ap 759 marine
manual no. 86

Contents - AP 759 Marine.

4. Edition

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General Description AP 759

The AP 759 is a VHF Radio Telephone for communication between ships and between ship and shore.

The set is equipped with 57 international channels with the added facility of incorporating up to ten private channels.

The 57 international channels are built in from the factory. The private channels are delivered with the required channels coded on a special printed board.
All 67 channels are controlled from 4 crystals. This is effected due to the enherent features of the synthesizer principle.

A built-in duplex filter permits simultaneous transmission and reception on the duplex channels with only one antenna. An indicator lamp shows the operator when a duplex channel is selected.

The radio has a "Dual Watch"-system which has the ability to switch between two channels, one second on each of them.
If a carrier is received, or the transmitter is keyed, the dual watch will remain at the channel, as long as the carrier is present.

When the carrier disappears, the dual watch will remain at the channel two seconds after.

When the "Dual Watch" is on, it is not possible to key the transmitter.

The dual watch shifts between channel 16 and a channel selected with the main selector.

When the dual watch shifts to channel 16, the channel number is indicated on a lamp.
The Radio Telephone is mounted in a compact, modernistically styled and completely splashproof case with the operating controls functionally positioned on the front panel. The unit is very simply installed and designed for easy operation.

The AP 759 is designed to operate from both positive and negative supplies of 12 and 24 volts.
Voltage and polarity is selected in the connector.

At the rear of the case are connectors for the supply, antenna, microphone, external speaker and tone equipment if desired.

General Description. AP 759 RC

The AP 759 remote controlled system consists of up to four identical subcontrol units and one transceiver with a build-in adaptor unit.
The local controlled transceiver is converted to remote control by removing the frontplate and replacing it by an adaptor unit, with four multiconnectors to the four subcontrol units. The adaptor is connected to the transceiver through the same internal connector which was used for the frontplate in the local controlled mode.
In this way the local controlled transceiver is converted to remote control, without changing anything in the transceiver unit.

The subcontrol units are connected to the transceiver through a 47 cored multicable.
To each subcontrol unit two handset and an external loudspeaker can be connected.

With this system it is possible to place the transceiver in the radioroom and control it from four different localities.

Technical data - AP 759

Number of channels:		57 international 10 private
Channel spacing:		25 kHz
Operating mode:		simplex and duplex
Power consumption:		receiving 1,2 A transmitting 5,0 A
Power supply:	Battery:	+12V, -12V, +24V, -24V Nom ± 13,6V and ± 27,2V after E.I.A.
Dimensions:		height x width x depth 132mm x 380mm x 165mm
Weight:		9 kg

Receiver:

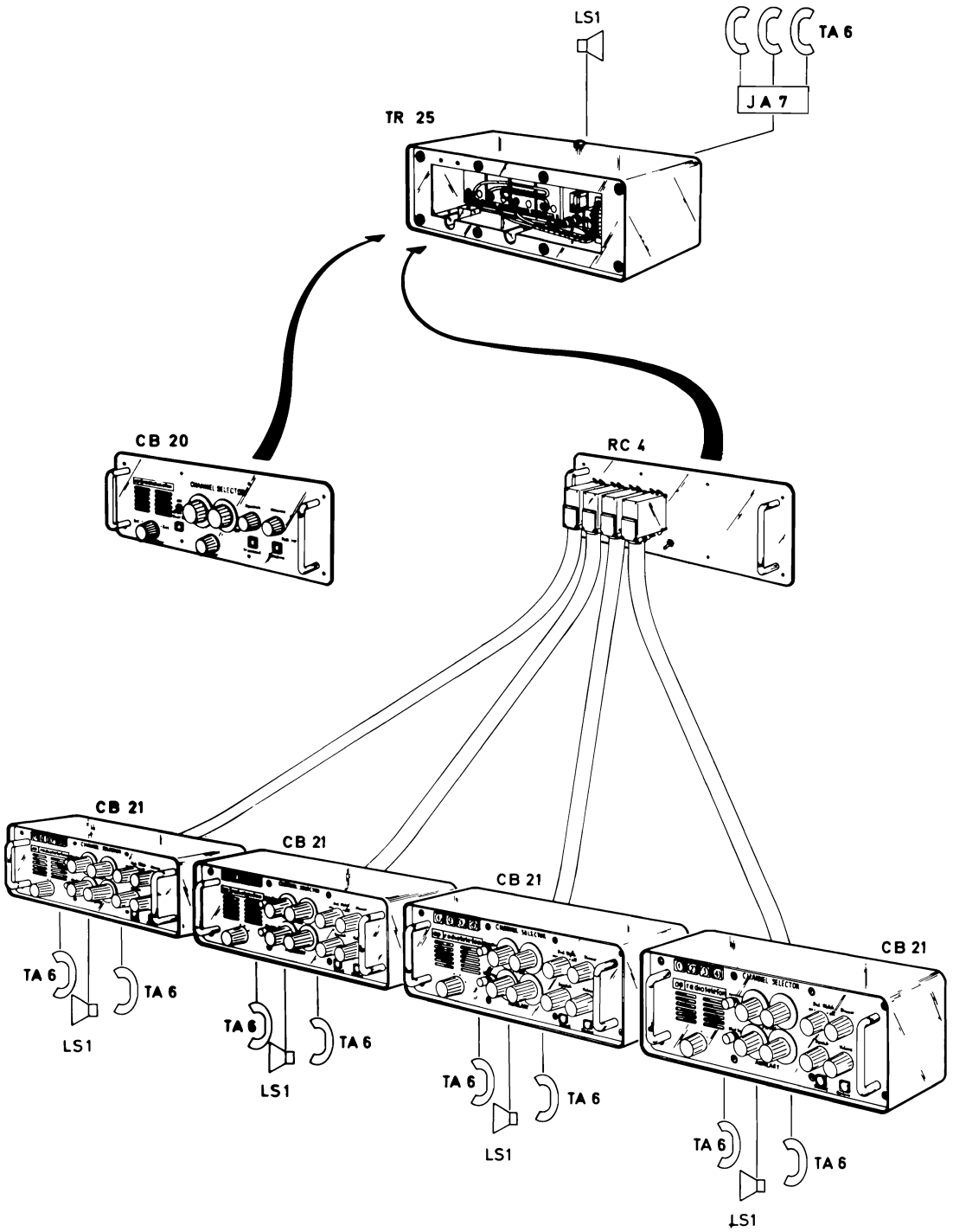
Frequency range:

International service:	simpl:	156,3 MHz - 156,875 MHz
	dupl:	160,625 MHz - 162,025 MHz
Private service :		155 MHz - 156 MHz or 157,425 MHz - 157,825 MHz

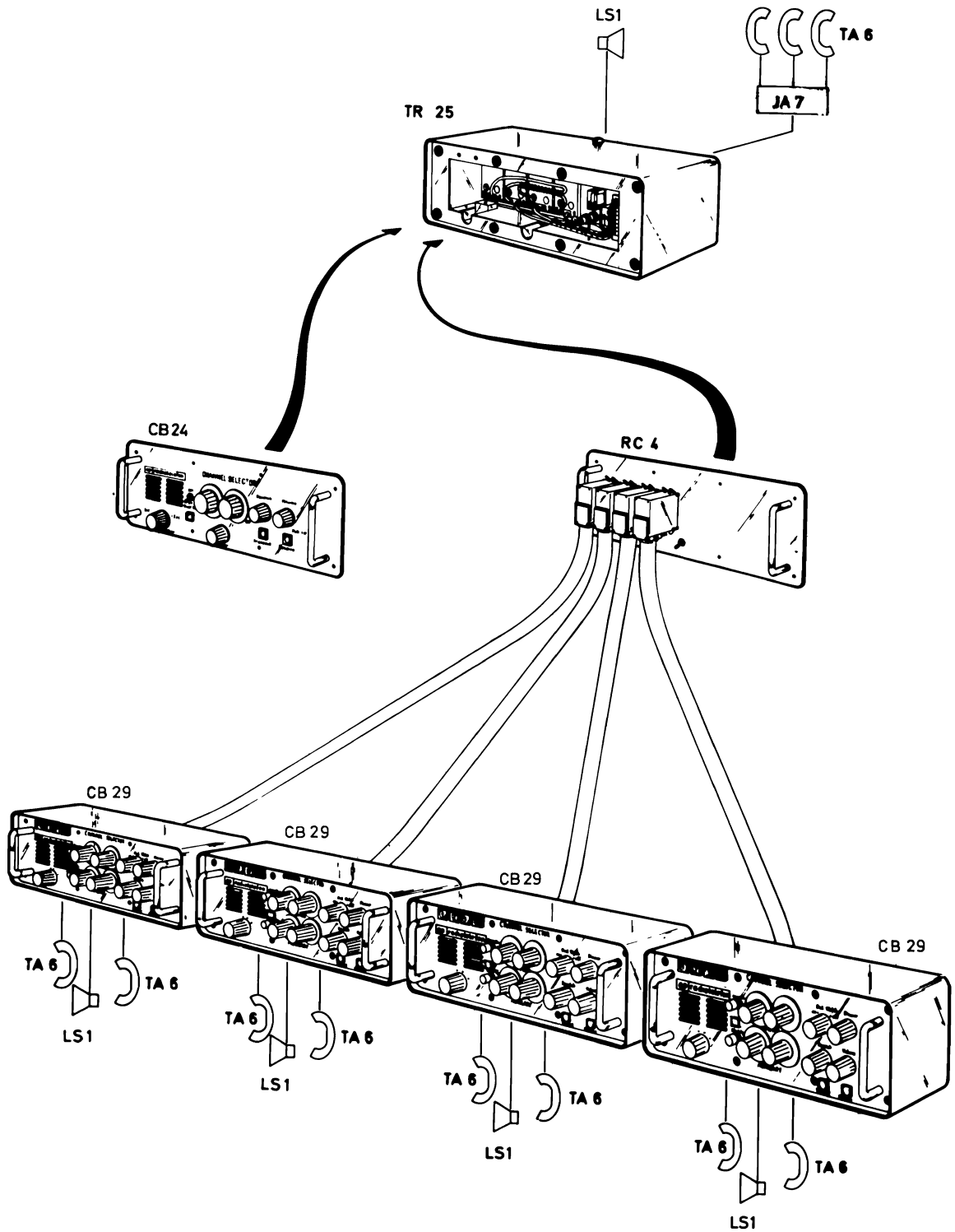
Sensitivity:	0,5 uV ½ E.M.F. for 12 dB Sinad
Output power:	2 W into 5 Ω load
Selectivity:	Better than 80 dB adjacent channel
Spurious responses:	75 dB
Intermodulation:	72 dB

Transmitter:

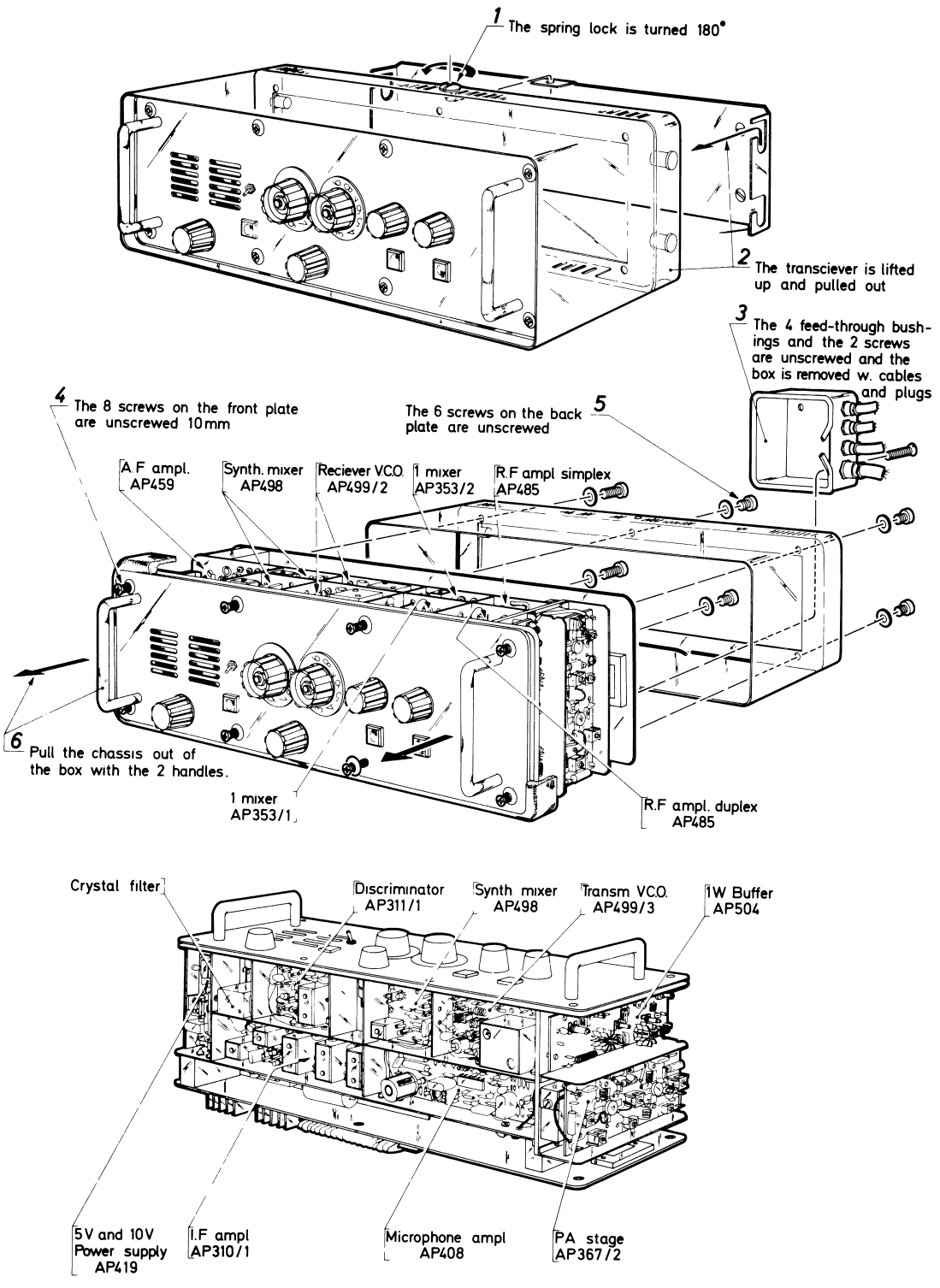
Frequency range:	155 MHz - 157,425 MHz or 156,025 MHz - 157,825 MHz
Power output:	20 watts 1 watt reduced power
Spurious emissions and harmonics:	less than 0,25 uW
Frequency stability:	Better than $\pm$ 1 KHz
Modulation Limiter:	compressor amplifier with max. 2% distortion at 20 dB compression.



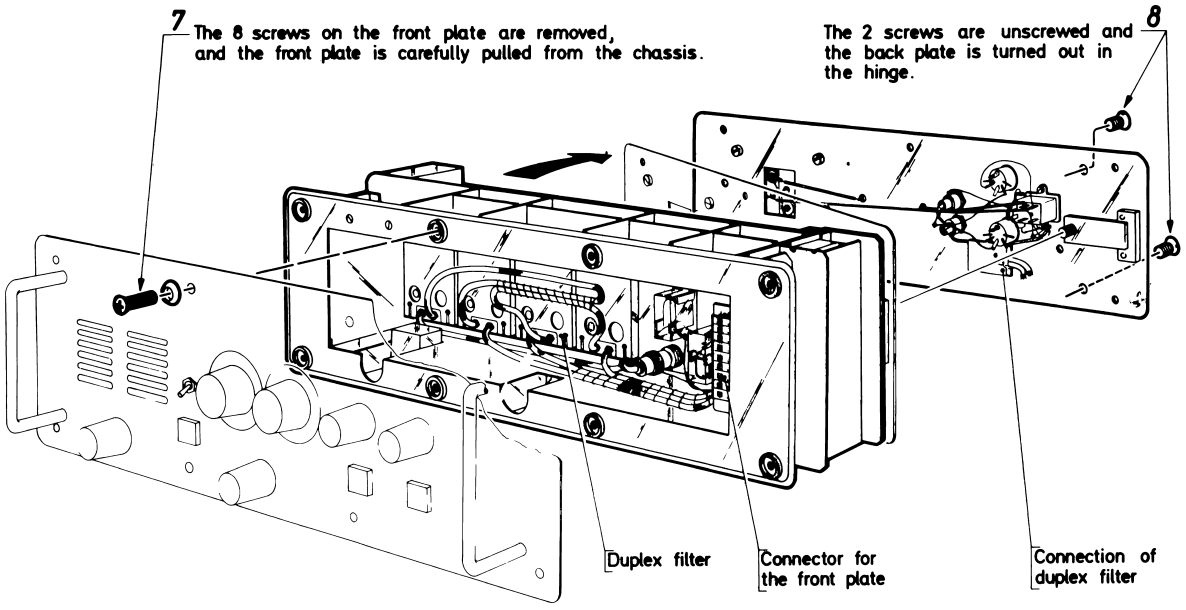
Rettet: 5-12-73 JAN	AP 759 SYSTEM	Tegn.: 18-3-73 A.C.	Kontr.: 18-3-73 H.M.
		Stykl. nr.:	
	AP-RADIOTELEFON	Tegn. nr.: 73079-4E	

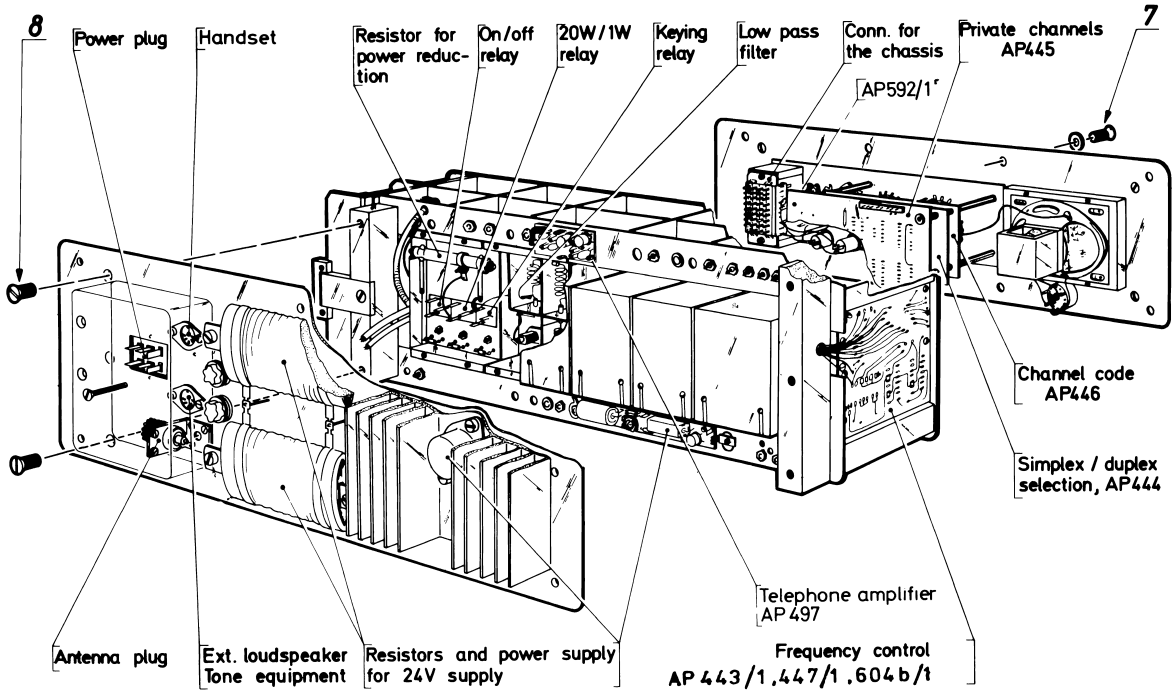


Rettet:	AP759 D SYSTEM	**Tegn.:** 5.-12.-74 NC	**Kontr.:** 5.-12.-74 HM
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	**Tegn. nr.:** 74529-4E	



Rettet:	DISASSEMBLING AND COMPONENT LAYOUT AP759	Tegn.: 14-3-74 A.C.	Kontr.: 14-3-74 H.M.
		Side: 1	
	AP-RADIOTELEFON A/S	Tegn. nr.: 74141 - 4E	





Disassembling and component layout
AP759

Rettet: 20.-2.-75 NC	DISASSEMBLING AND COMPONENT LAYOUT AP 759	Tegn.: 14-3-74 A.C.	Kontr.: 14-3-74 H.M.
		Side: 2	
	AP-RADIOTELEFON A/S	Tegn. nr.: 74141-4E	

Spareparts List for AP 759

	Description	Stock no.
1 pieces	I.F. amplifier	AP 310/3
1 "	Discriminator	AP 311/3
1 "	1. Mixer	AP 353/1
1 "	1. Mixer	AP 353/2
1 "	25 W P.A. Stage	AP 367a/2
1 "	Modulation ampl.	AP 408/3
1 "	5 and 10 V Power Supply	AP 419/1
1 "	Channel coding Simplex/duplex selection	AP 444/1-446/1
1 "	12 W Power Supply	AP 448/3
1 "	AF and Squelch	AP 459/2
2 "	RF amplifier	AP 485/1/2
3 "	Synthesizer mixer	AP 498/3
2 "	Receiver V.C.O.	AP 499/2
1 "	Transmitter V.C.O.	AP 499/3
1 "	1 W Bufferstage	AP 504a/1
1 "	Frequency control	AP 443/1-447/1-604b/1
1 "	Duplex Filter	
1 "	Handset	
1 "	Loud Speaker	E 230 MT-5Ω
3 "	Lamps	BA 7 - 24 V
1 "	Antenna Relay	RA/6002/B4
3 "	Relay (Key, 1W/20W, on/off	RA/9001/T 1
1 "	Transistor	2N 3055
1 "	Crystal Filter	901 BM
1 "	Fuse	0,2 A MT
2 "	Fuse	10 A FL
1 "	Dual Watch	AP 592/1

The Function of the Operating Controls.

1. Main Switch

When the control is rotated in a clockwise direction the unit is switched on and the channel indicator and receiving lamp are illuminated.

2. Channel Selector

The channel selector selects between the 57 international channels and the ten private channels.
The knob to the left selects the tens and the right knob selects the units.

3. Channel Indicator

The number of the selected channel is shown in the lighted window between the two channel selector knobs.

4. Volume

Clockwise rotation of the volume control increase the volume of the received signal.

5. Pull. 1 W.

When the volume knob is pulled out the transmitting power will be decreased to 1 W.

6. Squelch

The squelch control should be adjusted by turning the knob clockwise, until noise is heard in the loud speaker. Then the knob is turned counter-clockwise until noise just disappears.
The adjustment must be done without receiving signal.

7. Loud Speaker

The loud speaker is suppressed when the transmitter is keyed, i.e. by depressing the hand set switch.

8. Loud Speaker exr./int.

Selection of internal and external speakers is available in the following switched positions:

Left:	internal loud speaker
Middle:	both external and internal loud speaker
Right:	external loud speaker.

9. Dimmer

The knob is for dimming the light in the channel indicator and the receiving indecat.

10. Transmit

The lamp will switch on when the transmitter is keyed.

11. Receive

The receiver lamp indicates if the receiver is on. If the receiver is blocked, i.e. when the transmitter is keyed a simplex channel the lamp will not be illuminated.
In this way it is possible to recognise the duplex channel.

12. Press to Talk Switch (Key)

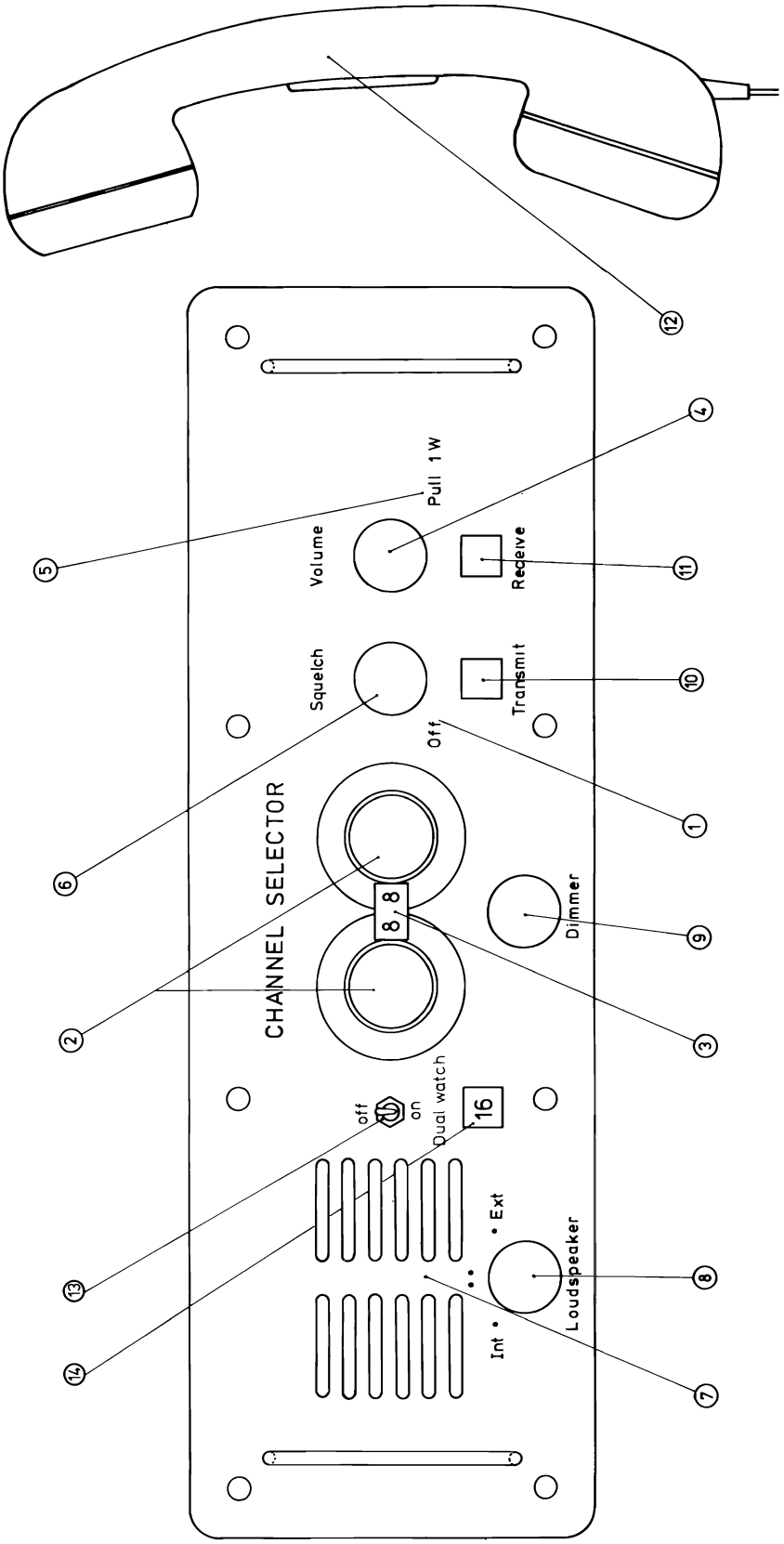
On simplex operation the hand set switch is used as a "press to talk" switch.
On duplex operation the hand set switch must be kept depressed whilst the conversation is in progress.

13. Dual Watch.

By normal use of the transceiver the switch is in the off-position, and the main selector is selecting the channel.
In the "on"-position the "dual watch" is started, and the receiver is switching between the main selector and channel 16, waiting one second on each of them.
When a signal is received, the receiver will remain on the channel three seconds after the signal is removed.
It is not possible to transmit when the "dual watch" is on.

14. Channel 16 Indicator.

When the receiver switches to channel 16 the lamp will switch on, indicating channel 16.



Rettet:	OPERATING CONTROLS MARINE AP759	Tegn.: 16-3-73 A.C.	Kontr.: 16-3-73 H.M.
		Stykl. nr.:	
	AP-RADIOTELEFON	Tegn. nr.:	72097-2E

Channel Designators	Transmitting Frequencies (Mc/s) Ship Stations	Transmitting Frequencies (Mc/s) Coast Stations	Intership	Port Operations Single Frequency	Port Operations Two Frequency	Public Correspondence
60	156.025	160.625			x	x
01	156.050	160.650			x	x
61	156.075	160.675			x	x
02	156.100	160.700			x	x
62	156.125	160.725			x	x
03	156.150	160.750			x	x
63	156.175	160.775			x	x
04	156.200	160.800			x	x
64	156.225	160.825			x	x
05	156.250	160.850			x	x
65	156.275	160.875			x	x
06	156.300		x			
66	156.325	160.925			x	x
07	156.350	160.950			x	x
67	156.375	156.375	x	x		
08	156.400		x			
68	156.425	156.425		x		
09	156.450	156.450	x	x		
69	156.475	156.475	x	x		
10	156.500	156.500	x	x		
70	156.525		x			
11	156.550	156.550		x		
71	156.575	156.575		x		
12	156.600	156.600		x		
72	156.625		x			
13	156.650	156.650	x	x		
73	156.675	156.675	x	x		
14	156.700	156.700		x		
74	156.725	156.725		x		
15	156.750	156.750	x	x		
75		Guard-band 167.7625 - 156.7875 Mc/s				
16	156.800	156.800	CALLING AND SAFETY			
76		Guard-band 156.8125 - 156.8375 Mc/s				
17	156.850	156.850	x	x		
77	156.875		x			
18	156.900	161.500			x	
78	156.925	161.525			x	
19	156.950	161.550			x	
79	156.975	161.575			x	
20	157.000	161.600			x	
80	157.025	161.625			x	
21	157.050	156.050 or 161.650			x	
81	157.075	161.675			x	
22	157.100	161.700			x	
82	157.125	161.725			x	x
23	157.150	156.150 or 161.750 or 156.175				x

Channel Designators	Transmitting Frequencies (Mc/s) Ship Stations	Transmitting Frequencies (Mc/s) Coast Stations	Intership	Port Operations Single Frequency	Port Operations Two Frequency	Public Correspondence
83	157.175	or 161.775				x
24	157.200	161.800				x
84	157.225	161.825			x	x
25	157.250	161.850				x
85	157.275	161.875				x
26	157.300	161.900				x
86	157.325	161.925				x
27	157.350	161.950				x
87	157.375	161.975				x
28	157.400	162.000				x
88g)	157.425	162.025				x

Channel code

	128	64	32	16	8	4	2	1	Tx-freq.	Rx-freq.
P 0										
P 1										
P 2										
P 3										
P 4										
P 5										
P 6										
P 7										
P 8										
P 9										

Rettet:	Channel code for private channels	Tegn.: NC 29.1.73	Kontr.: HM 29.1.73
		Stykl. nr.:	
	AP-RADIOTELEFON	Tegn. nr.:	73012-4E Page 3

Description of blockscematic of the MARITIME AP 759.

The AP 759 for maritime use is a multichannel set designed for the 35 international duplex channels and the 22 international simplex channels.
Further it is possible to have ten private channels.

The frequency generation is accomplished with two digital synthesizers, one for the two receivers and one for the transmitter. In this way one obtains 67 channels with only 2 crystals in the receiver, 1 in the transmitter and 1 crystal common for both receiver and transmitter.

Frequency Generator

Transmitter

The transmitter frequency is generated in a voltage controlled LC-oscillator, directly on the required frequency. The oscillator frequency can be changed by applying a dc-voltage via the loop filter to a varicap diode in the oscillator-circuit. The output signal from the oscillator is via a bufferstage supplied to the synthesizer mixer, where it is mixed with the fourth harmonic of the main oscillator. The resulting beat tone, which lies in the frequency range 2,3 - 5,125 MHz, is amplified and supplied to the clock input of the variable divider. This divider which consists of two monolithic integrated circuits, can be set to divide with all numbers between 92 and 205, by changing the dc-levels on eight controllines in a binary code.

The frequency setting of the set is made with this code.

The output signal from the variable divider is used to drive the frequency and phase comparator, which is also driven with a 25 kHz reference signal, obtained from the 6,4 MHz synthesizer oscillator divided by 256 in the fixed divider. All these circuits are made in monolithic integrated technique. The frequency comparator delivers a dc-voltage to the voltage controlled oscillator and adjusts the oscillator frequency until the frequency out of the variable divider is exactly 25 kHz.

If the division ratio of the variable divider is changed by one, the oscillator frequency will change by 25 kHz. This frequency control system employs phaselocking, giving zero static frequency error.

Receiver

The generation of the two local oscillator signals and the transmitter frequency is in the principle the same.

In the receiver part of the synthesizer loop the simplex/duplex selector selects between the V.C.O., the synthesizer mixer, and the 1. mixer in the simplex or duplex part of the loop.

The local oscillator signal for the two receivers are generated 10,7 MHz above the receiver input frequency.

Channel selector

The channel selection signal comes from the selector switch, where the first digit and second digit can be selected on two knobs. The channel number is indicated on a scale between the two knobs. The channel code grounds the correct combination of logic lines for each channel frequency.

The code for the variable counters in the receiver and the transmitter loop is the same. The difference in frequency is achieved by selecting the synthesizer-mixer frequencies with the desired distance.

Dual Watch.

The dual watch system makes the channelselector unit switch between the main channelselector and channel 16, when the dual watch is switched on.

Receiver

The duplex RF-amplifier is connected to the antenna through the Rx-output and the duplex filter. The simplex RF-amplifier is connected through the antenne relay to the Tx input of the duplex filter.

The RF and First Mixer stages are equipped with field effect transistors of the junction and dual gate MOS types resulting in high intermodulation spurious attenuation and good blocking properties.

The injectionsignal from the synthesizer controlled oscillator is supplied via a tuned bufferstage.

The concerted signal on 10.7 MHz is fed via a 8-pole crystal-filter, with 90 dB attenuation on adjacent channels, to the 10.7 MHz IF amplifierstage. The amplified signal is fed into the 2nd converter, and with an oscillator of 10.245 MHz converted down to 455 kHz.

The 455 kHz signal is amplified in two tuned stages and fed to the limiter and discriminator stages. The demodulated signal is integrated to 6 dB/octave roll off and amplified in a 4-stage squelch controlled AP amplifier, delivering 2 Watt in a 5Ω load.

The audiooutput for the microtelephone is delivered from a separate squelchcontrolled amplifier at a fixed level independent of the setting of the volume control.

A part of the noise in the discriminator primary is amplified and rectified, and after dc-amplification used to block the audioamplifiers in case of missing or weak RF-signal.

The tonereceiver is to be coupled to the discriminator-output.

Transmitter

The AF-signal from the microphone is amplified in a microphone amplifierchain partly made in integrated technique. The circuit also contains a compressorcircuit to limit the deviation during strong speech. The circuit is of the variable gain type and does not give the distortion that normal clippercircuits give. The speech channel also includes a lowpassfilter with 3 kHz cutoff.

The modulationvoltage is fed to a separate modulation varicap in the LC-oscillator, giving direct FM modulation. A differentiation network in the microphonechain ensures the proper 6 dB/ octave rise in frequency response. The phaselocked loop, controlling the frequency of the same oscillator, has a cutoff frequency of approx. 50 Hz and will not influence the modulation in the speech frequency range 300-3000 Hz.

The transmitting frequency from V.C.O. is amplified up to 25 W level in a 7-stage tuned amplifierchain divided on 2-pc-boards. This amplifier also suppresses the unwanted mixerproducts to meet the most severe present spuriousspecifications.

The power outputstage is followed by a 3 section Chebycheff lowpassfilter for harmonic attenuation.

The poweramplifier is protected against overheating, during continuous transmission in high ambient temperature or in case of a serious mismatched load by a temperature sensor, sensing the temperature of the heatsink and tuning down the drivelevel sufficient to limit the temperature to a safe value.

The output of the 25 W P.A. stage is via the antenna-relay fed to the Tx input of the duplex filter.

Duplex filter

The duplex filter is symmetrical with two filter sections in the transmitter branch and two in the receiver branch. The attenuation between the receiver and the transmitter is about 60dB. The power loss in the filter is 0,7-1,2 dB.

Power supply

The set can be supplied from 12V or 24V with both polarities. All transmitter stages and the receiver outputstage are operated directly on the 13,8 V line from the battery, or (with 24 V supply) from the stabilized 13,8 V supply. The remaining receiver and some synthesizer stages are operated on a stabilized 10 V supply, and the integrated circuits on a stabilized 5 V supply.

Frequency control circuit AP 447, AP 604 and AP 443.

The frequency control circuits are built of three print boards, AP 604, AP 447 and AP 443. AP 604 is used in the transmitter loop and 447 in the receiver loop. AP 443 is common for the transmitter and the receiver loop.

AP 447

Amplifier (T_1, T_2)
Pulse shortner ($\frac{1}{2}$ SN 7402)
Variable counter (2 SN 74193)
Phase and frequency comp. (SN 7400 + SN 7401 A)

AP 604

Consist of the same components as AP 447. Further it is equipped with diodes and one SN 7400 which are used to move the transmitter V.C.O. to channel 75.

AP 443

Ref. oscillator ($\frac{1}{2}$ SN 7402)
Ref. crystal (6,4 MHz)
Ref. divider (2 SN 7493)

Decupling resistors and capacitors.

The amplifier has to amplify the 5 MHz sinus from the mixer to a level, which can be used as an input signal to the integrated circuits (5 V p.p.).

The pulse shortner is built up of two NOR-gates. The output pulse width will be approx. C x R, in this case 50-100 nS. It is necessary using the pulse shortner to get a faster input count frequency. If the input pulse width was greater, we could not reach an input count frequency of typically 9 MHz.

The variable counter is 2 synchronous 4-bit up/down counters with individual preset inputs to each Flip-Flop. The counter is used only for the up-counting.
Because the Flip-Flop's have individual preset inputs, the counters are fully programmable; that is, the outputs may be preset to any state (logical "0" or "1"), by entering the desired data at the data input, when the load input is low. (All Flip-Flop's will be in the "0"-state). The output will change to agree with the data inputs.

This feature allows the counters to be used as modulo N-dividers.

With the two four-bit counters, the counter is able to count up to 255, if all the data inputs are on the "0"-level. If it is wanted to count to f.ex. 200 (divide by 200), the data at the data input must be 255-200=55.

55 in a binary code is reached, by setting log 1 at the inputs: 1, 2,4,16,32.

The output from the counter will be 25 kHz, as a result of the comparator output adjustment of the controlled oscillator. The output from the counter is fed directly to the comparator.

The reference oscillator is crystal controlled and built up of two NOR-gates. The output is a square wave of 6,4 MHz, 5 V p.p.

The reference divider consists of two binary counters each of four bit.
The division is 2^7, which gives an output frequency of 25 kHz.

Frequency control circuit with printed circuit-board AP 604.

Because the frequency of the transmitter V.C.O. might give some disturbances in the receiver, the V.C.O. is moved to channel 75 in the receiving mode. When TP 604-17 is grounded the code to the variable divider is O 1 O O 1 O O O. The inputs 1,2,4,16,32 and 128 is grounded with the diodes. The inputs 8 and 64 is set to log "1" by grounding the inputs IC 1-9 and IC 1-5.

Phase and frequency comparator.

The inputs of the comparator are two Flip-Flop's with the "reset" inputs connected together.
The Flip-Flop's will be set respectively from the variable frequency and the ref. frequency. At the time, when both Flip-Flop's have changed state, they will be reset from the gate, connected to the outputs of the Flip-Flop's. At the addition of these two pulse-trains from the Flip-Flop's at the condenser, the voltage at the output of the comparator is a measure of the phasedifference between the variable and the ref. frequency.

If there is a difference in the frequency, the Flip-Flop clocked at the fastest frequency will be set at a longer time, than the other one.

The voltage at the output of the comparator will then increase or decrease, depending on which frequency is the fastest.

The advantage of this comparator is that it cannot go out of lock, if the voltage range at the output of the comparator is adjusted to be between 2 V and 7 V in the frequency range of interest.

Channel code AP 446.

The channel code for the two variable counters is generated with four integrated circuits; NA 3, NA 4, NA 5 and a binary adder.

The code is simple generated by adding two binary numbers, one for the "ones" and one for the "tens".

The two channel selector-switches grounds different inputs of the nandgates to give the following codes at the inputs of the adder:

	Channel no.	Code							
		128	64	32	16	8	4	2	1
	0	0	0	0	1	0	0	1	0
	1	0	0	0	1	0	0	0	0
	2	0	0	0	0	1	1	1	0
	3	0	0	0	0	1	1	0	0
Code for "ones"	4	0	0	0	0	1	0	1	0
	5	0	0	0	0	1	0	0	0
	6	0	0	0	0	0	1	1	0
	7	0	0	0	0	0	1	0	0
	8	0	0	0	0	0	0	1	0
	9	0	0	0	0	0	0	0	0
		128	64	32	16	8	4	2	1
	0	0	1	0	1	0	1	0	1
	10	0	1	0	0	0	0	0	1
	20	0	0	1	0	1	1	0	1
Code for "tens"	60	0	1	0	1	0	1	0	0
	70	0	1	0	0	0	0	0	0
	80	0	0	1	0	1	1	0	0

By addition of the selected code for the "ones" with the selected code for the "tens", ones get the desired divide ratio in the variable counters.

Blocking of channels AP 446.

Because it is possible to set the frequency selector to channel numbers, which are not allowed to be used (channel no. 75+76) or do not exist in the system (00, 29, 89) it is necessary to block the set to avoid transmission at these channels. The blocking is accomplished by removing the 10V supply.

The signal for the blocking is decoded with I 1, OR 1, NA 1 and NA 2.

The inputs of the decoding-gates are simply connected to that channel on the channel selector switch, which should be blocked. The half of gate NA2 is used for blocking of private channels. If the channel selector is in position P, and no diodes are connected to the 12-13 inputs of NA 2, all the private channels will be blocked. For each private channel one wants to use, a diode must be connected to the desired channel number.

Selection simplex/duplex AP 444

AP 444 is used to select between the simplex and the duplex part of the receiver, and to indicate if the receiver is on.

The gates decode the codes for the simplex channels. The output of NO 1-6 gives "0" if the input code is for a simplex channel, and "1" if the code is for a duplex channel.

The codes for the simplex channels are:

Channel number	Channel code					
	32	16	8	4	2	1
06	0	1	1	0	1	1
67	0	1	1	0	0	0
08-68	0	1	0	1	1	x
09-69	0	1	0	1	0	x
10-70	0	1	0	0	1	x
11-71	0	1	0	0	0	x
12-72	0	0	1	1	1	x
13-73	0	0	1	1	0	x
14-74	0	0	1	0	1	x
15-75	0	0	1	0	0	x
16-76	0	0	0	1	1	x
17-77	0	0	0	1	0	x

The channelcode no. 1 which is marked with X may be both "0" and "1".

To select simplex or duplex in the private channel range, the simplex/duplex controlline TP 444-15 is grounded through a diode, if it is wanted to have a duplex channel. When the channel selector is set to position P, the output of NO 1-6 is set to "1" by the strobe input (NO 1-3), and it is now the output NA 3-11 that determines the simplex/duplex selection.

The output NA 1-4 is buffered to give 10 V to the simplex V.C.O. and 10 V to blocking of the duplex mixer.

The inverted output is also buffered and used for receiving indication.

As the output of the NA 1-4 is inverted to the duplex supply transistor, the voltage for the duplex **V**.C.O. will be zero if the voltage to the simplex V.C.O. is high.

Private channels AP 445

If one wants to equip the set with private channels, the print connector at printboard AP 446 is removed.

The printboard for the private channels (AP 445) is placed in the print sockets and fastened with the four screws in the corners. The print connector with the 9 datalines is placed at AP 445.

The printboard consists of two data selectors (SN 74157 N) and a diode matrix.

The data selectors selects the data from the international channels, when the select line is high, and the data from the diode matrix, when the line is low.

The diodes in the matrix are placed to give the desired code to the variable counter. For each channel in use there must be mounted a diode to suspend the blocking of the power supply.

If a P-channel is a duplex channel, it is necessary with a diode to ground the select-line to the simplex/duplex selector.

Power reduction AP 592/1

Until the 1st January, 1983 it is not allowed to transmit with more than 1 watt at the channels 15 and 17.
The codelines for 10 and for 5 and 7 from the channel selector are taken to two nor-gates. If the 10-line and 5 or 7 are grounded, the output NA-1-3 will be "1" and the transistor will switch on. This makes the 1w/20w relay to switch on, reducing the transmitting power to 1 w.

It is also possible to make a power reduction to 1 w of f.ex. the channels 10 and 13, by adding two diodes. (see diagram 74093).

Dual Watch, AP 592

The "Dual Watch" is built of a double one shot, a Flip-Flop and 4 transistors. The one half of the one shot is used as oscillator with a frequency of 1 hz to switch the Flip-Flop. The other half is used as a delay of 3 sec. which is activated when the key or the squelch signal are removed.
The dual watch is on, when the "clear" input (pin 2) at the F.F. is "1": the inputs 2-3 at the nor-gate is log 1.

When a signal is received and the squelch is opened, or the transmitter is keyed, TP 546-2 or TP 546-1 is grounded.
The two transistors Q1 and Q2 convert the input level to a logic "0" grounds the J-K inputs 4 and 10 of the F.F. and it will stop in the actual position.
When the signal or the keying is removed the collector of Q2 goes to logic "1".
This triggers the one shot and the output (Pin 4) is "0" for three seconds. The J-K inputs of the F.F. (Pins 3 and 9) are then grounded and the F.F. remain in the same position.
After 3 seconds the one shot output (Pin 4) is raised, and the F.F. will start switching.
Each time a pulse from the squelch or keyline is received, the delay in the one shot will be extended to 3 sec.

To block the transmitter in the "Dual Watch"-mode, the voltage to the key-relay is removed when the dual-watch switch is in the on-position.
When the channel selector is set to channel 16 the inputs TP6 and TP10 are log "0".
This makes the transistor Q4 to switch on and the channel 16 indicator will be lighted.

TUNING INSTRUCTIONS.

Computing of the divide ratio N.

The channel code for the transmitter and the receiver loop are computed from the same equation.

The code is computed from the wanted transmitting frequencies. The frequencies for the receiver injection signal are achieved by selecting the duplex main oscillator 15,3 MHz, and the simplex main oscillator 10,7 MHz above the transmitter frequency.

The code is computed from the following equation.

$$Fs - 152,2 = N \cdot 0,025$$

Where: Fs = transmitting frequency in MHz

N = decimal value of the code lines to the variable counter which will have to be grounded.
(The divide ratio in the variable counter).

This gives: $N = \frac{Fs - 152,2}{0,025}$

If f.ex. it is wanted to have a transmitter frequency of 155 MHz, then:

$$N = \frac{155 \% 152,2}{0,025} = \frac{2,8}{0,025} = 112$$

The binary value of 112 is:

$$64 + 32 + 16$$

This gives a binary code of:

128	64	32	16	8	4	2	1
1	0	0	0	1	1	1	1

155 is a frequency in the private range and the code must be selected on the printboard for private channels. There must be a diode mounted in the positions, where one wants the code lines to be grounded.

Private channels:

F. trans.: 155,0 - 156,000 ---------- N: 112 - 152
F. trans.: 157,425 - 157,825 --------- N: 205 - 225

Control of channel code AP 446.

It will not be necessary to control all the 57 code combinations for the international channels. To be sure of all the code combinations, it will be sufficient to control the code at the outputs on the following channels:

TP 446 ⟶	18	19	20	21	22	23	24	25	
Code No..	1	2	4	8	16	32	64	128	
Channel No.									
00	1	1	1	0	0	1	1	0	152
01	1	0	1	0	0	1	1	0	154
02	1	1	0	0	0	1	1	0	156
03	1	0	0	0	0	1	1	0	158
04	1	1	1	1	1	0	1	0	160
05	1	0	1	1	1	0	1	0	162
06	1	1	0	1	1	0	1	0	164
07	1	0	0	1	1	0	1	0	166
08	1	1	1	0	1	0	1	0	168
09	1	0	1	0	1	0	1	0	170
10	1	1	0	0	1	0	1	0	172
20	1	1	1	1	1	1	0	0	192
60	0	1	1	0	0	1	1	0	153
70	0	1	0	0	1	0	1	0	173
80	0	1	1	1	1	1	0	0	193

The code for private channels must be controlled separately on each channel.

The positions marked "1" should have a voltage between 3 V and 5,5 V.

The positions marked "0" should have a voltage between 0 V and 0,4 V.

Delete 3825-5225
153-209

Channel No.	N	128	64	32	16	8	4	2	1	
01	154	0	1	1	0	0	1	0	1	duplex
02	156	0	1	1	0	0	0	1	1	-
03	158	0	1	1	0	0	0	0	1	-
04	160	0	1	0	1	1	1	1	1	-
05	162	0	1	0	1	1	1	0	1	-
06	164	0	1	0	1	1	0	1	1	simplex
07	166	0	1	0	1	1	0	0	1	duplex
08	168	0	1	0	1	0	1	1	1	simplex
09	170	0	1	0	1	0	1	0	1	-
10	172	0	1	0	1	0	0	1	1	-
11	174	0	1	0	1	0	0	0	1	-
12	176	0	1	0	0	1	1	1	1	-
13	178	0	1	0	0	1	1	0	1	-
14	180	0	1	0	0	1	0	1	1	-
15	182	0	1	0	0	1	0	0	1	-
16	184	0	1	0	0	0	1	1	1	-
17	186	0	1	0	0	0	1	0	1	-
18	188	0	1	0	0	0	0	1	1	duplex
19	190	0	1	0	0	0	0	0	1	-
20	192	0	0	1	1	1	1	1	1	-
21	194	0	0	1	1	1	1	0	1	-
22	196	0	0	1	1	1	0	1	1	-
23	198	0	0	1	1	1	0	0	1	-
24	200	0	0	1	1	0	1	1	1	-
25	202	0	0	1	1	0	1	0	1	-
26	204	0	0	1	1	0	0	1	1	-
27	206	0	0	1	1	0	0	0	1	-
28	208	0	0	1	0	1	1	1	1	-
60	153	0	1	1	0	0	1	1	0	duplex
61	155	0	1	1	0	0	1	0	0	-
62	157	0	1	1	0	0	0	1	0	-
63	159	0	1	1	0	0	0	0	0	-
64	161	0	1	0	1	1	1	1	0	-
65	163	0	1	0	1	1	1	0	0	-
66	165	0	1	0	1	1	0	1	0	-
67	167	0	1	0	1	1	0	0	0	simplex
68	169	0	1	0	1	0	1	1	0	-
69	171	0	1	0	1	0	1	0	0	-
70	173	0	1	0	1	0	0	1	0	-
71	175	0	1	0	1	0	0	0	0	-
72	177	0	1	0	0	1	1	1	0	-
73	179	0	1	0	0	1	1	0	0	-
74	181	0	1	0	0	1	0	1	0	-
75	183	0	1	0	0	1	0	0	0	-
76	185	0	1	0	0	0	1	1	0	-
77	187	0	1	0	0	0	1	0	0	-
78	189	0	1	0	0	0	0	1	0	duplex
79	191	0	1	0	0	0	0	0	0	-
80	193	0	0	1	1	1	1	1	0	-
81	195	0	0	1	1	1	1	0	0	-
82	197	0	0	1	1	1	0	1	0	-
83	199	0	0	1	1	1	0	0	0	-
84	201	0	0	1	1	0	1	1	0	-
85	203	0	0	1	1	0	1	0	0	-
86	205	0	0	1	1	0	0	1	0	-
87	207	0	0	1	1	0	0	0	0	-
88	209	0	0	1	0	1	1	1	0	-

Control of simplex/duplex selection. AP 444

The control of the simplex/duplex selection is carried out by controlling the voltage at TP 444-9, TP 444-10 and TP 444-11. On the simplex channels TP 444-9 should be 10 V, and TP 444-10 should be 0 V.

On the duplex channels TP 444-10 should be 10 V and TP 444-9 0 V. TP 444-11 gives 13 V to the receiving indicator, when the set is on a duplex channel.

Simplex channels		duplex channels		
06		01	60	
08		02	61	
09		03	62	
10		04	63	
11		05	64	
12		07	65	
13	TP 444-9=10 V	18	66	TP 444-9 = 0 V
14	TP 444-10=0 V	19	78	TP 444-10=10 V
15		20	79	
16	TP 444-11=0 V	21	80	TP 444-11=13 V
17		22	81	
67		23	82	
68		24	83	
69		25	84	
70		26	85	
71		27	86	
72		28	87	
73			88	
74				
75				
76				
77				

In the private channel range the voltages at TP 444-9 will be 10 V and TP 444-10 0 V for a simplex channel, and the opposite for a duplex channel.

It will be necessary to control all the channels for the simplex/duplex selection.

Control of the channel blocking AP 446

The control of the blocking is simply done by setting the selector at the blocked channels and measure the voltage at TP 446-27.
At the blocked channels: 00,29,75,76,89 and the private channels, which are not used, TP 446-27 should be grounded.

Frequency controlcircuit 447/43

The frequency controlcircuits do not require any adjustment. If the check procedure is not in accordance with the specifications, it is recommended to return the defective printboard to the factory for repair.

1) Connect an oscillator to TP 447/1
2) Adjust the frequency to 5 MHz, and the output voltage to approx 50 mV.
3) Connect an oscilloscope to TP 447/2 and check the pulsewidth to be approx. 100 nS.
4) Connect a counter to TP 447/3 (V_{RP} = 4V).
   Ground one data input line and check the frequency in the following sequence:

Data inp. line grounded	Frequency at TP 416/2
128	39,1 kHz
1 + 128	38,75 kHz
2 + 128	38,46 kHz
4 + 128	37,88 kHz
8 + 128	36,7 kHz
16 + 128	34,7 kHz
32 + 128	31,2 kHz
64 + 128	26,0 kHz

5) Connect the counter to TP 443/23. Read 6,4 MHz.
6) Connect the counter to TP 443/10 and 443/11. Read 25 kHz.
7) Ground data input: 8,64,128
   The frequency at TP 447/3 is now 25 kHz.
   Connect the oscilloscope to TP 447/6
   The voltage at the output of the comparator (TP 447/6) will change in the following manner:

If the variable frequency is faster than the reference frequency, the output voltage will be a sawtooth, going slowly from 0 V to 5 V.

If the reference frequency is faster than the variable frequency, the output voltage will be a sawtooth, going slowly from 5 V to 10 V.

The speed of the comparator voltage change is depended on the difference in the frequency. If the differencies are exactly equal, the voltage will take a value dependent on the phase difference.

SYNTHESIZER LOOP

Synthesizer mixer AP 498

(2 in the receiver and 1 in the transmitter)

The oscillator circuit is tuned with S1 to max. DC-voltage on S2 (normal voltage + 2.0 V)
Tuning to the right frequency is carried out later.
The input voltage from the oscillator AP 499 is 0.4 V AC, measured at TP 498-2 with a diode probe.
The beattone output is 0.1 Volt AC, measured with the diode probe at TP 498-3.

Voltage controlled oscillator AP 499/2/3

The alignment procedure for the three V.C.O.'s is in the principle the same. The only difference is the frequency and the output levels.
Connect a counter to the buffer output TP 499-7. The trimmer in the oscillator (C 13) is tuned to the following frequencies:

Transmitter V.C.O.	:	157 MHz ± 1 MHz
Receiver, duplex V.C.O.	:	172 MHz ± 1 MHz
Receiver, simplex V.C.O.	:	168 MHz ± 1 MHz

The buffer output to the synthesizer mixer AP 498 is tuned to max. deflection (with C 26), measured with the diode probe at TP 499-7.
Voltage with the attenuation of AP 498 is normally for all three V.C.O.'s 0,4 V AC.

The buffer output to the transmitter bufferstage AP 504 is tuned to max. deflection with C 17. Measured with the diode probe at TP 499-4 and attenuated with AP 504, a value of 4V AC should be read.

It should now be possible to tune the phaselock system.

Tuning of the receiver loop

The receiver loop must be tuned with both the simplex and the duplex V.C.O. in the loop.
The locking in the loop should be controlled by tuning the trimmer in the V.C.O. box about 180°. With this change in the position of the trimmer the D.C. voltage on the V.C.O. control line (TP 499-8) should change from + 1 V D.C. to + 9 V D.C. The voltage will increase when turning clockwise, decrease turning anticlockwise, and change proportional to the turning.

An oscilloscope connected to TP 499-8 will show a sawtooth voltage with a frequency of 25 KHz when the system is locked. If the loop is out of lock it will show a sawtooth with a much lower frequency.

The channel selector is set on a channel in the middle of the frequency range. The voltage on the control line to the V.C.O. (TP 499-8) is tuned with C 13 to be 3,5 V D.C. (min. 25 kHz ripple).

Simplex: Channel 68, 3,5 V on the simplex V.C.O. TP 499-8
Duplex : Channel 18, 3,5 V on the duplex V.C.O. TP 499-8

It must be controlled if the system locks automatically on the highest and lowest frequency.
For this purpose must be used a private printboard (AP 445) coded to give the lowest: 155 MHz and the highest: 157,825 MHz. For the simplex V.C.O. is used P0 and P2 and for the duplex P 1 and P 3.

For both the duplex and the simplex loop the voltage is:
Highest frequency (P2 or P3) : norm. 6,4 V
Lowest frequency (PO or P1) : norm. 2,4 V.

Tuning of the transmitter loop.

The method of tuning the transmitter is exactly the same as for the receiver. The channel selector is set to channel 68 in the middle of the frequency range and adjusted to the recommended voltage on the control line to the V.C.O. (TP 499-8).

The ability to lock on the frequency limits is controlled on the channels PO and P2.

Highest frequency:	channel P2	norm. voltage: 6,4 V
Middle frequency:	channel 68	norm. voltage: 3,5 V
Lowest frequency:	channel PO	norm. voltage: 2,4 V.

FREQUENCY ADJUSTMENT

Receiver.

The adjustment of the receiver frequencies is made with the two synthesizer oscillators at the prints AP 498.
A counter is connected to TP 499-7 at the voltage controlled oscillator AP 499. (The counter must be connected via a capacitor).
The channel selector is set to a channel in the middle of the frequency range. The frequency is adjusted to the correct value with S1 at printboard AP 498.

Simplex receiver

Channel no. 68; freq. 156,425000 MHz ± 100 Hz (167.125 − 10.7 = 156.425)

Duplex receiver

Channel no. 18; freq. 161,500000 MHz ± 100 Hz (10.7 + 172.200)

It must be controlled that the D.C. voltage at the coil S2 at print AP 498 does not fall more than 10 % below the max. voltage. If a greater detuning is necessary to get the correct frequency, the series condensor (C 4), which is normally 68 pf, must be changed to100 pf if the frequency is too high, or to 47 pf if the frequency is too low to give the right voltage at S2.

Transmitter

The frequency of the transmitter is adjusted in the same way as the receiver.
The channel selector is set to a channel in the middle of the range, and the tuning is made with S2 at AP 498.

Channel no: 68; freq.: 156,425000 MHz ± 100 Hz

The frequency is measured with a counter connected to the measuring output at the wattmeter.

1st and 2nd IF amp. AP 310/3

With the RF probe of the VTVM connected to TP 310-6, check if the x-tal oscillator for the 2nd mixer is working. - reading 0,2 V.AC.

With the sweep generator adjusted to 10,7 MHz, tune the 1st and 2nd IF.
Connect the diode probe to TP 310-2, and the RF output to TP 353-2. Now the 1st IF can be tuned.

Starting on pcb. AP 353, tune S4 for min. ripple on the filter, continuing on pcb. AP 310, tune S1 for min. ripple and S2 for max. amplification.

Then move the diodeprobe to TP 310-5 and tune S3, S4 and S5 for max. amplification and symmetry.

Now connect the AF input of the sweep generator directly to TP 311-3. Tune S1 for max. slope and best possible symmetry.

1st mixer AP 353

The channel selector is set to a frequency in the middle of the range.
In the duplex frequency range the selector is set to channel 18 and the duplex mixer and V.C.O. are on.

The signal from the V.C.O. is tuned to max. H.F. voltage at the testpoint 353-2 with trimmer C 7. The normal voltage measured with a diode probe is o,8 V AC.

The signal generator, tuned to the signal frequency, is connected to the antenna input and its attenuator is turned until a usable signal is heard in the speaker. Tune C 1 and C 4 for the best possible sensitivity.

In the simplex frequency range the selector is set to channel 68, and the simplex mixer and V.C.O. are on. The tuning procedure for the duplex mixer is repeated.

RF amplifier AP 485/1

Tune S 1 and S 3 for max. sensitivity, which should be better than o,8 u V EMF for 12 dB sinad as well as the noise suppression should be better than 20 dB for 1,2 u V input.

RF amplifier AP 485/2

Rejection circuit (Tuned at channel 88) AP 485/2

The rejection circuit S3 - C6 - C7 in the duplex receiver is tuned to reject the transmitting frequency out of the receiver. The transmitter is keyed and the H.F.-voltage is mesured at TP 353/1 with the diode probe. The trimmer is tuned to min. H.F.-voltage (ca. 200 mV).

AF squelch AP 459/2

Normally it shouldn't be necessary to adjust the AF amplifier, but for controlling the squelch functioning the voltage readings on the different test points should be as follows:
On TP 459-20 there should be 2,5V AC "noise", so that the squelch can function satisfactorily.

With the squelch fully opened there should be 1,5 V DC on TP 459-21 and 1,2 V DC on TP 459-18.

With the squelch fully closed there should be no reading on TP 459-11 and the amplifier AF is blocked.

Microtelephone amplifier. AP 497

The output of the amplifier is tuned to an output of 80 mV with R 1.(3,5 kHz dev, 1 kHz modulation)

1 w Bufferstage AP 504 (tuned at channel 18).

Disconnect the 25 w P.A.-stage AP 367 from TP 504-4 and connect a wattmeter.

The trimmer C 11 is turned to max. capacitance (clockwise), and C 14 is turned to min. capacitance (anticlockwise).

All the trimmers (except C 11 and C 14) are tuned to max. output power, starting with S 2.

The output power should be approx. 1 w. The tuning of C 11 and C 14 is carried out later.

25 watts P.A.-stage AP 367 (tuned at channel 18)

The output from AP 504 (TP 504-4) is again connected to the input of the P.A. stage (TP 367-1).

The output 367-3 is connected to the wattmeter with the B.N.C. connector at the output from the spurious filter.

The trimmers are set in center position, and there should now be a reading at the wattmeter.

The tuning is started with C 1 and all trimmers through the stage should be tuned to max. reading at the wattmeter.

The output power should reach 25 watts.

It is possible to reach 25 watts with a wrong adjustment of C 6 and C 7. Because of that, it must be controlled that C 6 is almost in its center position.

Tuning of C 11 and C 14 at AP 504 (tuned at channel 18)

When the tuning is carried out, the set must be able to be used in the duplex mode.

An RF generator is connected via a 1 kΩ resistor to TP 504-4. The RF generator modulated with 1 kHz is tuned to the receiving frequency (161,5 MHz). The transmitter is keyed and the RF generator tuned until a usable signal is heard in the receiver. C 14 is tuned until a rejection is heard in the receiver.

The RF generator is tuned to a frequency 4,6 MHz below the transmitting frequency (152,3 MHz). The transmitter is keyed and C 11 is tuned until a rejection is heard in the receiver.

Tuning of the duplexfilter

It must be controlled that the power loss in the filter does not exceed 25 %.

In case of a loss of more than 25 % the filter should be returned to the factory for tuning. It is not recommended to try to tune the filter, because some special instruments are necessary.

It is possible to make some fine adjustments of the rejection circuits in the filter.

Fine adjustment of C 1 and C 3

A wattmeter with a measuring output is connected to the antenna output. A RF generator is connected to the measuring output.

The channelselector is set to channel 4 (160,8 MHz) and the RF generator is tuned until the receiver gives an output of 12 dB SINAD, with the transmitter keyed.

The trimmer C 1 in the duplexfilter is tuned until the best possible sensitivity is reached. The channel selector is changed to channel 24 (161,8 MHz), and the procedure is repeated, tuning to best possible sensitivity with C 3.

Fine adjustment of C 5 and C 7

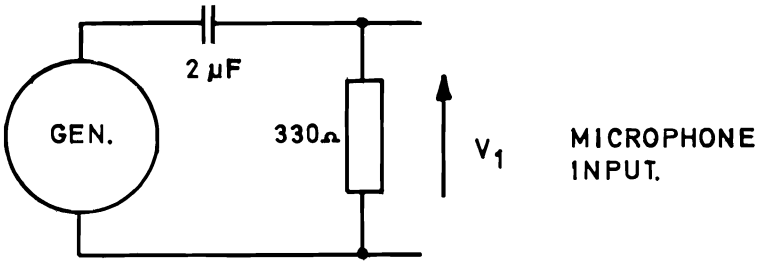
The receiver input to the filter is removed from the duplex receiver, and connected to a RF-voltmeter, with a 50 Ω input.

The channelselector is set to channel 28, the transmitter is keyed and the output voltage is tuned to min. with C 5.

The procedure is repeated on channel 60 and the output voltage is tuned to min. with C 7.

At last it must be controlled that the RF output is less than 50 mV on the channels 60, 18 and 28.

Modulation amplifier AP 408/3



The audiogenerator, V_1 = 2,25 V, 1000 Hz is connected to the carbon microphone input, with the shown diagram.

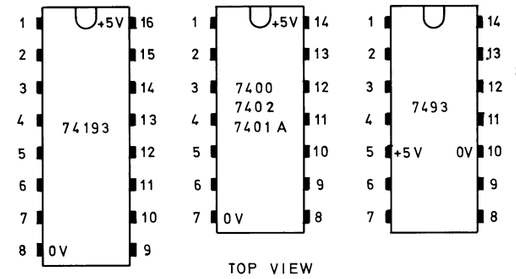
"Level" and "Limiter" pots are set in center position. The channel selector is set to channel 18 and the deviation is adjusted to ± 4,5 kHz with R 12.

The output of the audiogenerator is decreased 20 dB. The deviation is adjusted to ± 800 kHz with R 6 (The potm. nearest to the integrated circuit).

The output of the audiogenerator is increased 20 dB and the deviation is fine adjusted to ± 4,5 kHz with R 12.

The output of the audiogenerator is again decreased 20 dB and the deviation is fine adjusted to ± 800 kHz with R 6.

TP447-7 +5V
5 MHz±1
C8 4,7µF
C9 4,7µF
TP447-2
TP447-7 +5V
R4 470Ω
R1 100K
R2 100K
1/2 SN 7402
R3 220Ω
C2 1nF
Q1 BC 107
Q2 BC 107
C1 100 pF
C3 200 pF
AMPL.
PULSE SHORTN.
TP447-1
SN 74193
VARIABEL COUNTER
TP447-3
TP447-4
TP447-9
TP447-10
TP447-11
TP447-12
TP447-13
TP447-14
TP447-15
TP447-16
TP447-17
C4 2,2 µF
R9 1K
R10 1K
R8 4,7K
+5V
R5 1K
C6 1nF
R11 2,2K
TP447-6
TO LOOP FILTER
C7 47nF
SN 7401 A
5V
R6 2,7K
R7 2,7K
C5 47pF
SN 7400
AP447/1 RECEİVER
TP447-5
TP443-26
TP443-27



TOP VIEW

AP 443/1
4 x 1nF
C1 C2 C3 C4
TP443-1
TP443-2
TP443-3
TP443-4
TP443-5
TP443-6
TP443-7
TP443-8
TP443-9
R1 100Ω
R2 100Ω
R3 100Ω
R5 100Ω
R6 100Ω
R7 100Ω
R8 100Ω
R9 100Ω
C5 C6 C7 C8 C9
5 x 1nF
R 10 100Ω
+10 V
1nF C11
+ 5V
4,7µF/ 10 V
C12
C13 47 nF
TP443-12
TP443-13
TP443-14
TP443-15
TP443-16
TP443-17
TP443-18
TP443-19
TP443-20
TP443-21
TP443-22
TP443-25
TP443-24

+5V
6x4,7K
R12 R13 R14 R15 R16 R17
D1 D2 D3
D4 D5 D6
6x AAZ17
TP604-7 +5V
C8 4,7µF
C9 4,7µF
5 MHz±1
TP604-2
TP604-7 +5V
R4 470Ω
R1 100K
R2 100K
1/2 SN7402
R3 220Ω
C2 1nF
Q1 BC 107
Q2 BC 107
C1 100 pF
C3 200 pF
AMPL.
PULSE SHORTN.
TP604-1
SN 74193
IC 6
IC 5
VARIABEL COUNTER
TP604-3
TP -4
D7 TP 604-9
D8 TP604-10
D9 TP604-11
TP604-12
D10 TP604-13
TP604-14
D11 TP604-15
TP 604-16
D12 TP604-17
SN 7400
6xAAZ17
C4 2,2µF
R9 1K
R10 1K
R8 4,7K
+5V
R5 1K
C6 1nF
R11 2,2K
TP604-6
TO LOOP FILTER
C7 47nF
SN 7401 A
5V
R6 2,7K
R7 2,7K
C5 47pF
SN 7400
AP604b/1 TRANSMİTTER
TP604-5

TP443-10
TP443-11
1/2 SN 7402
REF. DİVİDER
SN 7493
6,4 MHz OSC.
C10 100pF
R11 330Ω
R12 680Ω
1/2 SN 7402
TP443-23

Component layout Dwg no. 72200-4E

Rettet:		FREQUENCY CONTROL CİRCUİT. SYNTHESİZER. PRİNT AP443/1-447/1-604b/1	Tegn.: ML. 17-5-72	Kontr.: HM. 17-5-72
17-11-72	H.P.		Stykl. nr.: 72166-4S	
4-4-73	A.C.			
5-12-73	JAN			
17-4-74	JAN			
30-5-74	JAN			
21-11-74	AC/HM	AP-RADIOTELEFON	Tegn. nr: 72166-3E	
14-4-75	AC/HM			

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		100 Ω ¼ w	IC		SN 7493
R 2		100 Ω ¼ w	IC		SN 7493
R 3		100 Ω ¼ w	IC		SN 7402
R 5		100 Ω ¼ w			Krystal 6,4 MHz
R 6		100 Ω ¼ w			
R 7		100 Ω ¼ w			
R 8		100 Ω ¼ w			
R 9		100 Ω ¼ w			
R 10		100 Ω ¼ w			
R 11		330 Ω ¼ w			
R 12		680 Ω ¼ w			
C 1		1 nF Ker.			
C 2		1 nF Ker.			
C 3		1 nF Ker.			
C 4		1 nF Ker.			
C 5		1 nF Ker.			
C 6		1 nF Ker.			
C 7		1 nF Ker.			
C 8		1 nF Ker.			
C 9		1 nF Ker.			
C 10		100 pF Ker.			
C 11		1 nF Ker.			
C 12		4,7 uF/10 V Tant.			
C 13		47 nF Ker.			

Frequency control circuit

Tilhører tegn. nr.: AP 443/1 72166-3E

Rettet: 5-12-73 JAN

Tegn. AC 11-1-73

Kontr. HN

Stykl. nr.: 72166-4S

AP-RADIOTELEFON

Nr.	Kode	Data
R 1		100 kΩ ¼ w
R 2		100 kΩ ¼ w
R 3		220 Ω ¼ w
R 4		470 Ω ¼ w
R 5		1 kΩ ¼ w
R 6		2,7 kΩ ¼ w
R 7		2,7 kΩ ¼ w
R 8		4,7 kΩ ¼ w
R 9		1 kΩ ¼ w
R 10		1 kΩ ¼ w
R 11		2,2 kΩ ¼ w
C 1		100 pF styroflex
C 2		1 nF Ker.
C 3		200 pF styroflex
C 4		2,2 uF tantal
C 5		47 pF styroflex
C 6		1 nF Ker.
C 7		47 nF Ker.
C 8		4,7 uF tantal
C 9		4,7 uF tantal

Nr.	Kode	Data
Q 1		BC 107
Q 2		BC 107
IC		SN 74193
IC		SN 74193
IC		SN 7402
IC		SN 7400
IC		SN 7401 A

Frequency control circuit

Tilhører tegn. nr.: AP 447/1 72166-3E

Rettet: 5-12-73 JAN

Tegn. AC 11-1-73

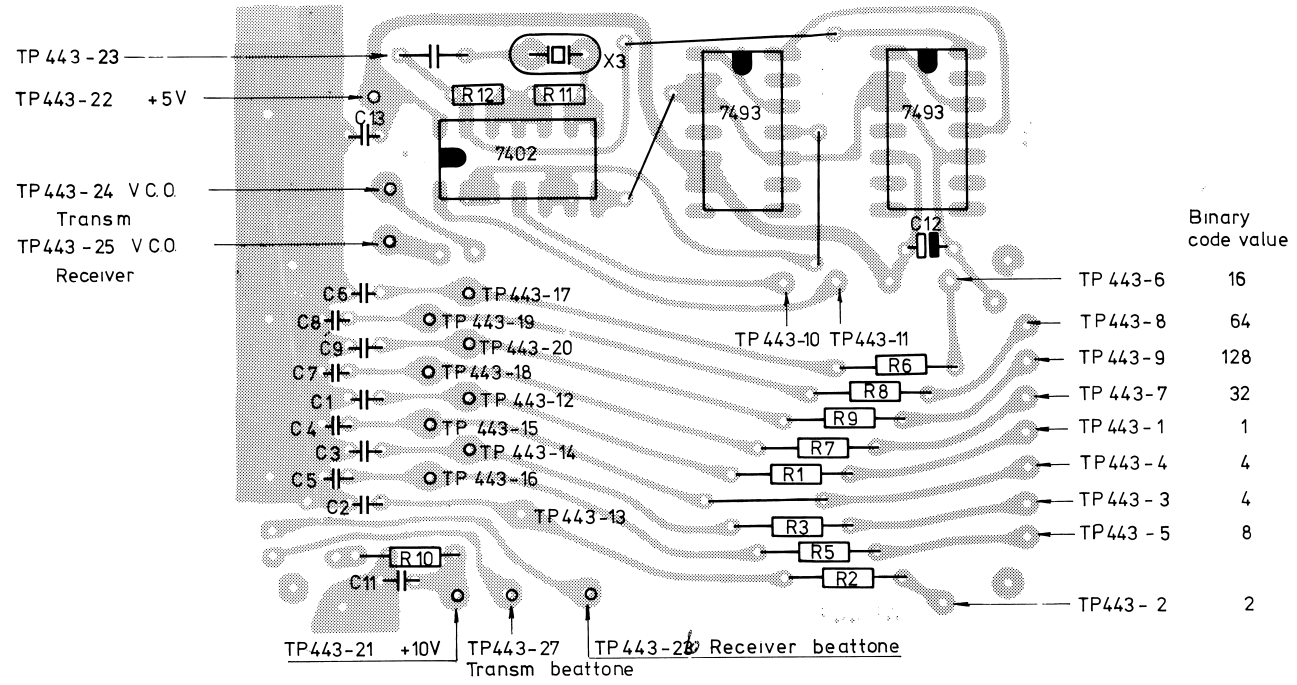
Kontr. HN

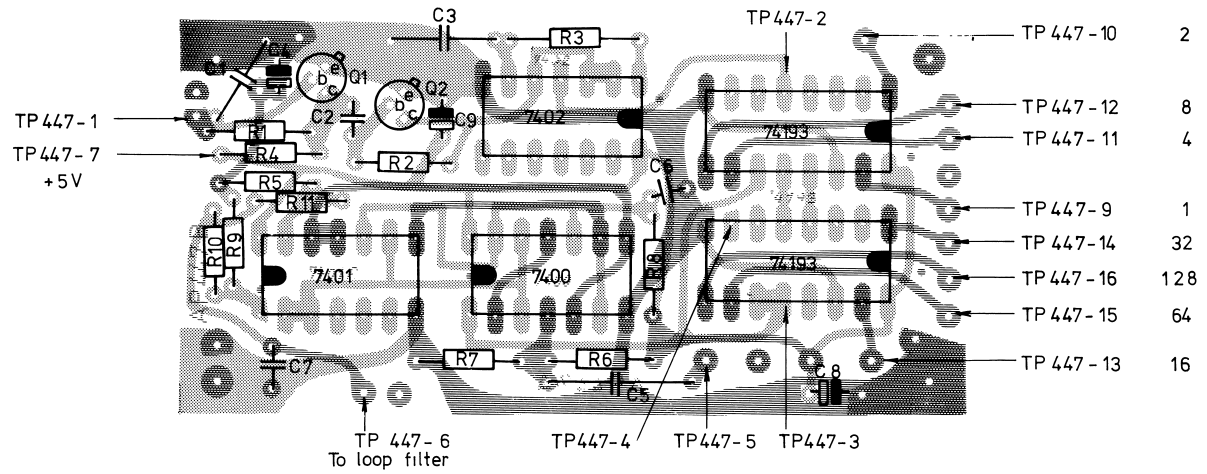
Stykl. nr.: 72166- 4S

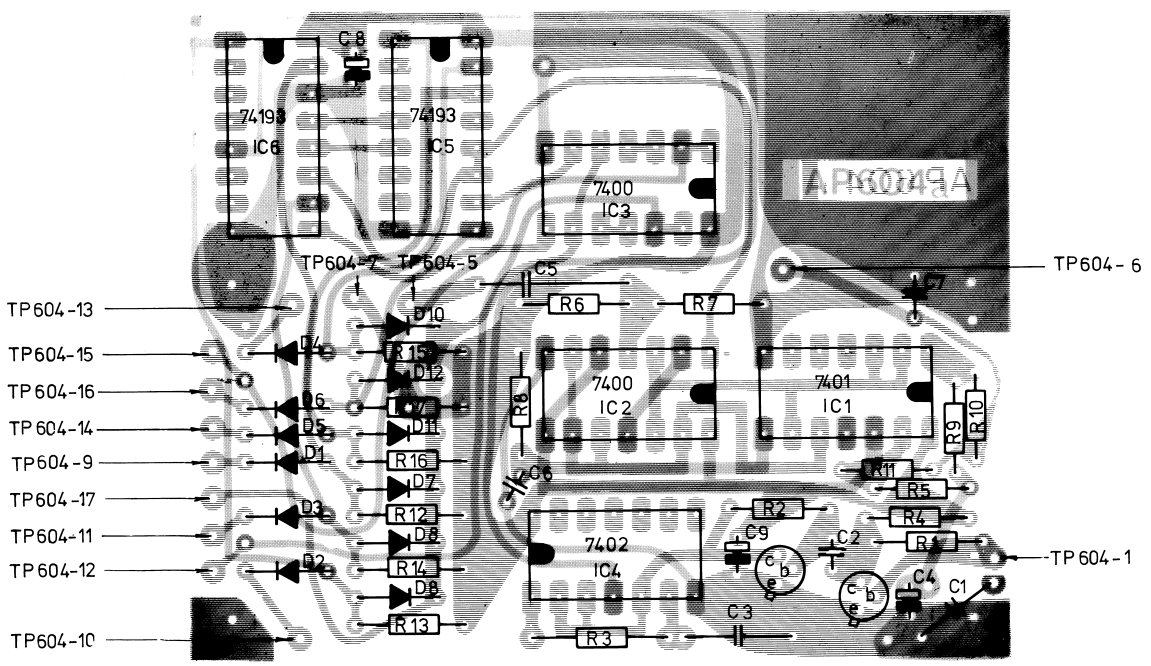
AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		100 kΩ ¼ w	D 8		AAZ 17
R 2		100 kΩ ¼ w	D 9		AAZ 17
R 3		220 Ω ¼ w	D10		AAZ 17
R 4		470 Ω ¼ w	D11		AAZ 17
R 5		1 kΩ ¼ w	D12		AAZ 17
R 6		2,7 kΩ ¼ w			
R 7		2,7 kΩ ¼ w			
R 8		4,7 kΩ ¼ w	Q 1		BC 107
R 9		1 kΩ ¼ w	Q 2		BC 107
R10		1 kΩ ¼ w			
R11		2,2 kΩ ¼ w			
R12		4,7 kΩ ¼ w	IC1		SN 7401 AN
R13		4,7 kΩ ¼ w	IC2		SN 7400 N
R14		4,7 kΩ ¼ w	IC3		SN 7400 N
R15		4,7 kΩ ¼ w	IC4		SN 7402 N
R16		4,7 kΩ ¼ w	IC5		SN 74193 N
R17		4,7 kΩ ¼ w	IC6		SN 74193 N
C 1		100 pF styr.			
C 1		1 nF ker.			
C 3		200 pF styr.			
C 4		4,7 µF tant.			
C 5		4,7 pF styr.			
C 6		1 nF ker.			
C 7		47 nF ker.			
C 8		4,7 µF tant.			
C 9		4,7 µF tant.			
D 1		AAZ 17			
D 2		AAZ 17			
D 3		AAZ 17			
D 4		AAZ 17			
D 5		AAZ 17			
D 6		AAZ 17			
D 7		AAZ 17			

Frequency control circuit AP 604b/1 Tilhører tegn. nr.: 72166-3E	Rettet:	Tegn.:	Stykl. nr.:
		Kontr.: HM	72166- 4S

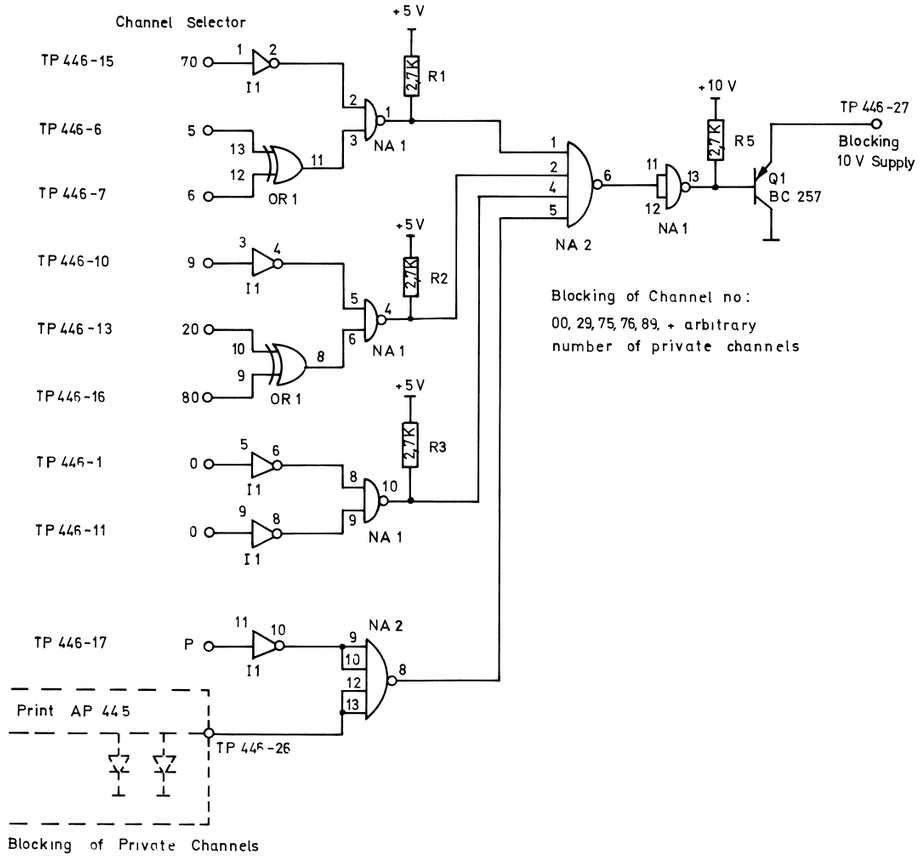


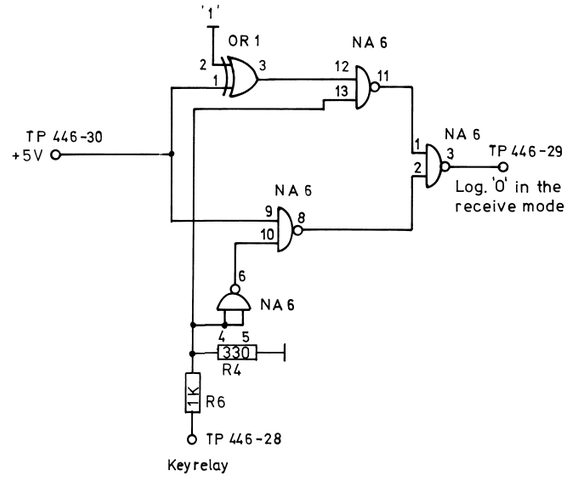


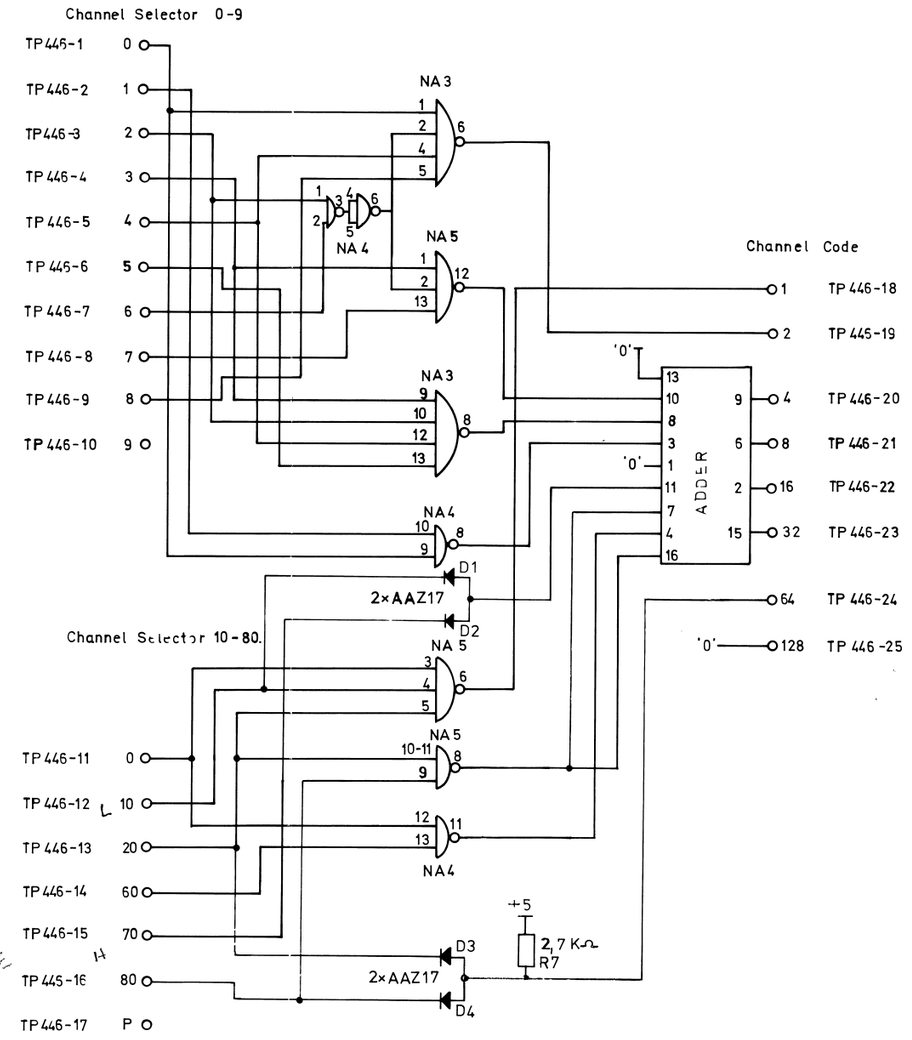


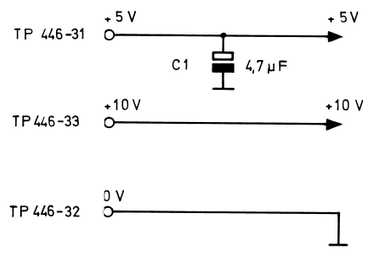
Frequency control circuit synthesizer Dwg. no 72166-3E

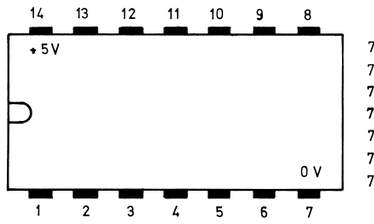
Rettet: 14-4-75 AC/HM	Component layout Print AP 443, AP 447 and AP 604.	Tegn.: 29-6-72 JAN Kontr.: 29-6-72 HM Stykl. nr.: Tegn. nr.: 72200-3E
	AP-RADIOTELEFON	

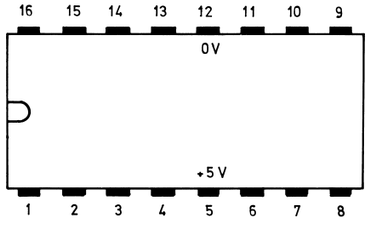


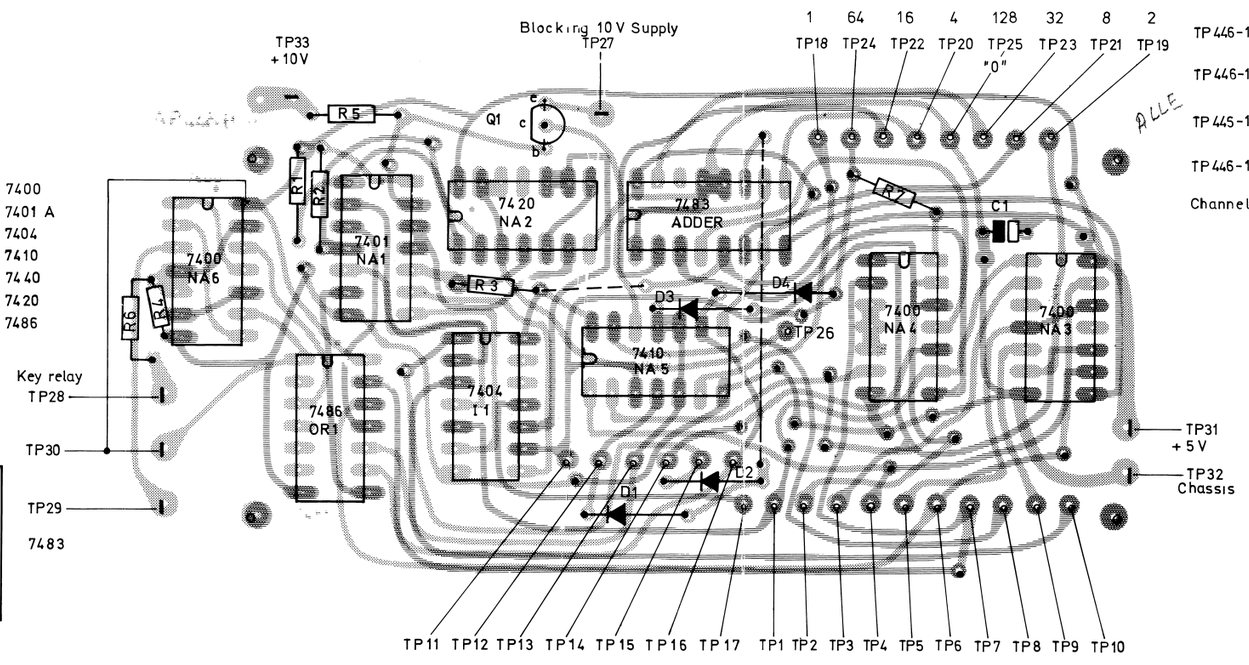












If AP 604 is used, a log"1" is set on TP 446-30

Rettet:	Blocking and channel coding. AP 446a/1	Tegn.: ML 11-4-72	Kontr.: HM. 11-4-72
17-11-72 H.P.		Stykl. nr.:	
9-3-73 AC.			
12-6-74 NC			
19.-3.-75 NC/HM	AP-RADIOTELEFON	Tegn. nr :	72153-2E

AP-RADIOTELEFON

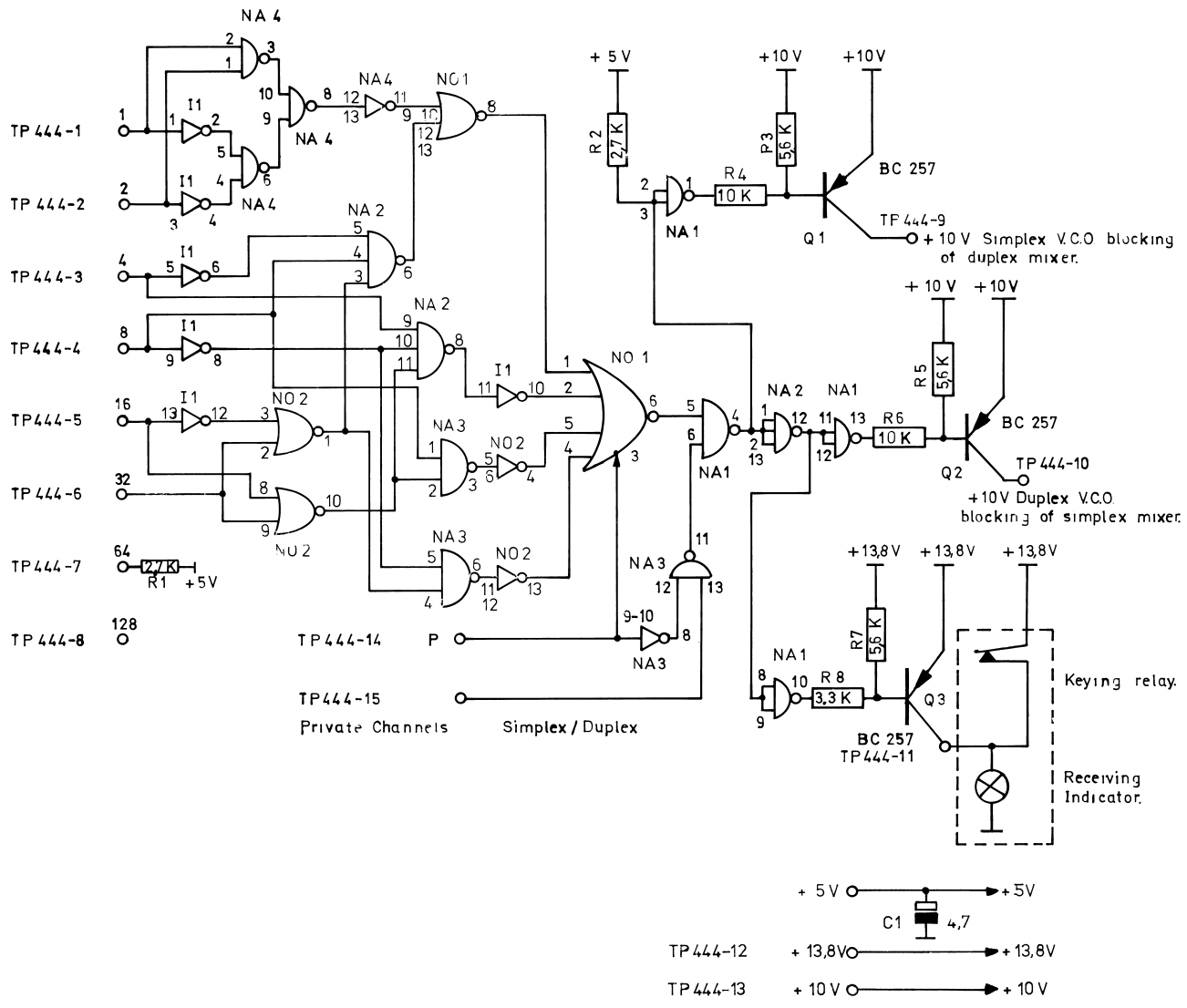
Nr.	Kode	Data	Nr.	Kode	Data
R 1		2,7 kΩ ¼ w			
R 2		2,7 kΩ ¼ w			
R 3		2,7 kΩ ¼ w			
R 4		330 Ω ¼ w			
R 5		2,7 kΩ ¼ w			
R 6		1 kΩ ¼ w			
R 7		2,7 kΩ ¼ w			
C 1		4,7 uF tant.			
D 1		AAZ 17			
D 2		AAZ 17			
D 3		AAZ 17			
D 4		AAZ 17			
NA1		SN 7401 A			
NA2		SN 7420			
NA3		SN 7400			
NA4		SN 7400			
NA5		SN 7410			
NA6		SN 7400			
OR1		SN 7402			
I 1		SN 7404			
ADD		SN 7483			

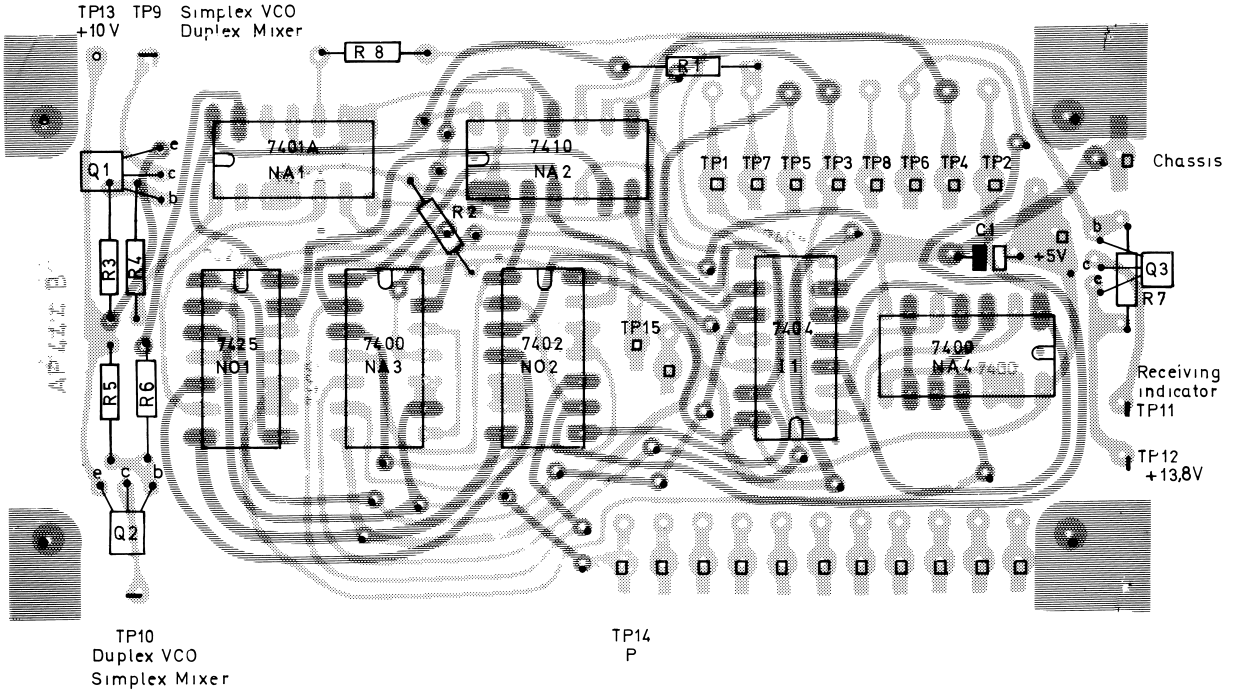
Blocking and channel coding
Print board AP 446a/1
Tilhører tegn. nr.: 72153-3E

Rettet:

Tegn.: AC 11.-1.-73
Kontr.: HM

Stykl. nr.: 72153-4S



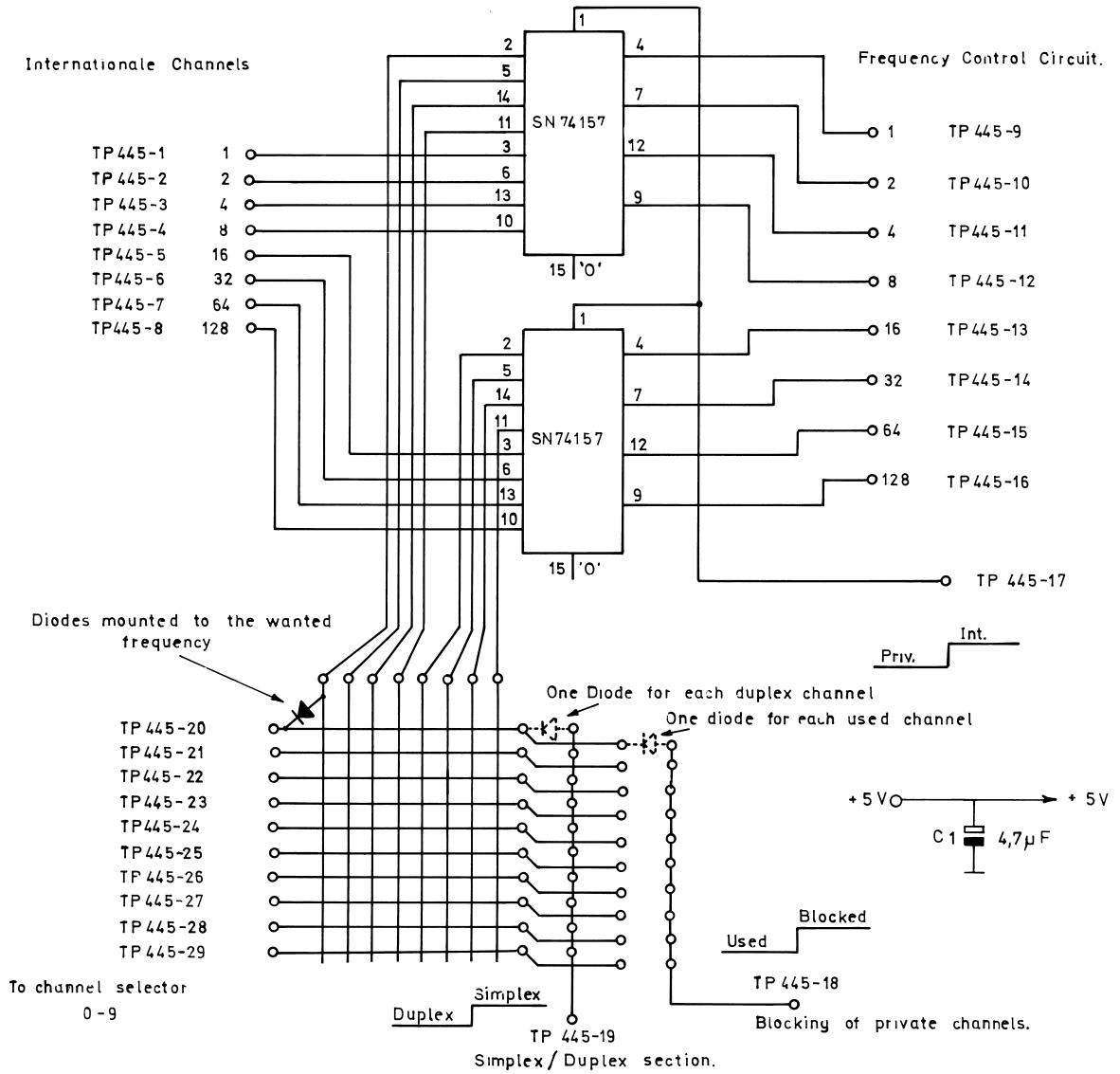


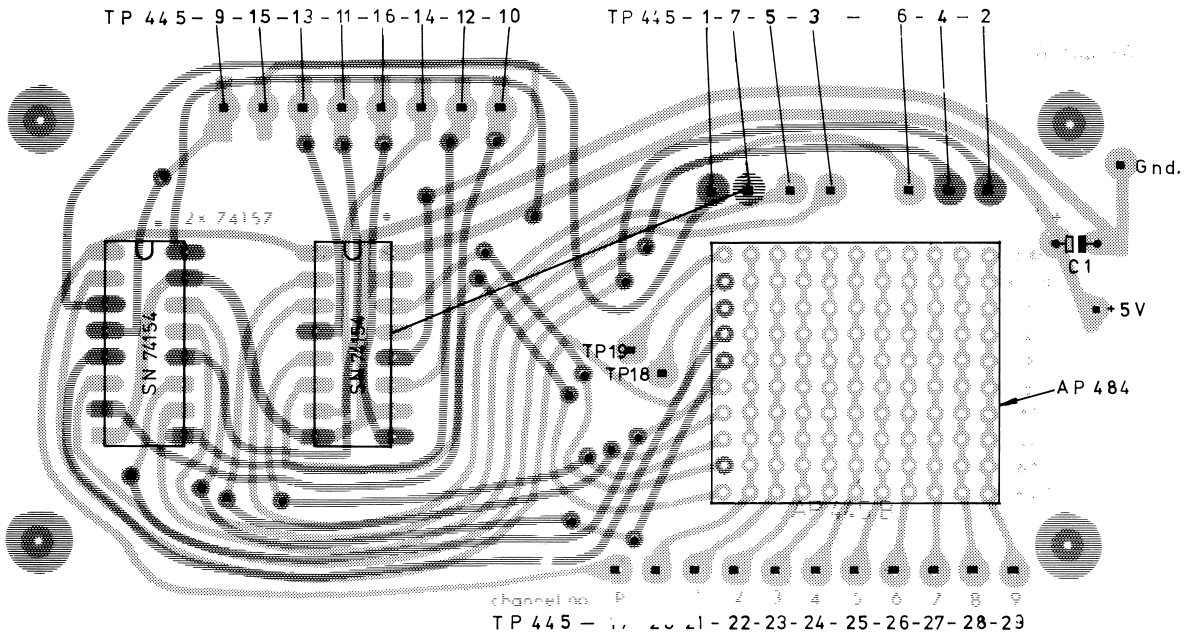
Rettet 20-11-72 NC 19-1-73 AC. 14-3-73 A.C. 5-12-73 JAN	Simplex / Duplex Selection. Print AP 444/1 AP-RADIOTELEFON	Tegn. ML 19-4-72 Kontr.: HM. 19-4-72 Stykl. nr.: 72161-4S Tegn. nr. 72161-3E

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		2,7 kOhm ¼ w			
R 2		2,7 kOhm ¼ w			
R 3		5,6 kOhm ¼ w			
R 4		10 kOhm ¼ w			
R 5		5,6 kOhm ¼ w			
R 6		10 kOhm ¼ w			
R 7		5,6 kOhm ¼ w			
R 8		3,3 kOhm ¼ w			
C 1		4,7 uF tant.			
Q 1		BC 257			
Q 2		BC 257			
Q 3		BC 257			
NA1		SN 7401 A			
NA2		SN 7410			
NA3		SN 7400			
NA4		SN 7400			
NO1		SN 7425			
NO2		SN 7402			
I 1		SN 7404			

Simplex/duplex selection Print board AP 444/1 **Tilhører tegn. nr.:**	**Rettet:** 5-12-73 JAN	**Tegn.:**	**Stykl. nr.:**	
		Kontr.:	72161-4S	



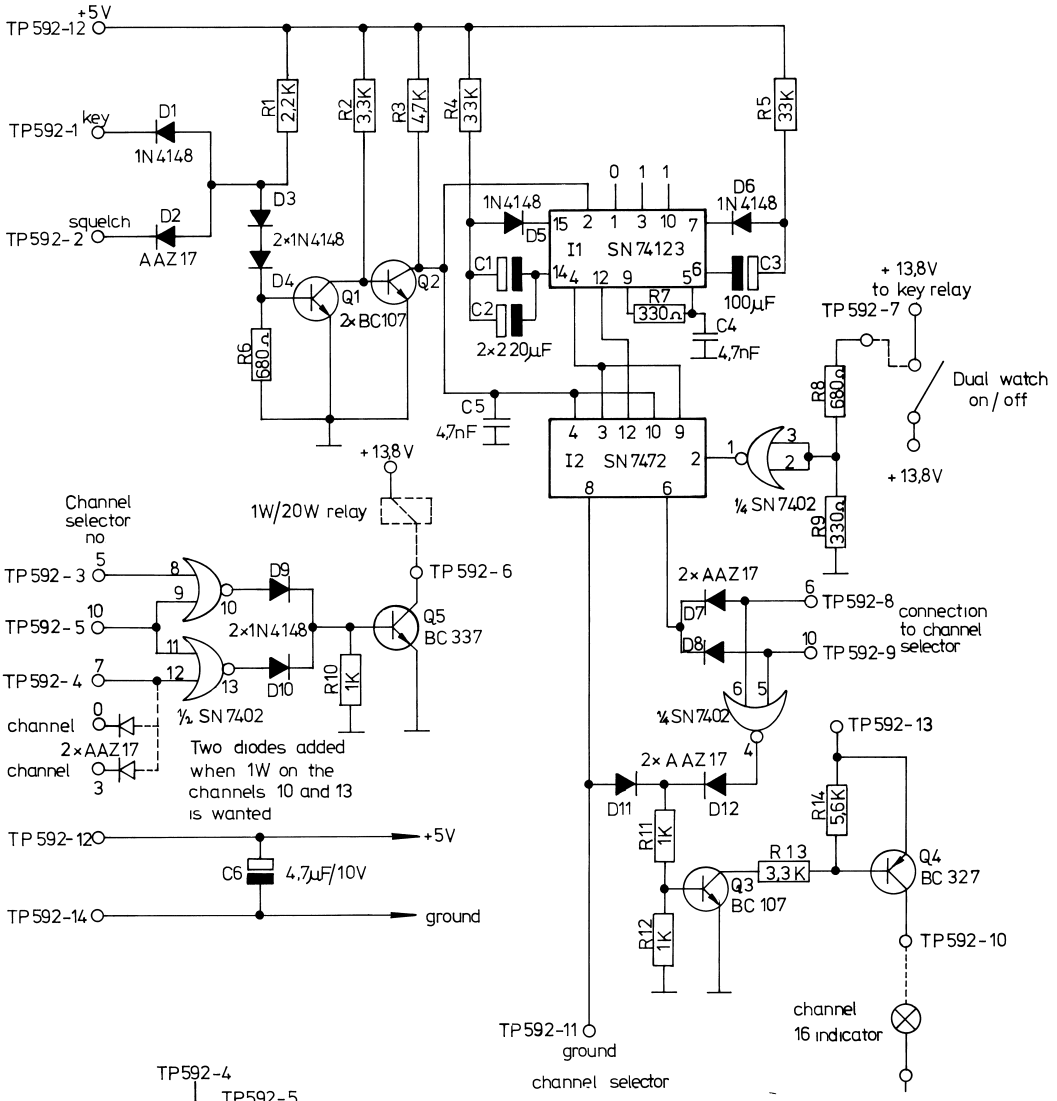


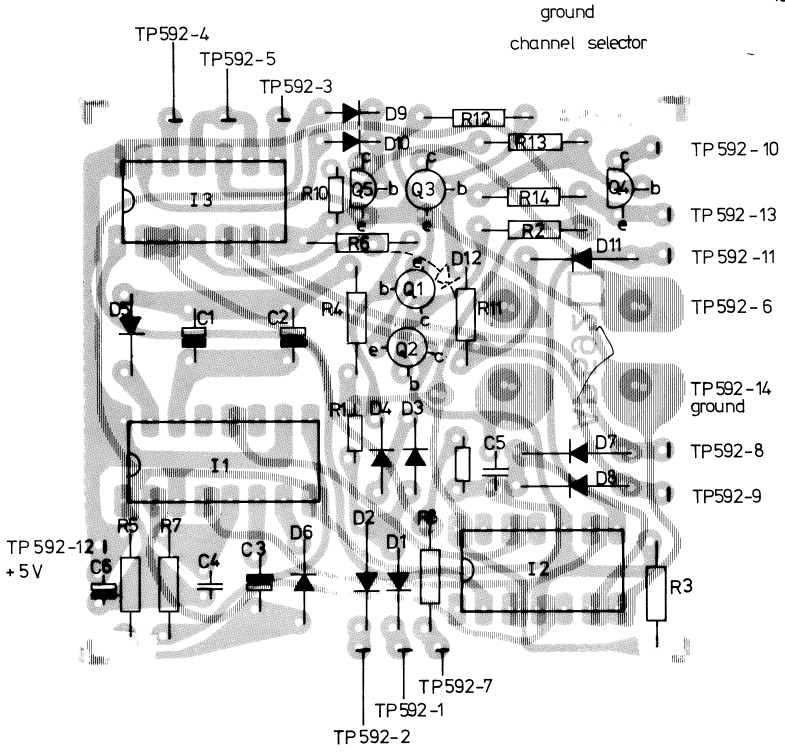
Rettet: 2-1-73 H.P.	PRIVATE CHANNELS. Print AP 445/1	Tegn.: ML 9-5-72 / Kontr.: HM. 9-5-72
		Stykl. nr.: 72172-4S
	AP-RADIOTELEFON	Tegn. nr. 72172-4E

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
C 1		4,7 uF/10v			
Ic		SN 74157			
Ic		SN 74157			
Diodes		1 N 4148			

Private channels Print board AP 445/1 **Tilhører tegn. nr.:** 72172-4E	**Rettet:**	Tegn. AC 11.-1.-73 Kontr.: HM	**Stykl. nr.:** 72172-4S





Rettet:	Dual watch and 1w/20w selector for AP 759 D Print AP 592/1	Tegn.: 26-2-74 AC; Kontr.: 27-2-74 M.J
		Stykl. nr.: 74093-4S
	AP-RADIOTELEFON	Tegn. nr.: 74093-3E

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		2,2 kΩ ¼ w	Q 1		BC 107
R 2		3,3 kΩ ¼ w	Q 2		BC 107
R 3		4,7 kΩ ¼ w	Q 3		BC 107
R 4		33 kΩ ¼ w	Q 4		BC 327
R 5		33 kΩ ¼ w	Q 5		BC 337
R 6		680 Ω ¼ w			
R 7		330 Ω ¼ w			
R 8		680 Ω ¼ w	I 1		SN 74123 N
R 9		330 Ω ¼ w	I 2		SN 7472 N
R10		1 kΩ ¼ w	I 3		SN 7402 N
R11		1 kΩ ¼ w			
R12		1 kΩ ¼ w			
R13		3,3 kΩ ¼ w			
R14		5,6 kΩ ¼ w			
C 1		220 µF/ 6V elco.			
C 2		220 µF/ 6V elco.			
C 3		100 µF/ 6V elco.			
C 4		4,7 nF ker.			
C 5		4,7 nF ker.			
C 6		4,7 µF/10V tant.			
D 1		1N 4148			
D 2		AAZ 17			
D 3		1N 4148			
D 4		1N 4148			
D 5		1N 4148			
D 6		1N 4148			
D 7		AAZ 17			
D 8		AAZ 17			
D 9		1N 4148			
D10		1N 4148			
D11		AAZ 17			
D12		AAZ 17			

Dual Watch and 1W/20W selector for AP 759 D Print AP 592/1

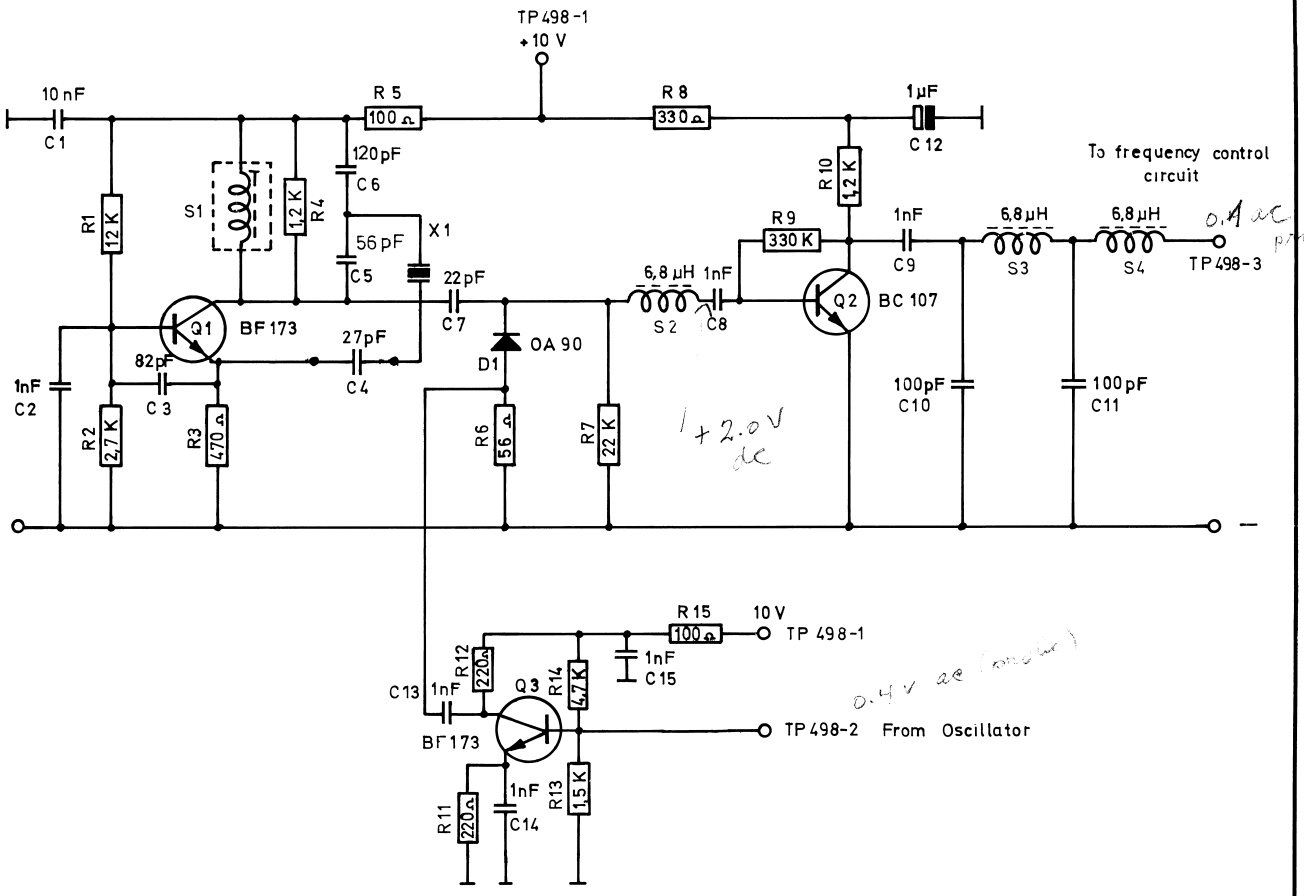
Tilhører tegn. nr.: 74093-3E

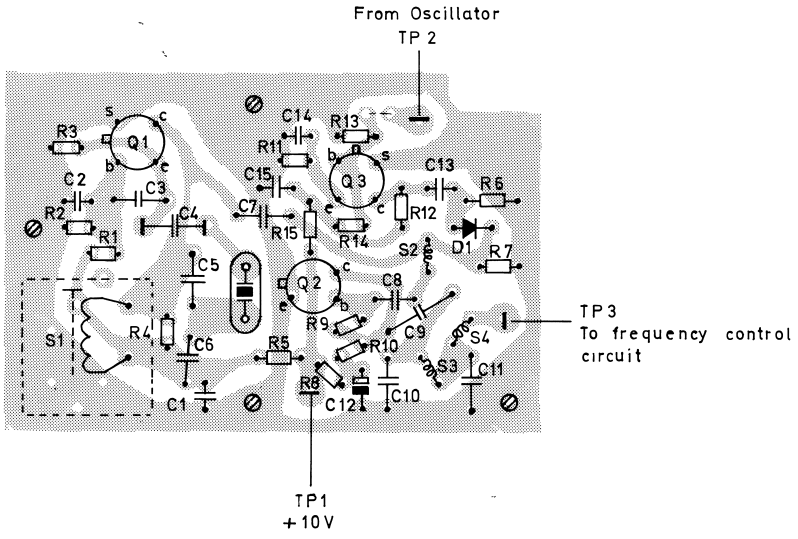
Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 74093-4S





Rettet:			
17-11-72	H.P	SYNTHESIZER MIXER PC BOARD AP498/1	Tegn.: ML. 14-4-72 / Kontr.: HM. 14-4-72
14-11-73	A.C.		Stykl. nr.: 72155-4S
5-12-73	JAN		Tegn. nr.: 72155-4E
		AP-RADIOTELEFON	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		12 kΩ	C 1		10 nF ker.
R 2		2,7 kΩ	C 2		1 nF ker.
R 3		470 Ω	C 3		82 pF ker.
R 4		1,2 kΩ	C 4		27 pF ker.
R 5		100 Ω	C 5		56 pF ker.
R 6		56 Ω	C 6		120 pF ker.
R 7		22 kΩ	C 7		22 pF ker.
R 8		330 Ω	C 8		1 nF ker.
R 9		330 kΩ	C 9		1 nF ker.
R 10		1,2 kΩ	C 10		100 pF ker.
R 11		220 Ω	C 11		100 pF ker.
R 12		220 Ω	C 12		1 uF tantal
R 13		1,5 kΩ	C 13		1 nF ker.
R 14		4,7 kΩ	C 14		1 nF ker.
R 15		100 Ω	C 15		1 nF ker.
S 1		L 208	Q 1		BF 173
S 2		6,8 uH	Q 2		BC 107
S 3		6,8 uH	Q 3		BF 173
S 4		6,8 uH			
D I		OA 90			
X I		crystal AP 9			

Synthesizer Mixer Printboard

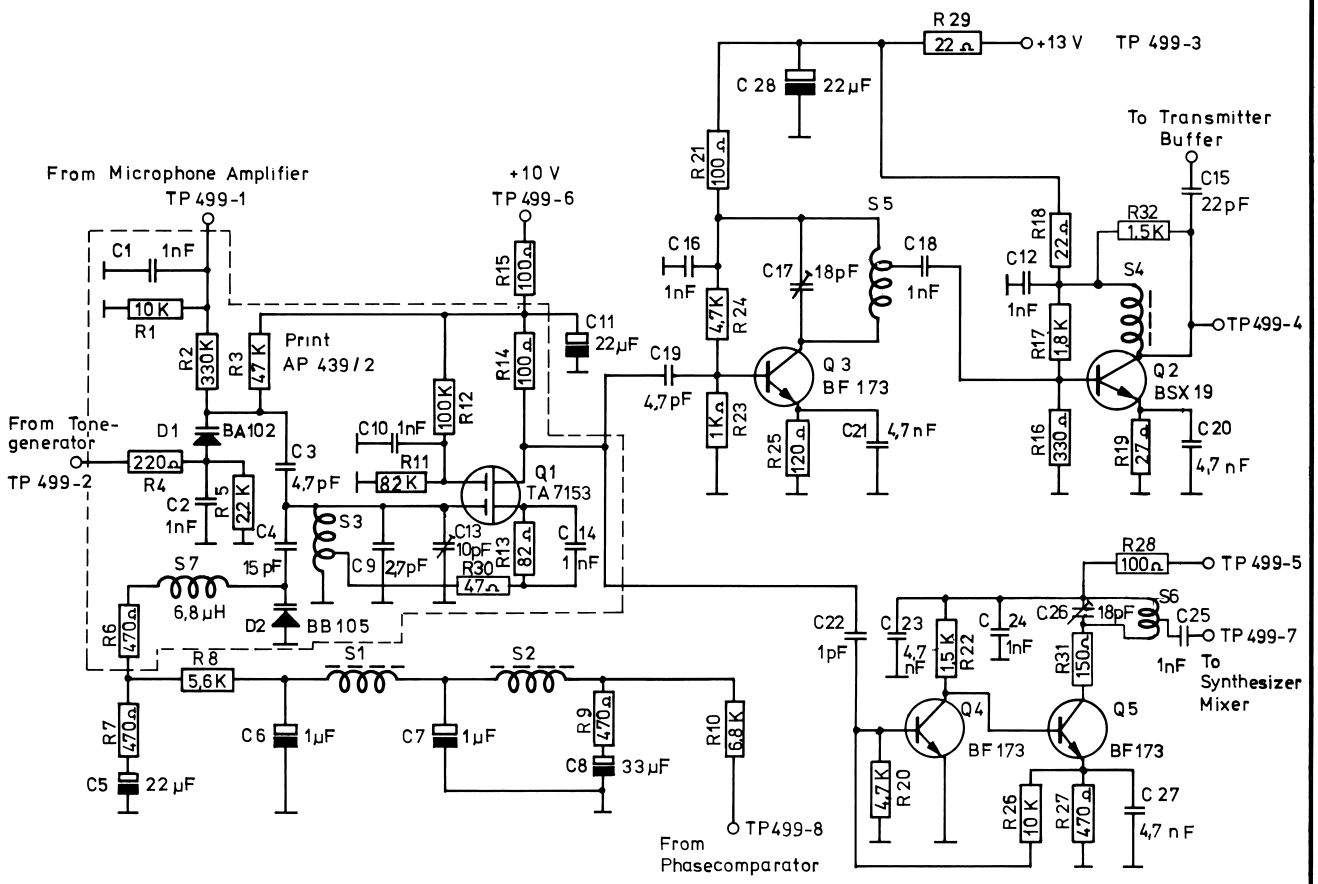
Tilhører tegn. nr.: AP 498/1 72155-4E

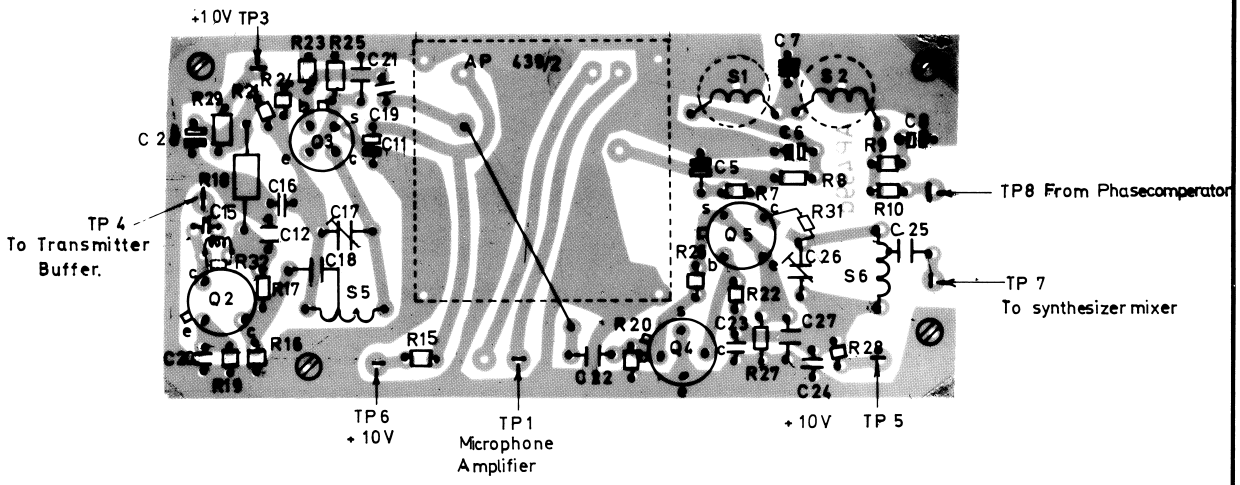
Rettet: 5-12-73 JAN

Tegn.: AC 11-1-73

Kontr.: HN

Stykl. nr.: 72155-4S





Rettet:
17-11-72 HP
14-11-73 AC
11-12-73 JAN
28-10-74 CHB/AC

Transmitter Oscillator Synthesizer.

Print Board AP 499a/3

RADIOTELEFONSERVICE

Tegn.: ML. 20-3-72	Kontr.: HM. 20-3-72
Stykl. nr.: 72121-4 S	
Tegn. nr.: 72121-4E	

AP-RADIOTELEFON

Nr.	Kode	Data
R 1		10 kΩ ¼ w
R 2		330 kΩ ¼ w
R 3		47 kΩ ¼ w
R 4		220 Ω ¼ w
R 5		2,2 kΩ ¼ w
R 6		470 Ω ¼ w
R 7		470 Ω ¼ w
R 8		5,6 kΩ ¼ w
R 9		470 Ω ¼ w
R10		6,8 kΩ ¼ w
R11		82 kΩ ¼ w
R12		100 kΩ ¼ w
R13		82 Ω ¼ w
R14		100 Ω ¼ w
R15		100 Ω ¼ w
R16		330 Ω ¼ w
R17		1,8 kΩ ¼ w
R18		22 Ω ¼ w
R19		27 Ω ¼ w
R20		4,7 kΩ ¼ w
R21		100 Ω ¼ w
R22		1,5 kΩ ¼ w
R23		1 kΩ ¼ w
R24		4,7 kΩ ¼ w
R25		120 Ω ¼ w
R26		10 kΩ ¼ w
R27		470 Ω ¼ w
R28		100 Ω ¼ w
R29		22 Ω ¼ w
R30		47 Ω 1/8 w
R31		150 Ω ¼ w
R32		1,5 kΩ ¼ w
Q 1		TA 7153
Q 2		BSX 19
Q 3		BF 173
Q 4		BF 173
Q 5		BF 173
D 1		BA 102
D 2		BB 105

Nr.	Kode	Data
C 1		1 nF ker
C 2		1 nF ker
C 3		4,7 pF ker.
C 4		15 pF ker.
C 5		22 uF tantal
C 6		1 uF tantal
C 7		1 uF tantal
C 8		33 uF tantal
C 9		2,7 pF ker.
C10		1 nF ker.
C11		22 uF tantal
C12		1 nF ker.
C13		10 pF trimmer
C14		1 nF ker.
C15		22 pF ker.
C16		1 nF ker.
C17		18 pF trimmer
C18		1 nF ker.
C19		4,7 pF ker.
C20		4,7 nF ker.
C21		4,7 nF ker.
C22		1 pF ker.
C23		4,7 nF ker.
C24		1 nF ker.
C25		1 nF ker.
C26		18 pF trimmer
C27		4,7 nF ker.
C28		22 uF tantal
S 1		L 210
S 2		L 210
S 3		L 203
S 4		6,8 uH R.F.C.
S 5		L 204
S 6		L 204
S 7		6,8 uH R.F.C.

Transmitter Oscillator Synthesizer.Print Board AP499a/3

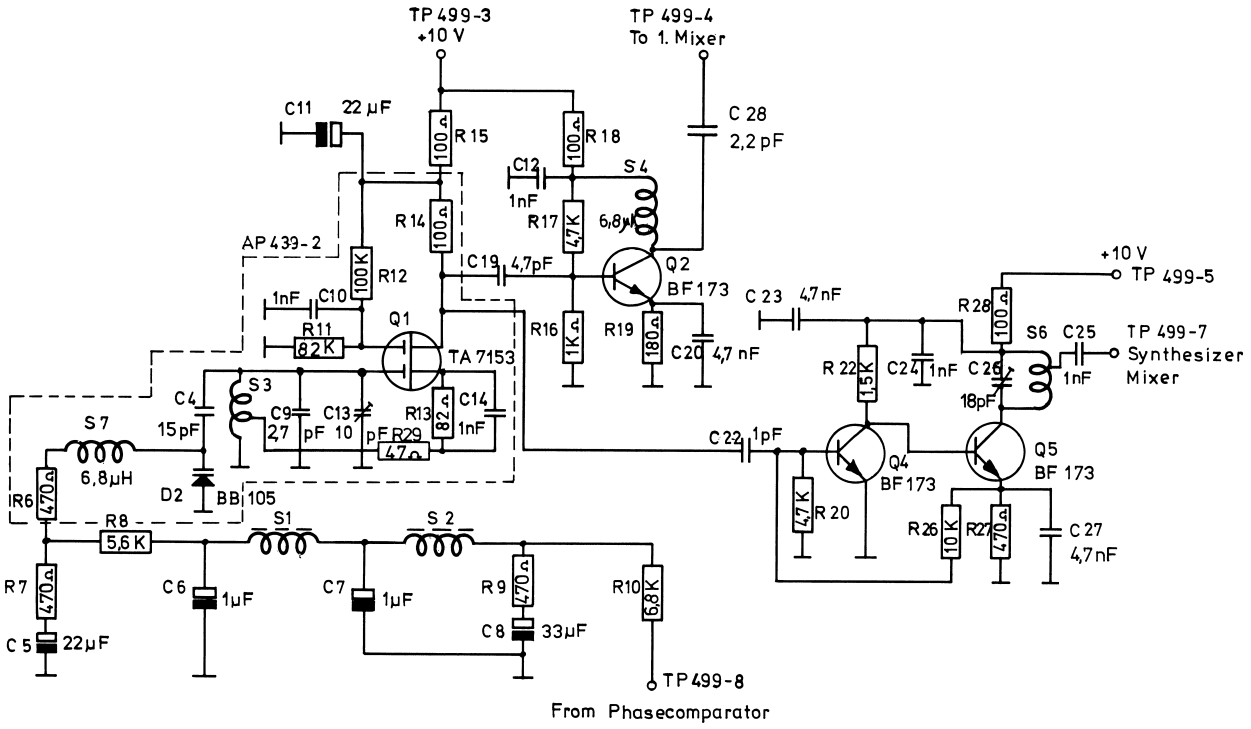
Tilhører tegn. nr.: 72121-4E

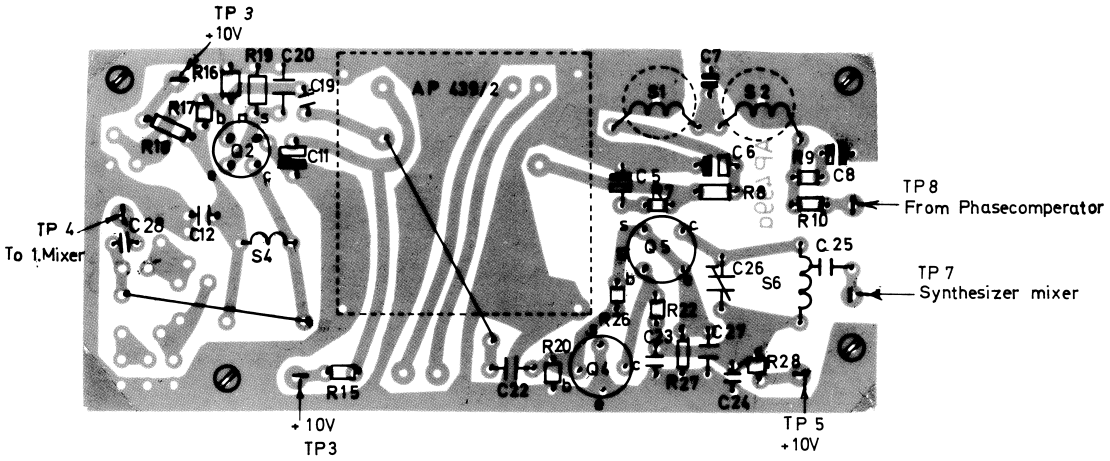
Rettet: 11-12-73 JAN

Tegn.: AC 11-1-73

Kontr.. HM

Stykl. nr.: 72121-4S





Rettet:	Receiver Oscillator, voltage controlled Synthesizer. Print Board AP 499a/2.	Tegn.: ML 20-3-72	Kontr.: HM 20-3-72
17-11-72 H.P.		Stykl. nr.: 72133-4S	
14-11-73 AC		Tegn. nr.:	
11-12-73 JAN			
28-10-74 CHB/AC			
	RADIOTELEFONSERVICE	72133-4E	

AP-RADIOTELEFON

Nr.	Kode	Data
R 6		470 Ω ¼ w
R 7		470 Ω ¼ w
R 8		5,6 kΩ ¼ w
R 9		470 Ω ¼ w
R10		6,8 kΩ ¼ w
R11		82 kΩ ¼ w
R12		100 kΩ ¼ w
R13		82 Ω ¼ w
R14		100 Ω ¼ w
R15		100 Ω ¼ w
R16		1 kΩ ¼ w
R17		4,7 kΩ ¼ w
R18		100 Ω ¼ w
R19		180 Ω ¼ w
R20		4,7 kΩ ¼ w
R22		1,5 kΩ ¼ w
R26		10 kΩ ¼ w
R27		470 Ω ¼ w
R28		100 Ω ¼ w
R29		47 Ω 1/8 w
Q 1		TA 7153
Q 2		BF 173
Q 4		BF 173
Q 5		BF 173
D 2		BB 105

Nr.	Kode	Data
C 4		15 pF ker.
C 5		22 uF tant.
C 6		1 uF tant.
C 7		1 uF tant.
C 8		33 uF tant.
C 9		2,7 pF ker.
C10		1 nF ker.
C11		22 uF tant.
C12		1 nF ker.
C13		10 pF trimmer
C14		1 nF ker.
C19		4,7 pF ker.
C20		4,7 nF ker.
C22		1 pF ker.
C23		4,7 nF ker.
C24		1 nF ker.
C25		1 nF ker.
C26		18 pF trimmer
C27		4,7 nF ker
C28		2,2 pF ker
S 1		L 210
S 2		L 210
S 3		L 203
S 4		6,8 uH R.F.C.
S 6		L 204
S 7		6,8 uH R.F.C.

Receiver oscillator, voltage controlled. Print board AP

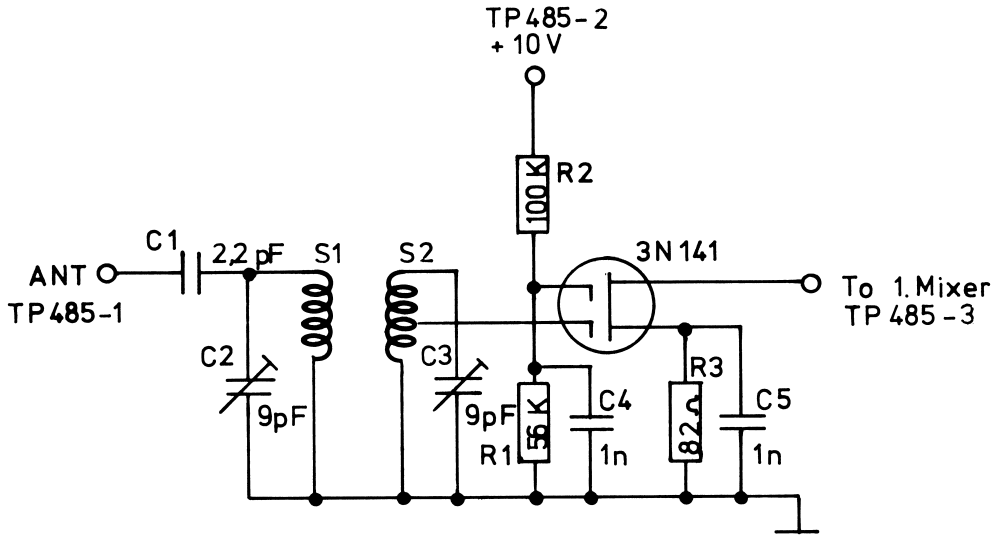
Tilhører tegn. nr.: 72133-4E 499a/2

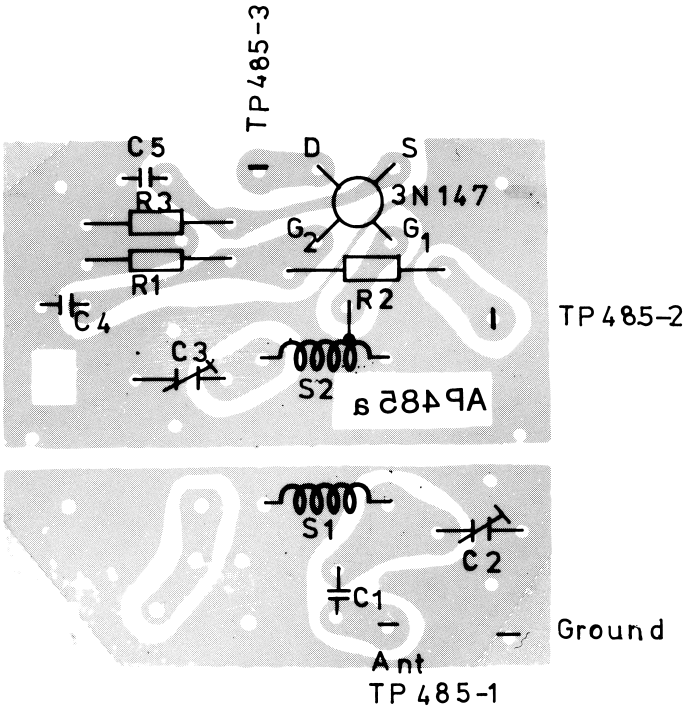
Rettet: 11-12-73 JAN

Tegn.. AC 11-1-73

Kontr.. HN

Stykl. nr.: 72133-4S



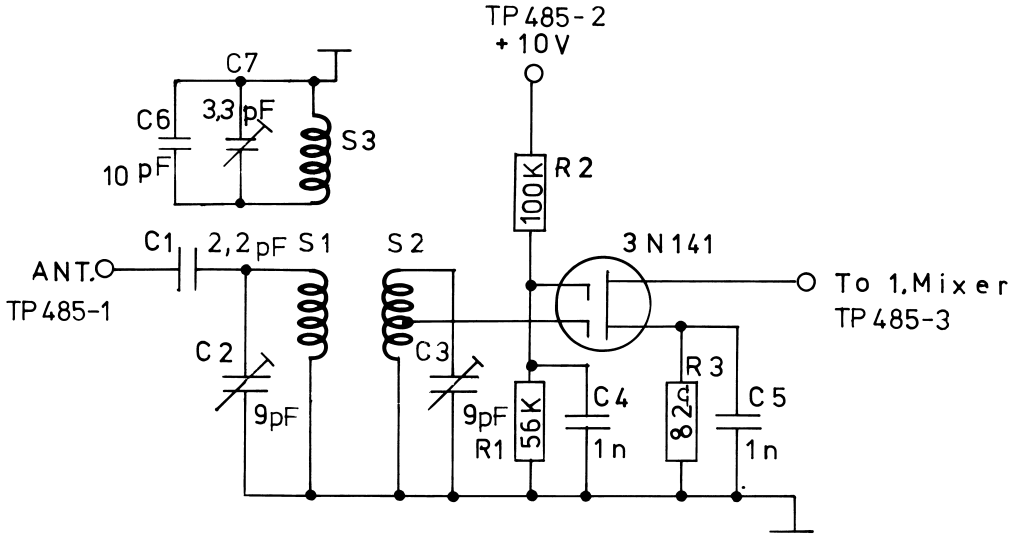


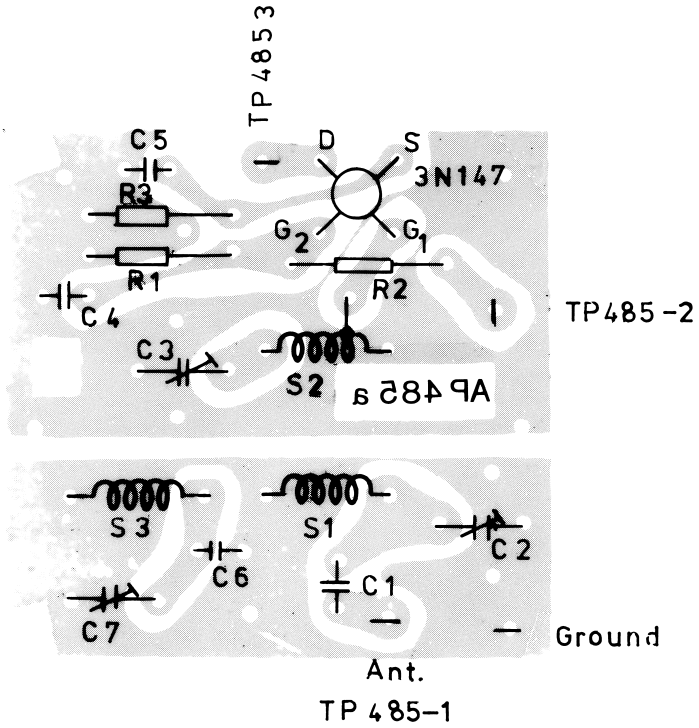
Rettet: 30-1-73 HP 5-12-73 JAN	RF AMPLIFIER PRINT BOARD AP485a/1	Tegn.: 25-1-73 AC.	Kontr.:
		Stykl. nr.: 72272-4S	
	AP-RADIOTELEFON	Tegn. nr.: 72272-4E	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		56 kOhm ½ w			
R 2		100 kOhm ¼ w			
R 3		82 kOhm ¼ w			
C 1		2,2 pF ker.			
C 2		9 pF trimmer			
C 3		9 pF trimmer			
C 4		1 nF ker.			
C 5		1 nF ker.			
Q 1		3 N 141			
S 1		L 1			
S 2		L 3			

RF amplifier, synthesizer print board AP 485 a/l Tilhører tegn. nr.: 72272-4E	Rettet: 5-12-73 JAN	Tegn.: Kontr.: HM	Stykl. nr.: 72272-4S





Rettet: 18-1-73 AC 24-1-73 AC 30-1-73 H.P. 5-12-73 JAN	RF AMPLIFIER PRINT BOARD AP 485a/2	Tegn.: 20-11-72 H.P.	Kontr.: 20-11-72 H.M.
		Stykl. nr.: 73025-4S	
	AP-RADIOTELEFON	Tegn. nr.: 73025-4E	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		56 kΩ ¼ w			
R 2		100 kΩ ¼ w			
R 3		82 kΩ ¼ w			
C 1		2,2 pF ker.			
C 2		9 pF trimmer			
C 3		9 pF trimmer			
C 4		1 nF ker.			
C 5		1 nF ker.			
C 6		10 pF ker.			
C 7		3,3 pF trimmer			
Q 1		3 n 141			
S 1		L 1			
S 2		L 3			
S 3		L 1			

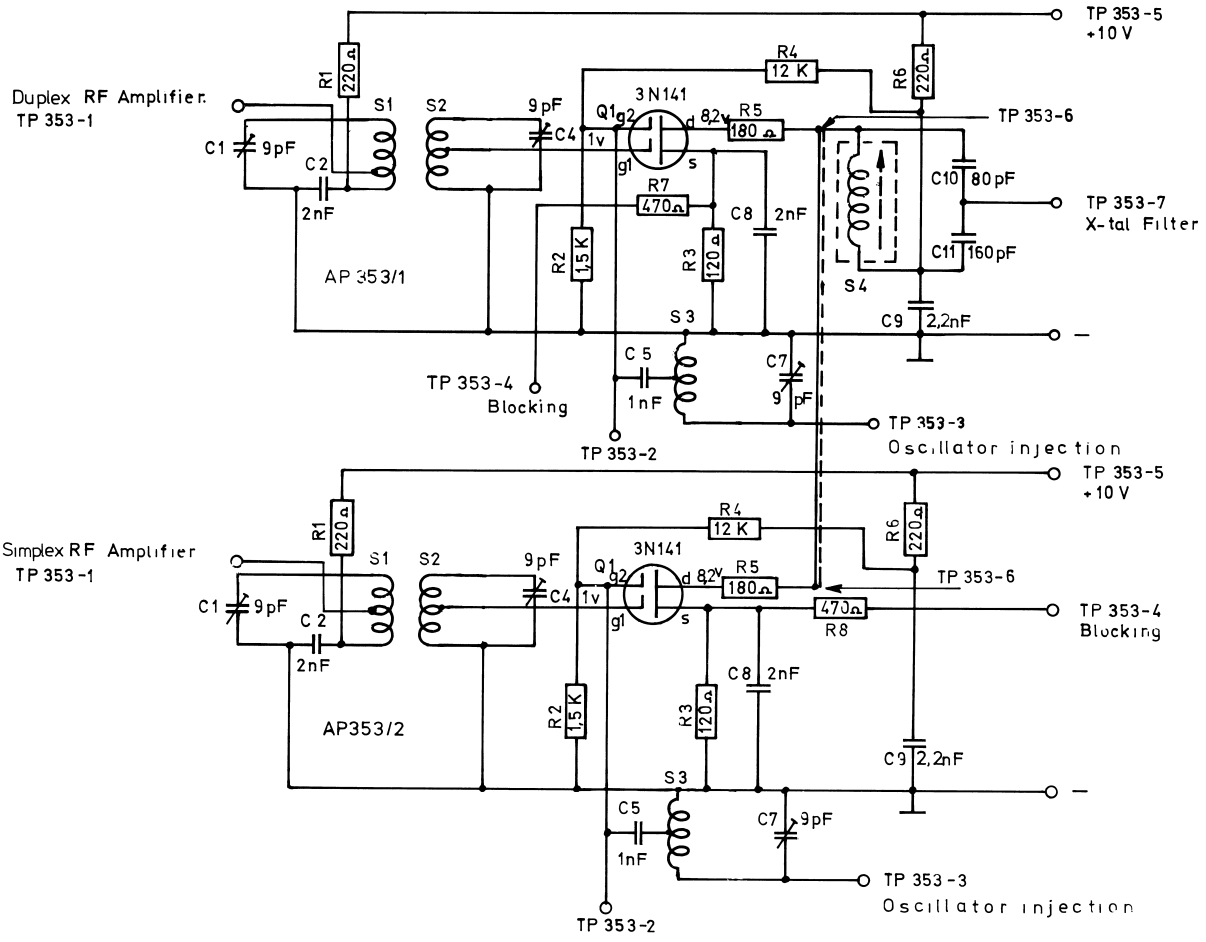
RF Amplifier, synthesizer
Print Board AP 485
Tilhører tegn. nr.: 73025-4E

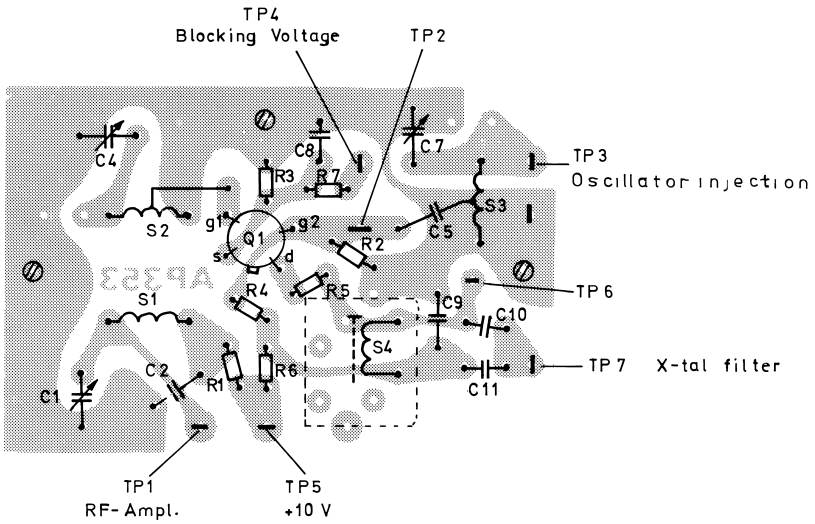
Rettet: 5-12-73 JAN

Tegn.. AC 1/-/-73

Kontr.. HM

Stykl. nr.: 73025.4S





The two Printboards are indentical except for the coil S4.

Rettet:	1. Mixer for double receiver. Print Board AP 353/1/2	Tegn.: ML. 23-3-72	Kontr.: HM. 23-3-72
20-11-72 H.P.		Stykl. nr.: 72138-4S	
9-3-73 A.C.		Tegn. nr.: 72138-4E	
27-3-73 A.C.			
14-11-73 A.C.			
	AP-RADIOTELEFON		

AP-RADIOTELEFON

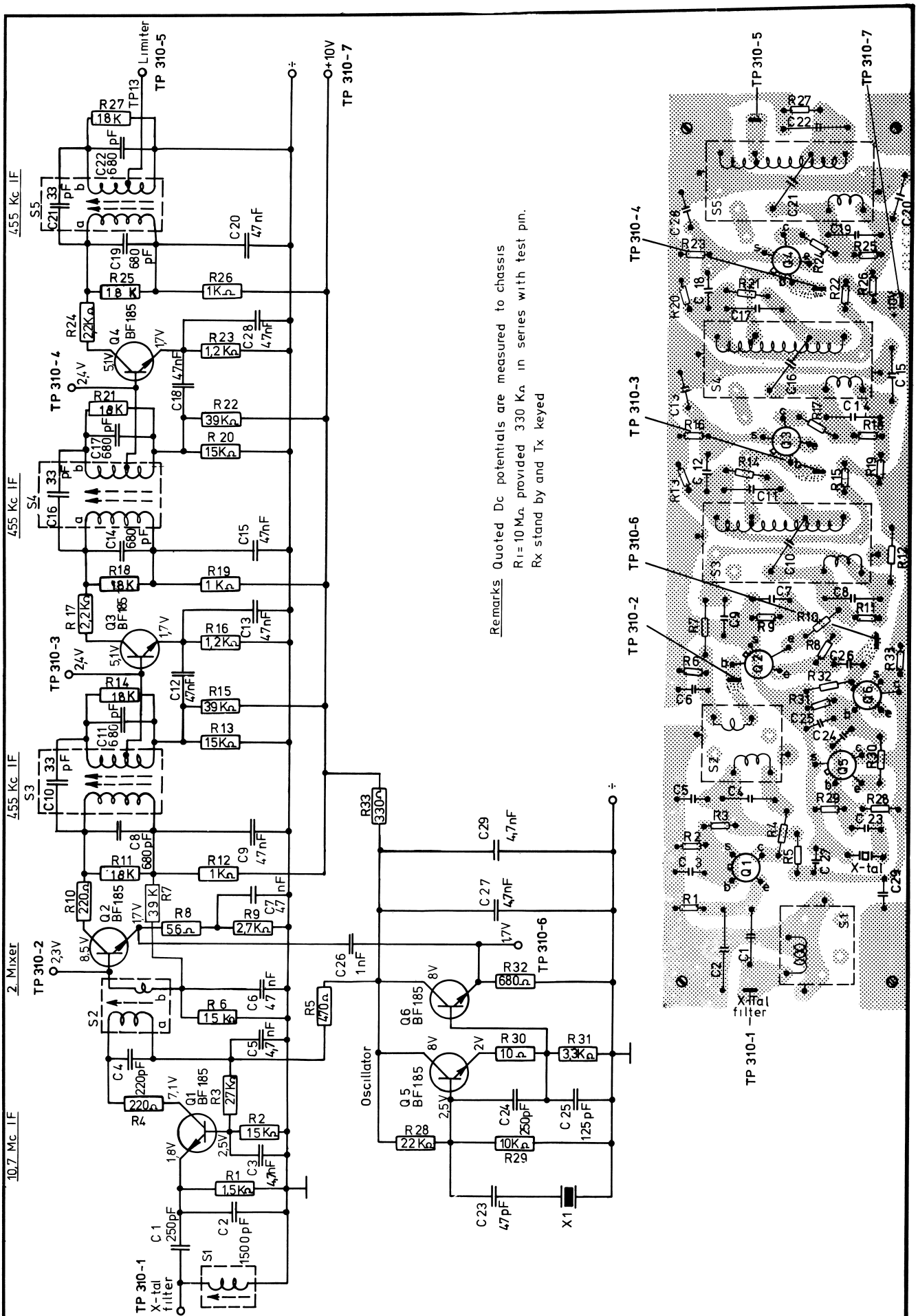
Nr.	Kode	Data	Nr.	Kode	Data
R 1		220 Ω ¼ w			
R 2		1,5 kΩ ¼ w			
R 3		120 Ω ¼ w			
R 4		12 kΩ ¼ w			
R 5		180 Ω ¼ w			
R 6		220 Ω ¼ w			
R 7		470 Ω ¼ w			
C 1		9 pF trimmer			
C 2		2 nF ker.			
C 4		9 pF trimmer			
C 5		1 nF ker.			
C 7		9 pF trimmer			
C 8		2 nF ker.			
C 9		2,2 nF ker.			
C10		80 pF styroflex			
C11		160 pF styroflex			
S 1		L 3			
S 2		L 3			
S 3		L 3			
S 4		L 7			
Q 1		3 N 141			

1.Mixer for double receiver
Print Board AP 353/1/2
Tilhører tegn. nr.: 72138-4E

Rettet: 14-11-73 AC

Tegn. AC 11-1-73
Kontr. HM

Stykl. nr.: 72138-4S



Rettet: 27-11-72 H.P. 18-3-74 H.P. 28-10-74 HJ. /J.S.	10,7 Mc and 455 Kc IF Amplifier Narrowband. Print AP 310a/3	Tegn.: ML 15-3-72	Kontr.: HM 15-3-72
		Stykl. nr.: 72129-4S	
	AP-RADIOTELEFON	Tegn. nr.: 72129-3E	

AP-RADIOTELEFON

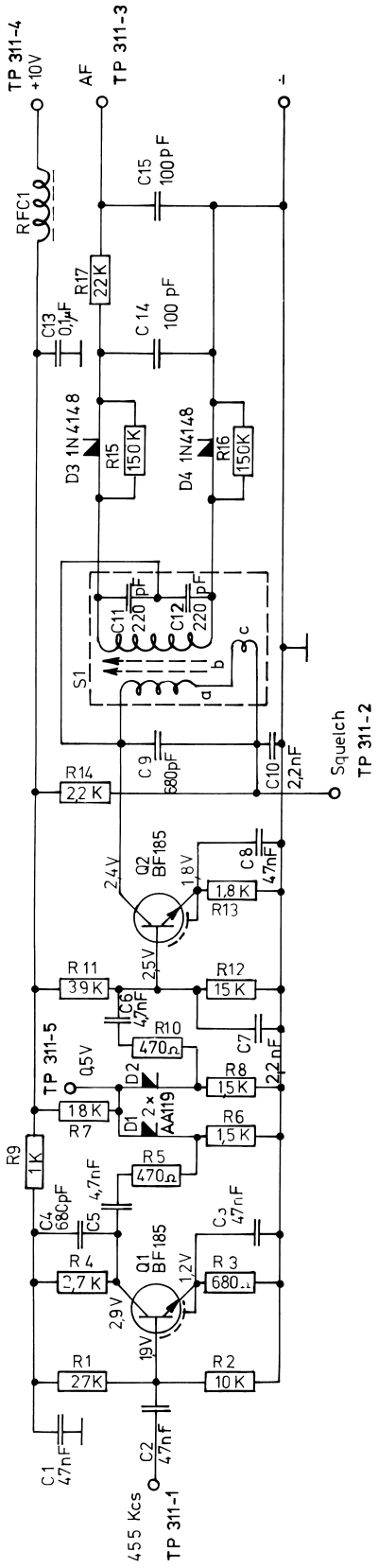
Nr.	Kode	Data
R 1		1,5 kΩ ¼ w
R 2		15 kΩ ¼ w
R 3		27 kΩ ¼ w
R 4		220 Ω ¼ w
R 5		470 Ω ¼ w
R 6		15 kΩ ¼ w
R 7		39 kΩ ¼ w
R 8		56 Ω ¼ w
R 9		2,7 kΩ ¼ w
R10		220 Ω ¼ w
R11		18 kΩ ¼ w
R12		1 kΩ ¼ w
R13		15 kΩ ¼ w
R14		18 kΩ ¼ w
R15		39 kΩ ¼ w
R16		1,2 kΩ ¼ w
R17		2,2 kΩ ¼ w
R18		18 kΩ ¼ w
R19		1 kΩ ¼ w
R20		15 kΩ ¼ w
R21		18 kΩ ¼ w
R22		39 kΩ ¼ w
R23		1,2 kΩ ¼ w
R24		2,2 kΩ ¼ w
R25		18 kΩ ¼ w
R26		1 kΩ ¼ w
R27		18 kΩ ¼ w
R28		22 kΩ ¼ w
R29		10 kΩ ¼ w
R30		10 Ω ¼ w
R31		3,3 kΩ ¼ w
R32		680 Ω ¼ w
R33		330 Ω ¼ w
C 1		250 pF styr.
C 2		1,5 nF styr.
C 3		4,7 nF ker.
C 4		220 pF styr.

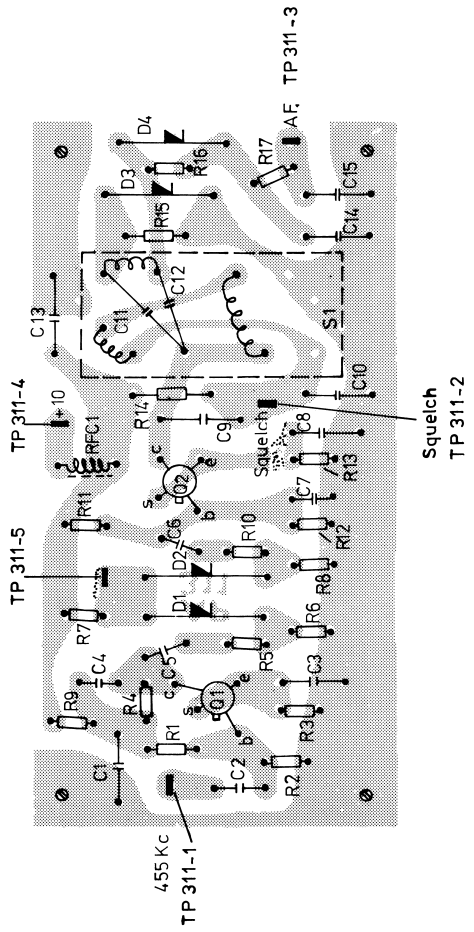
Nr.	Kode	Data
C 5		4,7 nF ker.
C 6		47 nF/12V ker.
C 7		47 nF/12V ker.
C 8		680 pF styr.
C 9		47 nF/12V ker.
C10		33 pF styr.
C11		680 pF styr.
C12		47 nF/12V ker.
C13		47 nF/12V ker.
C14		680 pF styr.
C15		47 nF/12V ker.
C16		33 pF styr.
C17		680 pF styr.
C18		47 nF/12V ker.
C19		680 pF styr.
C20		47 nF/12V ker.
C21		33 pF styr.
C22		680 pF styr.
C23		47 pF styr.
C24		250 pF styr.
C25		125 pF styr.
C26		1 nF ker.
C27		4,7 nF ker.
C28		47 nF ker.
C29		4,7 nF ker.
S 1		L11 Tg.68093/4
S 2		L12 Tg.68093/4
S 3		L13 Tg.68095/4
S 4		L13 Tg.68095/4
S 5		L13 Tg.68095/4
Q 1		BF 185
Q 2		BF 185
Q 3		BF 185
Q 4		BF 185
Q 5		BF 185
Q 6		BF 185
X 1	Finland	X-tal 11.155 MHz
	Others	X-tal 10.245 MHz

10,7Mc and 455Kc IF-Amplifier
Narrowband Print board AP 310a/3

Tilhører tegn. nr.: 72129-3E

Tegn.:	Stykl. nr.:
Kontr.:	72129-4S





Remarks Quoted Dc potentials are measured to chassis
R1 = 10 MΩ provided 330 KΩ in series with test pin
Rx stand by and Tx keyed

Rettet: 14-11-73 H.P.	LIMITER AND DISCRIMINATOR PRINT BOARD AP311/3	Tegn.: ML. 16-3-72 / Kontr.: HM. 16-3-72
		Stykl. nr.: 72132-4S
	AP-RADIOTELEFON	Tegn. nr.: 72132-4E

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		27 kΩ ¼ w	S 1		L 16 Tg.68096/4
R 2		10 kΩ ¼ w			
R 3		680 Ω ¼ w			
R 4		2,7 kΩ ¼ w	D 1		AA 119
R 5		470 Ω ¼ w	D 2		AA 119
R 6		1,5 kΩ ¼ w	D 3		1N 4148
R 7		18 kΩ ¼ w	D 4		1N 4148
R 8		1,5 kΩ ¼ w			
R 9		1 kΩ ¼ w			
R10		470 Ω ¼ w	Q 1		BF 185
R11		39 kΩ ¼ w	Q 2		BF 185
R12		15 kΩ ¼ w			
R13		1,8 kΩ ¼ w			
R14		2,2 kΩ ¼ w			
R15		150 kΩ ¼ w			
R16		150 kΩ ¼ w			
R17		22 kΩ ¼ w			
C 1		47 nF ker.			
C 2		47 nF ker.			
C 3		47 nF ker.			
C 4		680 pF styr.			
C 5		4,7 nF ker.			
C 6		4,7 nF ker.			
C 7		2,2 nF ker.			
C 8		47 nF ker.			
C 9		680 pF styr.			
C10		2,2 nF styr.			
C11		220 pF styr.			
C12		220 pF styr.			
C13		0,1 µF ker.			
C14		100 pF styr.			
C15		100 pF styr.			
RFC -1		Wide Band RFC			

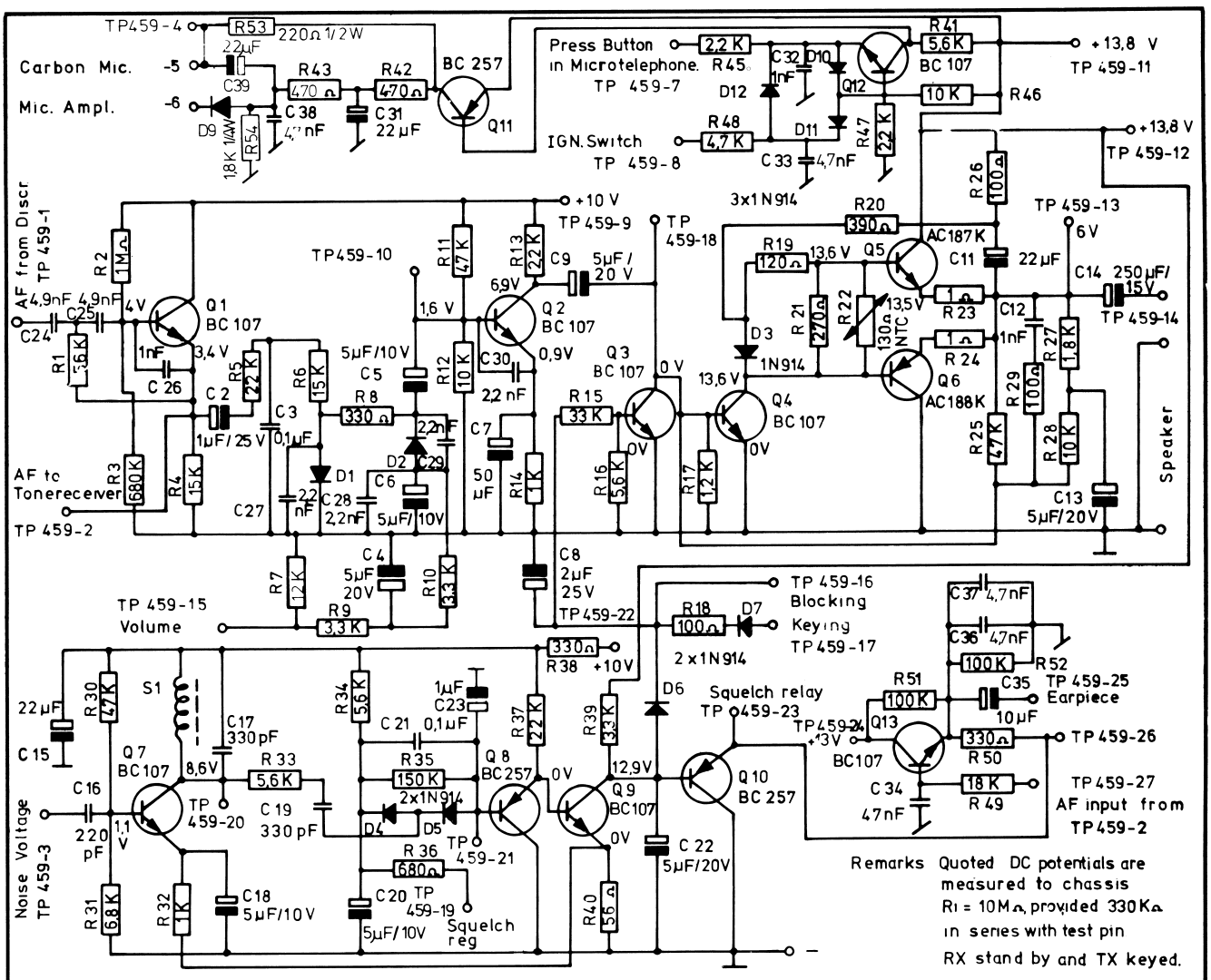
Limiter and Discriminator
Print board AP 311/3
Tilhører tegn. nr.: 72132-3E

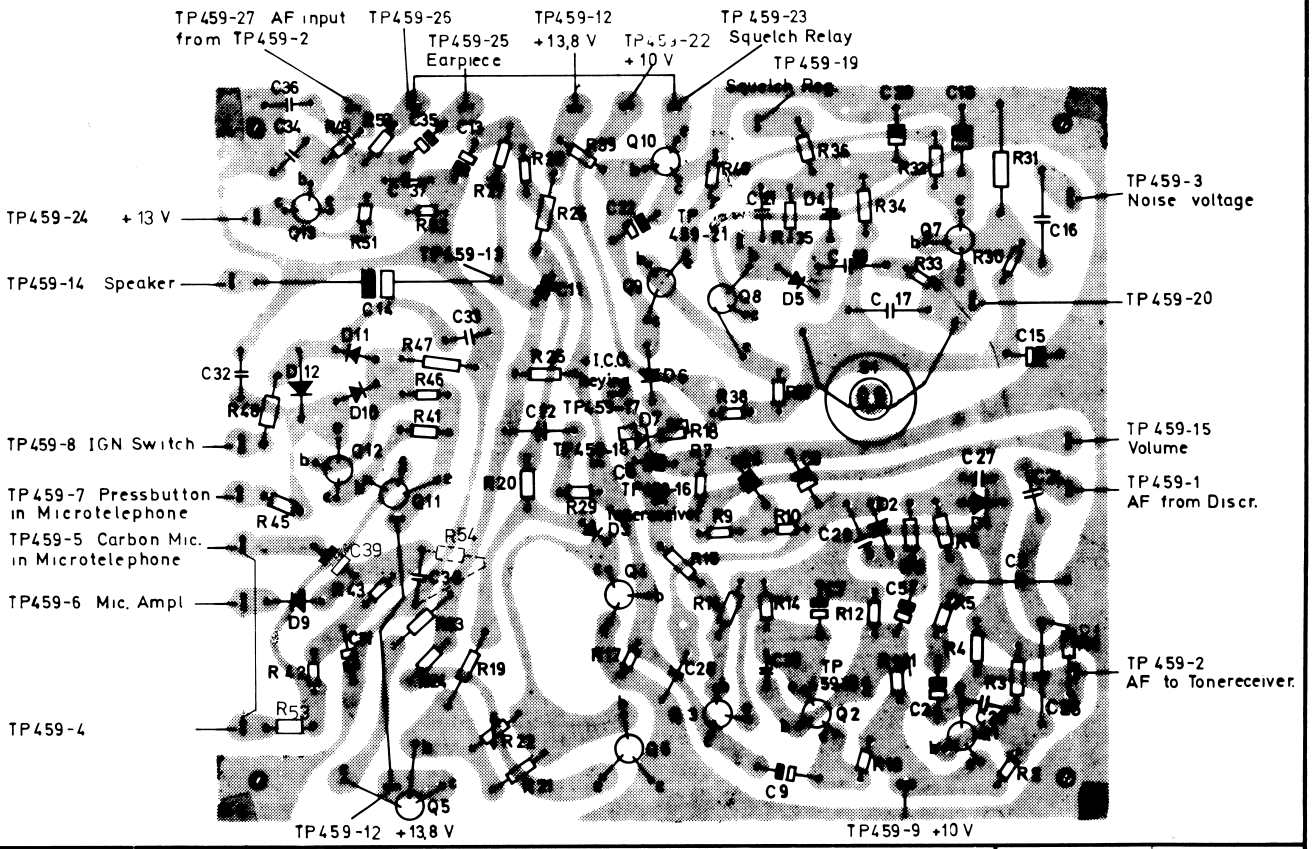
Rettet:14-11-73H.P.

Tegn.:

Kontr.:

Stykl. nr.: 72132-4S





Rettet	AF and Squelch Print Board AP 459/4	Tegn.. 11-10-74 AC | Kontr.: 11-10-74 CHB Stykl. nr.: 74438-4S Tegn. nr.: 74438-3E
	AP-RADIOTELEFON	

AP-RADIOTELEFON

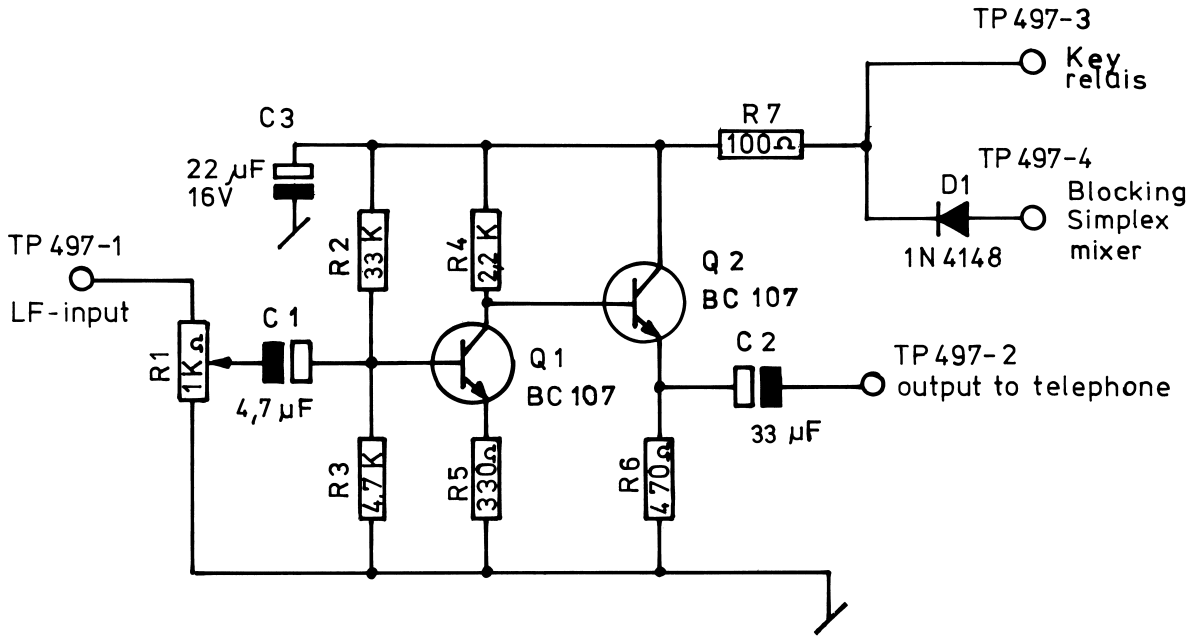
Nr.	Kode	Data	Nr.	Kode	Data
R 1		56 kΩ ¼ w	R38		330 Ω ¼ w
R 2		1M Ω ¼ w	R39		3,3 kΩ ¼ w
R 3		680 kΩ ¼ w	R40		56 Ω ¼ w
R 4		15 kΩ ¼ w	R41		5,6 kΩ ¼ w
R 5		22 kΩ ¼ w	R42		470 Ω ¼ w
R 6		15 kΩ ¼ w	R43		470 Ω ¼ w
R 7		12 kΩ ¼ w	R45		2,2 kΩ ¼ w
R 8		330 Ω ¼ w	R46		10 kΩ ¼ w
R 9		3,3 kΩ ¼ w	R47		2,2 kΩ ¼ w
R10		3,3 kΩ ¼ w	R48		4,7 kΩ ¼ w
R11		47 kΩ ¼ w	R49		18 kΩ ¼ w
R12		10 kΩ ¼ w	R50		330 Ω ¼ w
R13		2,2 kΩ ¼ w	R51		100 kΩ ¼ w
R14		1 kΩ ¼ w	R52		100 kΩ ¼ w
R15		33 kΩ ¼ w	R53		220 Ω ½ w
R16		5,6 kΩ ¼ w	R54		1,8 kΩ ¼ w
R17		1,2 kΩ ¼ w			
R18		100 Ω ¼ w			
R19		120 Ω ¼ w	C 1		
R20		390 Ω ¼ w	C 2		1 µF/35V tant.
R21		270 Ω ¼ w	C 3		0,1 µF/laco.
R22		130 Ω NTC	C 4		4,7 µF/25V tant.
R23		1 Ω ½ w	C 5		4,7 µF/10V tant.
R24		1 Ω ½ w	C 6		4,7 µF/10V tant.
R25		47 kΩ ¼ w	C 7		47 µF/16V frako
R26		100 Ω ¼ w	C 8		2,2 µF/25V tant.
R27		1,8 kΩ ¼ w	C 9		4,7 µF/25V tant.
R28		10 kΩ ¼ w	C10		
R29		100 Ω ¼ w	C11		22 µF/16V tant.
R30		47 kΩ ¼ w	C12		1000 pF styr.
R31		6,8 kΩ ¼ w	C13		4,7 µF/25V tant.
R32		1 kΩ ¼ w	C14		220 µF/16V elco.
R33		5,6 kΩ ¼ w	C15		22 µF/16V tant.
R34		5,6 kΩ ¼ w	C16		220 pF styr.
R35		150 kΩ ¼ w	C17		330 pF styr.
R36		680 Ω ¼ w	C18		4,7 µF/10V tant.
R37		22 kΩ ¼ w	C19		330 pF styr.

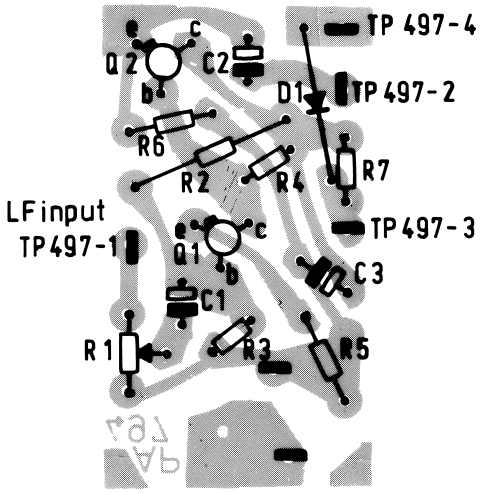
AF and Squelch Print Board AP 459/4 Tilhører tegn. nr.: 74438-3E	Rettet	Tegn.:	Stykl. nr.: 74438-4S
		Kontr.:	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
C20		4,7 µF/10V tant.	Q 1		BC 107
C21		0,1 µF/12V ker.	Q 2		BC 107
C22		4,7 µF/25V tant.	Q 3		BC 107
C23		1 µF/35V tant.	Q 4		BC 107
C24		4,9 nF styr.	Q 5		AC 187 K
C25		4,9 nF styr.	Q 6		AC 188 K
C26		1 nF ker.	Q 7		BC 107
C27		2,2 nF ker.	Q 8		BC 257
C28		2,2 nF ker.	Q 9		BC 107
C29		2,2 nF ker.	Q10		BC 257
C30		2,2 nF ker.	Q11		BC 257
C31		22 µF/16V tant.	Q12		BC 107
C32		1 nF ker.	Q13		BC 107
C33		4,7 nF ker.			
C34		47 nF/12V ker.			
C35		10 µF/25V tant.	S 1		L 21 67091-4
C36		4,7 nF ker.			
C37		4,7 nF ker.			
C38		4,7 nF ker.			
C39		22 µF/16V tant.			
D 1		1N 914			
D 2		1N 914			
D 3		1N 914			
D 4		1N 914			
D 5		1N 914			
D 6		1N 914			
D 7		1N 914			
D 9		1N 914			
D10		1N 914			
D11		1N 914			
D12		1N 914			

AF and Squelch Print Board AP 459/4 Tilhører tegn. nr.: 74438-3E	Rettet:	Tegn.:	Stykl. nr.: 74438-4S
		Kontr.:	





Rettet: 27.-9.-72 LT/NC 16-1-73 A.C.	AF Telephone Amplifier. Print AP 497/1	Tegn.: M L. 16-2-72	Kontr.: J S. 16-2-72
		Stykl. nr.: 72091-4 S	
	AP-RADIOTELEFON	Tegn. nr.: 72091-4E	

AP-RADIOTELEFON

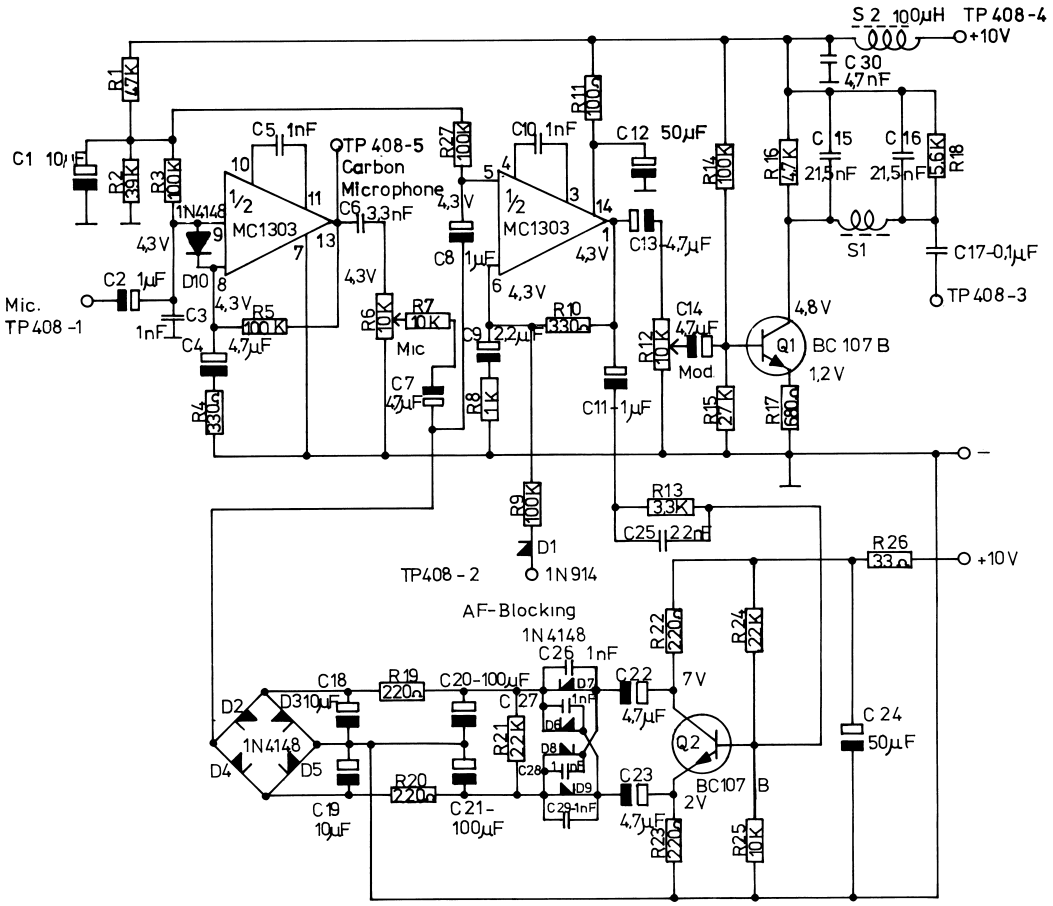
Nr.	Kode	Data	Nr.	Kode	Data
C 1		4,7 uF/10V tant.			
C 2		33 uF/10V tant.			
C 3		22 uF/16V tant.			
R 1		1 kΩ trim.pot.			
R 2		33 kΩ ¼ w			
R 3		4,7 kΩ ¼ w			
R 4		2,2 kΩ ¼ w			
R 5		330 Ω ¼ w			
R 6		470 Ω ¼ w			
R 7		100 Ω ¼ w			
Q 1		BC 107			
Q 2		BC 107			
D 1		1N 4148			

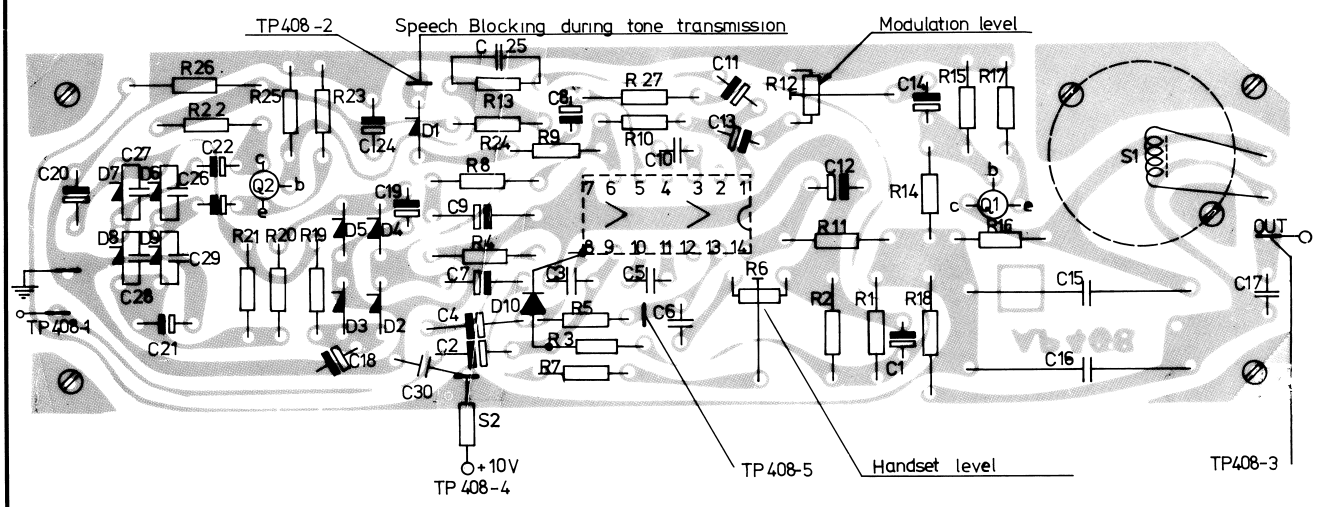
AF Telephone Amplifier
Print AP 497/1
Tilhører tegn. nr.: 72091-4E

Rettet:

Tegn. AC 11.-1-73
Kontr. HM

Stykl. nr.: 72091-4S





Remarks: Quoted DC potentials are measured to chassis

Ri = 10 MΩ provided 330 KΩ in series with test pin

Rx stand by and Tx keyed.

Rettet: 15-3-73 AC 28-3-73 AC 29-5-73 HP 4-12-73 JAN 14-5-74 HP	Modulation amplifier with AVC Printboard AP 408/3 AP-RADIOTELEFON	Tegn.: 31-10-73 AC Kontr.: 31-10-73 HM Stykl. nr.: 72128-4S Tegn. nr.: 72128-3E

AP-RADIOTELEFON

Nr.	Kode	Data
R 1		47 kΩ ¼ w
R 2		39 kΩ ¼ w
R 3		100 kΩ ¼ w
R 4		330 Ω ¼ w
R 5		100 kΩ ¼ w
R 6		10 kΩ trim.pot.
R 7		10 kΩ trim.pot.
R 8		1 kΩ ¼ w
R 9		100 kΩ ¼ w
R10		330 kΩ ¼ w
R11		100 Ω ¼ w
R12		10 kΩ ¼ w
R13		3,3 kΩ ¼ w
R14		100 kΩ ¼ w
R15		100 kΩ ¼ w
R16		4,7 kΩ ¼ w
R17		680 Ω ¼ w
R18		5,6 kΩ ¼ w
R19		220 Ω ¼ w
R20		220 Ω ¼ w
R21		22 kΩ ¼ w
R22		220 Ω ¼ w
R23		220 Ω ¼ w
R24		22 kΩ ¼ w
R25		10 kΩ ¼ w
R26		33 Ω ¼ w
C 1		10 µF/25V tant.
C 2		1 µF/35V tant.
C 3		1 nF ker.kond.
C 4		4,7 µF/10V tant.
C 5		1 nF ker.kond.
C 6		3,3 nF ker.kond.
C 7		4,7 µF/10V tant.
C 8		1 µF/35V tant.
C 9		2,2 µF/25V tant.
C10		1 nF ker.kond.
C11		1 µF/35V tant.
C12		47 µF frako.
C13		4,7 µF/10V tant.
C14		4,7 µF/10V tant.
C15		21,5 nF styr.
C16		21,5 nF styr.
C17		0,1 µF laco.
C18		10 µF/25V tant.
C19		10 µF/25V tant.
C20		100 µF/ 3V tant.
C21		100 µF/ 3V tant.
C22		4,7 µF/10V tant.
C23		4,7 µF/10V tant.
C24		47 µF frako.
C25		22 nF laco.
C26		1 nF ker.kond.
C27		1 nF ker.kond.
C28		1 nF ker.kond.
C29		1 nF ker.kond.
C30		4,7 nF
S 1		L 66 tg.70386/4
S 2		0,1 µH
D 1		1N 4148
D 2		1N 4148
D 3		1N 4148
D 4		1N 4148
D 5		1N 4148
D 6		1N 4148
D 7		1N 4148
D 8		1N 4148
D 9		1N 4148
D10		1N 4148
Q 1		BC 107 b
Q 2		BC 107 b
IC		MC 1303 IC

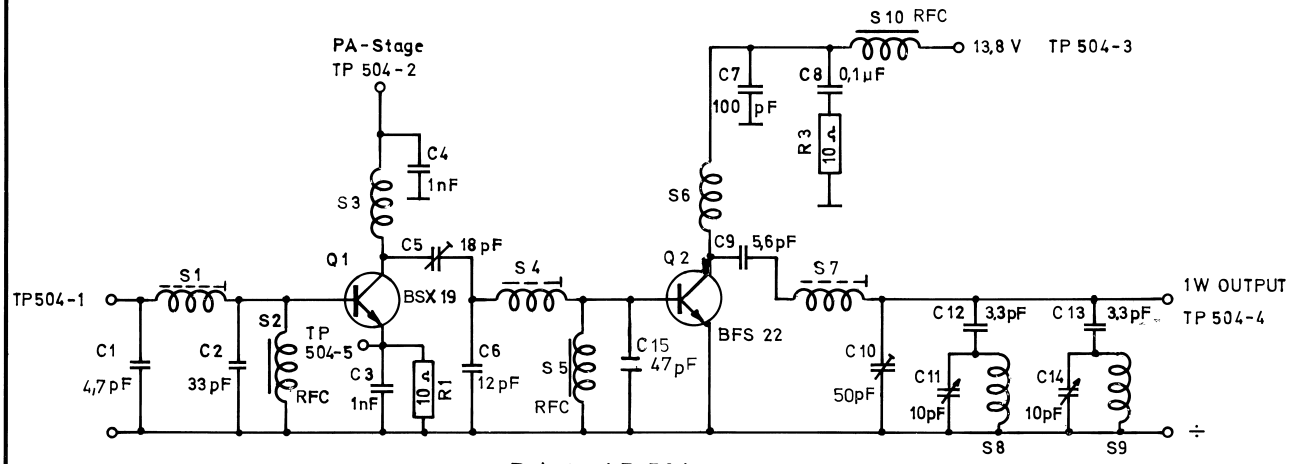
Modulation amplifier with AVC
Print Board AP 408/3
Tilhører tegn. nr.: 72128-3E

Rettet: 4.-12.-73

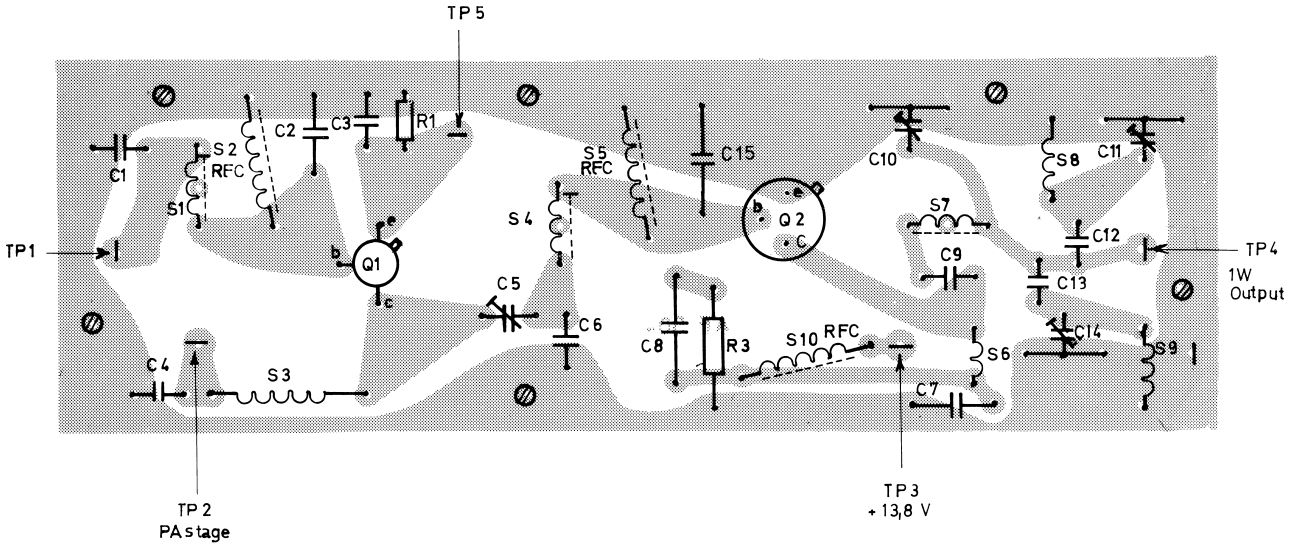
Tegn.:

Kontr.:

Stykl. nr.: 72128-4S



Print AP 504

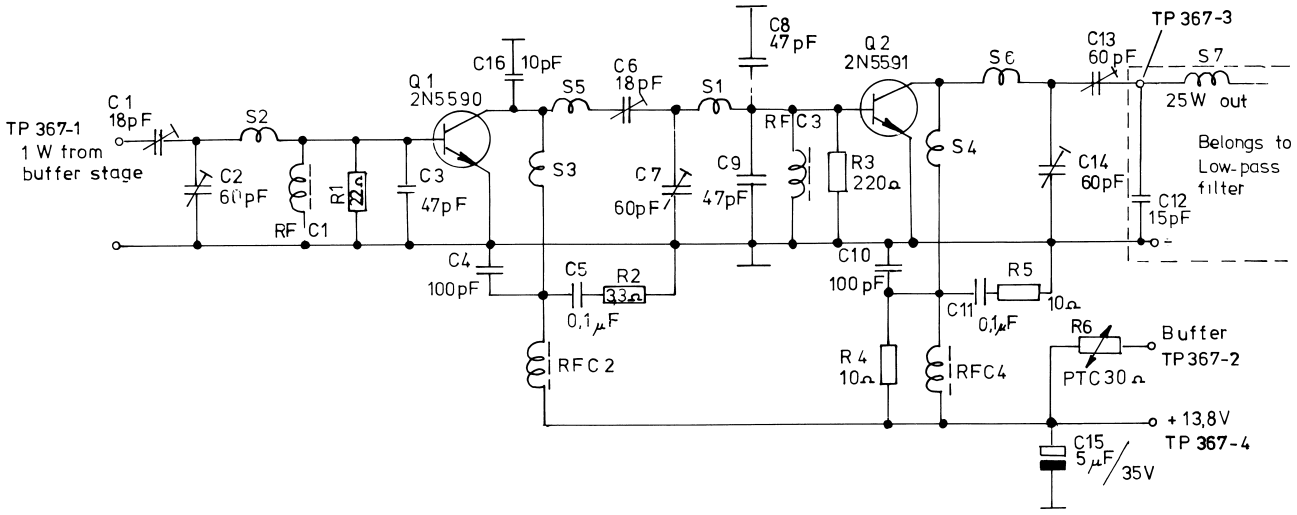


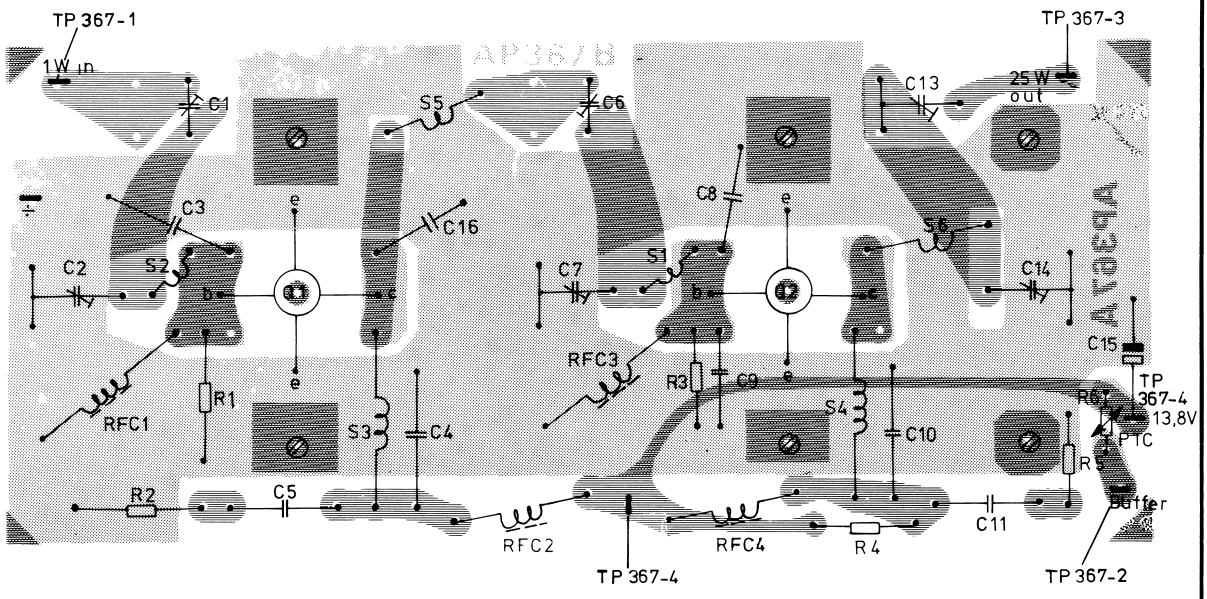
Rettet: 21-11-72 H.P. 4-4-73 A.C	1W BUFFERSTAGE 2M TRANSMITTER. PRINT AP 504.	Tegn.: M.L. 4-5-72. Kontr.: H.M. 4-5-72. Stykl. nr.: 72168-4S
	AP-RADIOTELEFON	Tegn. nr.: 72168-4E

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		10 Ω ¼ w			
R 3		10 Ω ¼ w			
C 1		4,7 pF ker.			
C 2		33 pF ker.			
C 3		1 nF ker.			
C 4		1 nF ker.			
C 5		18 pF trimmer			
C 6		12 pF ker.			
C 7		100 pF ker.			
C 8		0,1 uF pol.			
C 9		5,6 pF ker.			
C10		50 pF trimmer			
C11		10 pF trimmer			
C12		3,3 pF ker.			
C13		3,3 pF ker.			
C14		10 pF trimmer			
C15		47 pF ker.			
S 1		L 57			
S 2		RFC			
S 3		L 58			
S 4		L 56			
S 5		RFC			
S 6		L 60			
S 7		L 87			
S 8		L 224			
S 9		L 224			
S10		RFC			
Q 1		BSX 19			
Q 2		BFS 22			

1 W Bufferstage 2 m.transmitter Print Board AP 504/1 Tilhører tegn. nr.: 72168-4E	Rettet:	Tegn. AC 11-1-73 Kontr. HM	Stykl. nr.: 72168-4E



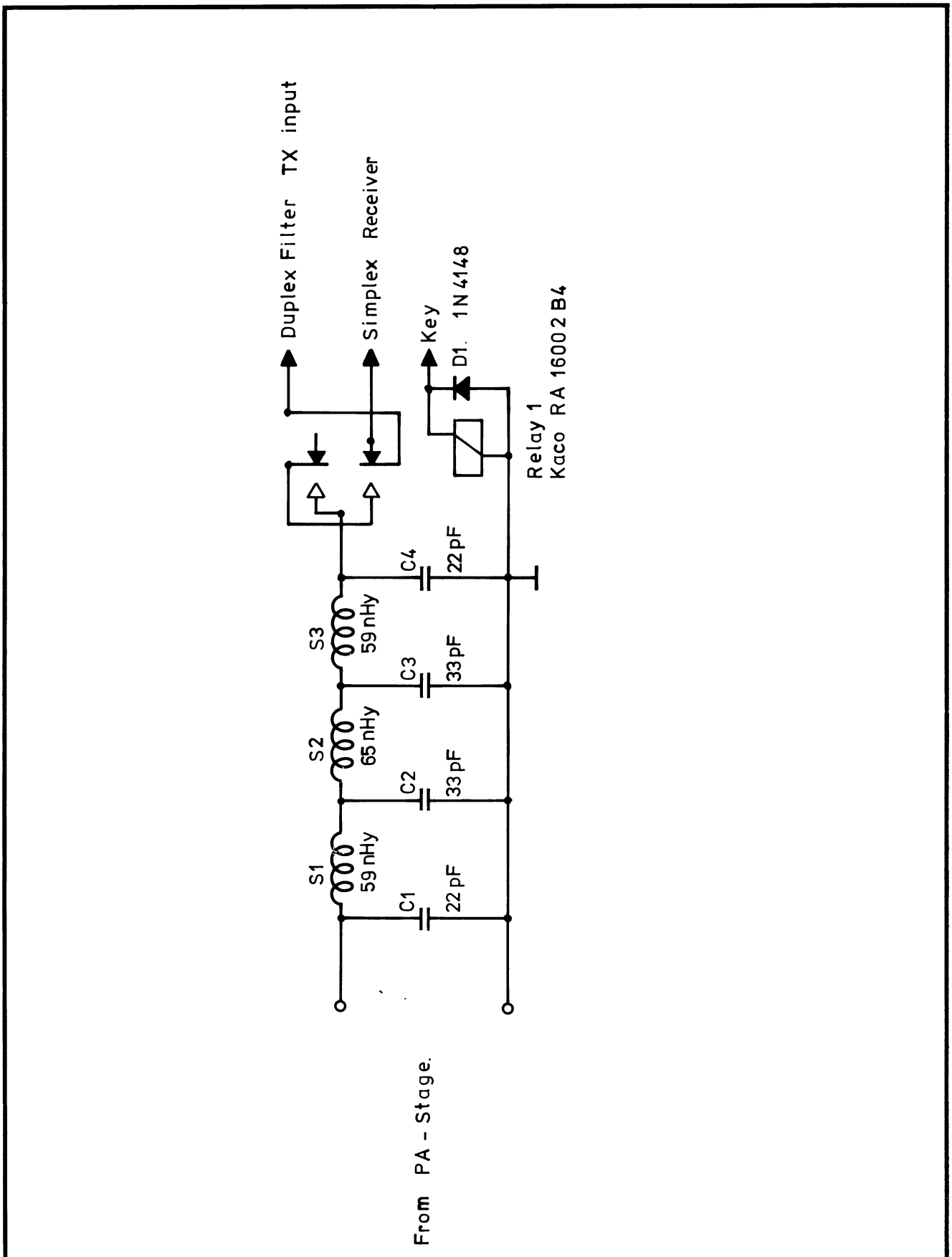


Rettet:	25 W P.A. STAGE 2M. PRINT BOARD AP 367a/2 Type 2	Tegn.: ML 15-3-72	Kontr.: HM 15-3-72
		Stykl. nr.: 72131-4 S	
	AP-RADIOTELEFON	Tegn. nr.: 72131-4E	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		22 Ω ¼ w	RFC		
R 2		3,3 Ω ¼ w	-1		Wide Band RFC
R 3		220 Ω ¼ w	RFC		
R 4		10 Ω ¼ w	-2		Wide Band RFC
R 5		10 Ω ¼ w	RFC		
R 6		30 Ω ¼ w PTC	-3		Wide Band RFC
			RFC		
			-4		Wide Band RFC
C 1		18 pF trimmer			
C 2		60 pF trimmer	Q 1		2 N 5590
C 3		47 pF trimmer	Q 2		2 N 5591
C 4		100 pF ker.			
C 5		0,1 mF pol.			
C 6		18 pF trimmer			
C 7		60 pF trimmer			
C 8		47 pF ker.			
C 9		47 pF ker.			
C10		100 pF ker.			
C11		0,1 mF pol.			
C13		60 pF trimmer			
C14		60 pF trimmer			
C15		5 mF/35v tant.			
C16		10 pF ker.			
S 1		L 170			
S 2		L 173			
S 3		L 174			
S 4		L 174			
S 5		L 175			
S 6		L 176			

25 w PA Stage 2 m. Transmitter Print Board AP 367a/2 Tilhører tegn. nr.: 72131-4E	Rettet:	Tegn. AC 11-1-73 Kontr. H.M.	Stykl. nr.: 72131-4S

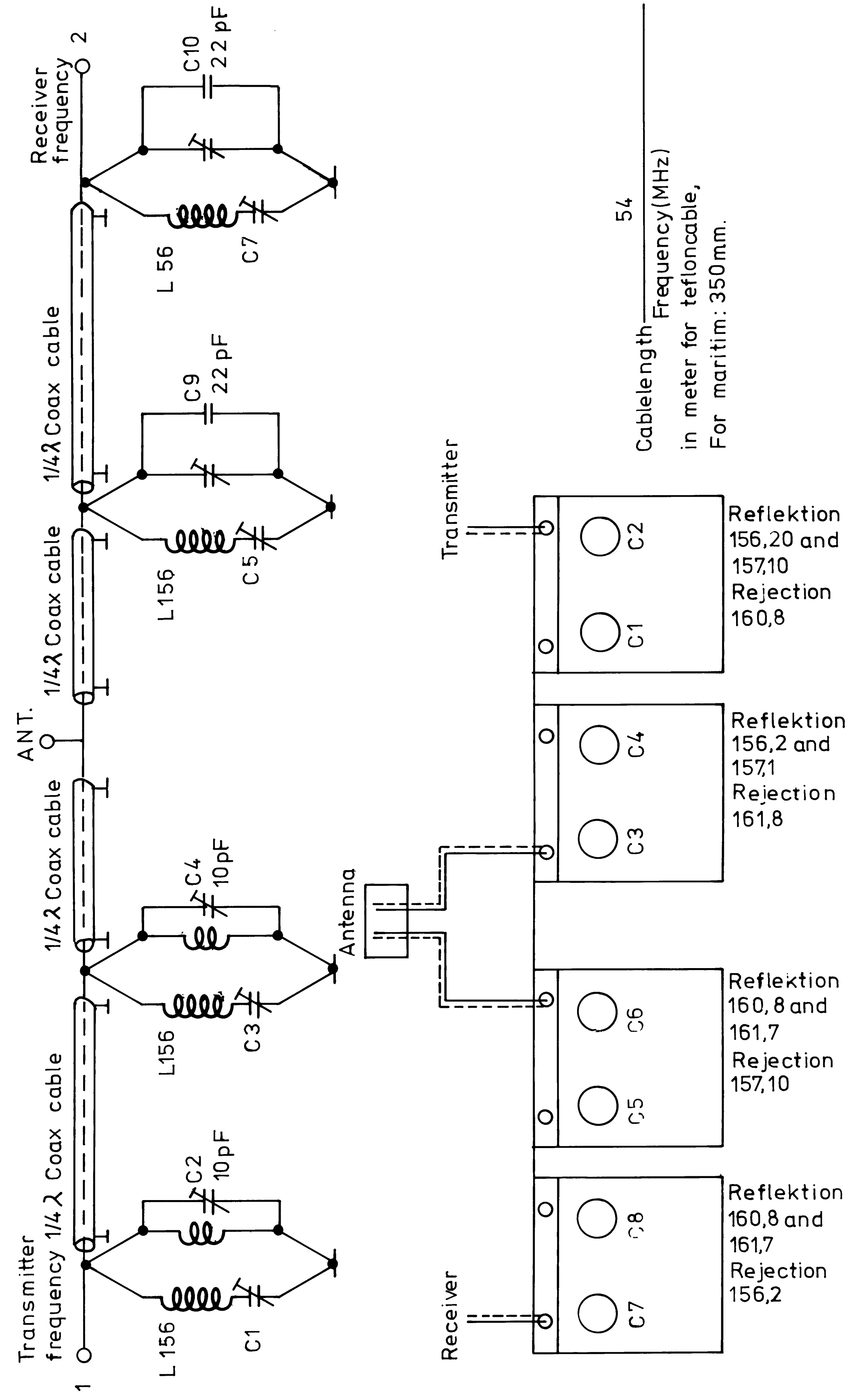


Rettet:	Low-Pass Filter. 2M X-Mtr.	Tegn.: ML. 24-3-72	Kontr.: HM. 24-3-72
		Stykl. nr.: 72139-4 S	
	AP-RADIOTELEFON	Tegn. nr.: 72139-4E	

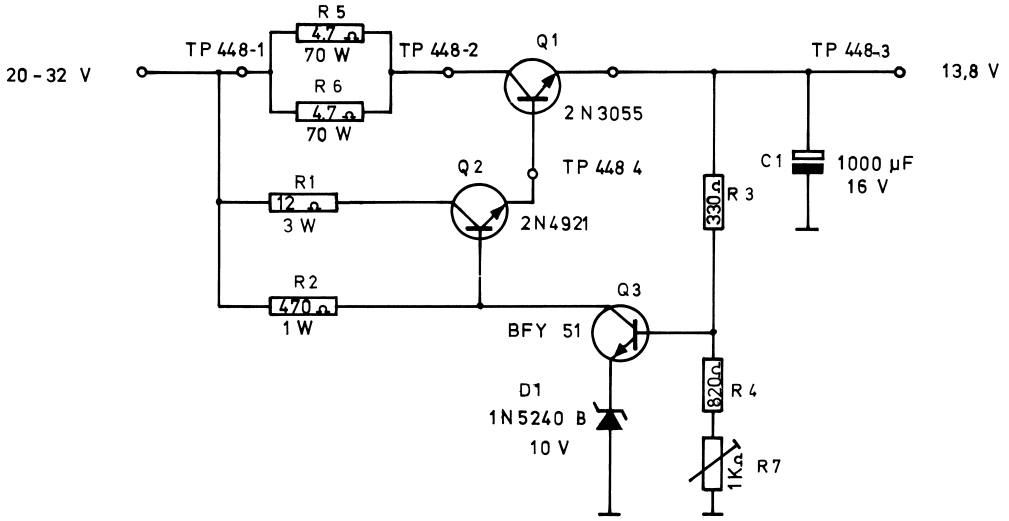
AP-RADIOTELEFON

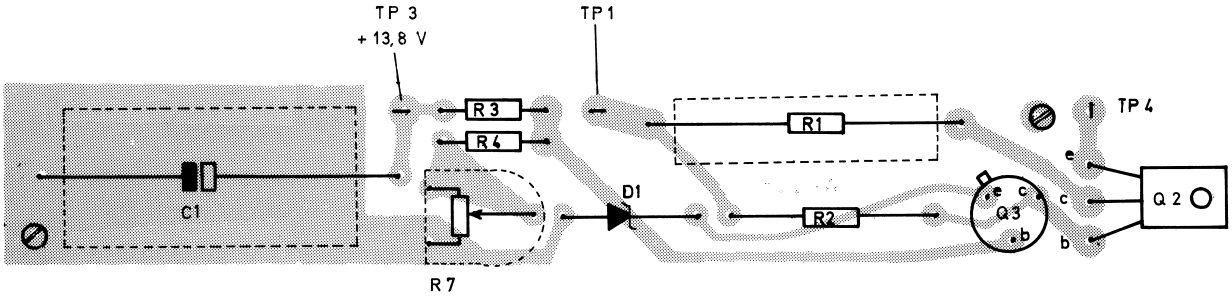
Nr.	Kode	Data	Nr.	Kode	Data
C 1		22 pF feed through			
C 2		33 pF feed through			
C 3		33 pF feed through			
C 4		22 pF feed through			
S 1		L 76			
S 2		L 77			
S 3		L 78			
Rel. -1		RA 16002 B 4			
D 1		IN 4148			

Low-Pass Filter 2 m. Transmitter **Tilhører tegn. nr.:** 72139-4E	**Rettet:**	Tegn.. AC 11-1.-73 Kontr.. HM	**Stykl. nr.:** 72139-4S



Rettet	2 M DUPLEXFILTER 4-4,6 MHz DUPLEXFILTER	Tegn.: 28-3-72 A.C.	Kontr.: H.M. 28-3-72
		Stykl. nr.:	
	AP-RADIOTELEFON	Tegn. nr.: 72163-4E	



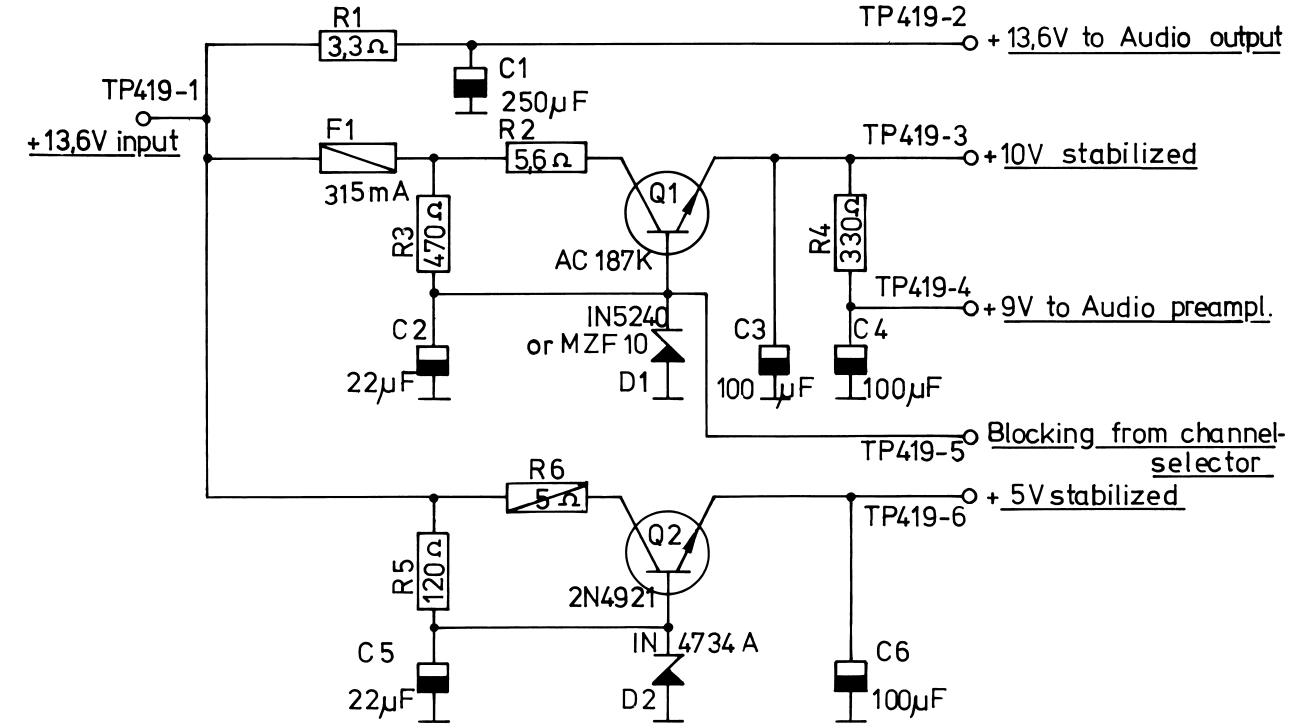


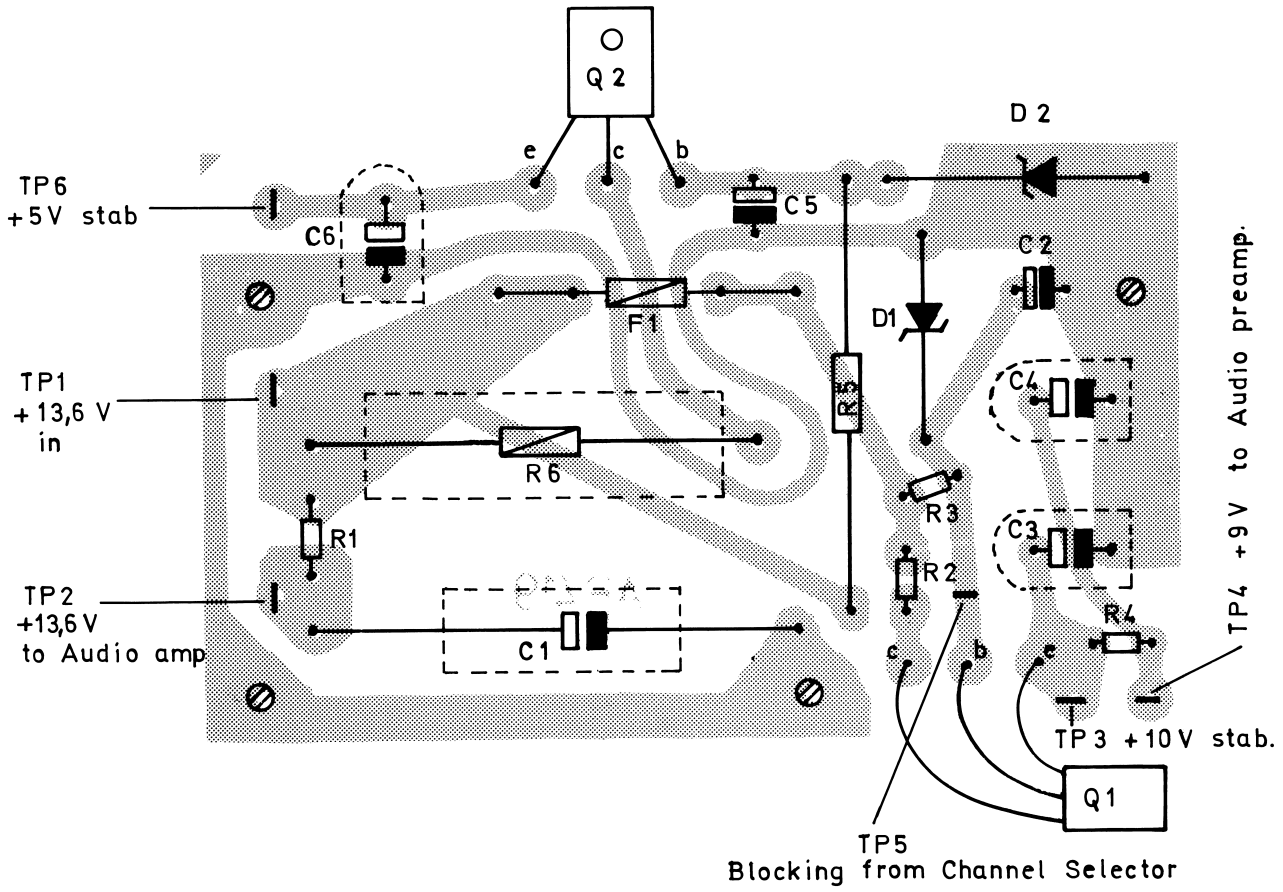
Rettet. 4-4-73 A.C 19-4-74 JAN	12 V POWERSUPPLY AP 448/1	Tegn.: M.L. 23-12-71 | Kontr.: H.M. 23-12-71 Stykl. nr.:
	AP-RADIOTELEFON	Tegn. nr.: 71304/4

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		12 Ω 3 w			
R 2		470 Ω 1 w			
R 3		330 Ω ¼ w			
R 4		820 Ω ¼ w			
R 5		4,7 Ω 70 w			
R 6		4,7 Ω 70 w			
R 7		1 kΩ trim.pot.			
C 1		1000 uF 16v			
D 1		1 N 5240 10v			
Q 1		2 N 3055			
Q 2		2 N 4921			
Q 3		BFY 51			

12v Power Supply AP 448/1 Tilhører tegn. nr.: 71304/4E	Rettet:	Tegn.: AC 11-1-73 Kontr.: HM	Stykl. nr.: 71304/4-S





Rettet: 1-11-73 H.P. 14-3-74 A.C.	Stabilized power supply, 5V and 10V Print Board AP419/1	Tegn.: ABP 2.12.70	Kontr.: P.L. 2.12.70.
		Stykl. nr.: 70482-4S	
	AP-RADIOTELEFON	Tegn. nr.: 70482/4	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R 1		3,3 Ω ½ w			
R 2		5,6 Ω ¼ w			
R 3		470 Ω ¼ w			
R 4		330 Ω ¼ w			
R 5		120 Ω 1 w			
R 6		5 Ω 5 w 19025			
C 1		250 uF Elektrolyt			
C 2		22 uF Tantal			
C 3		100 uF Frakolyt			
C 4		100 uF Frakolyt			
C 5		22 uF Tantal			
C 6		100 uF Frakolyt			
D 1		MZF10			
D 2		1N 4734A			
Q 1		AC 187 K			
Q 2		2N 4921			
F 1		315 mA middeltræg			

Stabilized power supply, 5V and 10V Print Board AP 419/1

Tilhører tegn. nr.: 70482-4

Rettet: 1-11-73.H.P

Tegn.: AC 11-1-73

Kontr.: HM

Stykl. nr.: 70482-4S

Low pass filter

AP 367/2
Power amplifier

AP 504
1W Buffer amplifier

AP 499-3
Voltage controlled osc.
Loop Filter

AP 498
Synthesizer Mixer
Main Oscillator
38,05 MHz

Antenne Relay

TX

RX

Ant.

Duplex Filter

AP604
Variable divider Transmitter
Frequency and phase comp. Transmitter
Variable divider Receiver
Frequency and phase comp. Receiver

AP 443
Reference Divider
Synthesizer Oscillator
6,4 MHz

AP447

AP 408
Microphone amplifier

AP 446
Channel Code
Channel Selector
Dual watch AP592/1
Private Channels
Simplex/ Duplex Selector

AP 445

AP 444

AP 499-2
Voltage controlled Oscillator
Loop filter

AP 498
Synthesizer Mixer
Main Oscillator
40,725 MHz

Telephone amplifier AP 497

Microtelephone Adaptor

AP 459/4

AF amplifier

AP 485
R.F Amplifier Simplex

AP 353/2
1. Mixer Simplex

AP 485
R.F Amplifier Duplex

AP 353/1
1. Mixer Duplex

Crystal filter 10,7 MHz

AP 310/3
IF Amplifier 10,7 MHz
2. Mixer
IF Amplifier 455 KHz
Crystal Oscillator
10,25 MHz

AP 311/3
Limiter and Discriminator

Squelch

Tonereceiver

AP 419
Stabilized power supply
5 V Stab.
10 V. Stab.
13,6 V
Stabilized power supply
AP 448

AP 499-2
Voltage controlled Oscillator
Loop Filter

AP 498
Synthesizer Mixer
Main Oscillator
41,875 MHz

Blockschematic for Maritime AP 759

AP-RADIOTELEFON

Tegn : 13-3-74 A.C.

Kontr :13-3-74 H.M.

Tegn. nr. 74134-3E

Wiring Main Chassis.

Power plug:

pin 1 → fuse → on/off relay
2 → on/off relay
3 → TP 448 - 1 → on/off relay
5 → TP 448 - 3 key relay → 20w/1w relay → pin 4 selective and ext. speaker → TP 419 - 1 → 2 pin multiplug.
6 → fuse → ground

Selective and ext. speaker:

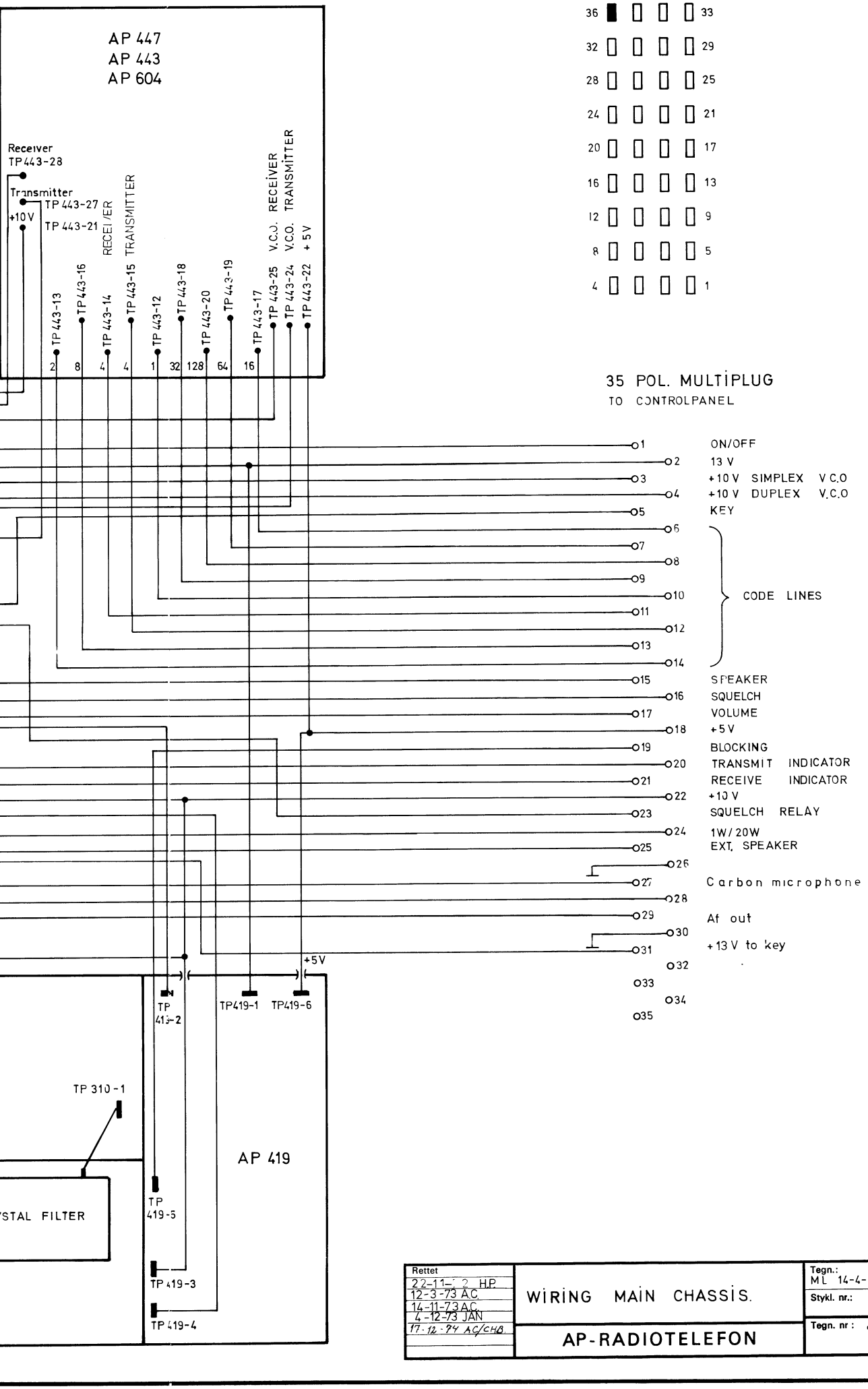
pin 1 → TP 459 - 2 → TP 459 - 2
2 → TP 459 - 16
3 → 25 multiplug
4 → TP 497 - 3 → key relay → TP 448 - 3 → TP 419 - 1 → 2 multiplug → 5 power plug.
5 → ground

Handset:

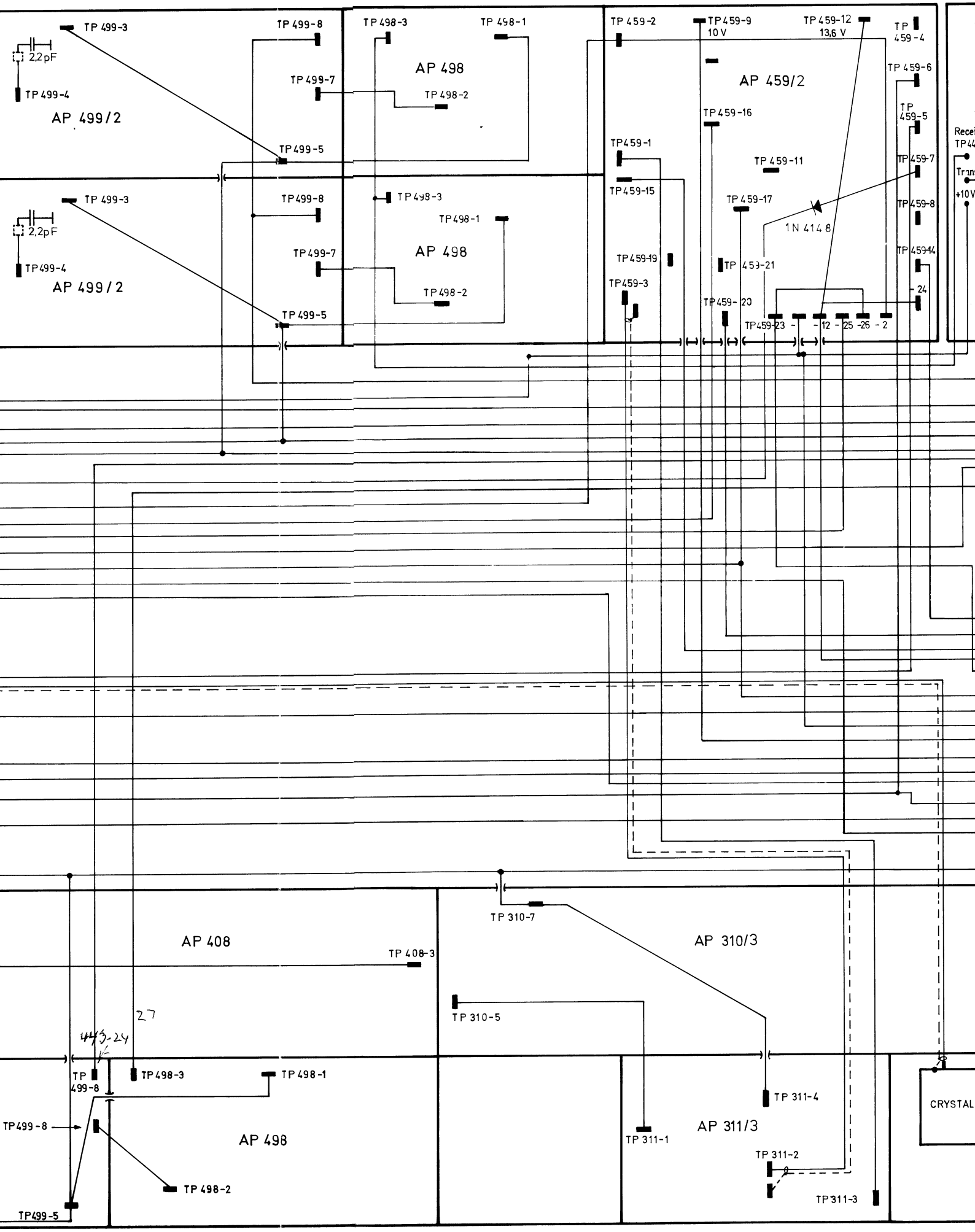
pin 1 → key relay → 5 multiplug → TP 459 - 7
2 → ground
3 → TP 497 - 2 → 29 multiplug
4 → shield → 28 multiplug
5 → TP 459-5. By use of handset pin 5 → TP 408-1

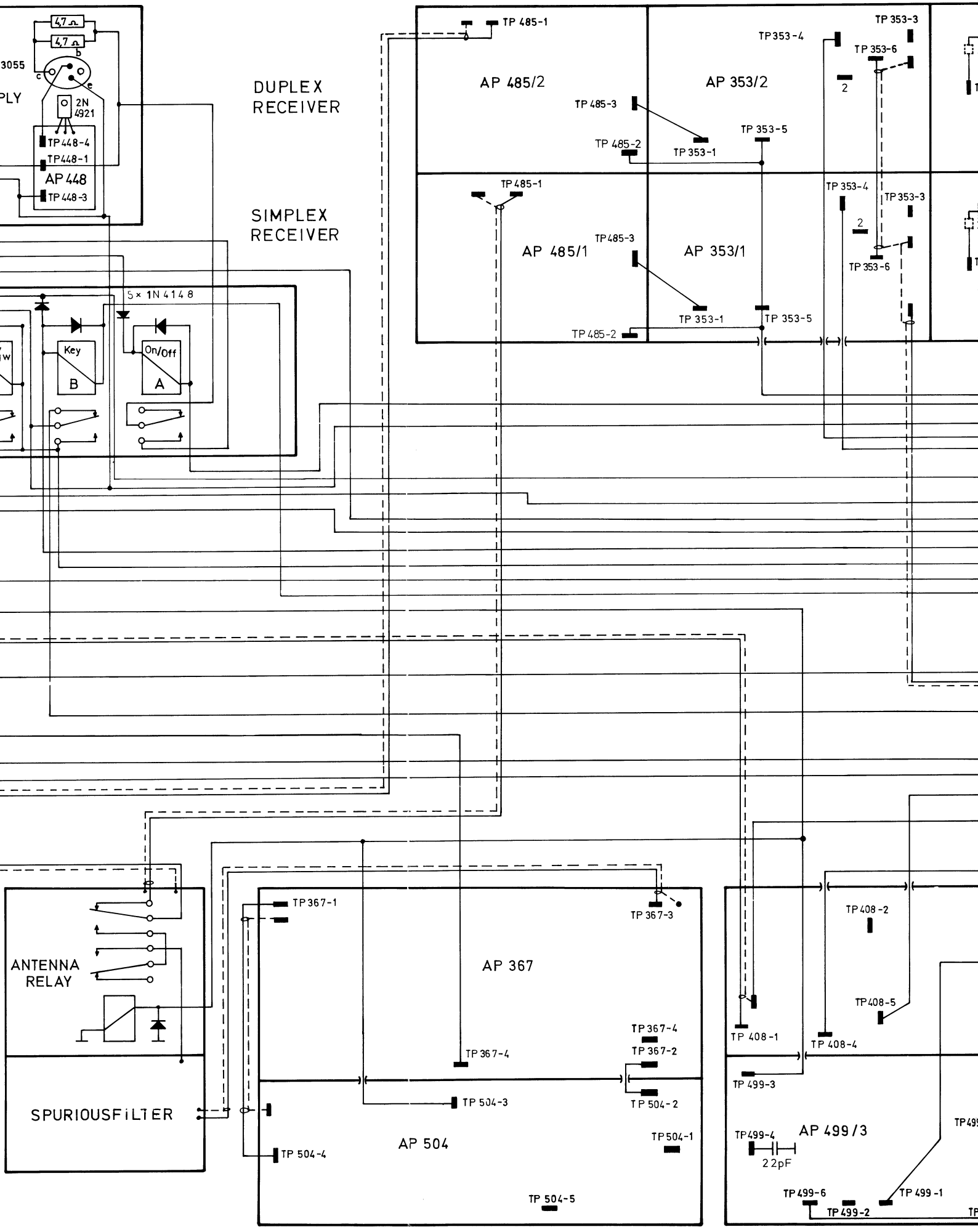
Multiplug to controlpanel:

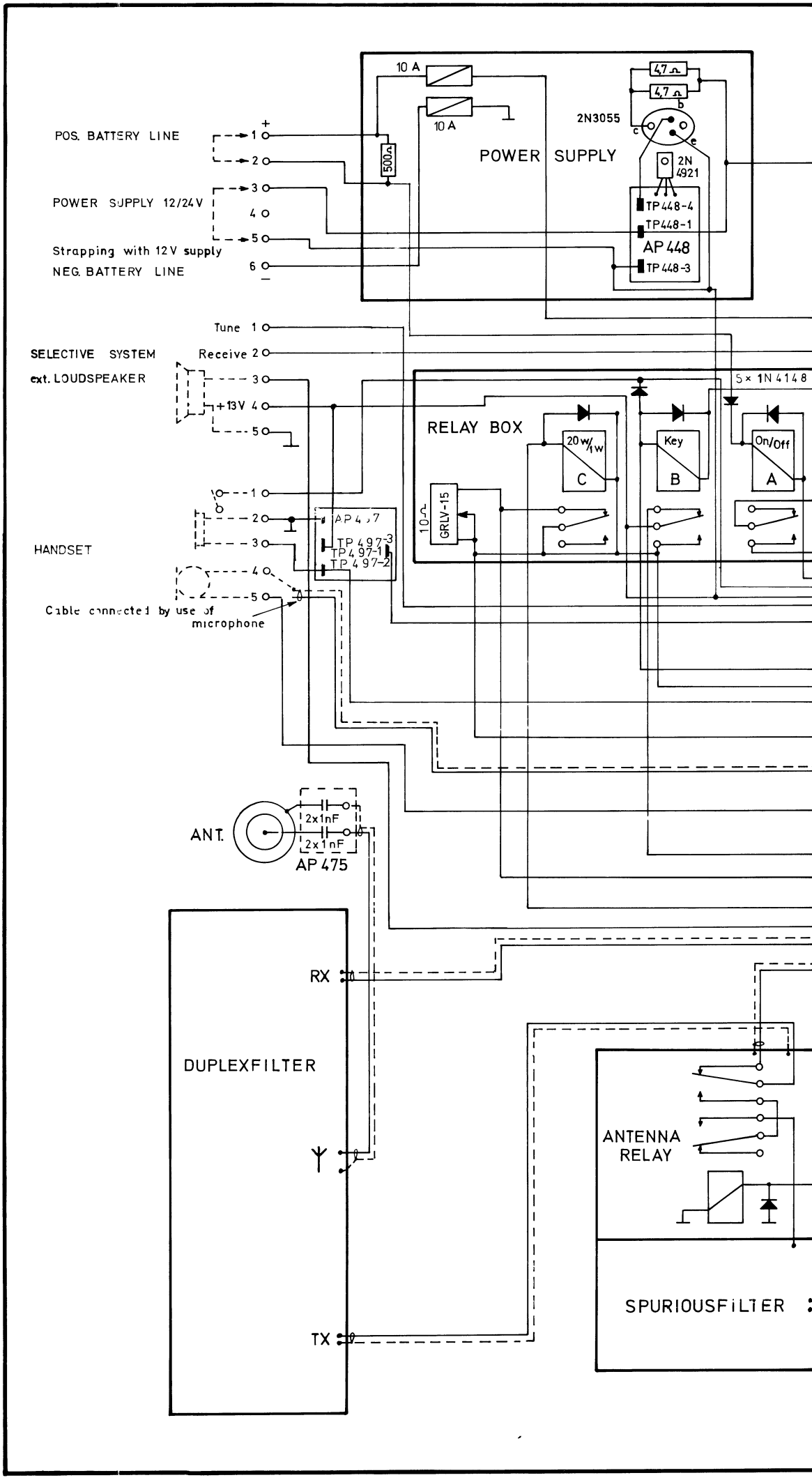
pin 1 → on/off relay
2 → TP 419-1 → key relay → TP 497-3 → 4 selective and ext. speaker → TP 448-3 → 5 power plug.
3 → TP 499-5 → TP 499-3 → TP 353-4
4 → TP 499-5 → TP 499-3 → TP 353-4
5 → key relay → 1 handset → TP 459-7
6 → TP 443-17
7 → TP 443-19
8 → TP 443-20
9 → TP 443-18
10 → TP 443-12
11 → TP 443-14
12 → TP 443-15
13 → TP 443-16
14 → TP 443-13
15 → TP 459-14
16 → TP 459-20
17 → TP 459-15
18 → TP 443-22 → TP 419-6
19 → TP 419-5
20 → TP 459-17 → key relay → 20w/1w relay → GRLV-15 → antenna relay TP 499-3 → TP 504-3
21 → key relay
22 → TP 459-22 → TP 443-21 → TP 353-5 → TP 485-2 → TP 419-3 → TP 310-7 TP 311-4 → TP 408-4 → TP 499-5 → TP 499-6 → TP 498-1
23 → TP 459-23 → TP 459-26
24 → 20w/1w relay
25 → 3 selective and ext. speaker
26 → ground
27 → TP 459-6 → TP 408-5
28 → shield 4 → handset
29 → TP 497-2 → 3 handset
30 → ground
31 → key relay

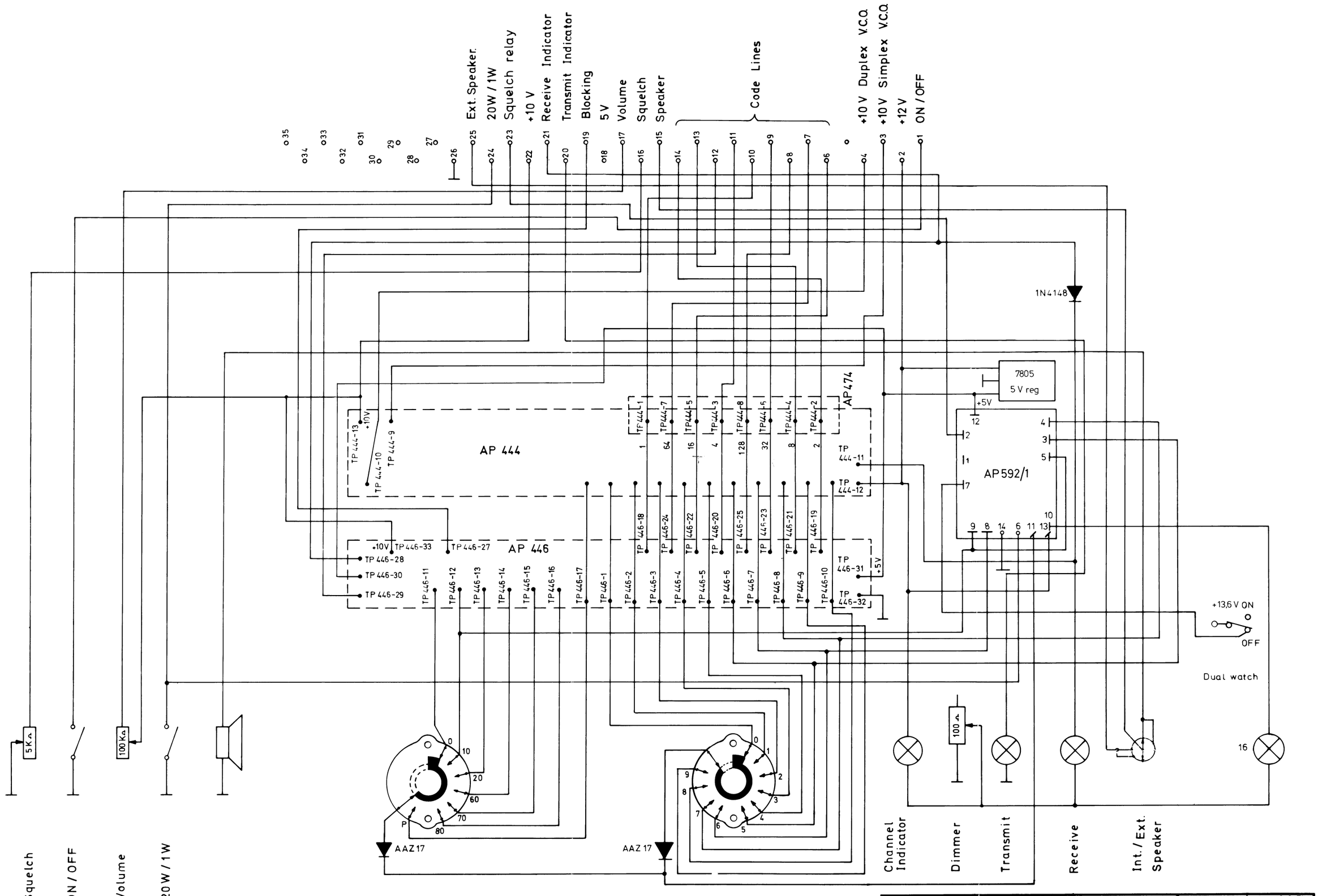


Rettet	WIRING MAIN CHASSIS.	Tegn.: ML 14-4-72	Kontr.: HM. 14-4-72
22-11-72 H.P.		Stykl. nr.:	
12-3-73 A.C.			
14-11-73 A.C.			
4-12-73 JAN			
17-12-74 AC/CHB.	AP-RADIOTELEFON	Tegn. nr:	72154-4E


TP 499-3
TP 499-8
2,2pF
TP 499-4
AP 499/2
TP 499-7
TP 499-5
TP 498-3
TP 498-1
AP 498
TP 498-2
TP 459-2
TP 459-9
10 V
TP 459-12
13,6 V
TP 459-4
AP 459/2
TP 459-6
TP 459-16
TP 459-5
TP 459-1
TP 459-11
TP 459-7
TP 459-15
TP 459-17
1N 414 8
TP 459-8
TP 459-19
TP 459-21
TP 459-14
TP 459-3
TP 459-20
TP 459-23
TP 459-12
TP 459-25
TP 459-26
TP 459-2
24
AP 408
TP 408-3
TP 310-7
AP 310/3
TP 310-5
TP 311-4
AP 311/3
TP 311-1
TP 311-2
TP 311-3
CRYSTAL
TP 499-8
TP 498-3
TP 498-1
AP 498
TP 498-2
TP 499-5

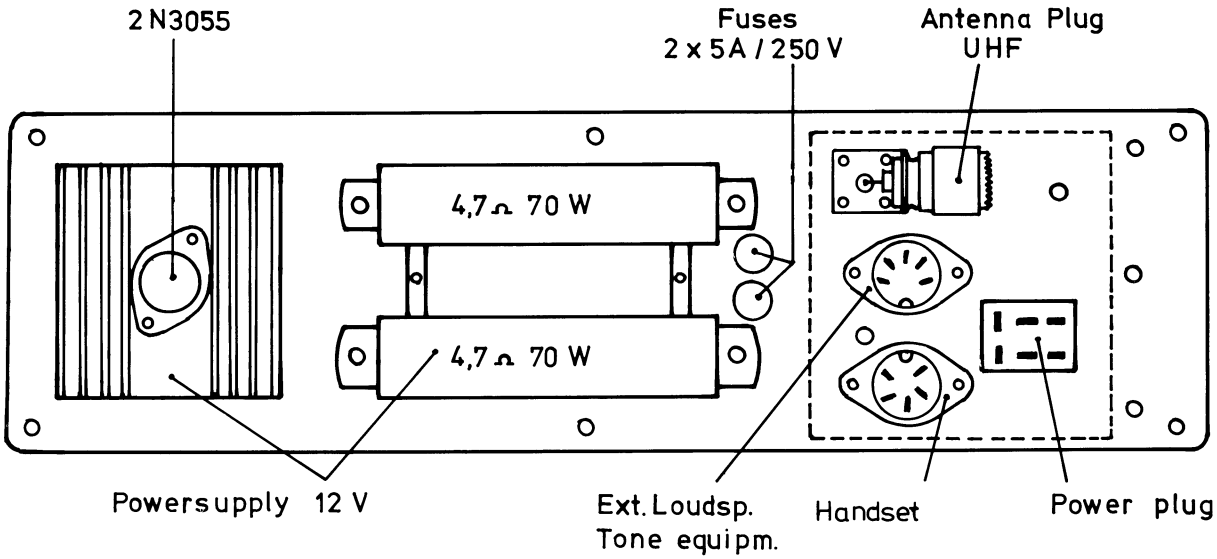

DUPLEX
RECEIVER
SIMPLEX
RECEIVER
AP 448
TP448-4
TP448-1
TP448-3
2N
4921
47Ω
4,7Ω
5× 1N 4148
Key
B
On/Off
A
AP 485/2
AP 353/2
AP 485/1
AP 353/1
TP 485-1
TP 485-2
TP 485-3
TP 353-1
TP 353-3
TP 353-4
TP 353-5
TP 353-6
2
ANTENNA
RELAY
SPURIOUSFILTER
AP 367
TP 367-1
TP 367-2
TP 367-3
TP 367-4
AP 504
TP 504-1
TP 504-2
TP 504-3
TP 504-4
TP 504-5
AP 499/3
TP 499-1
TP 499-2
TP 499-3
TP 499-4
TP 499-6
22pF
TP 408-1
TP 408-2
TP 408-4
TP 408-5


10 A
10 A
500Ω
POWER SUPPLY
4,7Ω
4,7Ω
2N3055
2N 4921
TP 448-4
TP 448-1
AP 448
TP 448-3
POS. BATTERY LINE
POWER SUPPLY 12/24V
Strapping with 12V supply
NEG. BATTERY LINE
Tune
Receive
SELECTIVE SYSTEM
ext. LOUDSPEAKER
+13V
5 x 1N 4148
RELAY BOX
20 w/1 w
C
Key
B
On/Off
A
GRLV-15
10Ω
HANDSET
TP 497-3
TP 497-1
TP 497-2
Cable connected by use of microphone
ANT.
2x1nF
2x1nF
AP 475
RX
DUPLEXFILTER
TX
ANTENNA RELAY
SPURIOUSFILTER



Rettet 19-2-75 AC/HM 19-2-75 NC/HM 14-4-75 AC/HM	Wiring Frontplate. Marine AP 759.	Tegn.: 13-3-74 A.C.	Kontr.: 13-3-74 HM
		Stykl. nr.:	
	AP-RADIOTELEFON	Tegn. nr: 74135-2E	

Installation



To make the connectors completely splashproof, they are covered with a box, and the cables are sealed with four feed-through bushings.
Remember to put the cables through the feed-through bushings before mounting the connectors.

Power: The voltage could be both 12 and 24 volts. The main chassis is isolated so that both polarities could be used. For connections in the plug see drawing No. 72164-4 E.

Plug: Painton 310.029
Fuse: 5 x 20 mm/10 Amp.
Cable: GKSO 2 x 2,5 mm^2
The set is protected against connection with wrong polarity. If this has been done the fuses and the diode 1N 4001 must be changed.

Antenna: The antenna should be matched to 50 Ω.
Cable: RG-8/u; Plug PL 259

Handset: The handset is delivered with a holder.
The holder should be mounted beside the radio on the wall.

Plug: Preh 71424-060
Cable: 1852 - 6 x 0,41

For connections in the plug see drawing No. 72165-4E.

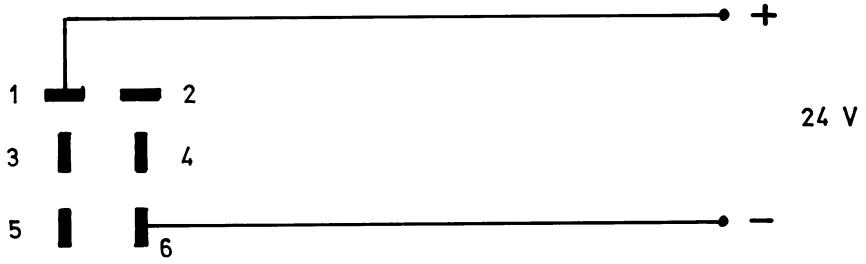
Ext. loudspeaker and tone equipment

The ext. loudspeaker and tone equipment are connected to the same plug.

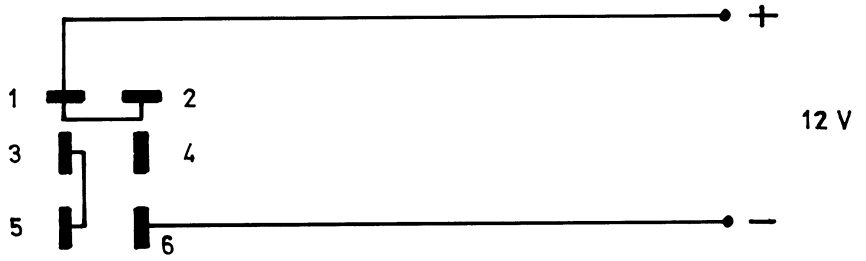
The tone equipment could be an external tone receiver. There is a 13 volts supply voltage to the tone equipment in the plug.

Plug: Preh 74424-060

For connections in the plug see drawing No. 72165-4 E.

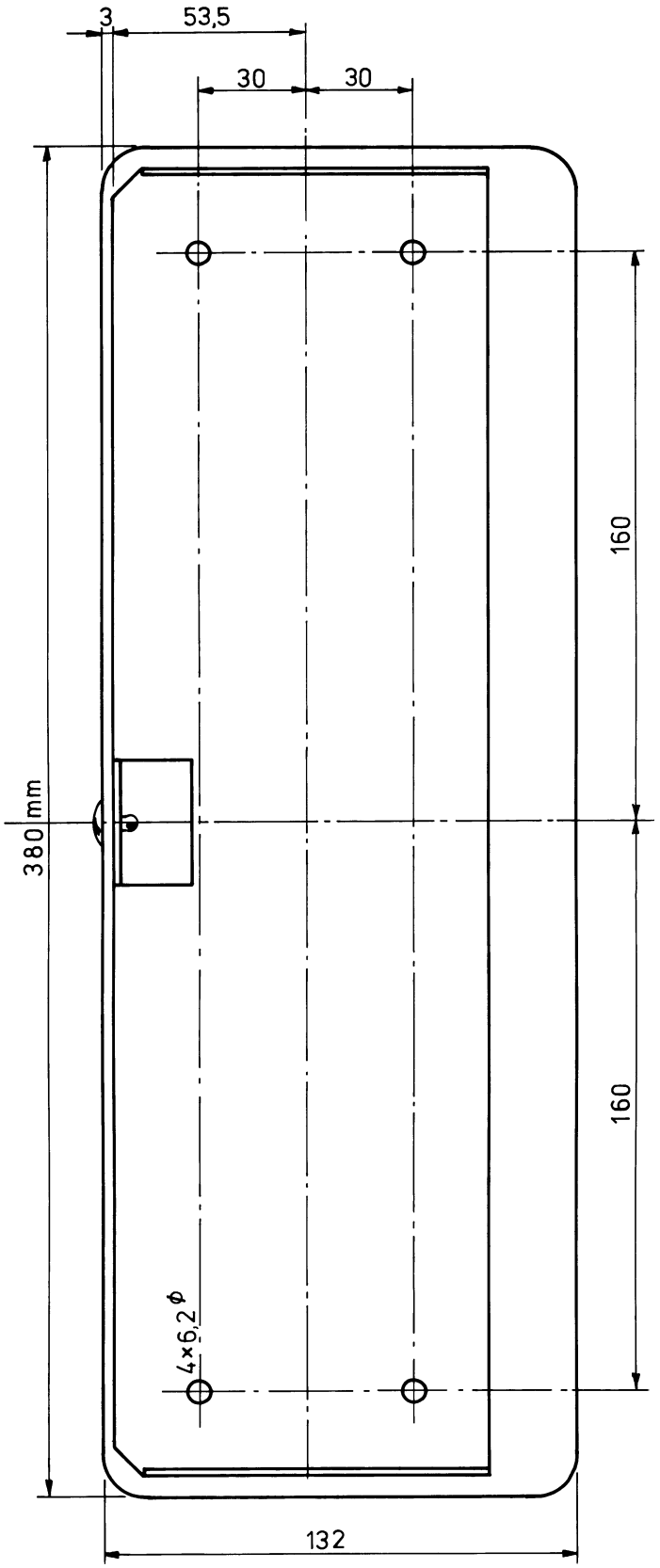


Painton : 310.029



Painton : 310.029

Rettet: 21-8-74 H.J.	Connection of the supply voltage 12 V and 24 V.	Tegn.: ML. 19-4-72	Kontr.: HM. 19-4-72
		Stykl. nr.:	
	AP-RADIOTELEFON	Tegn. nr.:	72164-4E

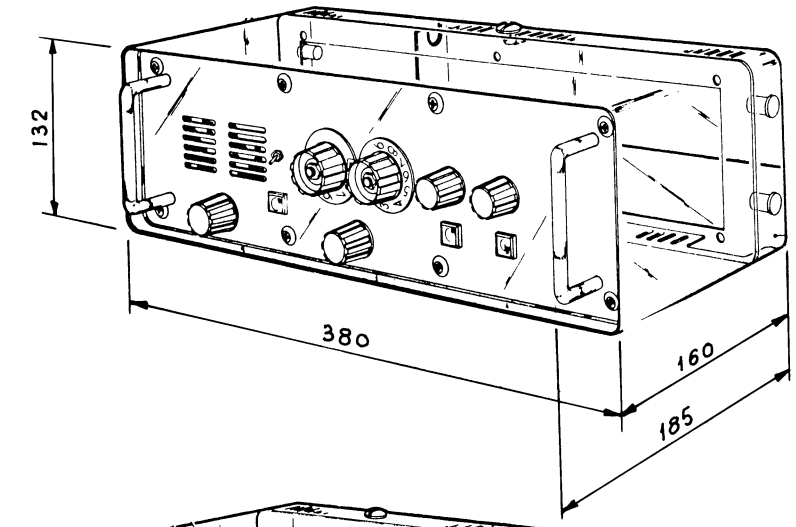


TR 25/CB20 depth: 185mm

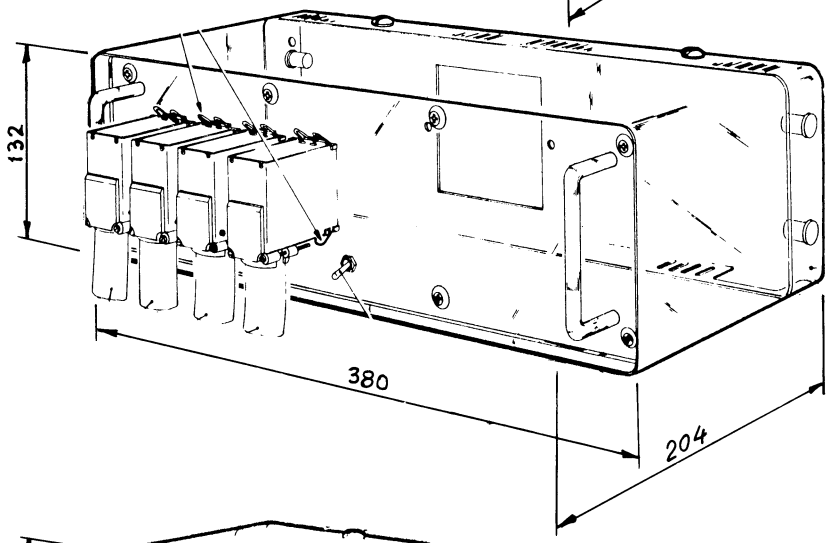
TR25/ RC4 depth:204mm

CB 21 depth:127mm

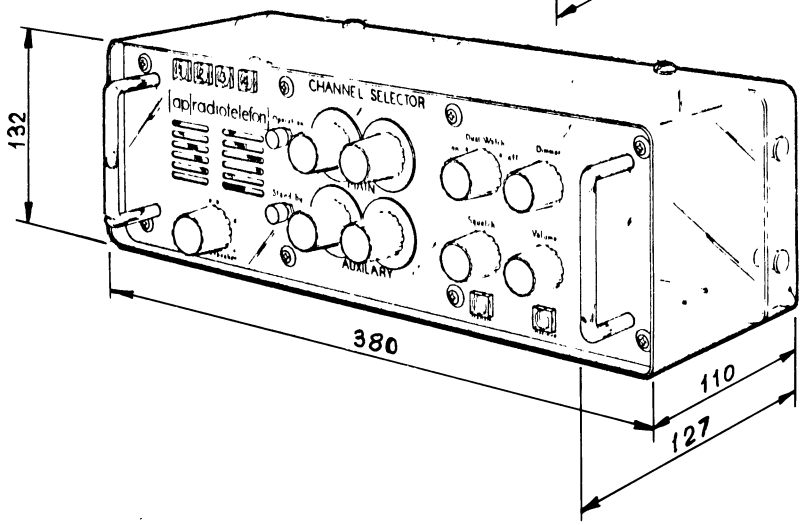
Rettet: 5-3-74 AC	Dimention sketch for wallmounting AP 759, AP 759RC - controlunit and transceiver	Tegn.: 5.-1.-73 NC	Kontr.: 5.-1.-73 HM
		Stykl. nr.:	
	AP-RADIOTELEFON	Tegn. nr.:	72292-4M



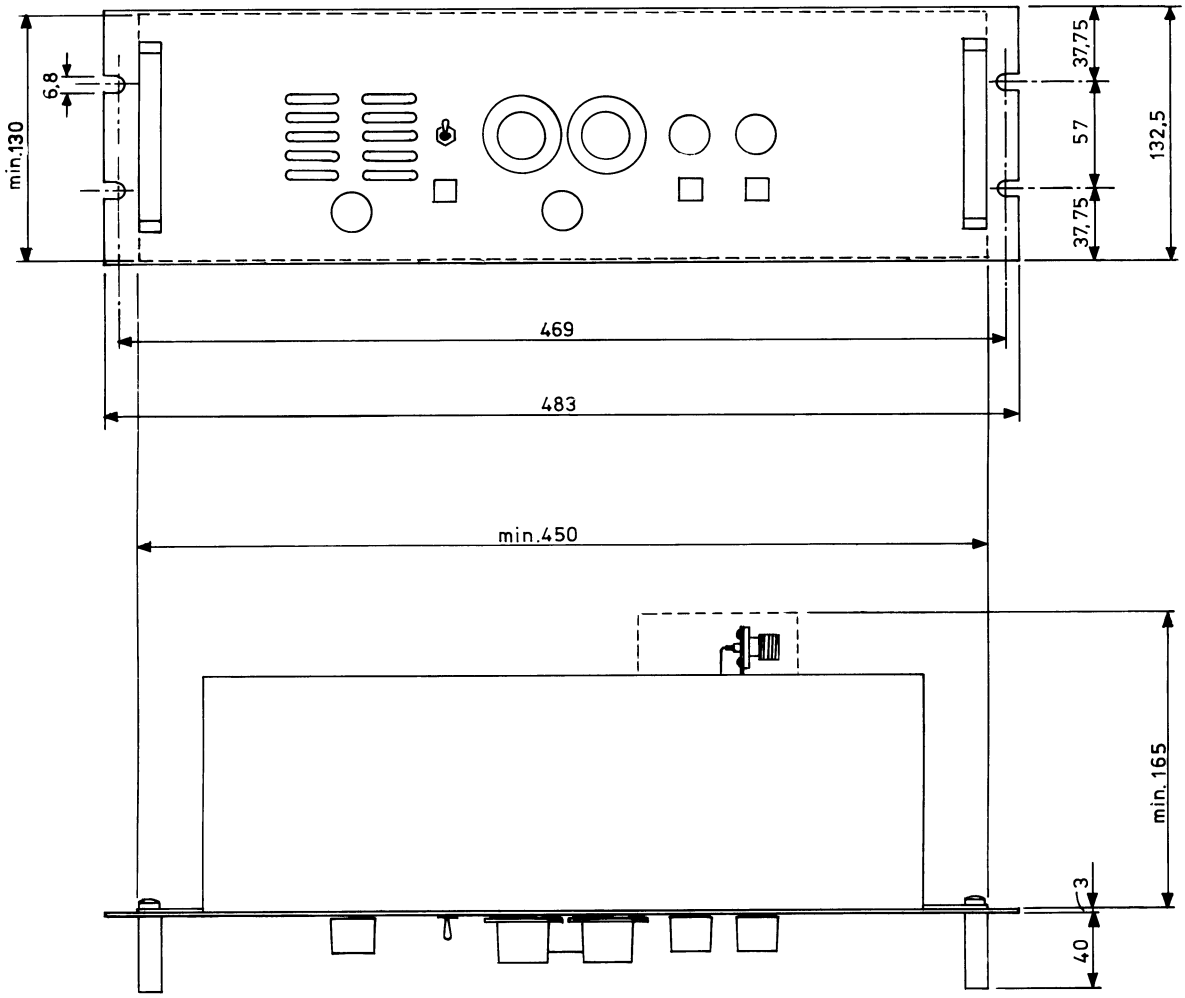
AP 759



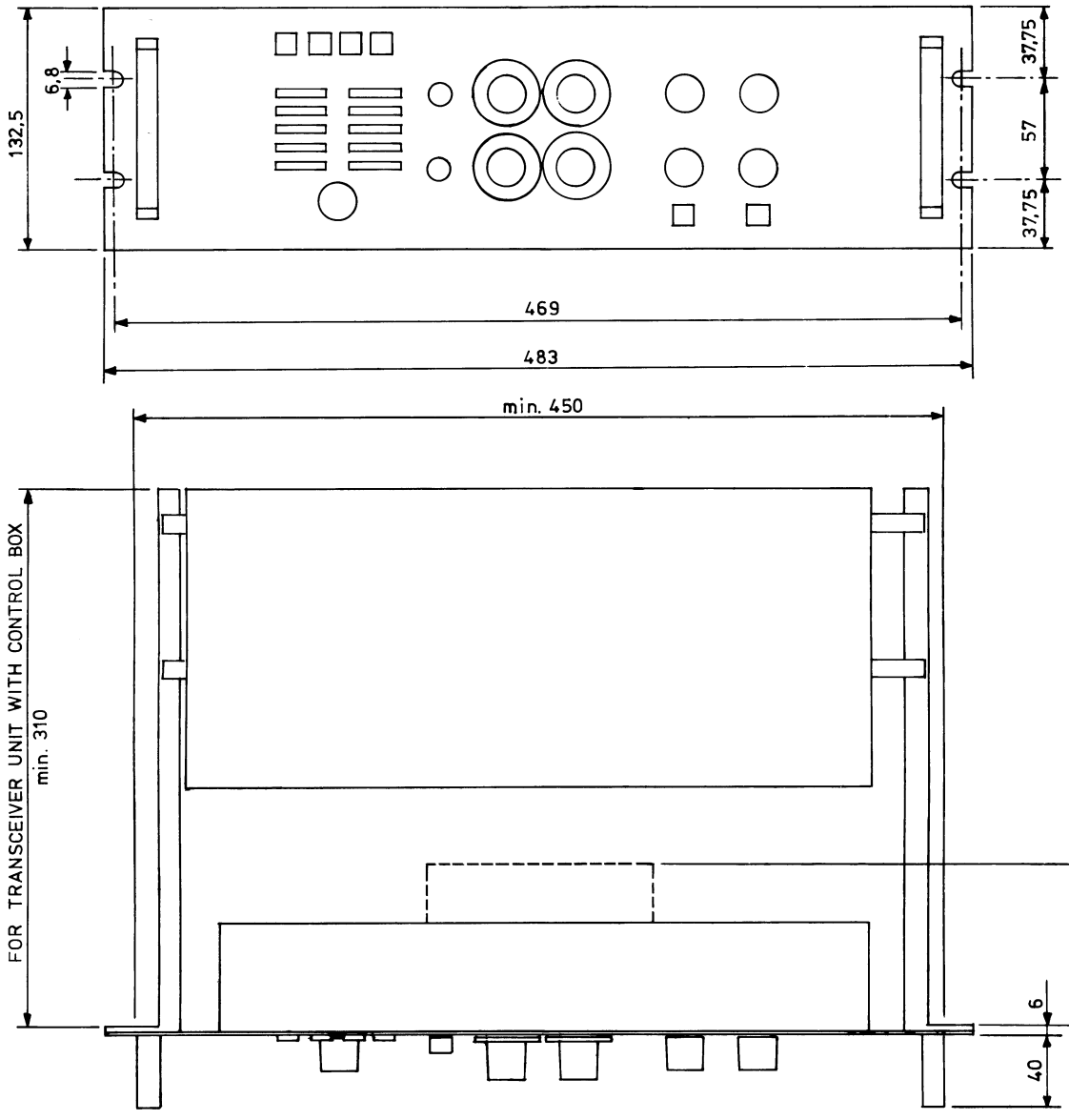
AP 759 RC



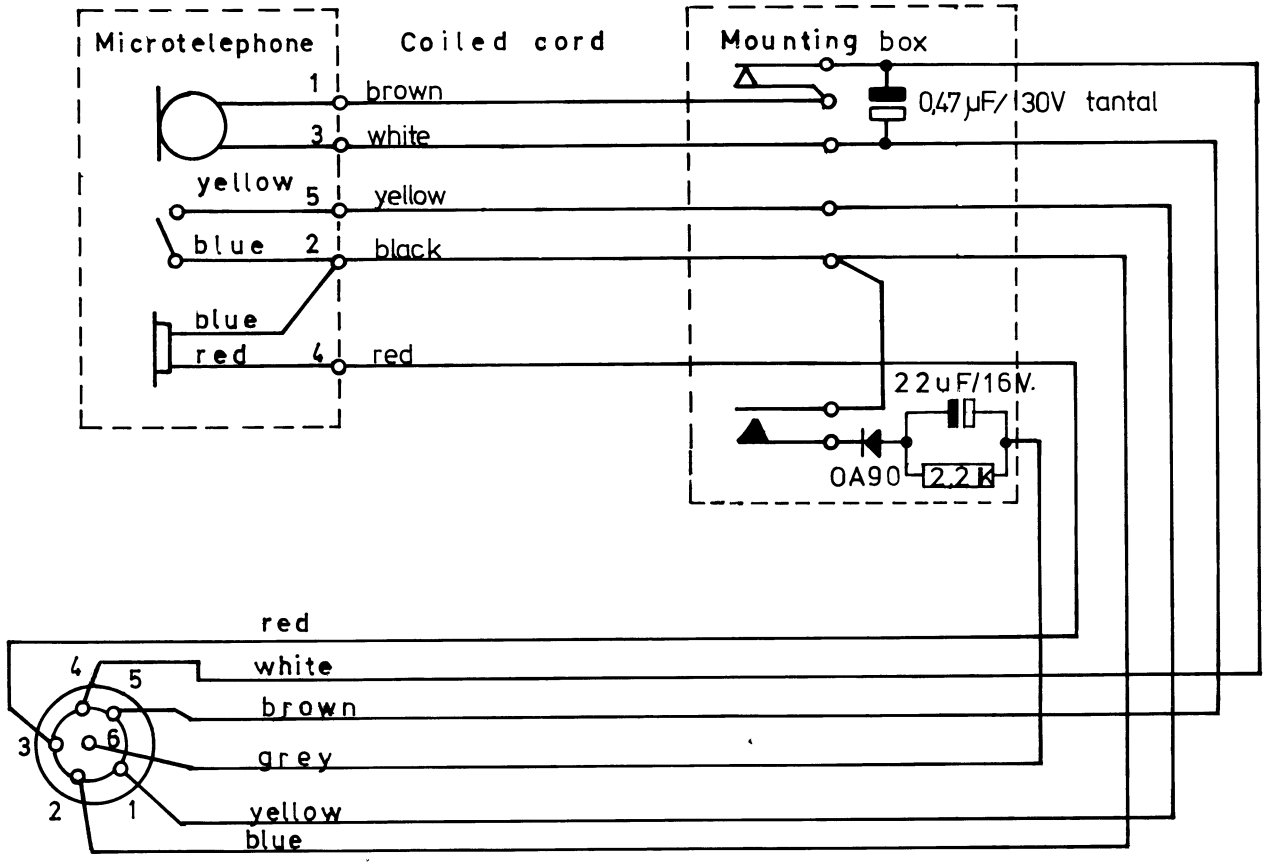
Rettet:	Dimension sketch for AP759 and RC	Tegn.: 24-10-74 NC	Kontr.: 24-10-74 JS
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.: 74465 - 4M	



Rettet: 6.-11.-74 NC	DIMENSION SKETCH OF AP 759 FOR MOUNTING IN RACK	Tegn.: 20.-8.-74 NC	Kontr.:
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.:	74358 - 4M

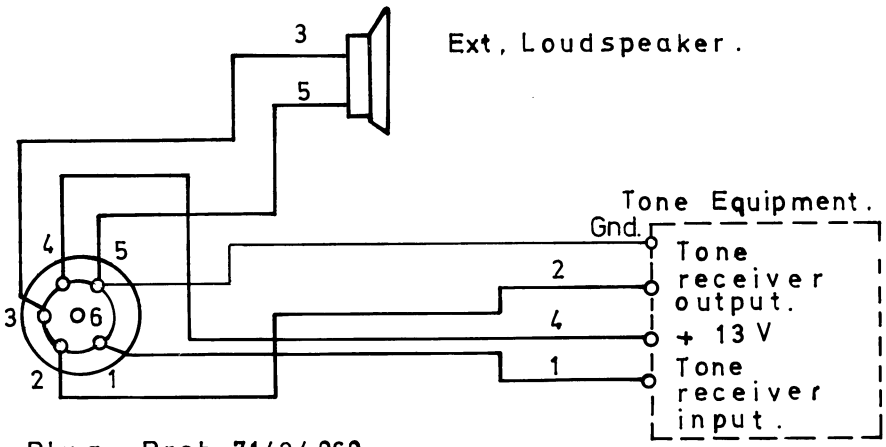


Rettet:	DIMENSION SKETCH OF AP 759 RC CONTROL BOX AND TRANSCEIVER UNIT FOR MOUNTING IN RACK	Tegn.: 18 9 74 NC	Kontr.:
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.: 74396 - 4M	



Plug: Preh 71424-060

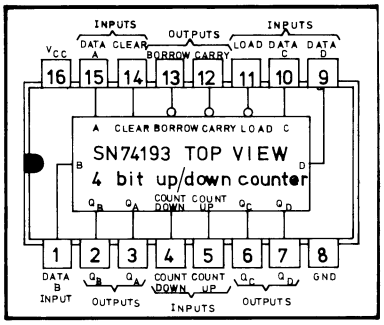
Connection of handset

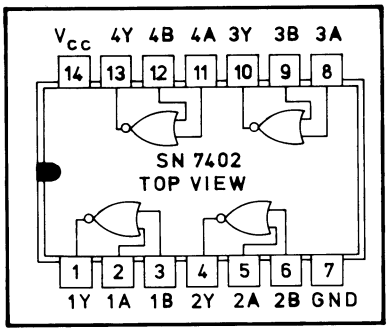


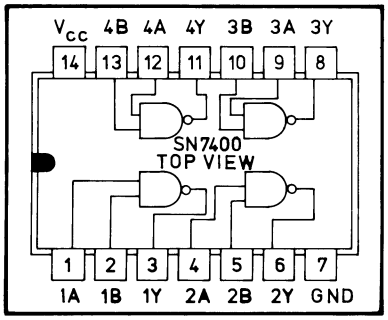
Plug: Preh 71424-060

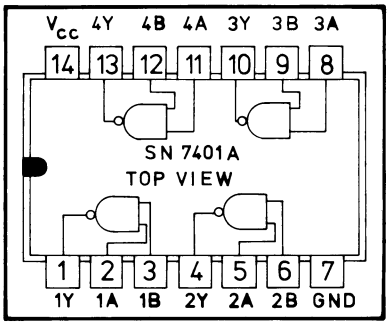
Connection of ext. Loudspeaker and toneequipment.

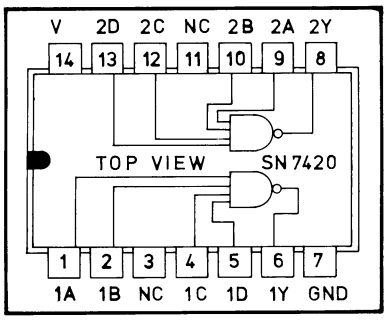
Rettet:	Connections of handset ext. Loudsp. and toneequipment.	Tegn.: H.P 30-6-72.	Kontr.: H.M-30-6-72.
27-11-72 H.P		Stykl. nr.:	
12-3-73 A.C.			
5-3-74 AC			
19-4-74 JAN			
14-11-74 AC			
	AP-RADIOTELEFON	Tegn. nr.: 72165-4E.	

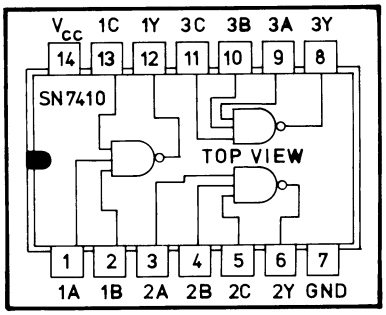


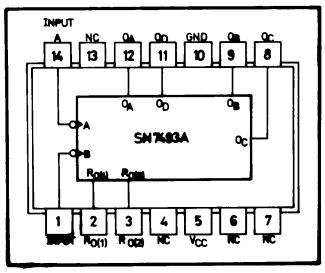












Rettet: 8 -10-74 AC	SN 74193 SN 7402 SN 7400 SN7493A SN 7401A SN 7420 SN 7410	Tegn.: 21- 5-73 H.P. Kontr.:
		Stykl. nr.:
	AP-RADIOTELEFON A/S	Tegn. nr.: 73163-4E