



Sailor

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INSTRUKTIONSBOG FOR
SAILOR R 114/M

INSTRUCTION BOOK FOR
SAILOR R 114/M

INSTRUKTIONSBUCH FÜR
SAILOR R 114/M

INSTRUCTIONS POUR
SAILOR R 114/M

INSTRUCCIONES PARA
SAILOR R 114/M



A/S S. P. RADIO · AALBORG · DENMARK

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A. Operating the SAILOR R114/M Watchkeeping Receiver for 2182 kHz

I. Description of the SAILOR R114/M

The SAILOR R114/M is intended for constant monitoring of the 2182 kHz distress and calling frequency.

The SAILOR R114/M has a built-in detector system, which in the MUTE mode will switch the receiver to NORMAL, when receiving a two tone distress call and keep the receiver muted, when receiving normal speech and noise.

The SAILOR R114/M is designed to meet the requirements of both national and international authorities, including the MPT 1203 requirements.

The SAILOR R114/M has a built-in speaker. The volume from that speaker (and from the speaker of the SAILOR E199, if installed) is controlled by the VOLUME.

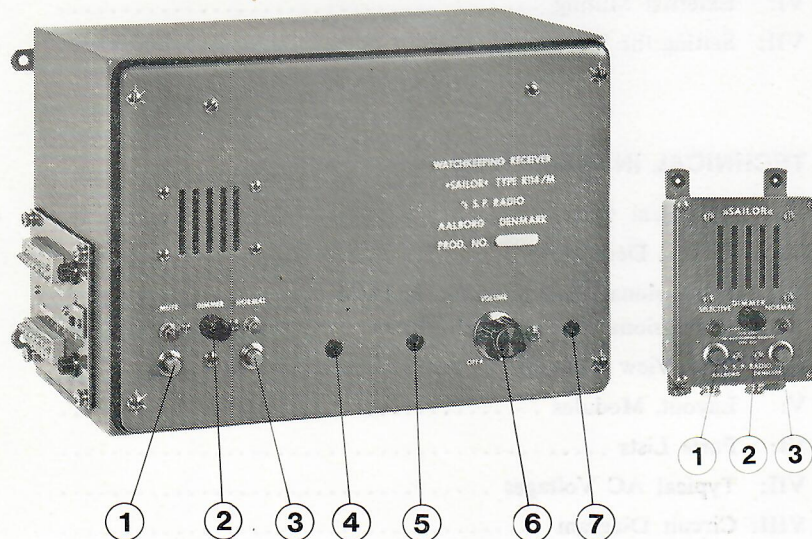
Volume cannot be turned fully down with the VOLUME, thus eliminating the risk of failing to hear an emergency call.

The SAILOR R114/M can be extended with a remote control unit SAILOR E199, from which the MUTE or the NORMAL mode can be chosen.

The SAILOR R114/M can be supplied in either 24V DC version or 24V DC – 110/220V AC version. The change-over switch is accessible from outside.

Other features include provision for muting during transmission with the transmitter of the vessel itself by means of an external 24V DC control voltage or an external contact function.

II. Controls



- 1) "MUTE": Push button for muting the loudspeaker when watchkeeping.
- 2) "DIMMER": Controls the lamp brightness.
- 3) "NORMAL": Push button for normal listening.
- 4) "RF-GAIN", preset control: Controls the RF amplification.
- 5) "AF-GAIN", preset control: Controls the AF amplification.
- 6) "VOLUME": Controls the volume from the built-in speaker. When turned fully anti-clockwise, the VOLUME turns off the supply voltage.
- 7) "AERIAL TUNE": Matches the aerial to the receiver.

B. Installation

I. Aerial and Earth Lead:

For aerial use a 5–20 m long wire or whip aerial, minimum length 4 m, placed as high and as much in the clear as possible. For the lead-in from the aerial use a good quality coaxial cable, ET10M or similar. It is important, that the lead-in is as short as possible, and that it is not laid near other electric cables.

The earth wire, insulated copper wire not less than 2.5 sq. mm. thick, should be connected to the hull (in iron vessels) or through a broad copper-band to the keel bolt or (in wooden vessels) to a metal plate not less than one sq. m. in size on the exterior of the hull below the water line. The earth wire should be as short as possible. A good earth connection is of decisive importance for low-noise reception.

All joints should be made by soldering.

The aerial and the earth wire are connected to the terminal strip on the side cover (the terminals are indicated by aerial and earth symbol).

II. Aerial Tune:

When the receiver has been installed, the aerial must be tuned. This is done by means of the aerial trimmer placed behind the blind cover to the extreme right on the front panel of the receiver.

For tuning use the following procedure:

1. Set receiver in NORMAL mode.
2. Turn the aerial tune by means of an insulated trimming stick for max. volume of noise or signal.

III. Supply Voltage:

Connect the mains 24V DC – 110/220V AC to the proper terminals on the side cover. Set the voltage switch located on the side cover for the actual supply voltage. The R114/M 110/220V AC version is factory preset for 220V AC. Conversion to 110V AC requires a minor rewiring job inside the receiver. The schematic diagram shows how to do this.

IV. Extension Loudspeaker:

A loudspeaker having 8 Ohms' impedance can be connected to terminals marked 1 and 2 in the REMOTE CONTROL terminal strip located on the side cover.

V. Remote Control:

The SAILOR E199 remote control unit may be mounted a considerable distance apart from the SAILOR R114/M.

The receiver and the remote control unit must be interconnected through a six-conductor cable of not less than 0.25 sq. mm. conductor size. The numbers on the REMOTE CONTROL terminal strip located on the side cover corresponds with the numbers on the terminal strip inside the remote control unit.

Several SAILOR E199 may be connected to either the receiver or the remote control unit in the same manner as described above.

VI. External Muting:

Terminals 7 and 8 located on the side cover may be used for muting the receiver, when the transmitter of the vessel is in operation.

The receiver is muted, when 24V DC is supplied to the terminals 7 and 8.

A minor rewiring job inside the receiver makes it possible to mute the receiver, when terminals 7 and 8 are short circuited. The schematic diagram shows how to do this.

The receiver is factory wired for 24V DC operation.

VII. Setting the RF and AF Preset Controls:

The RF and AF preset controls are located behind the blind covers at the front panel. With the receiver in the NORMAL setting and the VOLUME fully anti-clockwise the AF preset control is adjusted to a suitable volume level.

Under normal conditions the RF preset control shall be in the fully clockwise position. If there is too much electrical and atmospheric noise the RF gain may be decreased to the point, where the receiver noise, in the NORMAL setting, increases distinctly, when the aerial is connected. A simple method consists in short circuiting the aerial to earth and noting if the noise from the aerial exceeds the noise of the receiver itself, when the short circuit is removed. The adjustment should be made during daylight hours, preferably between 10 a.m. and 2 p.m., as atmospheric noise is then at its minimum.

C. Technical Information

I. Technical Data

Frequency:	2182 kHz, fixed tuned
IF:	600 kHz
Crystal frequency:	$2182 + 600 = 2782$ kHz
Frequency stability:	
long-term:	better than ± 100 Hz
Temperature stability:	better than ± 100 Hz 0-40° C
Selectivity:	
6 dB bandwidth:	greater than $\pm 2,7$ kHz
60 dB bandwidth:	less than ± 9 kHz
Sensitivity:	better than 10 dB/1uV for 10 dB SND/N
Image rejection:	greater than 80 dB
IF rejection:	greater than 100 dB
VOLUME control range:	20 dB
RF PRESET control range:	30 dB
AF PRESET control range:	16 dB

Selectivity of the tuned amplifiers:

1300 Hz:

6 dB bandwidth:	greater than ± 40 Hz
20 dB bandwidth:	less than ± 200 Hz

2200 Hz:

6 dB bandwidth:	greater than ± 70 Hz
20 dB bandwidth:	less than ± 300 Hz

Delay time: 0.5-6 secs. adjustable

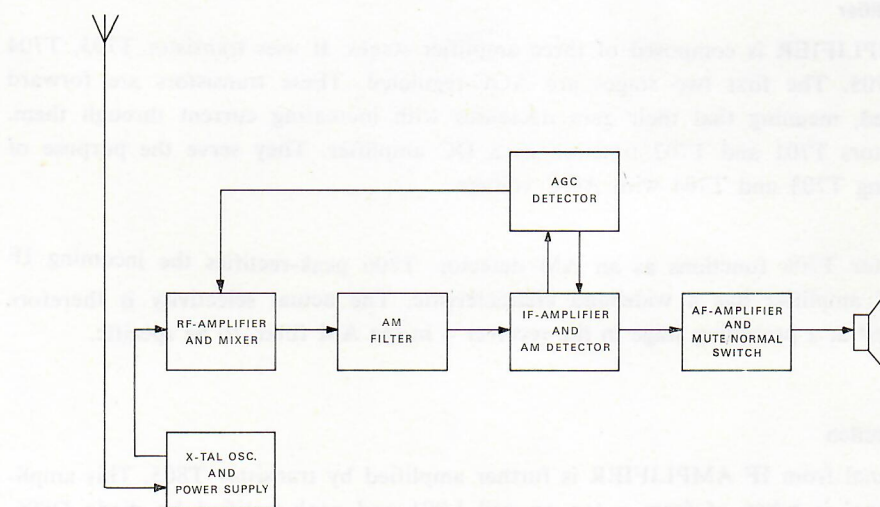
AF output:	6 watts in 4 ohms 3 watts in 8 ohms
Built-in speaker:	8 ohms
Extension speaker:	8 ohms
Power supply:	
Type R114/M-24V DC:	24V DC – 1.2A max.
Type R114/M-110/220V AC:	24V DC – 1.2A max. or 110–127V AC – 0.5A max. 220–254V AC – 0.3A max.
Fuses:	
Type R114/M-24V DC:	1.6A slow-blow $\phi 5 \times 20$ mm
Type R114/M-110/220V AC:	Two 1.6A slow-blow $\phi 5 \times 20$ mm
Dimensions:	Height: 232 mm Width: 342 mm Depth: 165 mm
Weight:	8 kg

II. Circuit Description, SAILOR R114/M

General:

The receiver is fully transistorised and composed of functional units. The individual functional units are shown clearly in the block diagram and in the main diagram.

The receiver is a superheterodyne using an IF of 600 kHz and designed for reception of A2, A2H, A3 and A3H signals.



Block Diagram Analysis

The signal from the aerial is fed through the mute relay to RF AMPLIFIER AND MIXER which amplifies and mixes the incoming 2182 kHz signal with the 2782 kHz oscillator signal, thereby producing the 600 kHz IF frequency.

The resulting IF signal is fed through AM FILTER to IF AMPLIFIER, which also contains the AM detector. IF AMPLIFIER is a selective amplifier having greater bandwidth than the AM filter. The amplifier has three stages, two of which are AGC regulated.

The output from IF AMPLIFIER is fed on to AGC DETECTOR, which contains an AGC amplifier and AGC detector.

The audio signal is fed on to the AF AMPLIFIER AND MUTE/NORMAL SWITCH, in which the signal may either be muted, the MUTE setting, or fed to the power amplifier IC202 and the loudspeaker, the NORMAL setting.

The units referred to are operated from the built-in POWER SUPPLY, which is either a 24V DC or 24V DC – 110/220V AC version.

RF Amplifier and Mixer

The signal-frequency circuit is a three-section permeability-tuned bandpass filter.

The neon lamp GL501 and diodes D101 and D102 protect the transistor T101, which functions as an RF amplifier, against overloading.

The mixer T102 is a field-effect transistor, which functions as a multiplicative mixer. Oscillator signal for the mixer is obtained from transistor T103 which functions as emitter follower for the crystal oscillator T104. Transistor T105 is the amplitude level control circuit which shifts the DC operating point of the oscillator on the basis of rectification of the oscillator signal at the base of T105, until constant amplitude is obtained.

The crystal oscillator is the Pierce-Colpitts type.

AM Filter

This filter is a five-section filter terminated by a field effect transistor, T401, to avoid interaction with the IF amplifier when the latter is AGC-regulated.

IF Amplifier

IF AMPLIFIER is composed of three amplifier stages. It uses transistor T703, T704 and T705. The first two stages are AGC-regulated. These transistors are forward regulated, meaning that their gain decreases with increasing current through them. Transistors T701 and T702 function as a DC amplifier. They serve the purpose of supplying T703 and T704 with AGC voltage.

signal.

Transistor T706 functions as an AM detector. T706 peak-rectifies the incoming IF. The IF amplifier has a wideband characteristic. The actual selectivity is therefore produced at a preceding stage in the receiver – in the AM filter, to be specific.

AGC Section

The signal from IF AMPLIFIER is further amplified by transistor T805. This amplified signal is taken off from a tap on coil L801 and peak-rectified by diode D806. Reservoir capacitor C804 furnishes voltage for the base of transistor T801, which operates as an emitter follower, and feeds the AGC voltage via R800 to C801. C801 discharges through R800 in series with R804.

The network comprising P801 and D802 is used for setting the operation point of IF AMPLIFIER for maximum gain with no signal coming from the aerial.

AUDIO AMPLIFIER:

The audio amplifier consists of a preamplifier stage equipped with T201 which feeds the signal to the VOLUME and the VOLUME PRESET controls. The signal is then fed to the two selective amplifiers – T202 tuned for 1300 Hz and T203 tuned for 2200

Hz. In the MUTE mode the signals from the tuned amplifiers are fed to two transistor detectors T204 and T205, from which the rectified signal is fed to IC201, which acts as an exclusive nor; that will say, when the inputs pin 8 and 9 are equal the output pin 1 is high $\geq 2.4V$.

On the contrary if the inputs are different the output is low $\leq 0.4V$. That will say, that if the receiver receives a distress signal, the inputs are different and the output is low, and the transistor T206 is off. By this the voltage across C212 increases until it reaches the trigger level of the SCR D204, which then goes ON and the relay RE201 is short circuited and the receiver returns to NORMAL setting, that will say that the audio amplifier is supplied with +14 Volts.

The power amplifier IC202 is an integrated circuit with an output power of 6 Watt into 4 ohms.

Power Supply

This unit furnishes two voltages: +14V and +18V.

The unit receives 24V either from the vessel's supply mains or, in the 110/220V AC version, from the built-in power supply consisting of power transformer TR301, rectifier D302 and reservoir capacitor C303.

Two 1-ohm resistors in series with the 24V supply leads limit the current through Zener diode D303, which protects against transients.

R304, D304 and C307 provide reference voltage for the 18V series regulator, T302. R307 and R308 provide reference voltage for the 14V series regulator, T501.

T301 protects the 14V supply against short-circuits and acts as a current limiter for the output amplifier IC202. If the current through R302 increases, and T301 enters the active range, the reference voltage for the 14V regulator will be reduced.

D301 protects the receiver against incorrect supply-voltage polarity.

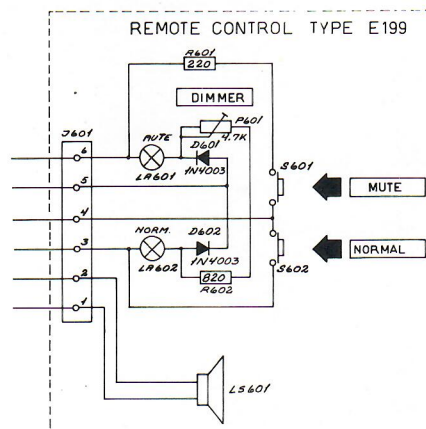
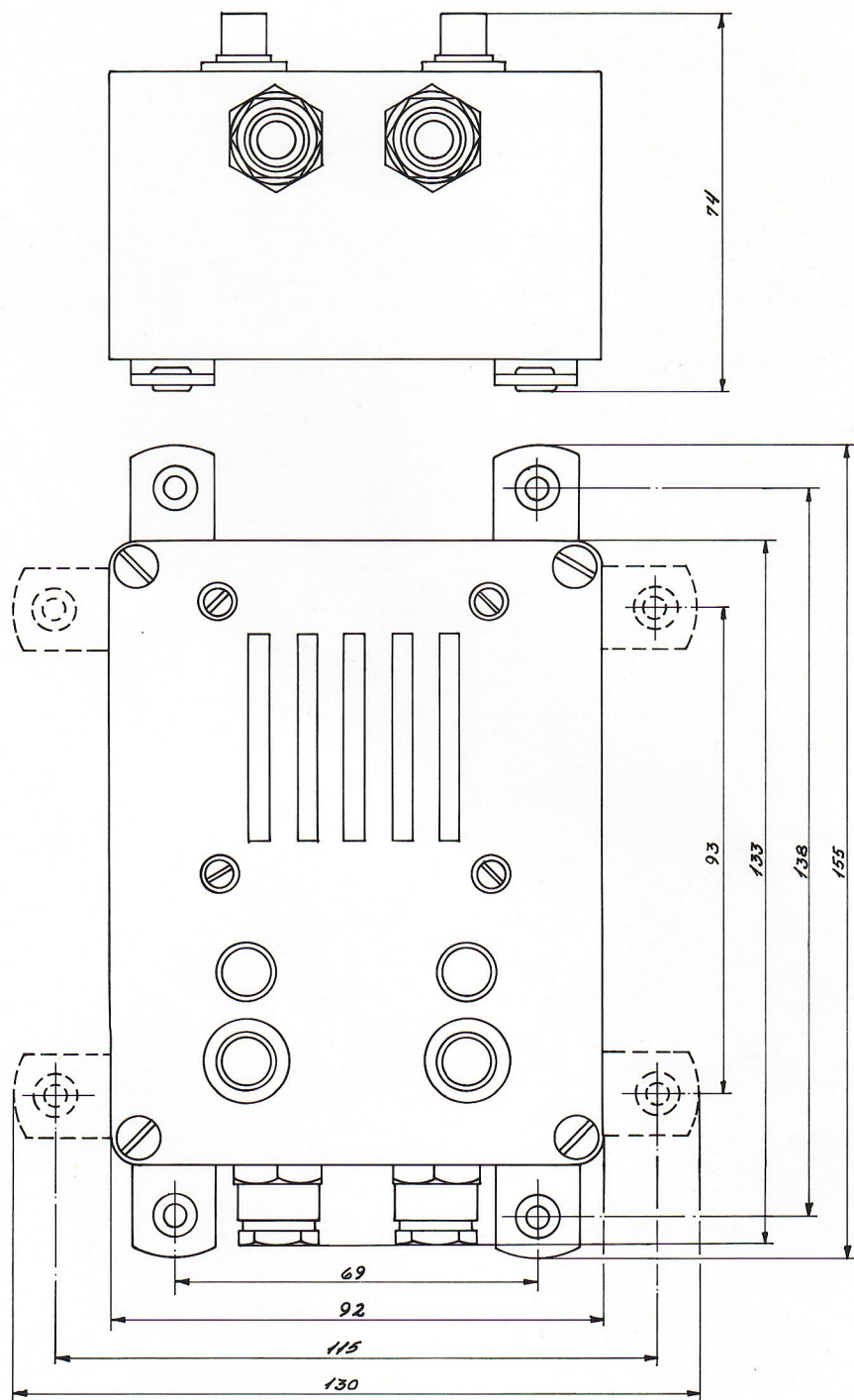
P301 determines the control range of RF preset.

RE301 is a mute relay which shorts the aerial input and removes the +14V and +18V potentials, the receiver being muted when the relay is energised.

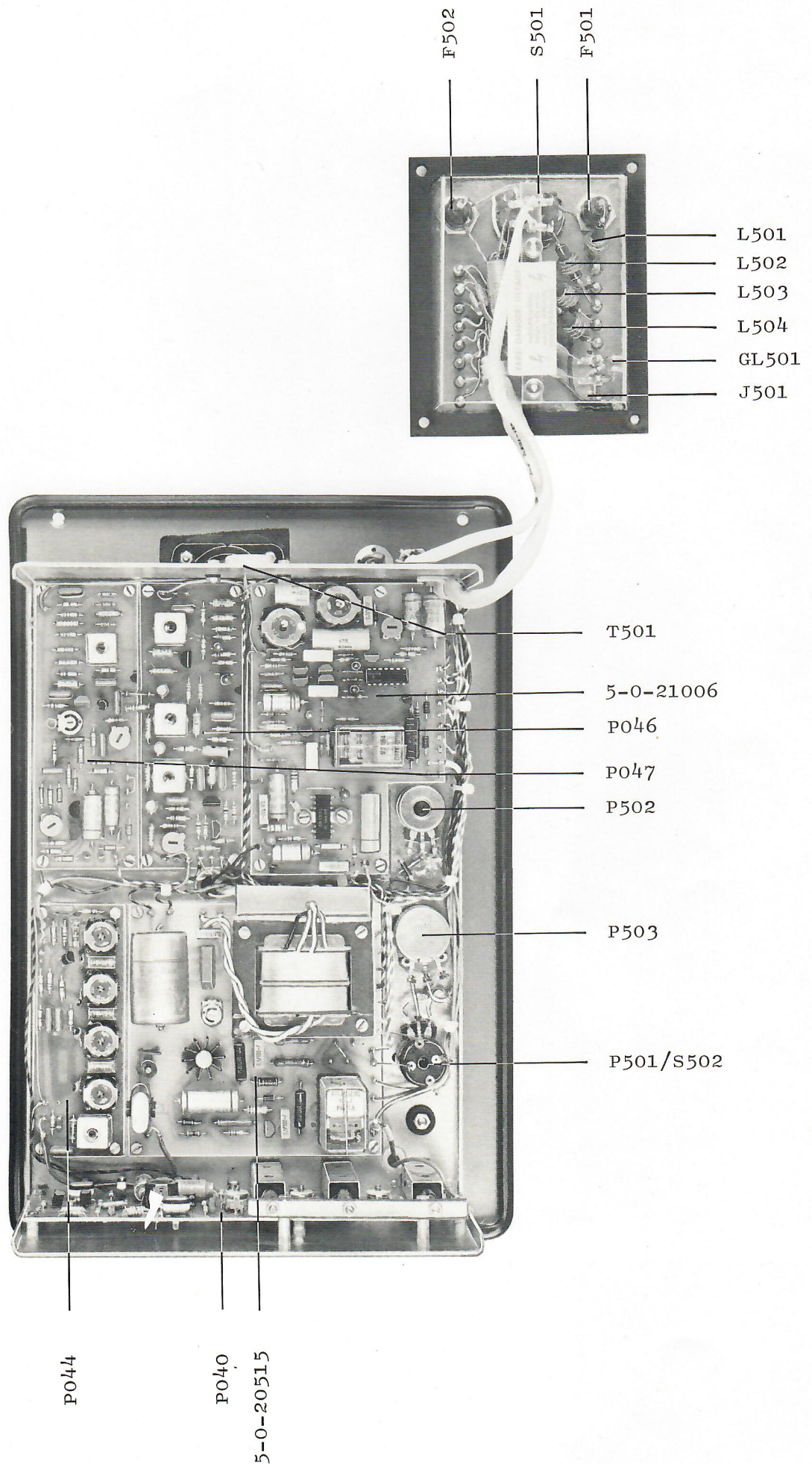
X301, C305 and C306 are the frequency-determining components of the crystal oscillator in the RF AMPLIFIER AND MIXER. C306 permits adjustment of the crystal oscillator frequency to 2782 kHz.

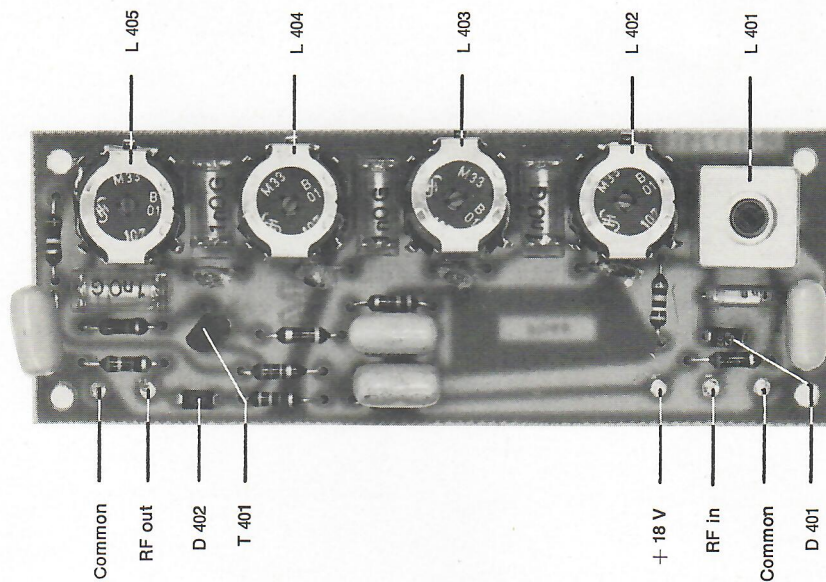
Other Circuits

The RF mains filter, fuses, voltage changeover switch and connection terminals are located on the side cover.

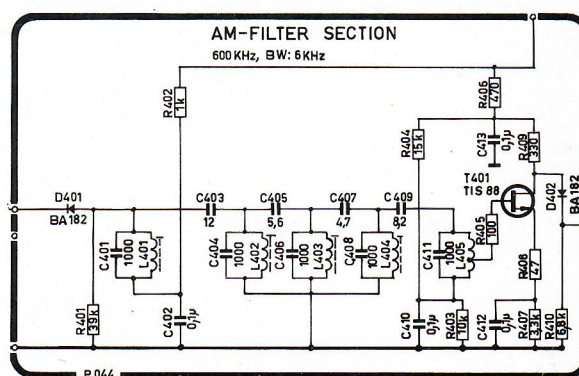


Dimensional Sketch Remote Control E199

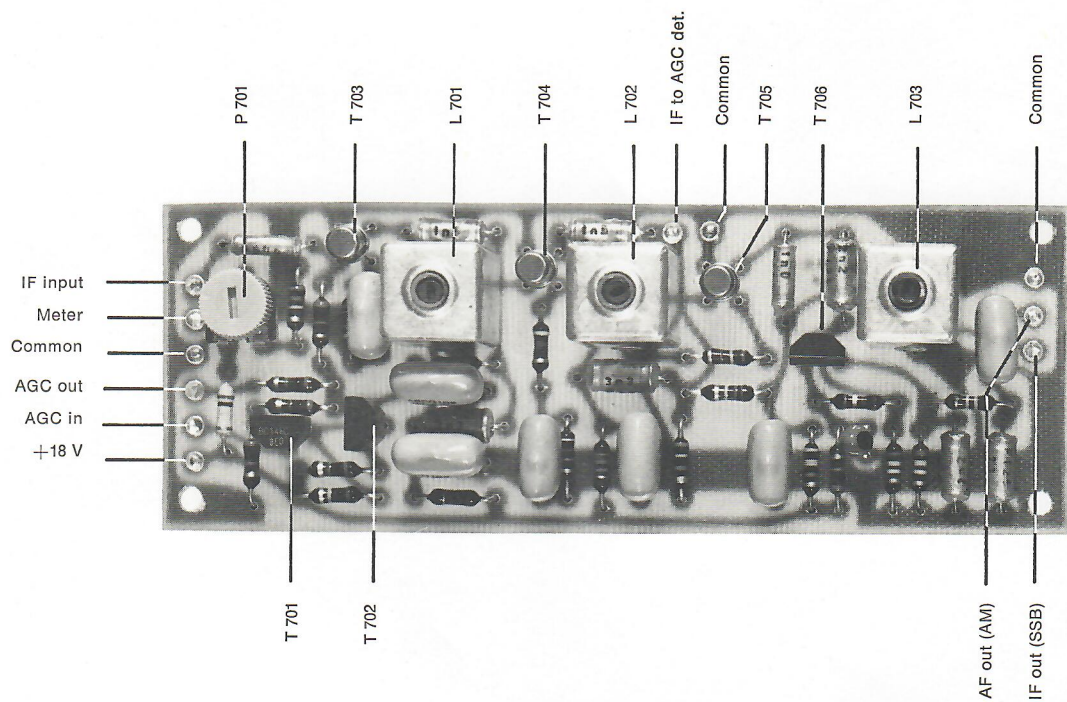




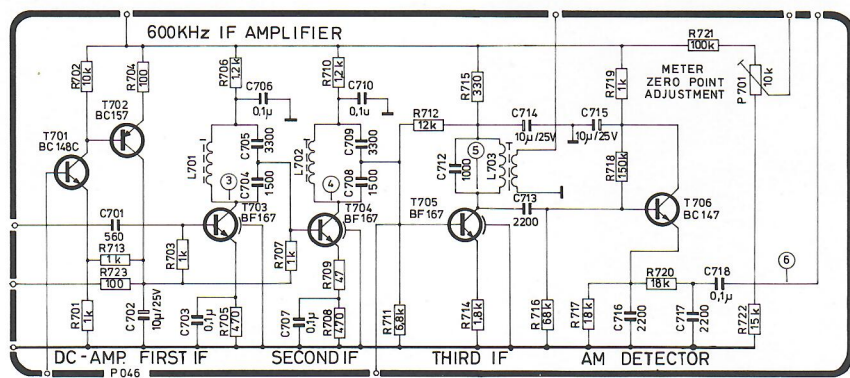
	T 401
D	14,2
S	7,6
G	5,8



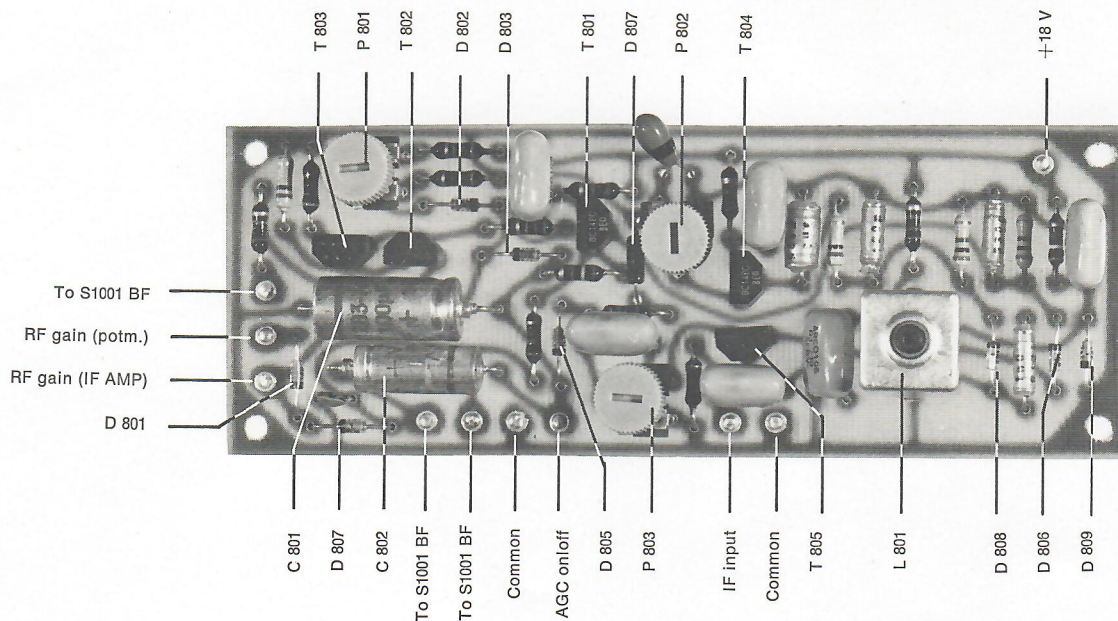
AM - filter section



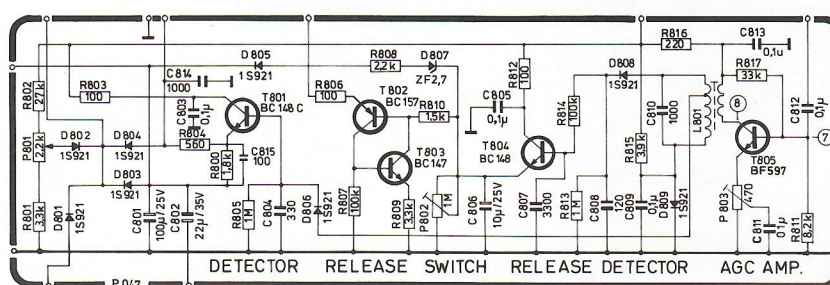
	T701	T702	T703	T704	T705	T706
E	1,4	2,6	1,9	1,9	5,0	4,7
B	2,0	16,9	2,6	2,6	5,8	5,2
C	16,9	17,6	12,9	13,3	16,5	17,4

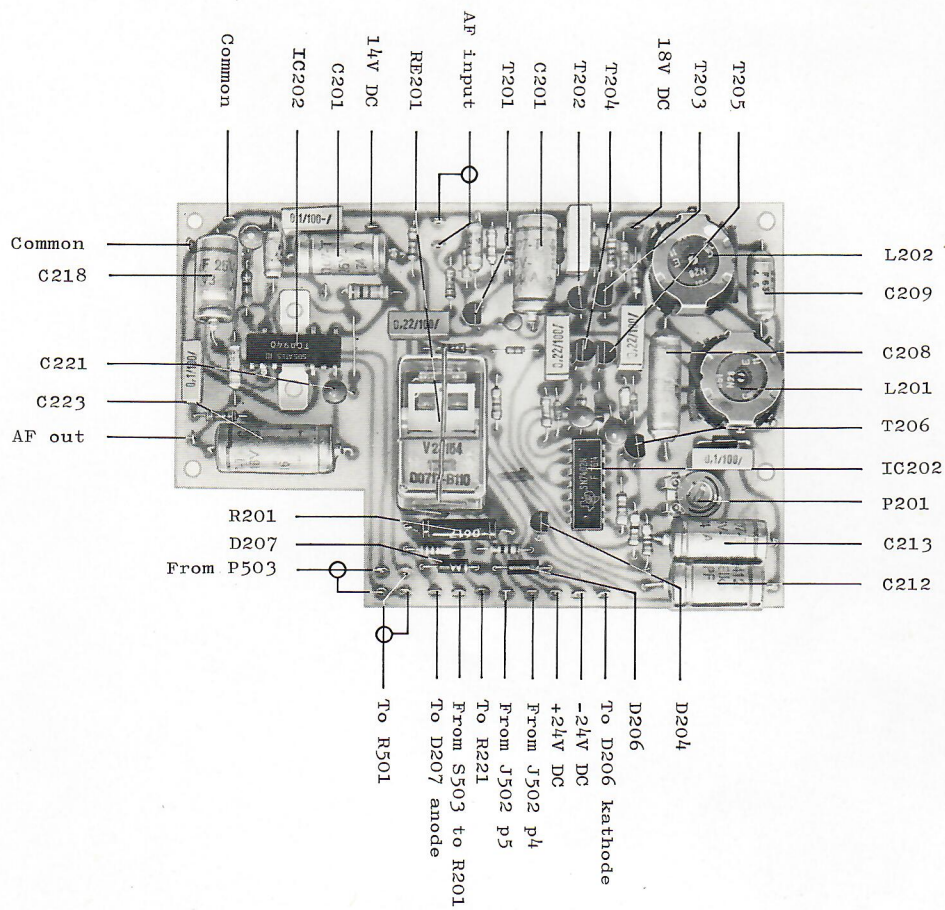


600 KHz IF amplifier

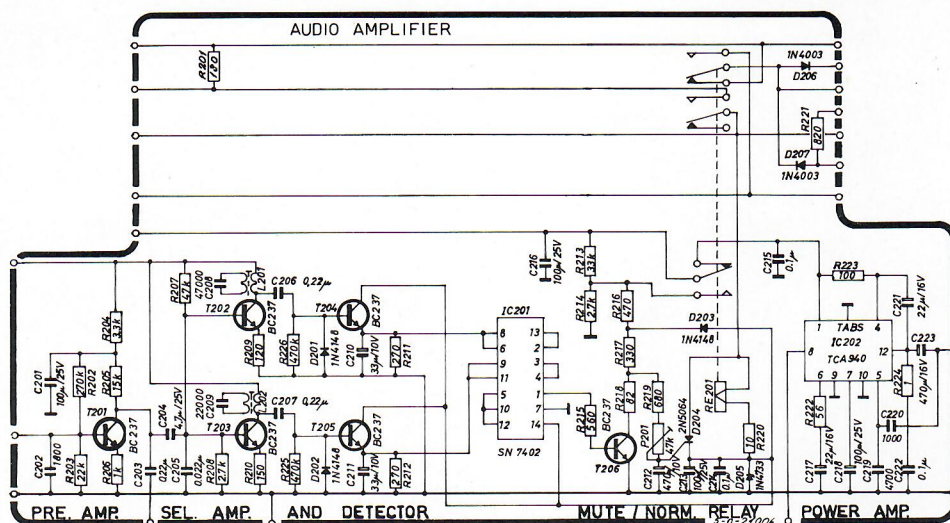


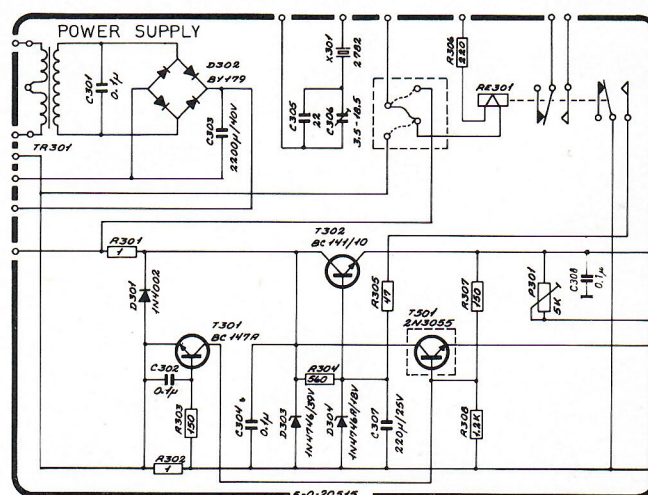
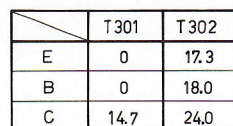
	T 801	T 802	T 803	T 804	T 805
E	0,7	1,0	0,0	0,8	2,3
B	0,5	0,5	0,2	0,7	2,9
C	17,8	0,2	0,5	17,8	16,4





IC201						
PIN	1	4	5	6	7	12
	14.0	13.8	0.71	1.3	9.1	6.8





■ CHANNEL TUNER SW I 1.6 - 4.2 MHz R103 R104 R105 R106 R110 R114 R115

Symbol	Description			Manufact.	
C 101 ^x	Capacitor trimmer	7-120pF	teflon	Dau	116.3901.120
C 102	Capacitor ceramic	100 pF \pm 5%	250V	Ferroperm	9/0121.3 insul.
C 103	Capacitor trimmer	4-38 pF	teflon	Dau	109.3901.038
C 104	Capacitor ceramic	3.3 pF \pm 0.25pF		Ferroperm	9/0112.9 400V
C 105	Capacitor trimmer	4-38 pF	teflon	Dau	109.3901.038
C 106	Capacitor polystyrene	1000 pF \pm 2%	125V	Philips	2222 425 31002
C 107	Capacitor ceramic	220 pF \pm 5%	250V	Ferroperm	9/0121.3 insul.
C 108	Capacitor polyester	0.1 uF \pm 10%	250V	Efco	PMT
C 109	Capacitor polystyrene	330 pF \pm 2%	250V	Philips	2222 426 33301
C 110	Capacitor polyester	0.1 uF	250V	Efco	PMT
C 111	Capacitor polyester	0.1 uF	250V	Efco	PMT
C 112	Capacitor polystyrene	1800 pF \pm 2%	125V	Philips	2222 425 31802
C 113	Capacitor polystyrene	820 pF \pm 2%	125V	Philips	2222 425 38201
C 114	Capacitor ceramic	270 pF \pm 5%	250V	Ferroperm	9/0121.3 insul.
C 115	Capacitor trimmer	4-38 pF	teflon	Dau	109.3901.038
C 116	Capacitor polyester	1000 pF \pm 2%	125V	Philips	2222 425 31002
C 117	Capacitor polyester	0.1 uF	250V	Efco	PMT
C 118	Capacitor polyester	0.1 uF	250V	Efco	PMT
C 119	Capacitor polystyrene	560 pF \pm 2%	125V	Philips	2222 425 35601
C 120	Capacitor polystyrene	390 pF \pm 2%	250V	Philips	2222 426 33901
C 121	Capacitor polystyrene	560 pF \pm 2%	125V	Philips	2222 425 35601
C 122	Capacitor polyester	0.1 uF	250V	Efco	PMT
C 123	Capacitor polystyrene	560 pF \pm 2%	125V	Philips	2222 425 35601
C 124	Capacitor polyester	0.1 uF	250V	Efco	PMT
C 125	Capacitor electrolytic	100 uF	25V	Siemens	B41283-A5107-Z
^x	Not used in R114				
CH101	Choke coil	1 mH \pm 10%		Prahn	1580/9K
D 101	Diode			Texas/Sie.	1S921/1N4148
D 102	Diode			Texas/Sie.	1S921/1N4148
L 101	Aerial coil	1		S.P.	Drg.no. TL 002
L 102	Aerial coil	11		S.P.	Drg.no. TL 002
L 103	RF coil			S.P.	Drg.no. TL 002
L 104	Shunt coil	600 kHz		S.P.	Drg.no. TL 003

a CHANNEL TUNER SW I 1.6 - 4.2 MHz R103 R104 R105 R106 R110 R114 R115

Symbol	Description			Manufact.	
R 100 ^x	Resistor	100K ohms	0.33W	Philips	2322 101 33104
R 101	Resistor	1 K ohm	0.33W	Philips	2322 101 33102
R 102	Resistor	680 ohms	0.33W	Philips	2322 101 33681
R 103	Resistor	47 ohms	0.33W	Philips	2322 101 33479
R 104	Resistor	1.8K ohms	0.33W	Philips	2322 101 33182
R 105	Resistor	47 ohms	0.33W	Philips	2322 101 33479
R 106	Resistor	470K ohms	0.33W	Philips	2322 101 33474
R 107	Resistor	2.7K ohms	0.33W	Philips	2322 101 33272
R 108	Resistor	220 ohms	0.33W	Philips	2322 101 33221
R 109	Resistor	680 ohms	0.33W	Philips	2322 101 33681
R 110	Resistor	33 ohms	0.33W	Philips	2322 101 33339
R 111	Resistor	10 K ohms	0.33W	Philips	2322 101 33103
R 112	Resistor	39 K ohms	0.33W	Philips	2322 101 33393
R 113	Resistor	1.5K ohms	0.33W	Philips	2322 101 33152
R 114	Resistor	1 K ohm	0.33W	Philips	2322 101 33102
R 115	Resistor	15 ohms	0.33W	Philips	2322 101 33159
R 116	Resistor	1.5K ohms	0.33W	Philips	2322 101 33152
R 117	Resistor	22 K ohms	0.33W	Philips	2322 101 33223
R 118	Resistor	22 K ohms	0.33W	Philips	2322 101 33223
R 119	Resistor	10 K ohms	0.33W	Philips	2322 101 33103
R 120	Resistor	18 K ohms	0.33W	Philips	2322 101 33183
T 101	Transistor			Siemens	BF 167
T 102	Transistor			Texas	TIS 88A
T 103	Transistor			Siemens	BC 147A
T 104	Transistor			Siemens	BC 147A
T 105	Transistor			Siemens	BC 147A
x	Not used in R114				

b

AUDIO AMPLIFIER, R114

Symbol	Description			Manufact.	
C201	Capacitor electrolytic	100uF	25V	Siemens	B41283-B5107-T
C202	Capacitor polystyrene	1800pF $\pm 1\%$	125V	Philips	2222 425 41802
C203	Capacitor polyester	0,22uF $\pm 20\%$	100V	Philips	2222 342 24224
C204	Capacitor tantal	4,7uF	25V	Ero	ETP 2D
C205	Capacitor polyester	0,022uF $\pm 10\%$	250V	Philips	2222 344 41223
C206	Capacitor polyester	0,22uF $\pm 20\%$	100V	Philips	2222 342 24224
C207	Capacitor polyester	0,22uF $\pm 20\%$	100V	Philips	2222 342 24224
C208	Capacitor polystyrene	0,047uF $\pm 1\%$	63V	Philips	2222 424 44703
C209	Capacitor polystyrene	0,022uF $\pm 1\%$	63V	Philips	2222 424 42203
C210	Capacitor tantal	33uF	10V	Ero	ETP 3G
C211	Capacitor tantal	33uF	10V	Ero	ETP 3G
C212	Capacitor electrolytic	470uF	10V	Siemens	B41283-A3477-T
C213	Capacitor electrolytic	100uF	25V	Siemens	B41283-B5107-T
C214	Capacitor polyester	0,1uF $\pm 20\%$	100V	Ero	MKT1822-410/0
C215	Capacitor polyester	0,1uF $\pm 20\%$	100V	Ero	MKT1822-410/0
C216	Capacitor electrolytic	100uF	25V	Siemens	B41283-B5107-T
C217	Capacitor tantal	22uF	16V	Ero	ETP 3G
C218	Capacitor electrolytic	100uF	25V	Siemens	B41283-B5107-T
C219	Capacitor polystyrene	4700pF $\pm 2\%$	63V	Philips	2222 424 34702
C220	Capacitor polystyrene	1000pF $\pm 2\%$	125V	Philips	2222 425 31002
C221	Capacitor tantal	22uF	16V	Ero	ETP 3G
C222	Capacitor polyester	0,1uF $\pm 20\%$	100V	Ero	MKT1822-410/0
C223	Capacitor electrolytic	470uF	16V	Siemens	B41283-A4477-T
IC201	Integrated circuit			Texas	SN7402N
IC202	Integrated circuit			SGS/ATES	TCA 940
L201	AF coil			S.P.	drawn. TL022
L202	AF coil			S.P.	drawn. TL021
RE201	Relais		12V	Siemens	V23154-DO717-B11
T201	Transistor	BC237A		Sie./Phil.	BC237A
T202	Transistor	BC237A		Sie./Phil.	BC237A
T203	Transistor	BC237A		Sie./Phil.	BC237A
T204	Transistor	BC237A		Sie./Phil.	BC237A
T205	Transistor	BC237A		Sie./Phil.	BC237A
T206	Transistor	BC237A		Sie./Phil.	BC237A

b

AUDIO AMPLIFIER, R114

Symbol	Description				Manufact.	
R201	Resistor	180 ohm \pm 5%	4,2W	Philips	2322 330 22181	
R202	Resistor	270K ohm \pm 5%	0,33W	Philips	2322 101 33274	
R203	Resistor	22K ohm \pm 5%	0,33W	Philips	2322 101 33223	
R204	Resistor	3,3K ohm \pm 5%	0,33W	Philips	2322 101 33332	
R205	Resistor	15K ohm \pm 5%	0,33W	Philips	2322 101 33153	
R206	Resistor	1K ohm \pm 5%	0,33W	Philips	2322 101 33102	
R207	Resistor	47K ohm \pm 5%	0,33W	Philips	2322 101 33473	
R208	Resistor	2,7K ohm \pm 5%	0,33W	Philips	2322 101 33272	
R209	Resistor	120 ohm \pm 5%	0,33W	Philips	2322 101 33121	
R210	Resistor	150 ohm \pm 5%	0,33W	Philips	2322 101 33151	
R211	Resistor	270 ohm \pm 5%	0,33W	Philips	2322 101 33271	
R212	Resistor	270 ohm \pm 5%	0,33W	Philips	2322 101 33271	
R213	Resistor	33K ohm \pm 5%	0,33W	Philips	2322 101 33333	
R214	Resistor	2,7K ohm \pm 5%	0,33W	Philips	2322 101 33272	
R215	Resistor	560 ohm \pm 5%	0,33W	Philips	2322 101 33561	
R216	Resistor	470 ohm \pm 5%	0,33W	Philips	2322 101 33471	
R217	Resistor	330 ohm \pm 5%	0,33W	Philips	2322 101 33331	
R218	Resistor	82 ohm \pm 5%	0,33W	Philips	2322 101 33829	
R219	Resistor	680 ohm \pm 5%	0,33W	Philips	2322 101 33681	
R220	Resistor	10 ohm \pm 5%	0,33W	Philips	2322 101 33109	
R221	Resistor	820 ohm \pm 5%	0,33W	Philips	2322 101 33821	
R222	Resistor	56 ohm \pm 5%	0,33W	Philips	2322 101 33569	
R223	Resistor	100 ohm \pm 5%	0,5W	Philips	2322 212 13101	
R224	Resistor	1 ohm \pm 5%	0,33W	Philips	2322 101 33108	
R225	Resistor	470K ohm \pm 5%	0,33W	Philips	2322 101 33474	
R226	Resistor	470K ohm \pm 5%	0,33W	Philips	2322 101 33474	
D201	Diode, silicium	1N4148		Tex./Phil.	1N4148	
D202	Diode, silicium	1N4148		Tex./Phil.	1N4148	
D203	Diode, silicium	1N4148		Tex./Phil.	1N4148	
D204	Diode, thyristor	2N5064		Motorola	2N5064	
D205	Diode, zener	5,1V \pm 5%	1W	Motorola	1N4733A	
D206	Diode, silicium	1N4003		Motorola	1N4003	
D207	Diode, silicium	1N4003		Motorola	1N4003	

b

POWER SUPPLY, R114

Symbol	Description				Manufact.	
C301 ^x	Capacitor polyethylene	0.1uF	$\pm 20\%$	100V	Ero	MKT1822-410/0
C302	Capacitor polyethylene	0.1uF	$\pm 20\%$	100V	Ero	MKT1822-410/0
C303 ^x	Capacitor electrolytic	2200uF		40V	Siemens	B41010-B7228-T
C304	Capacitor polyethylene	0.1uF	$\pm 20\%$	100V	Ero	MKT1822-410/0
C305	Capacitor ceramic	22pF	$\pm 5\%$	NPO	Ferroperm	9/0112.9
C306	Capacitor variable	2-18pF		100V	Dau	107.2901.018
C307	Capacitor electrolytic	220uF		25V	Siemens	B41283-B5227-T
C308	Capacitor polyethylene	0.1uF	$\pm 20\%$	100V	Ero	MKT1822-410/0
D301	Diode silicium				Motorola	1N4002
D302 ^x	Diodebridge				Philips	BY179
D303	Diode zener	39V	$\pm 5\%$	5W	Motorola	1N5366B
D304	Diode zener	18V	$\pm 5\%$	1W	Motorola	1N4746A
P301	Resistor variable	5 K ohm		LIN	Ruwido	0650-610 5K ohm
R301	Resistor	1 ohm	$\pm 10\%$	1W	Vitrohm	type 200-0
R302	Resistor	1 ohm	$\pm 10\%$	1W	Vitrohm	type 200-0
R303	Resistor	150 ohm	$\pm 5\%$	0.33W	Philips	2322 101 33151
R304	Resistor	560 ohm	$\pm 5\%$	4.2W	Philips	2322 330 22561
R305	Resistor	47 ohm	$\pm 5\%$	0.33W	Philips	2322 101 33479
R306	Resistor	220 ohm	$\pm 5\%$	4.2W	Philips	2322 330 22221
R307	Resistor	150 ohm	$\pm 5\%$	1W	Vitrohm	type 200-0
R308	Resistor	1.2K ohm	$\pm 5\%$	0.5W	Philips	2322 212 13122
RE301	Relais			12V	Siemens	V23154-DO717-F104
T301	Transistor	BC147A			Sie./Ph.	BC147A
T302	Transistor	BC141/10			Sie./Tel.	BC141/10
TR301 ^x	Transformer				Tradania	1988
X301	Crystal	2782 kHz	SSB spec.		KVG	
^x	110/220 VAC VERSION ONLY.					

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AM - FILTER R103 R104 R105 R106 R110 R111 R112 R114 R115

Symbol	Description	Manufact.	
C 401	Capacitor polystyrene 1000pF \pm 2% 125V	Philips	2222 425 31002
C 402	Capacitor polyester 0.1 uF \pm 10% 250V	Efco	PMT
C 403	Capacitor ceramic 8.2 pF \pm 0.5pF NPO	Ferroperm	9/0112.9
C 404	Capacitor polystyrene 1000pF \pm 2% 200V	Rifa	PFE 216
C 405	Capacitor ceramic 5.6 pF \pm 0.5pF NPO	Ferroperm	9/0112.9 - 400V
C 406	Capacitor polystyrene 1000pF \pm 2% 200V	Rifa	PFE 216
C 407	Capacitor ceramic 4.7 pF \pm 0.5pF NPO	Ferroperm	9/0112.9 - 400V
C 408	Capacitor polystyrene 1000pF \pm 2% 200V	Rifa	PFE 216
C 409	Capacitor ceramic 8.2 pF \pm 0.5pF NPO	Ferroperm	9/0112.9 - 400V
C 410	Capacitor polyester 0.1 uF \pm 10% 250V	Efco	PMT
C 411	Capacitor polystyrene 1000pF \pm 2% 200V	Rifa	PFE 216
C 412	Capacitor polyester 0.1 uF \pm 10% 250V	Efco	PMT
C 413	Capacitor polyester 0.1 uF \pm 10% 250V	Efco	PMT
D 401	Diode	Philips	BA 182
D 402	Diode	Philips	BA 182
L 401	Coil AM filter	S.P.	Drg.no. TL 144
L 402	Coil AM filter	S.P.	Drg.no. TL 003
L 403	Coil AM filter	S.P.	Drg.no. TL 003
L 404	Coil AM filter	S.P.	Drg.no. TL 003
L 405	Coil AM filter	S.P.	Drg.no. TL 014
R 401	Not used		
R 402	Resistor 1 K ohm 0.33W	Philips	2322 101 33102
R 403	Resistor 10 K ohms 0.33W	Philips	2322 101 33103
R 404	Resistor 15 K ohms 0.33W	Philips	2322 101 33153
R 405	Resistor 100 ohms 0.33W	Philips	2322 101 33101
R 406	Resistor 470 ohms 0.33W	Philips	2322 101 33471
R 407	Resistor 3.3K ohms 0.33W	Philips	2322 101 33332
R 408	Resistor 47 ohms 0.33W	Philips	2322 101 33479
R 409	Resistor 330 ohms 0.33W	Philips	2322 101 33331
R 410	Resistor 6.8K ohms 0.33W	Philips	2322 101 33682
T 401	Transistor FET, N-channel	Texas	TIS 88A

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CHASSIS, R114

Symbol	Description			Manufact.	
C501	Capacitor variable	2-120	Teflon	Dau	116.3901.120
C502	Capacitor polyester	0.1 uF	250V	Arco	Minidip B
C503	Capacitor polyester	0.1 uF	250V	Arco	Minidip B
C504 ^x	Capacitor polyester	0.01uF \pm 10%	1500V	Ero	KP1832-310/15
C505 ^x	Capacitor polyester	0.01uF \pm 10%	1500V	Ero	KP1832-310/15
C506	Capacitor polyester	0.47uF \pm 10%	250V	Philips	2222 342 45474
C507	Capacitor polyester	0.1 uF	250V	Arco	Minidip B
F501 ^x	Fuse	1.6 AT	5x20mm	Wickmann	1.6 AT
F502	Fuse	1.6 AT	5x20mm	Wickmann	1.6 AT
GL501	Neon lamp			Siemens	B1-C90-Q69x151
J501	Terminal block			Bell & Lee	L1409
J502	Terminal block			Bell & Lee	L1409
L501 ^x	Filter choke	250 mHy		S.P.	TL079
L502 ^x	Filter choke	250 mHy		S.P.	TL079
L503	Filter choke	250 mHy		S.P.	TL079
L504	Filter choke	250 mHy		S.P.	TL079
LA501	Lamp selective	24V/20mA		A.M.Mein.	SGF 99/1A
LA502	Lamp, normal	24V/20mA		A.M.Mein.	SGF 99/1A
LS501	Loudspeaker	8 ohm		Wigo	PM 65/12/85
P501	Potentiometer	100K ohm Lin w. switch		Piher	drawn. 0-3-20682
P502	Potentiometer	5K ohm Lin		Piher	drawn. 0-3-20680
P503	Potentiometer	50K ohm Lin		Piher	drawn. 0-3-20681
R501	Resistor	100K ohm \pm 5%	0.33W	Philips	2322 101 33104
R502	Resistor	100K ohm \pm 5%	0.33W	Philips	2322 101 33104
R503	Resistor	18K ohm \pm 5%	0.33W	Philips	2322 101 33183
R504	Resistor	5.6K ohm \pm 5%	0.33W	Philips	2322 101 33562
R505	Resistor NTC	15K ohm \pm 10%	0.6W	Philips	2322 635 02153

CHASSIS, R114

Symbol	Description	Manufact.	
R506	Resistor 10K ohm \pm 5% 0.33W	Philips	2322 101 33103
R507	Resistor 1K ohm \pm 5% 0.33W	Philips	2322 101 33102
S501 ^x	Switch 24 V DC/110-220 V AC	MEC	SMA-4
S502	Switch ON/OFF part of P501		
S503	Switch selective	Shadow	ZD-DG-rø-2u0.A
S504	Switch normal	Shadow	ZD-DG-rø-2u0.A
T501	Transistor 2N3055	Motorola	2N3055
x	110/220 VAC VERSION ONLY.		

REMOTE CONTROLLED MONITOR UNIT, E199

Symbol	Description			Manufact.	
J601	Terminal block			L. Poulsen	1941
LA601	Lamp selective	24V/20mA		A.M.Meinert	SGF 99/1A
LA602	Lamp normal	24V/20mA		A.M.Meinert	SGF 99/1A
LS601	Loudspeaker	8 ohm		Wigo	PM65/12/85
R601	Resistor	220 ohm \pm 5%	4.2W	Philips	2322 330 22221
R602	Resistor	1 K ohm \pm 5%	0.33W	Philips	2322 101 33102
R603	Resistor	1 K ohm \pm 5%	0.33W	Philips	2322 101 33102
S601	Switch selective			Shadow	ZD-DG-rø-2u0.A
S602	Switch normal			Shadow	ZD-DG-rø-2u0.A

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IF SECTION R103 R104 R105 R106 R110 R114 R115

Symbol	Description			Manufact.	
R713	Resistor	1 K ohm	0.33W	Philips	2322 101 33102
R714	Resistor	1.8K ohms	0.33W	Philips	2322 101 33182
R715	Resistor	330 ohms	0.33W	Philips	2322 101 33331
R716	Resistor	68 K ohms	0.33W	Philips	2322 101 33683
R717	Resistor	18 K ohms	0.33W	Philips	2322 101 33183
R718	Resistor	150K ohms	0.33W	Philips	2322 101 33154
R719	Resistor	1 K ohm	0.33W	Philips	2322 101 33102
R720	Resistor	18 K ohms	0.33W	Philips	2322 101 33183
R721	Resistor	100K ohms	0.33W	Philips	2322 101 33104
R722	Resistor	15 K ohms	0.33W	Philips	2322 101 33153
R723	Resistor	100 ohms	0.33W	Philips	2322 101 33101
P701	Potentiometer trimmer	10 K ohms		Philips	2322 410 43307
T701	Transistor			Siemens	BC 148C
T702	Transistor			Siemens	BC 157A
T703	Transistor			Siemens	BF 167
T704	Transistor			Siemens	BF 167
T705	Transistor			Siemens	BF 167
T706	Transistor			Siemens	BC 147A

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AGC SECTION R103 R104 R105 R106 R110 R111 R112 R114 R115

Symbol	Description	Manufact.	
C 801	Capacitor electrolytic 100 uF 25V	Siemens	B41283-B5107-T
C 802	Capacitor electrolytic 22 uF 40V	Siemens	B41283-B7226-T
C 803	Capacitor polyester 0.1 uF 250V	Efco	PMT
C 804	Capacitor polystyrene 330 pF \pm 2% 250V	Philips	2222 426 33301
C 805	Capacitor polyester 0.1 uF 250V	Efco	PMT
C 806	Capacitor tantalum 10 uF 25V	Ero	ETP 3
C 807	Capacitor polystyrene 3300pF \pm 2% 125V	Philips	2222 425 33302
C 808	Capacitor polystyrene 120 pF \pm 2% 500V	Philips	2222 427 31201
C 809	Capacitor polyester 0.1 uF 250V	Efco	PMT
C 810	Capacitor polystyrene 1000pF \pm 2% 125V	Philips	2222 425 31002
C 811	Capacitor polyester 0.1 uF 250V	Efco	PMT
C 812	Capacitor polyester 0.1 uF 250V	Efco	PMT
C 813	Capacitor polyester 0.1 uF 250V	Efco	PMT
C 814	Capacitor ceramic 1000pF +80/-20% 40V	Ferroperm	9/0129.8 insul.
C 815	Capacitor ceramic 100 pF \pm 20% 63V	Ferroperm	9/0116.8 insul.
D 801	Diode	Texas/Sie.	1S921/1N4148
D 802	Diode	Texas/Sie.	1S921/1N4148
D 803	Diode	Texas/Sie.	1S921/1N4148
D 804	Diode	Texas/Sie.	1S921/1N4148
D 805	Diode	Texas/Sie.	1S921/1N4148
D 806	Diode	Texas/Sie.	1S921/1N4148
D 807	Diode, stabistor 2.8V \pm 5%	Philips	BZX75 C2V8
D 808	Diode	Texas/Sie.	1S921/1N4148
D 809	Diode	Texas/Sie.	1S921/1N4148
L 801	ACC coil	S.P.	Drg.no. TL 016
P 801	Potentiometer 2.2 K ohms	Philips	2322 410 43305
P 802	Potentiometer 1 M ohm	Ruwido	S 52/S 52K
P 803	Potentiometer 470 ohms	Philips	2322 410 43303

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AGC SECTION R103 R104 R105 R106 R110 R111 R112 R114 R115

Symbol	Description			Manufact.	
R 800	Resistor	1.8 K ohms	0.33W	Philips	2322 101 33182
R 801	Resistor	3.3 K ohms	0.33W	Philips	2322 101 33332
R 802	Resistor	27 K ohms	0.33W	Philips	2322 101 33273
R 803	Resistor	100 ohms	0.33W	Philips	2322 101 33101
R 804	Resistor	560 ohms	0.33W	Philips	2322 101 33561
R 805	Resistor	1 M ohm	0.33W	Philips	2322 101 33105
R 806	Resistor	100 ohms	0.33W	Philips	2322 101 33101
R 807	Resistor	100 K ohms	0.33W	Philips	2322 101 33104
R 808	Resistor	2.2 K ohms	0.33W	Philips	2322 101 33222
R 809	Resistor	3.3 K ohms	0.33W	Philips	2322 101 33332
R 810	Resistor	1.5 K ohms	0.33W	Philips	2322 101 33152
R 811	Resistor	8.2 K ohms	0.33W	Philips	2322 101 33822
R 812	Resistor	100 ohms	0.33W	Philips	2322 101 33101
R 813	Resistor	1 M ohm	0.33W	Philips	2322 101 33105
R 814	Resistor	100 K ohms	0.33W	Philips	2322 101 33104
R 815	Resistor	3.9 K ohms	0.33W	Philips	2322 101 33392
R 816	Resistor	220 ohms	0.33W	Philips	2322 101 33221
R 817	Resistor	33 K ohms	0.33W	Philips	2322 101 33333
T 801	Transistor			Siemens	BC 148C
T 802	Transistor			Siemens	BC 157A
T 803	Transistor			Siemens	BC 147A
T 804	Transistor			Siemens	BC 148C
T 805	Transistor			Ph/Sie.	BF 199/BF 597

Measurement point	1	2	3	4	5	6	7	8
Voltage Vpp	1,3	1,4	0,025	0,56	1,1	0,12	0,14	12

Typical A.C. Voltages at Points on Main Diagram shown circled.

Tensions alternatives types, repérées sur le schéma général par les nombres entourés d'un cercle.

Condition de test:

Entrée antenne: 1 mV eff.

Circuit antenne: 250 pF en série avec 10 ohms ou 50 ohms seul.

Modulation du générateur de test: M.A.: 30 % 1 kHz.

Les tensions A.F. sont mesurées pour une puissance de sortie de 0,1 W.

Typically A.C. voltages indicated by circled numbers in main diagram.

Test conditions:

Antenna input: 1 mV RMS.

Dummy antenna: 250 pF in series with 10 ohm or 50 ohm alone.

Modulation of testgenerator: AM: 30 % 1 kHz.

AF voltages measured for 0,1 W output.

All voltages measured as peak to peak voltages with an oscilloscope. (Input impedance more than 1M Ω in parallel with max. 20pF).

Typiske vekselspændinger angivet ved indcirklede numre i hoveddiagrammet.

Målebetegnelser:

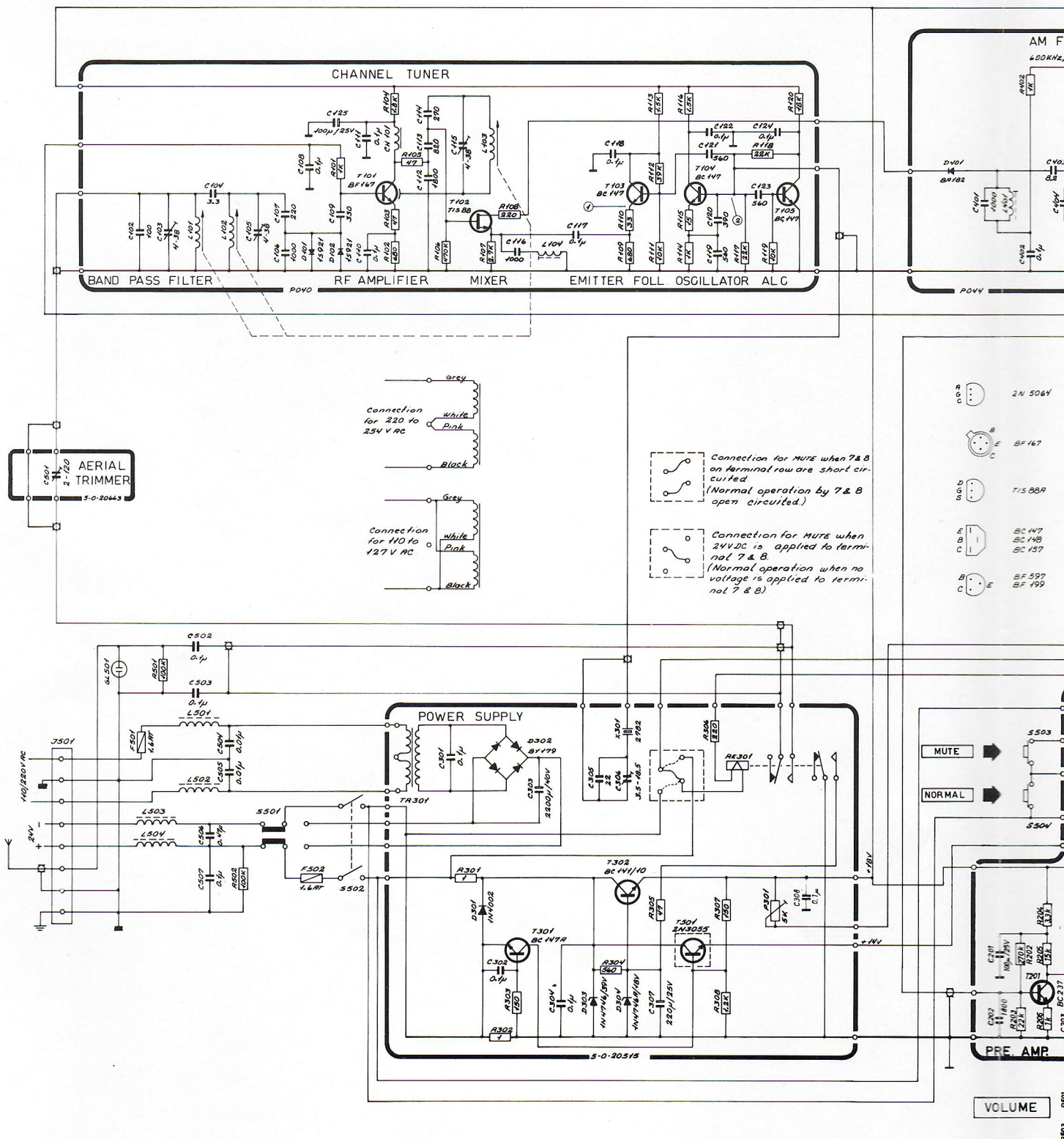
Antenne input: 1mV RMS.

Kunst antenne: 250 pF i serie med 10 ohm eller 50 ohm rent ohmsk.

Modulation af målesender: AM: 30 % 1 kHz.

LF spændinger målt for 0,1 W output.

Alle spændinger målt som spids-spids spændinger med oscilloscop. (Indgangsmodstand større end 1M Ω parallelt med max. 20 pF).



VOLUME

