears at pin. No. 2 of the multi-plug, and the main relay RE1201 is activated and supplies voltage to the print. Via the contact of the starting relay RE1202 current will pass through the starting resistors R1204 and R1205, and the converter will start working. The starting relay RE1202 is delayed by means of R1208 and C1208 and will break the connection to the starting resistors. The diode D1203 ensures rapid discharge of C1208, when the transmitter is stopped.

The rectifier circuits supplying the voltages to the transmitter, are all provided with diode bridges, and + 300 V is produced around the diode bridge D1211. + 900 V results from the addition of 3x200 V to the + 300 V and are produced around the diode bridges D1208, D1209 and D1210.

The negative voltage to the PA-tubes is produced around the diode bridge D1207 and, via the potentiometer P1201 and the complex D1205 and R1206, is supplied to the transmitter via plug pin No. 10. P1201 is of essential importance, P1301 and P1401 are in the other types of power supply units to be found at the same place. All trans-

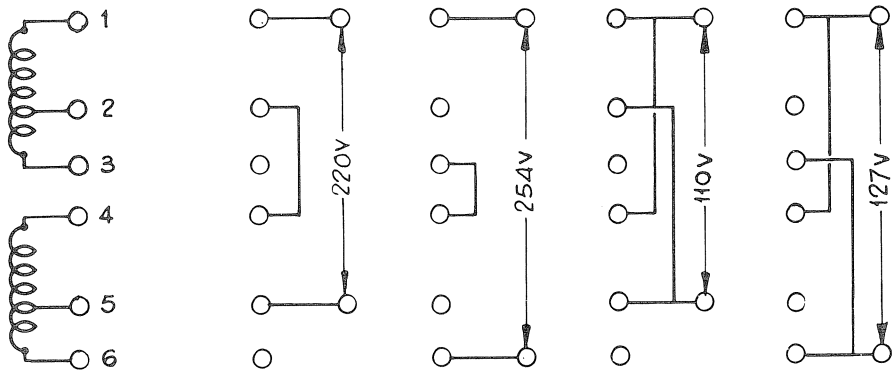
mitters of type T124/T128 have been adjusted at the factory for an input resistance of 14.00 Kohm ± 1 % between pin 10 and earth (pin 1). The power supply unit N178 is adjusted by means of the potentiometer P1201 (the power supply units N179 and N180 by means of the potentiometers P1301 and P1401 respectively) to have a negative output voltage of – 84 V, when the 300 V voltage is exactly 300 V (adjusted by variating the input voltage). It is a further condition that the transmitter is activated with the button TUNE depressed, and that the channel selector is set to a channel without crystal (i.e. there is quiescent current in the tubes).
+ 18 V will be produced as stabilized voltage from the serie stabilizer transistor T1202. As shown on the diagram, only + 18 V is stabilized. The other voltages are unstabilized, this design being by far the most reliable one, offering the highest efficiency.
Measures have been taken to minimise supply voltage variation effects, including among others the complex D1205 and R1206, so that the anode quiescent current is constantly 35 mA for the supply voltage fluctuation of – 10 % to + 30%.
The tuning of P1201 (respectively P1301 and P1401) will ensure that in principle it will be possible to alter an installation from e.g. 220 V AC to 24 V DC without doing anything else, except changing the power supply unit. (However it would be advisable to check the quiescent current in the output tubes as mentioned above, in view of possible ageing effects).

III. Circuit-description for the 24 V DC power supply unit type N179.

This DC – DC converter, working on the two-transformer-principle is equipped with two silicon power transistors T1301, the bases of which are controlled by the transformer TR1302, which in its turn receives its signal from the power transformer TR1301. The circuit is oscillating at a frequency of abt. 350 Hz, and in order to prevent emission of harmonics, and in order to protect the transistors against incoming transients from the supply line, the circuit is provided with a filter arrangement comprising L1301, C1309 and C1320.
The circuit around the relays RE1301 and RE1302 is the starting circuit and functions in the following way:
When the transmitter is keyed, 24 V will appear at pin No. 2 of the multi-plug, and the main relay RE1301 is activated and will suppdy voltage to the print. Via the contact of the starting relay RE1302 current will pass through the starting resistors R1304 and R1305, and the converter will start working. The starting relay RE1302 is delayed by means of R1308 and C1308 and will break the connection to the starting resistors. The diode D1303 ensures rapid discharge of C1308, when the transmitter is stopped.
The rectifier circuits supplying the voltages to the transmitter, are all provided with diodes bridges, and + 300 V is produced around the diode bridge D1311. + 900 V results from the addition of 3×200 V to the + 300 V produced around the diode bridges D1308, D1309 and D1310.
The negative voltage to the PA-tubes is produced around the diode bridge D1307 and via the potentiometer P1301 and the complex D1305 and R1306 is supplied to the transmitter via plug pin No. 10. The importance of P1301 has been mentioned in the description of the 12 V power supply unit (N178).
+ 18 V will be produced as stabilized voltage from the series stabilizer transistor T1302.
As shown on the diagram, only + 18 V is stabilized. The other voltages are unstabilized, this design being by far the most reliable one offering the highest efficiency.
Measures have been taken to minimise supply voltage variation effects, including among others the complex D1305 and R1306, so that the anode quiescent current is constantly 35 mA for the supply voltage fluctuation – 10 % to + 30 %

IV. Circuit-description for the 220/110 V AC power supply unit type N180.

The design of this type is so similar to the design of N178 and N179, especially as to the production of + 300 V, + 900 V, - 84 V and + 18 V, that further explanation will be superfluous, except that choke coils are used for the filtering. As seen from the diagram, N180 can be wired for the following voltages: 110 V AC, 127 V AC, 220 V AC and 254 V AC. It is to be noted that both the transformer TR1401 and the transformer TR1402 are to be wired as shown in the sketch below:



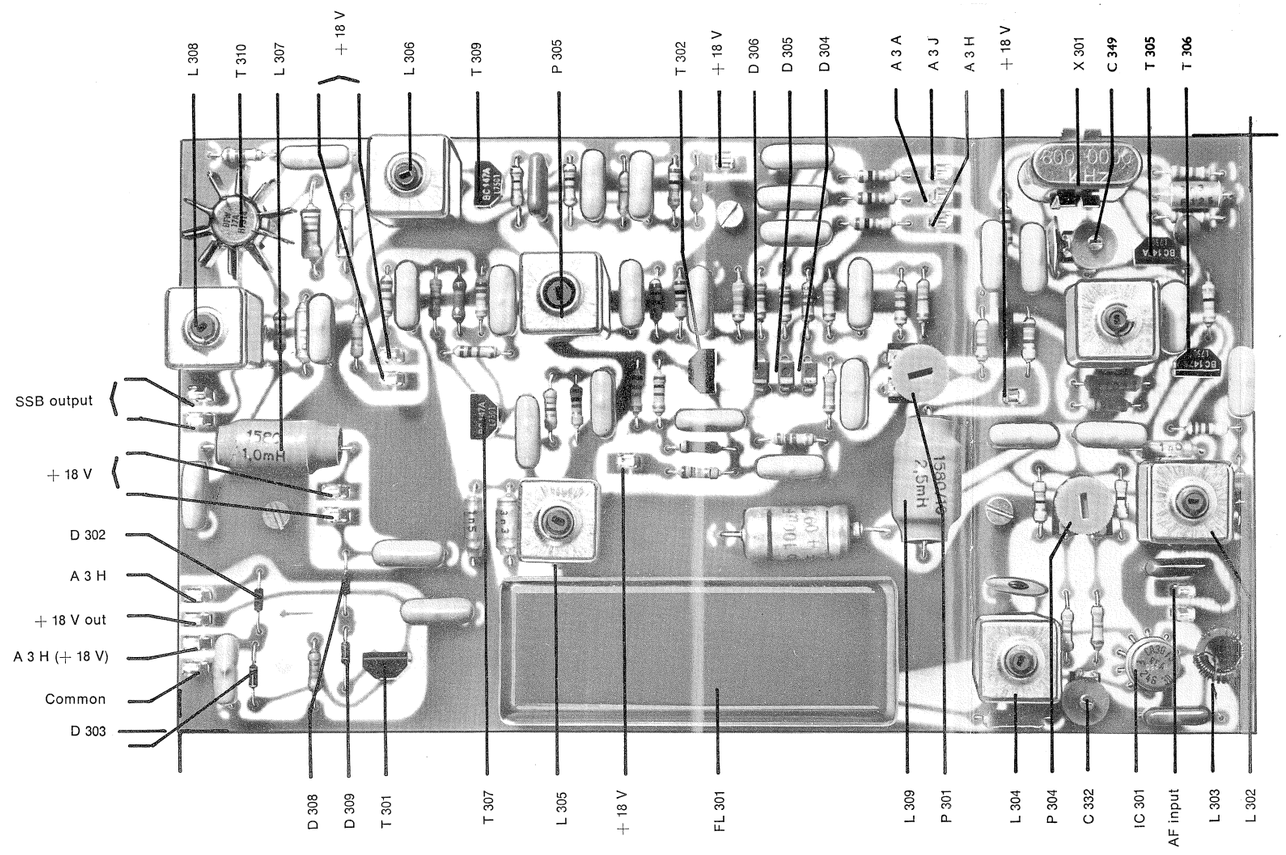
The transformer TR1402 supplies all voltages to the transmitter except filament voltage, and this transformer is connected, when either the button SIMPLEX or the button DUPLEX is pressed.

NOTE! Thus there is a voltage of 900 V on the anodes, when the transmitter is on, without having been keyed.

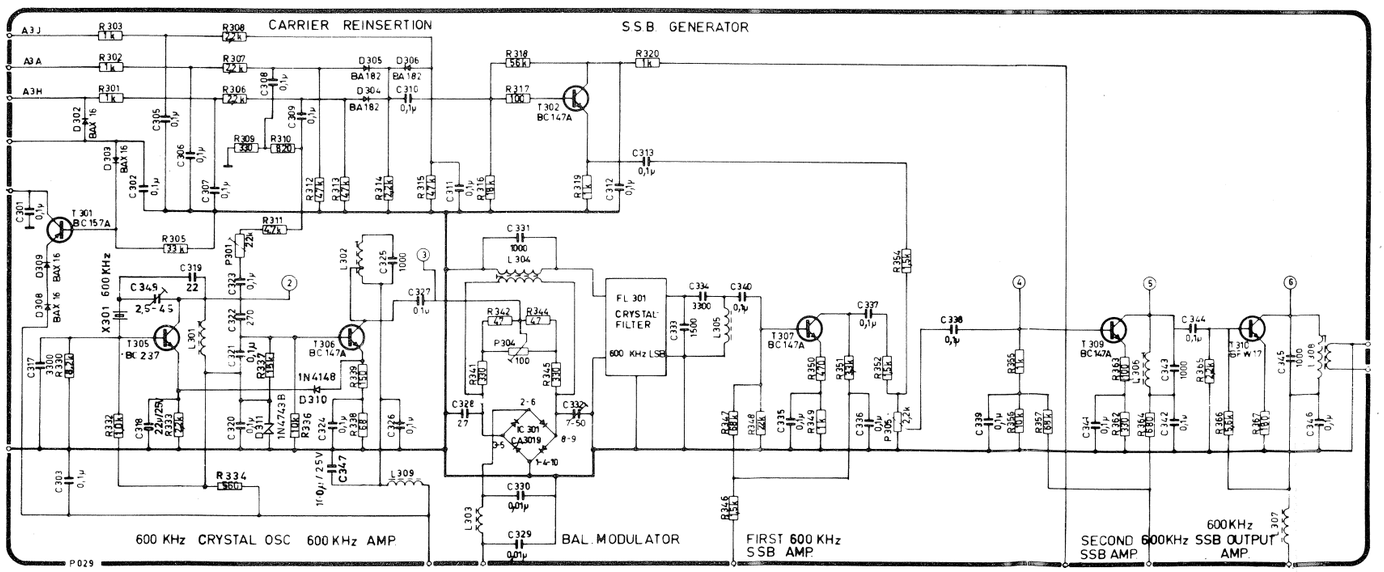
The transformer TR1402 is switched off, when the button STAND-BY is pressed.

Therefore please NOTE when servicing: Press STAND-BY or switch off the transmitter entirely. The function of switching off TR1402 in STAND-BY is controlled by the relay RE1401. It is to be noted that, when the safety switch S1103 is off, it prevents RE1401 from being activated in the same way. Similarly on the power supply units N178 and N179, the starting relay cannot be activated, when S1103 is off. When the transmitter is keyed, the relays RE1402 and RE1403 are activated and will couple in + 18 V respectively + 300 V to the transmitter.

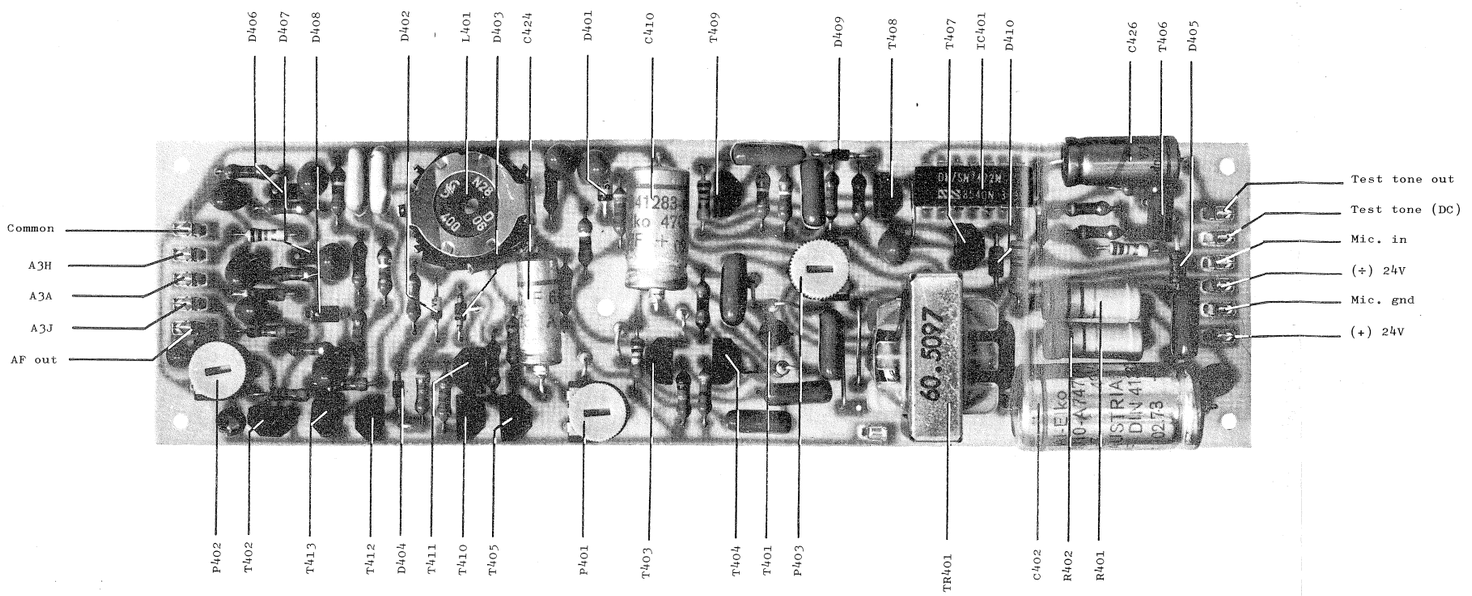
The transformer TR1401 will primarily supply current to the rectifier circuit with D1407, L1401 and C1414, which via the regulator circuit with the transistors T1401 and T1402, supplies voltage to the filaments of the PA-tubes and voltage to the receiver. This voltage is of 24 V and unstabilized, T1402 normally being completely saturated. The regulator circuit has the sole purpose of preventing the voltage from exceeding + 27 V, when the transmitter is off, in order to protect the receiver. The extra winding on TR1401 is used in connection with »Supply switch over and emergency battery charger unit type H184«.



	T301	T302	T305	T306	T307	T309	T310
E	15,6	2,6	9,5	3,9	2,6	1,3	3,7
B	14,9	3,3	10,0	4,6	3,3	2,0	4,1
C	15,6	14,4	17,8	17,6	8,4	14,9	17,2

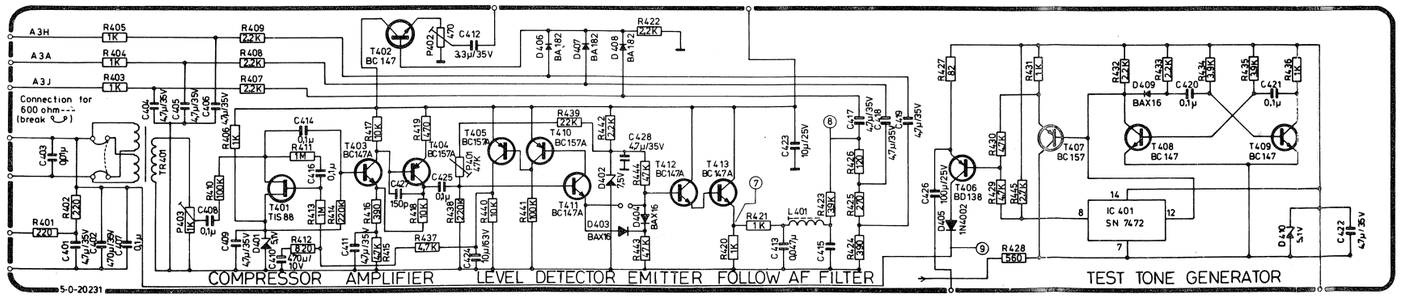


SSB Generator
T 124/T 126/T 128

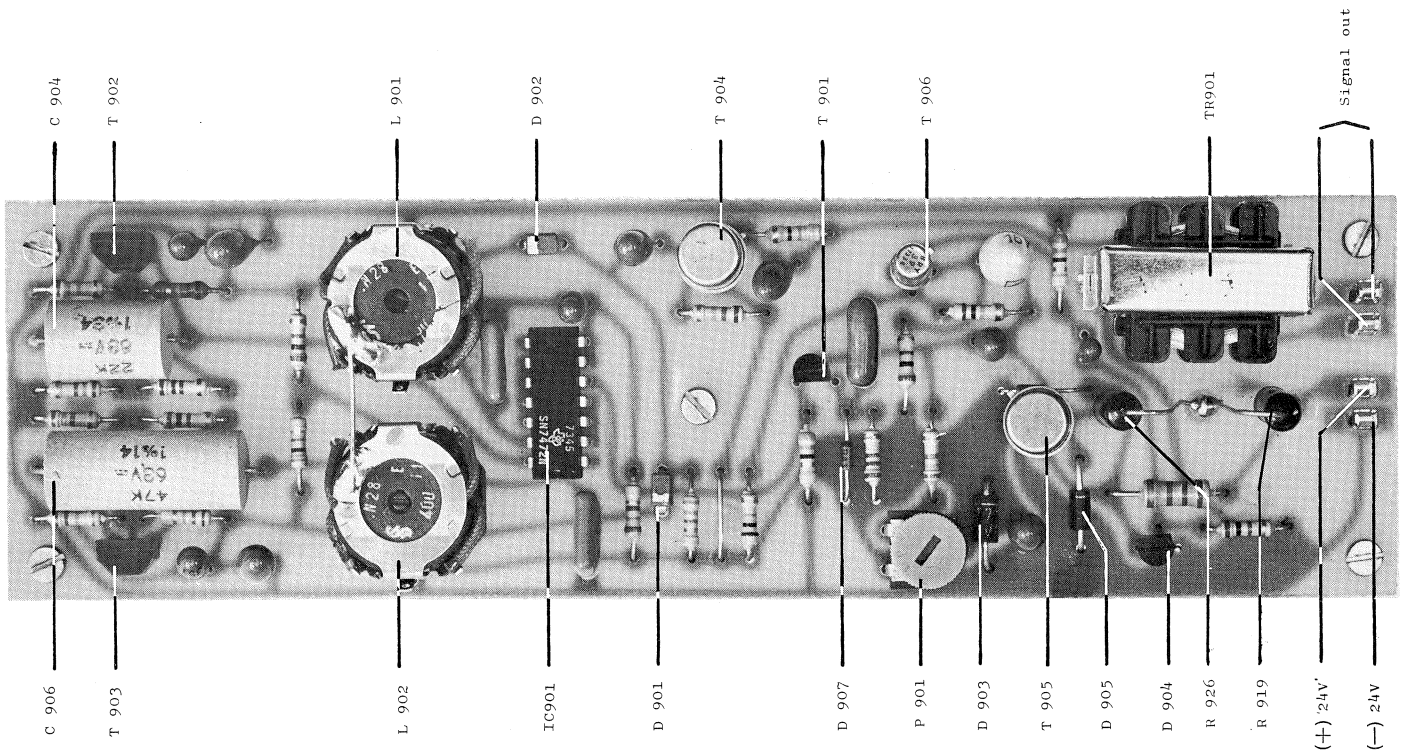


	T401		T402	T403	T404	T405	T406	T407	T408	T409	T410	T411	T412	T413
S	5,1	E	5,4	4,3	17,4	17,8	1,4	2,0	5,1	5,1	17,8	6,0	5,2	4,6
D	5,1	B	6,0	4,8	16,8	17,6	1,8	3,3	5,3	5,3	17,1	6,6	5,8	5,2
G	1,9	C	17,8	16,8	11,5	1,9	15,6	5,1	3,3	2,4	17,6	17,1	17,8	17,8

* Measured with ref to +24V.

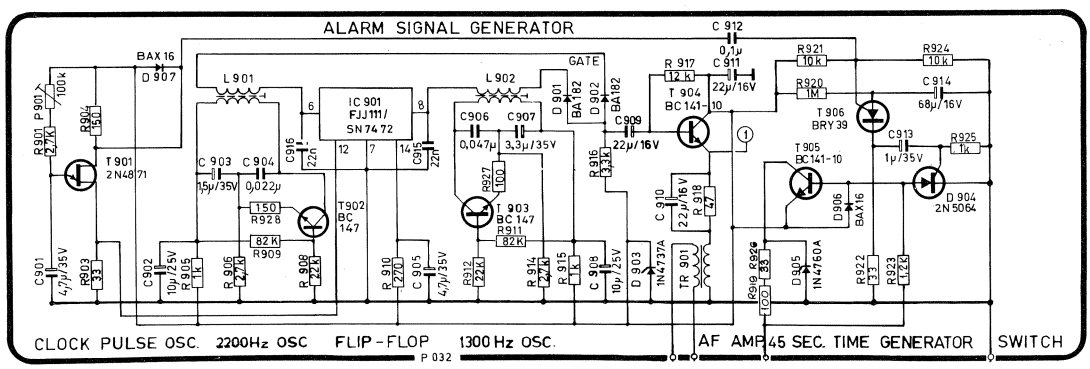


AF amplifier

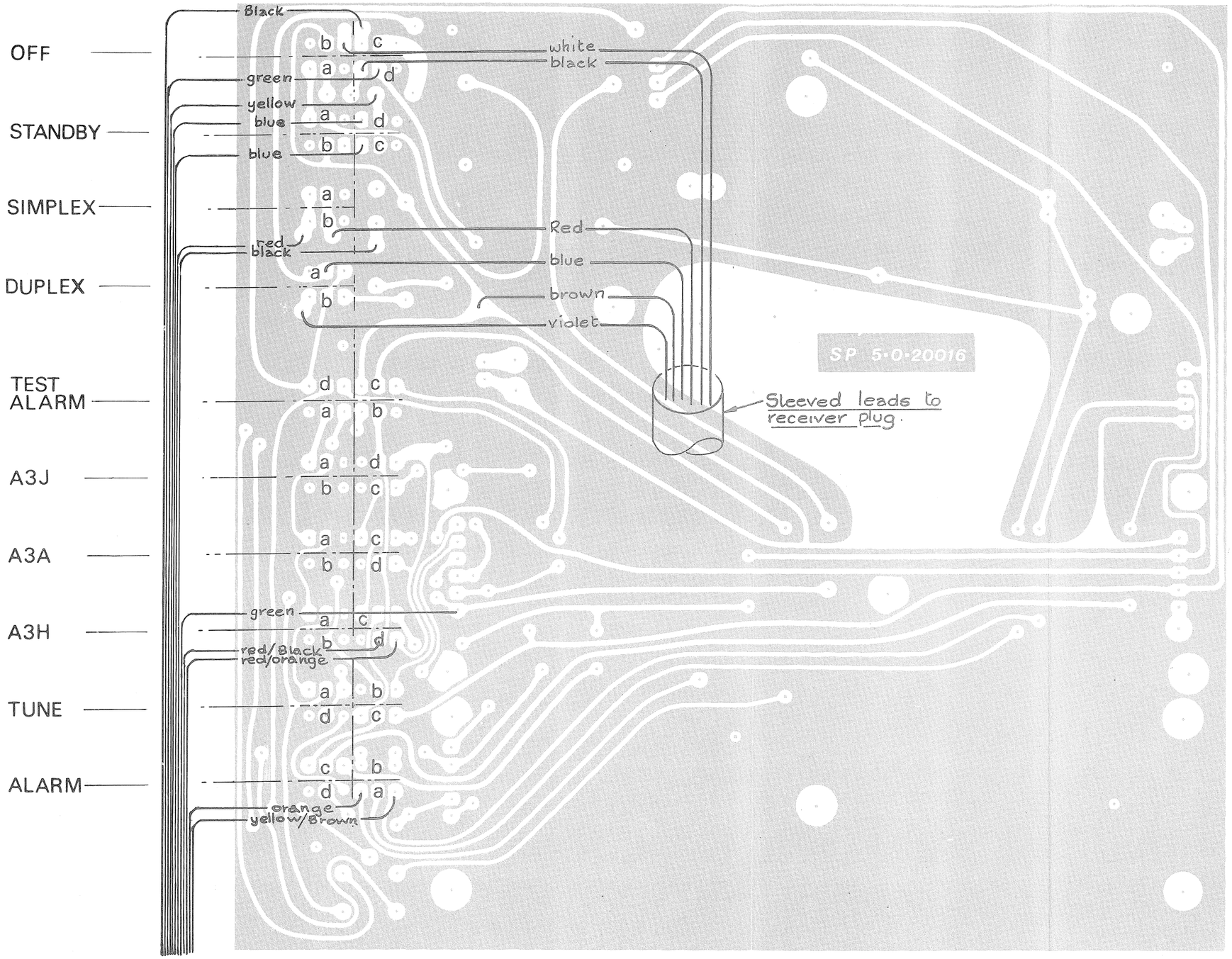


A

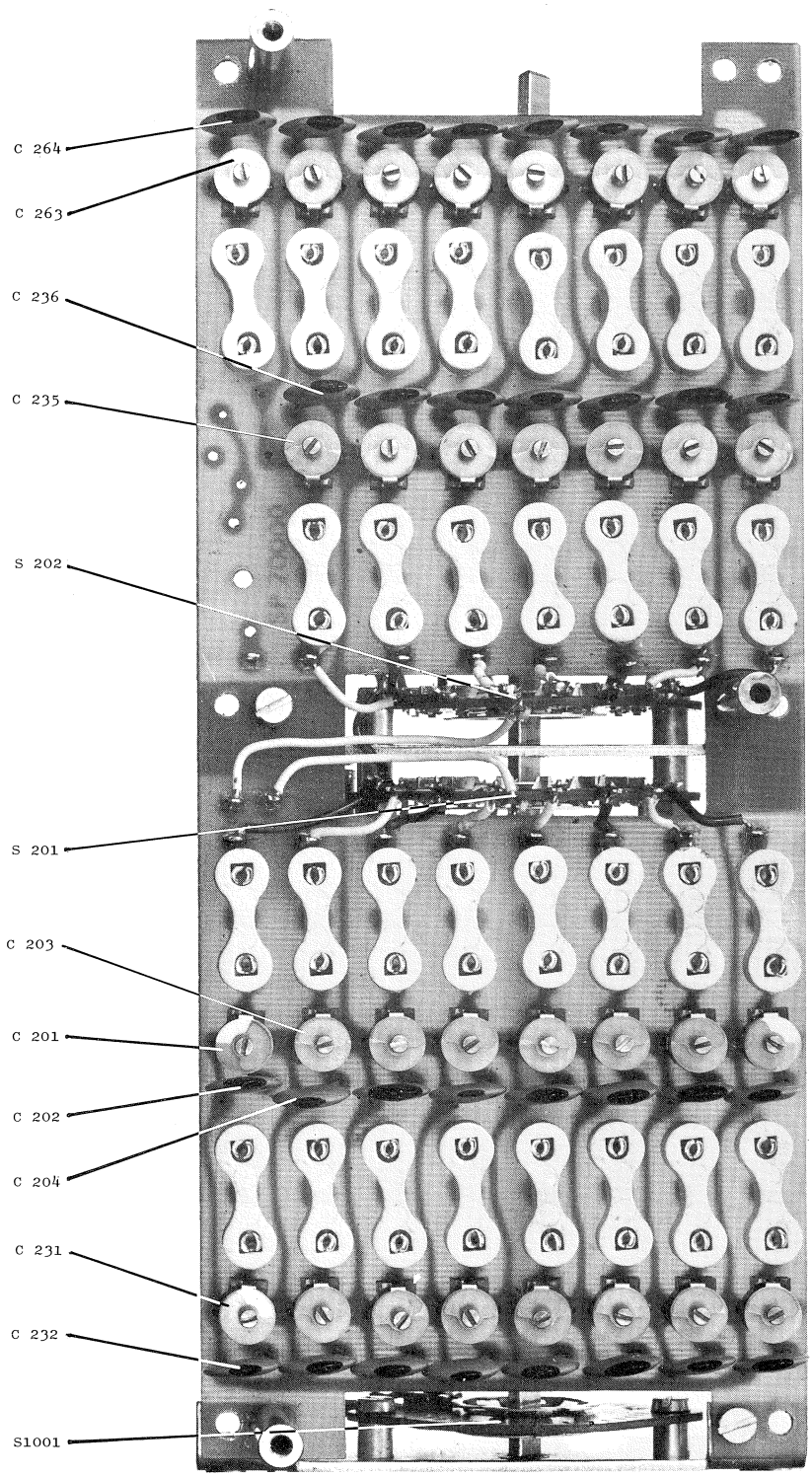
	T902	T903	T904	T905		T901		D904	T906
E	0,8	0,8	2,25	7,4 OR 0,2	B_1	0,14	K	0	0
B	1,2	1,3	2,85	8,1 OR 0,7	B_2	7,4	A	8,1 OR 0,7	0 - 3
C	7,0	7,0	7,5	7,6 OR 24	E	4,0	G	0	3,75

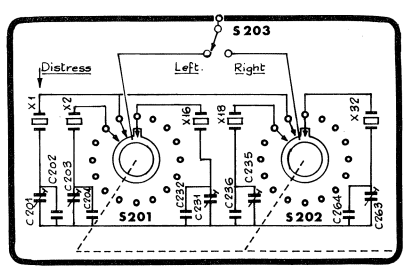


Alarm signal generator

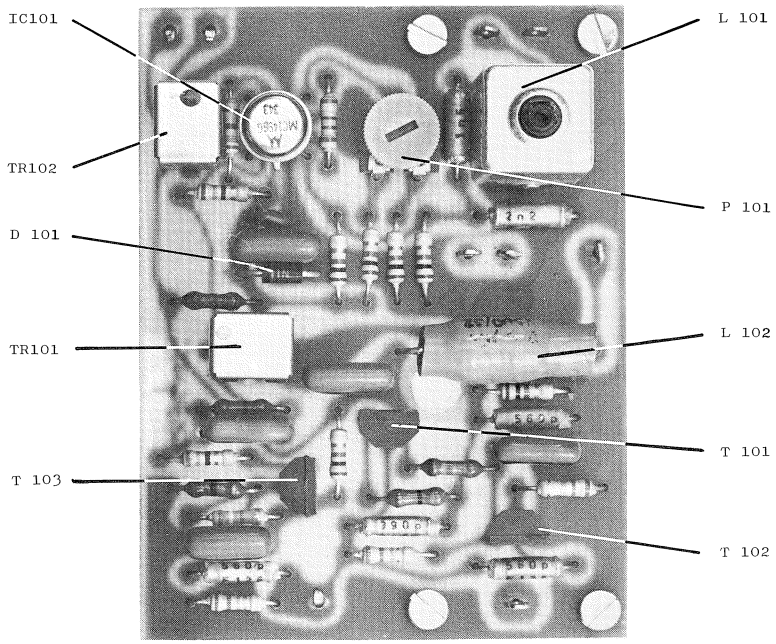

OFF
STANDBY
SIMPLEX
DUPLEX
TEST ALARM
A3J
A3A
A3H
TUNE
ALARM
Black
white
black
green
yellow
blue
blue
Red
red
black
blue
brown
violet
SP 5·0·20016
Sleeved leads to receiver plug.
green
red/Black
red/orange
orange
yellow/Brown

Base Print



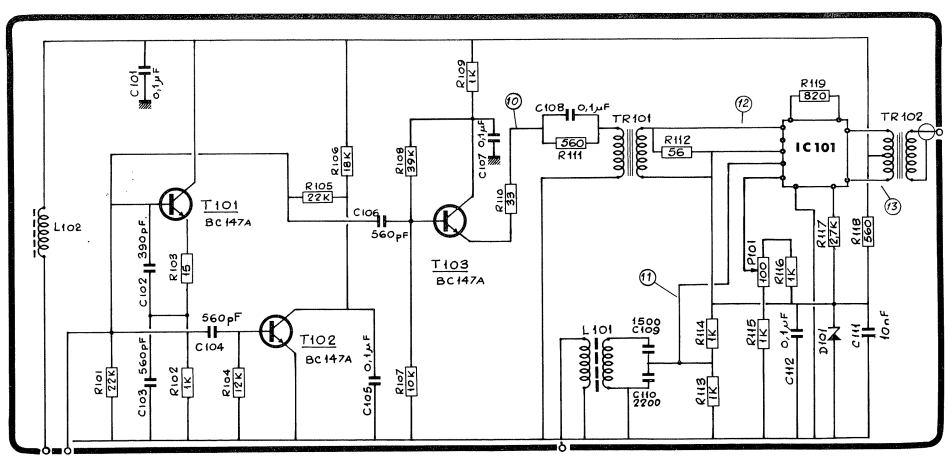


Crystal Section

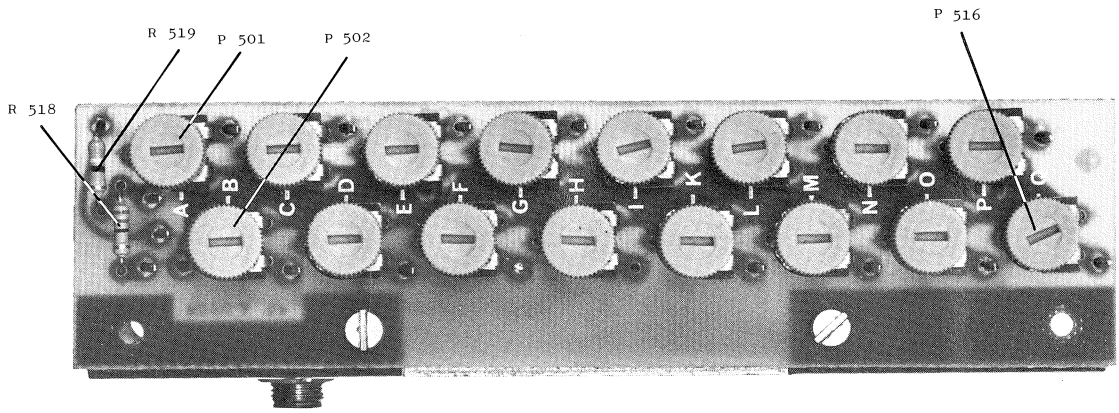


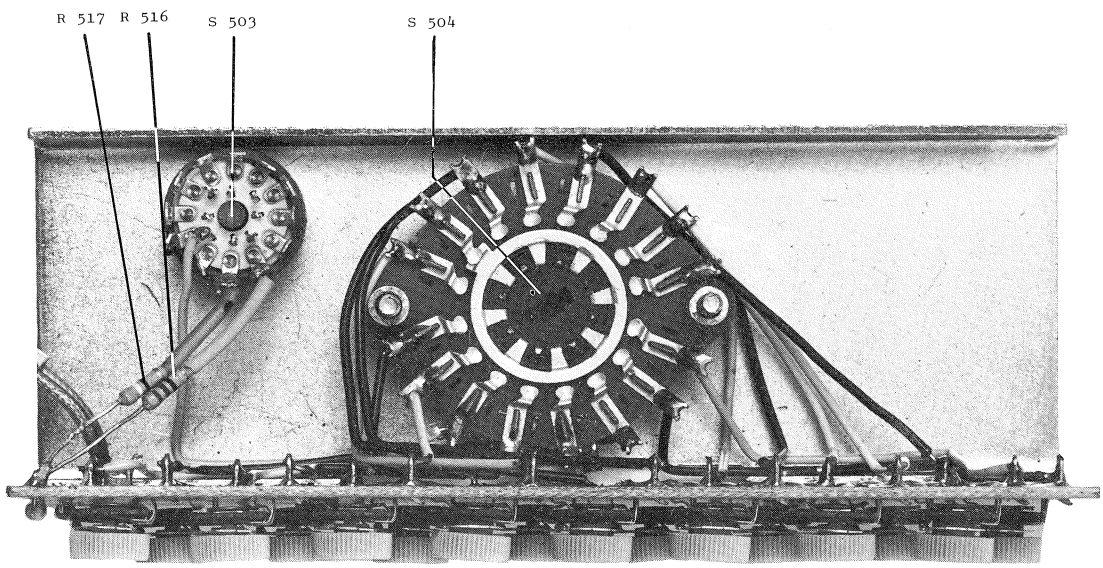
A

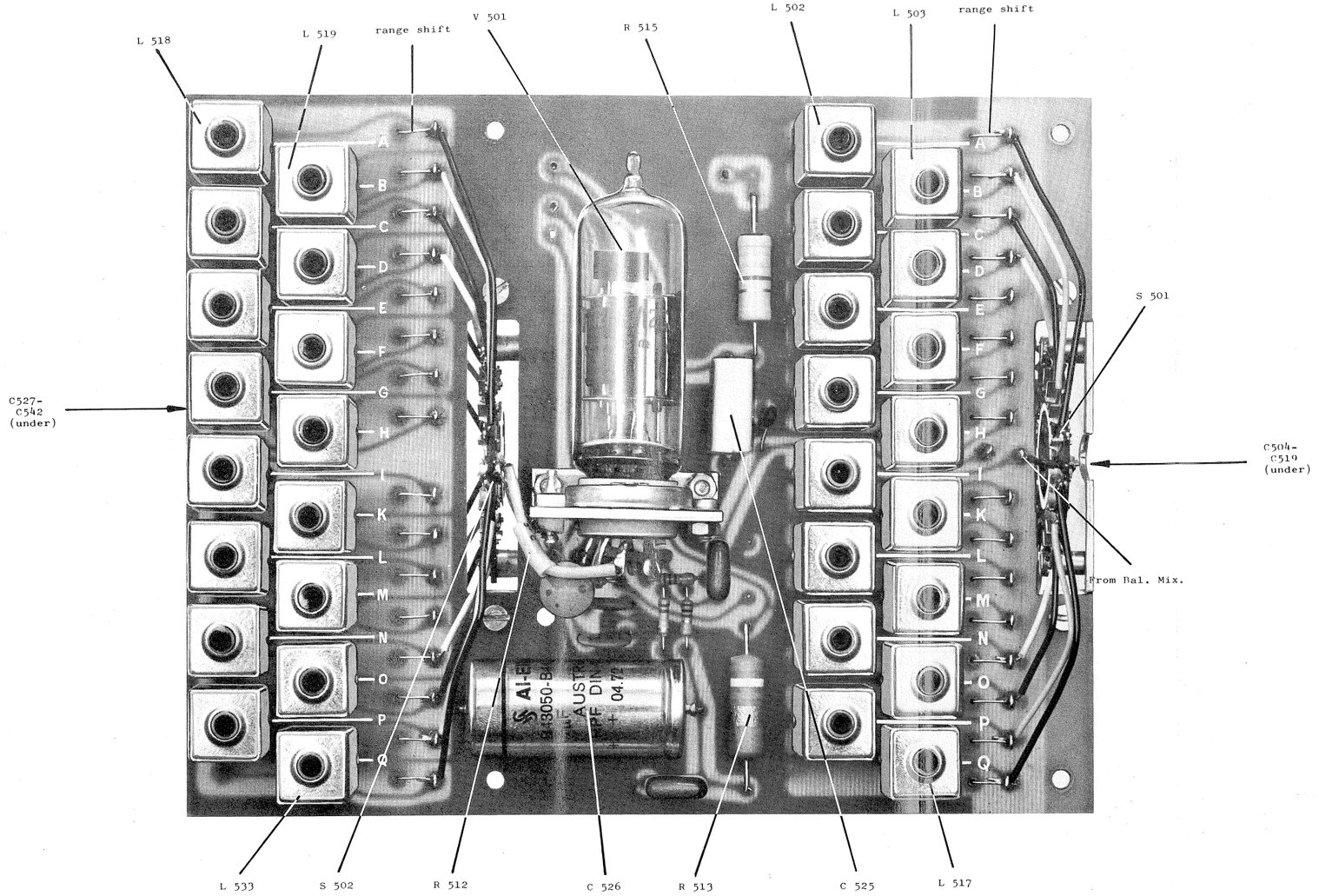
	T101	T102	T103
E	2,4	0	1,8
B	3,3	0,1	2,5
C	14,6	4,8	12,5

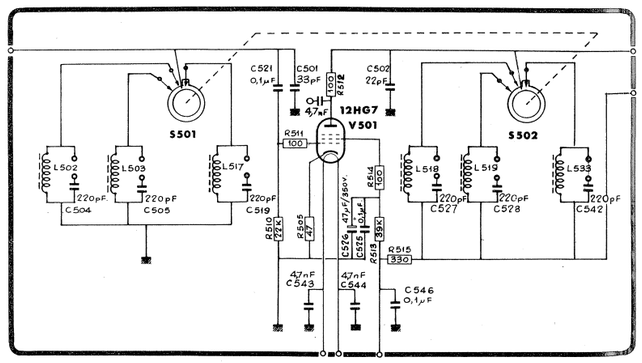


Crystal Osc. & Mixer print

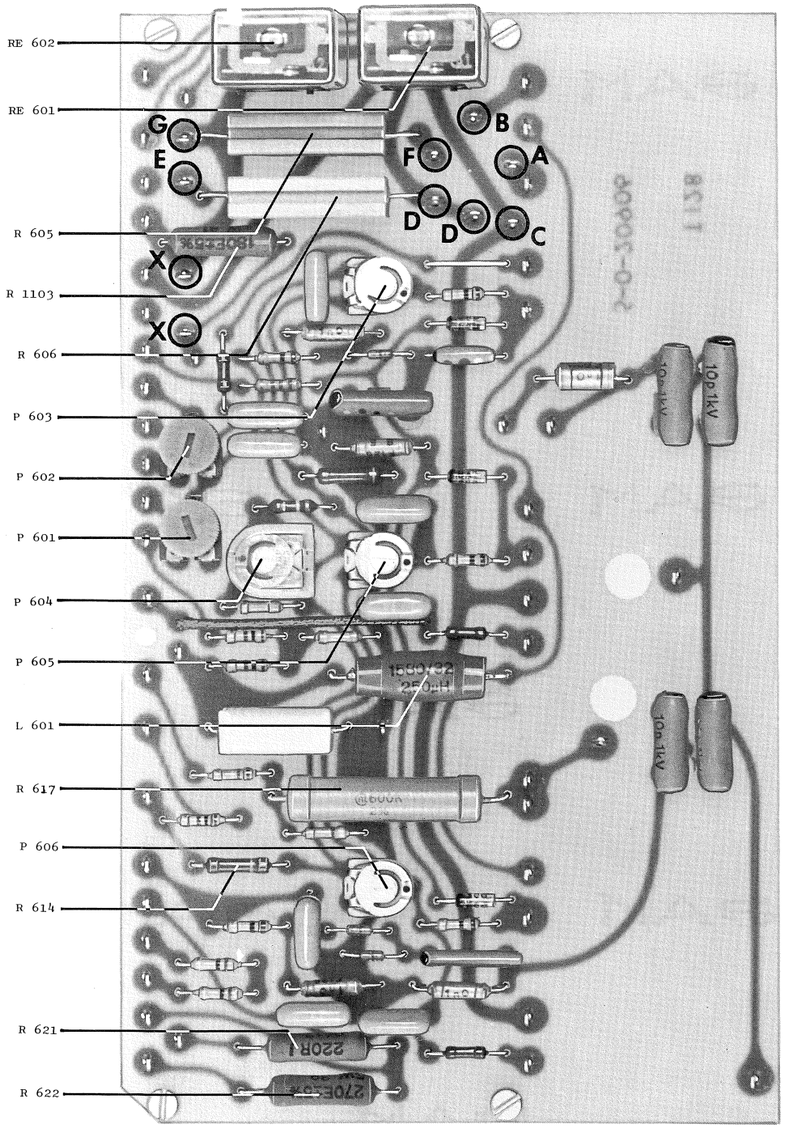

R 519
P 501
P 502
P 516
R 518
A
B
C
D
E
F
G
H
I
K
L
M
N
O
P

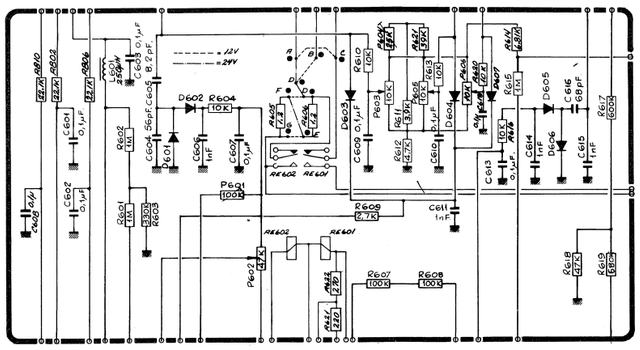

R 517
R 516
S 503
S 504



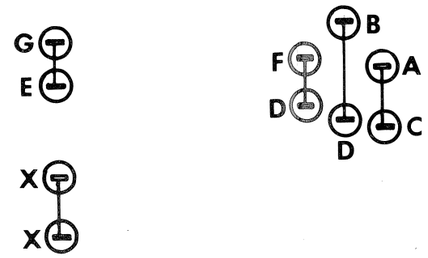


Driver Print

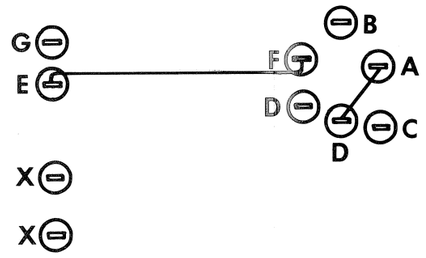




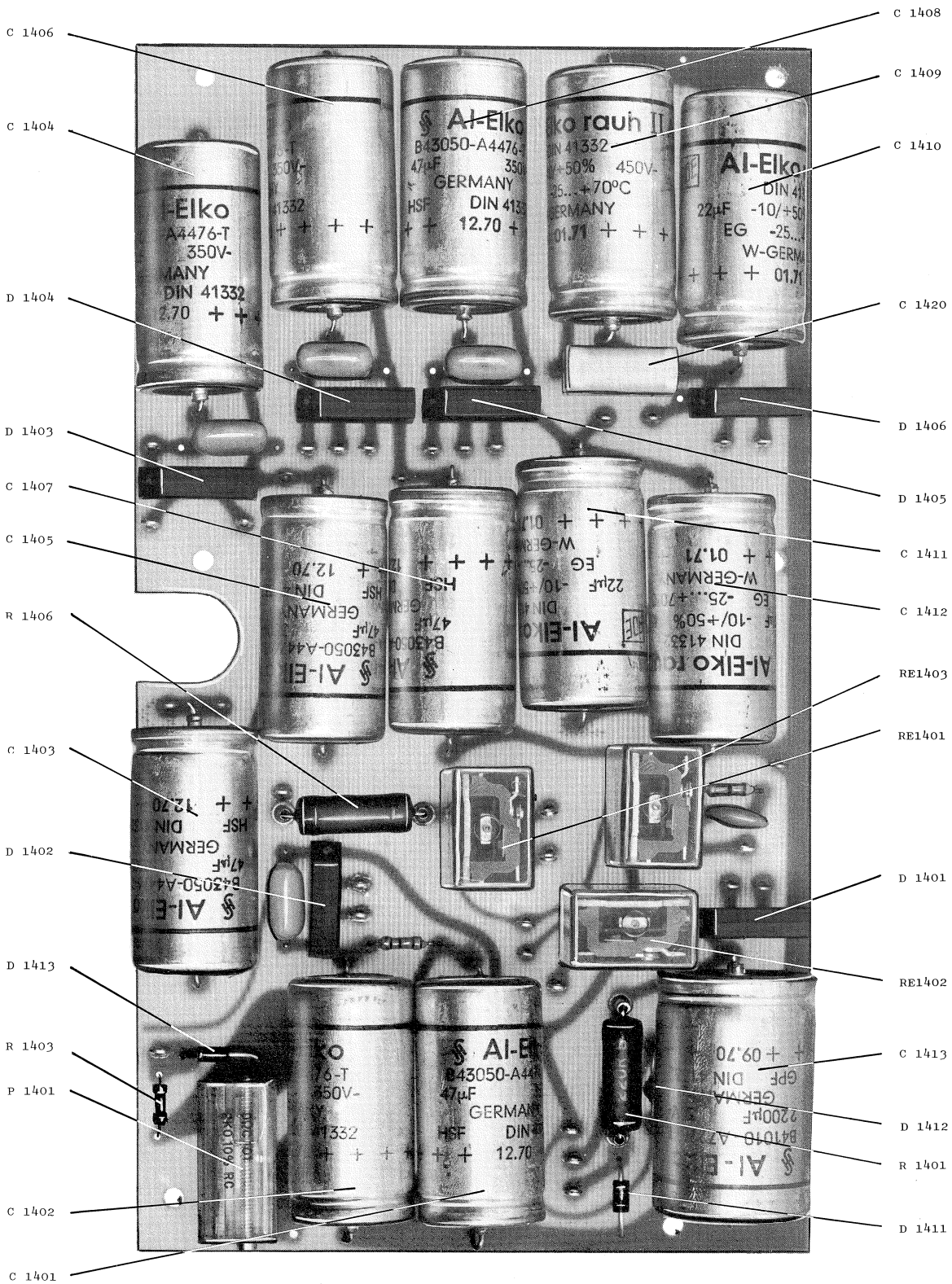
Jumpers shown for 12 V



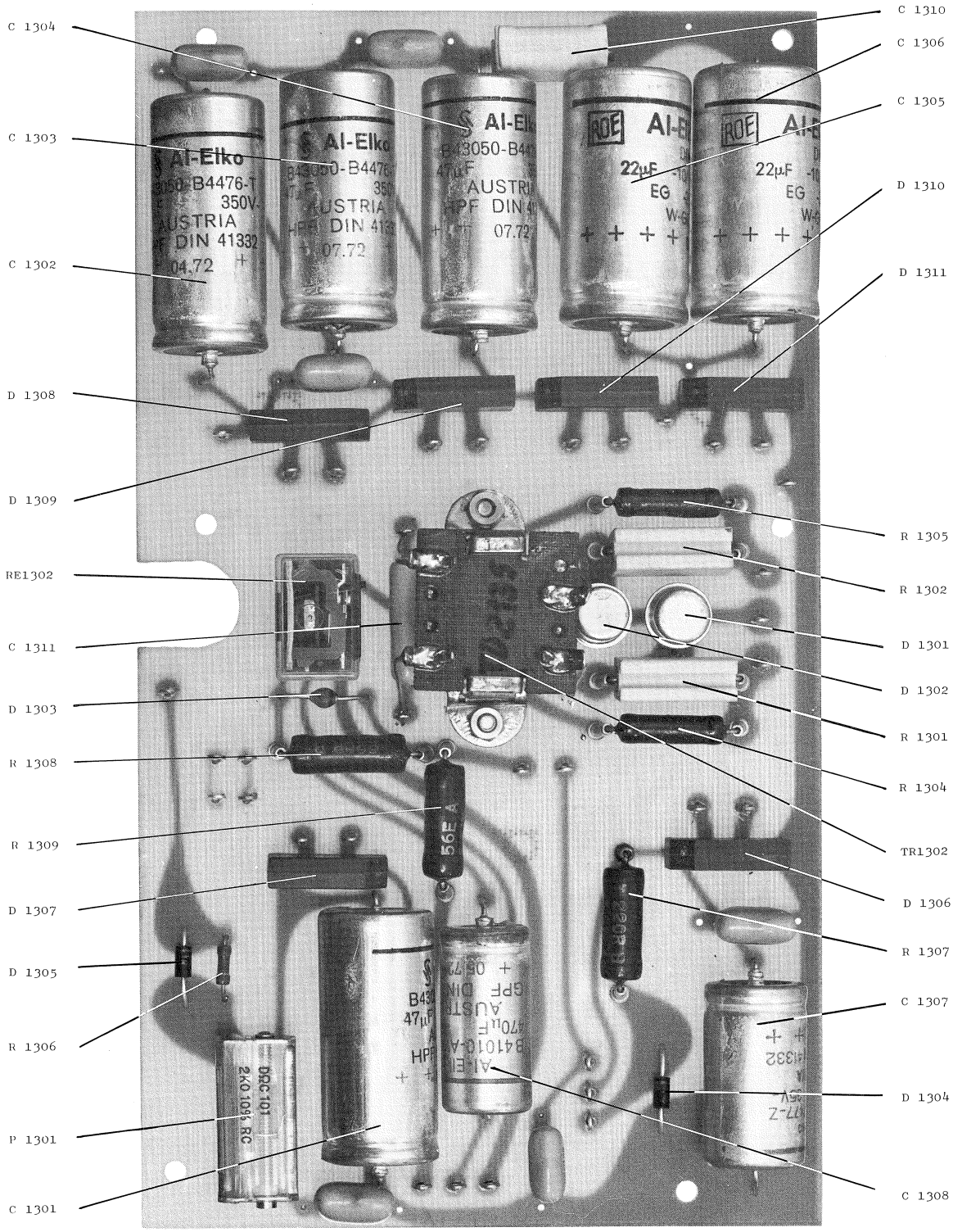
Jumpers shown for 24 V
110/220 V AC



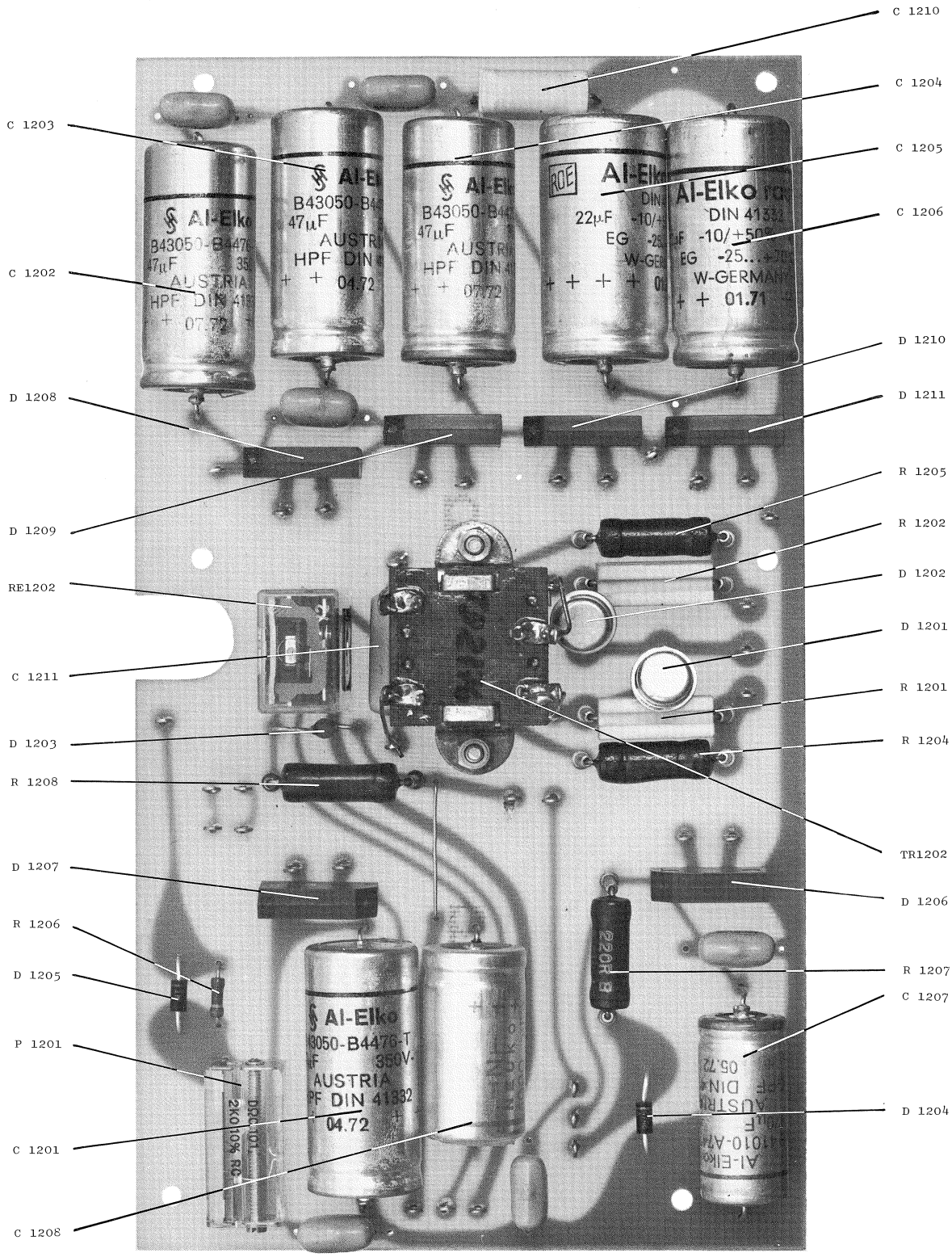
Supply voltage change see also fig. 4



220/110 VAC Power supply



24VDC Power supply



12 VDC Power supply

Typical AC Voltages at encircled numbers on main diagram.
T 124, T 126 and T 128

Test conditions: **TUNE,** and service switch in position **pre drive** or **driver.** (Channel B . . . Q).

Measurements: With an oscilloscope and a test probe 10:1 (10 Mohm/10 pF).

Output SSB generator under Test conditions	
T 126	0,8–0,9 Vpp
T 128	0,8–0,9 Vpp
T124	1 Vpp

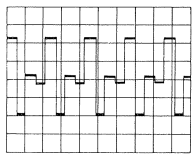
Fig. A 

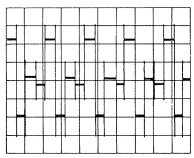
Fig. B 

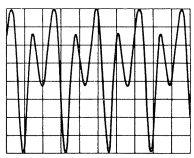
Fig. C 

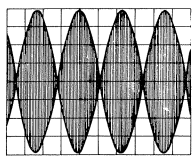
Fig. D 

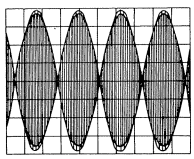
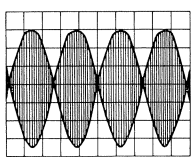
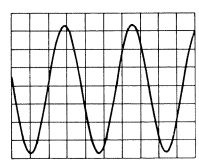
Fig. E 

Fig. F 

Encircled number	Vpp	Freq.	Curve shape
1	1,6	1,3/2,2 kc	Fig. G
2	13–20	600 kc	Fig. G
3	6	600 kc	Fig. G
4	0,04	600 kc Lower S.B.	Fig. E
5	0,4–0,5	600 kc Lower S.B.	Fig. D
6	13	600 kc Lower S.B.	Fig. D
7	4,5	1,1 kc	Fig. A
8	0,45	1,1 kc	Fig. C
9	0,9	1,1 kc	Fig. B
10	1,4	Xtal	Fig. G
11	0,7–1,4	600 kc Lower S.B.	Fig. D
12	0,45	Xtal	Fig. G
13	3–4,5	Output Upper S.B.	Fig. E
14	4–5	Output Upper S.B.	Fig. D
15	70–90	Output Upper S.B.	Fig. F

Fig. G 

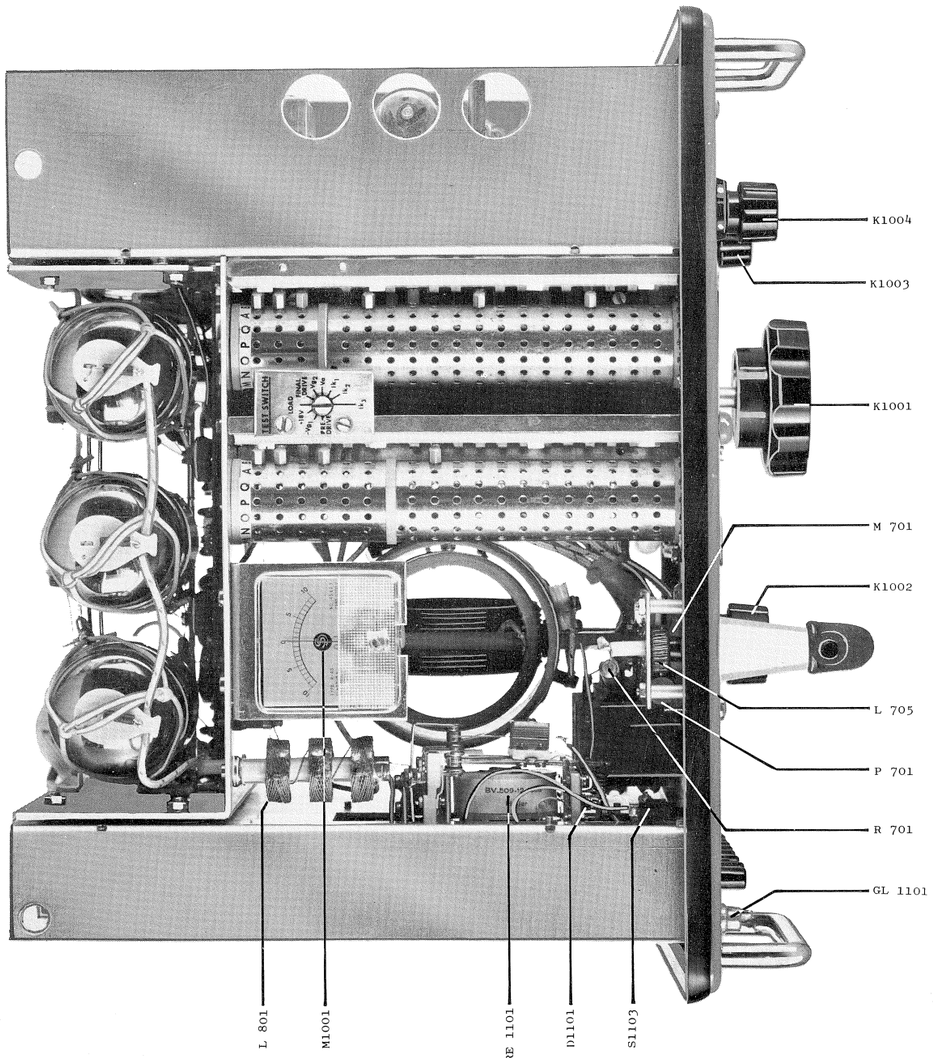
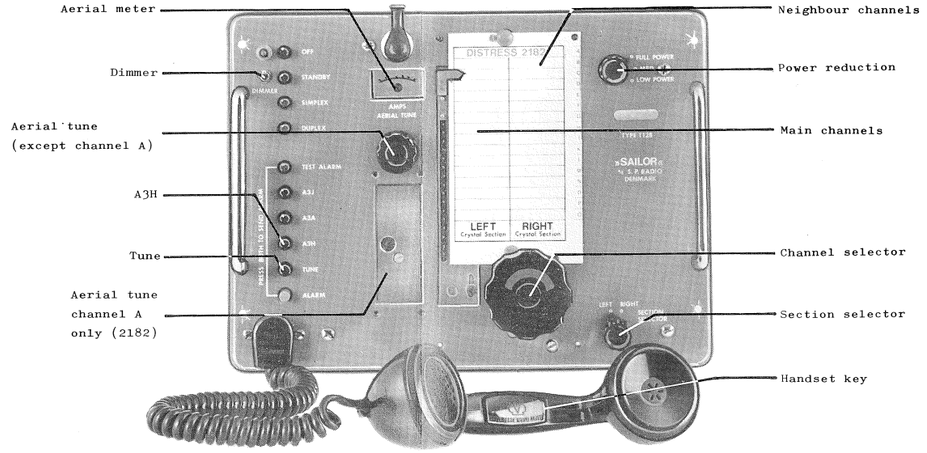
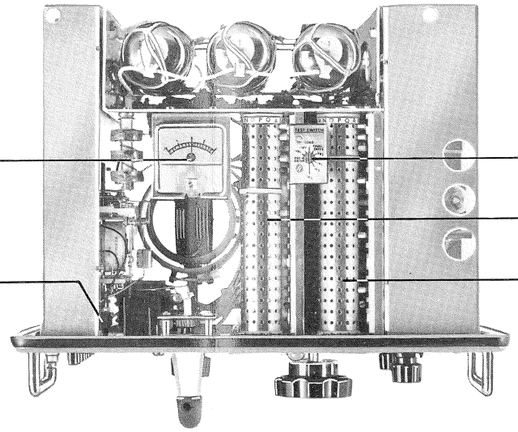


Figure 2 Top view T128





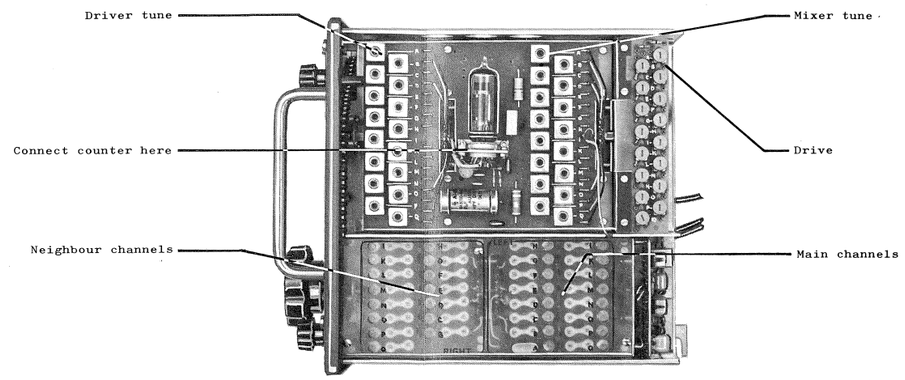


Figure 1 Tuning facilities T128

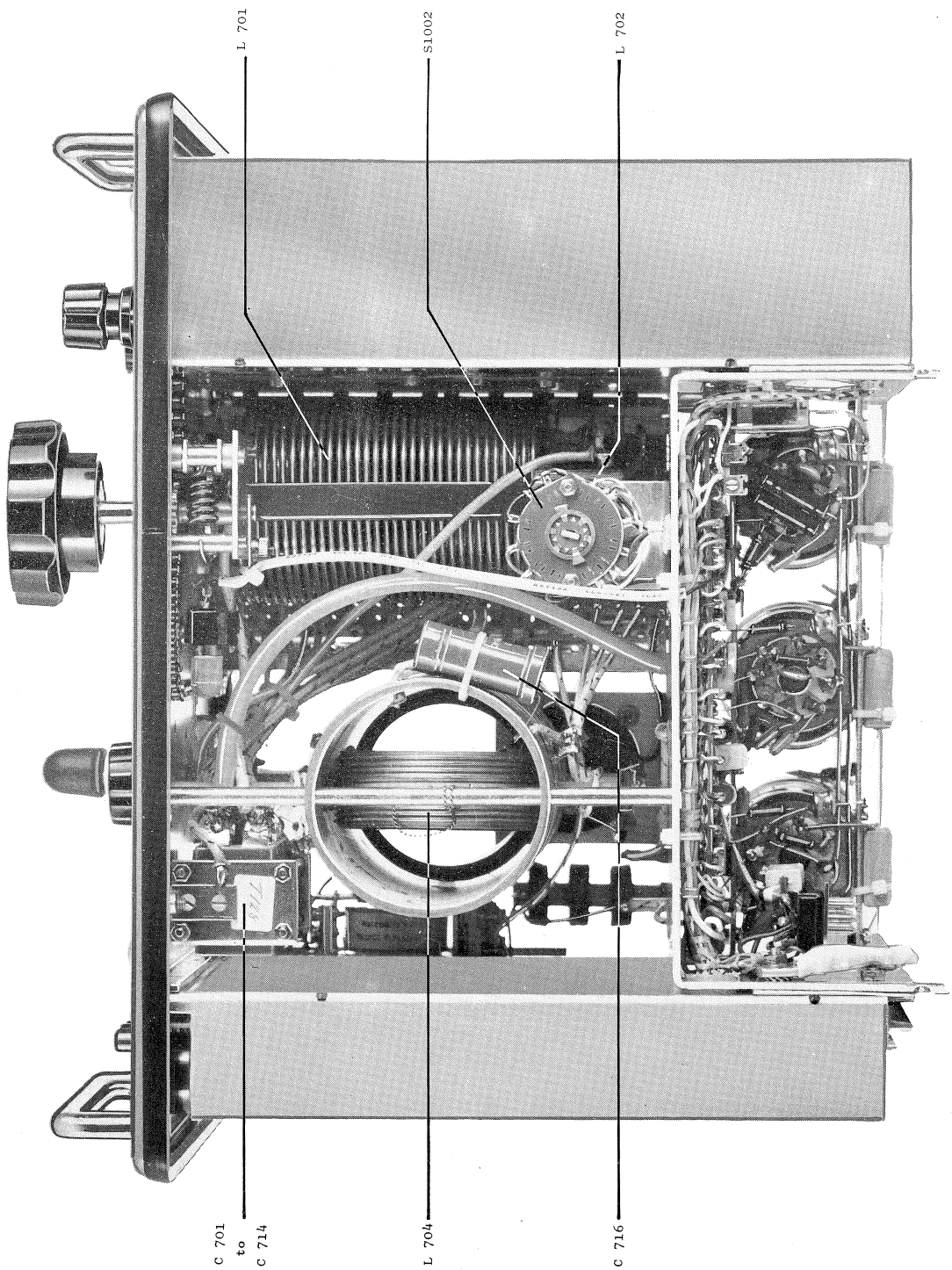


Figure 3 Bottom view T 128

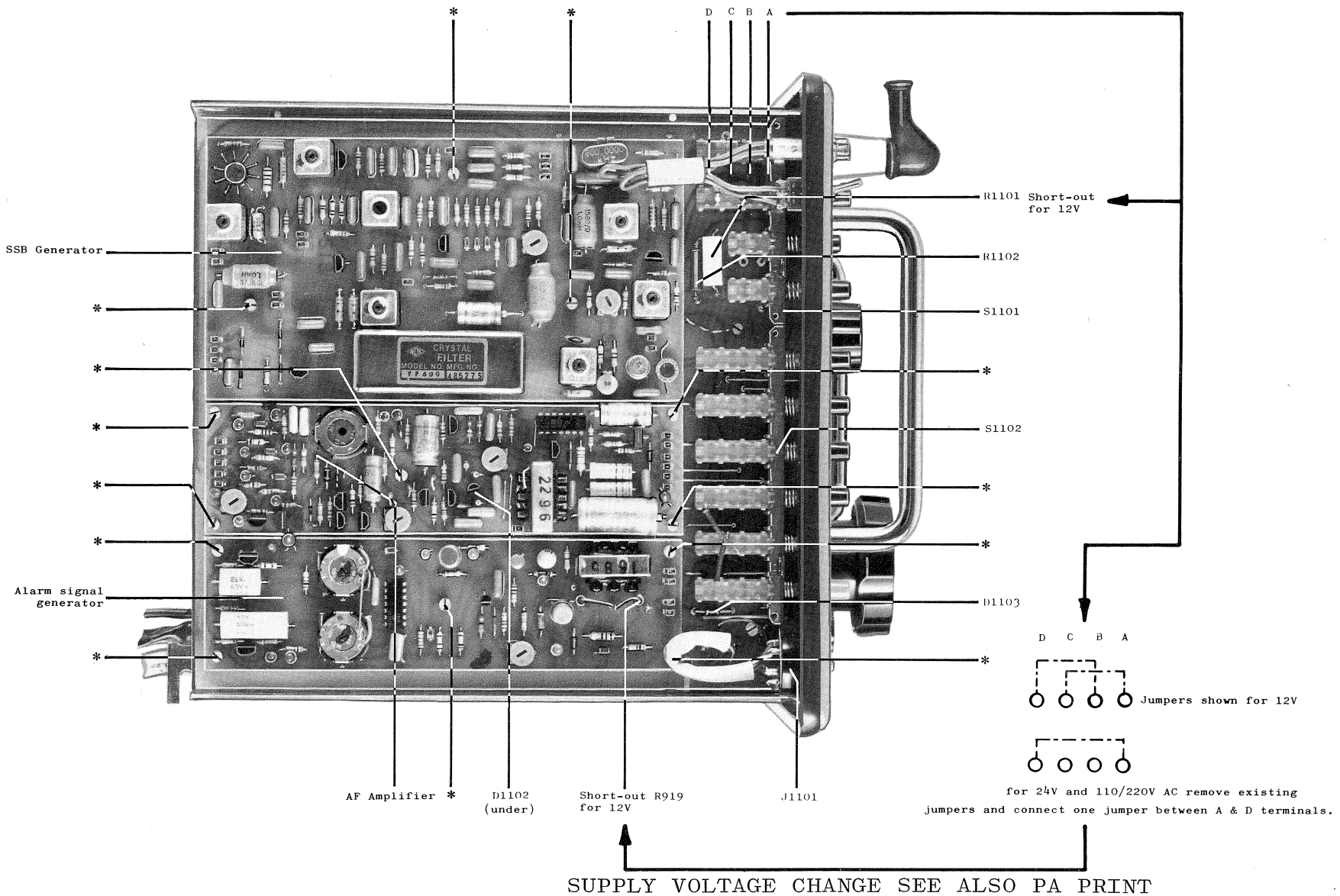


Figure 4 Left side view T128

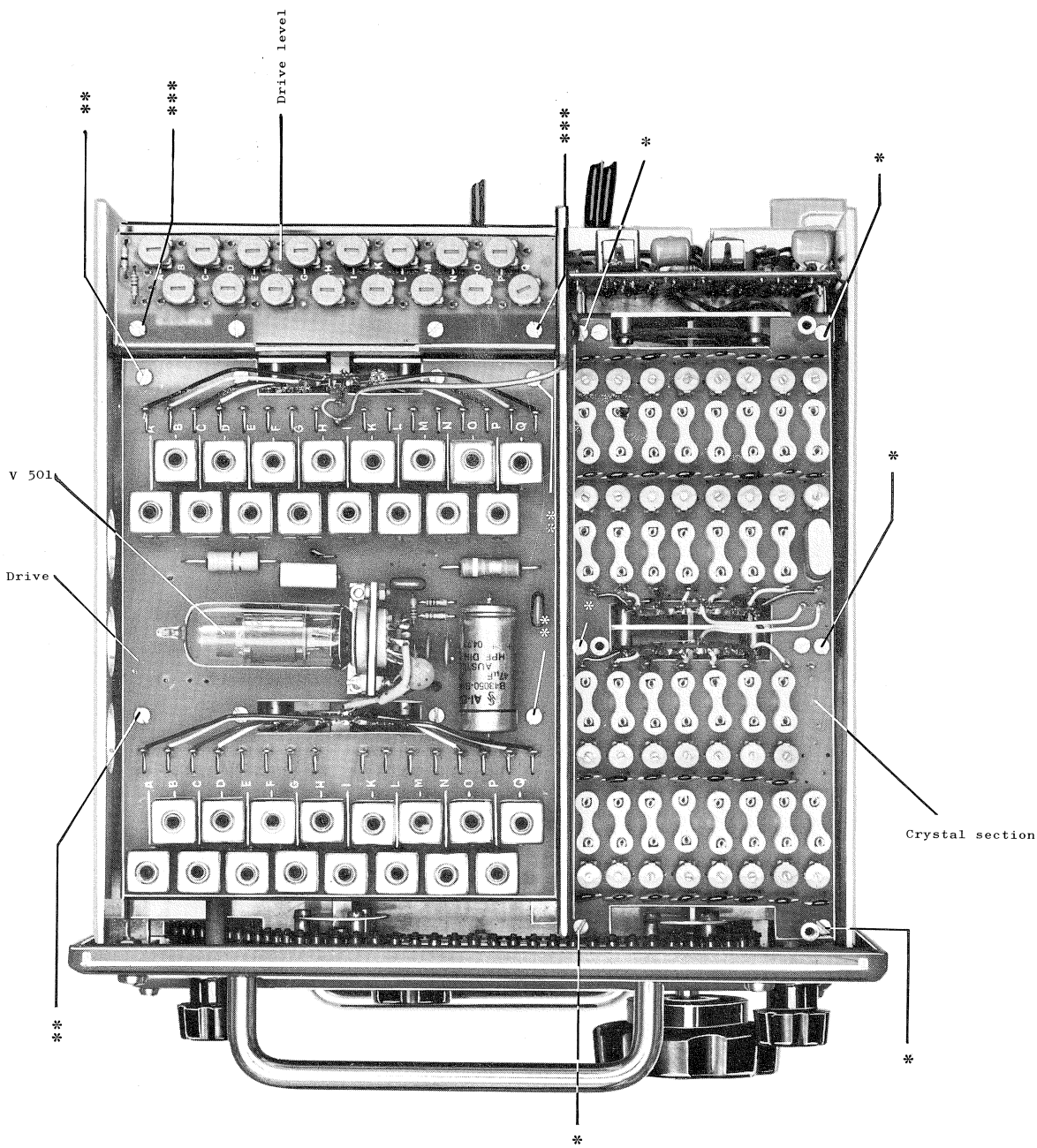


Figure 5 Right side view

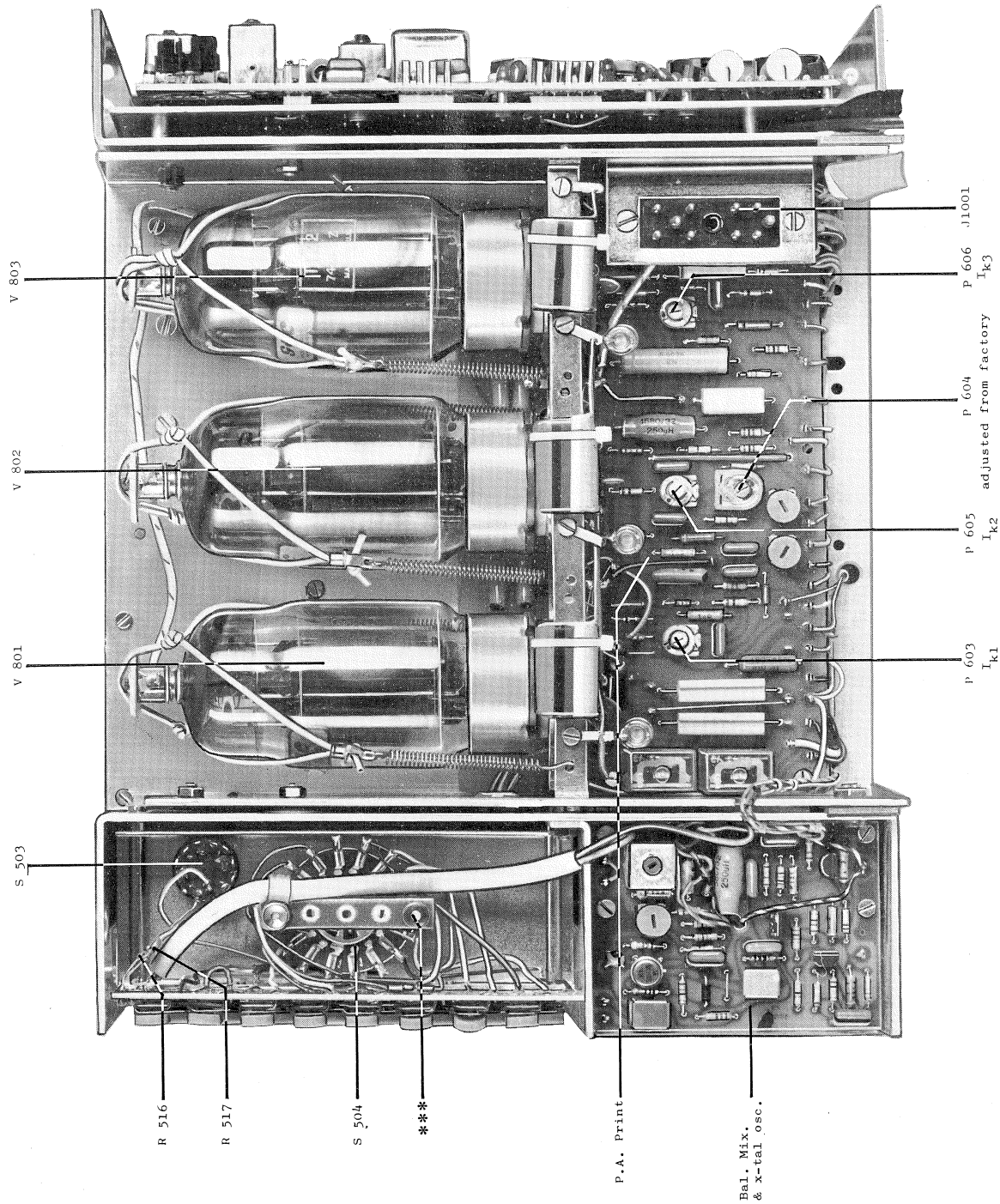
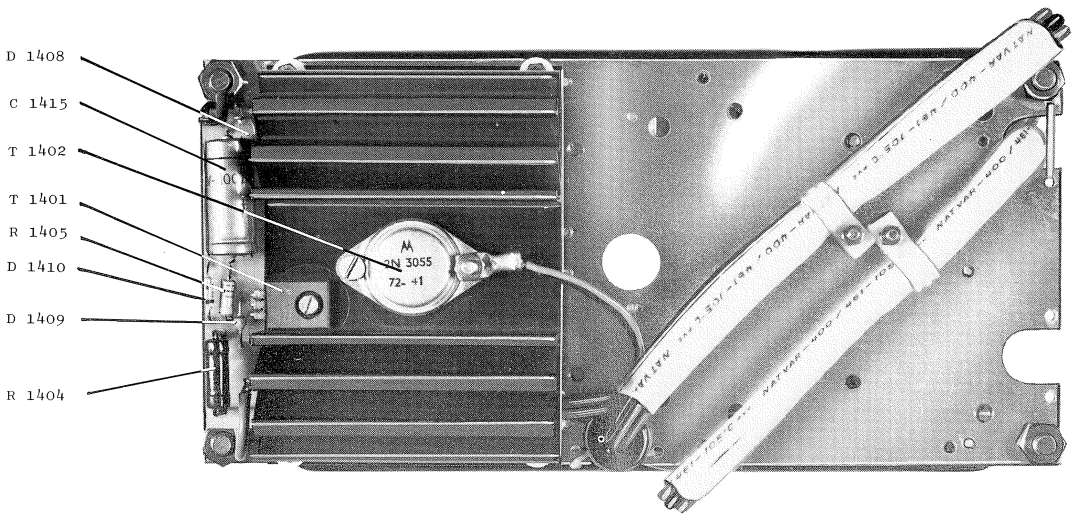


Figure 6 Rear view T 128



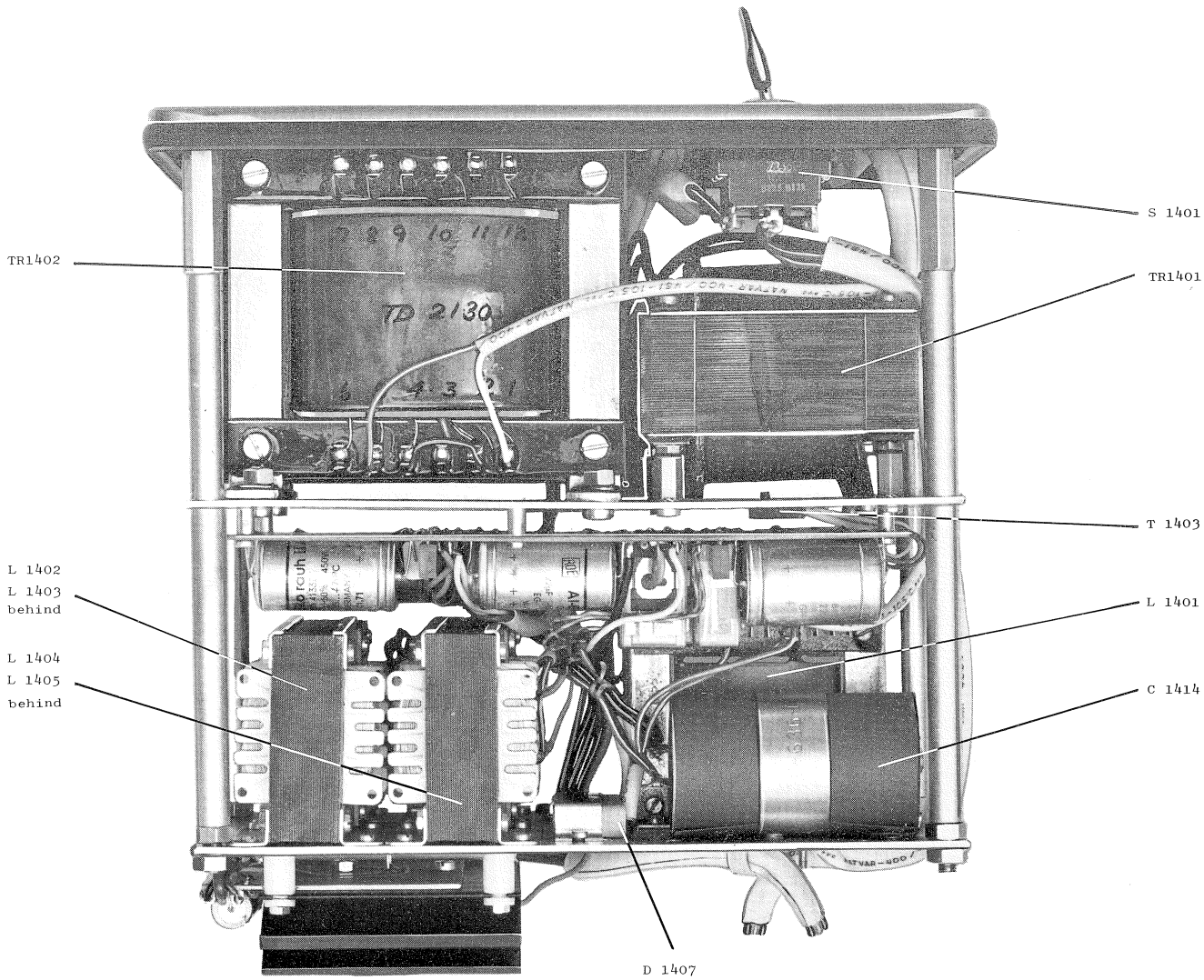
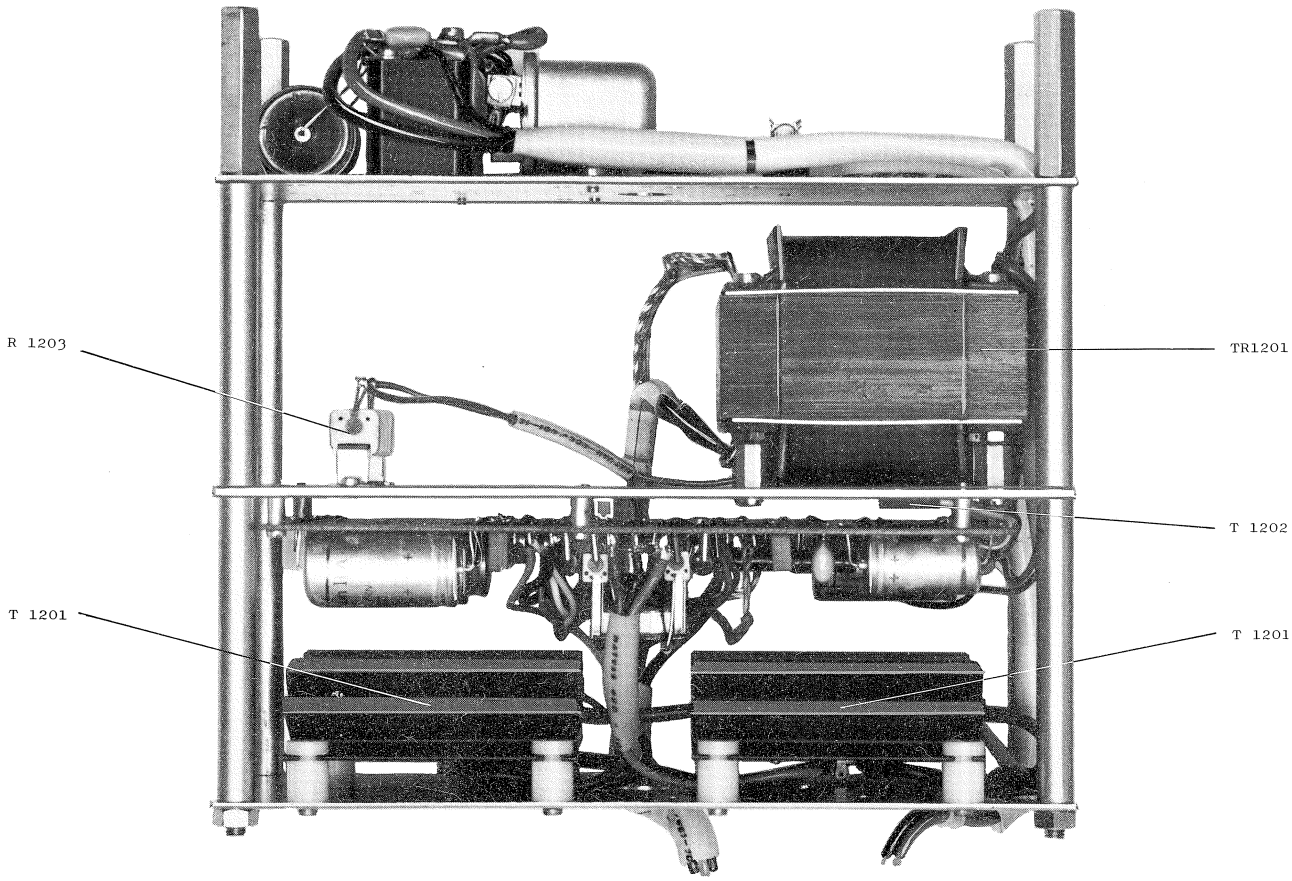


Figure 7 220/110 VAC Power supply



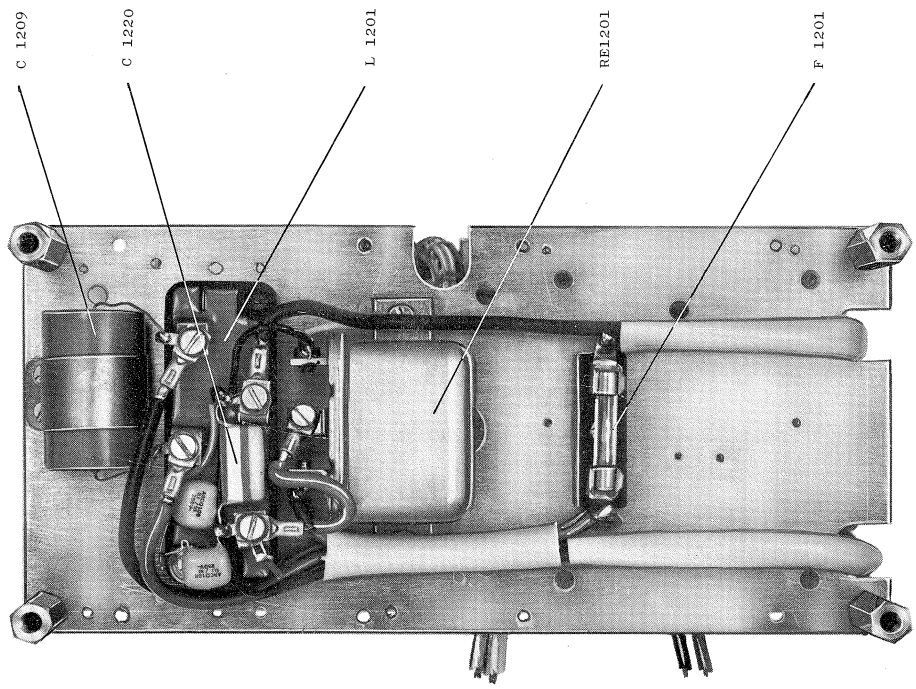
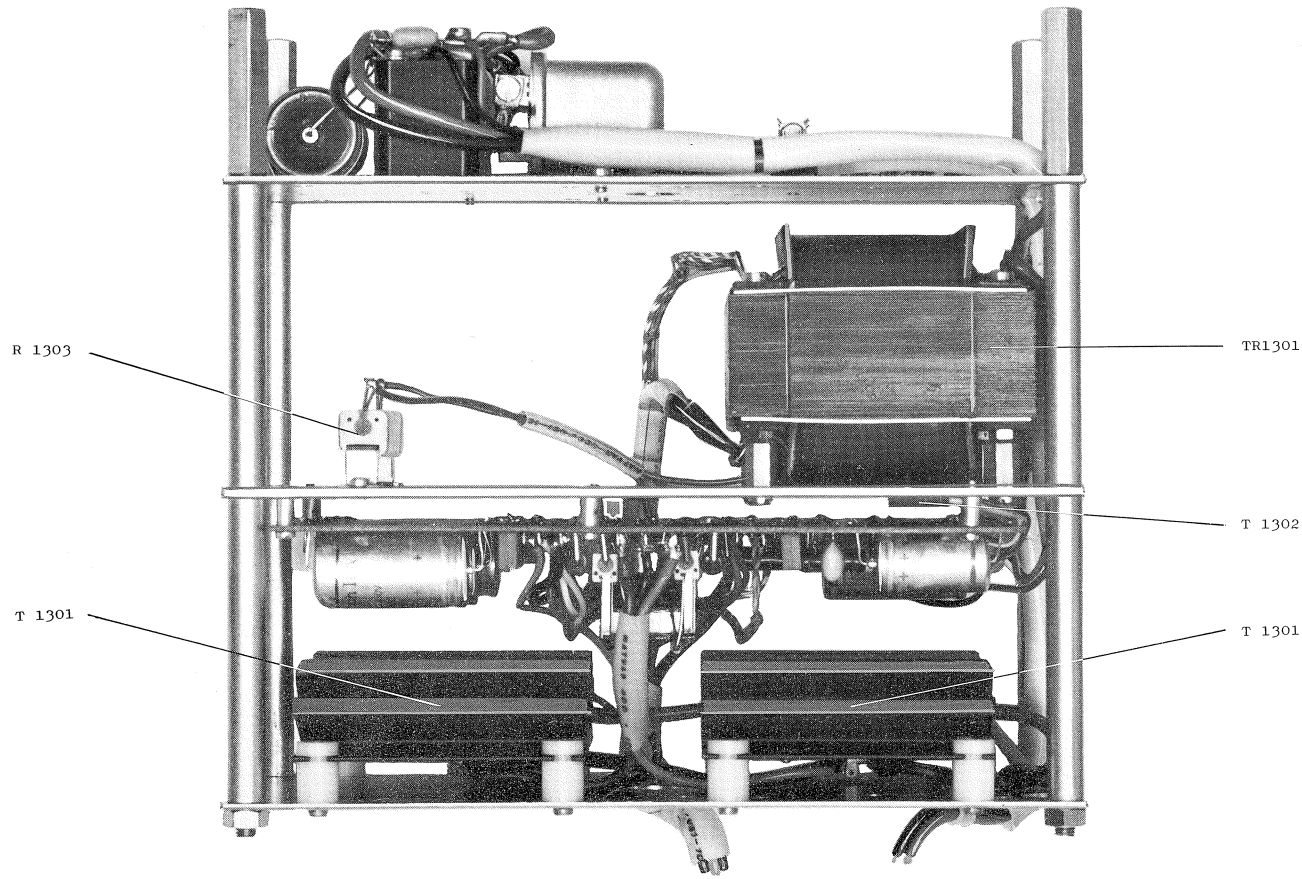


Figure 8 12VDC Power supply



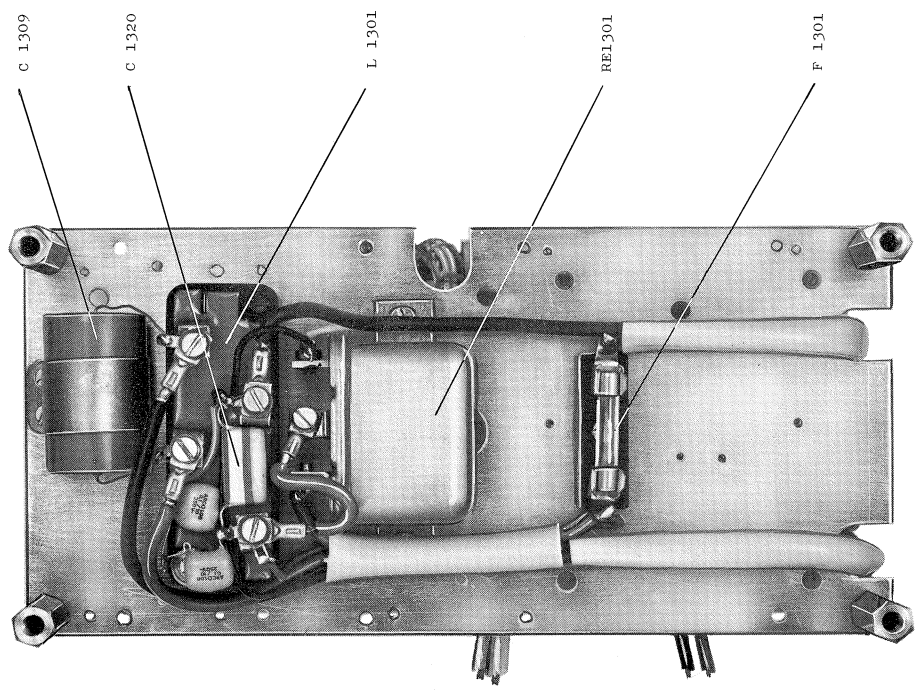
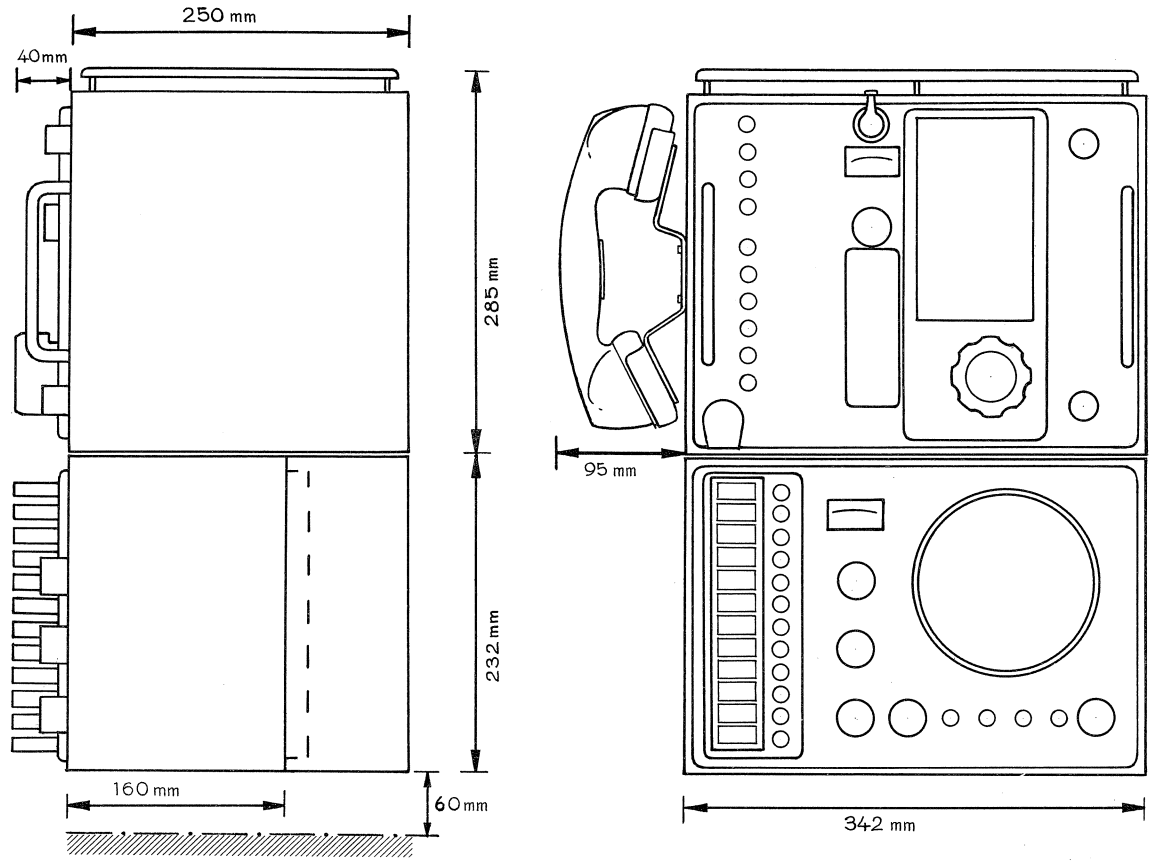


Figure 9 24VDC Power supply

Overall dimensions T 128 / R 103 or R 104



Mounting holes on bulkhead

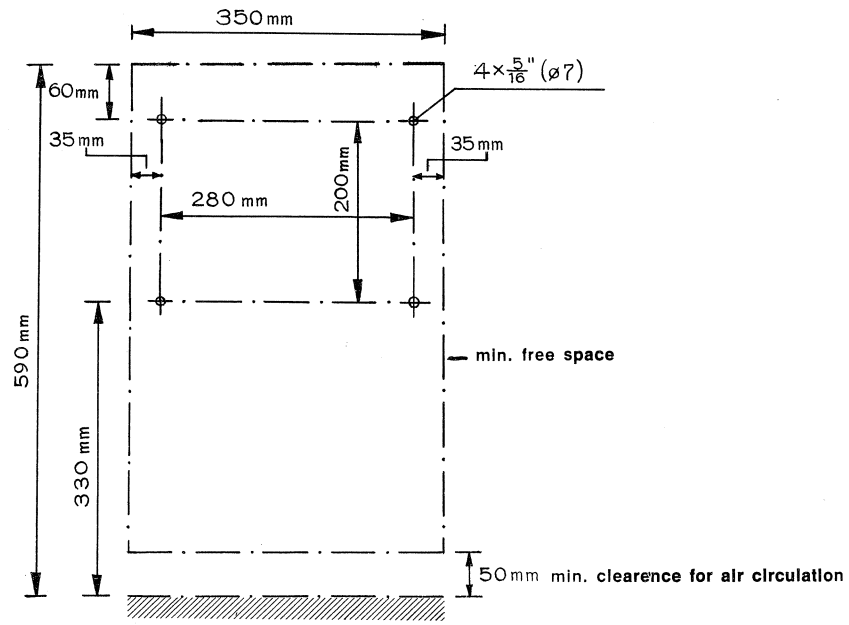
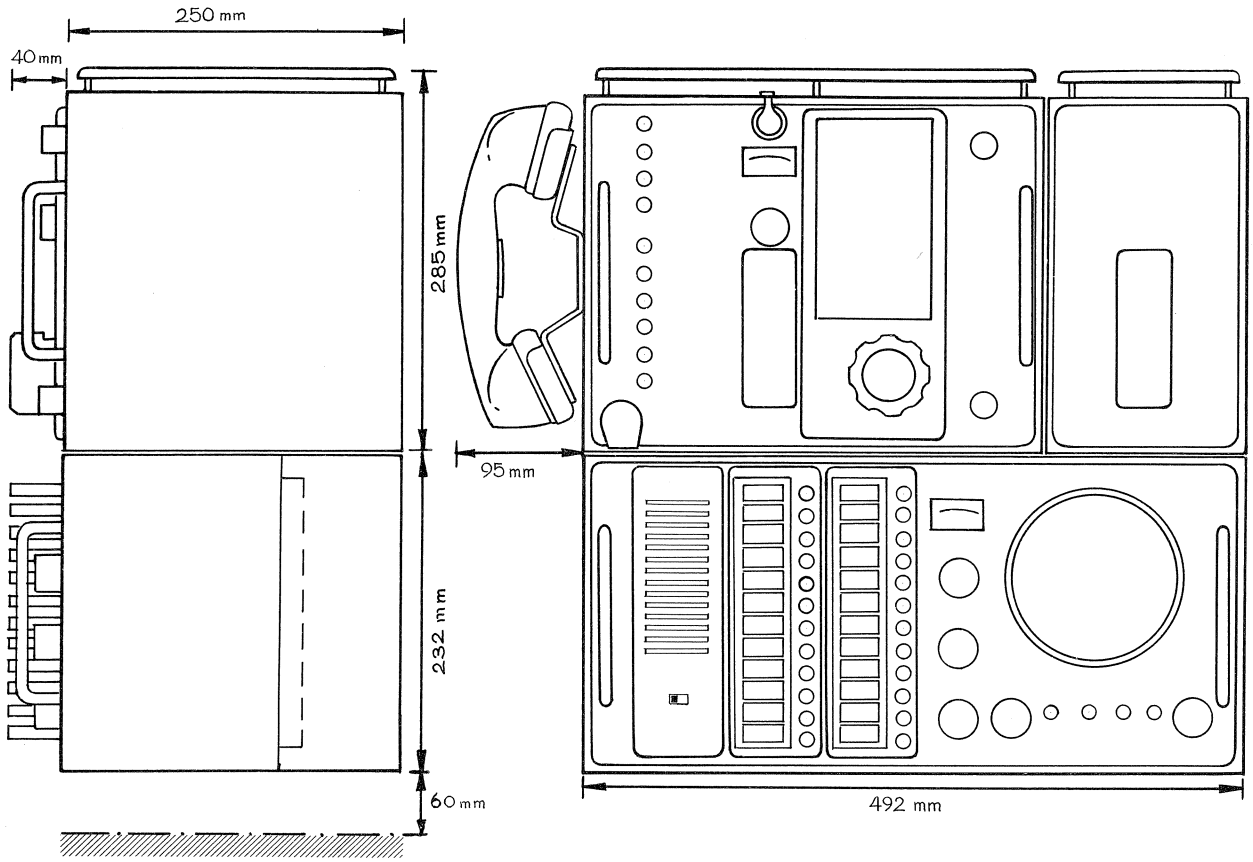


Figure 10

Overall dimensions T 128 / R 105 or R 106



Mounting holes on bulkhead

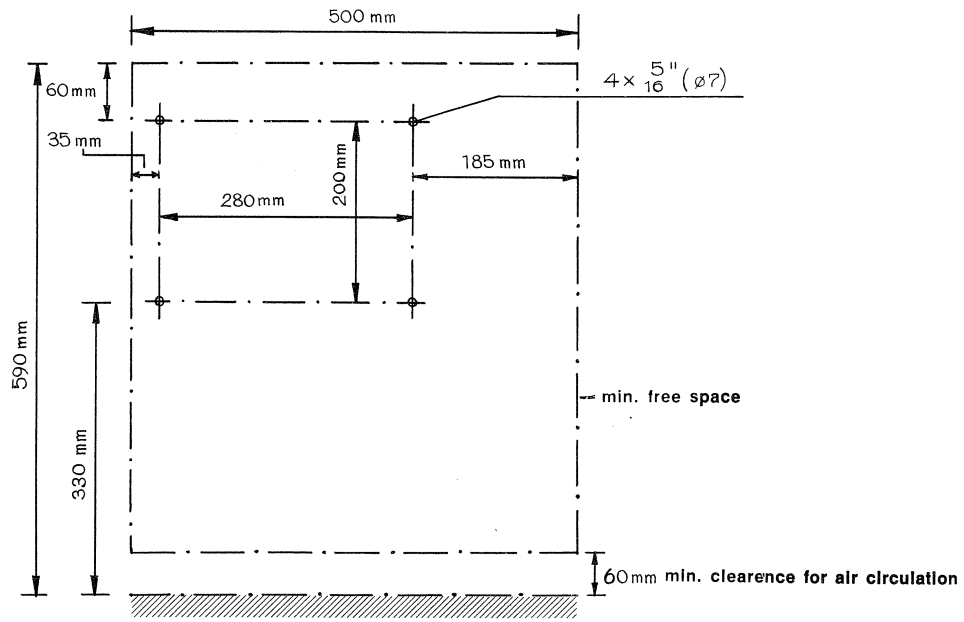
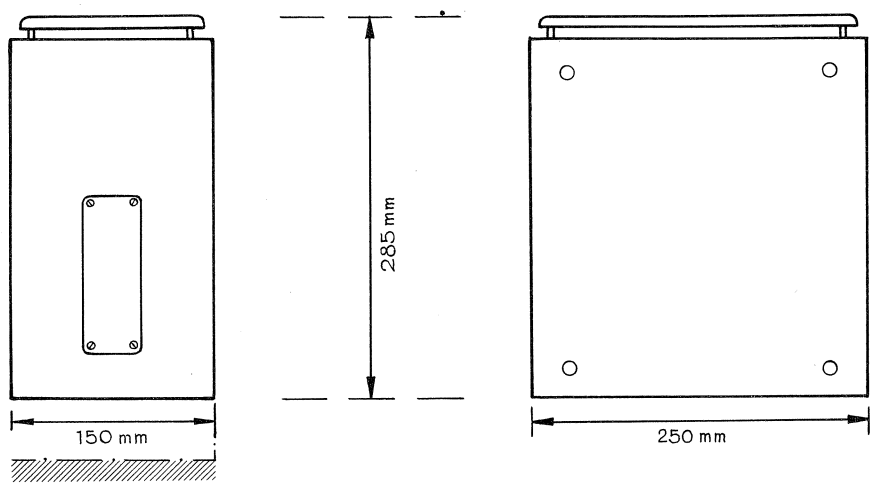


Figure 11

Overall dimensions N 178 – 179 – 180
Powersupply for T 128



Mounting holes on bulkhead

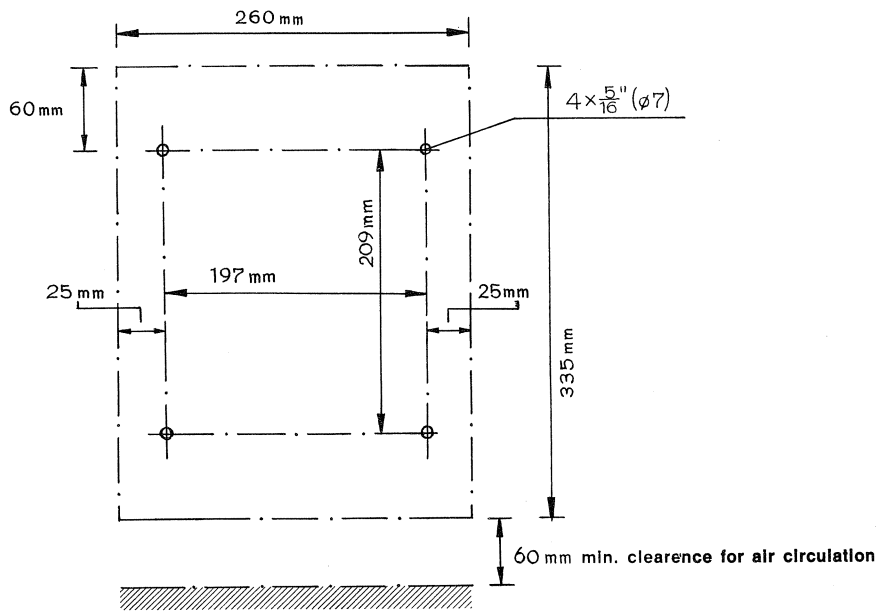
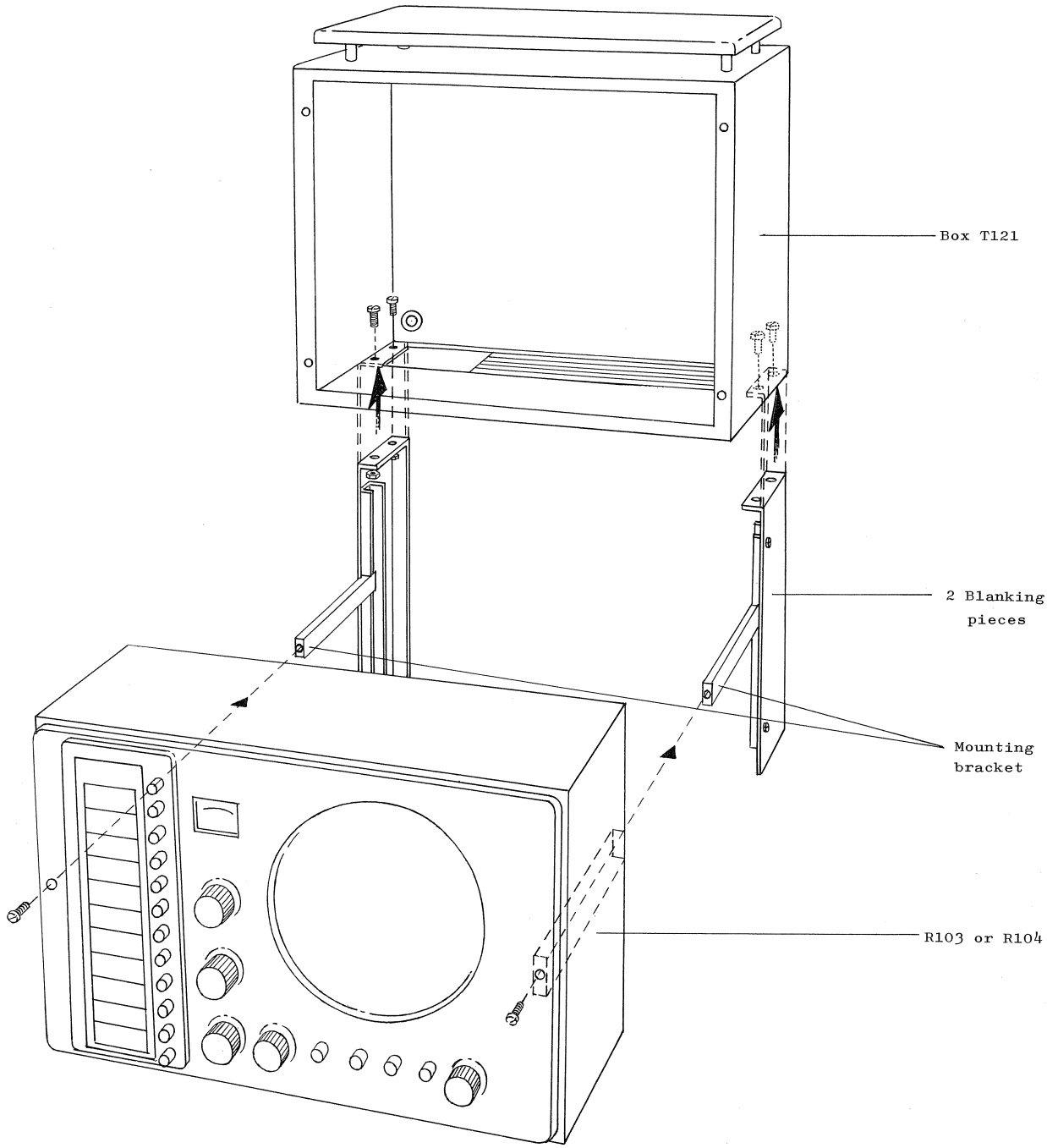


Figure 12

Method off mounting T 128 with R 103 and R 104



The transmitter case is fastened to the bulkhead in the normal manner utilising the four mounting holes in the back of the case.

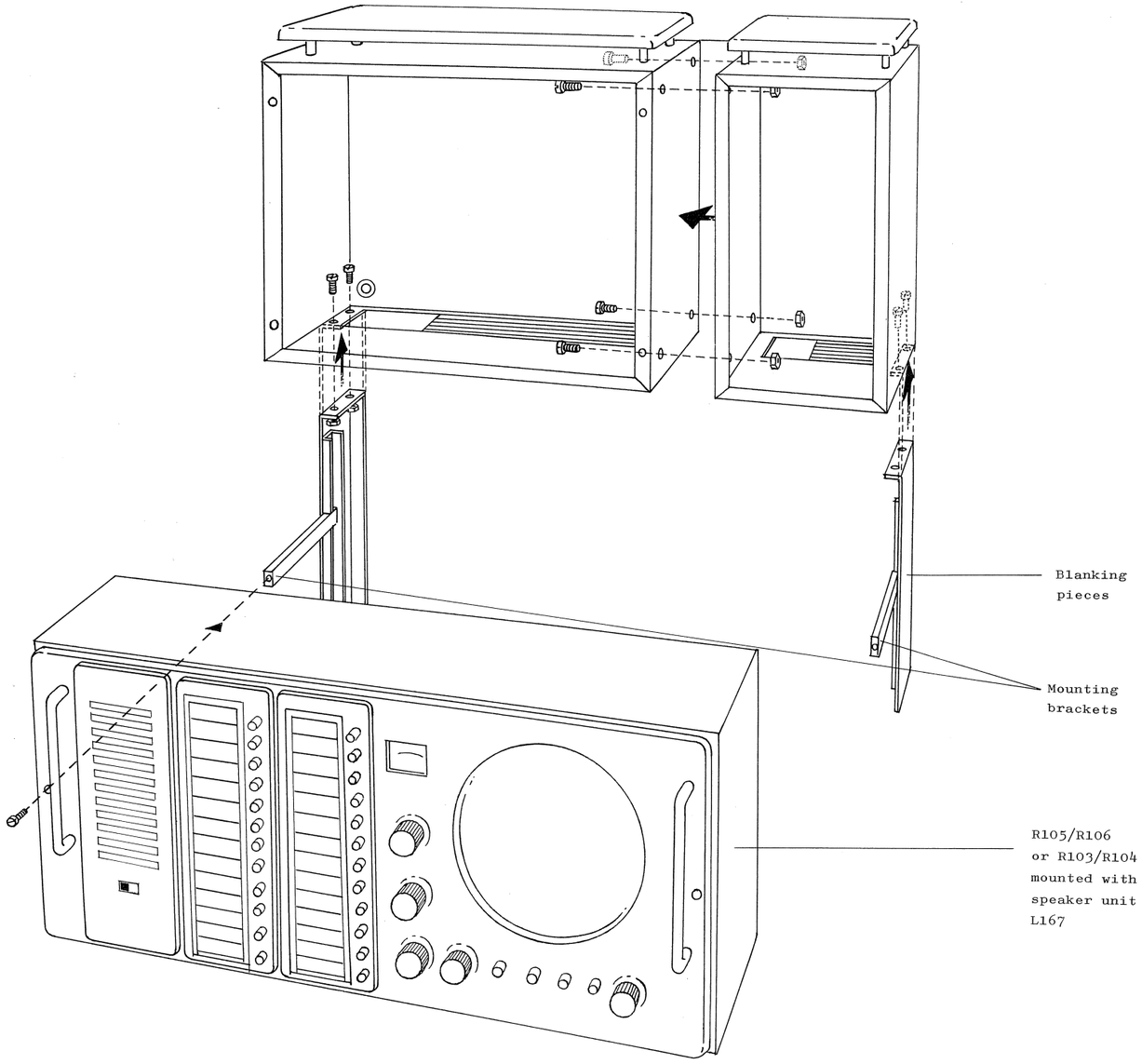
Fasten the two blanking pieces to the underside of the transmitter case, screws for this are provided in the installation kit.

N.B. The blanking pieces are not interchangable and should be fitted with the flanges facing inwards. Next fit the two T' shaped mounting brackets to the blanking pieces; again the flanges face inwardly and the screws and nuts are provided in the installation kit.

The receiver case can now be slid into position onto the arms of the mounting brackets.

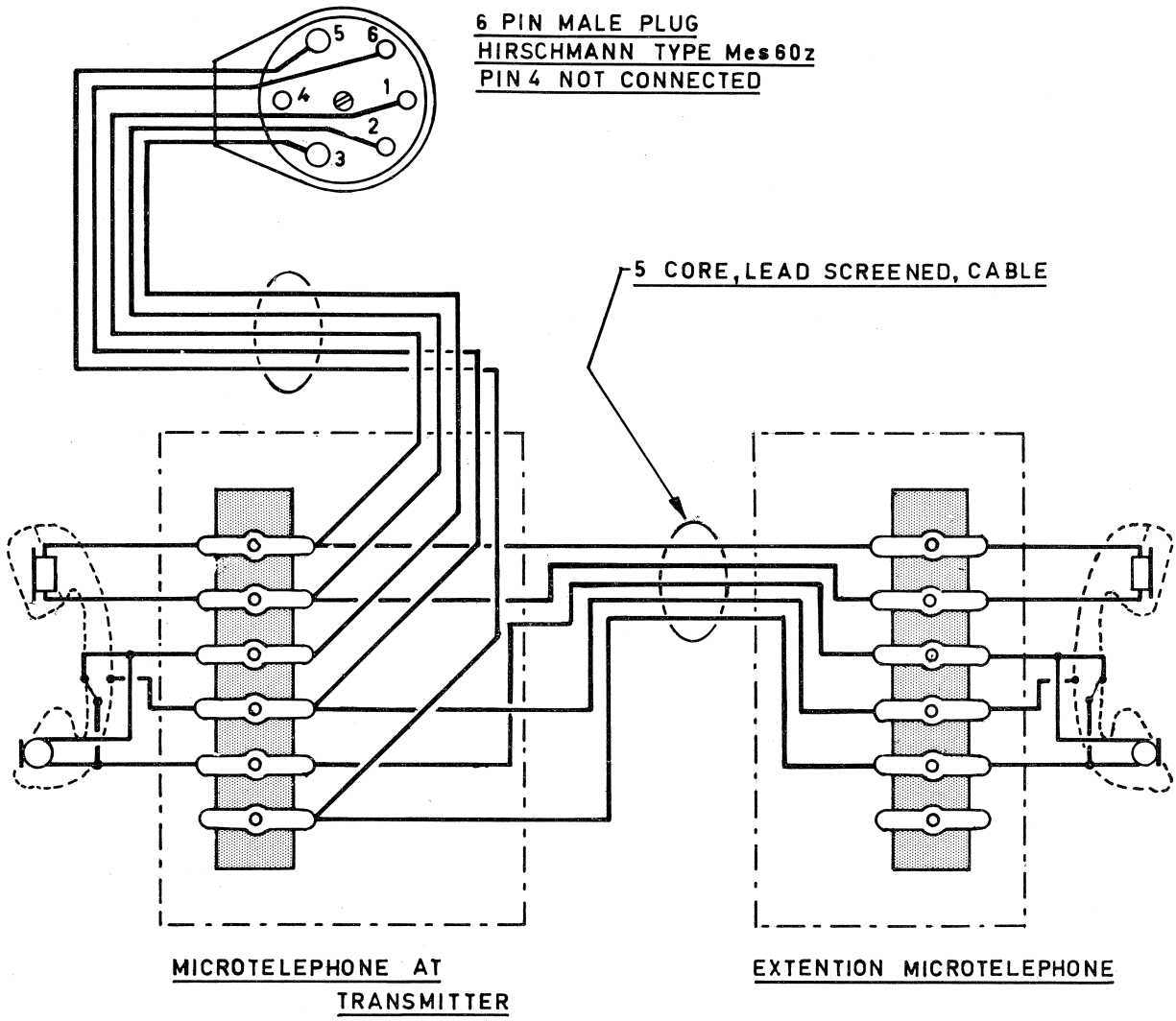
Figure 13

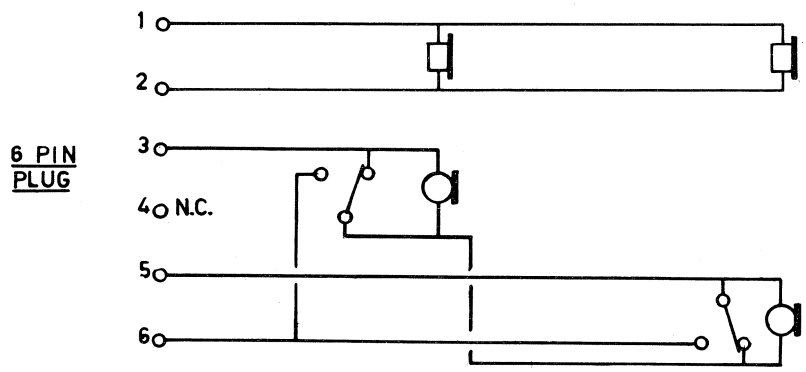
Method off mounting T 128 with R 105 and R 106



The transmitter case is fastened to the bulkhead in the normal manner utilising the four mounting holes in the back of the case. Take the power supply out of its case and mount the case on the side of the transmitter case using the four screws provided.
Fasten the two blanking pieces one to the underside of the transmitter case and one to the underside of the power supply case, screws for this are provided in the installation kit.
N.B. The blanking pieces are not interchangable and should be fitted with the flanges facing inwards. Next fit the two T' shaped mounting brackets to the blanking pieces; again the flanges face inwardly and the screws and nuts are provided in the installation kit.
The receiver case can now be slid into position onto the arms of the T' brackets.

Figure 14





Instructions for Fitting additional Microtelephone position to Transmitter

(a) Remove the microtelephone assemble from the transmitter.

(b) Fix the new telephone rest-box to the transmitter, after wiring as shown in the diagram.

(c) Run the extention cable (5 core, lead screened) to the extention position.

(d) Wire to the extention rest-box as shown in the diagram and fix box in position.

CRYSTAL OSCILLATOR AND MIXER T126/T128

Symbol	*Description*		*Manufact.*	
C101	Capacitor, polyester	0.1 uF 250V	Arco	Minidip
C102	Capacitor, polystyren	390 pF	Philips	2222 425 33901
C103	Capacitor, polystyren	560 pF	Philips	2222 425 35601
C104	Capacitor, polystyren	560 pF	Philips	2222 425 35601
C105	Capacitor, polyester	0.1 uF 250V	Arco	Minidip
C106	Capacitor, polystyren	560 pF	Philips	2222 425 35601
C107	Capacitor, polyester	0.1 uF 250V	Arco	Minidip
C108	Capacitor, polyester	0.1 uF 250V	Arco	Minidip
C109	Capacitor, polystyren	1500pF	Philips	2222 425 31502
C110	Capacitor, polystyren	2200pF	Philips	2222 425 32202
C111	Capacitor, ceramic	10nF -20/+80% 30V	Ferroperm	9/0145.9
C112	Capacitor, polyester	0.1 uF 250V	Arco	Minidip
D101	Zenerdiode	7.5 V ± 5% 1W	Motorola	1N4737A
IC101	Integrated circuit	MC1496	Motorola	
L101	Coil bal. mixer	TL026	S.P.	TL026
L102	Choke	250 uH	Prahn	1580/32K
P101	Potentiometer, trim	100 ohm	Philips	2322 410 43301
R101	Resistor	22 K ohm 0.33W	Philips	2322 101 33223
R102	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R103	Resistor	15 ohm 0.33W	Philips	2322 101 33159
R104	Resistor	12 K ohm 0.33W	Philips	2322 101 33123
R105	Resistor	22 K ohm 0.33W	Philips	2322 101 33223
R106	Resistor	18 K ohm 0.33W	Philips	2322 101 33183
R107	Resistor	10 K ohm 0.33W	Philips	2322 101 33103
R108	Resistor	39 K ohm 0.33W	Philips	2322 101 33393
R109	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R110	Resistor	33 ohm 0.33W	Philips	2322 101 33339
R111	Resistor	560 ohm 0.33W	Philips	2322 101 33561
R112	Resistor	56 ohm 0.33W	Philips	2322 101 33569
R113	Resistor	1 K ohm 0.33W	Philips	2322 101 33102

A

CRYSTAL OSCILLATOR AND MIXER T126/T128

Symbol	*Description*	*Manufact.*	
R114	Resistor 1 K ohm 0.33W	Philips	2322 101 33102
R115	Resistor 1 K ohm 0.33W	Philips	2322 101 33102
R116	Resistor 1 K ohm 0.33W	Philips	2322 101 33102
R117	Resistor 2.7 K ohm 0.33W	Philips	2322 101 33272
R118	Resistor 560 ohm 0.33W	Philips	2322 101 33561
R119	Resistor (T126) 470 ohm 0.33W	Philips	2322 101 33471
R119	Resistor (T128) 820 ohm 0.33W	Philips	2322 101 33821
T101	Transistor BC147	Siemens	BC147
T102	Transistor BC147	Siemens	BC147
T103	Transistor BC147	Siemens	BC147
TR101	Transformer xtal osc. TL074	S.P.	TL074
TR102	Transformer bal. mix. TL073	S.P.	TL073

CRYSTAL SECTION T126/T128

Symbol	*Description*	*Manufact.*	
C201	Capacitor, variable 3.5 - 18.5 pF	Dau	107.2901.018
C203	Capacitor, variable 3.5 - 18.5 pF	Dau	107.2901.018
C205	Capacitor, variable 3.5 - 18.5 pF	Dau	107.2901.018
....	" " " "	"	"
....	" " " "	"	"
C263	Capacitor, variable 3.5 - 18.5 pF	Dau	107.2901.018
C202	Capacitor, ceramic 22 pF ± 5% NPO 400V	Ferroperm	9/0112.9 insul.
C204	Capacitor, ceramic 22 pF ± 5% NPO 400V	Ferroperm	9/0112.9 insul.
C206	Capacitor, ceramic 22 pF ± 5% NPO 400V	Ferroperm	9/0112.9 insul.
....	" " " " " "	"	"
....	" " " " " "	"	"
C264	Capacitor, ceramic 22 pF ± 5% NPO 400V	Ferroperm	9/0112.9 insul.
S201	Switch wafer	S.P.	OM 008
S202	Switch wafer	S.P.	OM 008
S203	Switch crystal section selector	A.B.Metal	13101/4 - 5844

SSB - GENERATOR T126/T128

Symbol	*Description*				*Manufact.*	
C301	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C302	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C303	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C304	Not used					
C305	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C306	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C307	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C308	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C309	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C310	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C311	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C312	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C313	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C317	Capacitor, polystyren	3300pF	± 2%	125V	Philips	2222 425 33302
C318	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C319	Capacitor, ceramic	100 pF	± 5%	NPO	Ferroperm	9/0112.3 insul.
C320	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C321	Capacitor, polystyren	1000pF	± 2%	125V	Philips	2222 425 31002
C322	Capacitor, polystyren	270 pF	± 2%	125V	Philips	2222 425 32701
C323	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C324	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C325	Capacitor, polystyren	1000pF	± 2%	125V	Philips	2222 425 31002
C326	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C327	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C328	Capacitor, ceramic	27 pF	± 5%	NPO	Ferroperm	9/0112.3 insul.
C329	Capacitor	0.01uF	± 10%	250V	Philips	2222 342 45103
C330	Capacitor	0.01uF	± 10%	250V	Philips	2222 342 45103
C331	Capacitor, polystyren	1000pF	± 2%	125V	Philips	2222 425 31002
C332	Capacitor, trimmer	7-50pF		NPO	Dau	107 - 56S
C333	Capacitor, polystyren	1.5 nF	± 2%	125V	Philips	2222 425 31502
C334	Capacitor, polystyren	3300pF	± 2%	125V	Philips	2222 425 33302
C335	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C336	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C337	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C338	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C339	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C340	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C341	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C342	Capacitor, polyester	0.1 uF		250V	Efco	PMT (short)
C343	Capacitor, polystyren	1000pF	± 2%	125V	Philips	2222 425 31002

A SSB - GENERATOR T126/T128

Symbol	*Description*		*Manufact.*	
C344	Capacitor, polyester	0.1 uF 250V	Efco	PMT (short)
C345	Capacitor, polystyren	1000pF ± 2% 125V	Philips	2222 425 31002
C346	Capacitor, polyester	0.1 uF 250V	Efco	PMT (short)
C347	Capacitor, electrolytic	100 uF 25V	Siemens	B41283-A5107-T
C348	Capacitor, tantal	4.7 uF 35V	ITT	TAG 4.7/35
C349	Capacitor, variable	2.5-45pF	Dau	107.5901.045
D302	Diode		Philips	BAX 16
D303	Diode		Philips	BAX 16
D304	Diode		Philips	BA 182
D305	Diode		Philips	BA 182
D306	Diode		Philips	BA 182
D308	Diode		Philips	BAX 16
D309	Diode		Philips	BAX 16
D310	Diode		Ph/Sie/Tex	1N 4148
D311	Diode, zener	13V	Motorola	1N 4743 B
FL301	LSB crystalfilter	600 kHz	N.D.K.	YF - 600
X301	Crystal	600 kHz	K.V.G.	HC6 - U
IC301	Integrated circuit		RCA	CA 3019
L301	Oscillator coil		S.P.	TL 025
L302	Buffer coil		S.P.	TL 020
L303	RF choke	1 mHy	S.P.	TL 076
L304	Bal modulator coil		S.P.	TL 026
L305	Output coil xtal filter		S.P.	TL 013
L306	Driver coil		S.P.	TL 013
L307	RF choke	1 mHy	Prahn	1580/9K
L308	Output coil	600 kHz	S.P.	TL 023
L309	RF choke	2.5 mHy	Prahn	1580/10K
P301	Potentiometer	22 K ohm	Philips	2322 410 03308
P304	Potentiometer	100 ohm	Philips	2322 410 43304
P305	Potentiometer	2.2 K ohm	Philips	2322 410 43305

SSB - GENERATOR T126/T128

Symbol	*Description*		*Manufact.*	
R301	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R302	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R303	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R305	Resistor	33 K ohm 0.33W	Philips	2322 101 33333
R306	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R307	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R308	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R309	Resistor	330 ohm 0.33W	Philips	2322 101 33331
R310	Resistor	820 ohm 0.33W	Philips	2322 101 33821
R311	Resistor	22 K ohm 0.33W	Philips	2322 101 33223
R312	Resistor	47 K ohm 0.33W	Philips	2322 101 33473
R313	Resistor	47 K ohm 0.33W	Philips	2322 101 33473
R314	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R315	Resistor	47 K ohm 0.33W	Philips	2322 101 33473
R316	Resistor	18 K ohm 0.33W	Philips	2322 101 33183
R317	Resistor	100 ohm 0.33W	Philips	2322 101 33101
R318	Resistor	56 K ohm 0.33W	Philips	2322 101 33563
R319	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R320	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R330	Resistor	12 K ohm 0.33W	Philips	2322 101 33123
R332	Resistor	6.8K ohm 0.33W	Philips	2322 101 33682
R333	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R334	Resistor	33 ohm 0.33W	Philips	2322 101 33339
R336	Resistor	4.7K ohm 0.33W	Philips	2322 101 33472
R337	Resistor	12 K ohm 0.33W	Philips	2322 101 33123
R338	Resistor	68 ohm 0.33W	Philips	2322 101 33689
R339	Resistor	150 ohm 0.33W	Philips	2322 101 33151
R341	Resistor	330 ohm 0.33W	Philips	2322 101 33331
R342	Resistor	47 ohm 0.33W	Philips	2322 101 33479
R344	Resistor	47 ohm 0.33W	Philips	2322 101 33479
R345	Resistor	330 ohm 0.33W	Philips	2322 101 33331
R346	Resistor	1.5K ohm 0.33W	Philips	2322 101 33152
R347	Resistor	68 K ohm 0.33W	Philips	2322 101 33683
R348	Resistor	22 K ohm 0.33W	Philips	2322 101 33223
R349	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R350	Resistor	470 ohm 0.33W	Philips	2322 101 33471
R351	Resistor	3.3K ohm 0.33W	Philips	2322 101 33332
R352	Resistor	1.5K ohm 0.33W	Philips	2322 101 33152
R353	Not used			
R354	Resistor	1.5K ohm 0.33W	Philips	2322 101 33152

SSB - GENERATOR T126/T128

Symbol	*Description*			*Manufact.*	
R355	Resistor	1 K ohm	0.33W	Philips	2322 101 33102
R356	Resistor	10 K ohm	0.33W	Philips	2322 101 33103
R357	Resistor	68 K ohm	0.33W	Philips	2322 101 33683
R362	Resistor	330 ohm	0.33W	Philips	2322 101 33331
R363	Resistor	100 ohm	0.33W	Philips	2322 101 33101
R364	Resistor	680 ohm	0.33W	Philips	2322 101 33681
R365	Resistor	2.2K ohm	0.33W	Philips	2322 101 33222
R366	Resistor	5.6K ohm	0.33W	Philips	2322 101 33562
R367	Resistor	180 ohm	0.5W	Philips	2322 212 13181
T301	Transistor			Siemens	BC 157
T302	Transistor			Siemens	BC 147
T303	Not used				
T304	Not used				
T305	Transistor			Siemens	BC 147
T306	Transistor			Siemens	BC 147
T307	Transistor			Siemens	BC 147
T308	Not used				
T309	Transistor			Siemens	BC 147
T310	Transistor			Philips	BFW 17

MICROPHONE AMPLIFIER AND COMPRESSOR T126/T128

Symbol	*Description*			*Manufact.*	
C401	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C402	Capacitor, electrolytic	470 uF	35V	Siemens	B41010-A7477-Z
C403	Capacitor, polyester	0.01uF	250V	Philips	2222 342 45103
C404	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C405	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C406	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C407	Capacitor, polyester	0.1 uF	250V	Efco	PMT (short)
C408	Capacitor, polyester	0.1 uF	250V	Efco	PMT (short)
C409	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C410	Capacitor, electrolytic	470 uF	10V	Siemens	B41283-A3477-T
C411	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C412	Capacitor, tantal	3.3 uF	35V	Ero	ETP - 2
C413	Capacitor, polyester	0.047uF	250V	Philips	2222 342 45473
C414	Capacitor, polyester	0.1 uF	250V	Efco	PMT (short)
C415	Capacitor, polyester	0.047uF	250V	Philips	2222 342 45473
C416	Capacitor, polyester	0.1 uF	250V	Efco	PMT (short)
C417	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C418	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C419	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C420	Capacitor, polyester	0.1 uF	250V	Efco	PMT (short)
C421	Capacitor, polyester	0.1 uF	250V	Efco	PMT (short)
C422	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
C423	Capacitor, tantal	10 uF	25V	Ero	ETP - 3
C424	Capacitor, electrolytic	10 uF	63V	Siemens	B41283-A8106-T
C425	Capacitor, polyester	0.1 uF	250V	Efco	PMT (short)
C426	Capacitor, electrolytic	100 uF	25V	Siemens	B41283-B5107-T
C427	Capacitor, ceramic	150 pF	25V	Ferroperm	9/0121.8
C428	Capacitor, tantal	4.7 uF	35V	Ero	ETP - 2
D401	Diode, zener	5.1 V ± 5%	1W	Motorola	1N4733 A
D402	Diode, zener	7.5 V ± 5%	1W	Motorola	1N4737 A
D403	Diode			Philips	BAX 16
D404	Diode			Philips	BAX 16
D405	Diode			Motorola	1N4002
D406	Diode			Philips	BA 182
D407	Diode			Philips	BA 182
D408	Diode			Philips	BA 182
D409	Diode			Philips	BAX 16
D410	Diode, zener	5.1 V ± 5%	1W	Motorola	1N4733 A

MICROPHONE AMPLIFIER AND COMPRESSOR T126/T128

Symbol	*Description*		*Manufact.*	
IC401	Integrated circuit		Philips/NS	FJJ 111/SN7472N
L401	AF coil		S.P.	TL 018
P401	Potentiometer	47 K ohm	Philips	2322 410 43309
P402	Potentiometer	470 ohm	Philips	2322 410 43303
P403	Potentiometer	1 K ohm	Philips	2322 410 43304
R401	Resistor	220 ohm 1.15W	Philips	2322 214 13221
R402	Resistor	220 ohm 1.15W	Philips	2322 214 13221
R403	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R404	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R405	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R406	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R407	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R408	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R409	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R410	Resistor	100K ohm 0.33W	Philips	2322 101 33104
R411	Resistor	1 M ohm 0.33W	Philips	2322 101 33105
R412	Resistor	820 ohm 0.33W	Philips	2322 101 33821
R413	Resistor	1 M ohm 0.33W	Philips	2322 101 33105
R414	Resistor	220K ohm 0.33W	Philips	2322 101 33224
R415	Resistor	4.7K ohm 0.33W	Philips	2322 101 33472
R416	Resistor	390 ohm 0.33W	Philips	2322 101 33391
R417	Resistor	10 K ohm 0.33W	Philips	2322 101 33103
R418	Resistor	10 K ohm 0.33W	Philips	2322 101 33103
R419	Resistor	470 ohm 0.33W	Philips	2322 101 33471
R420	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R421	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R422	Resistor	2.2K ohm 0.33W	Philips	2322 101 33222
R423	Resistor	3.9K ohm 0.33W	Philips	2322 101 33392
R424	Resistor	390 ohm 0.33W	Philips	2322 101 33391
R425	Resistor	270 ohm 0.33W	Philips	2322 101 33271
R426	Resistor	120 ohm 0.33W	Philips	2322 101 33121
R427	Resistor	82 ohm 0.33W	Philips	2322 101 33829
R428	Resistor	560 ohm 0.50W	Philips	2322 212 13561
R429	Resistor	4.7K ohm 0.33W	Philips	2322 101 33472

MICROPHONE AMPLIFIER AND COMPRESSOR T126/T128

Symbol	*Description*			*Manufact.*	
R430	Resistor	4.7K ohm	0.33W	Philips	2322 101 33472
R431	Resistor	1 K ohm	0.33W	Philips	2322 101 33102
R432	Resistor	2.2K ohm	0.33W	Philips	2322 101 33222
R433	Resistor	2.2K ohm	0.33W	Philips	2322 101 33222
R434	Resistor	3.9K ohm	0.33W	Philips	2322 101 33392
R435	Resistor	3.9K ohm	0.33W	Philips	2322 101 33392
R436	Resistor	1 K ohm	0.33W	Philips	2322 101 33102
R437	Resistor	4.7K ohm	0.33W	Philips	2322 101 33472
R438	Resistor	220K ohm	0.33W	Philips	2322 101 33224
R439	Resistor	22 K ohm	0.33W	Philips	2322 101 33223
R440	Resistor	10 K ohm	0.33W	Philips	2322 101 33103
R441	Resistor	100K ohm	0.33W	Philips	2322 101 33104
R442	Resistor	2.2K ohm	0.33W	Philips	2322 101 33222
R443	Resistor	47 K ohm	0.33W	Philips	2322 101 33473
R444	Resistor	47 K ohm	0.33W	Philips	2322 101 33473
R445	Resistor	2.7K ohm	0.33W	Philips	2322 101 33272
T401	Transistor FET			Texas	TIS 88
T402	Transistor			Siemens	BC147 A
T403	Transistor			Siemens	BC147 A
T404	Transistor			Siemens	BC157 A
T405	Transistor			Siemens	BC157 A
T406	Transistor			Philips	BD138
T407	Transistor			Siemens	BC157 A
T408	Transistor			Siemens	BC147 A
T409	Transistor			Siemens	BC147 A
T410	Transistor			Siemens	BC157 A
T411	Transistor			Siemens	BC147 A
T412	Transistor			Siemens	BC147 A
T413	Transistor			Siemens	BC147 A
TR401	Microphone - trafo	150/150-600 ohm		Tradania	TD 2296

DRIVER AND DRIVE LEVEL T128

Symbol	*Description*	*Manufact.*	
C501	Capacitor, ceramic 33pF ±5% NPO 400V	Ferroperm	9/0112.9
C502	Not used		
C504	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C505	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C506	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C507	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C508	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C509	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C510	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C511	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C512	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C513	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C514	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C515	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C516	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C517	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C518	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C519	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C521	Capacitor, polyester 0.1uF 250V	Arco	
C525	Capacitor, polyester 0.1uF 250V	Arco	
C526	Capacitor, electrolytic 47uF 350V	Siemens	B43050-A4476-T
C527	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C528	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C529	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C530	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C531	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C532	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C533	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C534	Capacitor, ceramic 220pF NPO	Ferroeprm	9/0112.3
C535	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C536	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C537	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C538	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C539	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C540	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C541	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C542	Capacitor, ceramic 220pF NPO	Ferroperm	9/0112.3
C543	Capacitor, ceramic 4.7nF-20/+80% 400V	Ferroperm	9/0138.9 insul.
C544	Capacitor, ceramic 4.7nF-20/+80% 400V	Ferroperm	9/0138.9 insul.
C546	Capacitor, polyester 0.1uF 400V	Philips	2222 341 58104

DRIVER AND DRIVE LEVEL T128

Symbol	*Description*			*Manufact.*	
L502 to L533	Driver coil			S.P.	TL 024
P501 to P517	Potentiometer, trim	100 ohm		Philips	2322 410 43301
R505	Resistor	47 ohm	0.33W	Philips	2322 101 33479
R510	Resistor	22 K ohm	0.33W	Philips	2322 101 33223
R511	Resistor	100 ohm	0.33W	Philips	2322 101 33101
R512	Resistor	100 ohm	0.33W	Philips	2322 101 33101
R513	Resistor	39 K ohm	1.15W	Philips	2322 214 13393
R514	Resistor	100 ohm	0.33W	Philips	2322 101 33101
R515	Resistor	330 ohm	1.15W	Philips	2322 214 13331
R516	Resistor	15 ohm	0.33W	Philips	2322 101 33159
R517	Resistor	39 ohm	0.33W	Philips	2322 101 33399
R518	Resistor	22 ohm	0.33W	Philips	2322 101 33229
R519	Resistor	39 ohm	0.33W	Philips	2322 101 33399
S501	Driver switch			S.P.	OM 008
S502	Driver switch			S.P.	OM 008
S503	Switch power reduction			A.B.Metal	13098/A-5844
S504	Drive level switch			S.P.	2-4-20105
V501	Tube			R.C.A.	12HG7

PA - PRINT T128

Symbol	*Description*			*Manufact.*	
C601	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C602	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C603	Capacitor, polyester	0.1uF	400V	Philips	2222 341 58104
C604	Capacitor, ceramic	56 pF ± 10%	250V	Ferroperm	9/0112.3 insul.
C605	Capacitor, ceramic	8.2pF ± 1pF	250V	Ferroperm	9/0112.3 insul.
C606	Capacitor, polystyren	1 nF ± 1%	125V	Philips	2222 425 41002
C607	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C608	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C609	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C610	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C611	Capacitor, polystyren	1 nF ± 1%	125V	Philips	2222 425 41002
C612	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C613	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C614	Capacitor, polystyren	1 nF ± 1%	125V	Philips	2222 425 41002
C615	Capacitor, polystyren	1 nF ± 1%	125V	Philips	2222 425 41002
C616	Capacitor, ceramic	68 pF ± 10%	250V	Ferroperm	9/0112.3 insul.
D601	Diode			Texas	1N4148
D602	Diode			Texas	1N4148
D603	Diode			Sescosem	BA224/300
D604	Diode			Sescosem	BA224/300
D605	Diode			Texas	1N4148
D606	Diode			Texas	1N4148
D607	Diode			Sescosem	BA224/300
L601	Choke	250uH		Prahn	1580/32K
P601	Potentiometer, trim	100K ohm		Philips	2322 410 43311
P602	Potentiometer, trim	47 K ohm		Philips	2322 410 43309
P603	Potentiometer, trim	10 K ohm ± 10%		Ruwido	0650-610
P604	Potentiometer, trim	25 K ohm ± 20%		Ruwido	0650-611
P605	Potentiometer, trim	10 K ohm ± 10%		Ruwido	0650-610
P606	Potentiometer, trim	10 K ohm ± 10%		Ruwido	0650-610

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Symbol	*Description*				*Manufact.*	
R601	Resistor		1 M ohm	0.33W	Philips	2322 101 33105
R602	Resistor		1 M ohm	0.33W	Philips	2322 101 33105
R603	Resistor		330K ohm	0.33W	Philips	2322 101 33334
R604	Resistor		10 K ohm	0.33W	Philips	2322 101 33103
R605	Resistor		1.2 ohm ± 10%	5W	Vitrohm	208 - 0
R606	Resistor		1.2 ohm ± 10%	5W	Vitrohm	208 - 0
R607	Resistor		100K ohm	0.33W	Philips	2322 101 33104
R608	Resistor		100K ohm	0.33W	Philips	2322 101 33104
R609	Resistor		2.7K ohm	0.33W	Philips	2322 101 33272
R610	Resistor		10 K ohm	0.33W	Philips	2322 101 33103
R611	Resistor		3.9K ohm	0.33W	Philips	2322 101 33392
R612	Resistor	MF	4.75K ohm ± 1%	0.5W	Philips	2322 152 54752
R613	Resistor		10 K ohm	0.33W	Philips	2322 101 33103
R614	Resistor	MF	6.81K ohm ± 1%	0.5W	Philips	2322 152 56812
R615	Resistor		1 M ohm	0.33W	Philips	2322 101 33105
R616	Resistor		10 K ohm	0.33W	Philips	2322 101 33103
R617	Resistor		600K ohm ± 5%	2W	Rosenthal	LCA
R618	Resistor		47 K ohm	0.33W	Philips	2322 101 33473
R619	Resistor		680K ohm	0.33W	Philips	2322 101 33684
R620	Resistor		10 K ohm	0.33W	Philips	2322 101 33103
R621	Resistor		220 ohm	4.2W	Philips	2322 330 22221
R622	Resistor		270 ohm	4.2W	Philips	2322 330 22271
RE601	Relay				Siemens	V23016-B0005-A101
RE602	Relay				Siemens	V23016-B0005-A101

COIL SECTION T128

Symbol	*Description*		*Manufact.*	
C701 to C714	Stack capacitor	T128	S.P.	
C716	Capacitor, ceramic	300pF ± 20% 3KVs	Rosenthal	RA 16x40 Rosalt
C719	Capacitor, polyester	0.1uF 250V	Efco	PMT (short)
C720	Capacitor, polyester	0.1uF 250V	Efco	PMT (short)
D701	Diode		TFK	AA138
D702	Diode		Phil/Tex.	1N4148
L701	P.A. coil	T128	S.P.	
L702	Trim coil	T128	S.P.	
L703	Toroide		S.P.	TL 072
L704	Aerial coil	T128	S.P.	
M701	Meter	nonimeter	Elmatok	MG20/ 9-3-20458
P701	Potentiometer, trim	10 K ohm	Philips	2322 410 45007
R701	Resistor	5 M ohm±20% 8KV 2W	Rosenthal	LHK 2
R702	Resistor	470 ohm 0.33W	Philips	2322 101 33471
R703	Resistor	33 K ohm 0.33W	Philips	2322 101 33333
R704	Resistor	1.5K ohm 0.33W	Philips	2322 101 33152
R705	Resistor	3.9K ohm 0.33W	Philips	2322 101 33392
R706	Resistor	220K ohm 0.5W	Philips	2322 212 13224

P.A. SECTION T128

Symbol	*Description*			*Manufact.*	
C801	Capacitor, polyester	1 nF ± 1%	500V	Philips	2222 427 41002
C802	Capacitor, ceramic	10 pF NPO	1KV	Ferroperm	9/0112.3 insul.
C803	Capacitor, ceramic	10 pF NPO	1KV	Ferroperm	9/0112.3 insul.
C804	Capacitor, ceramic	4.7nF	400V	Ferroperm	9/0138.9 insul.
C805	Capacitor, ceramic	4.7nF	400V	Ferroperm	9/0138.9 insul.
C806	Capacitor, ceramic	4.7nF	400V	Ferroperm	9/0138.9 insul.
C807	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C808	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C809	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C810	Capacitor, polyester	1 uF	400V	Philips	2222 342 51105
C811	Capacitor, polyester	1 uF	400V	Philips	2222 342 51105
C812	Capacitor, polyester	1 uF	400V	Philips	2222 342 51105
C813	Capacitor, ceramic	10 pF NPO	1KV	Ferroperm	9/0112.3 insul.
C814	Capacitor, ceramic	10 pF NPO	1KV	Ferroperm	9/0112.3 insul.
C815	Capacitor, ceramic	4.7nF	5KV	Ferroperm	9/0138.9 insul.
C816	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C817	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C818	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C819	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C820	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
C821	Capacitor, polyester	0.1uF	250V	Arco	Minidip B
GL801	Glimtube			Siemens	B1-C150-Q69-X157
GL802	Glimtube			Siemens	B1-C150-Q69-X157
GL803	Glimtube			Siemens	B1-C150-Q69-X157
L801	Choke			S.P.	No. 1439A
R801	Resistor	1.8K ohm±2%	1W	Vitrohm	253-0
R802	Resistor MF	22.1K ohm±1%	0.4W	Philips	2322 151 52213
R803	Resistor	22 ohm±1%	1W	Vitrohm	253-0
R804	Resistor	100 ohm±2%	1W	Vitrohm	253-0
R805	Resistor	1.8K ohm±2%	1W	Vitrohm	253-0
R806	Resistor MF	22.1K ohm±1%	0.4W	Philips	2322 151 52213
R807	Resistor	22 ohm±1%	1W	Vitrohm	253-0
R808	Resistor	100 ohm±2%	1W	Vitrohm	253-0
R809	Resistor	1.8K ohm±2%	1W	Vitrohm	253-0

P.A. SECTION T128

Symbol	*Description*	*Manufact.*	
R810	Resistor MF 22.1K ohm ± 1% 0.4W	Philips	2322 151 52213
R811	Resistor 22 ohm ± 1% 1W	Vitrohm	253-0
R812	Resistor 100 ohm ± 2% 1W	Vitrohm	253-0
R813	Resistor 100K ohm 0.33W	Philips	2322 101 33104
R814	Resistor 47 ohm 7W	Philips	2322 330 32479
R815	Resistor 47 ohm 7W	Philips	2322 330 32479
V801	P.A. tube	G.E.C.	TT22
V802	P.A. tube	G.E.C.	TT22
V803	P.A. tube	G.E.C.	TT22

ALARM SIGNAL GENERATOR T126/T128

Symbol	*Description*		*Manufact.*	
C901	Capacitor, tantal	4.7 uF 35V	ITT	TAG 4.7/35
C902	Capacitor, tantal	10 uF 25V	ITT	TAG 10/25
C903	Capacitor, tantal	1.5 uF 35V	ITT	TAG 1.5/35
C904	Capacitor, polyester	0.022uF ± 1% 250V	Philips	2222 435 42203
C905	Capacitor, tantal	4.7 uF 35V	ITT	TAG 4.7/35
C906	Capacitor, polyester	0.047uF ± 1% 250V	Philips	2222 435 44703
C907	Capacitor, tantal	3.3 uF 35V	ITT	TAG 3.3/35
C908	Capacitor, tantal	10 uF 25V	ITT	TAG 10/25
C909	Capacitor, tantal	22 uF 16V	ITT	TAG 22/16
C910	Capacitor, tantal	22 uF 16V	ITT	TAG 22/16
C911	Capacitor, tantal	22 uF 16V	ITT	TAG 22/16
C912	Capacitor, polyester	0.1 uF 250V	Efco	PMT (short)
C913	Capacitor, tantal	1 uF 35V	ITT	TAG 1/35
C914	Capacitor, tantal	68 uF ± 10% 16V	Ero	ETQ - 5
C915	Capacitor, polyester	22 nF 250V	Philips	2222 342 45223
C916	Capacitor, polyester	22 nF 250V	Philips	2222 342 45223
D901	Diode		Philips	BA 182
D902	Diode		Philips	BA 182
D903	Diode zener	7.5 V ± 5% 1W	Motorola	1N4737 A
D904	Thyristor		Transitron	RTB 0110
D905	Diode zener	68 V 1W	Motorola	1N4760 A
D906	Diode		Philips	BAX 16
D907	Diode		Philips	BAX 16
IC901	Integrated circuit		N.S.	DM/SN 7472N
L901	AF coil	2200Hz	S.P.	TL 022
L902	AF coil	1300Hz	S.P.	TL 021
P901	Potentiometer	100 K ohm	Philips	2322 410 43311

ALARM SIGNAL GENERATOR T126/T128

Symbol	*Description*		*Manufact.*	
R901	Resistor	2.7K ohm 0.33W	Philips	2322 101 33272
R903	Resistor	33 ohm 0.33W	Philips	2322 101 33339
R904	Resistor	150 ohm 0.33W	Philips	2322 101 33151
R905	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R906	Resistor	2.7K ohm 0.33W	Philips	2322 101 33272
R908	Resistor	22 K ohm 0.33W	Philips	2322 101 33223
R909	Resistor	82 K ohm 0.33W	Philips	2322 101 33823
R910	Resistor	270 ohm 0.33W	Philips	2322 101 33271
R911	Resistor	82 K ohm 0.33W	Philips	2322 101 33823
R912	Resistor	22 K ohm 0.33W	Philips	2322 101 33223
R914	Resistor	2.7K ohm 0.33W	Philips	2322 101 33272
R915	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R916	Resistor	3.3K ohm 0.33W	Philips	2322 101 33332
R917	Resistor	12 K ohm 0.33W	Philips	2322 101 33123
R918	Resistor	47 ohm 0.33W	Philips	2322 101 33479
R919	Resistor	100 ohm 4.2W	Philips	2322 330 22101
R920	Resistor	1 M ohm 0.33W	Philips	2322 101 33105
R921	Resistor	10 K ohm 0.33W	Philips	2322 101 33103
R922	Resistor	33 ohm 0.33W	Philips	2322 101 33339
R923	Resistor	1.2K ohm 0.5W	Philips	2322 212 13122
R924	Resistor	10 K ohm 0.33W	Philips	2322 101 33103
R925	Resistor	1 K ohm 0.33W	Philips	2322 101 33102
R926	Resistor	39 ohm 4.2W	Philips	2322 330 21399
R927	Resistor	100 ohm 0.33W	Philips	2322 101 33101
R928	Resistor	150 ohm 0.33W	Philips	2322 101 33151
T901	Transistor		Motorola	2N4871
T902	Transistor		Siemens	BC147
T903	Transistor		Siemens	BC147
T904	Transistor		Siemens	BC141-10
T905	Transistor		Siemens	BC141-10
T906	Transistor		Philips	BRY 39
TR901	Alarmsignal trafo	50 ohm : 50 ohm	Tradania	1686

ADDITIONAL COMPONENTS T128

Symbol	*Description*			*Manufact.*	
C1001	Capacitor	0.1uF	250V	Arco	Minidip B
C1002	Capacitor	0.1uF	250V	Arco	Minidip B
C1003	Capacitor	0.1uF	250V	Arco	Minidip B
C1004	Capacitor	0.1uF	250V	Arco	Minidip B
C1005	Capacitor	0.1uF	400V	Philips	2222 341 58104
J1001	Male plug	(power)		Hirschmann	Stelei 100
K1001	Knob			Philips	2922 511 06201
K1002	Knob			Philips	2922 512 04101
K1003	Knob			Philips	2922 512 03206
K1004	Knob			Philips	2922 512 03206
M1001	Meter, service	100-0-100uA U001		Akita	R-45
S1001	Switch mode interlock override			S.P.	7-3-20092
S1002	Switch, service			S.P.	7-3-20062

SMALL SIGNAL SECTION T128

Symbol	*Description*		*Manufact.*	
D1101	Diode		Motorola	1N4002
D1102	Diode		Motorola	1N4002
D1103	Diode		Motorola	1N4002
GL1101	Bulb	24 V 20mA	H.Følsgdr.	SGF 99/1A
GL1102	Bulb	19 V 0.09	Philips	8097D
J1101	Multi socket	Meb 60H	T.S.	Hirschmann
J1102	Multi socket	Mek 60z	T.S.	Hirschmann
R1101	Resistor	82 ohm 4.2W	Philips	2322 330 21829
R1102	Resistor	4.7 ohm 4.2W	Philips	2322 330 21478
R1103	Resistor	180 ohm 4.2W	Philips	2322 330 22181
R1104	Resistor	470 ohm 0.5W	Philips	2322 212 13471
RE1101	Relay	12 V	Haller	BV509-12-1065
S1101	Switch		S.P.	7-3-20060
S1102	Switch		S.P.	7-3-20061
S1103	Microswitch	E62-1 ohm	E.V.Johan.	Cherry
S1104	Switch	ALCO	MER.EL.AS	MTA106E + N3

12 V DC POWER SUPPLY N178

Symbol	*Description*				*Manufact.*	
C 1201	Capacitor electrolytic	47 uF	350 V		Siemens	B43050-A4476-T
C 1202	Capacitor electrolytic	47 uF	350 V		Siemens	B43050-A4476-T
C 1203	Capacitor electrolytic	47 uF	350 V		Siemens	B43050-A4476-T
C 1204	Capacitor electrolytic	47 uF	350 V		Siemens	B43050-A4476-T
C 1205	Capacitor electrolytic	22 uF	450 V		ROE	EG
C 1206	Capacitor electrolytic	22 uF	450 V		ROE	EG
C 1207	Capacitor electrolytic	470 uF	40 V		Siemens	B41010-A7477-T
C 1208	Capacitor electrolytic	1000 uF	16 V		Siemens	B41010-A4108-T
C 1209	Capacitor electrolytic	2200 uF	40 V		Siemens	B41o1o-A7228-T
C 1210	Capacitor polyester	0,1 uF	400 V		Philips	2222 341 58104
C 1211	Capacitor polyester	0,47 uF	250 V		Philips	2222 342 45474
C 1212	Capacitor polyester	1 uF	250 V		Philips	2222 342 45105
C 1213	Capacitor polyester	1 uF	250 V		Philips	2222 342 45105
C 1214	Capacitor polyester	0,1 uF	250 V		ARCO	Minidip B
C 1215	Capacitor polyester	0,1 uF	250 V		ARCO	Minidip B
C 1216	Capacitor polyester	0,1 uF	250 V		ARCO	Minidip B
C 1217	Capacitor polyester	0,1 uF	250 V		ARCO	Minidip B
C 1218	Capacitor polyester	0,1 uF	250 V		ARCO	Minidip B
C 1219	Capacitor polyester	0,1 uF	250 V		ARCO	Minidip B
C 1220	Capacitor polyester	0,47 uF	250 V		Philips	2222 342 45474
C 1221	Capacitor ceramic	4,7 nF	5KV		Ferroperm	9/0138,9 insul.
D 1201	Diode				Motorola	1N4998/MR1031B
D 1202	Diode				Motorola	1N4998/MR1031B
D 1203	Diode				Motorola	1N4002
D 1204	Zenerdiode	1W Surmetic 18V ± 5%			Motorola	1N4746A
D 1205	Zenerdiode	1W Surmetic 39V ± 5%			Motorola	1N4754A
D 1206	Diodebridge				Philips	BY179
D ~~1207~~	Diodebridge				Philips	BY179
D 1208	Diodebridge				Philips	BY179
D 1209	Diodebridge				Philips	BY179
D 1210	Diodebridge				Philips	BY179
D 1211	Diodebridge				Philips	BY179
D 1212	Diode				Motorola	1N4002
F 1201	Fuse	littlefuse 4AG		40 A	Skarsten	PL411040
J 1201	Socket				Hirschmann	Leik 100

b

12 V DC POWER SUPPLY N178

Symbol	*Description*			*Manufact.*	
L 1201	Choke			S.P.	TL271
P 1201	Potentiometer trim	2 K ohm		DALE	type 724
R 1201	Resistor	0,47 ohm	4W	Vitrohm	206-0
R 1202	Resistor	0,47 ohm	4W	Vitrohm	206-0
R 1203	Resistor	15 ohm	23W	Vitrohm	222-0
R 1204	Resistor	27 ohm	4,2W	Philips	2322 330 21279
R 1205	Resistor	68 ohm	4,2W	Philips	2322 330 22689
R 1206	Resistor	6,8 K ohm	0,4W	Philips	2322 151 56812
R 1207	Resistor	220 ohm	4,2W	Philips	2322 330 22221
R 1208	Resistor	68 ohm	4,2W	Philips	2322 330 22689
RE1201	Relais	12 V		Bosch	03 32003011 SH/SE20AZ
RE1202	Relais	6 V		Siemens	V23016-B0002 A1o1
T 1201	Transistor	matched pair		Motorola	SP5408
T 1202	Transistor			Motorola	BD241A
TR1201	Transformer	Power		Tradania	TD2175
TR1202	Transformer	Drive		Tradania	TD2176

b 24V DC POWER SUPPLY N179

Symbol	*Description*	*Manufact.*	
C1301	Capacitor electrolytic 47 uF 350V	Siemens	B43050-A4476-T
C1302	Capacitor electrolytic 47 uF 350V	Siemens	B43050-A4476-T
C1303	Capacitor electrolytic 47 uF 350V	Siemens	B43050-A4476-T
C1304	Capacitor electrolytic 47 uF 350V	Siemens	B43050-A4476-T
C1305	Capacitor electrolytic 22 uF 450V	ROE	EG
C1306	Capacitor electrolytic 22 uF 450V	ROE	EG
C1307	Capacitor electrolytic 470 uF 40V	Siemens	B41010-A7477-T
C1308	Capacitor electrolytic 470 uF 40V	Siemens	B41010-A7477-T
C1309	Capacitor electrolytic 2200 uF 40V	Siemens	B41010-A7228-T
C1310	Capacitor polyester 0,1 uF 400V	Philips	2222 341 58104
C1311	Capacitor polyester 0,33 uF 250V	Philips	2222 342 45334
C1312	Capacitor polyester 1 uF 100V	Philips	2222 341 29105
C1313	Capacitor polyester 1 uF 100V	Philips	2222 341 29105
C1314	Capacitor polyester 0,1 uF 250V	ARCO	Minidip B
C1315	Capacitor polyester 0,1 uF 250V	ARCO	Minidip B
C1316	Capacitor polyester 0,1 uF 250V	ARCO	Minidip B
C1317	Capacitor polyester 0,1 uF 250V	ARCO	Minidip B
C1318	Capacitor polyester 0,1 uF 250V	ARCO	Minidip B
C1319	Capacitor polyester 0,1 uF 250V	ARCO	Minidip B
C1320	Capacitor polyester 1 uF 100V	Philips	2222 341 29105
C1321	Capacitor ceramic 4,7 nF 5KV	Ferroperm	9/0138,9 insul.
D1301	Diode	Motorola	1N4998/MR1031B
D1302	Diode	Motorola	1N4998/MR1031B
D1303	Diode	Motorola	1N4002
D1304	Zenerdiode 1W Surmetic 18 V ± 5%	Motorola	1N4746A
D1305	Zenerdiode 1W Surmetic 39 V ± 5%	Motorola	1N4754A
D1306	Diodebridge	Philips	BY179
D1307	Diodebridge	Philips	BY179
D1308	Diodebridge	Philips	BY179
D1309	Diodebridge	Philips	BY179
D1310	Diodebridge	Philips	BY179
D1311	Diodebridge	Philips	BY179
D1312	Diode	Motorola	1N4002
F1301	Fuse little fuse 20A	Skarsten	PL411020
J1301	Socket	Hirschmann	Leik 100

24 V DC POWER SUPPLY N179

Symbol	*Description*			*Manufact.*	
L 1301	Choke			Siemens	B82524-V-A6
P 1301	Potentiometer trim	2 K ohm		Diplomatic	type 101
R 1301	Resistor	0,47 ohm	4 W	Vitrohm	206-0
R 1302	Resistor	0,47 ohm	4 W	Vitrohm	206-0
R 1303	Resistor	60 ohm	23 W	Vitrohm	222-0
R 1304	Resistor	68 ohm	4,2 W	Philips	2322 330 22689
R 1305	Resistor	68 ohm	4,2 W	Philips	2322 330 22689
R 1306	Resistor	6,8 Kohm	0,4 W	Philips	2322 151 56812
R 1307	Resistor	220 ohm	4,2 W	Philips	2322 330 22221
R 1308	Resistor	220 ohm	4,2 W	Philips	2322 330 22221
R 1309	Resistor	56 ohm	4,2 W	Philips	2322 330 22569
RE1301	Relais	12 V		Bosch	03 32003011 SH/SE 20AZ
RE1302	Relais	12 V		Siemens	V23016-B0005 A101
T 1301	Transistor	matched pair		Motorola	MJ 802MP/TE00410
T 1302	Transistor			Motorola	BD577
TR1301	Transformer	Power		Tradania	TD 2132
TR1302	Transformer	Drive		Tradania	TD 2135

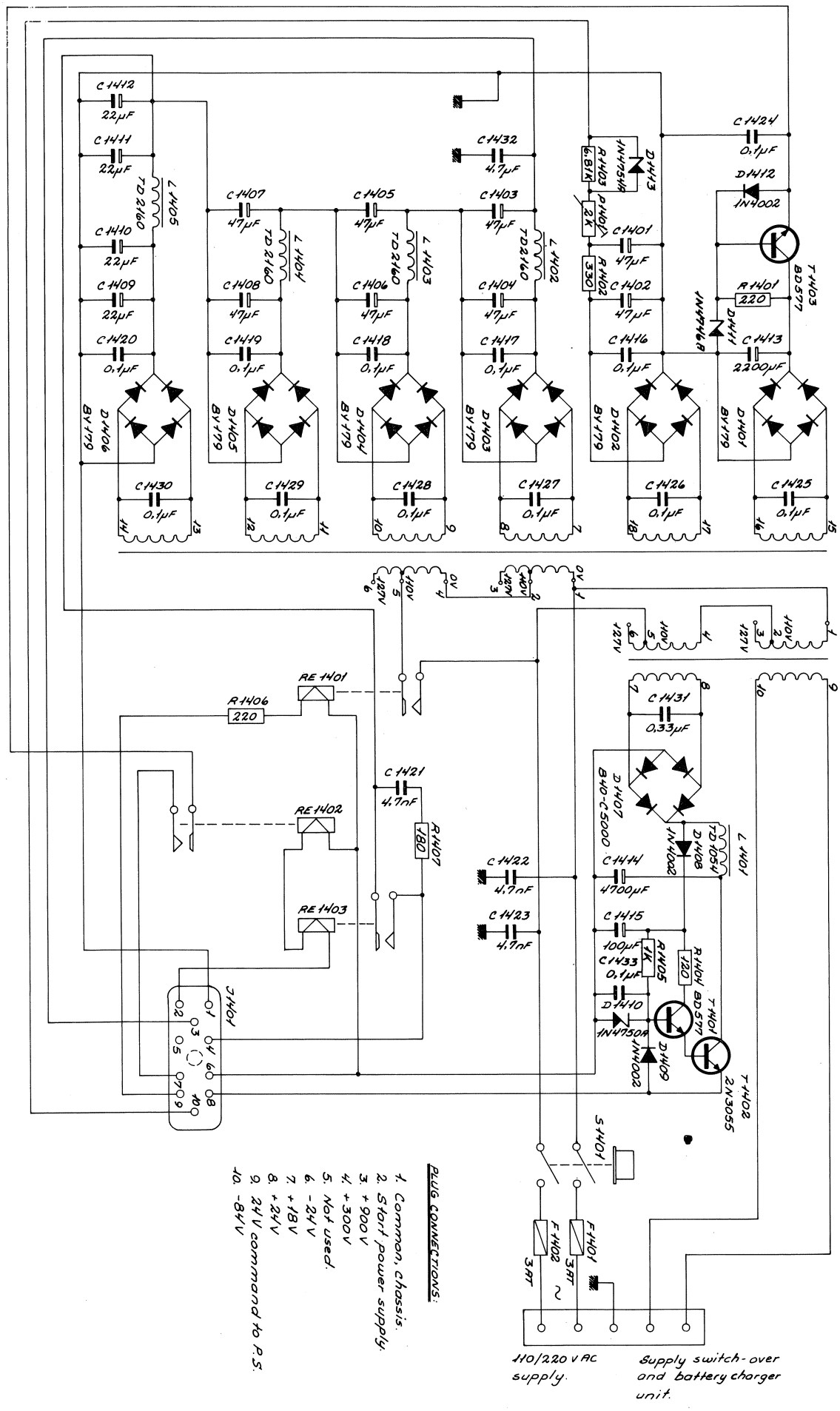
a

220/110V AC POWER SUPPLY N180

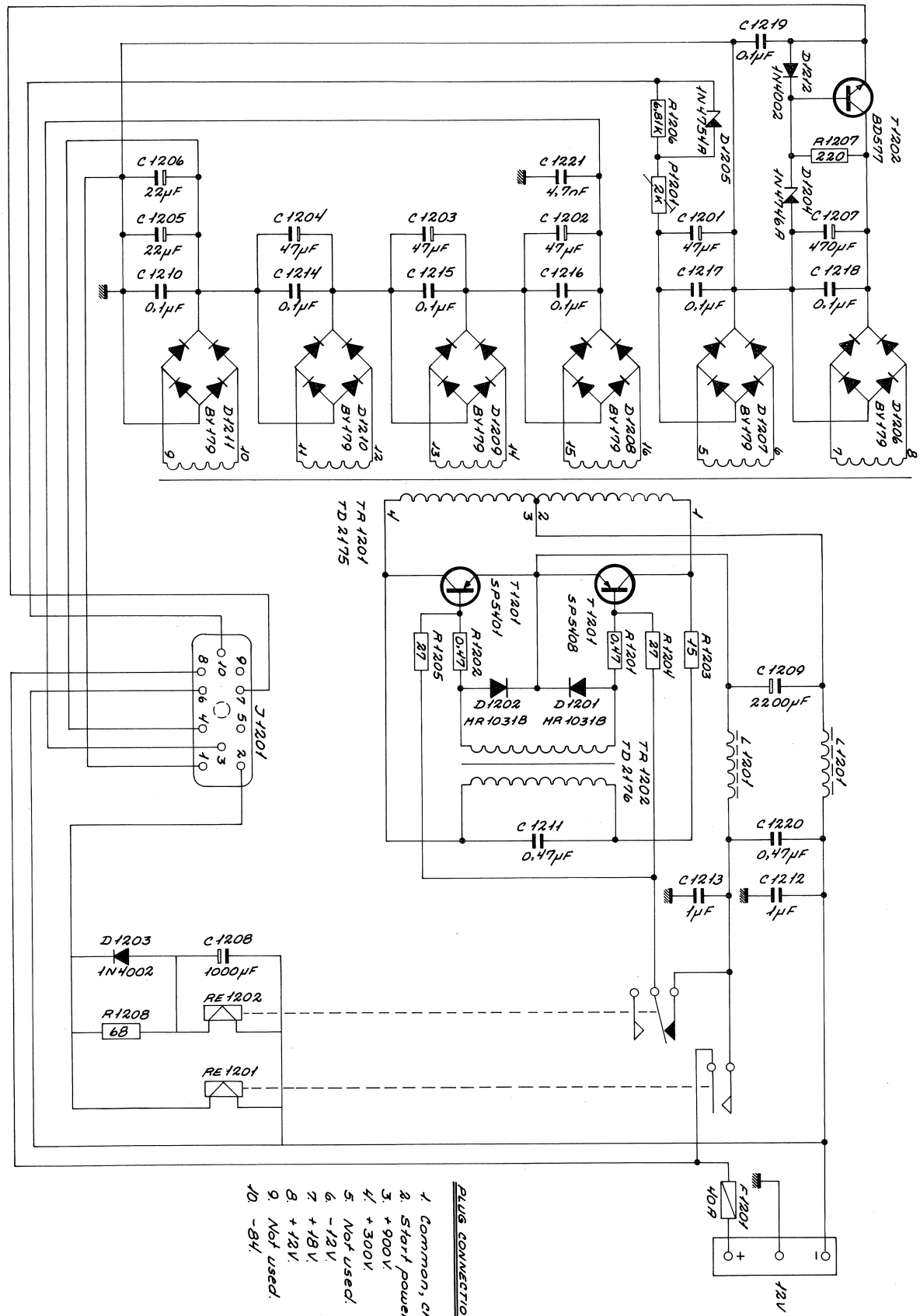
Symbol	*Description*			*Manufact.*	
C1401	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1402	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1403	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1404	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1405	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1406	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1407	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1408	Capacitor electrolytic	47 uF	350V	Siemens	B43050-A4476-T
C1409	Capacitor electrolytic	22 uF	450V	ROE	EG
C1410	Capacitor electrolytic	22 uF	450V	ROE	EG
C1411	Capacitor electrolytic	22 uF	450V	ROE	EG
C1412	Capacitor electrolytic	22 uF	450V	ROE	EG
C1413	Capacitor electrolytic	2200 uF	40V	Siemens	B41010-A7228-T
C1414	Capacitor electrolytic	4700 uF	63V	Siemens	B41070-A8478-T
C1415	Capacitor electrolytic	100 uF	63V	Siemens	B41283-A8107-T
C1416	Capacitor polyester	0,1 uF	250V	ARCO	Minidip B
C1417	Capacitor polyester	0,1 uF	250V	ARCO	Minidip B
C1418	Capacitor polyester	0,1 uF	250V	ARCO	Minidip B
C1419	Capacitor polyester	0,1 uF	250V	ARCO	Minidip B
C1420	Capacitor polyester	0,1 uF	400V	Philips	2222 341 58104
C1421	Capacitor ceramic	4,7 nF	400V	Ferroperm	9/0138,9 insul.
C1422	Capacitor ceramic	4,7 nF	5KV	Ferroperm	9/0138,9 insul.
C1423	Capacitor ceramic	4,7 nF	5KV	Ferroperm	9/0138,9 insul.
C1424	Capacitor polyester	0,1 uF	250V	ARCO	Minidip B
C1425	Capacitor polyester	0,1 uF	400V	Philips	2222 341 58104
C1426	Capacitor polyester	0,1 uF	400V	Philips	2222 341 58104
C1427	Capacitor polyester	0,1 uF	400V	Philips	2222 341 58104
C1428	Capacitor polyester	0,1 uF	400V	Philips	2222 341 58104
C1429	Capacitor polyester	0,1 uF	400V	Philips	2222 341 58104
C1430	Capacitor polyester	0,1 uF	400V	Philips	2222 341 58104
C1431	Capacitor polyester	0,33 uF	250V	Philips	2222 342 45334
C1432	Capacitor ceramic	4,7 nF	5KV	Ferroperm	9/0138,9 insul.
C1433	Capacitor polyester	0,1 uF	250V	ARCO	Minidip B
D1401	Diodebridge			Philips	BY179
D1402	Diodebridge			Philips	BY179
D1403	Diodebridge			Philips	BY179
D1404	Diodebridge			Philips	BY179
D1405	Diodebridge			Philips	BY179
D1406	Diodebridge			Philips	BY179

a 220/110V AC POWER SUPPLY N180

Symbol	Description			Manufact.	
D1407	Diodebridge			Siemens	B40-C5000/3300 Si-E 2506
D1408	Diode			Motorola	IN4002
D1409	Diode			Motorola	IN4002
D1410	Zenerdiode	27 V 5%	1W	Motorola	IN4750A
D1411	Zenerdiode	18 V 5%	1W	Motorola	IN4746A
D1412	Diode			Motorola	IN4002
D1413	Zenerdiode	39 V 5%	1W	Motorola	IN4754A
F1401	Fuse 5 x 20 mm slow blow 3A			Wickman	DIN 41571/PL-19201
F1402	Fuse 5 x 20 mm slow blow 3A			Wickman	DIN 41571/PL-19201
J1401	Socket			Hirschman	Leik 100
L1401	Choke			Tradania	TD1816
L1402	Choke			Tradania	TD2160
L1403	Choke			Tradania	TD2160
L1404	Choke			Tradania	TD2160
L1405	Choke			Tradania	TD2160
P1401	Potentiometer trim	2 K ohm		Diplomatic	type 101
R1401	Resistor	220 ohm	4,2W	Philips	2322 330 22221
R1402	Resistor	330 ohm	0,33W	Philips	2322 101 33331
R1403	Resistor	6,8K ohm 1%	0,4W	Philips	2322 151 56812
R1404	Resistor	120 ohm	4,2W	Philips	2322 330 22121
R1405	Resistor	1 K ohm	0,5W	Philips	2322 212 13102
R1406	Resistor	220 ohm	4,2W	Philips	2322 330 22221
R1407	Resistor	180 ohm	0,33W	Philips	2322 101 33181
S1401	Switch			NSF	8825/B121
T1401	Transistor			Motorola	BD577
T1402	Transistor			Motorola	2N3055
T1403	Transistor			Motorola	BD577
TR1401	Transformer Filament			Tradania	TD2184
TR1402	Transformer Power			Tradania	TD2133
RE1401	Relais	12 V		Siemens	V23016-B0005 A101
RE1402	Relais	12 V		Siemens	V23016-B0005 A101
RE1403	Relais	12 V		Siemens	V23016-B0005 A101



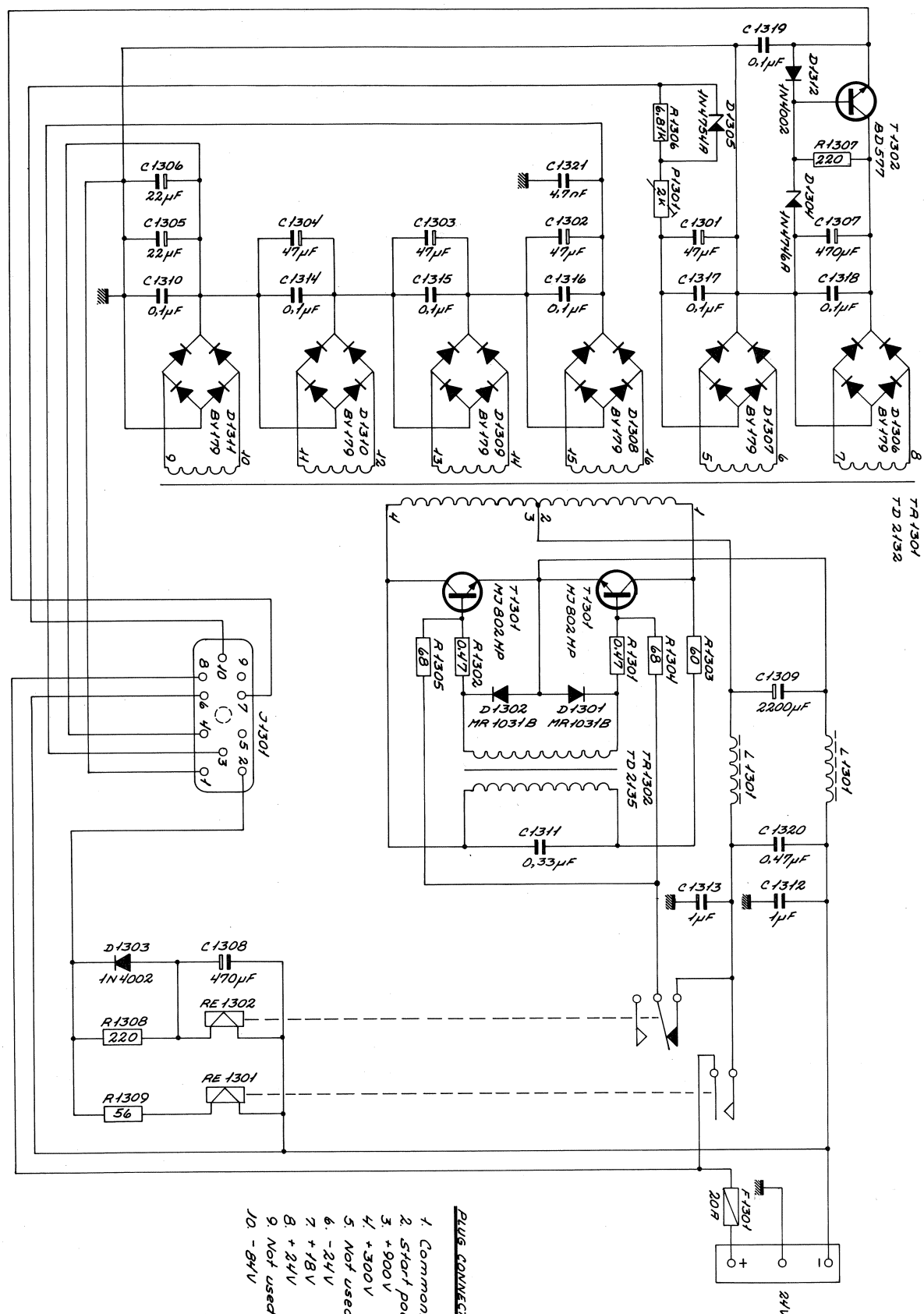
220/110 VAC Power supply N 180



PLUG CONNECTIONS:

1. Common, chassis.
2. Start power supply.
3. + 900 V.
4. + 300 V.
5. Not used.
6. - 12 V.
7. + 18 V.
8. + 12 V.
9. Not used.
10. - 84.

12 VDC Power supply N 178



PLUG CONNECTIONS:

1. Common, chassis.
2. Start power supply
3. +900 V
4. +300 V
5. Not used.
6. -24 V
7. +18 V
8. +24 V
9. Not used.
10. -84 V

Switch section identification
Refers to S1102 only.
A - conditional interlock (protects against wrong operation
B - A.F. from microphone, auto-alarm or test tone generator
C - Transmitting mode
D - Start transmitter

ALARM SIGNAL GENERATOR

CLOCK PULSE OSC. 2200Hz OSC. FLIP-FLOP 1300Hz OSC AF AMP 45 SEC. TIME GENERATOR SWITCH

CARRIER REINSERTION SSB GENERATOR

600 KHz CRYSTAL OSC 600 KHz AMP BAL MODULATOR FIRST 600 KHz SSB AMP SECOND 600KHz SSB AMP 600KHz SSB OUTPUT AMP

600 kHz to Bal. Mixer

COMPRESSOR AMPLIFIER LEVEL DETECTOR EMITTER FOLLOW AF FILTER TEST TONE GENERATOR

Test Tone output

+15.5V
Alarm sig out
+15.5V

J1101
Front panel socket for handset

RE 1101
D1101
D1103
D1102
S1103
R1102
S1102
S1101

2182 selected
GL1102 19V. 0.09A
DIMMER
GL1101 24V. 20ma 12V. DC
R1103 680
R1104 470
S1104

12 VDC
24 VDC 110/220 VAC

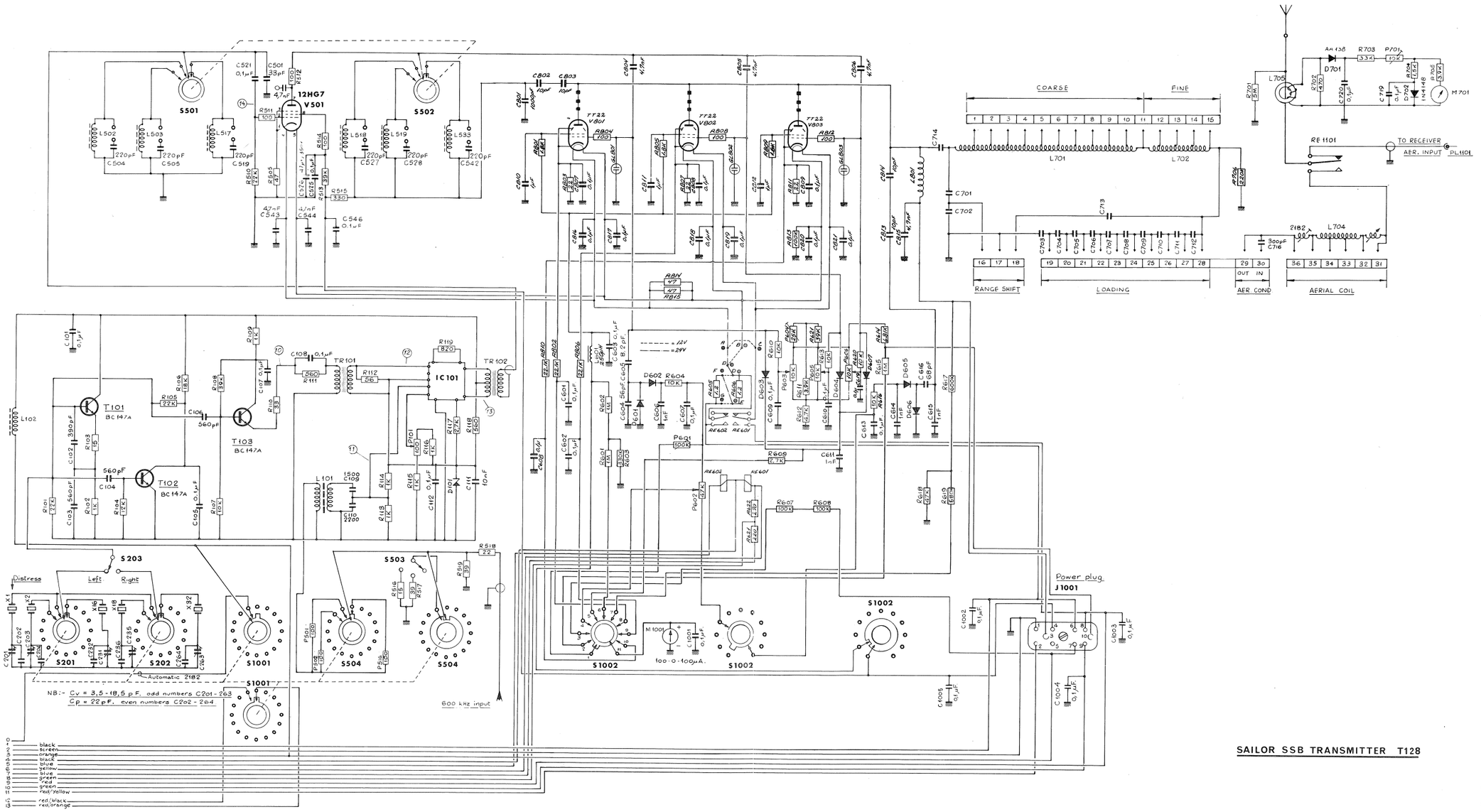
Voltage Selector
Jumpers shown for 12v operation; for 24v & 110/220vAC remove, & connect jumper between A & D as shown

J1102 Plug to Receiver

0	yellow/brn.	2182 Auto
1	black	- 12/24 V.
2	screen	Common
3	orange	+ 18v
4	black	Heater
5	blue	—"—
6	yellow	—"— centertap.
7	blue	—"—
8	green	—"—
9	red	+ 12/24v
10	green	24v command to P.S.
11	red/yellow	Start Power supply
12	red/black	Mode Interlock overide
13	red/orange	—"— —"—

Test Alarm A3J A3A A3H Tune Alarm Duplex Simplex Stand-by Off

1-6
2-7



SAILOR SSB TRANSMITTER T128