



Sailor

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INSTRUCTION BOOK FOR
SAILOR VHF RT145
CONTROL UNIT C401 - C402 - C403
REMOTE CONTROL BOX H410



A/S S. P. RADIO · AALBORG · DENMARK

INTRODUCTION TO SAILOR VHF PROGRAMME

SAILOR VHF programme is comprising of a series of units which give a greater flexibility unknown until now as regards installation and operation.

The most simple combination comprises of e.g. the SAILOR VHF RT145, which can be mounted hidden away close to the aerial feed-through or the batteries. A 16 lead multicable is installed from the RT145 to the most suitable operational point where the SAILOR Control Unit e.g. C401 easily can be mounted because of its small dimensions.

The most comprehensive installation with an unlimited number of operation points also consists as mentioned above of one SAILOR VHF RT145 and a number of SAILOR Control Units e.g. C401 and a corresponding number of SAILOR Remote Control Boxes H410.

All operation points have full-function on the stations, and only one operation point at a time can be in operation. All other Remote Control Boxes show occupied.

One or more operation points can have preference so that they at all times can have the full function of the station which is suitable for the Control Unit on the bridge. If there is more than one operation point on the bridge, they can all have preference.

TECHNICAL DATA FOR VHF RT145

General:

Channel separation: 25 kHz
Modulation: Phase
Operation: Simplex and semi-duplex
Temperature range: -20°C to $+55^{\circ}\text{C}$
Frequency stability: ± 10 ppm
Antenna impedance: 50 ohm
Power supply: 12V DC or 24V DC
Power consumption: Stand by = 0,7 Amp.
Transmit = 5 Amp.
Voltage variation: -10% to $+30\%$
(with reduced data
according to in-
ternational stan-
dards)
Dimensions: Height = 220 mm
Width = 320 mm
Depth = 145 mm
Weight 7,5 kg

Receiver:

Frequency range simplex: 155,000 - 158,600 MHz
Frequency range semi-duplex: 159,600 - 163,200 MHz
Sensitivity: 0,25 uV pd at 12 dB SINAD
AF output: 0,8V RMS/300 ohm

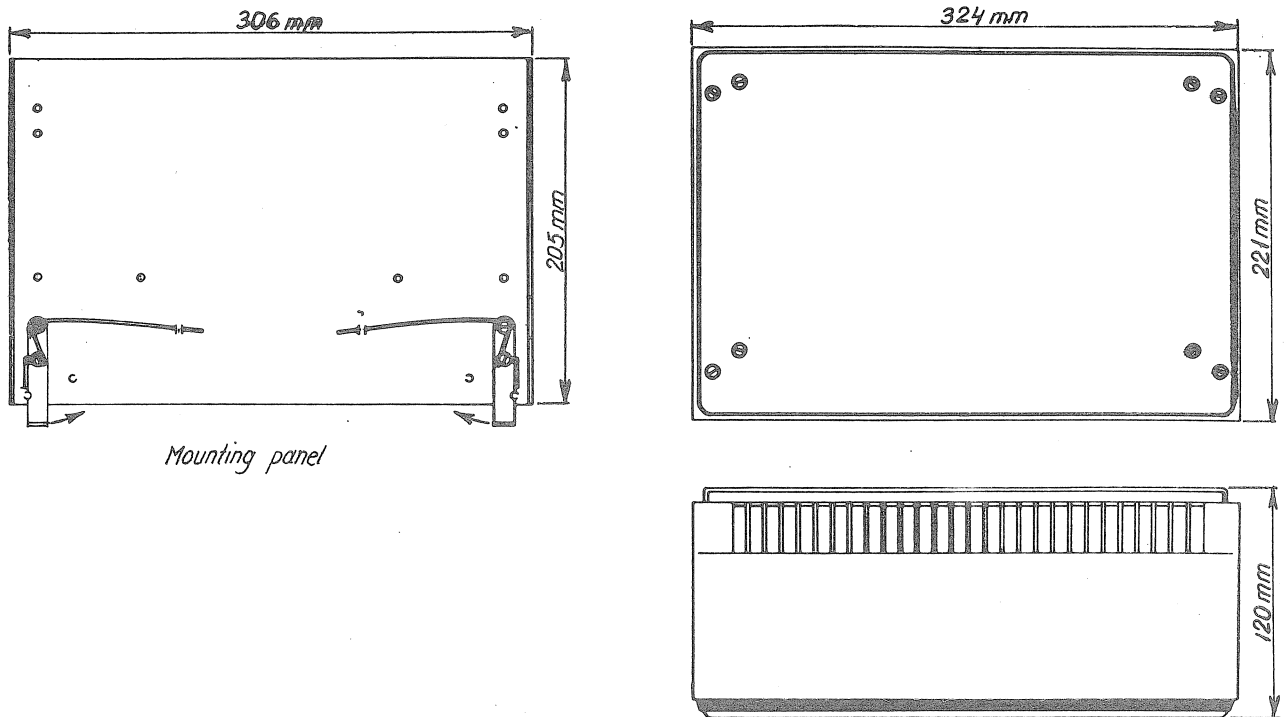
Transmitter:

Frequency range normal: 155,000 - 158,600 MHz
Frequency range special: 154,600 - 163,200 MHz
RF output power: 25 Watt
Reduced RF output: 1 Watt
Distortion: Less than 5%

OPERATING FREQUENCIES FOR SAILOR RT144AC/RT145

CHANNEL	TRANSMITTING FREQUENCY (MHz)	RECEIVING FREQUENCY (MHz)	
		US MODE (A.-CHANNELS)	INT'L MODE (INT.-CHANNELS)
01	156.050		160.650
02	156.100		160.700
03	156.150		160.750
04	156.200		160.800
05	156.250		160.850
06	156.300		156.300
07	156.350	156.350	160.950
08	156.400		156.400
09	156.450		156.450
10	156.500		156.500
11	156.550		156.550
12	156.600		156.600
13	156.650		156.650
14	156.700		156.700
15	156.750		156.750
16	156.800		156.800
17	156.850		156.850
18	156.900	156.900	161.500
19	156.950	156.950	161.550
20	157.000		161.600
21	157.050	157.050	161.650
22	157.100	157.100	161.700
23	157.150	157.150	161.750
24	157.200		161.800
25	157.250		161.850
26	157.300		161.900
27	157.350		161.950
28	157.400		162.000
60	156.025		160.625
61	156.075		160.675
62	156.125		160.725
63	156.175		160.775
64	156.225		160.825
65	156.275	156.275	160.875
66	156.325	156.325	160.925
67	156.375		156.375
68	156.425		156.425
69	156.475		156.475
70	156.525		156.525
71	156.575		156.575
72	156.625		156.625
73	156.675		156.675
74	156.725		156.725
77	156.875		156.875
78	156.925	156.925	161.525
79	156.975	156.975	161.575
80	157.025	157.025	161.625
81	157.075	157.075	161.675
82	157.125	157.125	161.725
83	157.175	157.175	161.775
84	157.225		161.825
85	157.275		161.875
86	157.325		161.925
87	157.375		161.975
88	157.425	157.425	162.025
WX1	Inhibit		162.550
WX2	Inhibit		162.400
WX3	Inhibit		162.475

INSTALLATION OF SAILOR VHF RT145



MOUNTING

The SAILOR VHF RT145 radiotelephone can easily be installed anywhere in the radio room or hidden away close to the antenna feed-through or the batteries. The mounting panel is fixed to the bulkhead by means of 4 screws. The set is hung up on this, there is 4 hooks on the mounting panel matching 4 slots at the back of the set. Two spring loaded locks prevent the set from becoming loose from this mounting panel. If the set has to be taken down, the locks must be pushed in the direction of the arrows, lifting the set simultaneously.

POWER SUPPLY

The SAILOR VHF RT145 can be delivered in two versions; for 12V DC supply and for 24V DC supply voltage.

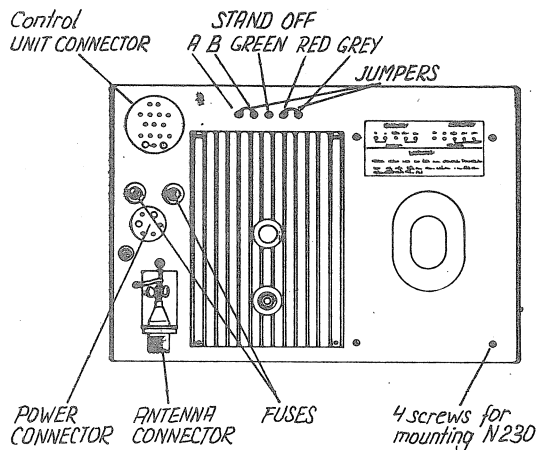
For 110V AC - 127V AC, 220V AC or 237V AC supply voltage an external power supply N163 must be used. In that case SAILOR VHF RT145 has to be a 24V DC version.

Please ascertain that the SAILOR VHF RT145 is set to 12V and 24V corresponding to the voltage of the mains of the vessel.

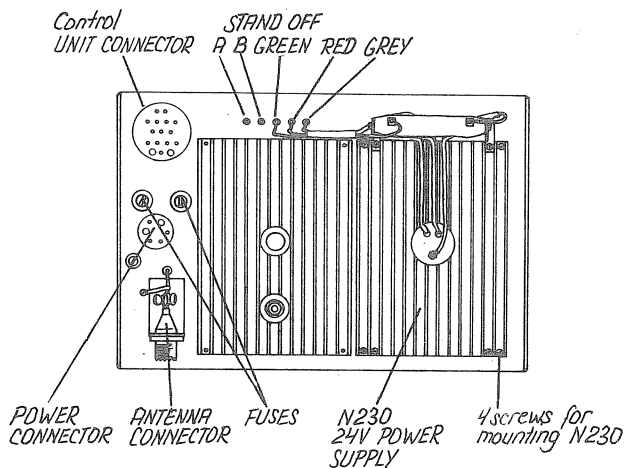
SAILOR VHF RT145 can easily be changed from 24V power supply to 12V power supply or vice versa.

Rear view of SAILOR RT145

12V VERSION



24V VERSION



Change from 12V power supply to 24V power supply:

Remove the jumpers from the stand-offs.

Mount the power supply unit N230.

Solder the three wires green-red-grey to the corresponding stand-offs.

Change from 24V power supply to 12V power supply:

Remove the wires from the stand-offs.

Remove the power supply N230.

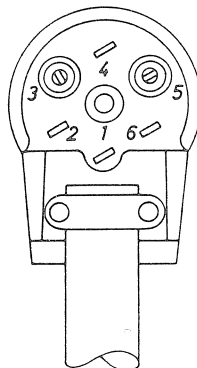
Solder a jumper between stand-offs marked A and B and a jumper between stand-offs marked red and grey.

When N230 has been dismantled, the screws placed in the holes intended for N230 must not exceed a length of 3 mm.

POWER CONNECTOR

View from mounting side.

- Pin 1. Connected to channel controlled relay contacts in special versions.
- Pin 2. E.g. for muting purposes.
- Pin 3. +12/24V power supply.
- Pin 4. No connection.
- Pin 5. -12/24V power supply.
- Pin 6. No connection.



ANTENNAS

All common 50 ohm antennas, which cover the used frequency range with a reasonable standing wave ratio, maximum 1:1.5, are applicable.

The antenna is connected to the set by means of a 50 ohm coaxial cable with low loss, e.g. RG8U. At the cable end a PL259 plug is mounted.

To ensure maximum operating range, the antenna should be mounted as high as possible, and the maximum distance to other metal parts must be at least 1 metre.

An antenna offering the necessary specifications can be delivered from S. P. Radio. This antenna is characterized by small external dimensions.

For further particulars see special brochure: VHF AERIALS.

NOTE!

If the connected control unit is placed in very noisy environments, it can be an advantage to reduce the sensitivity of the modulation circuitry, which under such circumstances can make the transmitted signal more understandable for the listener.

The modulator sensitivity is reduced by turning potentiometer R906 in the TX-exciter unit counter clockwise.

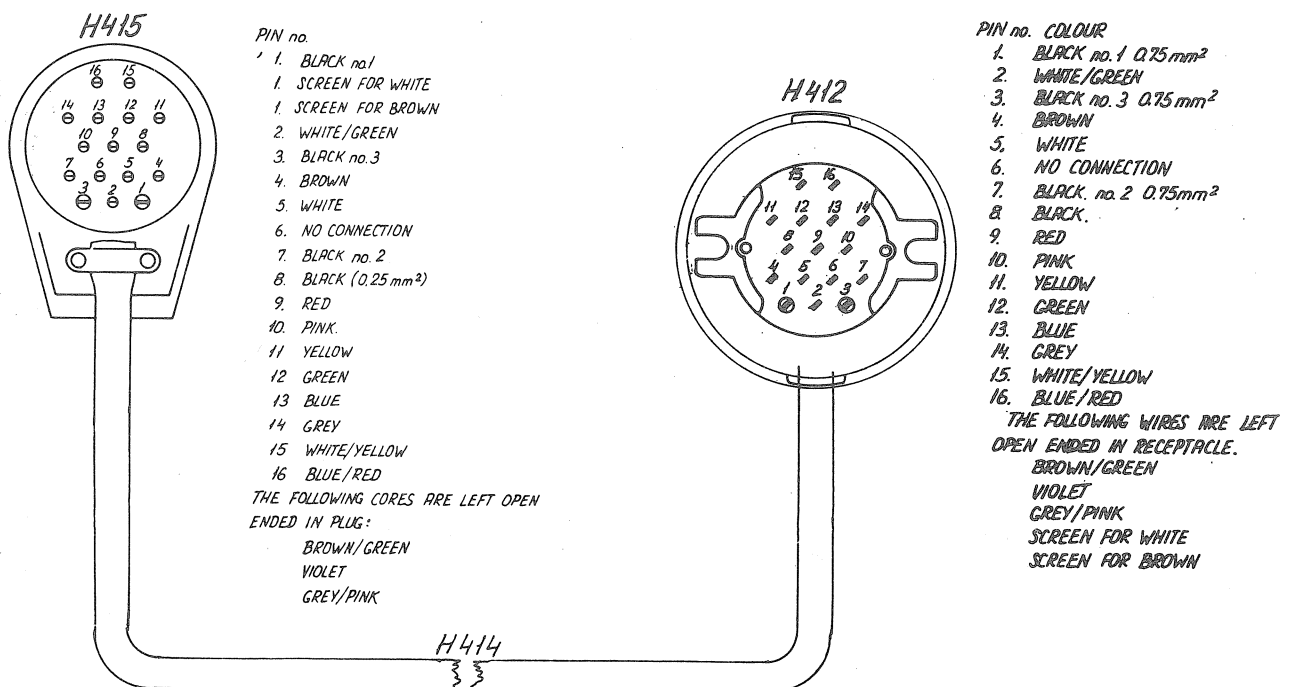
INSTALLATION OF CONTROL UNITS

Because of its small dimensions the VHF control units can be placed on the most convenient place for operation. The SAILOR MOUNTING PLATE H413 is fixed to the bulkhead by means of 4 screws. The control unit is placed at the mounting plate with the two hooks placed in the matching slots on the rear side of the control unit, and the control unit is pressed downwards until the spring loaded lock snaps in. The control unit is easily released from the mounting plate. The springlock arm is depressed and the control unit is pushed upwards. When mounted, the 16-pole plug on the cable from the control unit can be connected to the SAILOR VHF RT145 in either of the following three manners:

1. Directly to the 16-pole receptacle on the rear side of the transceiver.
2. To SAILOR CONNECTION BOX H412, when only one control unit is used and the multicable between RT145 and control unit has to be extended.
3. To SAILOR REMOTE CONTROL BOX H410, when more than one control unit has to be connected to the same SAILOR VHF RT145.

INSTALLATION OF SAILOR CONNECTION BOX H412

When the control unit has to be placed more than 1.5 metre away from the transceiver,* the multicable has to be extended by means of a 16-pole plug H415, SAILOR CONNECTION BOX H412 and the needed length of SAILOR MULTICABLE H414. The individual wires are soldered to the plug respectively the receptacle (H412) in the manner shown on the figure below.



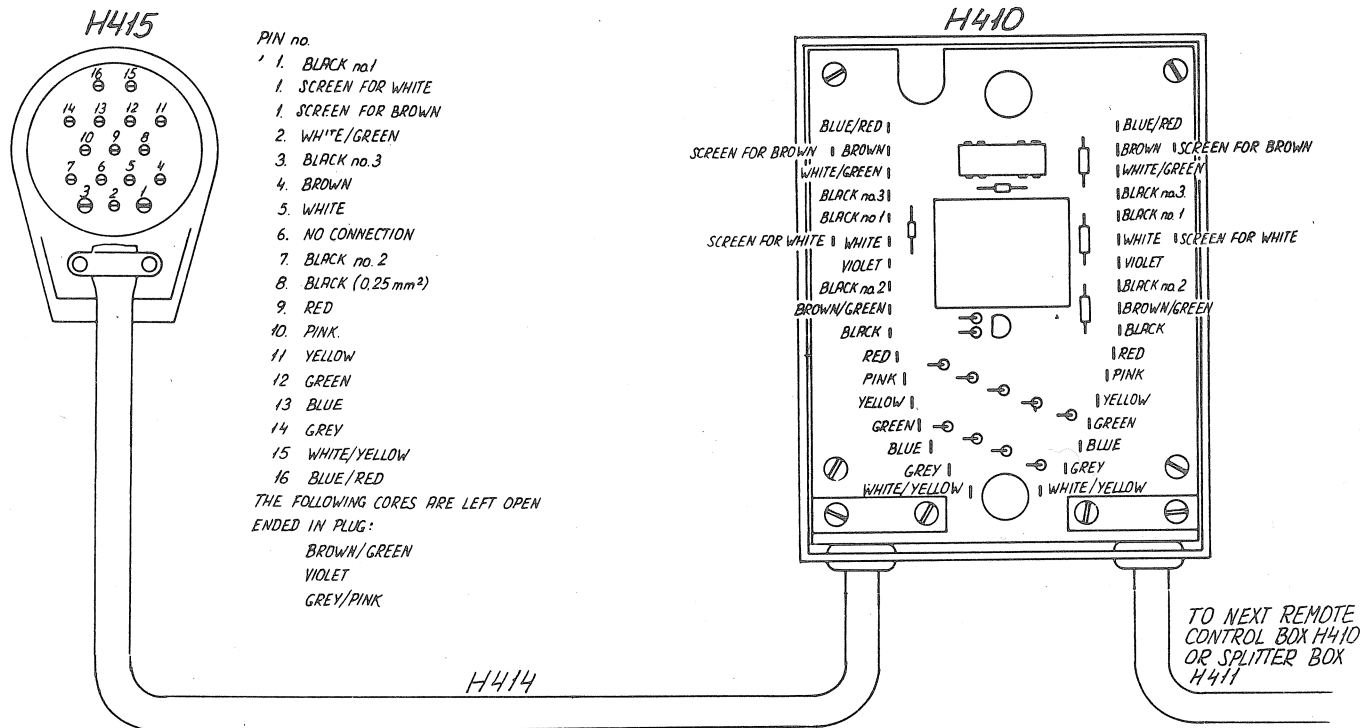
*
Max. 100 metres with 24 Volt supply.
Max. 40 metres with 12 Volt supply.

INSTALLATION OF SAILOR REMOTE CONTROL BOX H410

When more than one control unit has to be connected to SAILOR VHF RT145, the installation must be made by means of SAILOR REMOTE CONTROL BOX H410 and SAILOR MULTICABLE H414.

The individual wires in the multicable are soldered to the plug H415, respectively the REMOTE CONTROL BOX H410 in the manner shown below.

The distance between the VHF set and CONTROL UNIT must not exceed 100 metres with 24 Volt supply and 40 metres with 12 Volt supply.



When soldering the wires in H410, care must be taken to prevent a short-circuit between the screens around the white and brown wires. Therefore the two shielded wires are passed through the sleeveings - delivered with the remote control unit - before the plastic insulation is cut off and the stripped wires and the screens are soldered to the appropriate soldering lugs in H410.

The REMOTE CONTROL UNIT H410 is just fixed to the bulkhead by means of the two screws delivered with the unit.

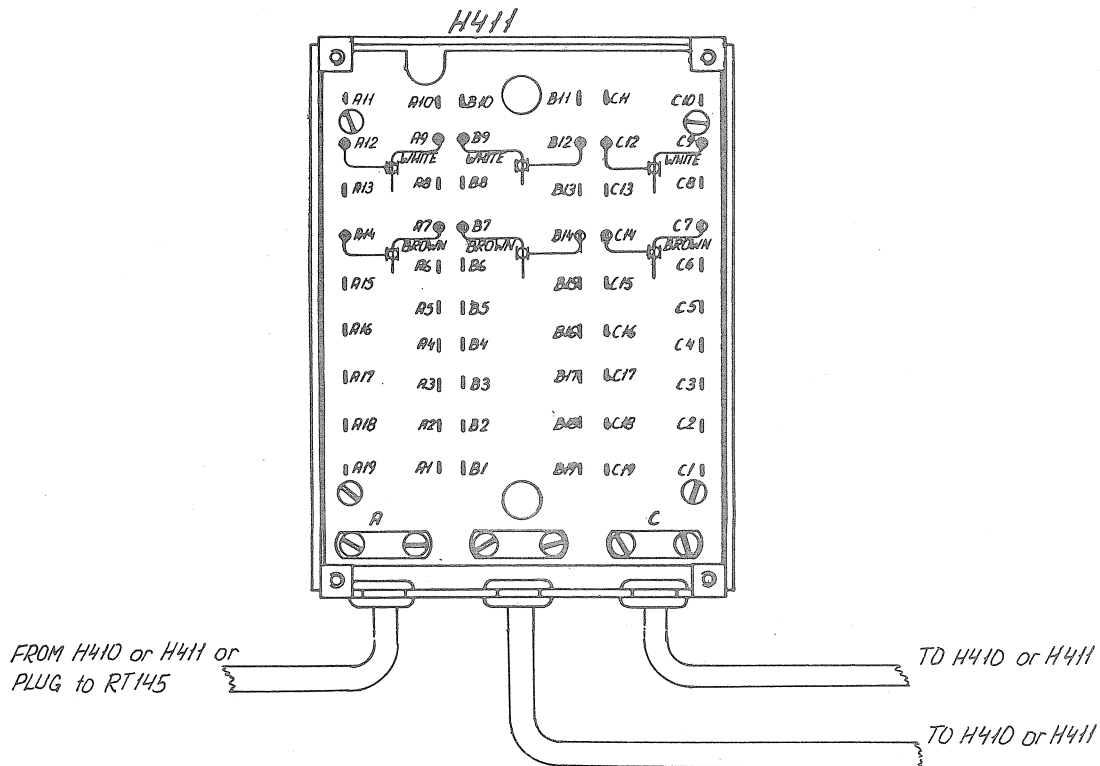
INSTALLATION OF SAILOR SPLITTER BOX H411

If a branch point is needed in the installation, the MULTICABLE H414 can be split up into two branches by means of SAILOR SPLITTER BOX H411.

The total length of cables in the installation must not exceed 200 metres.

The distance between the VHF set and a control-unit must not exceed 100 metres with 24V supply and 40 metres with 12V supply.

The installation of H411 is sketched and described below.



The screened wires in the three cables are soldered to the following lugs, as indicated on the printed circuit board:

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| A7: Brown in A. | B7: Brown in B. | C7: Brown in C. |
| A14: Screen for brown in A. | B14: Screen for brown in B. | C14: Screen for brown in C. |
| A9: White in A. | B9: White in B. | C9: White in C. |
| A12: Screen for white in A. | B12: Screen for white in B. | C12: Screen for white in C. |

To prevent a short-circuit between the screens around the white and brown wires, the two shielded wires are passed through the sleeveings - delivered with the splitter box - before the plastic insulation is cut off and the stripped wires and the screens are soldered to the appropriate soldering lugs in H411.

The remaining 15 wires can be soldered to the lugs as desired, the only demand is that the individual colours in the three cables are soldered to a set of lugs belonging together.

Ex. Blue in A to A3, blue in B to B3, blue in C to C3.

The grey/pink wire is not used and therefore just left open ended.

The splitter box is fixed to the bulkhead by means of two screws, delivered with the unit.

INSTALLATION OF AUXILIARY LOUDSPEAKER

If needed an 8 ohm external loudspeaker can be connected to a control unit. The external loudspeaker is coupled in parallel with the internal loudspeaker in the control unit by soldering the two wires for the ext. L.S. to the same two soldering lugs on the mounting panel as the internal loudspeaker is connected to.

The two wires for the ext. L.S. is taken through the plastic case covering the control unit in a hole which has to be made by the technician making the installation. The hole is made by biting off the thin part of the wall in the recess beside the feed-through for the cable to the microtelephone handset.

Precaution must be taken to avoid short-circuits between the two wires for the ext. L.S. and other wires, including ground.(DC on the wires).

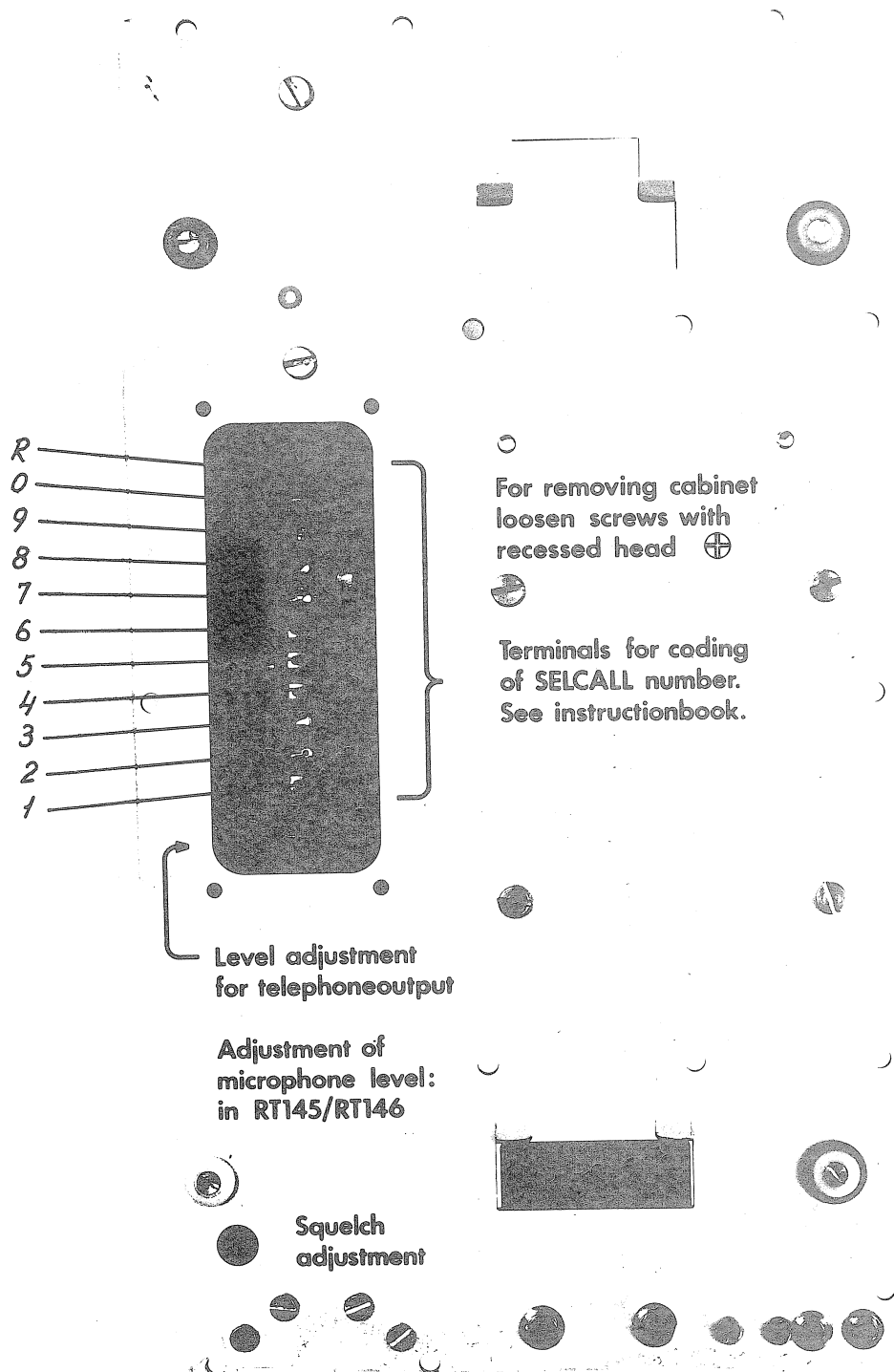
CODING OF SELCALL NUMBER :

The allocated call number is a five-figure number, and the coding is made by a simple soldering up of five wires. The colour of the five wires correspond to a certain figure-number, namely

- 1st figure - brown (most important figure)
- 2nd figure - red
- 3rd figure - orange
- 4th figure - yellow
- 5th figure - green (least important figure)

The five wires are soldered to the terminals carrying the numbers, which correspond to the figures of the call number, see photo.

If there are two identical figures in succession, the latter of them is to be soldered to (R).



PROGRAMMING OF PRIVATE CHANNELS

The programming of a SAILOR VHF RT145 is made by means of two PROM's. One used for the frequency code needed by the divider unit, and the other for the function codes concerning Block of RX/TX, Block of TX, Normal/Special TX, Full/Reduced power output and Simplex/Duplex operation.

A standard set of PROM's has all the international and U.S.A. maritime VHF channels permanently coded, and is prepared for coding of 20 private channels.

The two PROM's which are of the 256 x 8 bit type, are used in the following way:

CHANNEL-PROM IC204

PROM-output	Pin no.	Divider input
0 ₁	6	"1"
0 ₂	7	"2"
0 ₃	8	"4"
0 ₄	9	"8"
0 ₅	11	"16"
0 ₆	12	"32"
0 ₇	13	"64"
0 ₈	14	"128"

FUNCTION-PROM IC203

PROM-output	Pin no.	Function
0 ₁	6	Normally unused, left high.
0 ₂	7	Normally unused, left high.
0 ₃	8	Normally unused, left high.
0 ₄	9	High when RX/TX blocked Low when RX/TX not blocked
0 ₅	11	High when TX not blocked Low when TX blocked
0 ₆	12	High when Normal TX ($155,000 \text{ MHz} \leq f_{\text{TX}} \leq 158,600 \text{ MHz}$) Low when Special TX ($159,600 \text{ MHz} \leq f_{\text{TX}} \leq 163,200 \text{ MHz}$)
0 ₇	13	High when full power output Low when reduced power output
0 ₈	14	High when "Simplex" ($155,000 \text{ MHz} \leq f_{\text{RX}} \leq 158,600 \text{ MHz}$) Low when "Semiduplex" ($159,600 \text{ MHz} \leq f_{\text{RX}} \leq 163,200 \text{ MHz}$)

RT145

INPUT CODE FOR PROM'S

Inverting code for "10".

Input for PROM's:

	\bar{D}^{10}	\bar{C}^{10}	\bar{B}^{10}	\bar{A}^{10}
0	1	1	1	1
1	1	1	1	0
2	1	1	0	1
6	1	1	0	0
7	1	0	1	1
8	1	0	1	0
P	1	0	0	1
F	1	0	0	0

US - Mode:

$$\bar{D}^{10} = 0$$

Inverting code for "1".

Input for PROM's:

	\bar{D}^1	\bar{C}^1	\bar{B}^1	\bar{A}^1
0	1	1	1	1
1	1	1	1	0
2	1	1	0	1
3	1	1	0	0
4	1	0	1	1
5	1	0	1	0
6	1	0	0	1
7	1	0	0	0
8	0	1	1	1
9	0	1	1	0

PROM INDICATION

Under side: S.P. type No. - PRINT BOARD No. - IC No.

RT145
-22508-IC204

Top side: 5C for RT145 CHANNEL SELECTION

5C01:

5F for RT145 FUNCTIONS

5F01:

+ code for applications.

For special private channels:

Serial No. of RT145.

5C01:
232000

5F01:
232000

ADDRESS-TABLE

The PROM output codes for the individual channels are located in accordance with the following address-table.

CHAN- NEL	ADDRESS-CODE				COMMENTS
	INTERNATIONAL MODE		U.S.-MODE		
	BINARY-CODED	HEX-CODED	BINARY-CODED	HEX-CODED	
	A ₇	A ₀	A ₇	A ₀	
00	1 1 1 1 1 1 1 1	FF	0 1 1 1 1 1 1 1	7F	RX/TX Blocked
01	1 1 1 1 1 1 1 0	FE	0 1 1 1 1 1 1 0	7E	Duplex
02	1 1 1 1 1 1 0 1	FD	0 1 1 1 1 1 0 1	7D	Duplex
03	1 1 1 1 1 1 0 0	FC	0 1 1 1 1 1 0 0	7C	Duplex
04	1 1 1 1 1 0 1 1	FB	0 1 1 1 1 0 1 1	7B	Duplex
05	1 1 1 1 1 0 1 0	FA	0 1 1 1 1 0 1 0	7A	Duplex
06	1 1 1 1 1 0 0 1	F9	0 1 1 1 1 0 0 1	79	Simplex
07	1 1 1 1 1 0 0 0	F8	0 1 1 1 1 0 0 0	78	INT-Dupl/U.S.-Simpl.
08	1 1 1 1 0 1 1 1	F7	0 1 1 1 0 1 1 1	77	Simplex
09	1 1 1 1 0 1 1 0	F6	0 1 1 1 0 1 1 0	76	Simplex
10	1 1 1 0 1 1 1 1	EF	0 1 1 0 1 1 1 1	6F	Simplex
11	1 1 1 0 1 1 1 0	EE	0 1 1 0 1 1 1 0	6E	Simplex
12	1 1 1 0 1 1 0 1	ED	0 1 1 0 1 1 0 1	6D	Simplex
13	1 1 1 0 1 1 0 0	EC	0 1 1 0 1 1 0 0	6C	Simplex
14	1 1 1 0 1 0 1 1	EB	0 1 1 0 1 0 1 1	6B	Simplex
15	1 1 1 0 1 0 1 0	EA	0 1 1 0 1 0 1 0	6A	Reduced power
16	1 1 1 0 1 0 0 1	E9	0 1 1 0 1 0 0 1	69	Simplex
17	1 1 1 0 1 0 0 0	E8	0 1 1 0 1 0 0 0	68	Reduced power
18	1 1 1 0 0 1 1 1	E7	0 1 1 0 0 1 1 1	67	INT-Dupl/U.S.-Simpl.
19	1 1 1 0 0 1 1 0	E6	0 1 1 0 0 1 1 0	66	INT-Dupl/U.S.-Simpl.
20	1 1 0 1 1 1 1 1	DF	0 1 0 1 1 1 1 1	5F	Duplex
21	1 1 0 1 1 1 1 0	DE	0 1 0 1 1 1 1 0	5E	INT-Dupl/U.S.-Simpl.
22	1 1 0 1 1 1 0 1	DD	0 1 0 1 1 1 0 1	5D	INT-Dupl/U.S.-Simpl.
23	1 1 0 1 1 1 0 0	DC	0 1 0 1 1 1 0 0	5C	INT-Dupl/U.S.-Simpl.
24	1 1 0 1 1 0 1 1	DB	0 1 0 1 1 0 1 1	5B	Duplex
25	1 1 0 1 1 0 1 0	DA	0 1 0 1 1 0 1 0	5A	Duplex
26	1 1 0 1 1 0 0 1	D9	0 1 0 1 1 0 0 1	59	Duplex
27	1 1 0 1 1 0 0 0	D8	0 1 0 1 1 0 0 0	58	Duplex
28	1 1 0 1 0 1 1 1	D7	0 1 0 1 0 1 1 1	57	Duplex
29	1 1 0 1 0 1 1 0	D6	0 1 0 1 0 1 1 0	56	RX/TX Blocked
60	1 1 0 0 1 1 1 1	CF	0 1 0 0 1 1 1 1	4F	Duplex
61	1 1 0 0 1 1 1 0	CE	0 1 0 0 1 1 1 0	4E	Duplex
62	1 1 0 0 1 1 0 1	CD	0 1 0 0 1 1 0 1	4D	Duplex
63	1 1 0 0 1 1 0 0	CC	0 1 0 0 1 1 0 0	4C	Duplex

CHAN- NEL	ADDRESS-CODE				COMMENTS	
	INTERNATIONAL MODE		U.S.-MODE			
	BINARY-CODED	HEX-CODED	BINARY-CODED	HEX-CODED		
	A ₇	A ₀		A ₇	A ₀	
64	1 1 0 0 1 0 1 1	CB	0 1 0 0 1 0 1 1	4B	Duplex	
65	1 1 0 0 1 0 1 0	CA	0 1 0 0 1 0 1 0	4A	INT-Dupl/U.S.-Simpl.	
66	1 1 0 0 1 0 0 1	C9	0 1 0 0 1 0 0 1	49	INT-Dupl/U.S.-Simpl.	
67	1 1 0 0 1 0 0 0	C8	0 1 0 0 1 0 0 0	48	Simplex	
68	1 1 0 0 0 1 1 1	C7	0 1 0 0 0 1 1 1	47	Simplex	
69	1 1 0 0 0 1 1 0	C6	0 1 0 0 0 1 1 0	46	Simplex	
70	1 0 1 1 1 1 1 1	BF	0 0 1 1 1 1 1 1	3F	Simplex	
71	1 0 1 1 1 1 1 0	BE	0 0 1 1 1 1 1 0	3E	Simplex	
72	1 0 1 1 1 1 0 1	BD	0 0 1 1 1 1 0 1	3D	Simplex	
73	1 0 1 1 1 1 0 0	BC	0 0 1 1 1 1 0 0	3C	Simplex	
74	1 0 1 1 1 0 1 1	BB	0 0 1 1 1 0 1 1	3B	Simplex	
75	1 0 1 1 1 0 1 0	BA	0 0 1 1 1 0 1 0	3A	RX/TX Blocked	
76	1 0 1 1 1 0 0 1	B9	0 0 1 1 1 0 0 1	39	RX/TX Blocked	
77	1 0 1 1 1 0 0 0	B8	0 0 1 1 1 0 0 0	38	Simplex	
78	1 0 1 1 0 1 1 1	B7	0 0 1 1 0 1 1 1	37	INT-Dupl/U.S.-Simpl.	
79	1 0 1 1 0 1 1 0	B6	0 0 1 1 0 1 1 0	36	INT-Dupl/U.S.-Simpl.	
80	1 0 1 0 1 1 1 1	AF	0 0 1 0 1 1 1 1	2F	INT-Dupl/U.S.-Simpl.	
81	1 0 1 0 1 1 1 0	AE	0 0 1 0 1 1 1 0	2E	INT-Dupl/U.S.-Simpl.	
82	1 0 1 0 1 1 0 1	AD	0 0 1 0 1 1 0 1	2D	INT-Dupl/U.S.-Simpl.	
83	1 0 1 0 1 1 0 0	AC	0 0 1 0 1 1 0 0	2C	INT-Dupl/U.S.-Simpl.	
84	1 0 1 0 1 0 1 1	AB	0 0 1 0 1 0 1 1	2B	Duplex	
85	1 0 1 0 1 0 1 0	AA	0 0 1 0 1 0 1 0	2A	Duplex	
86	1 0 1 0 1 0 0 1	A9	0 0 1 0 1 0 0 1	29	Duplex	
87	1 0 1 0 1 0 0 0	A8	0 0 1 0 1 0 0 0	28	Duplex	
88	1 0 1 0 0 1 1 1	A7	0 0 1 0 0 1 1 1	27	INT-Dupl/U.S.-Simpl.	
89	1 0 1 0 0 1 1 0	A6	0 0 1 0 0 1 1 0	26	RX/TX Blocked	
P0	1 0 0 1 1 1 1 1	9F	0 0 0 1 1 1 1 1	1F	Private channel	
P1	1 0 0 1 1 1 1 0	9E	0 0 0 1 1 1 1 0	1E	Private channel	
P2	1 0 0 1 1 1 0 1	9D	0 0 0 1 1 1 0 1	1D	Private channel	
P3	1 0 0 1 1 1 0 0	9C	0 0 0 1 1 1 0 0	1C	Private channel	
P4	1 0 0 1 1 0 1 1	9B	0 0 0 1 1 0 1 1	1B	Private channel	
P5	1 0 0 1 1 0 1 0	9A	0 0 0 1 1 0 1 0	1A	Private channel	
P6	1 0 0 1 1 0 0 1	99	0 0 0 1 1 0 0 1	19	Private channel	
P7	1 0 0 1 1 0 0 0	98	0 0 0 1 1 0 0 0	18	Private channel	
P8	1 0 0 1 0 1 1 1	97	0 0 0 1 0 1 1 1	17	Private channel	
P9	1 0 0 1 0 1 1 0	96	0 0 0 1 0 1 1 0	16	Private channel	
F0	1 0 0 0 1 1 1 1	8F	0 0 0 0 1 1 1 1	0F	Private channel	
F1	1 0 0 0 1 1 1 0	8E	0 0 0 0 1 1 1 0	0E	Private channel	

CHAN- NEL	ADDRESS-CODE				COMMENTS
	INTERNATIONAL MODE		U.S.-MODE		
	BINARY-CODED	HEX-CODED	BINARY-CODED	HEX-CODED	
	A ₇	A ₀	A ₇	A ₀	
F2	1 0 0 0 1 1 0 1	8D	0 0 0 0 1 1 0 1	0D	Private channel
F3	1 0 0 0 1 1 0 0	8C	0 0 0 0 1 1 0 0	0C	Private channel
F4	1 0 0 0 1 0 1 1	8B	0 0 0 0 1 0 1 1	0B	Private channel
F5	1 0 0 0 1 0 1 0	8A	0 0 0 0 1 0 1 0	0A	Private channel
F6	1 0 0 0 1 0 0 1	89	0 0 0 0 1 0 0 1	09	Private channel
F7	1 0 0 0 1 0 0 0	88	0 0 0 0 1 0 0 0	08	Private channel
F8	1 0 0 0 0 1 1 1	87	0 0 0 0 0 1 1 1	07	Private channel
F9	1 0 0 0 0 1 1 0	86	0 0 0 0 0 1 1 0	06	Private channel

PROGRAMMING OF FUNCTION PROM.

In the table below is listed the types of private channels which are possible, and the associated codes which have to be programmed in the function PROM at the appropriate channel address.

Type	"Simplex"/"Duplex"	Normal/ Special TX	TX-Blocked	Full power/ Reduced power	PROM output code	
					Binary	HEX
A	"Simplex"	Normal	No	Full power	0 ₈ 1 1 1 1 0 1 1 1	0 ₁ F7
B	"Simplex"	Normal	No	Reduced power	1 0 1 1 0 1 1 1	B7
C	"Duplex"	Normal	No	Full power	0 1 1 1 0 1 1 1	77
D	"Duplex"	Normal	No	Reduced power	0 0 1 1 0 1 1 1	37
E	"Simplex"	Normal	Yes	Reduced power	1 1 1 0 0 1 1 1	E7
F	"Duplex"	Normal	Yes	Reduced power	0 1 1 0 0 1 1 1	67
G	"Simplex"	Special	No	Full power	1 1 0 1 0 1 1 1	D7
H	"Simplex"	Special	No	Reduced power	1 0 0 1 0 1 1 1	97
I	"Duplex"	Special	No	Full power	0 1 0 1 0 1 1 1	57
J	"Duplex"	Special	No	Reduced power	0 0 0 1 0 1 1 1	17

The private channels can be selected in the following frequency ranges:

Receiver: "Simplex" operation $155,000 \text{ MHz} \leq f_{RX} \leq 158,600 \text{ MHz}$
Semi-"Duplex" operation $159,600 \text{ MHz} \leq f_{RX} \leq 163,200 \text{ MHz}$

Transmitter: Normal $155,000 \text{ MHz} \leq f_{TX} \leq 158,600 \text{ MHz}$
Special $159,600 \text{ MHz} \leq f_{TX} \leq 163,200 \text{ MHz}$

FREQUENCY CODE TABLE

In the table below is listed the frequency output codes for the divider, which must be programmed into the CHANNEL PROM at the appropriate addresses for the private channels. (The possible address codes are found in the address table).

Frequency MHz	FREQUENCY CODE	
	BINARY-CODED	HEX-CODED
	0 ₈ 0 ₁	
155,000	1 1 0 1 0 1 0 1	D5
155,025	1 1 0 1 0 1 0 0	D4
155,050	1 1 0 1 0 0 1 1	D3
155,075	1 1 0 1 0 0 1 0	D2
155,100	1 1 0 1 0 0 0 1	D1
155,125	1 1 0 1 0 0 0 0	D0
155,150	1 1 0 0 1 1 1 1	CF
155,175	1 1 0 0 1 1 1 0	CE
155,200	1 1 0 0 1 1 0 1	CD
155,225	1 1 0 0 1 1 0 0	CC
155,250	1 1 0 0 1 0 1 1	CB
155,275	1 1 0 0 1 0 1 0	CA
155,300	1 1 0 0 1 0 0 1	C9
155,325	1 1 0 0 1 0 0 0	C8
155,350	1 1 0 0 0 1 1 1	C7
155,375	1 1 0 0 0 1 1 0	C6
155,400	1 1 0 0 0 1 0 1	C5
155,425	1 1 0 0 0 1 0 0	C4
155,450	1 1 0 0 0 0 1 1	C3
155,475	1 1 0 0 0 0 1 0	C2
155,500	1 1 0 0 0 0 0 1	C1
155,525	1 1 0 0 0 0 0 0	C0
155,550	1 0 1 1 1 1 1 1	BF
155,575	1 0 1 1 1 1 1 0	BE
155,600	1 0 1 1 1 1 0 1	BD
155,625	1 0 1 1 1 1 0 0	BC
155,650	1 0 1 1 1 0 1 1	BB
155,675	1 0 1 1 1 0 1 0	BA
155,700	1 0 1 1 1 0 0 1	B9
155,725	1 0 1 1 1 0 0 0	B8
155,750	1 0 1 1 0 1 1 1	B7
155,775	1 0 1 1 0 1 1 0	B6
155,800	1 0 1 1 0 1 0 1	B5
155,825	1 0 1 1 0 1 0 0	B4
155,850	1 0 1 1 0 0 1 1	B3

Frequency MHz	FREQUENCY CODE	
	BINARY-CODED	HEX-CODED
	0 ₈ 0 ₁	
155,875	1 0 1 1 0 0 1 0	B2
155,900	1 0 1 1 0 0 0 1	B1
155,925	1 0 1 1 0 0 0 0	B0
155,950	1 0 1 0 1 1 1 1	AF
155,975	1 0 1 0 1 1 1 0	AE
156,000	1 0 1 0 1 1 0 1	AD
156,025	1 0 1 0 1 1 0 0	AC
156,050	1 0 1 0 1 0 1 1	AB
156,075	1 0 1 0 1 0 1 0	AA
156,100	1 0 1 0 1 0 0 1	A9
156,125	1 0 1 0 1 0 0 0	A8
156,150	1 0 1 0 0 1 1 1	A7
156,175	1 0 1 0 0 1 1 0	A6
156,200	1 0 1 0 0 1 0 1	A5
156,225	1 0 1 0 0 1 0 0	A4
156,250	1 0 1 0 0 0 1 1	A3
156,275	1 0 1 0 0 0 1 0	A2
156,300	1 0 1 0 0 0 0 1	A1
156,325	1 0 1 0 0 0 0 0	A0
156,350	1 0 0 1 1 1 1 1	9F
156,375	1 0 0 1 1 1 1 0	9E
156,400	1 0 0 1 1 1 0 1	9D
156,425	1 0 0 1 1 1 0 0	9C
156,450	1 0 0 1 1 0 1 1	9B
156,475	1 0 0 1 1 0 1 0	9A
156,500	1 0 0 1 1 0 0 1	99
156,525	1 0 0 1 1 0 0 0	98
156,550	1 0 0 1 0 1 1 1	97
156,575	1 0 0 1 0 1 1 0	96
156,600	1 0 0 1 0 1 0 1	95
156,625	1 0 0 1 0 1 0 0	94
156,650	1 0 0 1 0 0 1 1	93
156,675	1 0 0 1 0 0 1 0	92
156,700	1 0 0 1 0 0 0 1	91
156,725	1 0 0 1 0 0 0 0	90
156,750	1 0 0 0 1 1 1 1	8F
156,775	1 0 0 0 1 1 1 0	8E
156,800	1 0 0 0 1 1 0 1	8D
156,825	1 0 0 0 1 1 0 0	8C
156,850	1 0 0 0 1 0 1 1	8B

Frequency MHz	FREQUENCY CODE	
	BINARY-CODED	HEX-CODED
	0 ₈ 0 ₁	
156,875	1 0 0 0 1 0 1 0	8A
156,900	1 0 0 0 1 0 0 1	89
156,925	1 0 0 0 1 0 0 0	88
156,950	1 0 0 0 0 1 1 1	87
156,975	1 0 0 0 0 1 1 0	86
157,000	1 0 0 0 0 1 0 1	85
157,025	1 0 0 0 0 1 0 0	84
157,050	1 0 0 0 0 0 1 1	83
157,075	1 0 0 0 0 0 1 0	82
157,100	1 0 0 0 0 0 0 1	81
157,125	1 0 0 0 0 0 0 0	80
157,150	0 1 1 1 1 1 1 1	7F
157,175	0 1 1 1 1 1 1 0	7E
157,200	0 1 1 1 1 1 0 1	7D
157,225	0 1 1 1 1 1 0 0	7C
157,250	0 1 1 1 1 0 1 1	7B
157,275	0 1 1 1 1 0 1 0	7A
157,300	0 1 1 1 1 0 0 1	79
157,325	0 1 1 1 1 0 0 0	78
157,350	0 1 1 1 0 1 1 1	77
157,375	0 1 1 1 0 1 1 0	76
157,400	0 1 1 1 0 1 0 1	75
157,425	0 1 1 1 0 1 0 0	74
157,450	0 1 1 1 0 0 1 1	73
157,475	0 1 1 1 0 0 1 0	72
157,500	0 1 1 1 0 0 0 1	71
157,525	0 1 1 1 0 0 0 0	70
157,550	0 1 1 0 1 1 1 1	6F
157,575	0 1 1 0 1 1 1 0	6E
157,600	0 1 1 0 1 1 0 1	6D
157,625	0 1 1 0 1 1 0 0	6C
157,650	0 1 1 0 1 0 1 1	6B
157,675	0 1 1 0 1 0 1 0	6A
157,700	0 1 1 0 1 0 0 1	69
157,725	0 1 1 0 1 0 0 0	68
157,750	0 1 1 0 0 1 1 1	67
157,775	0 1 1 0 0 1 1 0	66
157,800	0 1 1 0 0 1 0 1	65
157,825	0 1 1 0 0 1 0 0	64
157,850	0 1 1 0 0 0 1 1	63

Frequency MHz	FREQUENCY CODE	
	BINARY-CODED	HEX-CODED
	0 ₈ 0 ₁	
157,875	0 1 1 0 0 0 1 0	62
157,900	0 1 1 0 0 0 0 1	61
157,925	0 1 1 0 0 0 0 0	60
157,950	0 1 0 1 1 1 1 1	5F
157,975	0 1 0 1 1 1 1 0	5E
158,000	0 1 0 1 1 1 0 1	5D
158,025	0 1 0 1 1 1 0 0	5C
158,050	0 1 0 1 1 0 1 1	5B
158,075	0 1 0 1 1 0 1 0	5A
158,100	0 1 0 1 1 0 0 1	59
158,125	0 1 0 1 1 0 0 0	58
158,150	0 1 0 1 0 1 1 1	57
158,175	0 1 0 1 0 1 1 0	56
158,200	0 1 0 1 0 1 0 1	55
158,225	0 1 0 1 0 1 0 0	54
158,250	0 1 0 1 0 0 1 1	53
158,275	0 1 0 1 0 0 1 0	52
158,300	0 1 0 1 0 0 0 1	51
158,325	0 1 0 1 0 0 0 0	50
158,350	0 1 0 0 1 1 1 1	4F
158,375	0 1 0 0 1 1 1 0	4E
158,400	0 1 0 0 1 1 0 1	4D
158,425	0 1 0 0 1 1 0 0	4C
158,450	0 1 0 0 1 0 1 1	4B
158,475	0 1 0 0 1 0 1 0	4A
158,500	0 1 0 0 1 0 0 1	49
158,525	0 1 0 0 1 0 0 0	48
158,550	0 1 0 0 0 1 1 1	47
158,575	0 1 0 0 0 1 1 0	46
158,600	0 1 0 0 0 1 0 1	45

The above listed frequency codes shall always be used.
If the receiving frequency has to be in the frequency range 159,600 - 163,200 MHz (f_{listed} + 4,6 MHz), the channel has to be programmed as a semi-duplex channel in the FUNCTION PROM IC203.

Programming example:

A. Private simplex channel in P2 with full transmitter power at the frequency 155,875 MHz.

The channel address code is found in the ADDRESS TABLE:

		A ₇	A ₀	
	In international mode	1 0 0 1 1 1 0 1		(9D)
ADDRESS for P2 =	In U.S.A.-mode	0 0 0 1 1 1 0 1		(1D)

The frequency code is found in the table:

	O ₈	O ₁	
155,875 MHz is coded as	1 0 1 1 0 0 1 0		(B2)

Now the two addresses for P2 (1 0 0 1 1 1 0 1 and 0 0 0 1 1 1 0 1) is programmed with the output code (1 0 1 1 0 0 1 0) in the CHANNEL PROM IC204.

The private channel type is identified in the table PROGRAMMING of FUNCTION PROM, here type A.

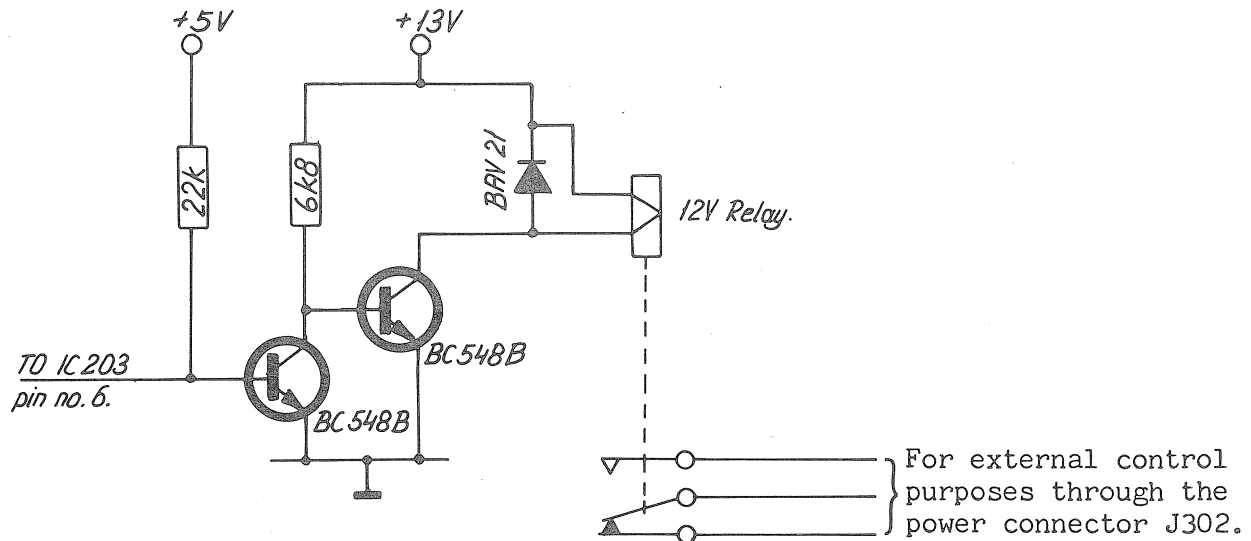
The corresponding PROM-output code (1 1 1 1 0 1 1 1) is programmed into the FUNCTION PROM IC203 in the two addresses for P2 (1 0 0 1 1 1 0 1 and 0 0 0 1 1 1 0.1).

As a special feature the FUNCTION PROM IC203 can be programmed in such a way that one or more channels can be provided with a logical low output level. This information could e.g. be used to control a relay contact (e.g. for blocking of auxiliary receivers).

All the possible codes programmed into the FUNCTION PROM IC203 on channels where RX/TX is not blocked will be of the type X X X X 0 1 1 1 or in hex-coded X7.

If a channel has to provide a logic low level for external control purposes, it must be programmed as a 0 as the least significant bit in the output code, so the output codes on such channels will be of the type X X X X 0 1 1 0 or in hex-code X6, which means that O₁ (pin no. 6) on IC203 will be low when the appropriate channel is selected.

For external control purposes the following circuit is recommended.



The relay contact will be drawn when the output O₁ on pin no. 6 IC203 goes low.

GENERAL DESCRIPTION

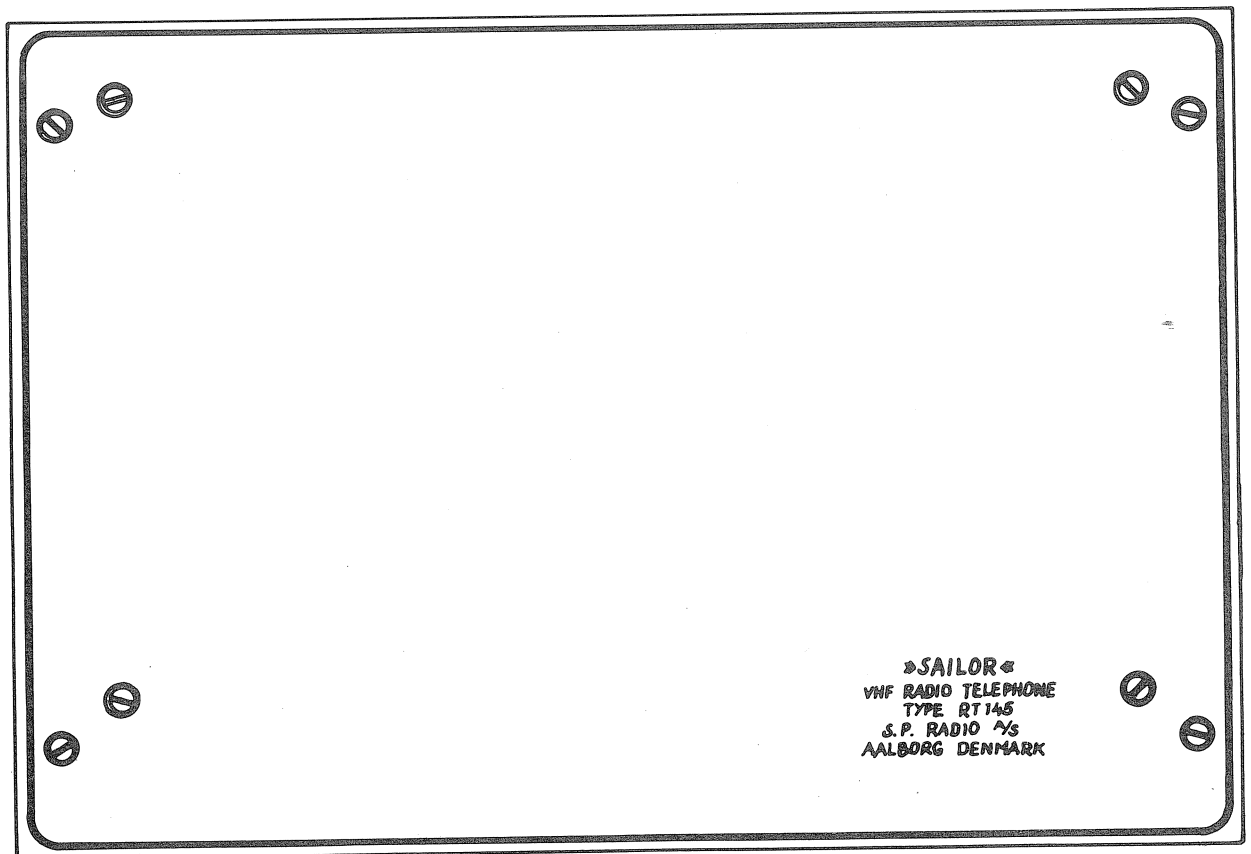
SAILOR VHF RT145 is an all transistorized maritime VHF telecommunication set for ship/ship and ship/shore communication. Can operate in simplex and semi-duplex mode.

SAILOR RT145 is built into an all welded steel cabinet with anti rust coated surface and nylon finish.

SAILOR RT145 is designed to be used in conjunction with the VHF Control Units C401, C402, C403.

SAILOR RT145 uses a digital synthesizer for frequency generation. The set has only one crystal to provide all channels and the 20 optional private channels.

SAILOR RT145 fulfils the international C.E.P.T. regulations and national regulations for maritime VHF radiotelephones.



CIRCUIT DESCRIPTION

RX-AMPLIFIER-UNIT

The RX-Amplifier-Unit is comprising the following circuits.

RF-Amplifier and first mixer

The receiver works in the frequency band 155,0 MHz – 163,2 MHz. The receiver front end is variably tuned to the frequency selected on the channel selector.

From the aerial the signal is led through the aerial relay to the RF-Amplifier stage T101.

The input transistor T101 is a low noise transistor, which is capable of handling powerful signals.

A double tuned filter before the transistor T101 and a double tuned filter after provide the necessary selectivity towards spurious signals.

These filters are variably tuned by the variocap. diodes D101, D103,

D104 and D105. The DC-tuning voltages to the diodes (RX-control) is delivered from the loop-filter in the phase-locked loop. From the double tuned filter the signal is led to the gate of the first mixer T102. The local oscillator injection signal passes the variably tuned filter and is coupled to the gate of the first mixer T102 via printed capacitor CP103.

The IF-signal of 10,7 MHz is fed from the matching network L105, C120 and C121 to the crystal-filter FL101, which alone is providing for the adjacent channel selectivity of the receiver.

Second mixer

By means of the circuit L107 and C126 the crystal filter is impedance-

matched to the mixer transistor T103.

The 11,1 MHz injection signal is amplified in transistor T104 and fed via capacitor C128 to the base of the mixer transistor T103. The diodes D107 and D108 protect the circuit against high level aerial signals.

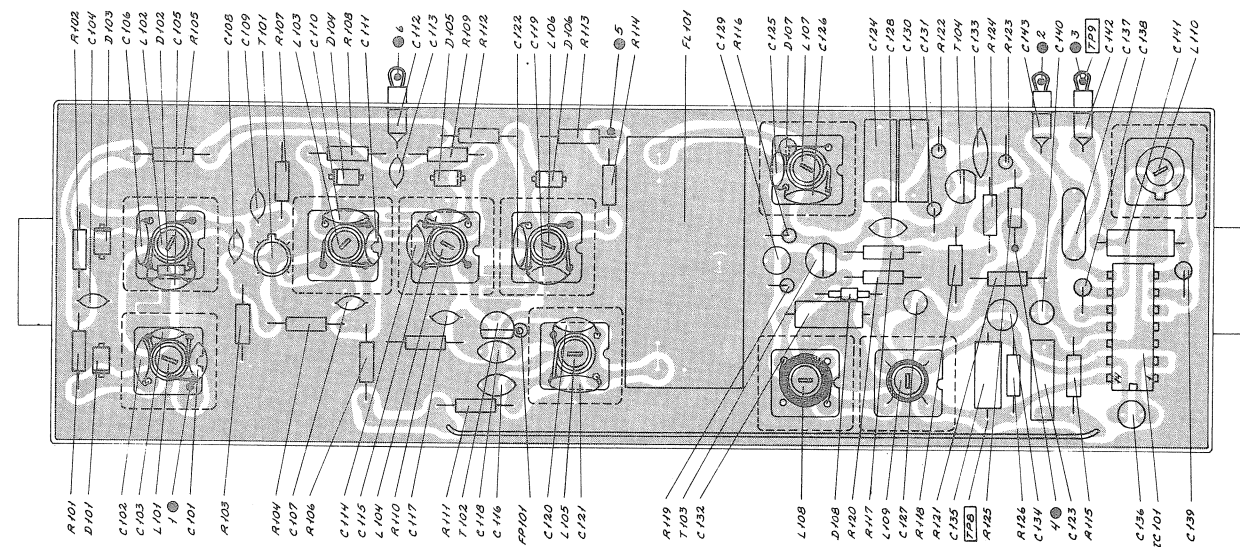
400 kHz IF-amplifier and discriminator

The 400 kHz mixer product is via the filter, comprising the components L108, L109, C132 and C135, fed to the integrated amplifier IC101 in which the final amplification of the IF-signal takes place. This amplification is so high that the amplifier itself provides for a limitation of the signal, so that AM-

modulation and noise will be eliminated.

The integrated amplifier IC101 also comprises the discriminator circuits.

The audio is taken from IC101 pin 8 to the AUDIO-AMPLIFIER-UNIT.

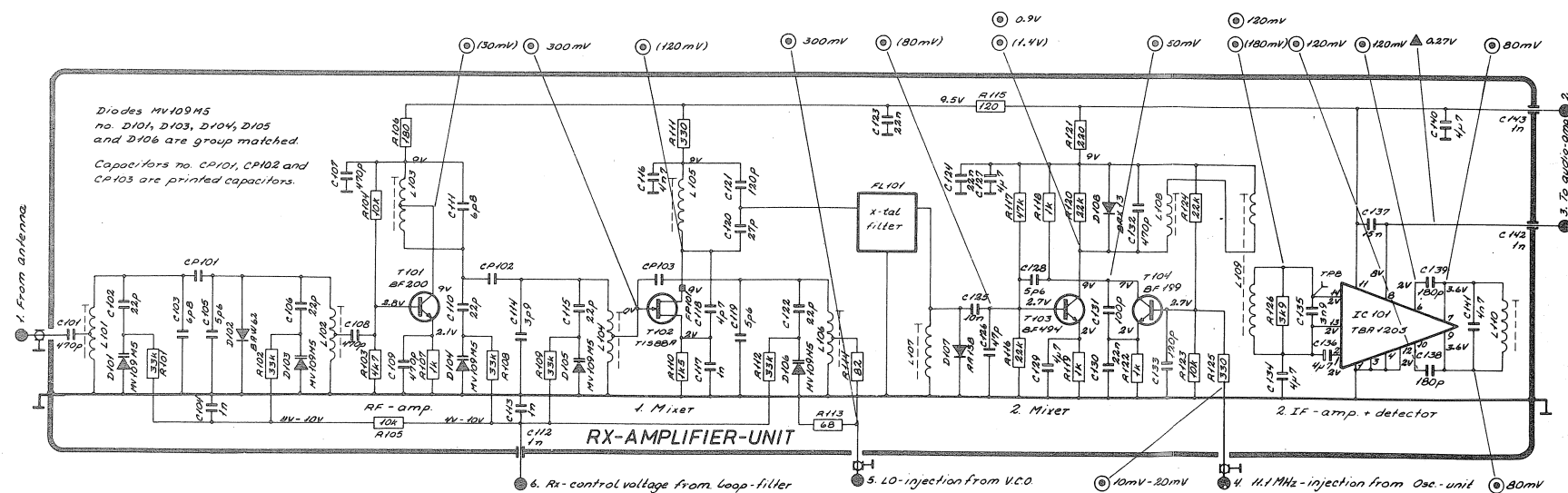


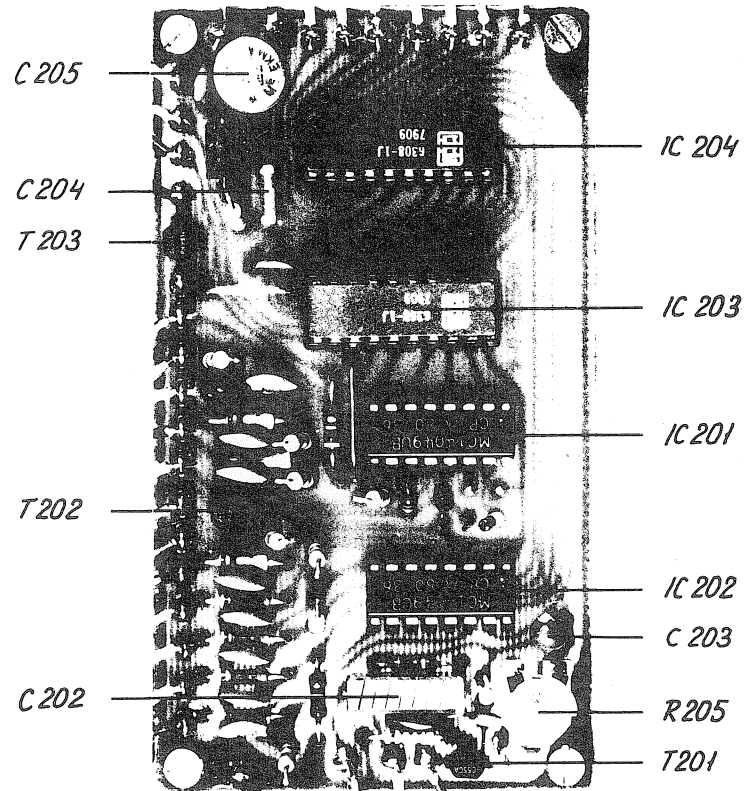
AC voltages outside frame of diagram.

- ▲: Measured with AF-voltmeter.
- : Measured with testprobe
- : Connections to module.
- TP: Testpoint.

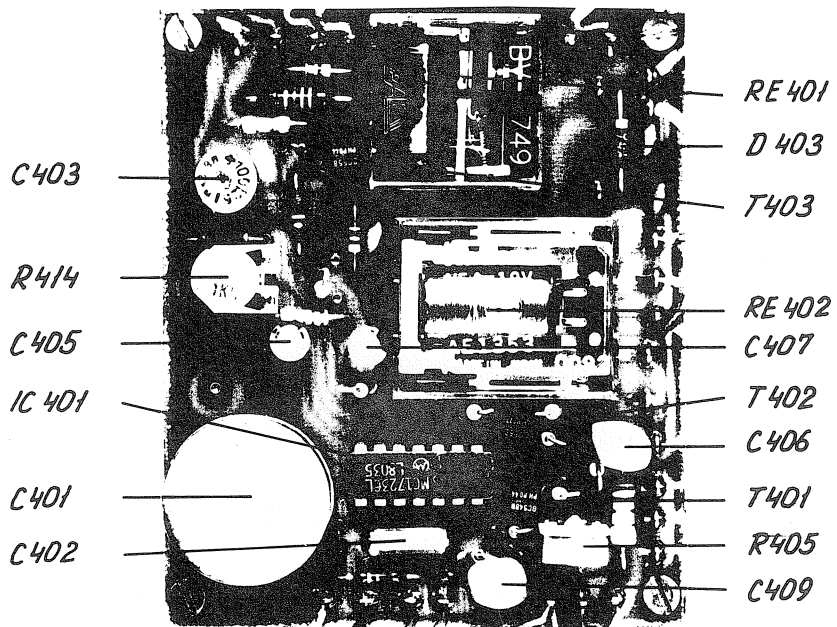
Testconditions:

- Voltages without brackets:
Antenna signal 1 mV EMF; $\Delta f = \pm 3$ kHz; $f_m = 1$ kHz.
- Voltages in brackets:
Antenna signal 10 mV EMF; $\Delta f = \pm 3$ kHz; $f_m = 1$ kHz.





PROGRAMMING - UNIT (200)



SUPPLY-UNIT (400)

OSCILLATOR-UNIT

The Oscillator-Unit comprises the following circuits.

Oscillator

The transistor T501 is oscillating by means of a 11,1 MHz crystal. From the emitter of T501, 11,1 MHz - injection signal for second mixer is taken.

From the collector of T501, 11,1 MHz signal is fed via L501 to reference-driver.

Signal for the multiplier is also taken from the collector of T501 and by means of the double tuned filter comprising the components L502, L503, C513, C514 and C515, only third overtone is by-passed to the transistor T502.

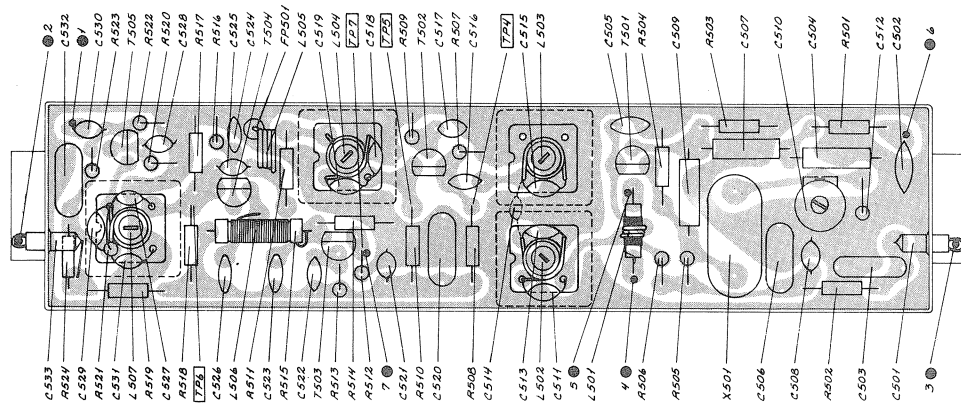
Multiplier

The transistor T502 is multiplying with four and the bandpass filter comprising the components L504,

C518 and C519 is adjusted to 12x11,1 MHz.

Mixer and amplifier

The feed-back signal from the V.C.O. is amplified in the transistor T505 and fed via capacitor C527 to the mixer transistor T504. The mixer product is led to amplifier T503 via filter comprising the components L506, C523 and C526. From amplifier T504 the variable frequency signal is taken to the pro-driver in DIVIDER-UNIT.

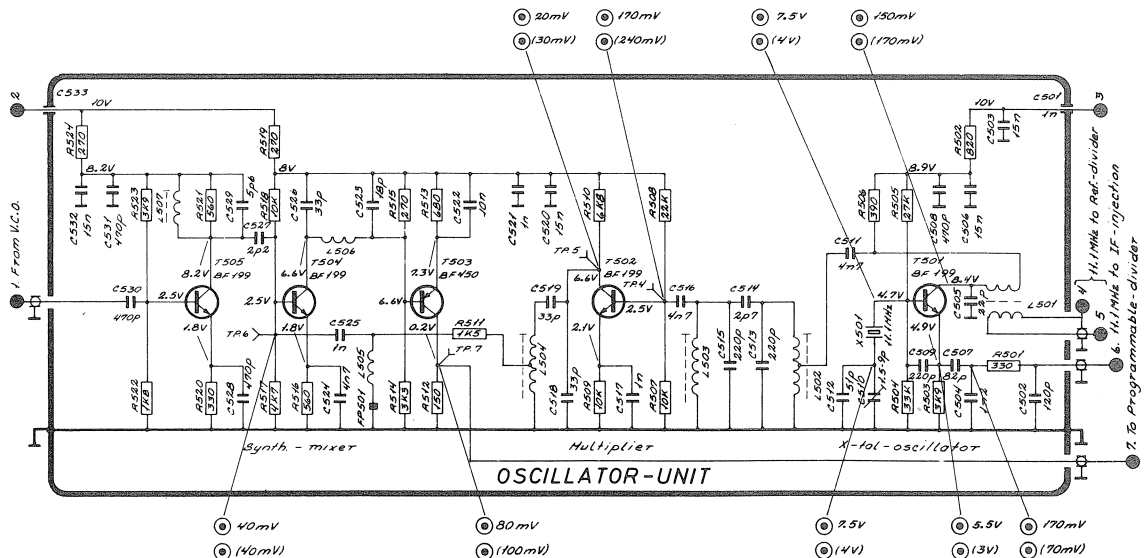


AC voltages outside frame of diagram.

- ▲: Measured with AF-voltmeter.
- : Measured with testprobe
- : Connections to module.
- TP: Testpoint.

Testconditions:

- Voltages without brackets: X-tal with typical activity.
- Voltages in brackets: X-tal with minimum activity.



DIVIDER-UNIT

The Divider-Unit comprises the following circuits.

Programmable divider

The variable frequency feed-back signal (11 MHz - 30 MHz) from the OSCILLATOR-UNIT is amplified in transistors T604, T605 and T606 to TTL-level. The programmable divider is dividing the variable frequency by the dividing-figure N and the working principle is the following.

The 145 potential frequencies in each band are controlled from the PROGRAMMING DISC, which encodes a start-figure P in the binary counters IC605 and IC608 from the switches S301, S302, S303, S304, S305, S306, S307 and S308.

In the programmable divider it is possible to encode four different stop-figures S for each band, simplex/duplex-receive and normal/special-transmit and these bands are controlled from S310, S314 and 10V-Rx. The gates IC601a, IC602b, IC602c, IC609a, IC607b, IC609b, IC610a and IC601b are decoding the stop-figure S, and when outputs from the counters reach the chosen stop-figure S the J-K flip-flop IC606b will load the counters IC605 and IC608 with the start-figure P. The counting will now start again

from the start-figure P. The dividing-figure is now $N = S - P$.

Reference-divider

The fixed frequency signal 11,1 MHz from the OSCILLATOR-UNIT is amplified in the transistors T603 to TTL-level.

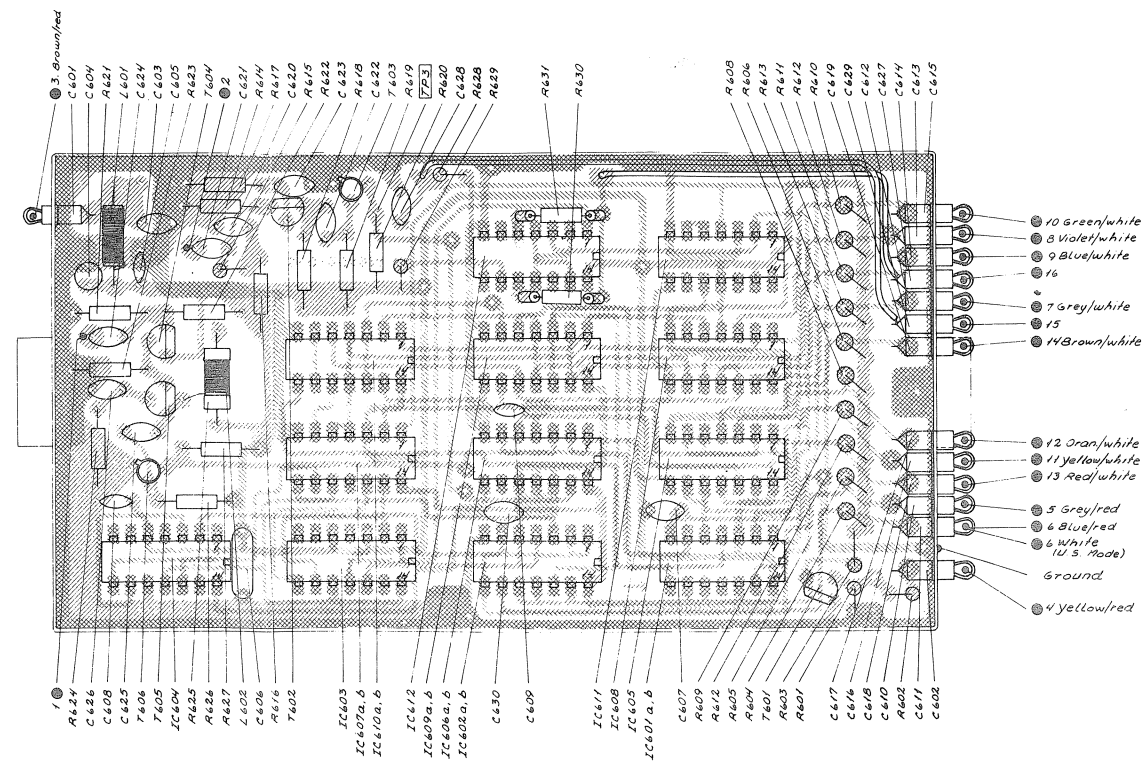
The reference-divider is dividing the reference-frequency by the dividing figure $N = 444$ to 25 kHz and working principle is the following. The reference signal is first divided by 2 in the J-K flip-flop IC 606a.

The two binary counters IC603 and IC604 have the possibility of counting to 256.

The gates IC607a and IC602a will decode the outputs from the counters IC603 and IC604 and when the counters reach 222 the gates will reset the counters and they will start counting again.

Phase/frequency-detector

The fixed frequency signal 25 kHz and the variable frequency signal are passed to the phase/frequency-detector IC612. Proportional to frequency or phase difference between the two signals the phase/frequency-detector IC612 will generate an error voltage, which is passed to the loop-filter in TX-EXCITER-UNIT.



AC voltages outside frame of diagram.

- : Measured with testprobe
- : Connections to module.
- TP : Testpoint.

Testconditions:

Voltages without brackets:

Operating in Rx-position.

Voltages in brackets:

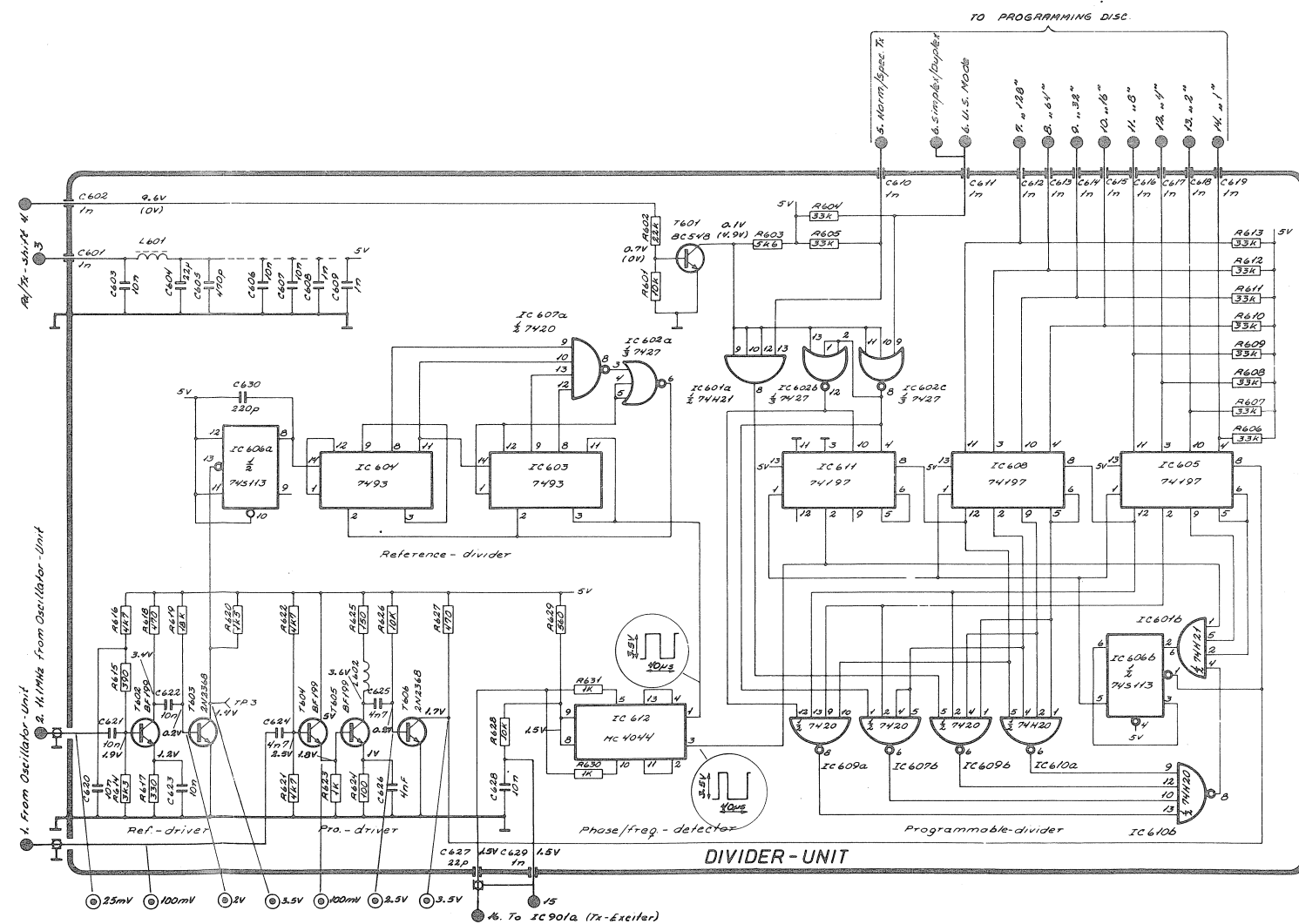
Operating in Tx-position.

Measurements on connection points

● 5 to ● 14:

Connections ● 5 to ● 14 is programmed from the programming disc. The code to the connection points is described in the section Programming of Private Channels. A screw inserted gives a logical »0« (0V).

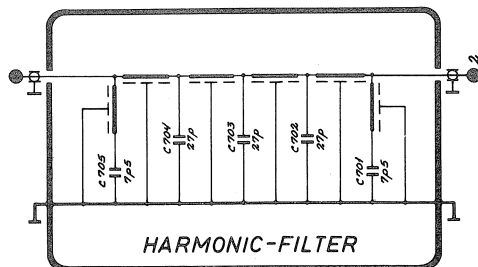
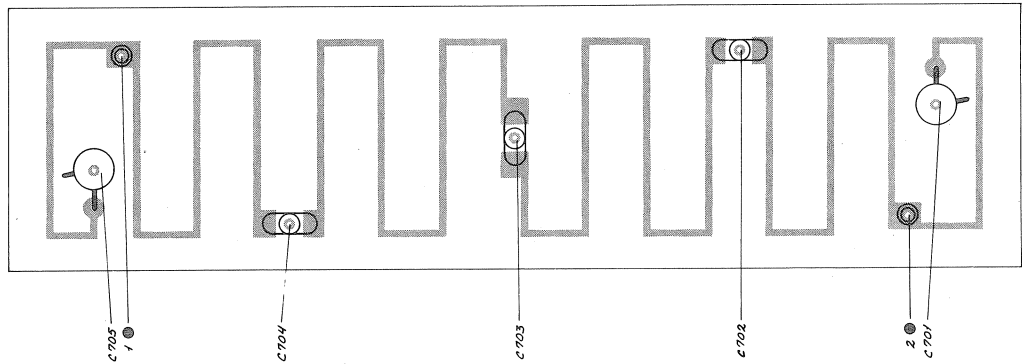
No screw gives a logical »1« (5V).



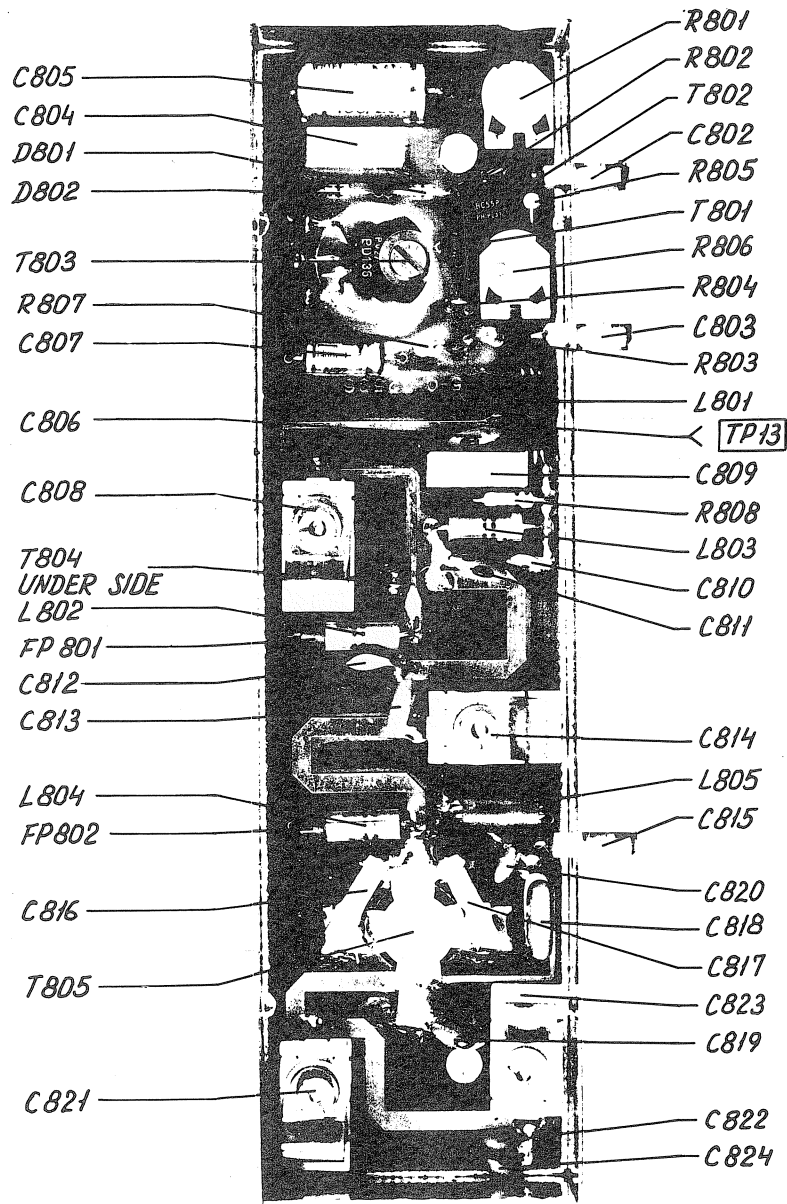
HARMONIC FILTER

The transistors in the TX-POWER-AMPLIFIER are working in class C and will result in heavy distortion of the signal and therefore, in order to prevent disturbances on other services, it will be necessary

to reduce the harmonic frequencies. For this purpose a filter is inserted between the TX-POWER-AMPLIFIER and the aerial. The harmonic filter consists of 3 M derived T-sections.



● : Connections to module.



TX - POWER AMPLIFIER - UNIT (800)

TX-EXCITER-UNIT

The Tx-Exciter-Unit comprises the following circuits.

Loop-filter

The operational amplifier IC901d in the loop-filter is summarizing the error voltage from the phase/frequency-detector in the following way.

If the phase-locked loop is locked, the voltage on both input terminals of IC901d pin 2 and pin 3 will be 1,5V and the voltage on the output terminal pin 1 will have a value between 2V and 10V corresponding to the V.C.O.-frequency. If the V.C.O.-frequency is too high, the error voltage from phase/frequency-detector IC612 will result in a current flowing from IC612 pin 10. This current will charge capacitor C919, so that the voltage on output terminal of IC901d pin 1 will decrease until the V.C.O.-frequency reaches the right value. (For principal understanding accept that C918 and R935 have no influence on the current, and also that no current is flowing into pin 2 of IC901d).

If the V.C.O.-frequency is too low an error voltage will result in a current flowing into pin 5 of IC612, and the voltage on pin 1 of IC901d will increase until the V.C.O.-frequency has reached the right value. The low-pass filter comprising the components L901, C920, C921 and C922, will attenuate the unwanted component on adjacent channels.

V.C.O.

The V.C.O. is a voltage controlled oscillator where the control voltage from the loop-filter can determine the frequency of the oscillator.

The field effect transistor T904 is the oscillator transistor, oscillating at a frequency mainly determined by the components L903, C929 and the variable capacitance diode D907.

Field effect transistor T905 is a buffer transistor. From transmit to receive position the V.C.O.-frequency is shifting abruptly 10,7 MHz. In receive position, 10V from Rx/Tx-shift will open the diode D906 and the capacitor C927 is coupled parallel to the main determine frequency component of the V.C.O. In transmit position, 0V from Rx/Tx-shift is reversing the diode D906 and the capacitor C927 has no influence on the frequency of the V.C.O. In transmit position the reversed diode D906 is used as a variocap. diode for modulating the V.C.O.

Buffer- and driver-amplifier

From the V.C.O. the signal is passed to the parallel coupled buffer transistors T906, T907 and T908. The transistor T906 works as buffer for phase-locked loop feedback signal to OSCILLATOR-UNIT. The transistor T907 works as buffer for injection signal to the first mixer in RX-AMPLIFIER-UNIT. The transistors T908, T909 and

T910 work as buffer and amplifier for the transmitter signal. The transistor T910 is the driver for the TX-POWER-AMPLIFIER. The potentiometer R963 can regulate the power output from driver transistor T910 from about 200 mW to 300 mW in 50 Ohm.

Microphone amplifier

The microphone signal is differentiated via capacitor C903 and the parallel combination of resistors R902 and R903.

Transistor T901 works as amplifier. The microphone sensitivity can be adjusted by potentiometer R906.

Microphone compressor

The compressor is a circuit which will work as a normal amplifier for small input signals and keep a certain output level when the signal level has passed the threshold value. In fact the compressor is very much like an ordinary clipper circuit. One important difference is that the compressor will not make any distortion when a constant high input level is applied.

The signal from microphone amplifier is passed to the variable attenuator R911 and field effect transistor T902. In this configuration T902 works as a variable resistor. Variation of the DC-voltage on the gate of T902 will change the drain-source resistance of T902.

From the attenuator the signal is

amplified in the operational amplifier IC901a, and inserted in the operational amplifier IC901b with gain -1. The two signals from IC901a and IC901b are now 180° out of phase. The full wave peak rectifier with diodes D903 and D904 will now start to rectify when the signal is higher than the threshold value. The transistor T903 will deliver current to charge the capacitor C911. The DC-voltage on C911 is now used to regulate the drain-source resistance of T902.

If the microphone signal has an

amplitude higher than the threshold value, the DC-voltage on the capacitor C911 will regulate the resistance of T902 and attenuate the microphone signal to the level determined by the threshold value.

The potentiometer R909 adjusts the threshold value for the compressor. The diodes D901 and D902 are stabilizing the DC-working point for the operational amplifier.

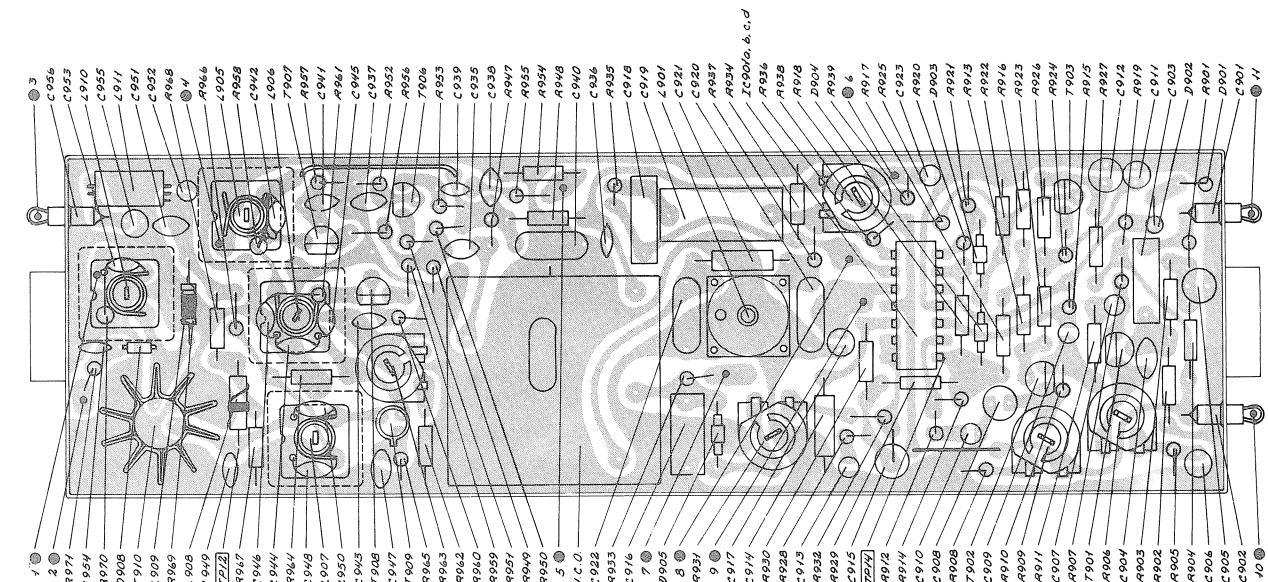
Microphone low-pass filter

From the compressor the signal

is fed to a low-pass filter which heavily attenuates all signals above 3 kHz. The low-pass filter is an active filter comprising the operational amplifier IC901c.

In transmit position the signal from the low-pass filter is passed to the modulation diode D906 in the V.C.O.

The potentiometer R931 is adjusted for maximum allowed frequency deviation.



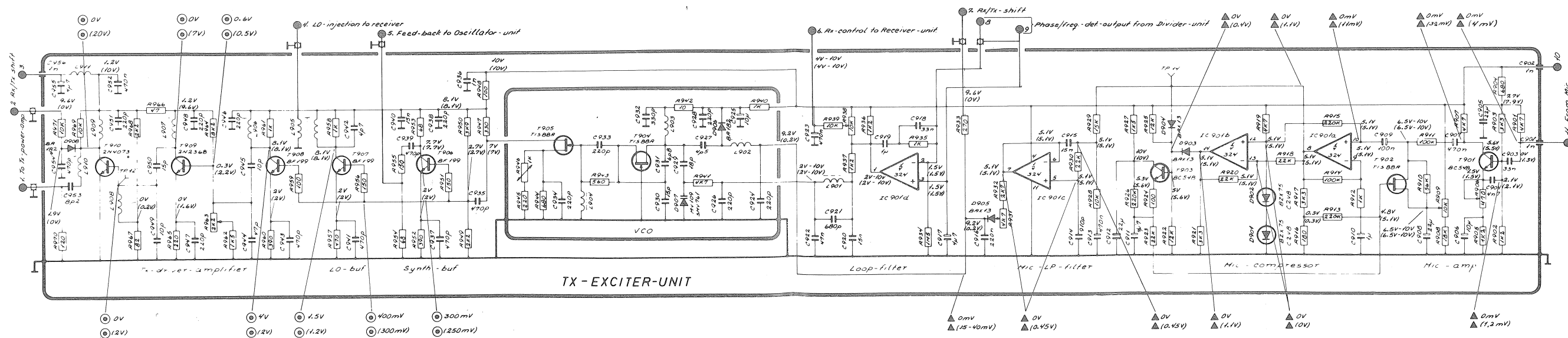
AC voltages outside frame of diagram.

- ▲: Measured with AF-voltmeter.
- : Measured with testprobe
- : Connections to module.
- TP: Testpoint.

Testconditions:

- Voltages without brackets: Operating in Rx-position. Squelch closed.
- Voltages in brackets: Operating in Tx-position.

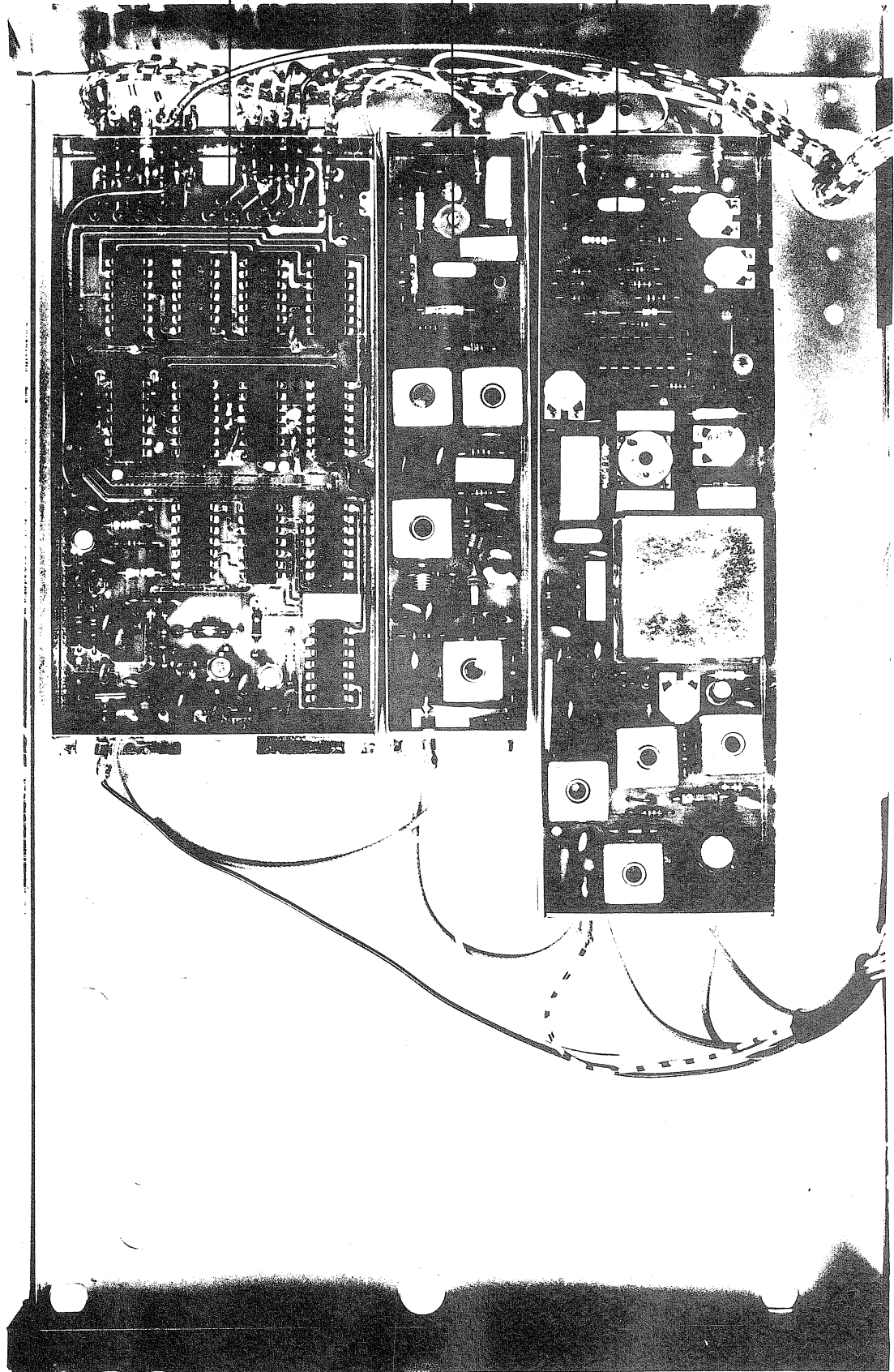
Modulation of transmitter: $\Delta f = \pm 3 \text{ kHz}$; $f_m = 1 \text{ kHz}$.
R906 adjusted to normal sensitivity.
AF-generator connected to microphone-connector J1003 pin 3 and 4.



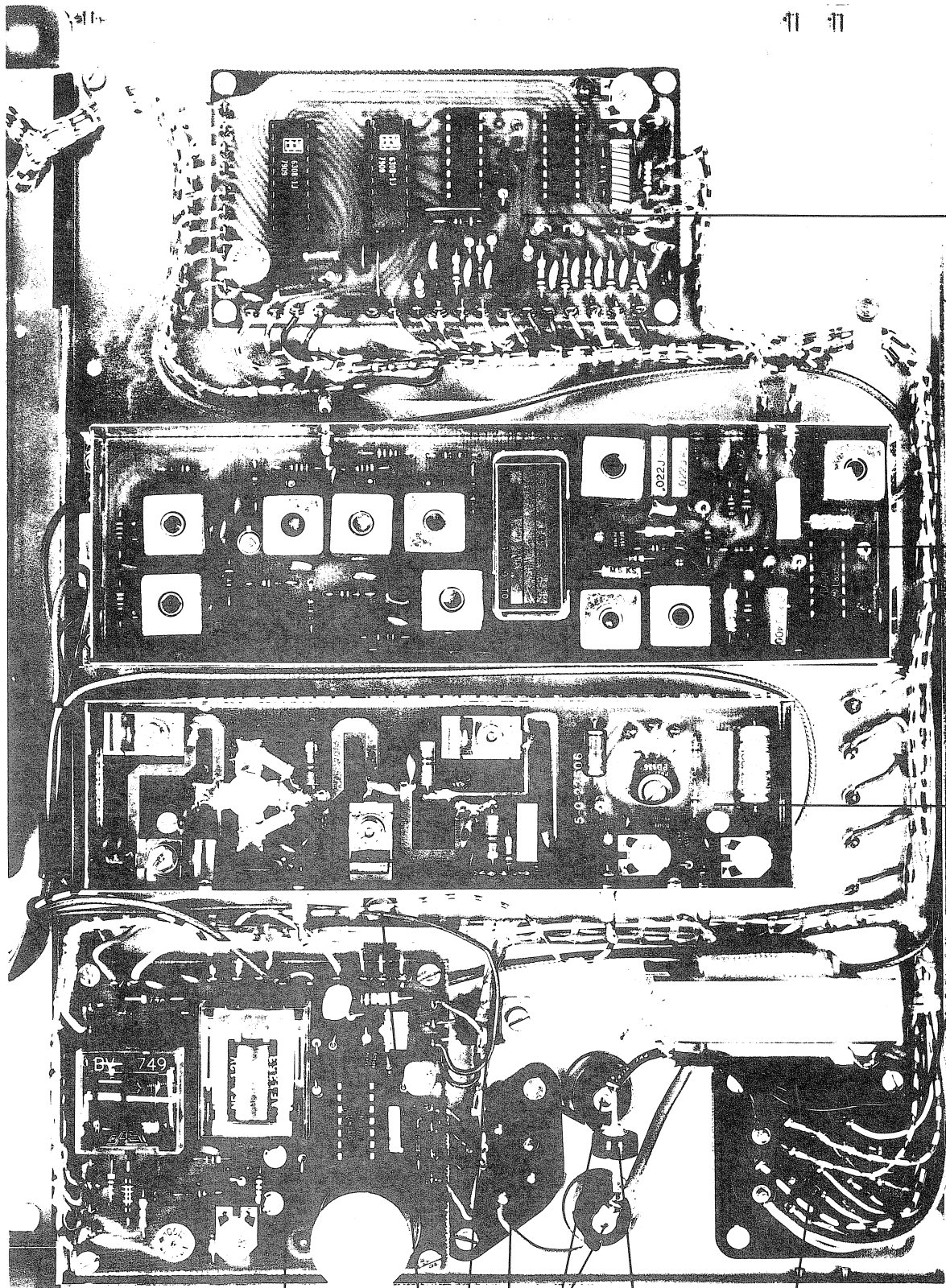
*DIVIDER - UNI
(600)*

*OSCILLATOR-
UNIT (500)*

*TX-EXCITER-
UNIT (900)*



INNER CHASSIS VIEW



PROGRAMMING UNIT (200)

RX-AMPLIFIER UNIT (100)

TX-POWER AMPLIFIER UNIT (800)

SUPPLY-UNIT (400)

T 302

IC 301

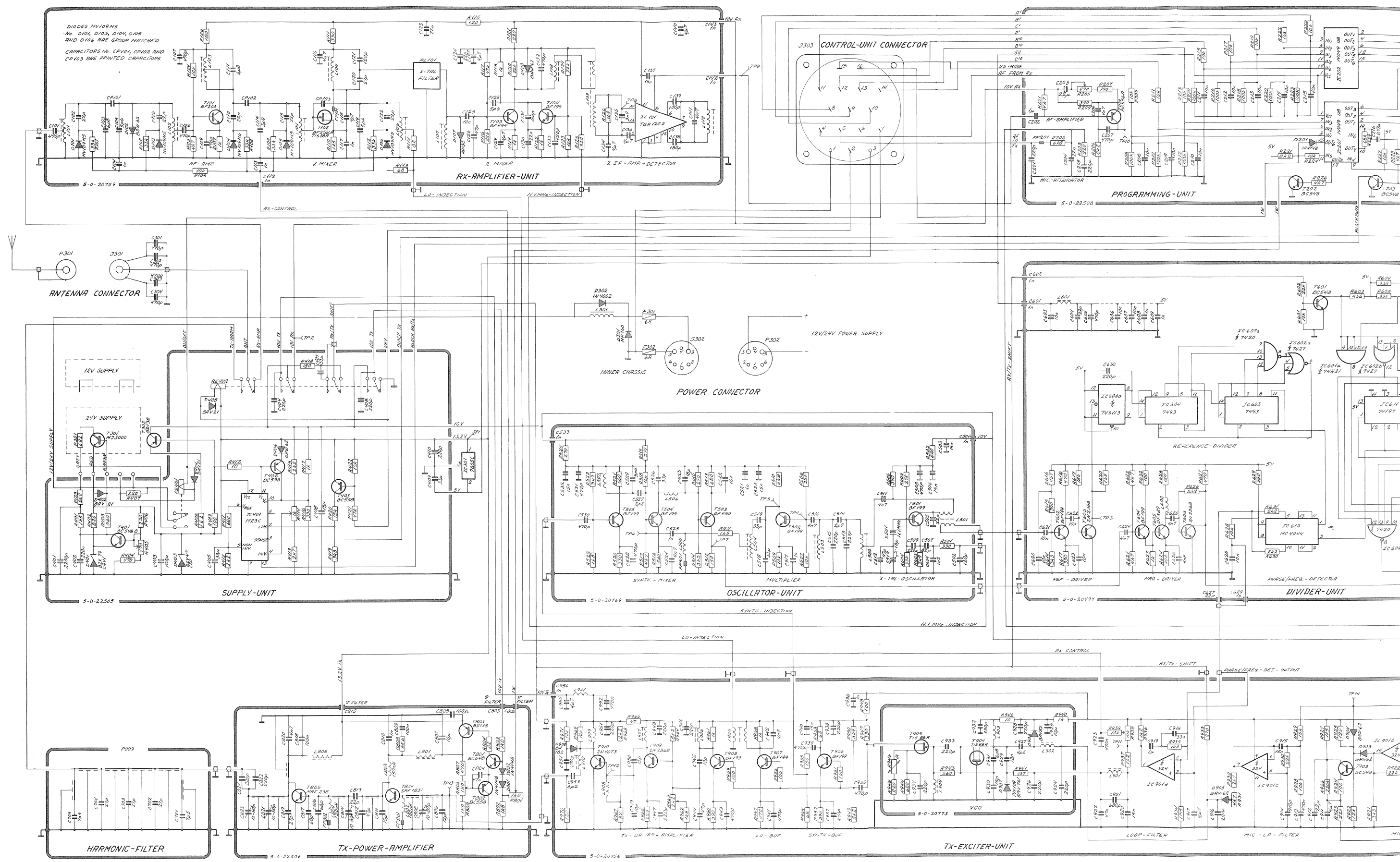
POWER CONNECTOR J 302

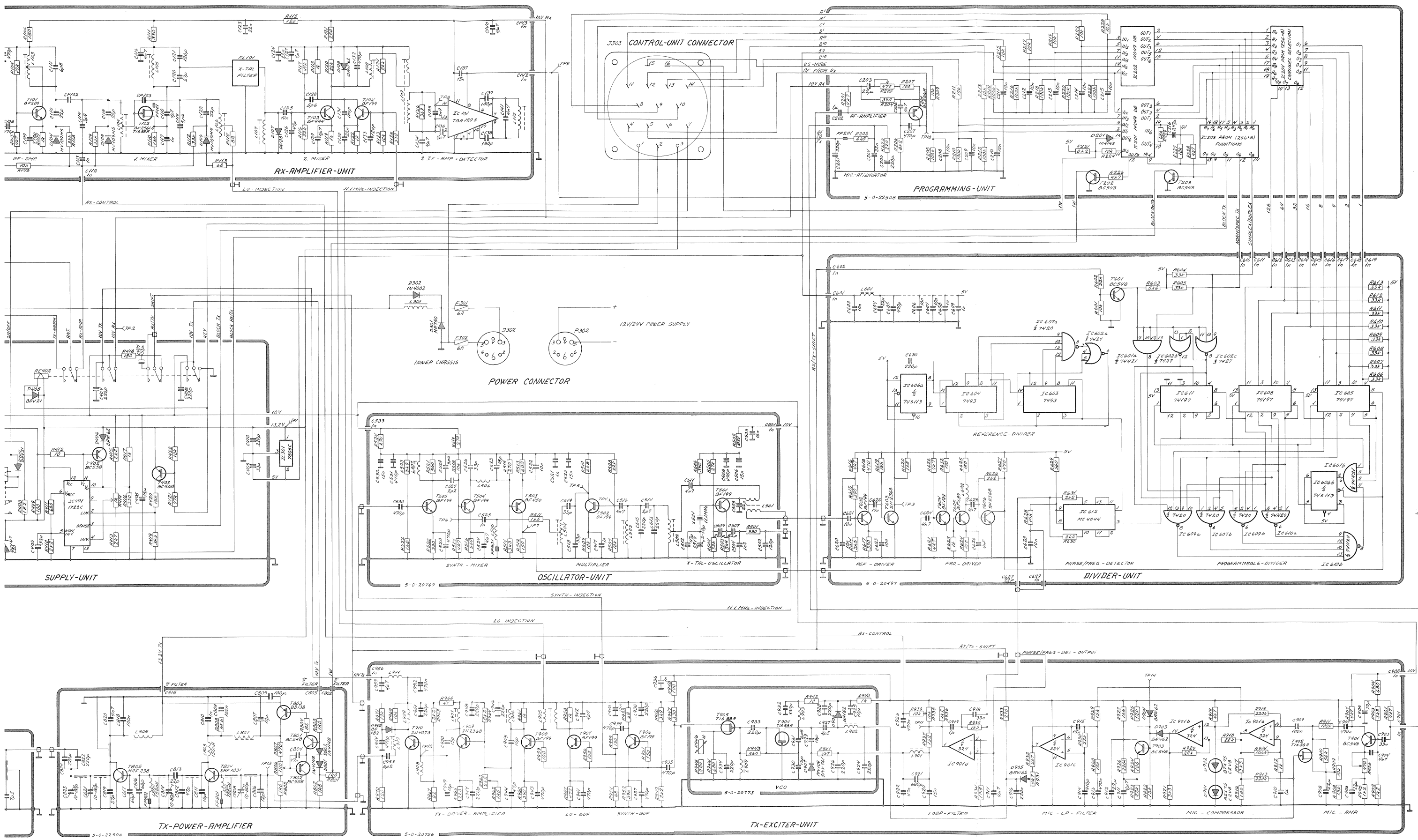
FUSES F301, F302

D 301

CONTROL-UNIT CONNECTOR J303

REAR CHASSIS VIEW





RX-AMPLIFIER-UNIT RT144 og RT145

Symbol	Description	Manufact.	
R101	Resistor 33 Kohm	Philips	2322 101 33333
R102	Resistor 33 Kohm	Philips	2322 101 33333
R103	Resistor 4,7 Kohm	Philips	2322 101 33472
R104	Resistor 10 Kohm	Philips	2322 101 33103
R105	Resistor 10 Kohm	Philips	2322 101 33103
R106	Resistor 180 ohm	Philips	2322 101 33181
R107	Resistor 1 Kohm	Philips	2322 101 33102
R108	Resistor 33 Kohm	Philips	2322 101 33333
R109	Resistor 33 Kohm	Philips	2322 101 33333
R110	Resistor 1,5 Kohm	Philips	2322 101 33152
R111	Resistor 330 ohm	Philips	2322 101 33331
R112	Resistor 33 Kohm	Philips	2322 101 33333
R113	Resistor 68 ohm	Philips	2322 101 33689
R114	Resistor 82 ohm	Philips	2322 101 33829
R115	Resistor 120 ohm	Philips	2322 101 33121
R116	Resistor 22 Kohm	Philips	2322 106 33223
R117	Resistor 47 Kohm	Philips	2322 101 33473
R118	Resistor 1 Kohm	Philips	2322 101 33102
R119	Resistor 1 Kohm	Philips	2322 106 33102
R120	Resistor 22 Kohm	Philips	2322 101 33223
R121	Resistor 220 ohm	Philips	2322 101 33221
R122	Resistor 1 Kohm	Philips	2322 106 33102
R123	Resistor 10 Kohm	Philips	2322 106 33103
R124	Resistor 22 Kohm	Philips	2322 101 33223
R125	Resistor 330 ohm	Philips	2322 101 33332
R126	Resistor 3,9 Kohm	Philips	2322 101 33392
C101	Capacitor ceramic 470pF/400V	Ferroperm	9/0129,9 ± 20%
C102	Capacitor ceramic 22pF/400V	Ferroperm	9/0116,9 ± 5%
C103	Capacitor ceramic 6,8pF/400V	Ferroperm	9/0112,9 ± 0,25pF
C104	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 - 20 + 80
C105	Capacitor ceramic 5,6pF/400V	Ferroperm	9/0112,9 ± 0,25pF
C106	Capacitor ceramic 22pF/400V	Ferroperm	9/0116,9 ± 5%
C107	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 - 20 + 80
C108	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 - 20 + 80
C109	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 - 20 + 80

RX-AMPLIFIER-UNIT RT144 og RT145

Symbol	Description	Manufact.	
C110	Capacitor ceramic 22pF/400V	Ferroperm	9/0116,9 ±5%
C111	Capacitor ceramic 6,8pF/400V	Ferroperm	9/0112,9 ±0,25pF
C112	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 ÷20 +80
C113	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 ÷20 +80
C114	Capacitor ceramic 3,9pF/400V	Ferroperm	9/0112,9 ±0,25pF
C115	Capacitor ceramic 22pF/400V	Ferroperm	9/0116,9 ±5%
C116	Capacitor ceramic 4,7nF/30V	Ferroperm	9/0145,9 ÷20 +80
C117	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 ÷20 +80
C118	Capacitor ceramic 4,7pF/400V	Ferroperm	9/0112,9 ±10%
C119	Capacitor ceramic 5,6pF/400V	Ferroperm	9/0112,9 ± 0,25pF
C120	Capacitor ceramic 27pF/400V	Ferroperm	9/0119,9 ±10%
C121	Capacitor ceramic 120pF/63V	Ferroperm	9/0121,8 ±10%
C122	Capacitor ceramic 22pF/400V	Ferroperm	9/0116,9 ±5%
C123	Capacitor polyester 22nF/250V	Philips	2222 342 44223
C124	Capacitor polyester 22nF/250V	Philips	2222 342 44223
C125	Capacitor ceramic 10nF/30V	Ferroperm	9/0145,9 ÷20 +80
C126	Capacitor ceramic 47pF/400V	Ferroperm	9/0121,9 ±10%
C127	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C128	Capacitor ceramic 5,6pF/400V	Ferroperm	9/0112,9 ± 0,5pF
C129	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C130	Capacitor polyester 22nF/250V	Philips	2222 342 44223
C131	Capacitor polystyrene 100pF/500V	Philips	2222 427 61001
C132	Capacitor polystyrene 470pF/250V	Philips	2222 426 24701
C133	Capacitor ceramic 120pF/63V	Ferroperm	9/0121,8 ±10%
C134	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C135	Capacitor polystyrene 3,9nF/63V	Philips	2222 424 23902
C136	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C137	Capacitor polyester 15nF/250V	Philips	2222 342 45153
C138	Capacitor polystyrene 180pF/500V	Philips	2222 427 61801
C139	Capacitor polystyrene 180pF/500V	Philips	2222 427 61801
C140	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C141	Capacitor polystyrene 4,7nF/63V	Philips	2222 424 24702
C142	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 ÷20 +80
C143	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 ÷20 +80

RX-AMPLIFIER-UNIT RT144 og RT145

Symbol	Description	Manufact.	
CP101			
CP103	Capacitor printed	S.P.	
L101	Coil TL152	S.P.	6-0-20827
L102	Coil TL153	S.P.	6-0-20828
L103	Coil TL154	S.P.	6-0-20829
L104	Coil TL155	S.P.	6-0-20830
L105	Coil TL156	S.P.	6-0-20831
L106	Coil TL157	S.P.	6-0-20832
L107	Coil TL158	S.P.	6-0-20833
L108	Coil TL159	S.P.	6-0-20834
L109	Coil TL160	S.P.	6-0-20835
L110	Coil TL161	S.P.	6-0-20836
T101	Transistor	Philips	BF200
T102	Transistor	TEXAS	BF256LA
T103	Transistor	Philips	BF494
T104	Transistor	Philips	BF199
D101	Diode variocap. } group	Motorola	MV109 M5
D103	Diode variocap. } matched	Motorola	MV109 M5
D104	Diode variocap. } diodes	Motorola	MV109 M5
D105	Diode variocap. }	Motorola	MV109 M5
D106	Diode variocap. }	Motorola	MV109 M5
D102	Diode	Philips	BAW62
D107	Diode	A.E.G.	AA138
D108	Diode	Philips	BAX13

RX-AMPLIFIER-UNIT RT144 og RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
IC101	Integrated circuit	Siemens	TBA 120S
FP101	Ferrit bead. Grade 4B	Philips	4322 020 34420
FL101	Crystal filter 10,7 MHz	K.V.G.	XFM-107 B

PROGRAMMING UNIT RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
R201	Resistor 4.7kohm	Philips	2322 211 13472
R202	Resistor 6.8kohm	Philips	2322 106 33682
R203	Resistor 220 ohm	Philips	2322 106 33221
R204	Resistor 390 ohm	Philips	2322 106 33391
R205	Trimming potentiometer 470 ohm	Philips	2322 410 03303
R206	Resistor 8.2kohm	Philips	2322 211 13822
R207	Resistor 100 ohm	Philips	2322 106 33101
R208	Resistor 100kohm	Philips	2322 106 33104
R209	Resistor 10kohm	Philips	2322 211 13103
R210	Resistor 100kohm	Philips	2322 106 33104
R211	Resistor 10kohm	Philips	2322 211 13103
R212	Resistor 100kohm	Philips	2322 106 33104
R213	Resistor 10kohm	Philips	2322 106 33103
R214	Resistor 100kohm	Philips	2322 106 33104
R215	Resistor 10kohm	Philips	2322 211 13103
R216	Resistor 100kohm	Philips	2322 211 13104
R217	Resistor 10kohm	Philips	2322 211 13103
R218	Resistor 100kohm	Philips	2322 106 33104
R219	Resistor 10kohm	Philips	2322 211 13103
R220	Resistor 100kohm	Philips	2322 106 33104
R221	Resistor 8.2kohm	Philips	2322 106 33822
R222	Resistor 10kohm	Philips	2322 211 33103
R223	Resistor 100kohm	Philips	2322 106 33104
R224	Resistor 10kohm	Philips	2322 106 33103
R225	Resistor 10kohm	Philips	2322 211 13103
R226	Resistor 4.7kohm	Philips	2322 106 33472
R227	Resistor 10kohm	Philips	2322 106 33103
R228	Resistor 4.7kohm	Philips	2322 211 13472
R229	Resistor 68kohm	Philips	2322 211 13683
C201	Capacitor ceramic 220pF-20/+80% 400V	Ferroperm	9/0129.9
C202	Capacitor MKT 1uF 100V	Siemens	B32562-1105-K
C203	Capacitor electrolytic 22uF 25V	R.O.E.	EKI 00 AA 222E
C204	Capacitor MKT 22nF 250V	Siemens	B32560-3223-K
C205	Capacitor electrolytic 220uF 10V	R.O.E.	EKM 00 CC 322C
C206	Capacitor ceramic 4.7nF-20/+80% 30V	Ferroperm	9/0145.9
C207	Capacitor ceramic 470pF-20/+80% 40V	Ferroperm	9/0129.8
C208	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z
C209	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z
C210	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z
C211	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z

PROGRAMMING UNIT RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
C212	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z
C213	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z
C214	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z
C215	Capacitor ceramic 10nF 50V	K.C.K.	HE 70 SJYF 103Z
C216	Capacitor electrolytic 0.47µF 50V	R.O.E.	EKI 00 AA 047H
D201	Diode	Philips	1N4148
T201	Transistor	Philips	BC556A
T202	Transistor	Philips	BC548B
T203	Transistor	Philips	BC548B
IC201	Hex inverter/buffer	Motorola	MC 14049 UB
IC202	Hex inverter/buffer	Motorola	MC 14049 UB
IC203	PROM (256X8)	M.M.I.	6308-1
IC204	PROM (256X8)	M.M.I.	6308-1
FP201	Ferrit bead	Kasche	K3/1200/0.1Hz/4/2/7A

MAIN CHASSIS RT145

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>	
R301	Resistor	0.82 ohm	35W	Danotherm	GRF 12/76L
C301	Capacitor ceramic	470 pF-20/+80%	400V	Ferroperm	9/0129.9
C302	Capacitor ceramic	470 pF-20/+80%	400V	Ferroperm	9/0129.9
C303	Capacitor ceramic	470 pF-20/+80%	400V	Ferroperm	9/0129.9
C304	Capacitor ceramic	470 pF-20/+80%	400V	Ferroperm	9/0129.9
L301	Coil			Tradania	2602
F301	Fuse	5x20mm	F6.3A	ELU	171100
F302	Fuse	5x20mm	F6.3A	ELU	171100
J301	Antenna jack (female)			K.W.Hansen	S0239
P301	Antenna plug (male)			K.W.Hansen	PL259
J302	Supply jack (male)			Hirschmann	Mesei 60F
P302	Supply plug (female)			Hirschmann	Mek 60 BZ
J303	Control unit jack (female)			Hirschmann	Meb 160
T301	Transistor			Motorola	MJ3000
T302	Transistor			Philips	BD138
D301	Diode			Motorola	MR750
D302	Diode			Motorola	1N4002
IC301	5V regulator			National	LM340

SUPPLY UNIT RT145

Symbol	Description	Manufact.	
R401	Resistor 1.5kohm	Philips	2322 211 13152
R402	Resistor 820 ohm	Philips	2322 106 33821
R403	Resistor 560 ohm	Philips	2322 106 33561
R404	Resistor 470 ohm	Philips	2322 106 33471
R405	Trimming potentiometer 470 ohm	Noble	TM8KH1-1S
R406	Resistor 220 ohm	Philips	2322 106 33221
R407	Resistor 220 ohm	1,6W Philips	2322 191 32201
R408	Resistor 1.2 ohm	1/2W Philips	2322 212 13128
R409	Resistor 100 ohm	Philips	2322 106 33101
R410	Resistor 2.2kohm	Philips	2322 106 33222
R411	Resistor 680 ohm	Philips	2322 106 33681
R412	Resistor 10 ohm	Philips	2322 106 33109
R413	Resistor 2.7kohm	Philips	2322 211 13272
R414	Trimming potentiometer 1kohm	Philips	2322 410 03304
R415	Resistor 2.2kohm	Philips	2322 211 13222
R416	Resistor 330 ohm	Philips	2322 106 33331
R417	Resistor 1kohm	Philips	2322 106 33102
R418	Resistor 180 ohm	Philips	2322 106 33181
R419	Resistor 3.3kohm	Philips	2322 106 33332
R420	Resistor 15kohm	Philips	2322 211 13153
R421	Resistor 47kohm	Philips	2322 211 13473
R422	Resistor 10kohm	Philips	2322 106 33103
R423	Resistor 2.2 ohm	1W Vitrohm	200-0
C401	Capacitor electrolytic 2200uF	40V ROE	EG 03 MG 422G
C402	Capacitor MKT 220nF	100V Siemens	B32561-D1224-K
C403	Capacitor electrolytic 100uF	25V ROE	EKM 00DN310E
C404	Capacitor ceramic 220pF-20/+80%400V	Ferroperm	9/0129.9
C405	Capacitor electronic 33uF	35V ROE	EKI 00BB233F
C406	Capacitor solid alumin 15uF	16V Philips	2222 122 55159
C407	Capacitor electrolytic 33uF	35V ROE	EKI 00BB233F
C408	Capacitor ceramic 220pF-20/+80%400V	Ferroperm	9/0129.9
C409	Capacitor solid alumin 33uF	10V Philips	2222 122 54339
C410	Capacitor ceramic 220pF-20/+80%400V	Ferroperm	9/0129.9
T401	Transistor	Philips	BC548B
T402	Transistor	Philips	BC558
T403	Transistor	Philips	BC558

SUPPLY UNIT RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
D401	Zenerdiode	Philips	BZX 79 C9V1
D402	Diode	Philips	BAV21
D403	Zenerdiode	Sescosem	BZV 47 C20
D404	Diode	Philips	BAV21
D405	Diode	Philips	BAV21
D406	Diode	Philips	BAW62
IC401	Integrated circuit	Motorola	MC1723C
RE401	Relay	PASI	BV1191
RE402	Relay	National	NF4-12V

OSCILLATOR-UNIT RT144 og RT145

Symbol	Description	Manufact.	
R501	Resistor 330 ohm	Philips	2322 101 33331
R502	Resistor 820 ohm	Philips	2322 101 33821
R503	Resistor 3,9 Kohm	Philips	2322 101 33392
R504	Resistor 33 Kohm	Philips	2322 101 33333
R505	Resistor 27 Kohm	Philips	2322 106 33273
R506	Resistor 390 ohm	Philips	2322 106 33391
R507	Resistor 10 Kohm	Philips	2322 106 33103
R508	Resistor 22 Kohm	Philips	2322 101 33223
R509	Resistor 10 Kohm	Philips	2322 106 33103
R510	Resistor 6,8 Kohm	Philips	2322 101 33682
R511	Resistor 1,5 Kohm	Philips	2322 101 33152
R512	Resistor 150 ohm	Philips	2322 106 33151
R513	Resistor 680 ohm	Philips	2322 106 33681
R514	Resistor 3,3 Kohm	Philips	2322 101 33332
R515	Resistor 270 ohm	Philips	2322 212 13271
R516	Resistor 560 ohm	Philips	2322 106 33561
R517	Resistor 4,7 Kohm	Philips	2322 101 33472
R518	Resistor 10 Kohm	Philips	2322 101 33103
R519	Resistor 270 ohm	Philips	2322 101 33271
R520	Resistor 330 ohm	Philips	2322 106 33331
R521	Resistor 560 ohm	Philips	2322 106 33561
R522	Resistor 1,8 Kohm	Philips	2322 106 33182
R523	Resistor 3,9 Kohm	Philips	2322 106 33392
R524	Resistor 270 ohm	Philips	2322 101 33271
C501	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 ± 20 +80
C502	Capacitor ceramic 120pF/63V	Ferroperm	9/0121,8 $\pm 10\%$
C503	Capacitor polyester 15nF/250V	Philips	2222 342 44153
C504	Capacitor polystyrene 1,2nF/63V	Philips	2222 424 21202
C505	Capacitor ceramic 22pF/400V	Ferroperm	9/0116,9 $\pm 10\%$
C506	Capacitor polyester 15nF/250V	Philips	2222 342 44153
C507	Capacitor polystyrene 82pF/500V	Philips	2222 427 48209
C508	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 ± 20 +80
C509	Capacitor polystyrene 220pF/500V	Philips	2222 427 42201
C510	Trimming capacitor 2-18pF	D.A.U.	107.1901.009
C511	Capacitor ceramic 4,7nF/30V	Ferroperm	9/0145,9 ± 20 +80

OSCILLATOR-UNIT RT144 og RT145

Symbol	Description	Manufact.	
C512	Capacitor polystyrene 47pF/63V	Siemens	B 31063-A 5470-H $\pm 2.5\%$
C513	Capacitor ceramic 220pF/25V	Ferroperm	9/0213,8 $\pm 10\%$
C514	Capacitor ceramic 2,7pF/250V	Ferroperm	9/0112,9 $\pm 0,25\text{pF}$
C515	Capacitor ceramic 220pF/25V	Ferroperm	9/0213,8 $\pm 10\%$
C516	Capacitor ceramic 4,7nF/30V	Ferroperm	9/0145,9 $\div 20 +80$
C517	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 $\div 20 +80$
C518	Capacitor ceramic 33pF/63V	Ferroperm	9/0116,8 $\pm 10\%$
C519	Capacitor ceramic 33pF/63V	Ferroperm	9/0116,8 $\pm 10\%$
C520	Capacitor polyester 15nF/250V	Philips	2222 342 44153
C521	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 $\div 20 +80$
C522	Capacitor ceramic 10nF/30V	Ferroperm	9/0145,9 $\div 20 +80$
C523	Capacitor ceramic 18pF/400V	Ferroperm	9/0112,9 $\pm 10\%$
C524	Capacitor ceramic 4,7nF/30V	Ferroperm	9/0145,9 $\div 20 +80$
C525	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 $\div 20 +80$
C526	Capacitor ceramic 33pF/400V	Ferroperm	9/0119,9 $\pm 10\%$
C527	Capacitor ceramic 2,2pF/250V	Ferroperm	9/0112,9 $\pm 0,25\text{pF}$
C528	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 $\div 20 +80$
C529	Capacitor ceramic 5,6pF/400V	Ferroperm	9/0112,9 $\pm 0,5\text{pF}$
C530	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 $\div 20 +80$
C531	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 $\div 20 +80$
C532	Capacitor polyester 15nF/250V	Philips	2222 342 44153
C533	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 $\div 20 +80$
L501	Coil TL162	S.P.	6-0-20837
L502	Coil TL163	S.P.	6-0-20838
L503	Coil TL164	S.P.	6-0-20839
L504	Coil TL165	S.P.	6-0-20840
L505	Coil TL166	S.P.	6-0-20841
L506	Coil TL167	S.P.	6-0-20842
L507	Coil TL168	S.P.	6-0-20843
FP501	Ferrit bead. Grade 4B	Philips	4322 020 34420

OSCILLATOR-UNIT RT144 og RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
X501	Crystal 11100.000 KHz	K.V.G.	
T501	Transistor	Philips	BF199
T502	Transistor	Philips	BF199
T503	Transistor	Philips	BF450
T504	Transistor	Philips	BF199
T505	Transistor	Philips	BF199

DIVIDER-UNIT RT144 og RT145

Symbol	Description	Manufact.	
R601	Resistor 10 Kohm	Philips	2322 106 33103
R602	Resistor 22 Kohm	Philips	2322 106 33223
R603	Resistor 5,6 Kohm	Philips	2322 106 33562
R604-			
R613	Resistor 33 Kohm	Philips	2322 106 33333
R614	Resistor 3,3 Kohm	Philips	2322 101 33332
R615	Resistor 390 ohm	Philips	2322 106 33391
R616	Resistor 4,7 Kohm	Philips	2322 101 33472
R617	Resistor 330 ohm	Philips	2322 101 33331
R618	Resistor 470 ohm	Philips	2322 101 33471
R619	Resistor 18 Kohm	Philips	2322 101 33183
R620	Resistor 1,5 Kohm	Philips	2322 101 33152
R621	Resistor 4,7 Kohm	Philips	2322 106 33472
R622	Resistor 4,7 Kohm	Philips	2322 101 33472
R623	Resistor 1 Kohm	Philips	2322 106 33102
R624	Resistor 100 ohm	Philips	2322 101 33101
R625	Resistor 150 ohm $\frac{1}{2}W$	Philips	2322 212 13151
R626	Resistor 2,2 Kohm	Philips	2322 101 33222
R627	Resistor 470 ohm	Philips	2322 101 33471
R628	Resistor 10 Kohm	Philips	2322 106 33103
R629	Resistor 560 ohm	Philips	2322 106 33561
R630	Resistor 2,2 Kohm	Philips	2322 101 33222
R631	Resistor 2,2 Kohm	Philips	2322 101 33222
R632	Resistor 100 ohm	Philips	2322 106 33101
C601	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 $\div 20$ +80
C602	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 $\div 20$ +80
C603	Capacitor ceramic 10nF/30V	Ferroperm	9/0145,9 $\div 20$ +80
C604	Capacitor tantal 22uF/16V	ERO	ETP 3G
C605	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 $\div 20$ +80
C606	Capacitor polyester 10nF/250V	Philips	2222 342 44103
C607	Capacitor ceramic 10nF/30V	Ferroperm	9/0145,9 $\div 20$ +80
C608	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 $\div 20$ +80
C609	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 $\div 20$ +80
C610-			
C619	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 $\div 20$ +80

DIVIDER-UNIT RT144 og RT145

Symbol	Description	Manufact.	
C620-			
C623	Capacitor ceramic 10nF/30V	Ferroperm	9/0145,9 ÷20 +80%
C624-			
C626	Capacitor ceramic 4,7nF/30V	Ferroperm	9/0145,9 ÷20 +80%
C627	Capacitor feed-through 22pF/350V	Philips	2222 700 03229
C628	Capacitor ceramic 10nF/30V	Ferroperm	9/0145,9 ÷20 +80%
C629	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 ÷20 +80%
C630	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 ÷20 +80%
L601	Coil TL169	S.P.	6-0-20844
L602	Coil TL170	S.P.	6-0-20845
T601	Transistor	Philips	BC548
T602	Transistor	Philips	BF199
T603	Transistor	Philips	2N2368
T604	Transistor	Philips	BF199
T605	Transistor	Philips	BFX89
T606	Transistor	Philips	2N2368
IC601	Integrated circuit	TEXAS	SN74H21
IC602	Integrated circuit	TEXAS	SN7427
IC603	Integrated circuit	TEXAS	SN7493A
IC604	Integrated circuit	TEXAS	SN7493A
IC605	Integrated circuit	TEXAS	SN74197
IC606	Integrated circuit	TEXAS	SN74S113
IC607	Integrated circuit	TEXAS	SN7420
IC608	Integrated circuit	TEXAS	SN74197
IC609	Integrated circuit	TEXAS	SN7420
IC610	Integrated circuit	TEXAS	SN74H20
IC611	Integrated circuit	TEXAS	SN74197
IC612	Integrated circuit	Motorola	MC4044

HARMONIC FILTER RT144 og RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
C701	Capacitor ceramic 7,5 pF/400V	Ferropem	9/0112,9 ±5%
C702-			
C704	Capacitor feed-through 27 pF	Ferropem	9/0112,5 ±5%
C705	Capacitor ceramic 7,5 pF/400V	Ferropem	9/0112,9 ±5%

TX-POWER-AMPLIFIER RT145

Symbol	Description	Manufact.	
R801	Potentiometer 1kohm	NOBLE	TM8K V2-1S
R802	Resistor 1.8kohm	Philips	2322 106 33182
R803	Resistor 1kohm	Philips	2322 106 33102
R804	Resistor 82 ohm	Philips	2322 106 33829
R805	Resistor 1kohm	Philips	2322 106 33102
R806	Potentiometer 1kohm	Noble	TM8K V2-1S
R807	Resistor 470 ohm	Philips	2322 106 33471
R808	Resistor 5.6 ohm	Philips	2322 211 13568
C802	VHF - π -filter	Ferroperm	9/0168.5
C803	VHF - π -filter	Ferroperm	9/0168.5
C804	Capacitor polyester 0.047uF	100V Philips	2222 344 24473
C805	Capacitor electrolytic 100uF	25V ROE	EB 00 FB 310 E
C806	Capacitor ceramic 12pF $\pm 10\%$	400V Ferroperm	9/0112.9
C807	Capacitor electrolytic 10uF	25V ROE	EL 00 BA 210 E
C808	Capacitor trimmer 10-80pF	Radioparts	S14
C809	Capacitor polyester 0.1uF	100V Philips	2222 344 24104
C810	Capacitor ceramic 1nF -20/+80%	40V Ferroperm	9/0129.8
C811	Capacitor ceramic 15pF $\pm 10\%$	400V Ferroperm	9/0112.9
C812	Capacitor ceramic 47pF $\pm 10\%$	63V Ferroperm	9/0116.8
C813	Capacitor ceramic 22pF $\pm 10\%$	400V Ferroperm	9/0116.9
C814	Capacitor trimmer 10-80pF	Radioparts	S14
C815	VHF - π -filter	Ferroperm	9/0168.5
C816	Capacitor ceramic 68pF $\pm 10\%$	400V Ferroperm	9/0117.3
C817	Capacitor ceramic 68pF $\pm 10\%$	400V Ferroperm	9/0117.3
C818	Capacitor polyester 0.1uF	100V Philips	2222 342 24104
C819	Capacitor ceramic 27pF $\pm 10\%$	400V Ferroperm	9/0119.9
C820	Capacitor ceramic 4.7nF -20/+80%	30V Ferroperm	9/0145.9
C821	Capacitor trimmer 10-80pF	Radioparts	S14
C822	Capacitor ceramic 220pF -20/+80%	400V Ferroperm	9/0129.9
C823	Capacitor trimmer 10-80pF	Radioparts	S14
C824	Capacitor ceramic 220pF -20/+80%	400V Ferroperm	9/0129.9
FP801	Ferrit bead Grade 3B	Philips	4322 020 34400
FP802	Ferrit bead Grade 3B	Philips	4322 020 34400
L801	Choke TL066	S.P.	6-0-20846
L802	Choke 0.15uH $\pm 20\%$	AIRCO Elec	4415-1m
L803	Choke 0.15uH $\pm 20\%$	AIRCO Elec	4415-1m
L804	Choke 0.15uH $\pm 20\%$	AIRCO Elec	4415-1m
L805	Choke TL066	S.P.	6-0-20846

TX-POWER-AMPLIFIER RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
T801	Transistor	Philips	BC548B
T802	Transistor	Philips	BC558B
T803	Transistor	Philips	BD138
T804	Transistor	Motorola	SRF 1831
T805	Transistor	Motorola	MRF 238
D801	Diode	Philips	1N4148
D802	Diode	Philips	1N4148

TX-EXCITER-UNIT RT144 og RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
R901	Resistor	4,7 Kohm	Philips 2322 106 33472
R902	Resistor	1,2 Kohm	Philips 2322 101 33122
R903	Resistor	3,3 Kohm	Philips 2322 101 33332
R904	Resistor	680 Ohm	Philips 2322 101 33681
R905	Resistor	1,2 Kohm	Philips 2322 106 33122
R906	Trimming potentiometer	470 Ohm	Philips 2322 410 03303
R907	Resistor	4,7 Kohm	Philips 2322 106 33472
R908	Resistor	18 Kohm	Philips 2322 106 33183
R909	Trimming potentiometer	10 Kohm	Philips 2322 410 03307
R910	Resistor	56 Kohm	Philips 2322 106 33563
R911	Resistor	100 Kohm	Philips 2322 101 33104
R912	Resistor	1 Kohm	Philips 2322 106 33102
R913	Resistor	220 Kohm	Philips 2322 101 33224
R914	Resistor	100 Kohm	Philips 2322 106 33104
R915	Resistor	220 Kohm	Philips 2322 106 33224
R916	Resistor	180 ohm	Philips 2322 101 33181
R917	Resistor	3,3 Kohm	Philips 2322 101 33332
R918	Resistor	22 Kohm	Philips 2322 101 33223
R919	Resistor	4,7 Kohm	Philips 2322 106 33472
R920	Resistor	22 Kohm	Philips 2322 106 33223
R921	Resistor	3,3 Kohm	Philips 2322 106 33332
R922	Resistor	12 Kohm	Philips 2322 101 33123
R923	Resistor	22 Kohm	Philips 2322 101 33223
R924	Resistor	100 ohm	Philips 2322 106 33101
R925	Resistor	12 Kohm	Philips 2322 106 33123
R926	Resistor	220 Kohm	Philips 2322 106 33224
R927	Resistor	1,5 Kohm	Philips 2322 106 33152
R928	Resistor	10 Kohm	Philips 2322 106 33103
R929	Resistor	15 Kohm	Philips 2322 101 33153
R930	Resistor	22 Kohm	Philips 2322 101 33223
R931	Trimming potentiometer	4,7 Kohm	Philips 2322 410 03306
R932	Resistor	2,7 Kohm	Philips 2322 106 33272
R933	Resistor	270 ohm	Philips 2322 106 33271
R934	Resistor	1,5 Mohm	Philips 2322 101 33155
R935	Resistor	1,5 Kohm	Philips 2322 101 33152
R936	Resistor	1,2 Kohm	Philips 2322 101 33122
R937	Resistor	1,2 Kohm	Philips 2322 106 33122
R938	Trimming potentiometer	10 Kohm	Philips 2322 410 03307
R939	Resistor	10 Kohm	Philips 2322 106 33103

TX-EXCITER-UNIT RT144 og RT145

Symbol	Description	Manufact.	
R940	Resistor 1 Kohm	Philips	2322 106 33102
R941	Resistor 4,7 Kohm	Philips	2322 106 33472
R942	Resistor 10 ohm	Philips	2322 101 33109
R943	Resistor 560 ohm	Philips	2322 106 33561
R944	Resistor 680 ohm	Philips	2322 106 33681
R945	Resistor 220 ohm	Philips	2322 106 33221
R946	Resistor NTC 1 Kohm	Philips	2322 642 11102
R947	Resistor 330 ohm	Philips	2322 106 33331
R948	Resistor 100 ohm	Philips	2322 101 33101
R949	Resistor 2,2 Kohm	Philips	2322 106 33222
R950	Resistor 3,9 Kohm	Philips	2322 106 33392
R951	Resistor 150 ohm	Philips	2322 106 33151
R952	Resistor 390 ohm	Philips	2322 106 33391
R953	Resistor 68 ohm	Philips	2322 106 33689
R954	Resistor 68 ohm	Philips	2322 101 33689
R955	Resistor 150 ohm	Philips	2322 106 33151
R956	Resistor 100 ohm	Philips	2322 106 33101
R957	Resistor 470 ohm	Philips	2322 106 33471
R958	Resistor 1 Kohm	Philips	2322 106 33102
R959	Resistor 100 ohm	Philips	2322 106 33101
R960	Resistor 390 ohm	Philips	2322 106 33391
R961	Resistor 1 Kohm	Philips	2322 106 33102
R962	Resistor 1,5 Kohm	Philips	2322 101 33152
R963	Trimming potentiometer 2,2 Kohm	Philips	2322 410 03305
R964	Resistor 8,2 Kohm	Philips	2322 101 33822
R965	Resistor 180 ohm	Philips	2322 106 33181
R966	Resistor 47 ohm	Philips	2322 106 33479
R967	Resistor 82 ohm	Philips	2322 101 33829
R968	Resistor 2,2 Kohm	Philips	2322 101 33222
R969	Resistor 10 Kohm	Philips	2322 106 33103
R970	Resistor 120 ohm	Philips	2322 106 33121
R971	Resistor 10 Kohm	Philips	2322 101 33103
C901	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 ±20 +80
C902	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 ±20 +80
C903	Capacitor polyester 33nF/250V	ERO	MKT 1822 333 25 5
C904	Capacitor ceramic 4,7nF/30V	Ferroperm	9/0145,9 -20 +80
C905	Capacitor tantal 22uF/16V	ERO	ETP 3G

TX-EXCITER-UNIT RT144 og RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
C906	Capacitor tantal 22uF/16V	ERO	ETP 3G
C907	Capacitor tantal 0,47uF/35V	ERO	ETP 1A
C908	Capacitor tantal 22uF/16V	ERO	ETP 3G
C909	Capacitor tantal 0,1uF/35V	ERO	ETP 1A
C910	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C911	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C912	Capacitor tantal 22uF/16V	ERO	ETP 3G
C913	Capacitor tantal 0,47uF/35V	ERO	ETP 1A
C914	Capacitor polystyrene 910pF/125V	Philips	2222 425 29101
C915	Capacitor polystyrene 15nF/63V	Philips	2222 424 61503
C916	Capacitor polyester 0,22uF/100V	Philips	2222 342 25224
C917	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C918	Capacitor polyester 33nF/400V	Philips	2222 344 55333
C919	Capacitor polyester 1uF/100V	Philips	2222 344 25105
C920	Capacitor polyester 15nF/250V	Philips	2222 342 45153
C921	Capacitor polystyrene 680pF/125V	Philips	2222 425 46801
C922	Capacitor polyester 47nF/250V	Philips	2222 342 45473
C923	Capacitor tantal 0,47uF/35V	ERO	ETP 1A
C924	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 \pm 20%
C925	Capacitor tantal 10uF/16V	ERO	ETP 2E
C926	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 \pm 20%
C927	Capacitor ceramic 4,5pF/400V	Ferroperm	9/0112,9 \pm 0,1pF
C928	Capacitor ceramic 270pF/400V	Ferroperm	9/0129,9 \pm 20%
C929	Capacitor ceramic 18pF/400V	Ferroperm	9/0112,9 \pm 5%
C930	Capacitor ceramic 15pF/400V	Ferroperm	9/0112,9 \pm 5%
C931	Capacitor ceramic 6,8pF/400V	Ferroperm	9/0116,9 \pm 0,25%
C932	Capacitor ceramic 330pF/25V	Ferroperm	9/0213,8 \pm 10%
C933	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 \pm 20%
C934	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 \pm 20%
C935	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 -20 +80%
C936	Capacitor ceramic 1nF/40V	Ferroperm	9/0129,8 -20 +80%
C937	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 -20 +80%
C938	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 \pm 20%
C939	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 -20 +80%
C940	Capacitor polyester 15nF/250V	Philips	2222 342 44153
C941	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 -20 +80%
C942	Capacitor ceramic 4,7pF/400V	Ferroperm	9/0112,9 \pm 10%
C943	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 -20 +80%
C944	Capacitor ceramic 47pF/63V	Ferroperm	9/0116,8 \pm 10%
C945	Capacitor ceramic 10pF/400V	Ferroperm	9/0112,9 \pm 10%

TX-EXCITER-UNIT RT144 og RT145

Symbol	Description	Manufact.	
C946	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 ± 20%
C947	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 ± 20%
C948	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 ± 20%
C949	Capacitor ceramic 10pF/400V	Ferroperm	9/0121,9 ± 10%
C950	Capacitor ceramic 15pF/400V	Ferroperm	9/0121,9 ± 10%
C951	Capacitor ceramic 220pF/400V	Ferroperm	9/0129,9 ± 20%
C952	Capacitor tantal. 0,47uF/35V	ERO	ETP 1A
C953	Capacitor ceramic 8,2pF/400V	Ferroperm	9/0121,9 ± 10%
C954	Capacitor ceramic 470pF/40V	Ferroperm	9/0129,8 -20 +80%
C955	Capacitor tantal 4,7uF/16V	ERO	ETP 2C
C956	Capacitor feed-through 1nF/250V	Ferroperm	9/0138,58 -20 +80%
L901	Coil TL172	S.P.	6-0-20847
L902	Coil TLO59	S.P.	6-0-20844
L903	Coil TL173	S.P.	6-0-20848
L904	Coil TLO59	S.P.	6-0-20844
L905	Coil TL174	S.P.	6-0-20849
L906	Coil TL175	S.P.	6-0-20850
L907	Coil TL176	S.P.	6-0-20851
L908	Coil 0,15uHy	Ferroperm	1587
L909	Coil TL177	S.P.	6-0-20852
L910	Coil TL178	S.P.	6-0-20853
L911	Coil TLO67	S.P.	6-0-20854
T901	Transistor	Philips	BC548
T902	Transistor	Texas	TIS 88A
T903	Transistor	Philips	BC548
T904	Transistor	Texas	TIS 88A
T905	Transistor	Texas	TIS 88A
T906	Transistor	Philips	BF199
T907	Transistor	Philips	BF199
T908	Transistor	Philips	BF199
T909	Transistor	Philips	2N2368
T910	Transistor	Motorola	2N4073

TX-EXCITER-UNIT RT144 og RT145

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
D901	Diode	Philips	BZX75 C2V8
D902	Diode	Philips	BZX75 C2V8
D903	Diode	Philips	BAX13
D904	Diode	Philips	BAX13
D905	Diode	Philips	BAX13
D906	Diode	Philips	BA182
D907	Diode	Motorola	SMV761
D908	Diode	Philips	BA182
IC901	Integrated circuit	National	LM324

TECHNICAL DATA FOR VHF CONTROL UNIT C401

All international maritime VHF channels
Private channels: 20
Temperature range: -20°C to $+55^{\circ}\text{C}$
AF output power: 3 Watt/4 ohm
Telephone output: 0,55V RMS/200 ohm
Distortion: Less than 5%
Dimensions: Height = 220 mm
Width = 120 mm
Depth = 90 mm
Weight: 1,4 kg

CONTROLS C401

All functions are key-board controlled.

ON/OFF

To switch the VHF set ON or OFF.

Not in function when remote controlled by H410.

DISPLAY

The LED display shows the selected channel number.

CHANNEL

The two keys to the right shift the unit digit of the channel number up or down.

The two keys to the left shift the tens digit of the channel number up or down.

D.W. (DUAL WATCH)

When the "D.W." key is pressed and the handset is in its holder, the receiver is listening to the selected channel and is watching channel 16 (preference channel). The display is flashing showing the selected channel number and channel 16.

If a signal is received on channel 16, the receiver will listen continuously to channel 16, until the signal disappears. The display shows channel number 16.

If the handset is removed from its holder, the Dual Watch is switched off and the selected channel is on.

When the "D.W." key is pressed again the Dual Watch is switched off.

16. (DISTRESS AND CALLING)

When the key "16" is pressed, channel 16 is quickly selected. Press the key 16 again, and the previous channel is selected.

DIM

The intensity of the LED display and the illumination of the symbols can be controlled in four steps.

1W

When the key "1W" is pressed, the LED "1W" will light, and the transmitter output is reduced to less than 1 Watt.

CONTROLS C401 cont.:

SQ

The squelch sensitivity can be controlled in 15 steps.

Adjustment of best squelch sensitivity:

Press the key with the arrow "up" until white noise is heard in the loudspeaker. Then press the key with the arrow "down" just until the white noise in the loudspeaker stops. The adjustment is to be done on a channel without signal.

VOL

The volume can be controlled in 15 steps.

GENERAL DESCRIPTION

SAILOR VHF Control Unit C401 is designed to be used in conjunction with the SAILOR VHF RT145 and RT146.

SAILOR C401 contains all the necessary controls for full operation of the SAILOR VHF RT145 and RT146.

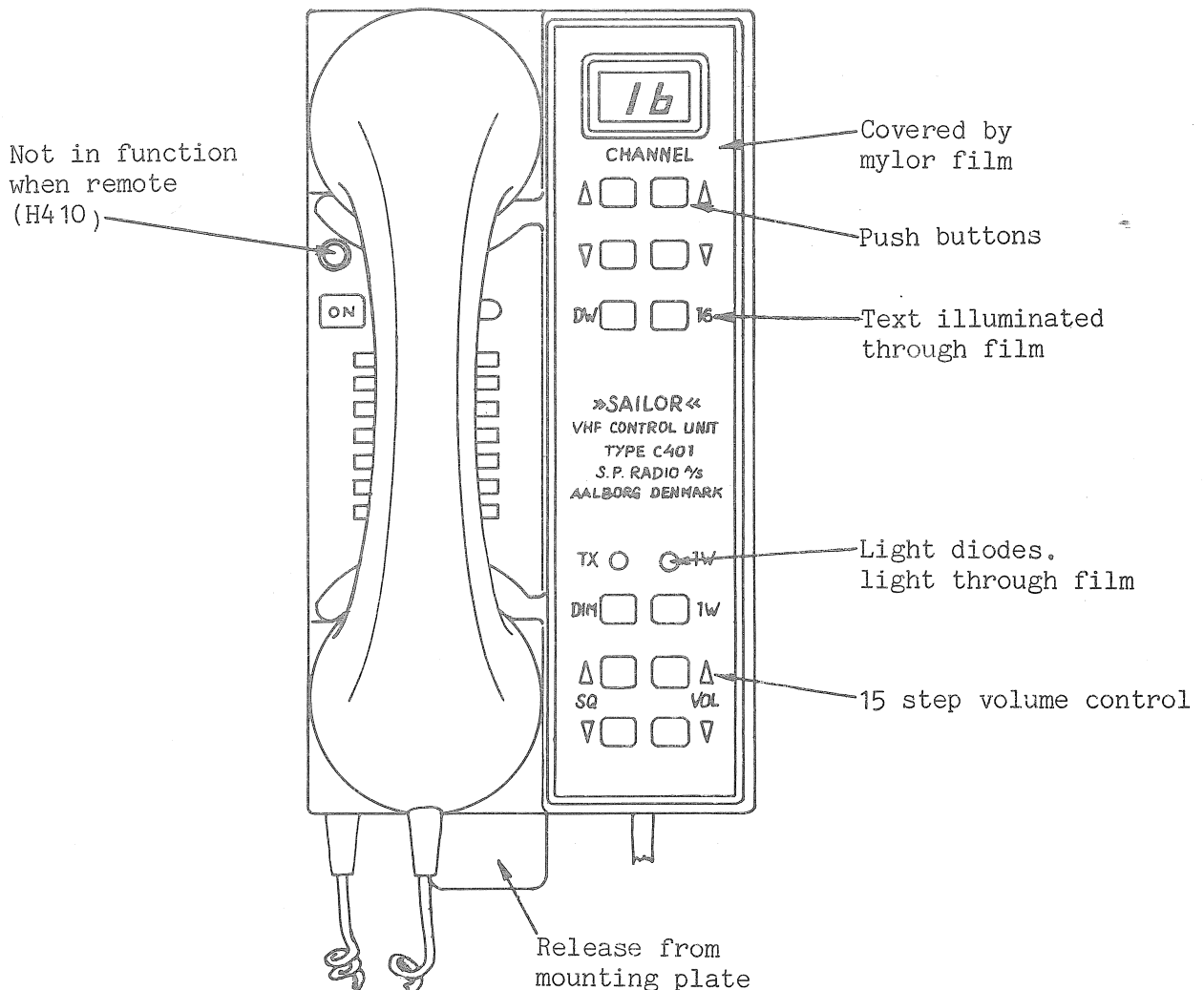
SAILOR C401 has a key board to control all functions. The channel selector, the volume control, the squelch control, the dimmer are all operated by push buttons.

SAILOR C401 is provided with dual watch facilities which enables the operator to listen to two channels at the same time, the selected channel and channel 16 which is the preference channel.

SAILOR C401 has quick selection of channel 16.

SAILOR C401 has built in loudspeaker.

SAILOR C401 can be installed up to 100 meters away from the SAILOR VHF sets RT145 and RT146.



TECHNICAL DATA FOR VHF CONTROL UNIT C402

All international maritime VHF channels

Private channels: 20
Temperature range: -20°C to $+55^{\circ}\text{C}$
AF output power: 3 Watt/4 ohm
Telephone output: 0,55V RMS/200 ohm
Distortion: Less than 5%
Dimensions: Height = 220 mm
Width = 120 mm
Depth = 90 mm
Weight: 1,5 kg

Selective call decoder recommended by CCIR

Signal/Noise ratio: 0 dB
Reaction time: Individual call 50 m Sec.
All ships call 12 m Sec.
Wait: Individual call 220 m Sec.
All ships call 220 m Sec.
Acoustic Alarm: Built-in loudspeaker
Visual Alarm: Two light diodes, one for
Individual call and one for
All ships call.

CONTROLS C402

All functions are key-board controlled.

ON/OFF

To switch the VHF set ON or OFF.

Not in function when remote controlled by H410.

DISPLAY

The LED display shows the selected channel number.

CHANNEL

The two keys to the right shift the unit digit of the channel number up or down.

The two keys to the left shift the tens digit of the channel number up or down.

D.W. (DUAL WATCH)

When the "D.W." key is pressed and the handset is in its holder, the receiver is listening to the selected channel and is watching channel 16 (preference channel). The display is flashing showing the selected channel number and channel 16.

If a signal is received on channel 16, the receiver will listen continuously to channel 16, until the signal disappears. The display shows channel number 16.

If the handset is removed from its holder, the Dual Watch is switched off and the selected channel is on.

When the "D.W." key is pressed again the Dual Watch is switched off.

16. (DISTRESS AND CALLING)

When the key "16" is pressed, channel 16 is quickly selected. Press the key 16 again, and the previous channel is selected.

DIM

The intensity of the LED display and the illumination of the symbols can be controlled in four steps.

1W

When the key "1W" is pressed, the LED "1W" will light, and the transmitter output is reduced to less than 1 Watt.

CONTROLS C402 cont.:

SQ

The squelch sensitivity can be controlled in 15 steps.

Adjustment of best squelch sensitivity:

Press the key with the arrow "up" until white noise is heard in the loudspeaker. Then press the key with the arrow "down" just until the white noise in the loudspeaker stops. The adjustment is to be done on a channel without signal.

VOL

The volume can be controlled in 15 steps.

SET

When the key "SET" is pressed the selcall decoder will be reset after a call. The acoustic and the visual alarm will be cancelled.

CALL

The LED will light when an individual call has been received. The acoustic alarm will stop after 10 secs.

CQ

The LED will light when an ALL SHIPS call has been received. The acoustic alarm will be on until the key "SET" is pressed.

TST

When the key "TST" is pressed the selcall decoder will be tested. First the acoustic alarm and the individual call LED will be ON and shortly after the all ships call LED will be ON.

GENERAL DESCRIPTION

SAILOR VHF Control Unit C402 is designed to be used in conjunction with the SAILOR VHF RT145 and RT146.

SAILOR C402 contains all the necessary controls for full operation of the SAILOR VHF RT145 and RT146.

SAILOR C402 has a key board to control all functions. The channel selector, the volume control, the squelch control, the dimmer are all operated by push buttons.

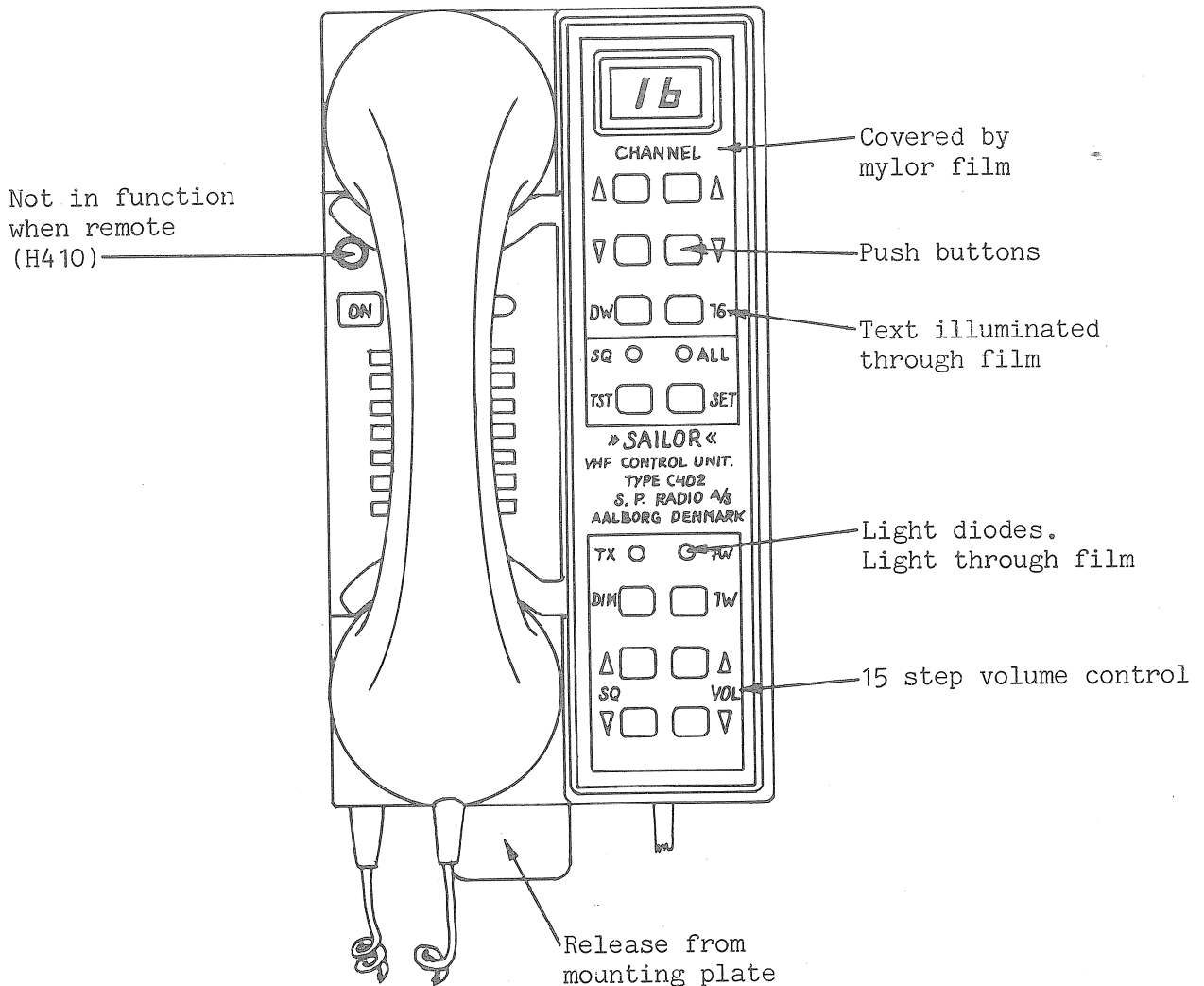
SAILOR C402 is provided with dual watch facilities which enables the operator to listen to two channels at the same time, the selected channel and channel 16 which is the preference channel.

SAILOR C402 has quick selection of channel 16.

SAILOR C402 has built in loudspeaker.

SAILOR C402 can be installed up to 100 meters away from the SAILOR VHF sets RT145 and RT146.

SAILOR C402 has built in selcall facilities as recommended by CCIR.



TECHNICAL DATA FOR VHF CONTROL UNIT C403

All international maritime VHF channels and the channel required in USA (U.S. mode)

Private channels:	20
Temperature range:	-20°C to +55°C
AF output power:	3 Watt/4 ohm
Telephone output:	0,55V RMS/200 ohm
Distortion:	Less than 5%
Dimensions:	Height = 220 mm
	Width = 120 mm
	Depth = 90 mm
Weight:	1,4 kg

CONTROLS C403

All functions are keyboard controlled.

ON/OFF

To switch the VHF set ON or OFF.

Not in function when remote controlled by H410.

DISPLAY

The LED display shows the selected channel number.

CHANNEL

The two keys to the right shift the unit digit of the channel number up or down.

The two keys to the left shift the tens digit of the channel number up or down.

D.W. (DUAL WATCH)

When the "D.W." key is pressed and the handset is in its holder, the receiver is listening to the selected channel and is watching channel 16 (preference channel). The display is flashing showing the selected channel number and channel 16.

If a signal is received on channel 16, the receiver will listen continuously to channel 16, until the signal disappears. The display shows channel number 16.

If the handset is removed from its holder, the Dual Watch is switched off and the selected channel is ON.

When the "D.W." key is pressed again the Dual Watch is switched off.

16. (DISTRESS AND CALLING)

When the key "16" is pressed, channel 16 is quickly selected. Press the key 16 again, and the previous channel is selected.

US (INTERNATIONAL MODE/US-MODE)

The switch can change the channel programming of SAILOR RT145 from International Mode to US-mode. See frequency table.

DIM

The intensity of the LED display and the illumination of the symbols can be controlled in four steps.

CONTROLS C403 cont.:

1W

When the key "1W" is pressed, the LED "1W" will light, and the transmitter output is reduced to less than 1 Watt.

SQ

The squelch sensitivity can be controlled in 15 steps.

Adjustment of best squelch sensitivity:

Press the key with the arrow "up" until white noise is heard in the loudspeaker. Then press the key with the arrow "down" just until the white noise in the loudspeaker stops. The adjustment is to be done on a channel without signal.

VOL

The volume can be controlled in 15 steps.

GENERAL DESCRIPTION

SAILOR VHF Control Unit C403 is designed to be used in conjunction with the SAILOR VHF RT145 and RT146.

SAILOR C403 contains all the necessary controls for full operation of the SAILOR VHF RT145 and RT146.

SAILOR C403 has a key board to control all functions. The channel selector, the volume control, the squelch control, the dimmer are all operated by push buttons.

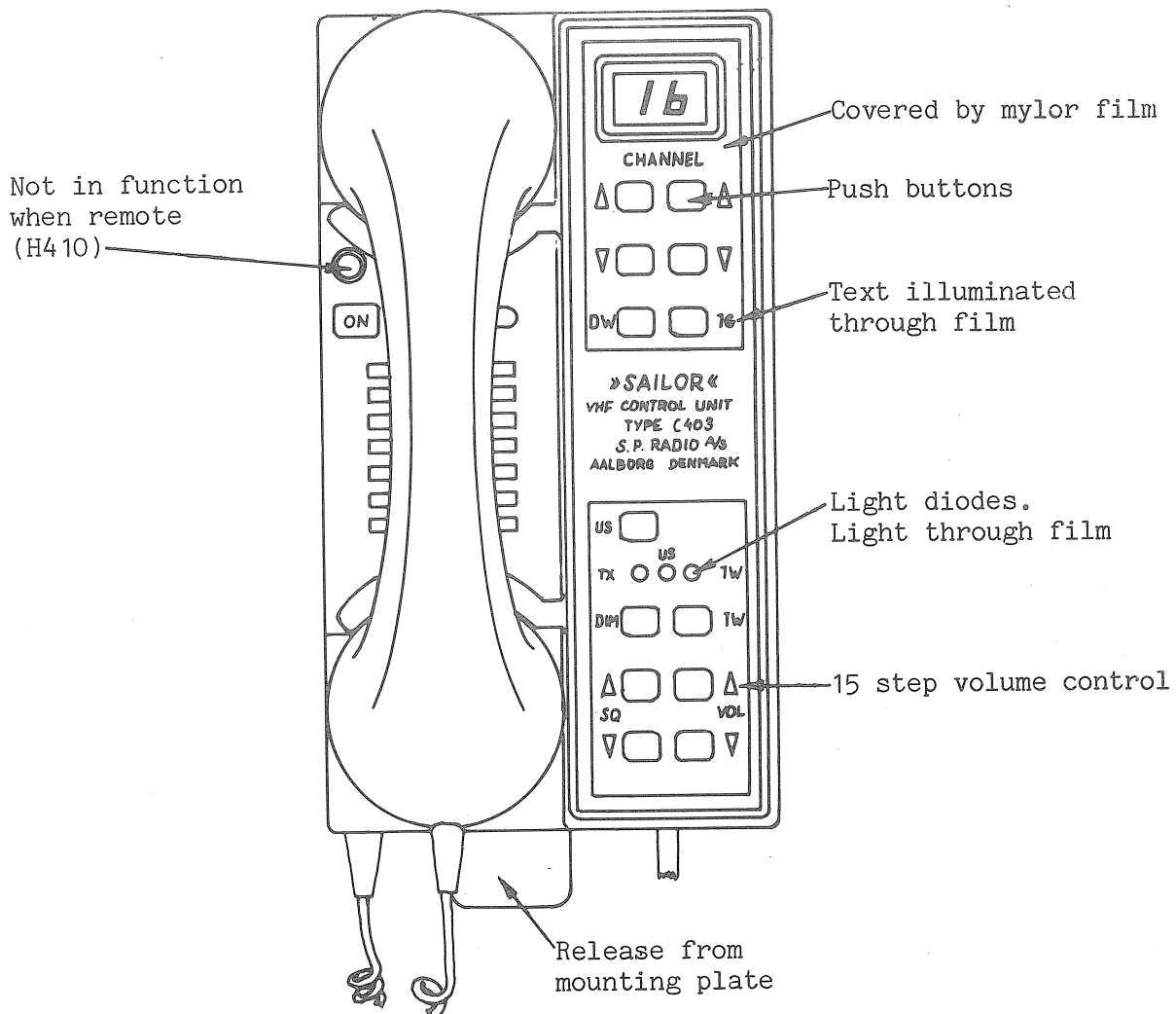
SAILOR C403 is provided with dual watch facilities which enables the operator to listen to two channels at the same time, the selected channel and channel 16 which is the preference channel.

SAILOR C403 has quick selection of channel 16.

SAILOR C403 has built in loudspeaker.

SAILOR C403 can be installed up to 100 meters away from the SAILOR VHF sets RT145 and RT146.

SAILOR C403 can be switched between the international maritime VHF channels and the channels required in USA (U.S. mode).



CONTROLS H410

ON

To switch the VHF set ON.

(The ON/OFF key on C401 - C402 - C403 is not in function).

OFF

To switch the VHF set OFF.

IN USE

The LED will light when one of the CONTROL UNITS C401 - C402 - C403 is in use.

PREFERENCE

One or more of the Remote Control Boxes H410 can be programmed for preference.

The Remote Control Box with preference can always be switched ON also when the LED IN USE is lightening.

The Remote Control Box without preference, can not be switched ON when the LED IN USE is lightening.

GENERAL DESCRIPTION

SAILOR Remote Control Box H410 is designed to be used in conjunction with the SAILOR Control Units C401, C402 or C403.

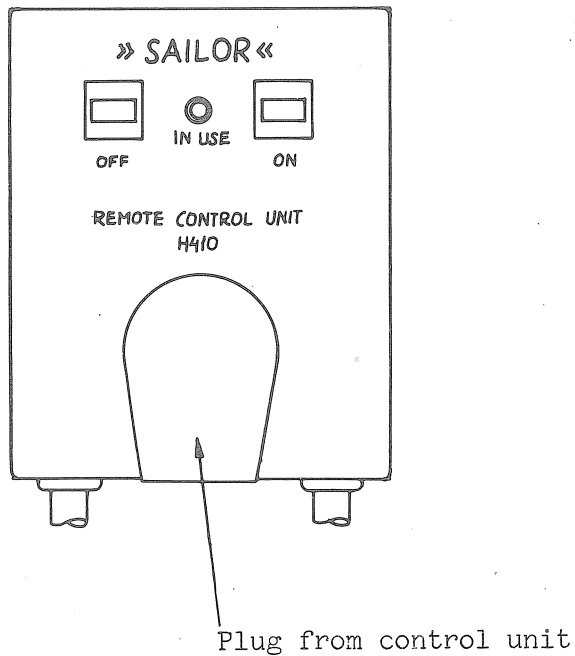
SAILOR H410 gives full remote control facilities for the SAILOR Control Units.

SAILOR H410 switches ON and OFF the SAILOR Control Unit.

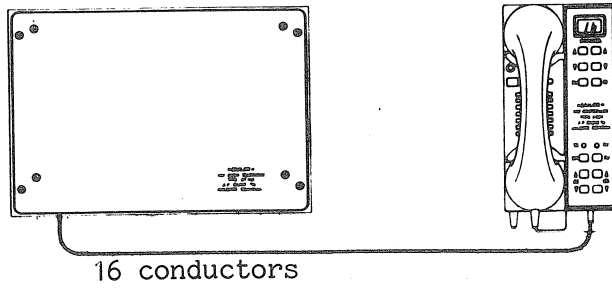
SAILOR H410 indicates if the VHF set is occupied from other location.

SAILOR H410 can be programmed (with a jumber) for preference. More than one location can have preference e.g. when there is 2 or 3 Control Units on the bridge.

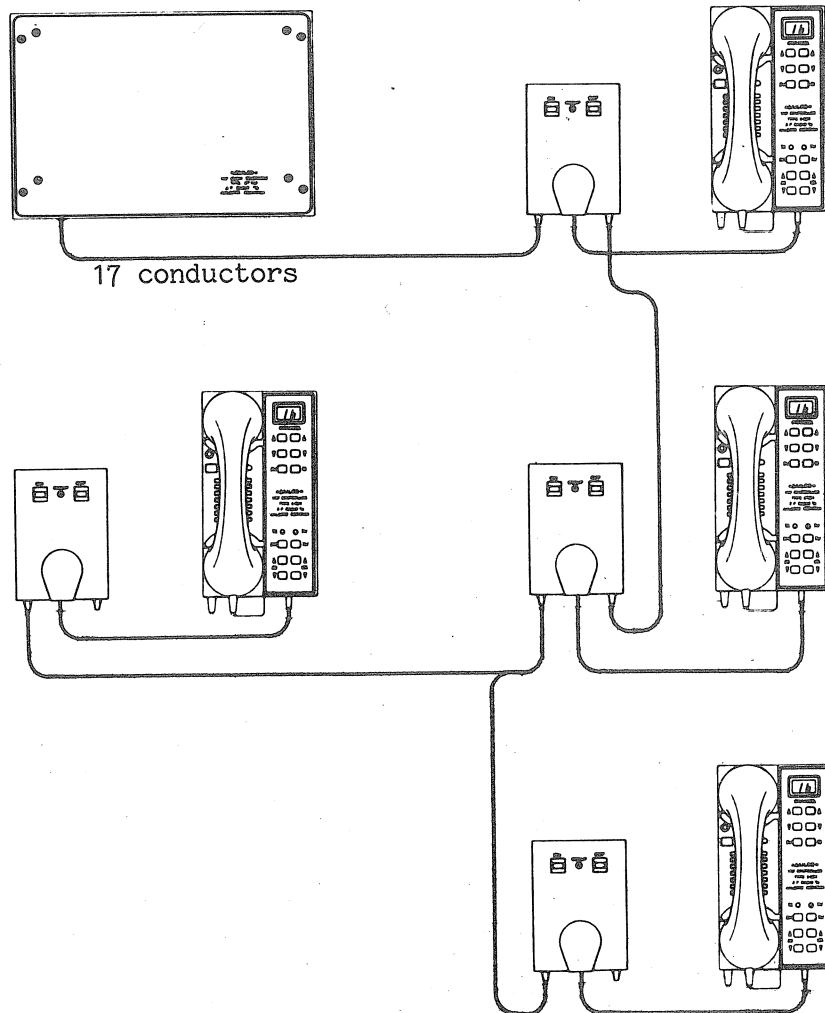
SAILOR H410 secures that only one Control Unit at a time can be switched ON.

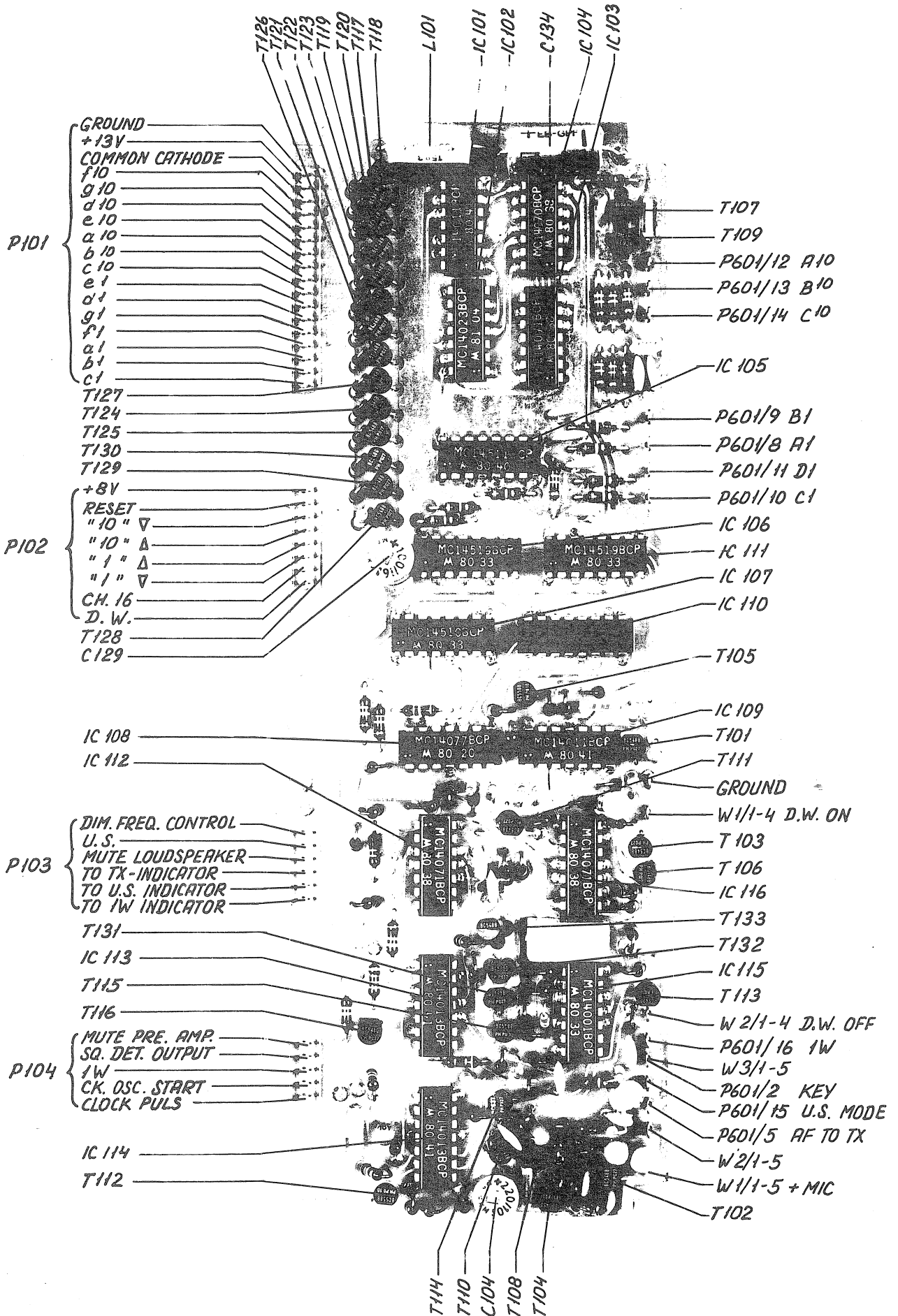


NORMAL INSTALLATION

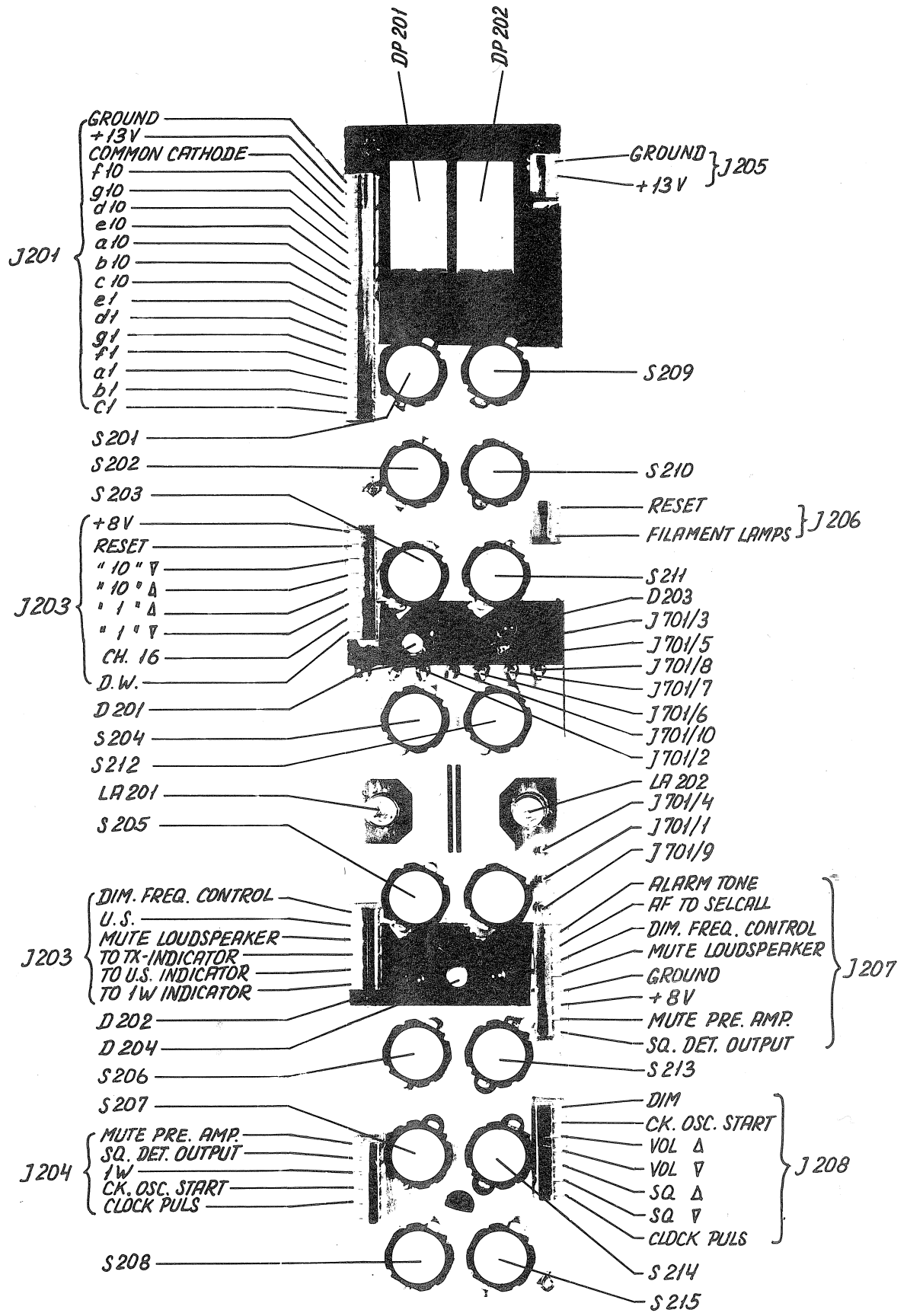


FULL REMOTE CONTROL INSTALLATION

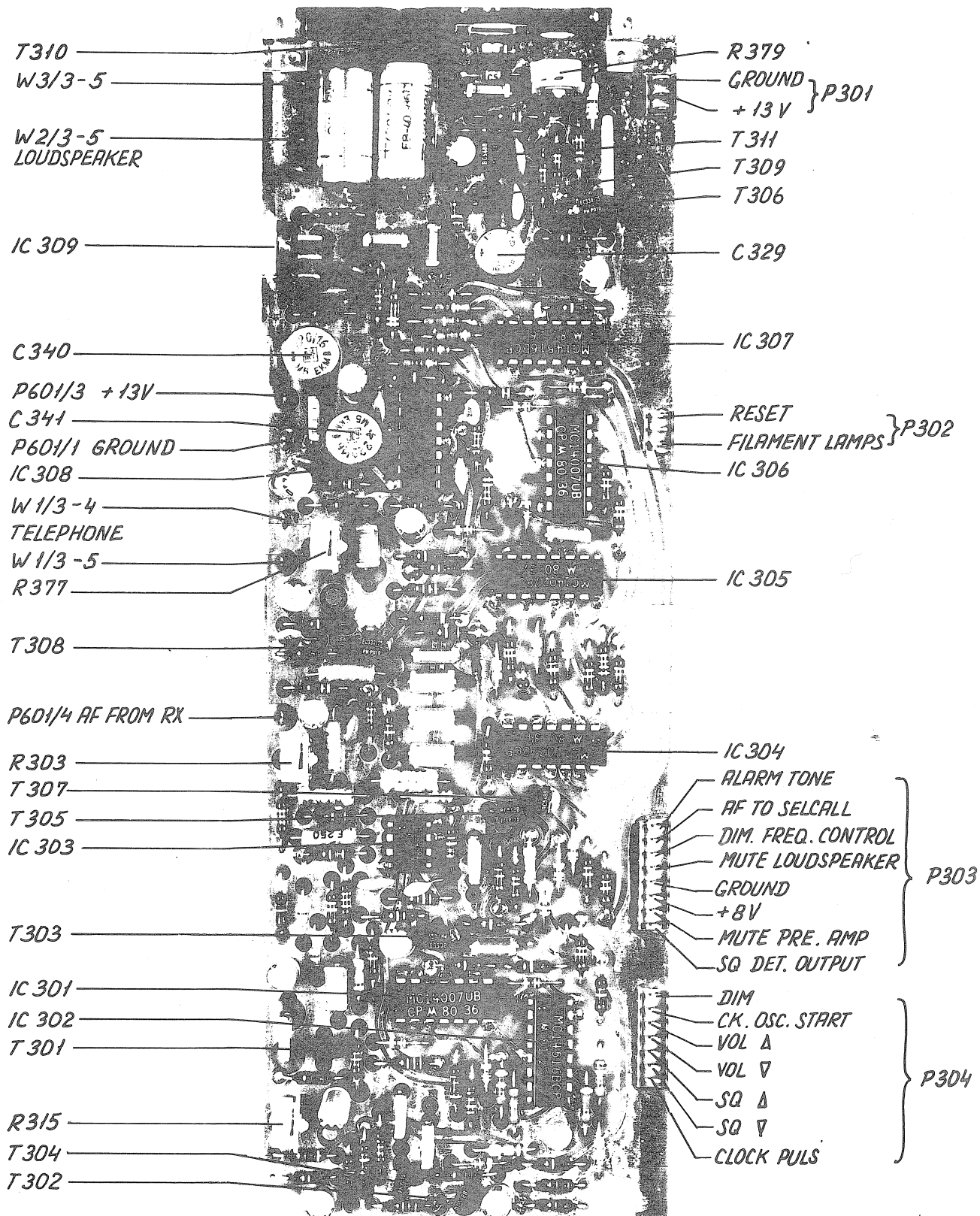




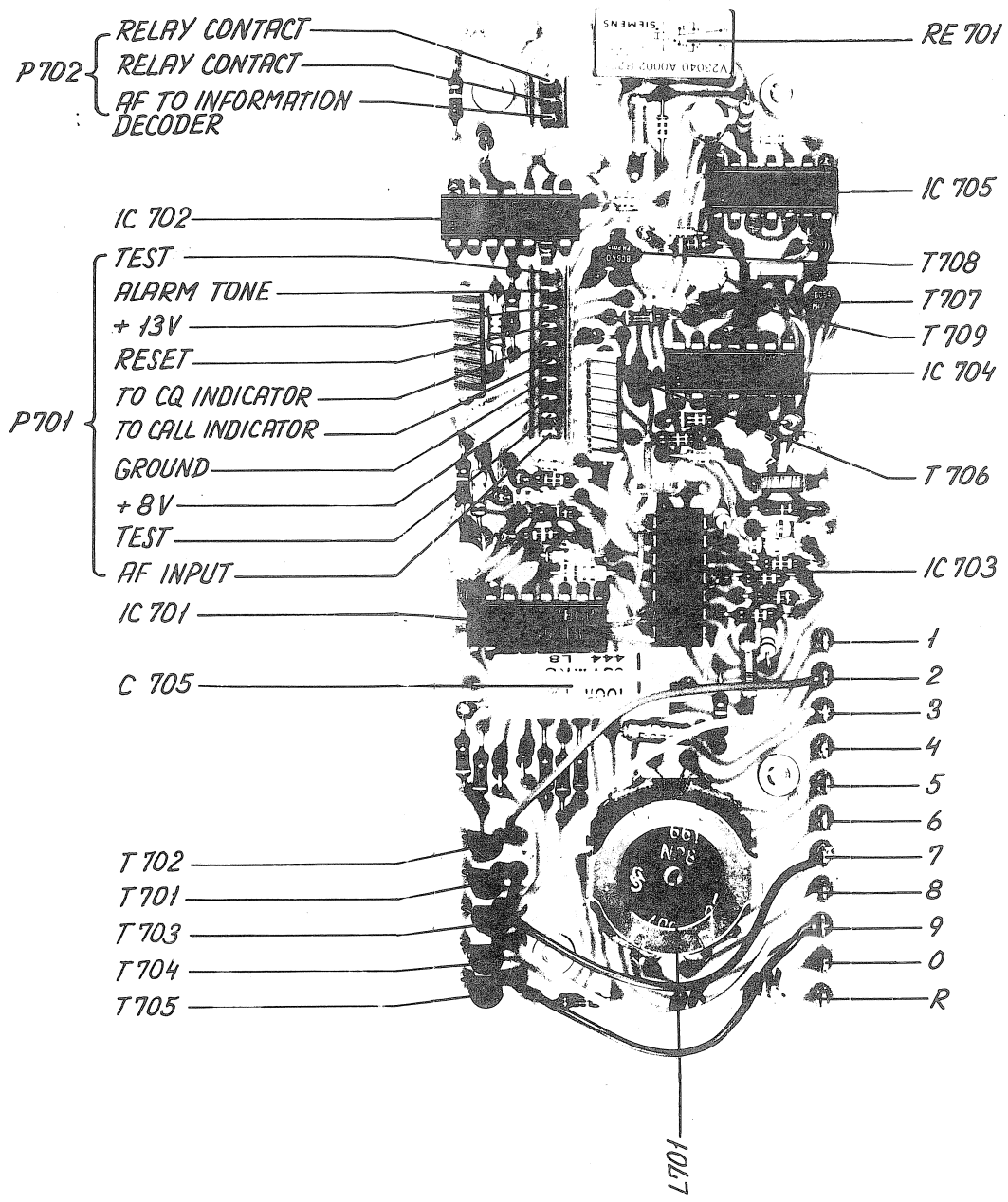
CHANNEL SELECTOR UNIT (100)



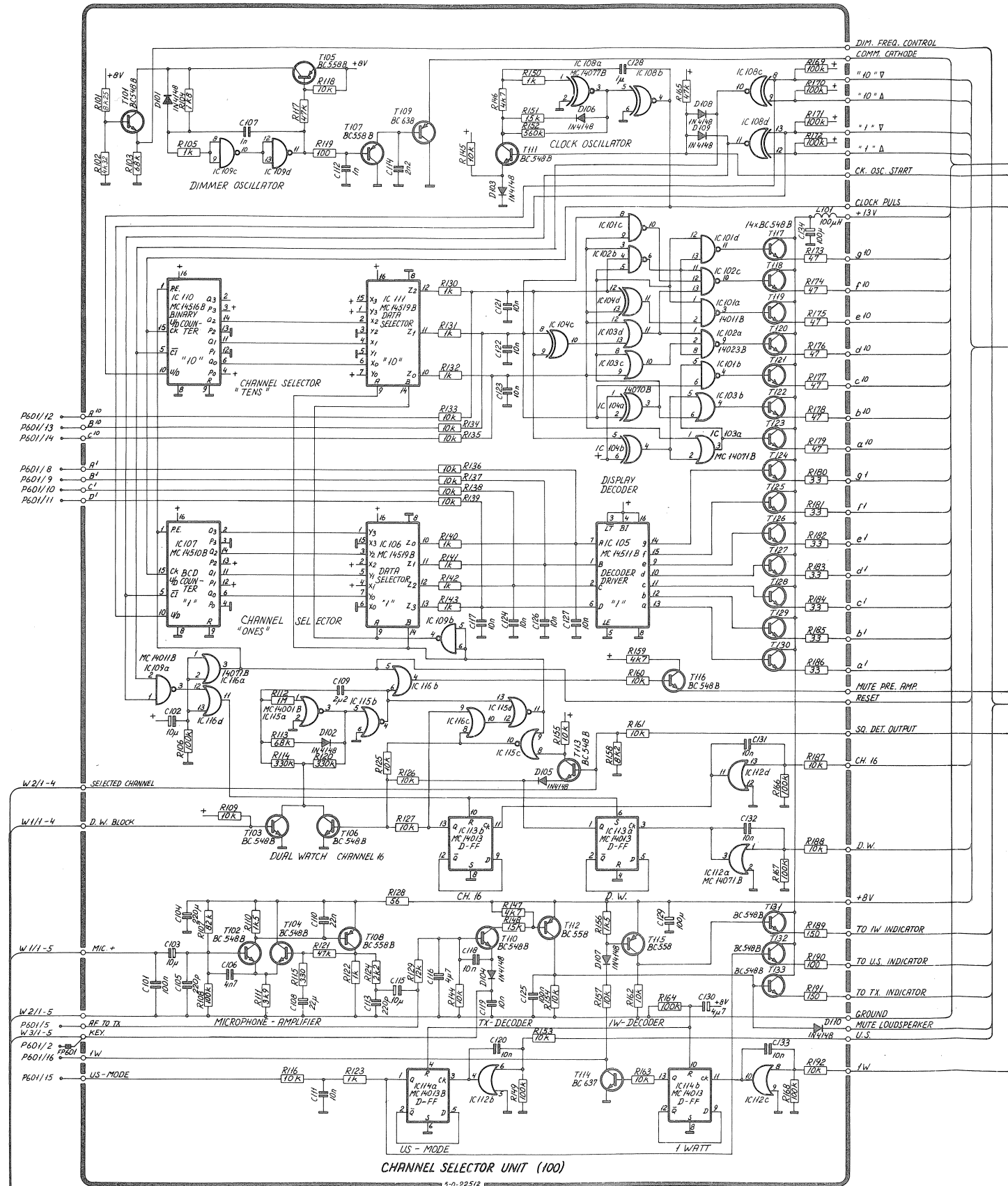
KEYBOARD (200)



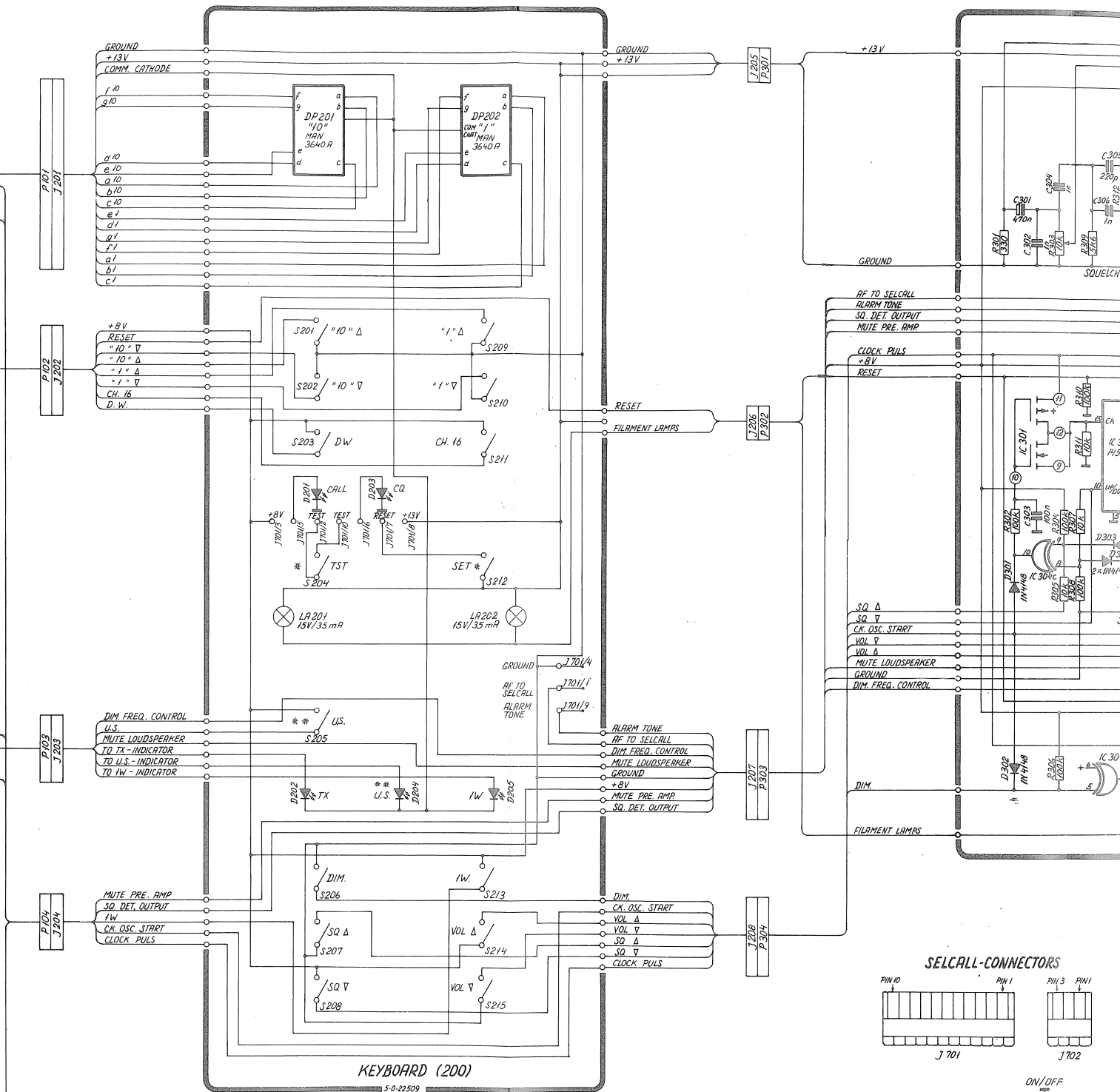
AUDIO AMPLIFIER UNIT (300)



SELCALL (700)



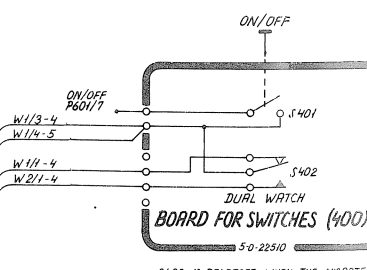
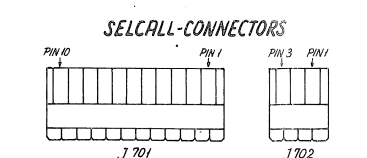
CHANNEL SELECTOR UNIT (100)



KEYBOARD (200)

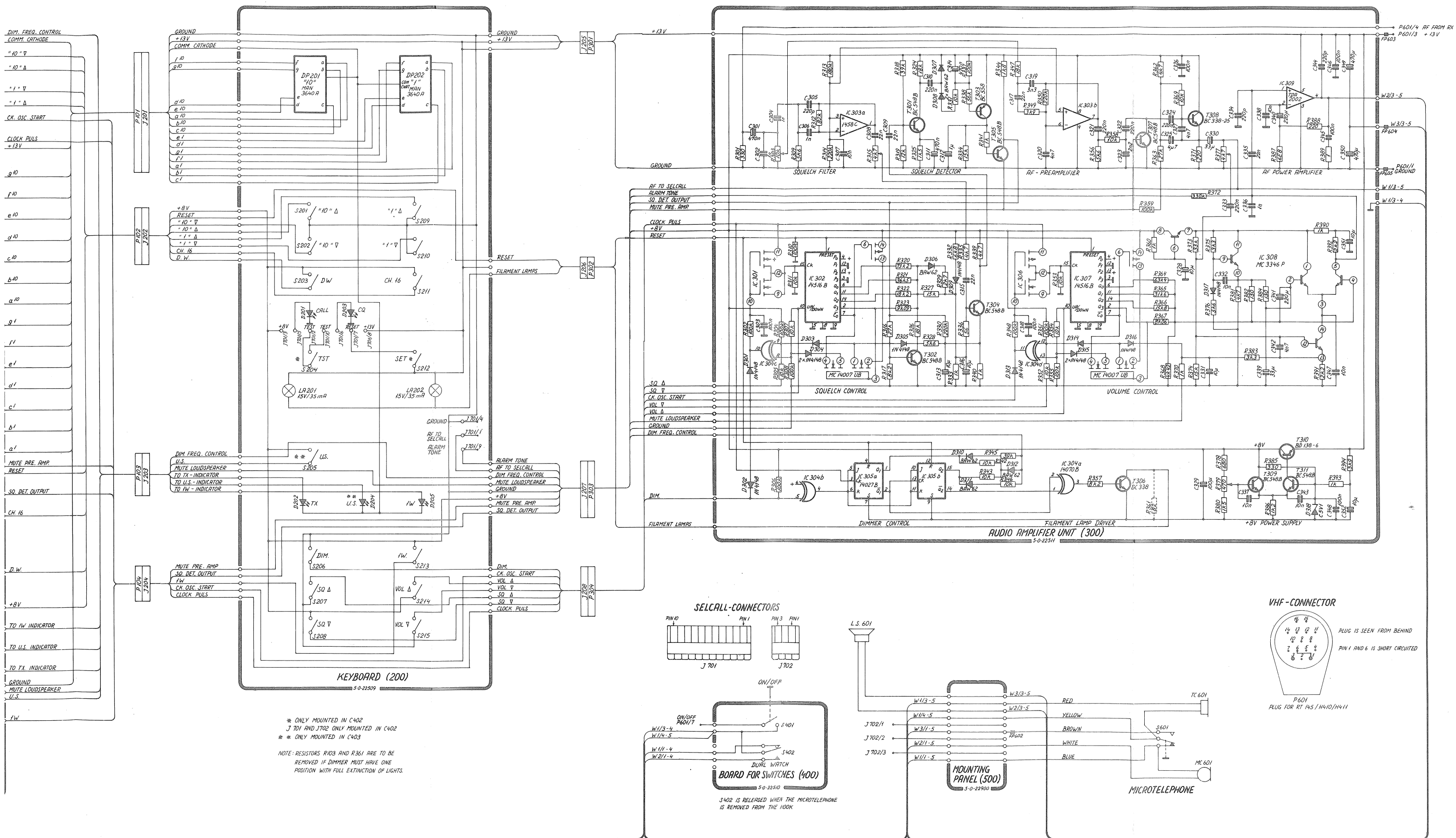
* ONLY MOUNTED IN C402
 J 701 AND J702 ONLY MOUNTED IN C402
 ** ONLY MOUNTED IN C403

NOTE: RESISTORS R103 AND R361 ARE TO BE REMOVED IF DIMMER MUST HAVE ONE POSITION WITH FULL EXTINCTION OF LIGHTS.



BOARD FOR SWITCHES (400)

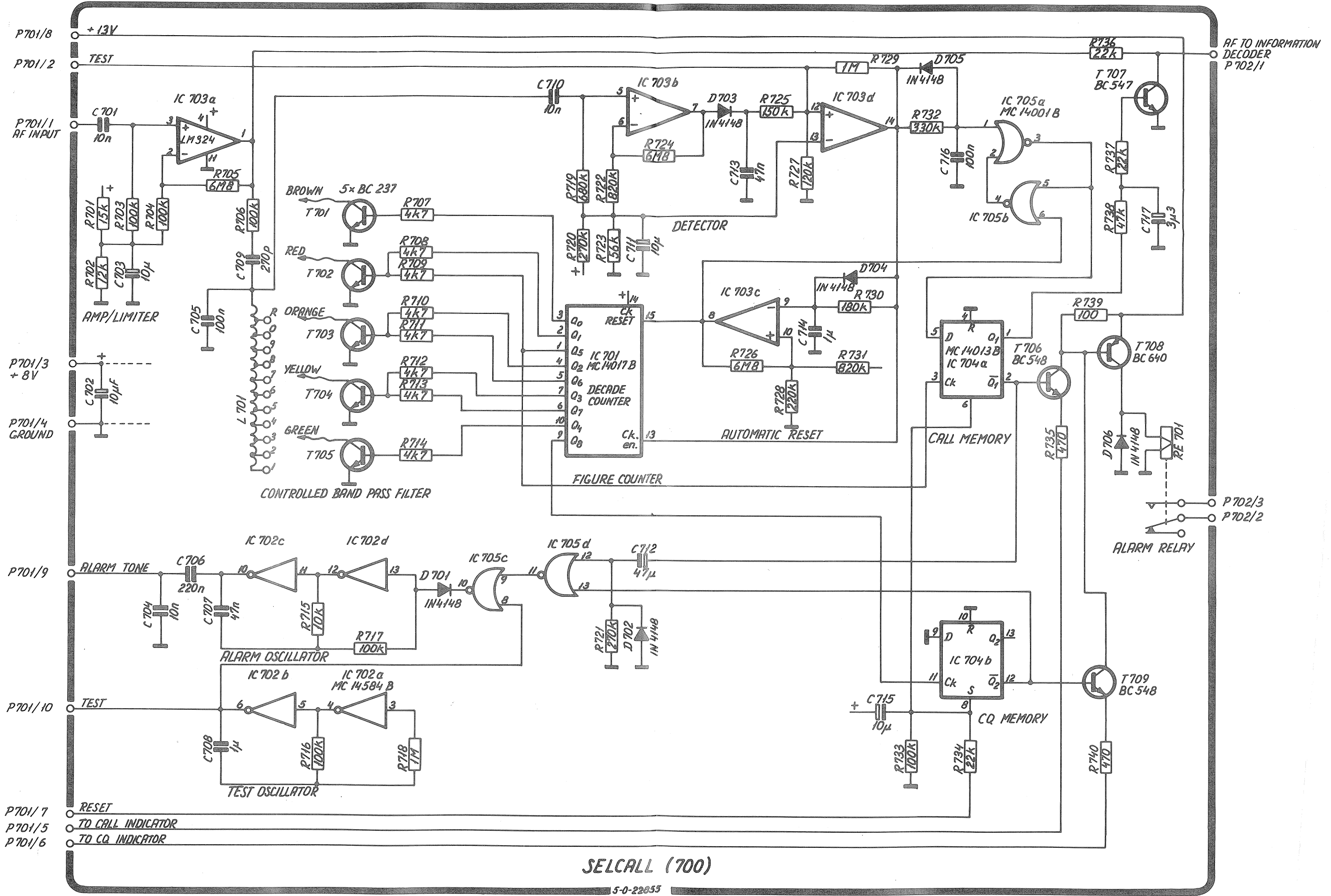
S402 IS RELEASED WHEN THE MICROTELLE IS REMOVED FROM THE VOOK



* ONLY MOUNTED IN C402
 J 701 AND J702 ONLY MOUNTED IN C402
 ** ONLY MOUNTED IN C403

NOTE: RESISTORS R103 AND R361 ARE TO BE REMOVED IF DIMMER MUST HAVE ONE POSITION WITH FULL EXTINCTION OF LIGHTS.

(A) SAILOR VHF CONTROL UNIT C401, C402, C403.



SELCALL (700)

Symbol	Description	Manufact.	
R101	Resistor 8.25Kohm \pm 1% 0.4W	Philips	2322 151 58252
R102	Resistor 4.32Kohm \pm 1% 0.4W	Philips	2322 151 54322
R103	Resistor 68Kohm \pm 5% 0.33W	Philips	2322 106 33683
R104	Resistor 1.8Kohm \pm 5% 0.33W	Philips	2322 106 33182
R105	Resistor 1Kohm \pm 5% 0.33W	Philips	2322 106 33102
R106	Resistor 100Kohm \pm 5% 0.33W	Philips	2322 106 33104
R107	Resistor 82Kohm \pm 5% 0.33W	Philips	2322 106 33823
R108	Resistor 100Kohm \pm 5% 0.33W	Philips	2322 106 33104
R109	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 106 33103
R110	Resistor 1.5Kohm \pm 5% 0.33W	Philips	2322 106 33152
R111	Resistor 3.9Kohm \pm 5% 0.33W	Philips	2322 106 33392
R112	Resistor 1Mohm \pm 5% 0.33W	Philips	2322 106 33105
R113	Resistor 68Kohm \pm 5% 0.33W	Philips	2322 106 33683
R114	Resistor 330Kohm \pm 5% 0.33W	Philips	2322 106 33334
R115	Resistor 330 ohm \pm 5% 0.33W	Philips	2322 106 33331
R116	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R117	Resistor 47Kohm \pm 5% 0.33W	Philips	2322 106 33473
R118	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 106 33103
R119	Resistor 100 ohm \pm 5% 0.33W	Philips	2322 211 13101
R120	Resistor 330Kohm \pm 5% 0.33W	Philips	2322 106 33334
R121	Resistor 47Kohm \pm 5% 0.33W	Philips	2322 106 33473
R122	Resistor 1Kohm \pm 5% 0.33W	Philips	2322 106 33102
R123	Resistor 1Kohm \pm 5% 0.33W	Philips	2322 106 33102
R124	Resistor 2.2Kohm \pm 5% 0.33W	Philips	2322 106 33222
R125	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 106 33103
R126	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 106 33103
R127	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 106 33103
R128	Resistor 56 ohm \pm 5% 0.33W	Philips	2322 106 33569
R129	Resistor 12Kohm \pm 5% 0.33W	Philips	2322 106 33123
R130	Resistor 1Kohm \pm 5% 0.33W	Philips	2322 211 13102
R131	Resistor 1Kohm \pm 5% 0.33W	Philips	2322 211 13102
R132	Resistor 1Kohm \pm 5% 0.33W	Philips	2322 211 13102
R133	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R134	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R135	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R136	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R137	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R138	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R139	Resistor 10Kohm \pm 5% 0.33W	Philips	2322 211 13103
R140	Resistor 1Kohm \pm 5% 0.33W	Philips	2322 211 13102

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>	
R141	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R142	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R143	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R144	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R145	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R146	Resistor	4.7kohm $\pm 5\%$	0.33W	Philips	2322 106 33472
R147	Resistor	4.7kohm $\pm 5\%$	0.33W	Philips	2322 106 33472
R148	Resistor	15kohm $\pm 5\%$	0.33W	Philips	2322 106 33153
R149	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R150	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 106 33102
R151	Resistor	15kohm $\pm 5\%$	0.33W	Philips	2322 106 33153
R152	Resistor	560kohm $\pm 5\%$	0.33W	Philips	2322 106 33564
R153	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R154	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R155	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R156	Resistor	1.5kohm $\pm 5\%$	0.33W	Philips	2322 106 33152
R157	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R158	Resistor	8.2kohm $\pm 5\%$	0.33W	Philips	2322 106 33822
R159	Resistor	4.7kohm $\pm 5\%$	0.33W	Philips	2322 211 13472
R160	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R161	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R162	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R163	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R164	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R165	Resistor	47kohm $\pm 5\%$	0.33W	Philips	2322 211 13473
R166	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R167	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 211 13104
R168	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R169	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R170	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R171	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 211 13104
R172	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 211 13104
R173	Resistor	47 ohm $\pm 5\%$	0.33W	Philips	2322 106 33479
R174	Resistor	47 ohm $\pm 5\%$	0.33W	Philips	2322 106 33479
R175	Resistor	47 ohm $\pm 5\%$	0.33W	Philips	2322 106 33479
R176	Resistor	47 ohm $\pm 5\%$	0.33W	Philips	2322 106 33479
R177	Resistor	47 ohm $\pm 5\%$	0.33W	Philips	2322 106 33479
R178	Resistor	47 ohm $\pm 5\%$	0.33W	Philips	2322 106 33479
R179	Resistor	47 ohm $\pm 5\%$	0.33W	Philips	2322 106 33479
R180	Resistor	33 ohm $\pm 5\%$	0.33W	Philips	2322 106 33339
R181	Resistor	33 ohm $\pm 5\%$	0.33W	Philips	2322 106 33339

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>	
R182	Resistor	33 ohm $\pm 5\%$	0.33W	Philips	2322 106 33339
R183	Resistor	33 ohm $\pm 5\%$	0.33W	Philips	2322 106 33339
R184	Resistor	33 ohm $\pm 5\%$	0.33W	Philips	2322 106 33339
R185	Resistor	33 ohm $\pm 5\%$	0.33W	Philips	2322 106 33339
R186	Resistor	33 ohm $\pm 5\%$	0.33W	Philips	2322 106 33339
R187	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R188	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 106 33103
R189	Resistor	150 ohm $\pm 5\%$	0.33W	Philips	2322 211 13151
R190	Resistor	100 ohm $\pm 5\%$	0.33W	Philips	2322 106 33101
R191	Resistor	150 ohm $\pm 5\%$	0.33W	Philips	2322 106 33151
R192	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
C101	Capacitor MKT	100nF $\pm 10\%$	100V	Siemens	B32560-D1104-K
C102	Capacitor electrolytic	10uF $\pm 20\%$	35V	ROE	EKI 00 AA 210F
C103	Capacitor tantal	10uF -20/+50%	16V	ERO	ETP 2 E
C104	Capacitor electrolytic	220uF -10/+50%	10V	ROE	EKM 00 CC 322C
C105	Capacitor ceramic	220pF -20/+80%	400V	Ferroperm	9/0129.9
C106	Capacitor ceramic	4.7nF -20/+80%	30V	Ferroperm	9/0145.9
C107	Capacitor MKT	1nF $\pm 10\%$	400V	Siemens	B32560-D6102-K
C108	Capacitor electrolytic	22uF $\pm 20\%$	25V	ROE	EKI 00 AA 222E
C109	Capacitor MKT	2.2uF $\pm 10\%$	100V	Siemens	B32562-D1225-K
C110	Capacitor MKT	22nF $\pm 10\%$	250V	Siemens	B32560-D3223-K
C111	Capacitor ceramic	10nF -20/+80%	30V	Ferroperm	9/0145.9
C112	Capacitor ceramic	1nF -20/+80%	40V	Ferroperm	9/0129.8
C113	Capacitor ceramic	220pF -20/+80%	400V	Ferroperm	9/0129.9
C114	Capacitor MKT	2.2nF $\pm 10\%$	400V	Siemens	B32560-D6222-K
C115	Capacitor electrolytic	10uF $\pm 20\%$	35V	ROE	EKI 00 AA 210F
C116	Capacitor tantal	4.7uF -20/+80%	16V	ERO	ETP2C
C117	Capacitor ceramic	10nF -20/+80%	30V	Ferroperm	9/0145.9
C118	Capacitor ceramic	10nF -20/+80%	30V	Ferroperm	9/0145.9
C119	Capacitor ceramic	10nF -20/+80%	30V	Ferroperm	9/0145.9
C120	Capacitor ceramic	10nF -20/+80%	30V	Ferroperm	9/0145.9
C121	Capacitor ceramic	10nF -20/+80%	30V	Ferroperm	9/0145.9

Symbol	Description	Manufact.	
C122	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C123	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C124	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C125	Capacitor MKT 100nF+10% 100V	Siemens	B32560-D1104-K
C126	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C127	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C128	Capacitor MKT 1uF+10% 100V	Siemens	B32562-D1105-K
C129	Capacitor electrolytic 100uF-10/+50% 16V	ROE	EKM 00 DC 310D
C130	Capacitor electrolytic 4.7uF+20% 50V	ROE	EKI 00 AA 147H
C131	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C132	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C133	Capacitor ceramic 10nF-20/+80% 30V	Ferroperm	9/0145.9
C134	Capacitor electrolytic 100uF-10/+50% 25V	ROE	EB 00 FB 310 E
L101	Coil 100uH+10% 0.4A	Ferroperm	1583
D101	Diode	Philips	1N4148
D102	Diode	Philips	1N4148
D103	Diode	Philips	1N4148
D104	Diode	Philips	1N4148
D105	Diode	Philips	1N4148
D106	Diode	Philips	1N4148
D107	Diode	Philips	1N4148
D108	Diode	Philips	1N4148

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
D109	Diode	Philips	1N4148
D110	Diode	Philips	1N4148
P601	Connector	AMP	1-164713-7
P602	Connector	AMP	164713-8
P603	Connector	AMP	164713-6
P604	Connector	AMP	164713-5
T101	Transistor	Philips	BC 548 B
T102	Transistor	Philips	BC 548 B
T103	Transistor	Philips	BC 548 B
T104	Transistor	Philips	BC 548 B
T105	Transistor	Philips	BC 558 B
T106	Transistor	Philips	BC 548 B
T107	Transistor	Philips	BC 558 B
T108	Transistor	Philips	BC 558 B
T109	Transistor	Philips	BC 638
T110	Transistor	Philips	BC 548 B
T111	Transistor	Philips	BC 548 B
T112	Transistor	Philips	BC 558
T113	Transistor	Philips	BC 548 B
T114	Transistor	Philips	BC 637
T115	Transistor	Philips	BC 558
T116	Transistor	Philips	BC 548 B
T117	Transistor	Philips	BC 548 B
T118	Transistor	Philips	BC 548 B
T119	Transistor	Philips	BC 548 B
T120	Transistor	Philips	BC 548 B
T121	Transistor	Philips	BC 548 B
T122	Transistor	Philips	BC 548 B
T123	Transistor	Philips	BC 548 B
T124	Transistor	Philips	BC 548 B
T125	Transistor	Philips	BC 548 B
T126	Transistor	Philips	BC 548 B
T127	Transistor	Philips	BC 548 B
T128	Transistor	Philips	BC 548 B
T129	Transistor	Philips	BC 548 B
T130	Transistor	Philips	BC 548 B
T131	Transistor	Philips	BC 548 B
T132	Transistor	Philips	BC 548 B
T133	Transistor	Philips	BC 548 B

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
IC101	Quad 2-input nand gate	Motorola	MC 14011 BCP
IC102	Triple 3-input nand gate	Motorola	MC 14023 BCP
IC103	Quad 2-input or gate	Motorola	MC 14071 BCP
IC104	Quad excl. or gate	Motorola	MC 14070 BCP
IC105	Decoder, driver	Motorola	MC 14511 BCP
IC106	Data selector	Motorola	MC 14519 BCP
IC107	BCD up/down counter	Motorola	MC 14510 BCP
IC108	Quad excl. nor gate	Motorola	MC 14077 BCP
IC109	Quad 2-input nand gate	Motorola	MC 14011 BCP
IC110	Binary up/down counter	Motorola	MC 14516 BCP
IC111	Data selector	Motorola	MC 14519 BCP
IC112	Quad 2-input or gate	Motorola	MC 14071 BCP
IC113	Dual D flip flop	Motorola	MC 14013 BCP
IC114	Dual D flip flop	Motorola	MC 14013 BCP
IC115	Quad 2-input nor gate	Motorola	MC 14001 BCP
IC116	Quad 2-input or gate	Motorola	MC 14071 BCP

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
D201	LED, yellow	General Instrument	MV 5374/B
D202	LED, red	General Instrument	MV 5774/B
D203	LED, red	General Instrument	MV 5774/B
D204	LED, yellow	General Instrument	MV 5374/B
D205	LED, red	General Instrument	MV 5374/B
DP201	7 segment display	General Instrument	MAN 3640 A (EFG)
DP202	7 segment display	General Instrument	MAN 3640 A (EFG)
LA201	Filament lamp 15V/35mA	OSHINO	OL-6003 MB
LA202	Filament lamp 15V/35mA	OSHINO	OL-6003 MB
S201	Disc. element	ITT Jeanrenaud	ED
S202	Disc. element	ITT Jeanrenaud	ED
S203	Disc. element	ITT Jeanrenaud	ED
S204	Disc. element	ITT Jeanrenaud	ED
S205	Disc. element	ITT Jeanrenaud	ED
S206	Disc. element	ITT Jeanrenaud	ED
S207	Disc. element	ITT Jeanrenaud	ED
S208	Disc. element	ITT Jeanrenaud	ED
S209	Disc. element	ITT Jeanrenaud	ED
S210	Disc. element	ITT Jeanrenaud	ED
S211	Disc. element	ITT Jeanrenaud	ED
S212	Disc. element	ITT Jeanrenaud	ED
S213	Disc. element	ITT Jeanrenaud	ED
S214	Disc. element	ITT Jeanrenaud	ED
S215	Disc. element	ITT Jeanrenaud	ED
J201	Connector	AMP	1-164711-7
J202	Connector	AMP	164711-8
J203	Connector	AMP	164711-6
J204	Connector	AMP	164711-5
J205	Connector	AMP	164711-3
J206	Connector	AMP	164711-3
J207	Connector	AMP	164711-8
J208	Connector	AMP	164711-7

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>	
R301	Resistor	330 ohm	$\pm 5\%$ 0.33W	Philips	2322 211 13331
R302	Resistor	100 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13104
R303	Trimming potentiometer	10 kohm	$\pm 20\%$ 0.3W	NOBLE	TM8 KH1-1S
R304	Resistor	100 kohm	$\pm 5\%$ 0.33W	Philips	2322 106 33104
R305	Resistor	10 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13103
R306	Resistor	100 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13104
R307	Resistor	10 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13103
R308	Resistor	100 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13104
R309	Resistor	5.6 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13562
R310	Resistor	100 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13104
R311	Resistor	10 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13103
R312	Resistor	82 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13823
R313	Resistor	180 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13184
R314	Resistor	220 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13224
R315	Trimming potentiometer	47 kohm	$\pm 20\%$ 0.3W	NOBLE	TM8 KH1-1S
R316	Resistor	27 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13273
R317	Resistor	8.2 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13822
R318	Resistor	39 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13393
R319	Resistor	12 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13123
R320	Resistor	73.2 kohm	$\pm 1\%$ 0.4W	Philips	2322 151 57323
R321	Resistor	36.5 kohm	$\pm 1\%$ 0.4W	Philips	2322 151 53653
R322	Resistor	18.2 kohm	$\pm 1\%$ 0.4W	Philips	2322 151 51823
R323	Resistor	9.09 kohm	$\pm 1\%$ 0.4W	Philips	2322 151 59092
R324	Resistor	18 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13183
R325	Resistor	1.5 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13152
R326	Resistor	18 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13183
R327	Resistor	15 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13153
R328	Resistor	5.6 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13562
R329	Resistor	2.7 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13272
R330	Resistor	220 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13224
R331	Resistor	10 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13103
R332	Resistor	6.8 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13682
R333	Resistor	1 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13102
R334	Resistor	15 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13153
R335	Resistor	4.7 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13472
R336	Resistor	56 ohm	$\pm 5\%$ 0.33W	Philips	2322 211 13569
R337	Resistor	100 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13104
R338	Resistor	56 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13563
R339	Resistor	4.7 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13472
R340	Resistor	1 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13102
R341	Resistor	1 kohm	$\pm 5\%$ 0.33W	Philips	2322 211 13102

Symbol	Description			Manufact.	
R342	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R343	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R344	Resistor	1.8kohm $\pm 5\%$	0.33W	Philips	2322 211 13182
R345	Resistor	39Kohm $\pm 5\%$	0.33W	Philips	2322 106 33393
R346	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R347	Resistor	18kohm $\pm 5\%$	0.33W	Philips	2322 211 13183
R348	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 211 13104
R349	Resistor	3.9kohm $\pm 5\%$	0.33W	Philips	2322 211 13392
R350	Resistor	220kohm $\pm 5\%$	0.33W	Philips	2322 211 13224
R351	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R352	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R353	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R354	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R355	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 106 33104
R356	Resistor	5.6kohm $\pm 5\%$	0.33W	Philips	2322 211 13562
R357	Resistor	8.2kohm $\pm 5\%$	0.33W	Philips	2322 211 13822
R358	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R359	Resistor	100kohm $\pm 5\%$	0.33W	Philips	2322 211 13104
R360	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R361	Resistor	82 ohm $\pm 5\%$	0.33W	Philips	2322 211 13829
R362	Resistor	4.7kohm $\pm 5\%$	0.33W	Philips	2322 211 13472
R363	Resistor	27kohm $\pm 5\%$	0.33W	Philips	2322 211 13273
R364	Resistor	63,4kohm $\pm 1\%$	0.4W	Philips	2322 151 56343
R365	Resistor	31.6kohm $\pm 1\%$	0.4W	Philips	2322 151 53163
R366	Resistor	15.8kohm $\pm 1\%$	0.4W	Philips	2322 151 51583
R367	Resistor	8.06kohm $\pm 1\%$	0.4W	Philips	2322 151 58062
R368	Resistor	4.42kohm $\pm 1\%$	0.4W	Philips	2322 151 54422
R369	Resistor	10kohm $\pm 5\%$	0.33W	Philips	2322 211 13103
R370	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R371	Resistor	220 ohm $\pm 5\%$	0.33W	Philips	2322 211 13221
R372	Resistor	330kohm $\pm 5\%$	0.33W	Philips	2322 211 13334
R373	Resistor	33kohm $\pm 5\%$	0.33W	Philips	2322 211 13333
R374	Resistor	15kohm $\pm 5\%$	0.33W	Philips	2322 211 13153
R375	Resistor	3.3kohm $\pm 5\%$	0.33W	Philips	2322 211 13332
R376	Resistor	5.6kohm $\pm 5\%$	0.33W	Philips	2322 211 13562
R377	Trimming pot.meter	4.7kohm $\pm 20\%$	0.3W	Noble	TM8 KH1-1S
R378	Resistor	680 ohm $\pm 5\%$	0.33W	Philips	2322 211 13681
R379	Trimming pot.meter	470 ohm $\pm 20\%$	0.3W	Noble	TM8 KH1-1S
R380	Resistor	1.5kohm $\pm 5\%$	0.33W	Philips	2322 211 13152
R381	Resistor	4.7kohm $\pm 5\%$	0.33W	Philips	2322 211 13472

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>	
R382	Resistor	130 ohm $\pm 1\%$	0.4W	Philips	2322 151 51301
R383	Resistor	3.3kohm $\pm 5\%$	0.33W	Philips	2322 211 13332
R384	Resistor	130 ohm $\pm 1\%$	0.4W	Philips	2322 151 51301
R385	Resistor	330 ohm $\pm 5\%$	0.33W	Philips	2322 211 13331
R386	Resistor	1.2kohm $\pm 5\%$	0.33W	Philips	2322 211 13122
R387	Resistor	6.8 ohm $\pm 5\%$	0.33W	Philips	2322 211 13688
R388	Resistor	220 ohm $\pm 5\%$	0.33W	Philips	2322 211 13221
R389	Resistor	1 ohm $\pm 5\%$	0.33W	Philips	2322 211 13108
R390	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R391	Resistor	2.2kohm $\pm 5\%$	0.33W	Philips	2322 211 13222
R392	Resistor	2.2kohm $\pm 5\%$	0.33W	Philips	2322 211 13222
R393	Resistor	1kohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R394	Resistor	3.9kohm $\pm 5\%$	0.33W	Philips	2322 211 13392
C301	Capacitor electrolytic	470nF $\pm 20\%$	50V	ROE	EKI 00 AA 047H
C302	Capacitor ceramic	1nF $\pm 20\%$	500V	KCK	HM 60 SJ YD 102M
C303	Capacitor MKT	100nF $\pm 10\%$	100V	Siemens	B32560-D1104-K
C304	Capacitor polystyrene	1nF $\pm 5\%$	160V	Philips	2222 425 21002
C305	Capacitor polystyrene	220pF $\pm 5\%$	500V	Philips	2222 427 22201
C306	Capacitor polystyrene	1nF $\pm 5\%$	160V	Philips	2222 425 21002
C307	Capacitor ceramic	10nF $-20/+80\%$	50V	Ferroperm	9/145.9
C308	Capacitor MKT	22nF $\pm 10\%$	250V	Siemens	B32560-D3223-K
C309	Capacitor MKT	22nF $\pm 10\%$	250V	Siemens	B32560-D3223-K
C310	Capacitor MKT	220nF $\pm 10\%$	100V	Siemens	B32560-D1104-K
C311	Capacitor electrolytic	470nF $\pm 20\%$	50V	ROE	EKI 00 AA 047H
C312	Capacitor electrolytic	1uF $\pm 20\%$	50V	ROE	EKI 00 AA 110H
C313	Capacitor electrolytic	10uF $\pm 20\%$	35V	ROE	EKI 00 AA 210F
C314	Capacitor electrolytic	470nF $\pm 20\%$	50V	ROE	EKI 00 AA 047H
C315	Capacitor MKT	22nF $\pm 10\%$	250V	Siemens	B32560-D3223-K
C316	Capacitor electrolytic	10uF $\pm 20\%$	35V	ROE	EKI 00 AA 210F
C317	Capacitor MKT	22nF $\pm 10\%$	250V	Siemens	B32560-D3223-K
C318	Capacitor MKT	100nF $\pm 10\%$	100V	Siemens	B32560-D1104-K
C319	Capacitor polystyrene	3.3nF $\pm 5\%$	160V	Philips	2222 425 23302
C320	Capacitor ceramic	4.7nF $\pm 20\%$	50V	KCK	HE 80 SJ YD 472M
C321	Capacitor MKT	220nF $\pm 10\%$	100V	Siemens	B32560-D1224-K

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>	
C322	Capacitor MKT	220nF \pm 10%	100V	Siemens	B32560-D1224-K
C323	Capacitor polystyrene	2.2nF \pm 5%	160V	Philips	2222 425 22202
C324	Capacitor MKT	220nF \pm 10%	100V	Siemens	B32560-D1224-K
C325	Capacitor electrolytic	4.7uF \pm 20%	50V	ROE	EKI 00 AA 147A
C326	Capacitor MKT	100nF \pm 10%	100V	Siemens	B32560-D1104-K
C327	Capacitor ceramic	4.7nF \pm 20%	50V	KCK	HE 80 SJ YD 472M
C328	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F
C329	Capacitor electrolytic	100uF \pm 20%	16V	ROE	EKM 00 CC 310D
C330	Capacitor electrolytic	33uF \pm 20%	16V	ROE	EKI 00 AA 233D
C331	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F
C332	Capacitor ceramic	10nF-20/+80%	50V	Ferroperm	9/145.9
C333	Capacitor MKT	220nF \pm 10%	100V	Siemens	B32560-D1224-K
C334	Capacitor ceramic	220pF-20/+80%	400V	Ferroperm	9/129.9
C335	Capacitor MKT	22nF \pm 10%	250V	Siemens	B32560-D3223-K
C336	Capacitor ceramic	1nF \pm 20%	500V	KCK	HM 60 SJ YD 102M
C337	Capacitor ceramic	10nF-20/+80%	50V	Ferroperm	9/145.9
C338	Capacitor ceramic	10nF-20/+80%	50V	Ferroperm	9/145.9
C339	Capacitor electrolytic	33uF \pm 20%	16V	ROE	EKI 00 AA 233D
C340	Capacitor electrolytic	220uF \pm 20%	10V	ROE	EKM 00 CC 322C
C341	Capacitor electrolytic	220uF \pm 20%	10V	ROE	EKM 00 CC 322C
C342	Capacitor ceramic	4.7nF \pm 20%	50V	KCK	HE 80 SJ YD 472M
C343	Capacitor ceramic	10nF-20/+80%	50V	Ferroperm	9/145.9
C344	Capacitor ceramic	220pF-20/+80%	400V	Ferroperm	9/129.9
C345	Capacitor MKT	100nF \pm 10%	100V	Siemens	B32560-D1104-K
C346	Capacitor MKT	100nF \pm 10%	100V	Siemens	B32560-D1104-K
C347	Capacitor ceramic	10nF-20/+80%	50V	Ferroperm	9/145.9
C348	Capacitor MKT	100nF \pm 10%	100V	Siemens	B32560-D1104-K
C349	Capacitor electrolytic	470uF-10/+50%	10V	ROE	EB 00 GC 347C
C350	Capacitor electrolytic	470uF-10/+50%	10V	ROE	EB 00 GC 347C
C351	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F
C352	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F

AUDIO AMPLIFIER UNIT (300) C401, C402, C403

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<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
D301	Diode	Philips	1N4148
D302	Diode	Philips	1N4148
D303	Diode	Philips	1N4148
D304	Diode	Philips	1N4148
D305	Diode	Philips	1N4148
D306	Diode	Philips	BAW62
D307	Diode	Philips	BAW62
D308	Diode	Philips	BAW62
D309	Diode	Philips	1N4148
D310	Diode	Philips	BAW62
D311	Diode	Philips	BAW62
D312	Diode	Philips	BAW62
D313	Diode	Philips	1N4148
D314	Diode	Philips	1N4148
D315	Diode	Philips	1N4148
D316	Diode	Philips	1N4148
D317	Diode	Philips	1N4148
D318	Diode, zener 5.1V +5%	o,5W Motorola	BZX79 C5V1
T301	Transistor	Philips	BC 548
T302	Transistor	Philips	BC 548
T303	Transistor	Philips	BC 558
T304	Transistor	Philips	BC 548
T305	Transistor	Philips	BC 548
T306	Transistor	Philips	BC 338
T307	Transistor	Philips	BC 548
T308	Transistor	Philips	BC 338-25
T309	Transistor	Philips	BC 548B
T310	Transistor	Motorola	BD 138-6
T311	Transistor	Philips	BC 548B

AUDIO AMPLIFIER UNIT (300) C401, C402, C403

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<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
IC301	Dual complementary pair plus inverter	Motorola	MC 14007 UBCP
IC302	Binary up/down counter	Motorola	MC 14516 BCP
IC303	Dual operational amplifier	Motorola	MC 1458C
IC304	Quad excl. or gate	Motorola	MC 14070 BCP
IC305	Dual J-K flip flop	Motorola	MC 14027 BCP
IC306	Dual complementary pair plus inverter	Motorola	MC 14007 UBCP
IC307	Binary up/down counter	Motorola	MC 14516 BCP
IC308	Transistor array	Motorola	MC 3346P
IC309	Audio power amplifier	SGS-ATES	TDA 2002
P301	Connector	AMP	164713-3
P302	Connector	AMP	164713-8
P303	Connector	AMP	164713-8
P304	Connector	AMP	164713-7

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
S401	Modular switch MK II Push-Push	MEC	15.550
S402	Micro-switch	CHERRY	E62 10H SPDT

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
P601	Plug	Hirschmann	MES 160
LS601	Loudspeaker 8 ohm	SEAS	6 F=L
TC601	Telephone cartridge	HOLMCO	6890 350 A3
MC601	Microphone cartridge	HOLMCO	6890 350 A3
S601	Microtelephone handset switch	CHERRY	E62 10H SPDT
FP601	Ferroxcube bead	Kasche	K3/1200/0.1 Hz/4/2/7A
FP602	Ferroxcube bead	Kasche	K3/1200/0.1 Hz/4/2/7A
FP603	Ferroxcube bead	Kasche	K3/1200/0.1 Hz/4/2/7A
FP604	Ferroxcube bead	Kasche	K3/1200/0.1 Hz/4/2/7A
FP605	Ferroxcube bead	Kasche	K3/1200/0.1 Hz/4/2/7A

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>		
R701	Resistor	15Kohm	+5%	0.33W	Philips	2322 211 13153
R702	Resistor	12Kohm	+5%	0.33W	Philips	2322 211 13123
R703	Resistor	100Kohm	+5%	0.33W	Philips	2322 211 13104
R704	Resistor	100Kohm	+5%	0.33W	Philips	2322 211 13104
R705	Resistor	6.8Mhom	+5%	0.25W	Philips	2322 241 13685
R706	Resistor	100Kohm	+5%	0.33W	Philips	2322 211 13104
R707	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 106 33472
R708	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 211 13472
R709	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 211 13472
R710	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 106 33472
R711	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 211 13472
R712	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 211 13472
R713	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 211 13472
R714	Resistor	4.7Kohm	+5%	0.33W	Philips	2322 211 13472
R715	Resistor	10Kohm	+5%	0.33W	Philips	2322 106 33103
R716	Resistor	100Kohm	+5%	0.33W	Philips	2322 211 13104
R717	Resistor	100Kohm	+5%	0.33W	Philips	2322 211 13104
R718	Resistor	1Mohm	+5%	0.33W	Philips	2322 211 13105
R719	Resistor	680Kohm	+5%	0.33W	Philips	2322 211 13684
R720	Resistor	270Kohm	+5%	0.33W	Philips	2322 211 13274
R721	Resistor	270Kohm	+5%	0.33W	Philips	2322 106 33274
R722	Resistor	820Kohm	+5%	0.33W	Philips	2322 211 13824
R723	Resistor	56Kohm	+5%	0.33W	Philips	2322 211 13563
R724	Resistor	6.8Mohm	+5%	0.25W	Philips	2322 241 13685
R725	Resistor	150Kohm	+5%	0.33W	Philips	2322 211 13154
R726	Resistor	6.8Mohm	+5%	0.25W	Philips	2322 241 13685
R727	Resistor	120Kohm	+5%	0.33W	Philips	2322 211 13124
R728	Resistor	220Kohm	+5%	0.33W	Philips	2322 211 13224
R729	Resistor	1Mohm	+5%	0.33W	Philips	2322 211 13105
R730	Resistor	180Kohm	+5%	0.33W	Philips	2322 211 13184
R731	Resistor	820Kohm	+5%	0.33W	Philips	2322 211 13824
R732	Resistor	330Kohm	+5%	0.33W	Philips	2322 211 13334
R733	Resistor	100Kohm	+5%	0.33W	Philips	2322 211 13104
R734	Resistor	22Kohm	+5%	0.33W	Philips	2322 211 13223
R735	Resistor	470 ohm	+5%	0.33W	Philips	2322 106 33471
R736	Resistor	22Kohm	+5%	0.33W	Philips	2322 211 13223
R737	Resistor	22Kohm	+5%	0.33W	Philips	2322 106 33223
R738	Resistor	47Kohm	+5%	0.33W	Philips	2322 211 13473
R739	Resistor	100 ohm	+5%	0.33W	Philips	2322 106 33101
R740	Resistor	470 ohm	+5%	0.33W	Philips	2322 211 13471

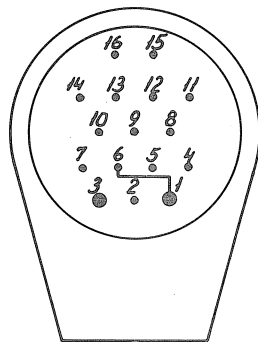
<i>Symbol</i>	<i>Description</i>		<i>Manufact.</i>		
C701	Capacitor MKT	10nF \pm 10%	400V	Siemens	B32560-D6103-K
C702	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F
C703	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F
C704	Capacitor MKT	10nF \pm 10%	400V	Siemens	B32560-D6103-K
C705	Capacitor polystyrene	100nF \pm 1%	63V	Philips	2222 444 41004
C706	Capacitor MKT	220nF \pm 10%	100V	Philips	B32560-D1224-K
C707	Capacitor MKT	47nF \pm 10%	250V	Siemens	B32560-D3473-K
C708	Capacitor MKT	1uF \pm 10%	100V	Siemens	B32562-D1105-K
C709	Capacitor polystyrene	270pF \pm 1%	630V	Philips	2222 427 42701
C710	Capacitor MKT	10nF \pm 10%	400V	Siemens	B32560-D6103-K
C711	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F
C712	Capacitor electrolytic	47uF \pm 20%	10V	ROE	EKI 00 AA 247C
C713	Capacitor MKT	47nF \pm 10%	250V	Siemens	B32560-D3473-K
C714	Capacitor MKT	1uF \pm 10%	100V	Siemens	B32562-D1105-K
C715	Capacitor electrolytic	10uF \pm 20%	35V	ROE	EKI 00 AA 210F
C716	Capacitor MKT	100nF \pm 10%	100V	Siemens	B32560-D1104-K
C717	Capacitor electrolytic	3.3uF \pm 20%	50V	ROE	EKI 00 AA 133H
L701	Coil			S.P.	TL262
T701	Transistor			Siemens	BC237
T702	Transistor			Siemens	BC237
T703	Transistor			Siemens	BC237
T704	Transistor			Siemens	BC237
T705	Transistor			Siemens	BC237
T706	Transistor			Philips	BC548
T707	Transistor			Philips	BC547
T708	Transistor			Philips	BC640
T709	Transistor			Philips	BC548
D701	Diode			Philips	1N4148
D702	Diode			Philips	1N4148
D703	Diode			Philips	1N4148
D704	Diode			Philips	1N4148
D705	Diode			Philips	1N4148
D706	Diode			Philips	1N4148

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
IC701	Decade counter	Motorola	MC14017BCP
IC702	HEX inverter	Motorola	MC14584BCP
IC703	Operational amplifier	National	LM324N
IC704	Dual D flip flop	Motorola	MC14013BCP
IC705	Quad nor-gate	Motorola	MC14001BCP
RE701	12V relay 2A contacts	Siemens	V23040-A0002-B201

* IF CONNECTED TO PLUG JUST LEFT OPEN ENDED IN PLUG.
 IF CONNECTED TO ANOTHER H410 CONNECTED TO APPROPRIATE TERMINAL.

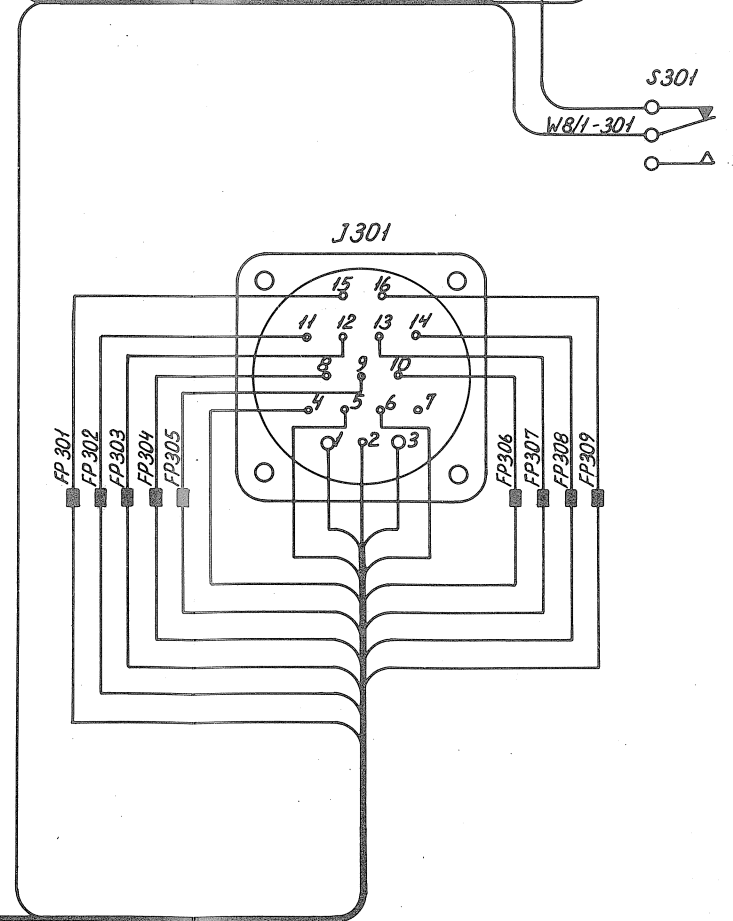
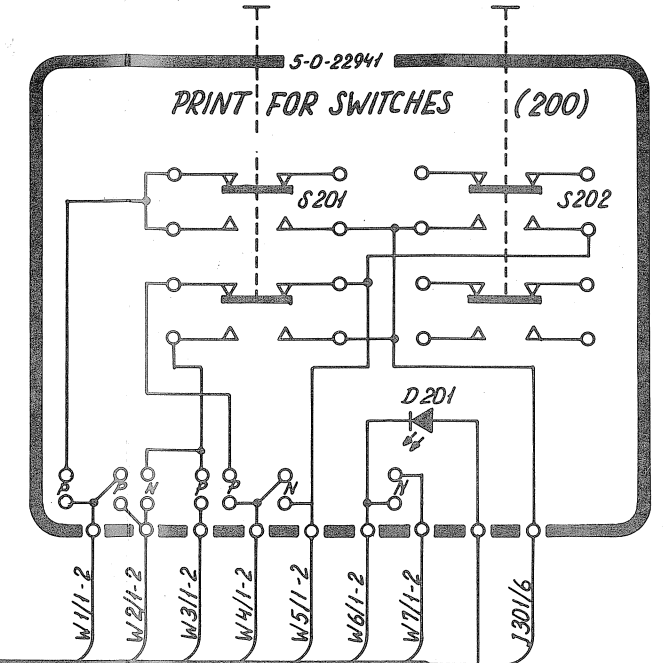
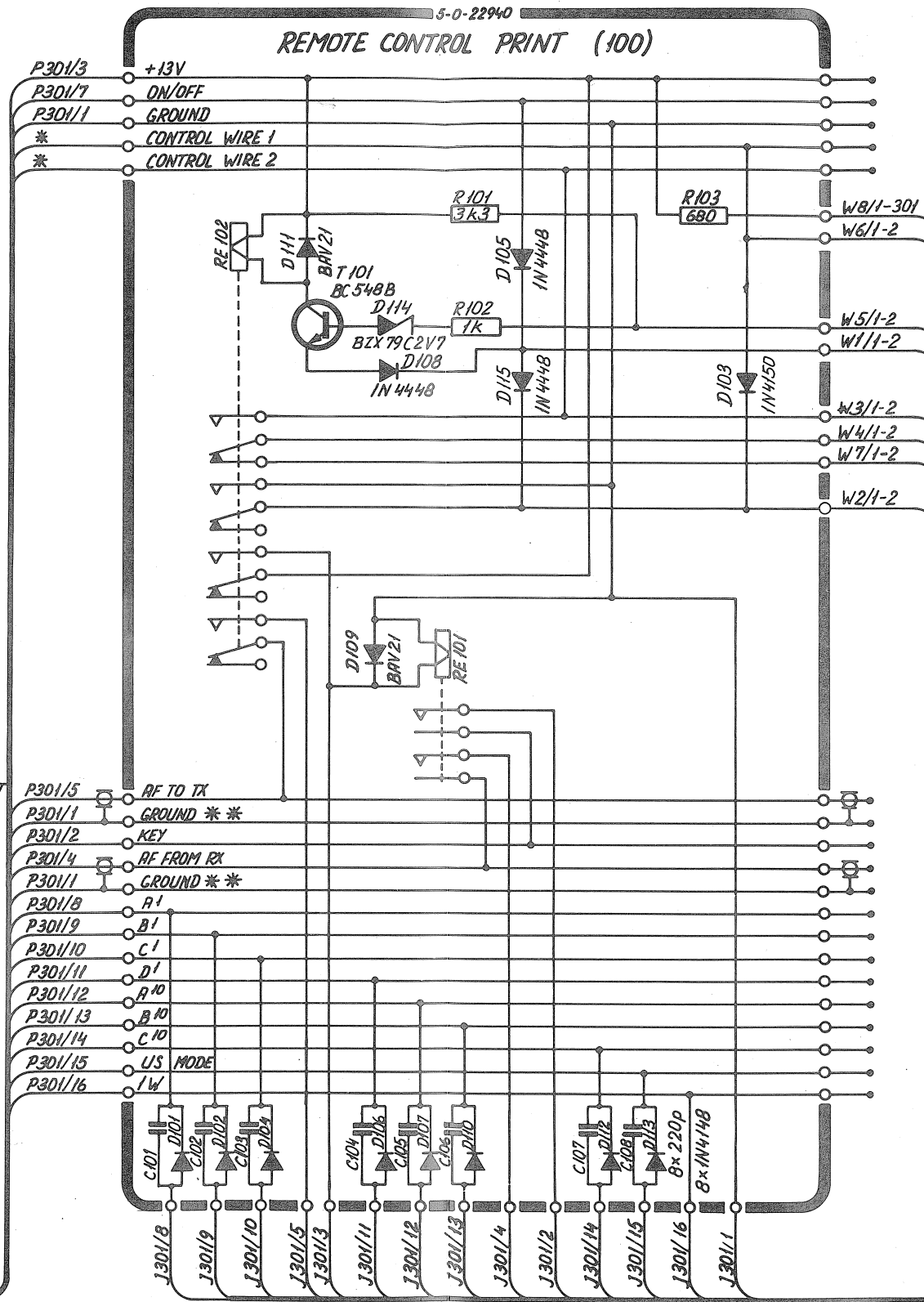
** IF CONNECTED TO ANOTHER H410, CONNECTED TO APPROPRIATE TERMINALS.

VHF - CONNECTOR



P301
 PLUG FOR RT145
 PLUG IS SEEN FROM BEHIND
 PIN 1 AND 6 ARE SHORT CIRCUITED

- WIRE COLOURS IN PLUG
 PIN NO.
1. BLACK NO.1 0.75 mm²
 2. WHITE / GREEN
 3. BLACK NO.3 0.75 mm²
 4. BROWN
 5. WHITE
 6. SHORT CIRCUITED TO PIN NO.1
 7. BLACK NO.2 0.75 mm²
 8. BLACK
 9. RED
 10. PINK
 11. YELLOW
 12. GREEN
 13. BLUE
 14. GREY
 15. WHITE / YELLOW
 16. BLUE / RED



REMOTE CONTROL PRINT (200) FOR H410

<i>Symbol</i>	<i>Description</i>		<i>Manufact.</i>	
R101	Resistor 3k3 ohm $\pm 5\%$	0.33W	Philips	2322 211 13332
R102	Resistor 1k0 ohm $\pm 5\%$	0.33W	Philips	2322 211 13102
R103	Resistor 680 ohm $\pm 5\%$	0.33W	Philips	2322 211 13681
T101	Transistor		Philips	BC548B
D101	Diode		Philips	1N4148
D102	Diode		Philips	1N4148
D103	Diode		Philips	1N4150
D104	Diode		Philips	1N4148
D105	Diode		Philips	1N4448
D106	Diode		Philips	1N4148
D107	Diode		Philips	1N4148
D108	Diode		Philips	1N4448
D109	Diode		Philips	BAV 21
D110	Diode		Philips	1N4148
D111	Diode		Philips	BAV 21
D112	Diode		Philips	1N4148
D113	Diode		Philips	1N4148
D114	Zenerdiode		Philips	BZX79C2V7
D115	Diode		Philips	1N4448
RE101	Reed relay (DPST)		Siemens	V23100-V43-12-B000
RE102	Relay (4PDT)		National	NF-4C-12V
C101- C108	Capacitor ceramic 220pF/400V		Ferroperm	9/0129.9-20/+80%

PRINT FOR SWITCHES (200) FOR H410

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
D201	L.E.D. red	General Electr.	MV5753
S201	Miniswitch, Unimec, momentary	M.E.C.	MKII
S202	Miniswitch	M.E.C.	MKII

CHASSIS FOR H⁴10

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
J301	16 pole connector, MEB160	Hirschmann	973009-100
S301	Switch	C & K	7101

