

MANUAL 159
2 m, dual receiver
AP 2000

This manual covers the typenumbers:

AP 2253	AP 2268
AP 2259	AP 2269
AP 2274	AP 2284
AP 2279	AP 2289

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Technical data AP 2000 Series 2 m.

General:

The equipment is homologated in several countries where the technical requirements are based on the CEPT Recommendation T/R 17.

Frequency range:	146 - 174 MHz
Principle:	Digital frequency synthesizer
Number of channels:	Max. 80
Channel spacing:	25 kHz or 20 kHz or 12,5 kHz
RF-bandwidth:	Typ. 2 MHz at 1 dB reduction
Mode of operation:	Simplex, semi-duplex
Supply voltage:	12 V DC chassis negative - nom. 13,2 V. DC-DC converter available for 6 V, 12 V and 24 V chassis positive operation. A 220 V AC supply is available too.
Supply voltage variations:	10,8 V to 15,6 V
Operation temperature:	+ 25°C to + 60°C
Frequency stability:	Typ. \pm 10 ppm for the above specified temperature and supply voltage variations
Loudspeaker:	External 4 Ω
Microphone:	1 k Ω condenser microphone or 200 Ω dynamic close talk micro- phone with push-button
Antenna impedance:	50 Ω
Power consumption:	At 13,2 V reception approx. 0,25 A transmission { 25 W approx. 5,5 A 6 W " 2,0 A

Receiver:

Sensitivity:	Typ. 0,4 μ V (1/2 E.M.F.) for 20 dB SINAD
Adjacent channel sensitivity:	Typ. 75 dB (CEPT Method)
Spurious and image rejection:	Typ. 80 dB (CEPT Method)
Intermodulation attenuation:	Typ. 71 dB (CEPT Method)
Undesired conducted power:	Typ. 1,5 nW

Deemphassis:	Following 6 dB per octave curve from 0,3 to 3 kHz within + 1- 3 dB relative level at 1000 Hz
Audio power:	3 watts into 4 Ω at 10 per cent distortion, 13,2 V supply voltage
Output for microphone:	1 mW in 300 Ω
Hum and noise:	Typ. 50 dB (CEPT Method)
Function of limiter:	Less than 1 dB variation in output voltage for RF-input levels between 1 μ V and 100 mV EMF
 <u>Transmitter:</u>	
Power output:	6 W \pm 0,5 dB, 10-25 W \pm 0,5 - 1,0 dB from \pm 25 $^{\circ}$ C to \pm 60 $^{\circ}$ C at 13,2 V.
	 With external PA: 25 W \pm 0 dB \pm 2 dB from \pm 25 $^{\circ}$ C to 60 $^{\circ}$ C at 13,2 V.
Spurious outputs and harmonics:	Typ. each less than 2 μ W into 50 Ω
Adjacent channel power:	Typ. 80 dB below the output power
Frequency deviation:	Following 6 dB per octave curve from 0,3 to 3 kHz within + 1-3 dB relative level at 1000 Hz
Harmonic distortion:	Typ. 1 per cent at \pm 3 kHz deviation and 1000 Hz modulation frequency.
Hum and noise:	Typ. 45 dB realtive \pm 3 kHz deviation and 1000 Hz modulation frequency (CEPT Method).

Technical description for AP 2000
2m with dual receiver
Receiver (Fig.1)

Aerial switch (75011-4E2)

The aerial switch is made by a relay, while C1, TR1 and D1 makes a forward power sensing circuit for the transmitter.

RF-amplifier and 1st mixer (77413-4E2)

The RF amplifier consists of a Dual-gate Mos-transistor with several tuned circuits to give the necessary selectivity. The first mixer converts the RF-signal 147 - 174 Mc to 21,4 Mc with an oscillator injection of 168,4 - 195,4 Mc on gate 2. Matching of the mixer output impedance to the crystal filter is made by the turned circuit L 6. With the varicap diodes D1 to D7 it is possible to shift all the tuned circuits from high to low band.

21,4 Mc and 455 Kc IF (75076-3E2)

The 21,4 Mc crystal filter is followed by a dual-gate Mos-amplifier which gives approximately 20 dB gain. This stage is followed by the second mixer which converts 21,4 Mc to the low IF 455 Kc. The second mixer consists of an integrated doublebalanced transistor mixer, in which one section is used as the crystal oscillator. An emitter follower with some RC low-pass sections feeds the signal to IC 2, which is an integrated high gain amplifier/limiter and quadrature detector. The coil L 4 is the detector phase shift network. AF output is supplied by the emitter follower Q 3.

AF-amplifier, squelch and key circuit (75017-3E2)

The AF-signal goes through an amplifier stage Q 6 to the volume control circuit. Here, the diodes D1, D2 and D3 act as an electronic attenuator regulated by the diode current. This circuit is also used for external AF-blocking and squelch. An integrated AF output amplifier is used for the 3 W loud-speaker output and here the feedback-capacitors C 6 and C 7 produce the deemphasis.

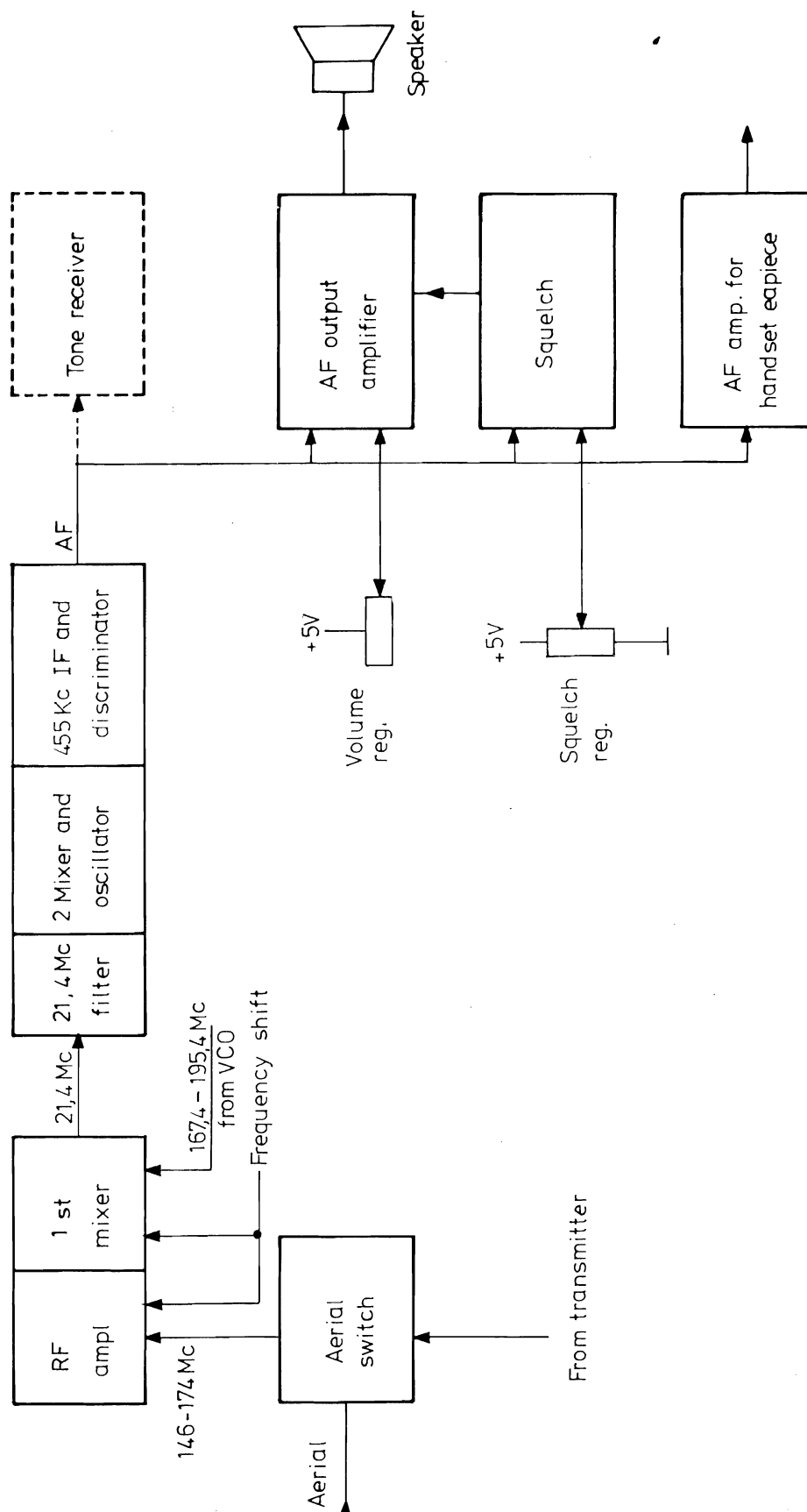


Fig 1.

Rettet: 	Technical description for AP2000,2m band With dual receiver AP-RADIOTELEFON $\frac{A}{S}$	Tegn.: 29-11-77 H.J.	Kontr.:
		Stykl. nr.: Page 2.	
		Tegn. nr.: 80092-4E2	

For the handset earpiece Q 4 and Q 5 makes an amplifier while D 15 is for blocking. The squelch circuit consists of an 8 kHz tuned amplifier Q 3 followed by a detector D 11 and D 12. With increasing noise level on the AF-input the voltage on the negative side on C 19 will decrease from + 5 V. Getting lower than the squelch reg. voltage on point 7, the amplifier IC 2 switches over to an output voltage of + 5 V and thus blocking the AF-output through the volume control circuit. In the key control circuit Q 1 and Q 2 goes ON when the button in the handset connects point 11 to chassis, thus producing + 12 V on point 14. A positive voltage applied on point 10 will inhibit this function.

TRANSMITTERS (Fig. 2, 3 and 4)

Transmitter mixer and amplifier (75014-4E2)

Because the VCO has a frequency 21,4 MHz higher than the operating Rx-frequency this signal is fed to the transmitter mixer and converted to the desired transmitting frequency. For simplex operation the necessary 21,4 MHz signal comes from a combined crystal oscillator/doubler. Thus the crystal will be 10,7 MHz. For good suppression of VCO - and 21,4 MHz injection the Tx-mixer is a balanced diode type. The three amplifier stages Q 1, Q 2 and Q 3 give further suppression of unwanted sidebands and the necessary amplification to reach an output of approx. 150 mW.

6 W power amplifier (75013-4E2)

The 6 W power amplifier consists of two stages Q 1 and Q 2, where the output level can be regulated by varying the supply voltage for Q 1.

10-25 W PA-stage (76307-4E2)

This power amplifier consists of three stages Q 1, Q 2 and Q 3, of which Q 1 is getting its power supply from the power sense amplifier. In this way it is possible to adjust the output power to any desired value between 10-25 W. This stage is only intended for intermittent service. It is therefore provided with "thermal shut down circuit".

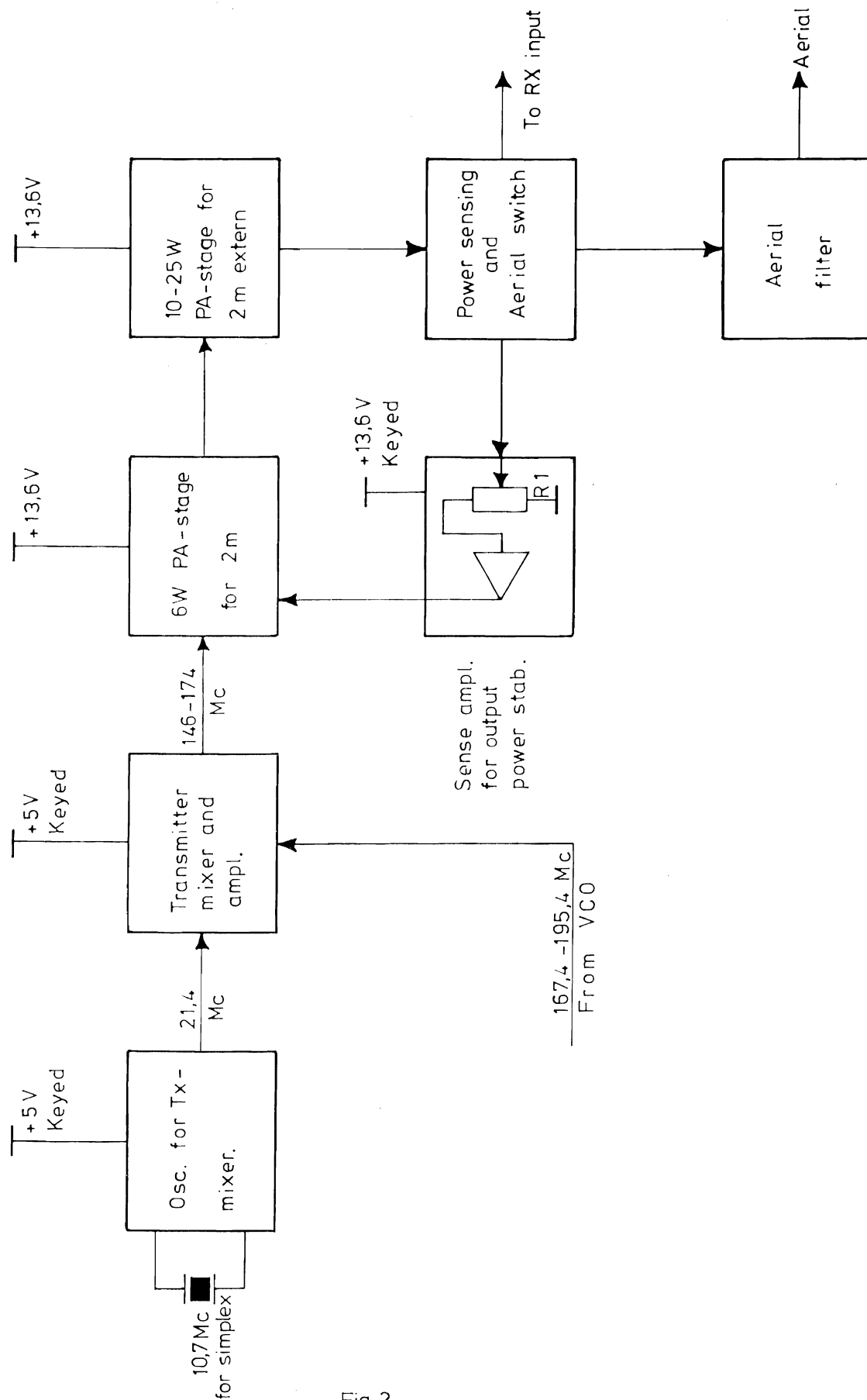
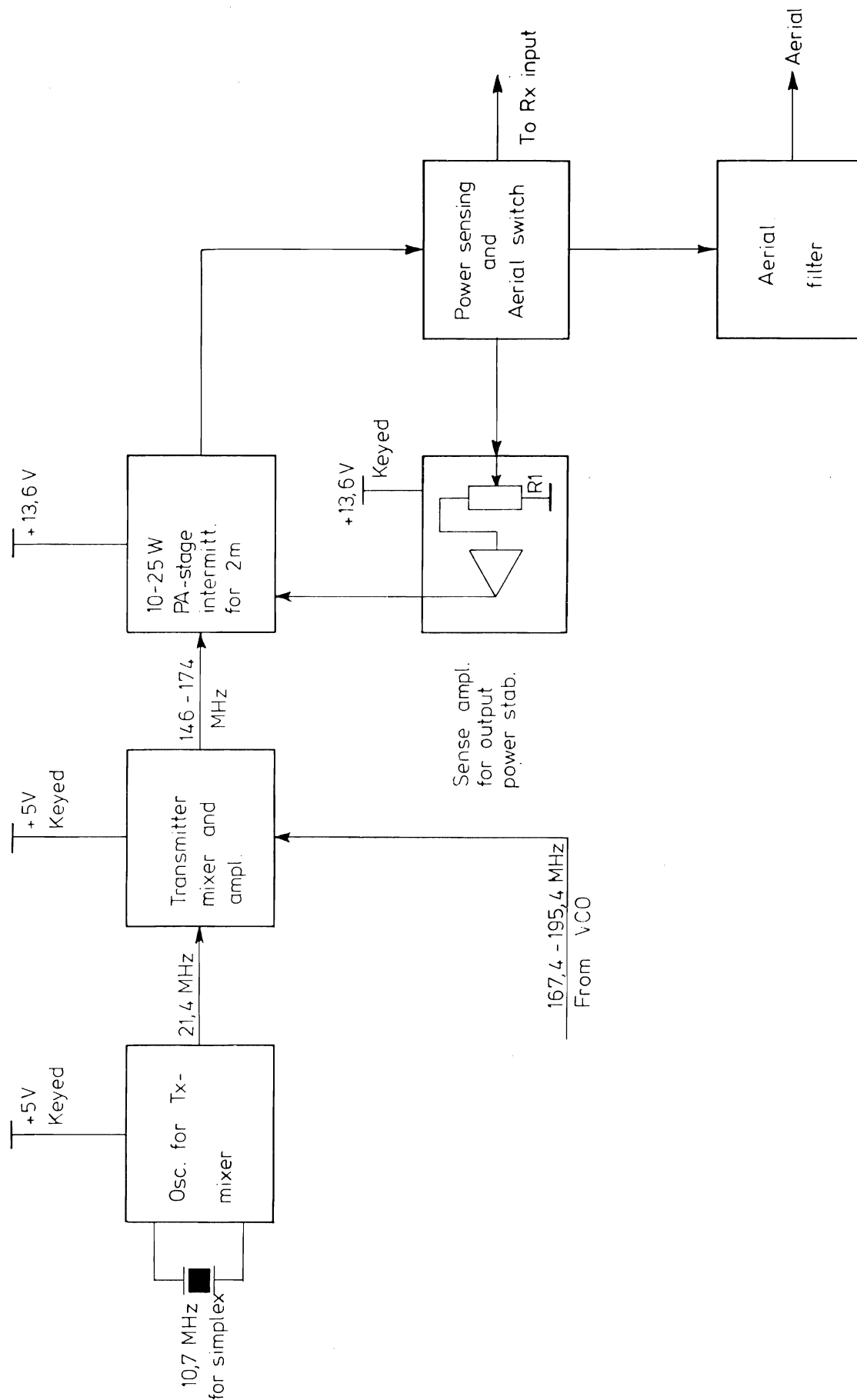


Fig. 2

Rettet:	10-25 W ext. Technical decription for AP 2000, 2m band	Tegn.: 30-4-75 E.H.	Kontr.:
		Page: 4	
	AP-RADIOTELEFON $\frac{A}{S}$	Tegn. nr.: 80092-4E2	



Rettet:

Technical description for AP 2000, 2m band
10-25 W PA

AP-RADIOTELEFON ^{A/s}

Tegn.: 23-6-78
AMC

Kontr.:

Stykl. nr.:

Page: 5

Tegn. nr.:

80092-4E2

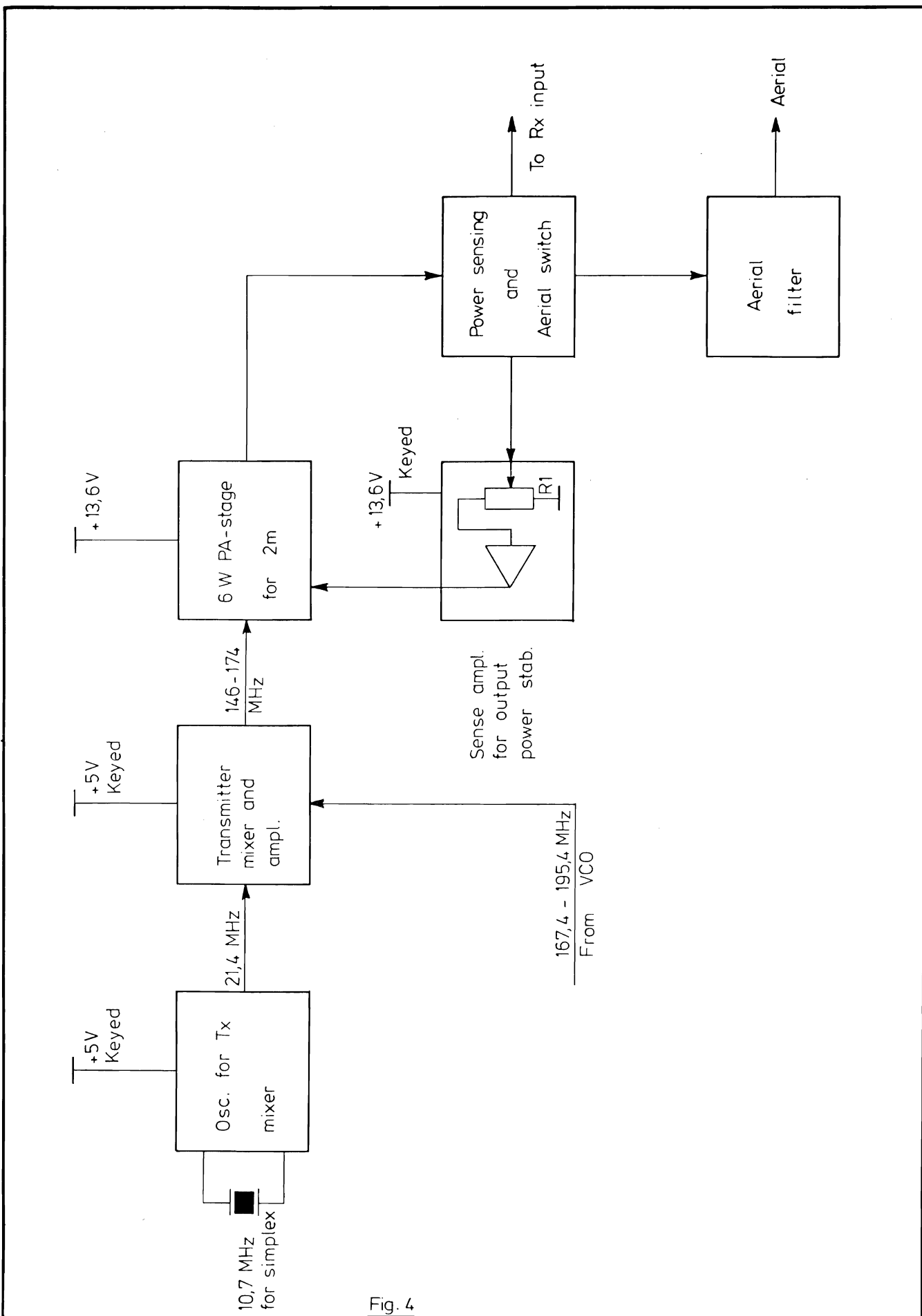


Fig. 4

Rettet: 	Technical description for AP 2000, 2 m band 6W PA-stage AP-RADIOTELEFON A/s	Tegn.: 27- 6 - 78 AMC Stykl. nr.: Tegn. nr.:	Kontr.: Page: 6 80092-4E2
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10-25 W power cassette (75009-4E2)

This consists only of one stage Q 1, here as well the output goes through a forward powersensing circuit, making it possible to adjust the output power by means of a potentiometer located on print board B 24.

This stage is intended for continuous service and therefore it is located in an external cassette in order to get sufficient cooling.

Output power stabilizing (75622-4E2 and 76325-4E2)

From the power-sensing circuit a DC voltage proportional to the forward power is led to an amplifier. Here it is compared to a zener-voltage, and if it is greater than this threshold level, the amplifier IC 1 will give less base-current for Q 1, and thus reduce the voltage for driver transistor Q 1 in the 6 W stage. This will act in the following manner:

For low supply voltages (~11 V) the output power will increase with increasing supply voltage, and when the output reaches the desired value it will be constant for further increase in supply voltage. The output level is adjustable with R 1 on B 57 for internal PA-stages and with R 2 on B 24 for external PA-stage. Note that the oscillator for Tx-mixer, the transmitter mixer and amplifier, and sense amplifier have keyed supply lines, while the final transistor in the 6 W stage and the 10-25 W external stage are supplied independent of the key. In the 10-25 W internal PA-stage the last two transistors are supplied independent of the key.

Aerial filter (75016-4E2)

The aerial filter is a low-pass filter for suppression of the harmonics from the transmitter.

Modulation amplifier 79112-3E2

The modulation amplifier has two input terminals with different sensitivities. Using the less sensitive input 2 (terminal 3), the mic. switch terminal carries + 5V thereby inhibiting IC 1 b (used as the most sensitive amplifier) via D 2 and enabling IC 1 a via D 1. For selective tone transmission, the transmitter tone input (terminal 5) is used while the speech path is inhibited via D 3. D 4 is used for inhibition of the modulation amplifier

while receiving in simplex mode. IC 2 a limits the AF signal prior to pre-emphasis, thereby reducing the peak deviation caused by AF signal below approximately 1 kHz. IC 2 b limits the AF signal after pre-emphasis in order to limit the overall peak deviation. Q 1 and Q 2 form an active 3 kHz low-pass filter. A variable capacitance diode in the VCO is used for modulation.

Frequency synthesizer circuit 2M dual receiver

Basic phase lock loop operation

A simple phase locked loop consists of 3 elements, a phase comparator, a filter and the VCO (Fig. 1).

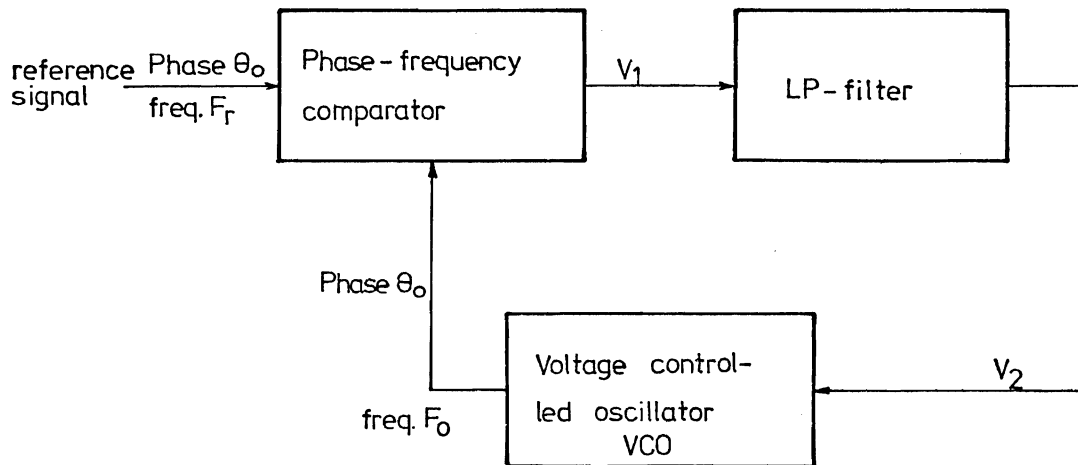


Fig.1 Basic phase locked loop.

Phase-frequency comparator

If the VCO-frequency $F_o = F_r$, the comparator gives out a DC-level proportional to the phase difference between F_o and F_r (Fig. 2). We have $V_1 = K_1 \times (\theta_r - \theta_o)$ where K_1 is a constant. When there is a frequency difference between F_o and F_r , V_1 will be low for F_o greater than F_r and high for F_o less than F_r .

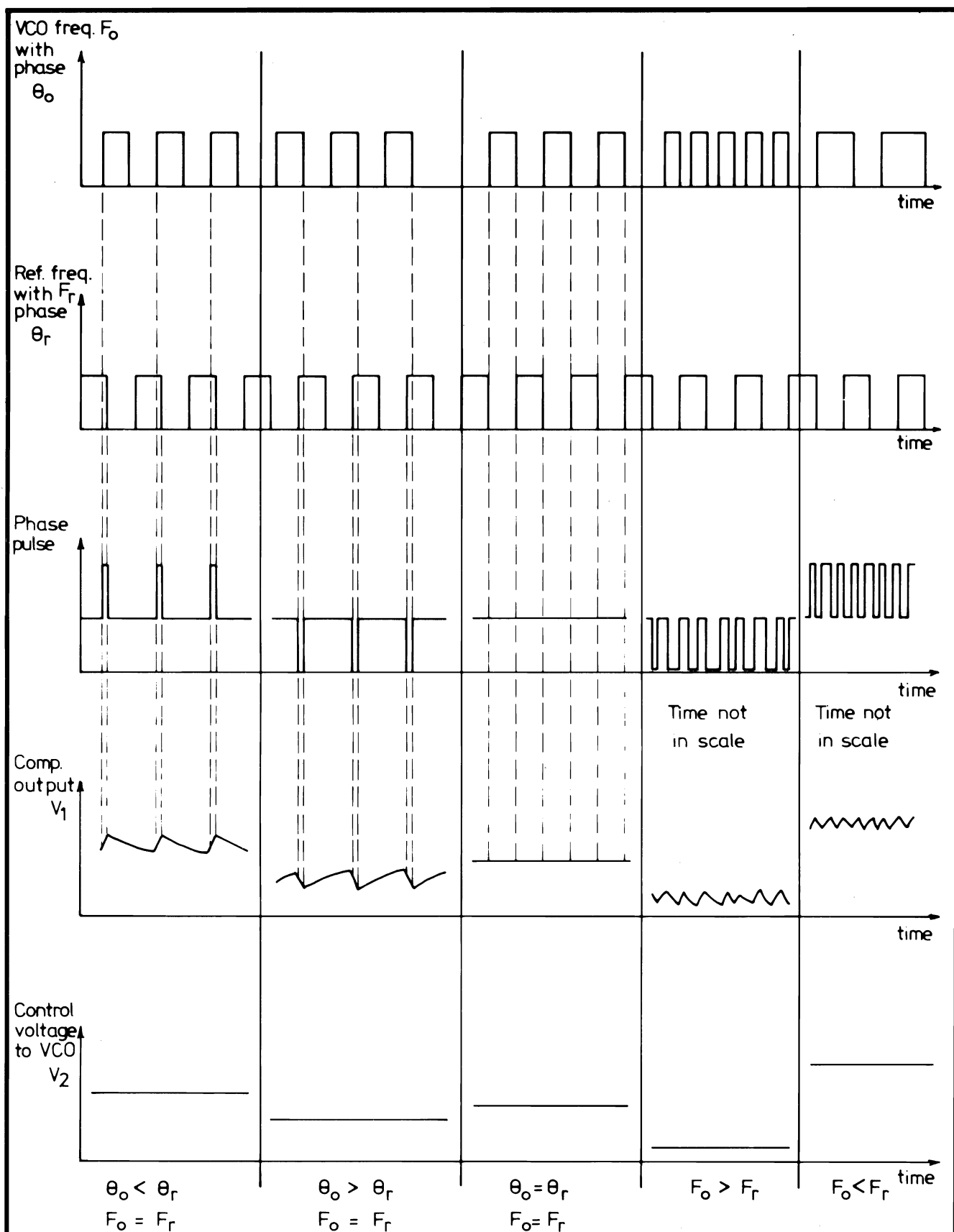
Voltage controlled oscillator

This can be a LC-oscillator whose frequency is controlled with a varicap. $F_o = K_2 \times V_1$ where K_2 is a constant.

LP-filter

This filter removes the ripple on V_1 (Fig. 2) and determines the dynamic behaviour (stability, step response) of the loop.

Let us consider a situation where the loop is out of lock and



SIMPLIFIED OPERATION of frequency and phase comparator

Fig. 2

Rettet:	Figure for synthesizer description	Tegn.: 5-12-77 H.J.	Kontr.:
		Page: 2	
		Tegn. nr.: 77410-4E2	
	AP-RADIOTELEFON ½		

F_o is greater than F_r . The comparator output voltage V_1 will contain the normal ripple with frequency F_r and a beat note, but the mean DC level ($= V_2$ after the filter) will be low (Fig. 4). Thus the VCO frequency will decrease and at the time F_o reaches F_r the loop will go in lock. Now $F_o = F_r$ and the phase difference will assume a level for V_2 sufficient to hold the VCO frequency in lock with F_r . If the tuning of the VCO is changed (such as by varying the value of the tuning capacitor) the frequency F_o from the VCO will attempt to change. This will result in a change in phase angle between F_o and F_r , resulting in a change in DC-level of V_1 which will act to maintain frequency lock. In this way tuning of the VCO will change the ripple and the DC-level on V_1 but as long as lock is maintained F_o will be equal F_r .

A multichannel synthesizer (Fig. 3)

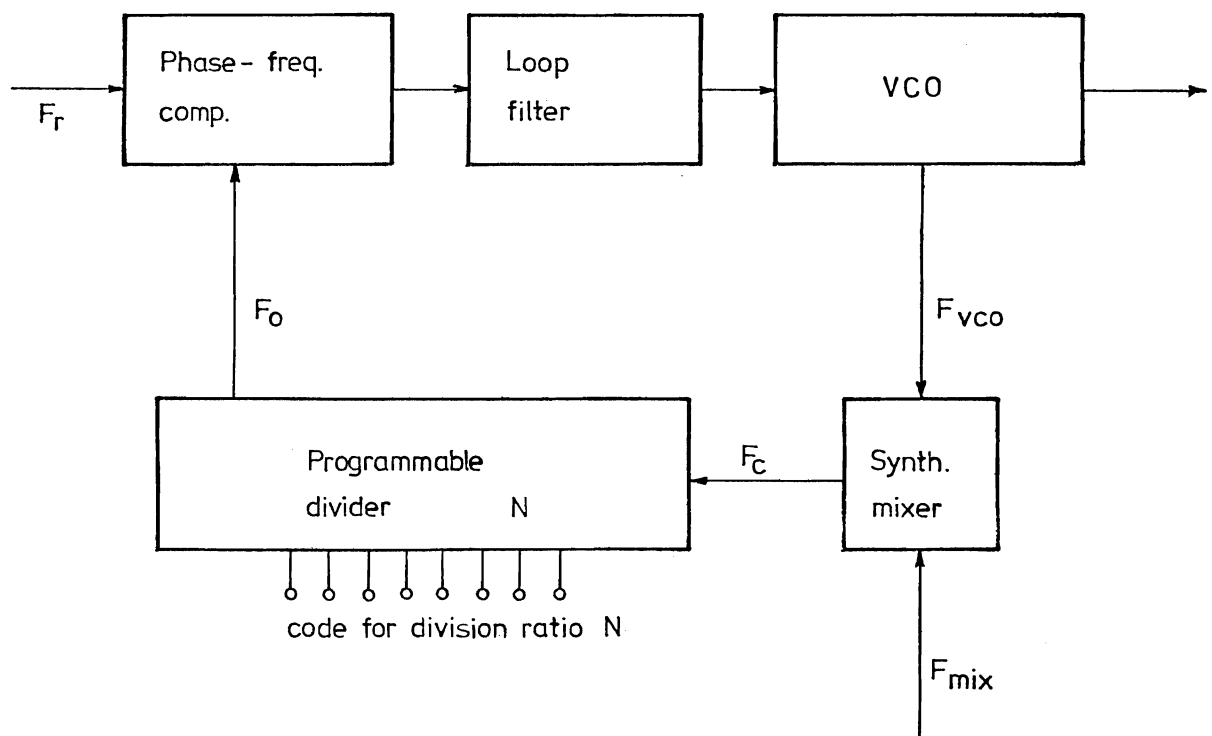


Fig. 3 Synthesizer loop

To build a multichannel synthesizer we have to add some more components (Fig. 3) but the basic function is the same. Here the VCO frequency is converted to a lower frequency F_c suitable

for the digital divider. $F_c = F_{vco} - F_{mix}$ (1). When the loop is in lock the incoming frequencies F_r and F are equal, but they can have a phase difference. $F = F_r$ (2). The programmable divider divides frequency F_c with a number N , which can be selected by a binary code. $F_c = N \times F$ (3).

Combining equations (1), (2) and (3) give

$$F_{vco} = F_{mix} + N \times F_r \quad (4).$$

By changing the division ratio N we can get a lot of VCO-frequencies with the spacing F_r , and the stability depends only on F_{mix} and F_r which can be crystal oscillators.

The synthesizer circuit in AP 2000 (Fig. 4)

Synthesizer logic (75062-3E2 25 kHz, 77201-3E2 20 kHz and 78153-3E2 12,5 kHz)

The 25, 20 or 12,5 kHz reference frequency is produced by dividing a 400, 320 or 200 kHz crystal oscillator (X 1 and Q 4) by 16 in the counter IC 6.

The input signal to the programmable divider is amplified in Q 1 and Q 2, while the two gates from IC 1 shape the waveform to narrow pulses. IC 2 and IC 3 from the programmable divider, where the division ratio N is the Binary number on the eight channel code lines. The numbers on the code lines correspond to the binary value of each line. In this way a division ratio $N = 168$ will have a channel code:

Number on code line	128	64	32	16	8	4	2	1
---------------------	-----	----	----	----	---	---	---	---

Binary value	128	64	32	16	8	4	2	1
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Code for $N = 168$	1	0	1	0	1	0	0	0
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where 0 means 0 V and 1 means + 5 V.

The two cascaded counters IC 2 and IC 3 count down from 168. When the counters reach zero a borrow pulse is generated and used to preset the number 168, thus starting a new count cycle. The very narrow borrow pulses with a repetition rate of 25, 20 or 12,5 kHz are used as input to the frequency-phase comparator IC 4. The comparator input voltage V_1 (Fig. 2) can be seen on a test point TP 1. To suppress the 25, 20 or 12,5 kHz ripple on the comparator voltage Q 3 is connected as an active lowpass filter. IC 5 is for DC-amplification.

High and low band receiving

Shift between two receiver frequency bands is obtained by moving the VCO frequency. To do this one of the two synthesizer oscillators, is selected by a switch in the front section or by coding from the channel selector. When the synthesizer oscillator is changed, the phase comparator will try lock the VCO on the new frequency. To make this possible, the tuned circuit in the VCO must be changed correspondingly by a varicap diode. In the same way all tuned circuits in the RF amplifier and mixer are changed. When keying the transmitter the high VCO frequency is always achieved, and mixed with the TX oscillator it gives the TX frequency.

Voltage controlled oscillator (77416-3E2)

The transistor Q 1 is used switch between two loop filters. When Q 1 is 'ON' the slow filter R 1, R 3 and C 2 are in function while R 1, R 2 and C 1 give the loop a fast step response for Q 1 'OFF'. The fast loop filter is only used in connection with automatic channel scanning. Diode D 1 is used to clamp the control voltage thus preventing too great VCO frequency excursions when the loop is out of lock. The frequency of oscillator Q 2 is controlled by tuning diode D 2 while diode D 3 is for modulation, and shift from high to low band. Transistors Q 3 to Q 7 make the three output buffers with ferrite core transformers L 3 to L 5.

Synthesizer oscillator and mixer (78001-2E2)

Q 1 and Q 7 are two 40 MHz oscillators with third overtone crystals X 1 and X 2, Q 4 and Q 5 are buffers with common collectors. The oscillator signal passes through TR 1 to the mixer Q 3. The signal from the VCO passes through the buffer Q 2 to the mixer, and is with the fourth harmonic of the 40 MHz to give an output signal of 3,2 - 5,2 MHz. After passing a 10 MHz low-pass filter, this signal is amplified in Q 6. Shift between osc.1 and osc.2 is achieved with pin 1. When pin 1 is open or connected to + 5 V, Q 11 is off, and Q 9 is on, and osc.2 is operating. At the same time Q 10 is off, and the voltage on pin 3 and 4 is 5 V. When pin 1 is grounded, Q 11 goes on, and Q 9 goes off, and osc. 1 is operating.

Then Q 10 is on and grounds the bottom end of R 50 and R 53, and the voltage on pin 3 and 4 can now be adjusted between 0 and 5 V. When keying the TX pin 2 goes to + 5 V, and osc.2 is operating, whatever pin 1 is grounded or not.

Channel code

From the blockschematic of the synthesizer circuit (Fig. 4) we have:

$$F_{VCO} = 4 F_x + N \times 0,025 \text{ Mc where } 128 < N < 208.$$

The VCO frequency lies 21,4 Mc above the receiver frequency leading to:

$$\text{Receiver frequency } F_{RX} = 4 F_x + N \times 0,025 - 21,4 \text{ Mc (5).}$$

Here N is the division ratio and F_x is the synthesizer mixer crystal.

1. Computation of the receiver frequency:

Known is: Crystal frequency F_x and channel code.

Example:

$$F_x = 42,05 \text{ Mc}$$

$$\text{Code : } 1 \ 0 \ 0 \ 1 \ 0 \ 0 \ 1 \ 1$$

$$\text{Division ratio } N = 128 + 16 + 2 + 1 = 147$$

Using equation (5):

$$F_{RX} = 4 \times 42,05 + (147 \times 0,025) - 21,4 = \underline{150,475 \text{ Mc.}}$$

2. Computatation of the channel code:

Known is Crystal frequency F_x and desired receiver frequency F_m .

Rearranging equation (5) gives

$$N = \frac{F_{RX} - 4 F_x + 21,4}{0,025}$$

Example ;

$$F_x = 42,05 \text{ Mc, } F_{RX} = 151,625 \text{ Mc.}$$

$$N = (151,625 - 4 \times 42,05 + 21,4) / 0,025 = 193$$

$$N = 128 + 64 + 0 + 0 + 0 + 0 + 0 + 1$$

$$\text{Channel code } \underline{1 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1}$$

Computation of the crystal frequencies, for 2m dual receiver.

X2 (High freq.) Is choosed after the crystal tabel.

$$X1 \quad (\text{Low freq.}) = X2 - \frac{F_{RX}^{\text{high}} - F_{RX}^{\text{low}}}{4}$$

$$X3 \quad (\text{TX}) = 10,7 + \frac{F_{RX}^{\text{high}} - F_{TX}}{2}$$

The channel code is calculated from X2

DIVISION RATIO AND CHANNELCODE

The division ratio N corresponds to the 8 - bit channel code in this way.

Bit number	8	7	6	5	4	3	2	1
Value of each bit	128	64	32	16	8	4	2	1
Example: channel code =	1	1	0	0	0	0	0	1
N = 193	= 128+ 64 + 0 + 0+ 0+ 0+ 0+ 1							
Logic 1 = +5 Volts. Logic 0 = 0 Volts								

Div. ratio	Channel code							
N	128	64	32	16	8	4	2	1
128	1	0	0	0	0	0	0	0
129	1	0	0	0	0	0	0	1
130	1	0	0	0	0	0	1	0
131	1	0	0	0	0	0	1	1
132	1	0	0	0	0	1	0	0
133	1	0	0	0	0	1	0	1
134	1	0	0	0	0	1	1	0
135	1	0	0	0	0	1	1	1
136	1	0	0	0	1	0	0	0
137	1	0	0	0	1	0	0	1
138	1	0	0	0	1	0	1	0
139	1	0	0	0	1	0	1	1
140	1	0	0	0	1	1	0	0
141	1	0	0	0	1	1	0	1
142	1	0	0	0	1	1	1	0
143	1	0	0	0	1	1	1	1
144	1	0	0	1	0	0	0	0
145	1	0	0	1	0	0	0	1
146	1	0	0	1	0	0	1	0
147	1	0	0	1	0	0	1	1
148	1	0	0	1	0	1	0	0
149	1	0	0	1	0	1	0	1
150	1	0	0	1	0	1	1	0
151	1	0	0	1	0	1	1	1
152	1	0	0	1	1	0	0	0
153	1	0	0	1	1	0	0	1
154	1	0	0	1	1	0	1	0
155	1	0	0	1	1	0	1	1
156	1	0	0	1	1	1	0	0
157	1	0	0	1	1	1	0	1
158	1	0	0	1	1	1	1	0
159	1	0	0	1	1	1	1	1
160	1	0	1	0	0	0	0	0
161	1	0	1	0	0	0	0	1
162	1	0	1	0	0	0	1	0
163	1	0	1	0	0	0	1	1
164	1	0	1	0	0	1	0	0
165	1	0	1	0	0	1	0	1
166	1	0	1	0	0	1	1	0
167	1	0	1	0	0	1	1	1

Div. ratio	Channel code							
N	128	64	32	16	8	4	2	1
168	1	0	1	0	1	0	0	0
169	1	0	1	0	1	0	0	1
170	1	0	1	0	1	0	1	0
171	1	0	1	0	1	0	1	1
172	1	0	1	0	1	1	0	0
173	1	0	1	0	1	1	0	1
174	1	0	1	0	1	1	1	0
175	1	0	1	0	1	1	1	1
176	1	0	1	1	0	0	0	0
177	1	0	1	1	0	0	0	1
178	1	0	1	1	0	0	1	0
179	1	0	1	1	0	0	1	1
180	1	0	1	1	0	1	0	0
181	1	0	1	1	0	1	0	1
182	1	0	1	1	0	1	1	0
183	1	0	1	1	0	1	1	1
184	1	0	1	1	1	0	0	0
185	1	0	1	1	1	0	0	1
186	1	0	1	1	1	0	1	0
187	1	0	1	1	1	0	1	1
188	1	0	1	1	1	1	0	0
189	1	0	1	1	1	1	0	1
190	1	0	1	1	1	1	1	0
191	1	0	1	1	1	1	1	1
192	1	1	0	0	0	0	0	0
193	1	1	0	0	0	0	0	1
194	1	1	0	0	0	0	1	0
195	1	1	0	0	0	0	1	1
196	1	1	0	0	0	1	0	0
197	1	1	0	0	0	1	0	1
198	1	1	0	0	0	1	1	0
199	1	1	0	0	0	1	1	1
200	1	1	0	0	1	0	0	0
201	1	1	0	0	1	0	0	1
202	1	1	0	0	1	0	1	0
203	1	1	0	0	1	0	1	1
204	1	1	0	0	1	1	0	0
205	1	1	0	0	1	1	0	1
206	1	1	0	0	1	1	1	0
207	1	1	0	0	1	1	1	1
208	1	1	0	1	0	0	0	0

1. Tuning of the synthesizer circuit

A. Synthesizer oscillators. (Print board C 05)

Set the receiver at the low frequency band and adjust L 1 to max. DC at TP 1. Approx. 3 V should be obtained with a high resistance DC voltmeter. Then set the receiver on the high frequency band and adjust L 4 to max. DC on TP 2.

B. Phase locked loop

Set the receiver at the high frequency band. If the set contains more than one channel, turn the channel selector to a channel with frequency in the middle of the used band. Check the channel code with a voltmeter on points 1,2 64, 128 on print board B 17. Computation of the channel code is contained in the technical description of the synthesizer circuit. Note that there are two type of VCO, one for the range 146-160 Mc and the other for RX-frequencies 160 - 174 Mc, and check that the right type is used for the desired frequency range. the marking is noted on the VCO-diagram. Connect the voltmeter to point 1 on the VCO print board and an oscilloscope (sensitivity 1 V/div.) to test point TP 1 on the logic print (print board B 17). Adjust the VCO trimmer until the loop goes in lock. The loop is in lock when a stable 25 kc ripple sawtooth is appearing on the scope, and the voltage on the voltmeter increases while turning the VCO trimmer clockwise. Adjust the VCO so that the loop voltage is 3 V. This loop voltage corresponds to min. 25 kc ripple on TP 1. For multi-channel sets, turn the channel selector to the lowest and highest frequency and check that the loop still goes in lock. Considering a set with the max. possible bandwidth 2 mc, the loop voltage shall lie between 2 and 4 going from the lowest channel to the highest in such a manner that increasing voltage corresponds to increasing frequency.

Set the receiver at the low frequency band by the high-low switch, or by grounding pin 1 on print board C 05. Adjust R 50 on print board C 05 to exact same voltage at pin 1 in the VCO, as when the frequency was high.

C. RX-frequency

Select the mid-frequency channel and connect a 200 Mc counter to the VCO-output point 5. The reading will be RX frequency + 21,4 Mc and for fine tuning of the RX-frequency, use coil L 2 on synthesizer mixer print board C 05 for the low frequency band, and L 3 for the high frequency band.

2. Tuning of the receiver

A. 21,4 Mc and 455 kc IF (print board B 01)

Connect a 21,4 Mc and 455 sweep generator (a 10,7 Mc sweep generator normally contains sufficient second harmonics to be used on 21,4 Mc) to point TP on the RF and mixer print board B 101 and the (DC) probe on point TP 1 on the IF print board B 01. Adjust L 6 (print board C 01 and L 1 (print board B 01) for minimum ripple. L2 is tuned to max. amplitude while L 3 is tuned to best possible symmetry. Use the lowest possible input level to prevent limiting in the mixer. Connect the probe to the AF output from the detector (a suitable point is pin 1 on the ampl. print B 09) and adjust L 4 in IF to max. discriminator slope and the best linearity.

B. RF amplifier and mixer (Print board C 01)

Set the receiver at the high frequency band, and adjust C 15 and C 19 for max DC at TP 2 (approx 1 V). With signalgenerator to the receiver input, adjust C 3, C 4, C 9, C 13 and C 16 to give optimum sensisivity. Now set the receiver at the low frequency band, and with signal generator at the new frequency, adjust R 53 on print board C 05 for optimum sensisivity.

C. AF-amplifier, squelch and key circuit (print board B 09)

Adjust the output level for the handset earpiece to 60 mV with potmeter R 31. (3,5 kc dev., 1 kc modulation.)

Alternative method for tuning of RX front IF without
a sweep generator

Adjust C 17 and C 18 as desired under 'B'. Connect the RF-signal generator output TP 1 in the RF-amplifier and use the horizontal deflection voltage from an oscilloscope for modulation (FM) of the generator. Now the IF can be tuned as previously described. By connecting the signal generator output to the aerial input, all the capacitors in the RF-amplifier and mixer can be tuned to max. deflection with the probe on TP 1 in the IF amplifier.

3. Tuning of the transmitter

A. Transmitter mixer and amplifier (print board B 07)

The transmitter shall be keyed. The oscillator injection to the transmitter mixer is tuned with L 1 (print board B 07) to max. DC-voltage on TP 1. Turn the capacitors C 2, C 6, C 11, C13 and C 18 to max. Capacitance. Connect the voltmeter to the can of transistor Q 2 (can is connected to emitter) and tune C 2 and C6 to max. reading. Remove the cable from the transmitter-amplifier output (pin 4) and replace it with a wattmeter (50 ohms, range 1 W). Now tune C 11, C13 and C18 and readjust C 2 and C 6 to get max. output power (approx. 150 mW). When X-tal = 10,7 MHz, C 24 is removed. When X-tal > 10,7 MHz, C 22 is removed. When X-tal < 10,7 MHz, both capacitors are used.

B. 6 W PA-stage (print board B 06)

Turn the potmeter R 1 (print board B 57) counter-clockwise to get the output power stabilization out of function. connect a wattmeter (50 Ω , 10 or 50 W) to the test installation output and set the supply voltage to 12,0 V. Now tune all the trimmers in the PA-stage to max. output power and finish with a fine adjustment of C 18 on the transmitter amplifier print B 07. Increase the supply voltage to 13,2 V and turn the potmeter R 1 clockwise until the output power decreases to the desired value.

C. 10-25 W PA-stage (print board B 79)

Turn the potmeter R 1 (print board B 57) counterclockwise to get the power stabilization out of function. Now connect a RF-wattmeter (50 ohm - 50 W) to get transmitter output, and set the supply voltage to 12,0 V. Now tune all the trimmers in the PA-stage to max. output power and finish with a fine adjustment of C 18 on the transmitter amplifier (print board B 07). Then turn the potmeter R 1 clockwise until the output power is decreased to the desired value.

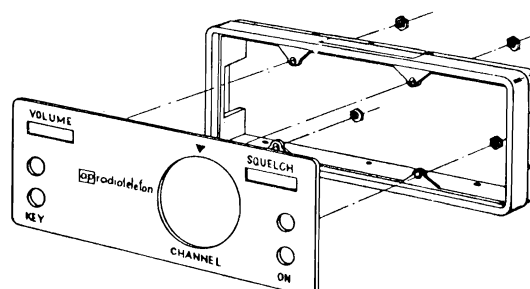
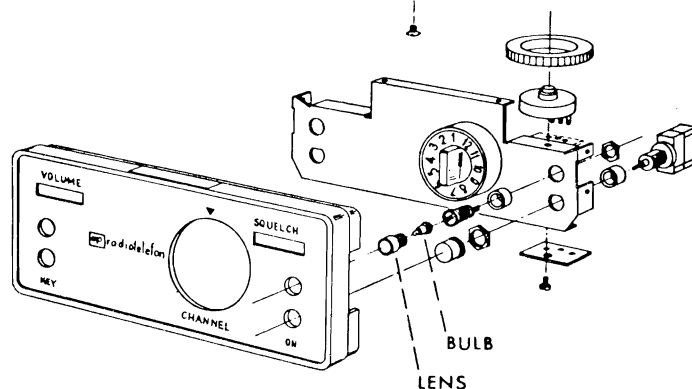
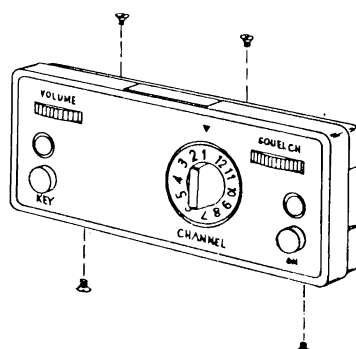
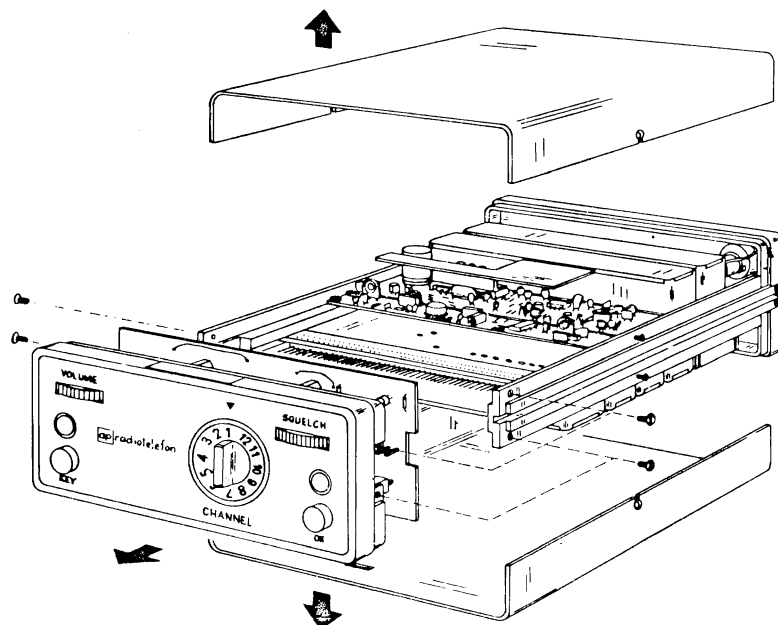
D. Transmitter frequency

Connect a frequency counter to a wattmeter with attenuated output and adjust the transmitter frequency with the capacitor C 29 in the Tx-oscillator (print board B 11).

E. Modulation amplifier (print board C 61)

Connect a modulation meter to the transmitter and a low output impedance tone generator to microphone input 1 (terminal 1). Set all three potentiometers to their centre positions and set the tone generator to give an output level of 22 mV at 100 Hz. Adjust potentiometer R 35 to give 4,5 kHz deviation on the modulation meter. Set the tone generator output to 2,2 mV (corresponding to a sound pressure of 2,7 Pascal), and adjust potentiometer R 10 for a deviation of 2,5 kHz. Repeat the procedure to check and fine adjust R 35 and R 10 as necessary.

This covers the 25 kHz version. With respect to the 12,5 kHz version, use the same procedure but read 2,3 kHz in place of 4,5 kHz, and 1,5 kHz in place of 2,5 kHz.



Rettet: 29-11-76 H.J.

Disassembling of AP 2000

AP-RADIOTELEFON $\frac{1}{2}$

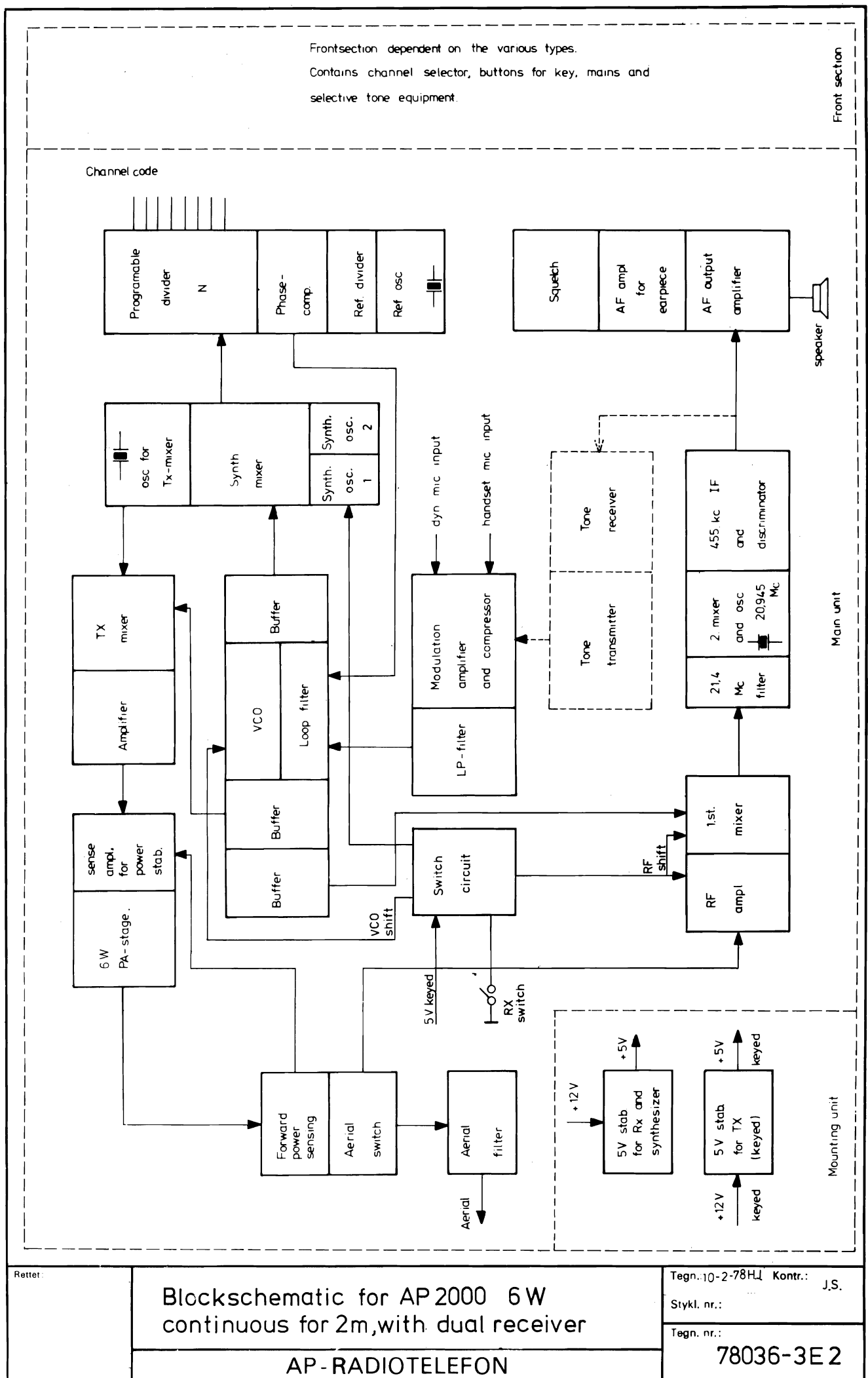
Tegn.: 10-8-76
AC

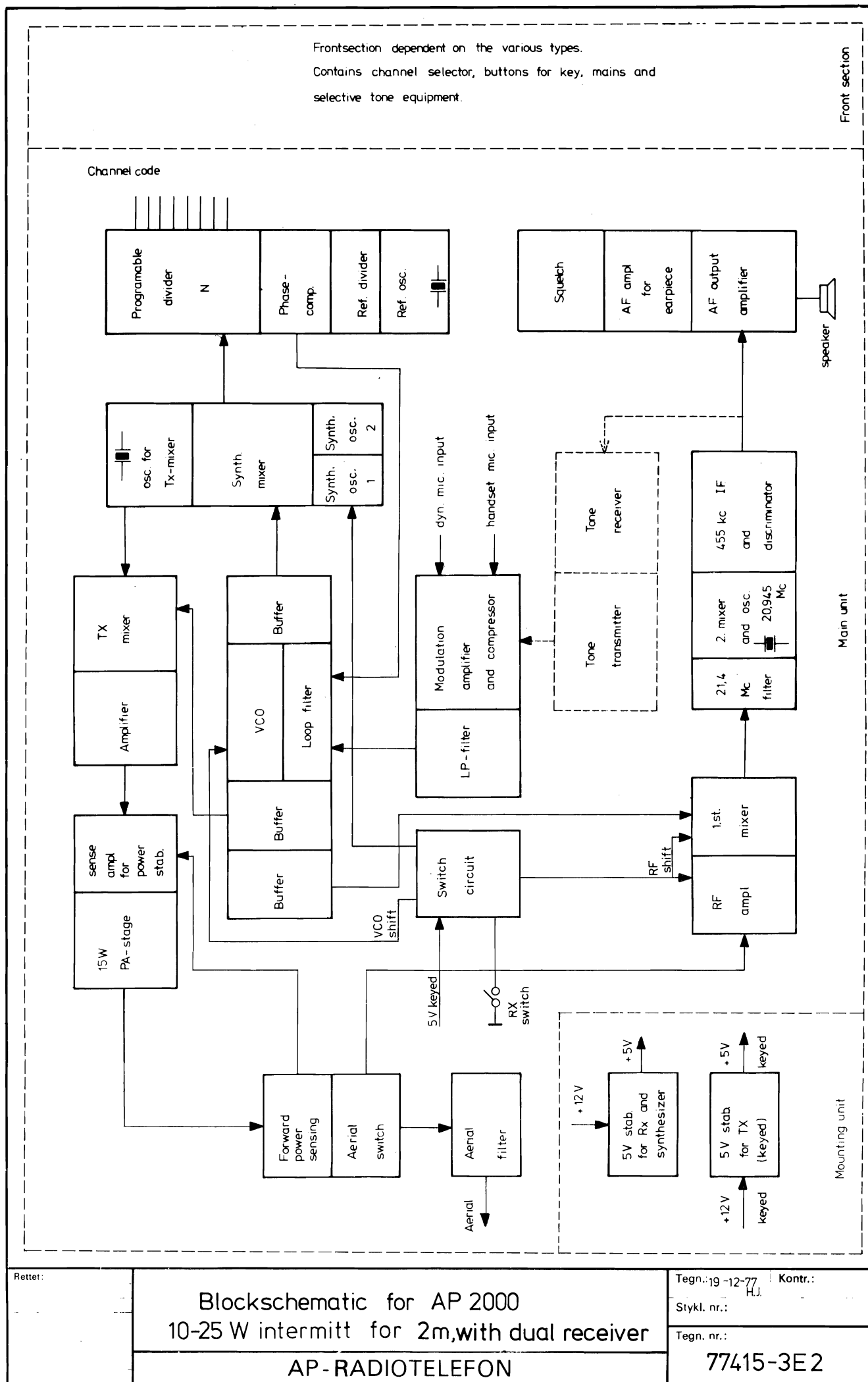
Kontr.:

Stykl. nr.:

Tegn. nr.:

76218 - 4M2





Synth. mixer x-tal Fx

SPECIFICATION

for Quartz Crystal Unit

AP 20

1. Mode of operation : 3rd overtone
2. Holder : HC-42/U
3. Frequency range : 40-48 MHz
4. Adjustment tolerance : ± 10 ppm at 25°C
5. Temperature tolerance : ± 10 ppm $\%$ 20°C to + 70°C
6. Drive level : 1 mW
7. Load : 0,5 μ H
8. Shunt capacitance (C_o) : 5 pF max.
9. Equivalent series resistance : 40 Ω max.
10. Marking : AP 20 frequency in MHz

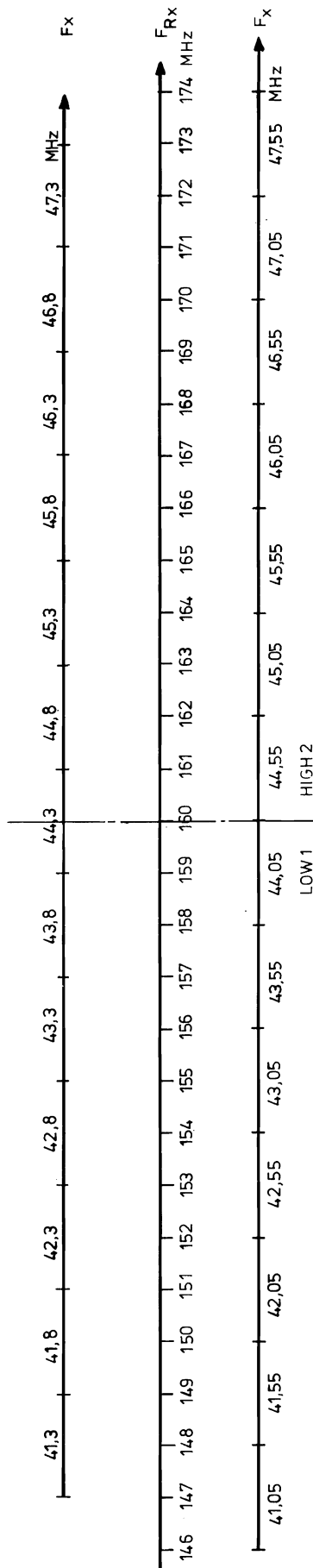
Calculation of the division ratio N

$$N = \frac{F_{Rx} - 4 F_x + 21,4}{0,025}$$

Example:

$$F_x = 42,05 \text{ MHz}, F_{Rx} = 151,625 \text{ MHz}$$

$$N = \frac{(151,625 - 4 \times 42,05 + 21,4)}{0,025} = 193$$



SPECIFICATION

for Quartz Crystal Unit

AP 22

Transmitter mixer oscillator

1. Mode of operation : AT-Fundamental
2. Holder : HC-42/U
3. Frequency range : 10-22 MHz
4. Resonance : Parallel (30 pF)
5. Calibration tolerance : ± 15 ppm at 25°C
6. Temperature tolerance : ± 10 ppm $\%$ 20°C to + 70°C
7. Drive level : 1 mW
8. Equivalent serie resistance : Max. 40 Ω
9. Marking : AP 22 frequency in MHz

Calculation of the crystal frequency for the transmitter mixer oscillator

$$F_{Tx \text{ mix}} = 10,7 + \frac{F_{Rx} - F_{Tx}}{2} \text{ Spec. AP 22}$$

Normal mode of operation: F_{Rx} higher than or equal to F_{Tx} . However F_{Rx} can be lower than F_{Tx} if $F_{Tx} - F_{Rx}$ is less than 5 MHz.

Rettet:

14-2-77 NC
27-11-79 MO/AMC

Standard crystals for M/AP 2000 2m band
low range: 1, high: 2
For channel frequencies ending with
00, 25, 50, 75 kHz

AP-RADIOTELEFON $\%$

Tegn.: 16-5-75
AC

Stykl. nr.:

Kontr.:

Tegn. nr.:

75237-4E2

Synth. mixer x-tal Fx

SPECIFICATION for Quartz Crystal Unit

AP 20

1. Mode of operation : 3rd overtone
2. Holder : HC-42/U
3. Frequency range : 40-48 MHz
4. Adjustment tolerance : ± 10 ppm at 25°C
5. Temperature tolerance : ± 10 ppm $\times 20^\circ\text{C}$ to $+ 70^\circ\text{C}$
6. Drive level : 1 mW
7. Load : 0,5 μH
8. Shunt capacitance (C_0) : 5 pF max.
9. Equivalent series resistance : 40 Ω max.
10. Marking : AP 20 frequency in MHz

Calculation of the division ratio N

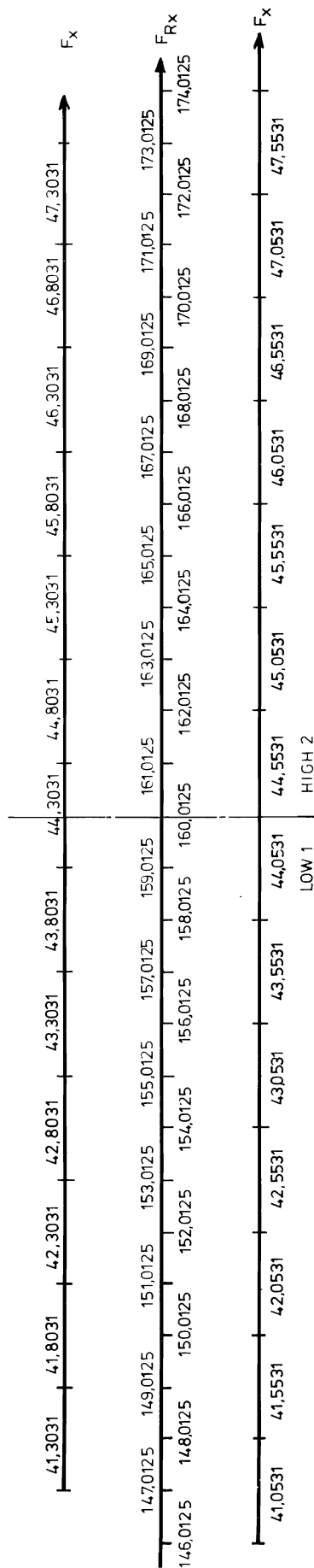
$$N = \frac{F_{Rx} - 4 F_x + 21,4}{0,025}$$

Example:

$$F_x = 42,0531 \text{ MHz}, F_{Rx} = 151,6375$$

$$N = \frac{(151,6375 - 4 \times 42,0531 + 21,4)}{0,025} = 193,004$$

$$N = 193$$



Transmitter mixer osc.

SPECIFICATION for Quartz Crystal Unit

AP 22

1. Mode of operation : AT-Fundamental
2. Holder : HC-42/U
3. Frequency range : 10-22 MHz
4. Resonance : Parallel (30 pF)
5. Calibration tolerance : ± 15 ppm at 25°C
6. Temperature tolerance : ± 10 ppm $\times 20^\circ\text{C}$ to $+ 70^\circ\text{C}$
7. Drive level : 1 mW
8. Equivalent series resistance : Max. 40 Ω
9. Marking : AP 22 frequency in MHz

Calculation of the crystal frequency for the transmitter mixer oscillator

$$F_{Tx \text{ mix}} = 10,7 + \frac{F_{Rx} - F_{Tx}}{2} \quad \text{Spec. AP 22}$$

Normal mode of operation: F_{Rx} higher than or equal to F_{Tx} however F_{Rx} can be lower than F_{Tx} if $F_{Tx} - F_{Rx}$ is less than 5 MHz.

Rettet:

14-2-77 NC

Standard crystals for AP 2000 2m band
low range: 1, high: 2
For channel frequencies ending with
12,5, 375, 625, 875 kHz

AP-RADIOTELEFON %

Tegn.: 31-1 - 77
AC

Kontr.:

Stykl. nr.:

Tegn. nr.:

77078 - 4E2

Synth. mixer x-tal Fx

SPECIFICATION for Quartz Crystal Unit AP 20

1. Mode of operation : 3rd overtone
2. Holder : HC-42/U
3. Frequency range : 40-48 MHz
4. Adjustment tolerance : ± 10 ppm at 25°C
5. Temperature tolerance : ± 10 ppm $\times 20^\circ\text{C}$ to $+ 70^\circ\text{C}$
6. Drive level : 1 mW
7. Load : 0,5 μH
8. Shunt capacitance (C_o) : 5 pF max.
9. Equivalent series resistance : 40 Ω max.
10. Marking : AP 20 frequency in MHz

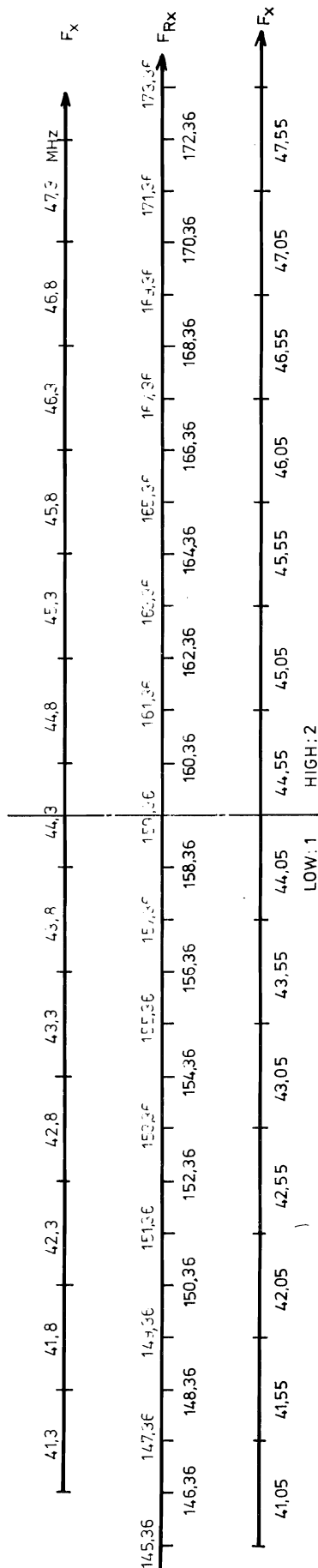
Calculation of the division ratio N

$$N = \frac{F_{Rx} - 4 F_x}{0,02}$$

Example:

$$F_x = 42,05 \text{ MHz}, F_{Rx} = 150,660 \text{ MHz}$$

$$N = \frac{(150,66 - 4 \times 42,05 + 21,4)}{0,02} = 193$$



Transmitter mixer osc.

SPECIFICATION for Quartz Crystal Unit AP 22

1. Mode of operation : AT-Fundamental
2. Holder : HC-42/U
3. Frequency range : 10-22 MHz
4. Resonance : Parallel (30 pF)
5. Calibration tolerance : ± 15 ppm at 25°C
6. Temperature tolerance : ± 10 ppm $\times 20^\circ\text{C}$ to $+ 70^\circ\text{C}$
7. Drive level : 1 mW
8. Equivalent serie resistance : Max. 40 Ω
9. Marking : AP 22 frequency in MHz

Calculation of the crystal frequency for the transmitter mixer oscillator

$$F_{Tx \text{ mix}} = 10,7 + \frac{F_{Rx} - F_{Tx}}{2} \quad \text{Spec. AP 22}$$

Normal mode of operation: F_{Rx} higher than or equal to F_{Tx} however F_{Rx} can be lower than F_{Tx} if $F_{Tx} - F_{Rx}$ is less than 5 MHz.

Rettet:

14-2-77 NC

Standard crystals for AP2000 2m band
low range : 1, high:2
For channel frequencies ending with
00,20,40,60,80..... kHz

AP-RADIOTELEFON %

Tegn.: 31-1-77
AC

Kontr.:

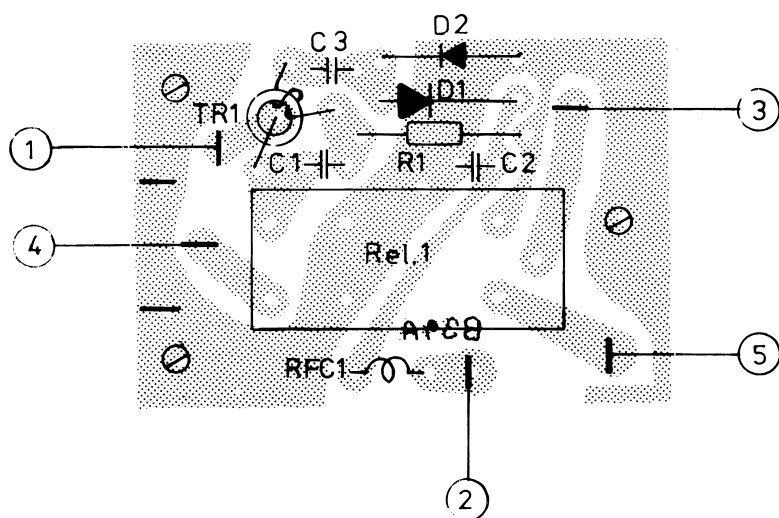
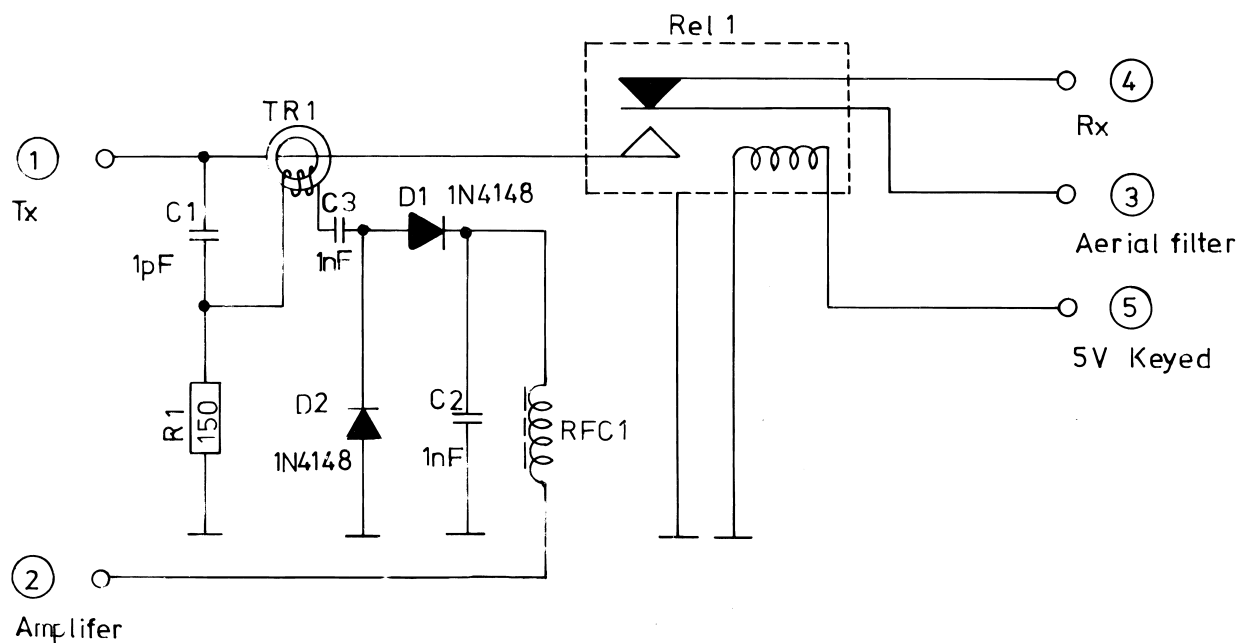
Stykl. nr.:

Tegn. nr.:

77077-4E2

<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;"><u>SPECIFICATION</u> for Quartz Crystal Unit</p> <p style="text-align: center;"><u>AP 20</u></p> <ol style="list-style-type: none"> 1. Mode of operation : 3rd overtone 2. Holder : HC-42/U 3. Frequency range : 40-48 MHz 4. Adjustment tolerance : ± 10 ppm at 25°C 5. Temperature tolerance : ± 10 ppm % 20°C to + 70°C 6. Drive level : 1 mW 7. Load : 0,5 μH 8. Shunt capacitance (C_0) : 5 pF max. 9. Equivalent series resistance : 40 Ω max. 10. Marking : AP 20 frequency in MHz </div> <div style="width: 50%; text-align: center;"> <p><u>Synth.mixer x-tal F_x</u></p> <p>20 kHz Channel spacing</p> </div> </div>	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;"><u>SPECIFICATION</u> for Quartz Crystal Unit</p> <p style="text-align: center;"><u>AP 22</u></p> <ol style="list-style-type: none"> 1. Mode of operation : AT-Fundamental 2. Holder : HC-42/U 3. Frequency range : 10-22 MHz 4. Resonance : Parallel (30 pF) 5. Calibration tolerance : ± 15 ppm at 25°C 6. Temperature tolerance : ± 10 ppm % 20°C to + 70°C 7. Drive level : 1 mW 8. Equivalent serie resistance : Max. 40 Ω 9. Marking : AP 22 frequency in MHz </div> <div style="width: 50%; text-align: center;"> <p><u>Transmitter mixer osc.</u></p> <p>20 kHz Channel spacing</p> </div> </div>	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Calculation of the division ratio N</p> $N = \frac{F_{Rx} - 4 F_x + 21,4}{0,02}$ <p>Example:</p> $F_x = 42,05 \text{ MHz}, F_{Rx} = 150,660 \text{ MHz}$ $N = \frac{(150,66 - 4 \times 42,05 + 21,4)}{0,02} = 193$ </div> <div style="width: 50%; text-align: center;"> <p>Calculation of the crystal frequency for the transmitter mixer oscillator</p> $F_{Tx \text{ mix}} = 10,7 + \frac{F_{Rx} - F_{Tx}}{2} \quad \text{Spec. AP 22}$ <p>Normal mode of operation: F_{Rx} higher than or equal to F_{Tx} however F_{Rx} can be lower than F_{Tx} if $F_{Tx} - F_{Rx}$ is less than 5 MHz.</p> </div> </div>	

<p>Rettet:</p>	<p>Standard crystals for AP2000 2m band low range : 1, high : 2 For channel frequencies ending with 10,30,50,70,90 kHz</p>	<p>Tegn.: 23-5-77 HJ</p> <p>Stykl. nr.:</p>	<p>Kontr.:</p>
<p>AP-RADIOTELEFON %</p>		<p>Tegn. nr.: 77193- 4E 2</p>	



Rettet: 5-5-77 HJ.
2-10-79 BJ/BC

Aerial switch for 2m internal PA

Tegn.: 2-7-75
EH

Kontr.:

Print board B 39B 1

Stykl. nr.:

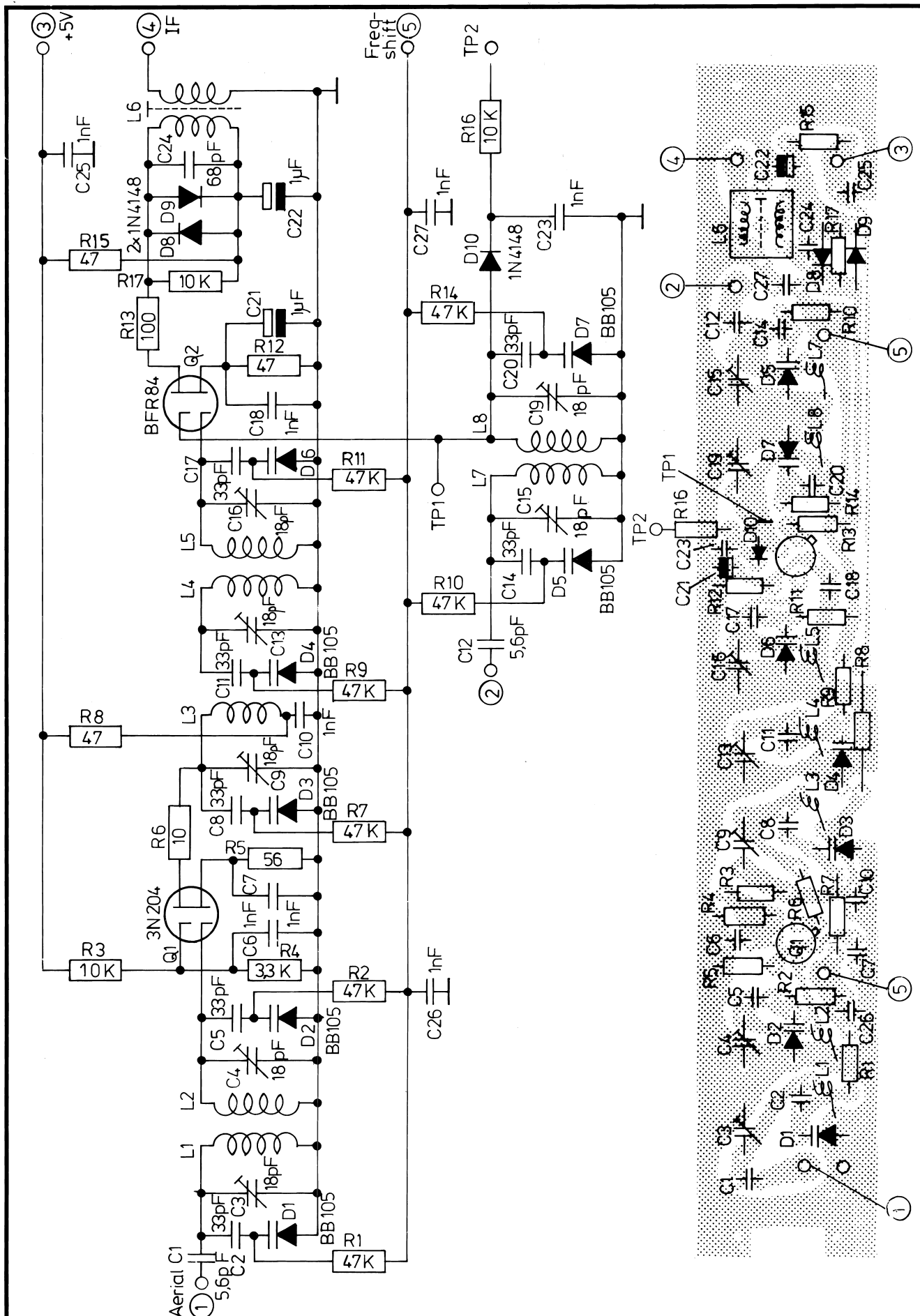
AP-RADIOTELEFON 1/5

Tegn. nr.:

75011 - 4E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-402	150 Ω $\frac{1}{4}$ W CR 25			
C1	11-361	1 pF Ker.			
C2	11-409	1 nF "			
C3	11-409	1 nF "			
D1	04-062	1N4148			
D2	04-062	1N4148			
TR1		75332-4E2			
RFC- 1		75290-4E2			
RE 1	17-059	AE 5612-02, RS-6V National			
Aerial switch for 2 m internal PA Print board B 39B1 Tilhører tegn. nr.: 75011-4E2			Rettet:		Tegn.: Kontr.:
					Stykl. nr.: 75011-4S2



Rettet:

RF-amplifier and mixer
Print board C01A1

AP-RADIOTELEFON ½

Tegn.: 12-12-77
AC

Kontr.:

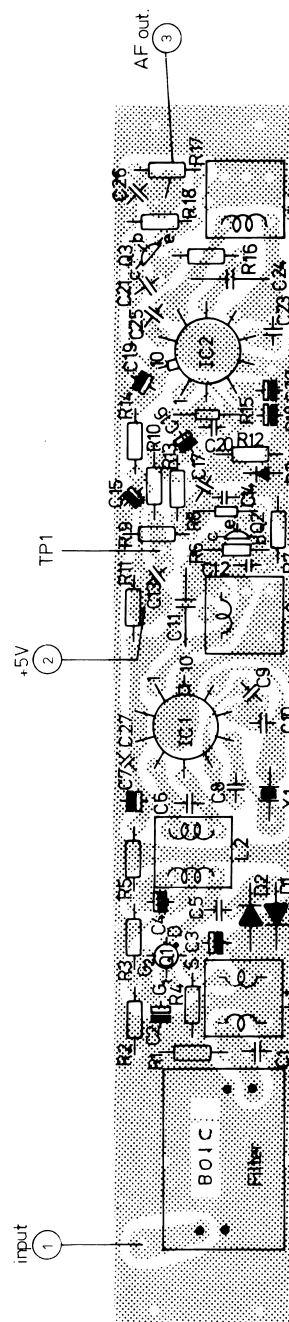
Stykl. nr.:

Tegn. nr.:

77413-4E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-302	47 K Ω 1/8W CR16	C20	11-390	33 pF ker.
R2	13-302	47 K Ω " "	C21	11-502	1 μ F/35V tant.
R3	13-295	10 K Ω " "	C22	11-502	1 μ F/35V "
R4	13-283	3,3 K Ω " "	C23	11-409	1 nF ker.
R5	13-268	56 Ω " "	C24	11-397	68 pF "
R6	13-259	10 Ω " "	C25	11-409	1 nF "
R7	13-302	47 K Ω " "	C26	11-409	1 nF "
R8	13-267	47 Ω " "	C27	11-409	1 nF "
R9	13-302	47 K Ω " "			
R10	13-302	47 K Ω " "	D1	04-009	BB 105G
R11	13-302	47 K Ω " "	D2	04-009	BB 105G
R12	13-267	47 Ω " "	D3	04-009	BB 105G
R13	13-271	100 Ω " "	D4	04-009	BB 105G
R14	13-302	47 K Ω " "	D5	04-009	BB 105G
R15	13-267	47 Ω " "	D6	04-009	BB 105G
R16	13-295	10 K Ω " "	D7	04-009	BB 105G
R17	13-295	10 K Ω " "	D8	04-062	1N4148
			D9	04-062	1N4148
C1	11-372	5,6 pF ker.	D10	04-062	1N4148
C2	11-390	33 pF "			
C3	19-330	18 pF trim.	Q1	19-185	3N 204
C4	19-330	18 pF trim.	Q2	19-118	BFR 84
C5	11-390	33 pF ker.			
C6	11-409	1 nF "	L1		75329-4E2
C7	11-409	1 nF ker.	L2		75329-4E2
C8	11-390	33 pF "	L3		75329-4E2
C9	19-330	18 pF trim.	L4		75329-4E2
C10	11-409	1 nF ker.	L5		75329-4E2
C11	11-390	33 pF "	L6		76222-4E2
C12	11-372	5,6 pF NPO "	L7	75328-4E2	75328-4E2
C13	19-330	18 pF trim.	L8		75328-4E2
C14	11-390	33 pF ker.			
C15	19-330	18 pF trim.			
C16	19-330	18 pF "			
C17	11-390	33 pF ker.			
C18	11-409	1 nF "			
C19	19-330	18 pF trim.			
RF-amplifier and mixer Print board C 01 A1 Tilhører tegn. nr.: 77413-4E2			Rettet:		<div>Tegn.: AMC</div> <div>Kont.: JH</div>
					Stykl. nr.: 77413-4S2

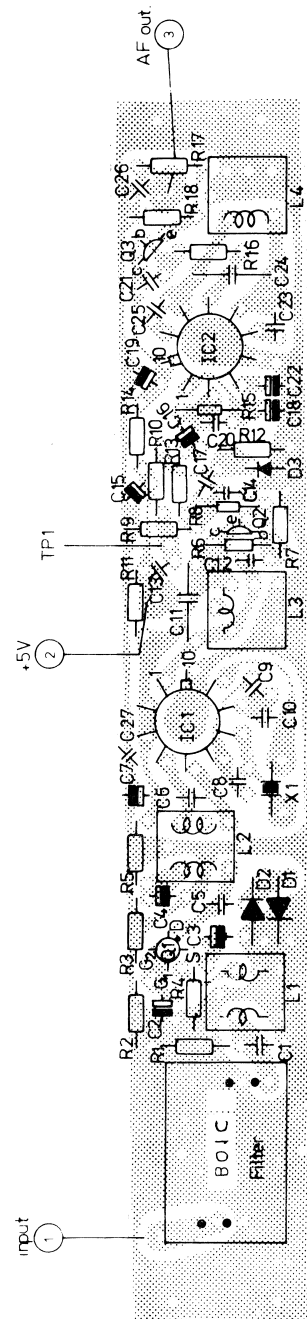


Printno.	kHz	X 2
B01C1	25	11-854
B01C3	20	11-857

75076 - 3E2

AP-RADIOTELEFON

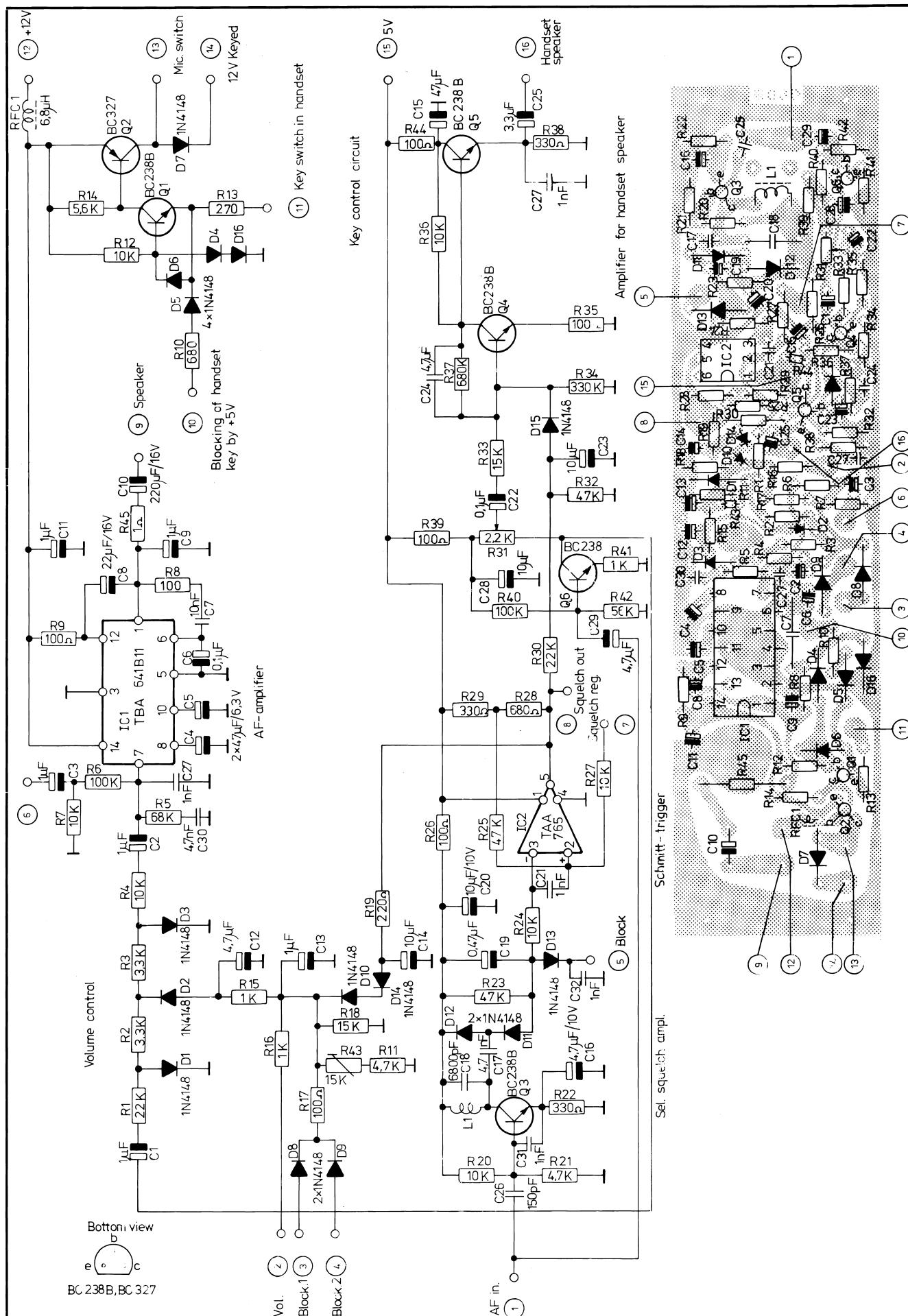
Nr.	Kode	Data	Nr.	Kode	Data
R1	13-290	3,9 KΩ 1/8W CR 16	C19	11-504	4,7 μF/10V Tant.
R2	13-302	47 KΩ " "	C20	11-409	1 nF Ker.
R3	13-302	47 KΩ " "	C21	11-416	4,7 nF "
R4	13-272	120 Ω " "	C22	11-504	4,7 μF/10V Tant.
R5	13-263	22 Ω " "	C23	11-404	150 pF Ker.
R6	13-295	10 KΩ " "	C24	11-461	2,2 nF MKM
R7	13-295	10 KΩ " "	C25	11-404	150 pF Ker.
R8	13-271	100 Ω " "	C26	11-416	4,7 nF "
R9	13-279	470 Ω " "	C27	11-409	1 nF "
R10	13-295	10 KΩ " "	D1	04-062	1N4148
R11	13-267	47 Ω " "	D2	04-062	1N4148
R12	13-306	100 KΩ " "	D3	04-036	0A90
R13	13-271	100 Ω " "			
R14	13-267	47 Ω " "	Q1	19-128	40673
R15	13-279	470 Ω " "	Q2	19-104	BF199
R16	13-263	22 Ω " "	Q3	19-093	BC238B
R17	13-281	680 Ω " "			
R18	13-289	3,3 KΩ " "	IC1	09-007	S042E
			IC2	09-006	S041E
C1	11-403	120 pF Ker.			
C2	11-504	4,7 μF/10V Tant.	L1		75282-4E2
C3	11-502	1 μF/35V "	L2		75281-4E2
C4	11-504	4,7 μF/10V "	L3		75280-4E2
C5	11-409	1 nF Ker.	L4		75279-4E2
C6	11-396	56 pF "			
C7	11-504	4,7 μF/10V Tant.	X1	11-815	AP 22 20,945 Mhz
C8	11-413	150 pF N750 Ker.	X2	11-854	21,4 Mhz
C9	11-396	56 pF Ker.	X2	11-857	21,4 Mhz
C10	11-413	150 pF N750 Ker.	RFC-	06-001	Ferritperle-
C11	11-461	2,2 nF MKM	1		Philips
C12	11-416	4,7 nF Ker.			
C13	11-416	4,7 nF "			
C14	11-409	1 nF "			
C15	11-502	1 μF/35V Tant.			
C16	11-500	0,1 μF/35V "			
C17	11-416	4,7 nF Ker.			
C18	11-504	4,7 μF/10V Tant.			
21,4 MHz IF Print B 01 C 1 and B 01 C3 Tilhører tegn. nr.: 75076-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 75076-4S2



Rettet 27-2-79 AC/6 21,4 MHz IF 12,5 kc band width Print B01C2	Tegn... 2C-10-78 BC Stykl. nr.: Tegn. nr.:	Kontr.: 78152-3E2
AP - RADIOTELEFON		

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-290	3,9 KΩ 1/8W CR 16	C19	11-504	4,7 μF/10V Tant.
R2	13-302	47 KΩ " "	C20	11-409	1 nF Ker.
R3	13-302	47 KΩ " "	C21	11-416	4,7 nF "
R4	13-272	120 Ω " "	C22	11-504	4,7 μF/10V Tant.
R5	13-263	22 Ω " "	C23	11-404	150 pF Ker.
R6	13-295	10 KΩ " "	C24	11-494	4,7 nF MKM
R7	13-295	10 KΩ " "	C25	11-404	150 pF Ker.
R8	13-271	100 Ω " "	C26	11-416	4,7 nF "
R9	13-279	470 Ω " "	C27	11-409	1 nF "
R10	13-295	10 KΩ " "	D1	04-062	1N4148
R11	13-267	47 Ω " "	D2	04-062	1N4148
R12	13-306	100 KΩ " "	D3	04-036	0A90
R13	13-271	100 Ω " "			
R14	13-267	47 Ω " "	Q1	19-128	40673
R15	13-279	470 Ω " "	Q2	19-104	BF199
R16	13-263	22 Ω " "	Q3	19-093	BC238B
R17	13-281	680 Ω " "			
R18	13-289	3,3 KΩ " "	IC1	09-007	S042E
			IC2	09-006	S041E
C1	11-403	120 pF Ker.			
C2	11-504	4,7 μF/10V Tant.	L1		75282-4E2
C3	11-502	1 μF/35V "	L2		75281-4E2
C4	11-504	4,7 μF/10V "	L3		78134-4E2
C5	11-409	1 nF Ker.	L4		78135-4E2
C6	11-396	56 pF "			
C7	11-504	4,7 μF/10V Tant.	X1	11-819	AP 22 21,1725 Mhz
C8	11-413	150 pF N750 Ker.	X2	11-856	21,4 Mhz
C9	11-396	56 pF Ker.			
C10	11-413	150 pF N750 Ker.	RFC-	06-001	Ferritperle -
C11	11-494	4,7 nF MKM			Philips
C12	11-416	4,7 nF Ker.			
C13	11-416	4,7 nF "			
C14	11-409	1 nF "			
C15	11-502	1 μF/35V Tant.			
C16	11-500	0,1 μF/35V "			
C17	11-416	4,7 nF Ker.			
C18	11-504	4,7 μF/10V Tant.			
21,4 MHz IF. 12,5 kc band width Print B 01 C2 Tilhører tegn. nr.: 78152-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div> <div>Stykl. nr.: 78152-4S2</div>



Rettet: 12-4-77 JH/AC
7-6-77 JH/AC
13-4-78 POR/AMC

AF-amplifier, squelch and key circuit
Print board B09 D 1

AP-RADIOTELEFON

Tegn.: 15-1-75
AC
Stykl. nr.:

Tegn. nr.:

75017-3E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-299	22 KΩ 1/8W CR 16	R38	13-277	330 Ω 1/8W CR 16
R2	13-289	3,3 KΩ " "	R39	13-271	100 Ω " "
R3	13-289	3,3 KΩ " "	R40	13-306	100 KΩ " "
R4	13-295	10 KΩ " "	R41	13-283	1 KΩ " "
R5	13-304	68 KΩ " "	R42	13-303	56 KΩ " "
R6	13-306	100 KΩ " "	R43	13-663	15 KΩ NTC
R7	13-295	10 KΩ " "	R44	13-271	100 Ω 1/8W CR 16
R8	13-271	100 Ω " "	R45	13-409	1 Ω 1/2W CR 37
R9	13-271	100 Ω " "	C1	11-502	1 μF/35V Tant.
R10	13-281	680 Ω " "	C2	11-502	1 μF/35V "
R11	13-291	4,7 KΩ " "	C3	11-502	1 μF/35V "
R12	13-295	10 KΩ " "	C4	11-509	47 μF/6,3V "
R13	13-276	270 Ω " "	C5	11-509	47 μF/6,3V "
R14	13-292	5,6 KΩ " "	C6	11-500	0,1 μF/35V "
R15	13-283	1 KΩ " "	C7	11-350	10 nF Laco
R16	13-283	1 KΩ " "	C8	11-507	22 μF/16V Tant.
R17	13-271	100 Ω " "	C9	11-502	1 μF/35V "
R18	13-297	15 KΩ " "	C10	05-024	220 μF/16V Elko
R19	13-275	220 Ω " "	C11	11-502	1 μF/35V Tant.
R20	13-295	10 KΩ " "	C12	11-504	4,7 μF/10V "
R21	13-291	4,7 KΩ " "	C13	11-502	1 μF/35V "
R22	13-277	330 Ω " "	C14	11-506	10 μF/25V "
R23	13-302	47 KΩ " "	C15	11-509	47 μF/6,3V "
R24	13-295	10 KΩ " "	C16	11-504	4,7 μF/10V "
R25	13-302	47 KΩ " "	C17	11-416	4,7 nF Ker.
R26	13-271	100 Ω " "	C18	11-465	6,8 nF MKH
R27	13-295	10 KΩ " "	C19	11-501	0,47 μF/35V Tant.
R28	13-281	680 Ω " "	C20	11-506	10 μF/25V "
R29	13-277	330 Ω " "	C21	11-409	1 nF Ker.
R30	13-299	22 KΩ " "	C22	11-500	0,1 μF/35V Tant.
R31	19-255	2,2 KΩ Trim.	C23	11-506	10 μF/25V "
R32	13-302	47 KΩ 1/8W CR 16	C24	11-416	4,7 nF Ker.
R33	13-297	15 KΩ " "	C25	11-519	3,3 μF/16V Tant.
R34	13-310	330 KΩ " "	C26	11-404	150 pF Ker.
R35	13-271	100 Ω " "	C27	11-409	1 nF "
R36	13-295	10 KΩ " "	C28	11-506	10 μF/25V Tant.
R37	13-311	680 KΩ " "	C29	11-504	4,7 μF/10V "

AF-amplifier, squelch and key circuit
 Print board B 09 D 1
 Tilhører tegn. nr.: 75017-3E2

Tegn.:

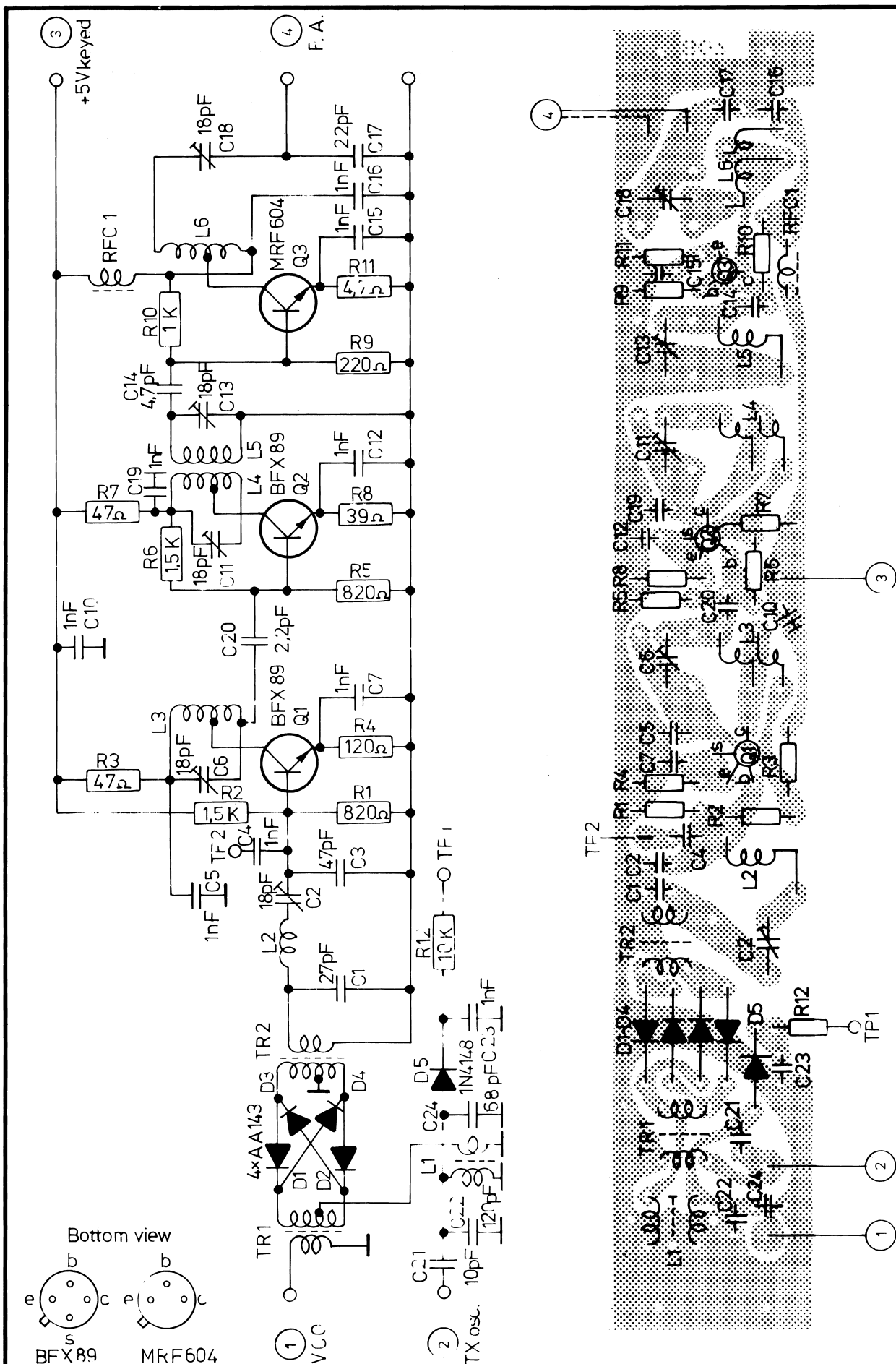
Stykl. nr.:

Kontr.:

75017-4S2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
C30	11-416	4,7 nF ker.			
C31	11-409	1 nF "			
C32	11-409	1 nF "			
D1	04-062	1N4148			
D2	04-062	1N4148			
D3	04-062	1N4148			
D4	04-062	1N4148			
D5	04-062	1N4148			
D6	04-062	1N4148			
D7	04-062	1N4148			
D8	04-062	1N4148			
D9	04-062	1N4148			
D10	04-062	1N4148			
D11	04-062	1N4148			
D12	04-062	1N4148			
D13	04-062	1N4148			
D14	04-062	1N4148			
D15	04-062	1N4148			
D16	04-062	1N4148			
Q1	19-093	BC 238B			
Q2	19-095	BC 327			
Q3	19-093	BC 238B			
Q4	19-093	BC 238B			
Q5	19-093	BC 238B			
Q6	19-093	BC 238B			
IC1	09-004	TBA 641B11			
IC2	09-003	TAA 765A			
RFC 1	04-114	74016-4E2 drossel			
L1		75295-4E2			
AF-amplifier, squelch and key circuit. Print board B 09 D1 Tilhører tegn. nr.: 75017-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 75017-4S2



Rettet: 8-5-78 JH/AC
18-5-79 BJ/AC

Transmitter mixer and amplifier 2 in.
Print board B07 D 1

AP-RADIOTELEFON ½

Tegn.: 7-1-75
AC

Kontr.:

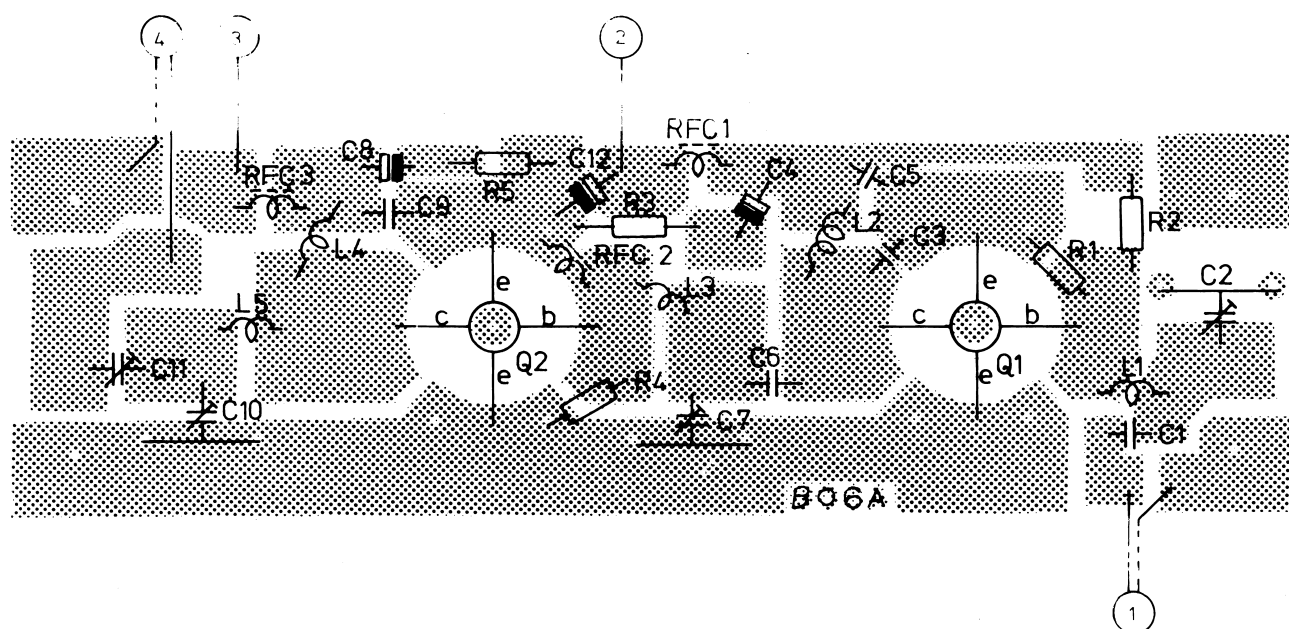
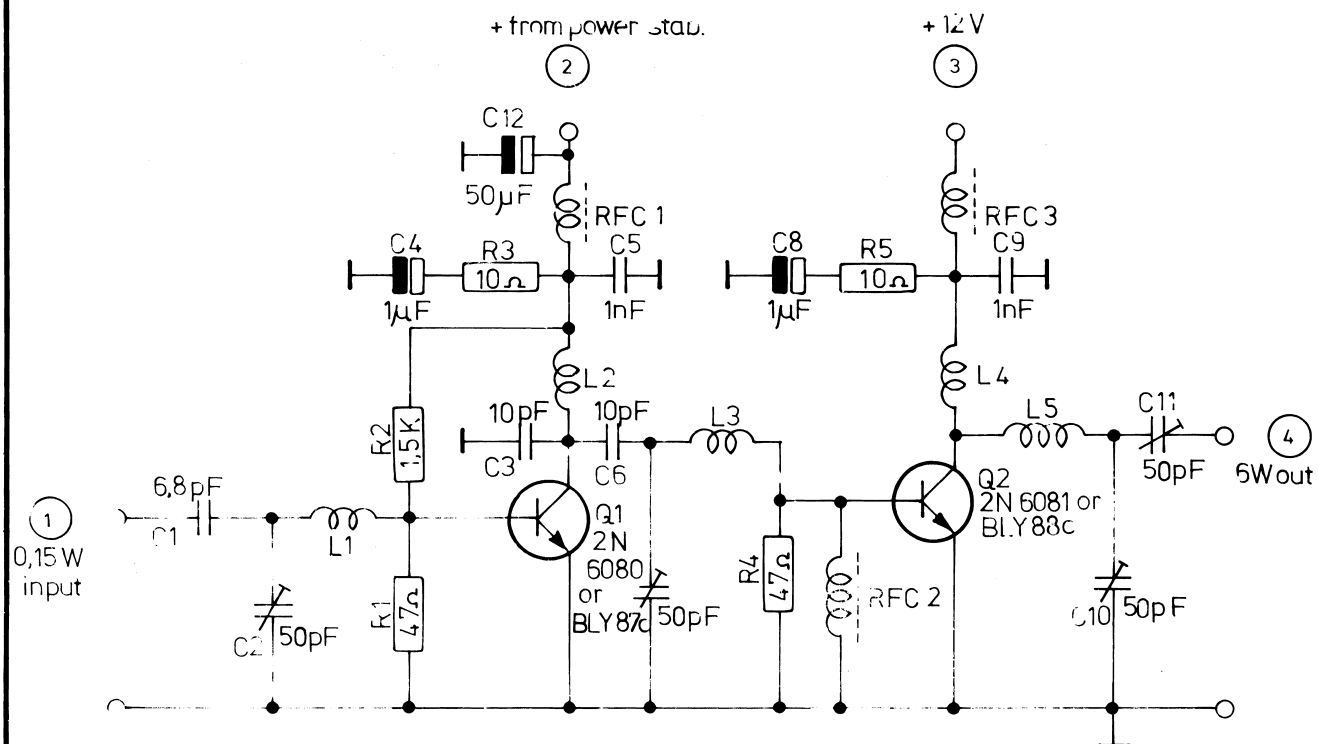
Stykl. nr.:

Tegn. nr.:

75014-4E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-282	820 Ω 1/8W CR 16	D1	04-003	AA143
R2	13-285	1,5 K Ω " "	D2	04-003	AA143
R3	13-267	47 Ω " "	D3	04-003	AA143
R4	13-272	120 Ω " "	D4	04-003	AA143
R5	13-282	820 Ω " "	D5	04-062	1N4148
R6	13-285	1,5 K Ω " "			
R7	13-267	47 Ω " "	Q1	19-102	BFX89
R8	13-266	39 Ω " "	Q2	19-102	BFX89
R9	13-275	220 Ω " "	Q3	19-124	MRF 604
R10	13-283	1 K Ω " "			
R11	13-257	4,7 Ω " "	RFC1		75290-4E2
R12	13-382	10 K Ω " "			
			TR1		75289-4E2
C1	11-388	27 pF Ker.	TR2		75289-4E2
C2	19-330	18 pF Trim.			
C3	11-394	47 pF Ker.	L1		75517-4E2
C4	11-409	1 nF "	L2		75327-4E2
C5	11-409	1 nF "	L3		75323+75325-4E2
C6	19-330	18 pF Trim.	L4		75323+75325-4E2
C7	11-409	1 nF Ker.	L5		75326-4E2
C8			L6		75323+75324-4E2
C9					
C10	11-409	1 nF Ker.			
C11	19-330	18 pF Trim.			
C12	11-409	1 nF Ker.			
C13	19-330	18 pF Trim.			
C14	11-368	4,7 pF Ker.			
C15	11-409	1 nF "			
C16	11-409	1 nF "			
C17	11-385	22 pF "			
C18	19-330	18 pF Trim.			
C19	11-409	1 nF Ker.			
C20	11-363	2,2 pF "			
C21	11-376	10 pF "			
C22	11-403	120 pF "			
C23	11-409	1 nF "			
C24	11-397	68 "			
Tranmitter mixer and amplifier Print board B 07 D 1 Tilhører tegn. nr.: 75014-4E2			Rettet:		<div>Tegn.:</div> <div>Stykl. nr.:</div>
					<div>Kontr.:</div> <div>75014-4S2</div>



Rettet: 23-8-79 AC

6 W PA-stage for 2 m

Print board B06 A 1

AP-RADIOTELEFON 1/2

Tegn.: 6-1-75
AC

Kontr.:

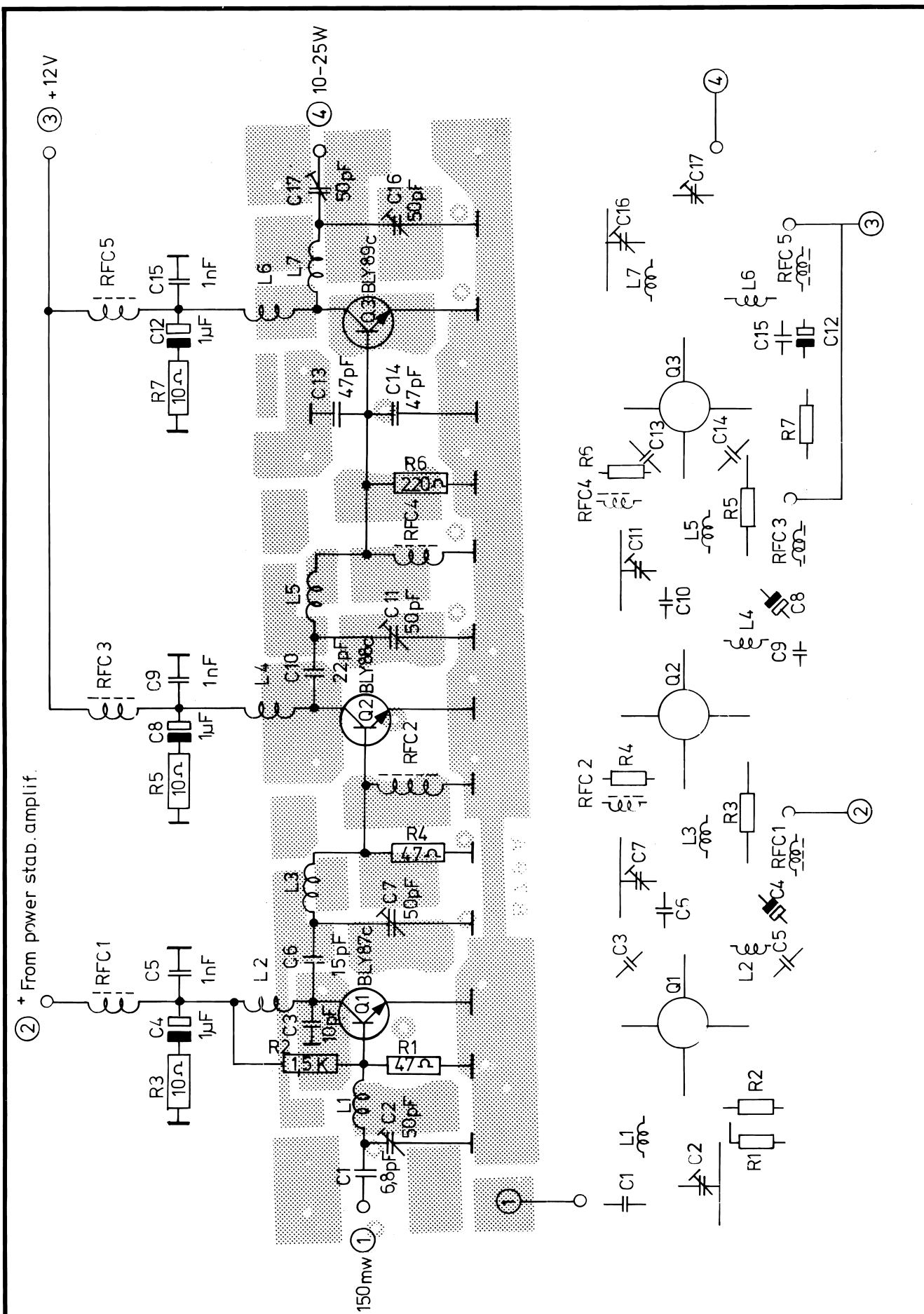
Stykl. nr.:

Tegn. nr.:

75013-4E2

AP-RADIOTELEFON

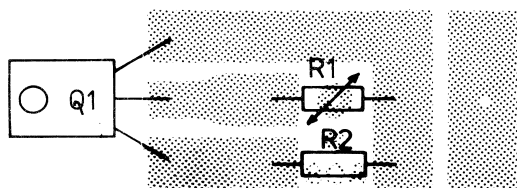
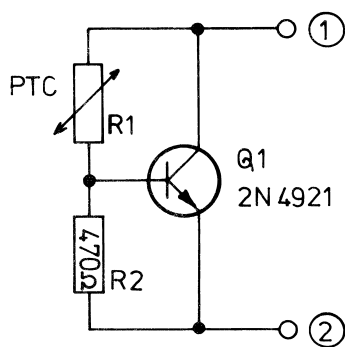
Nr.	Kode	Data	Nr.	Kode	Data
R1	13-267	47 Ω 1/8W CR 16			
R2	13-285	1,5 K Ω " "			
R3	13-259	10 Ω " "			
R4	13-267	47 Ω " "			
R5	13-259	10 Ω " "			
C1	11-373	6,8 pF Ker.			
C2	19-334	50 pF Trim.			
C3	11-376	10 pF Ker.			
C4	11-502	1 μ F/35V Tant.			
C5	11-409	1 nF Ker.			
C6	11-376	10 pF "			
C7	19-334	50 pF Trim.			
C8	11-502	1 μ F/35V Tant.			
C9	11-409	1 nF Ker.			
C10	19-334	50 pF Trim.			
C11	19-334	50 pF "			
C12	05-014	47 μ F/16 V ellyt.			
Q1		2N6080 or BLY87c			
Q2		2N6081 or BLY88c			
RFC1		75290-4E2			
RFC2		75290-4E2			
RFC3		75290-4E2			
L1		75320-4E2			
L2		75320-4E2			
L3		75318-4E2			
L4		75320-4E2			
L5		75319-4E2			
6 W PA-stage for 2m Printboard B 06 A 1 Tilhører tegn. nr.: 75013-4E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 75013-4S2



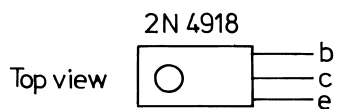
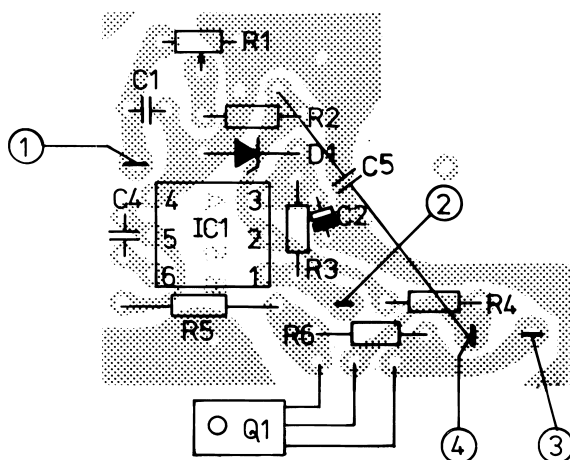
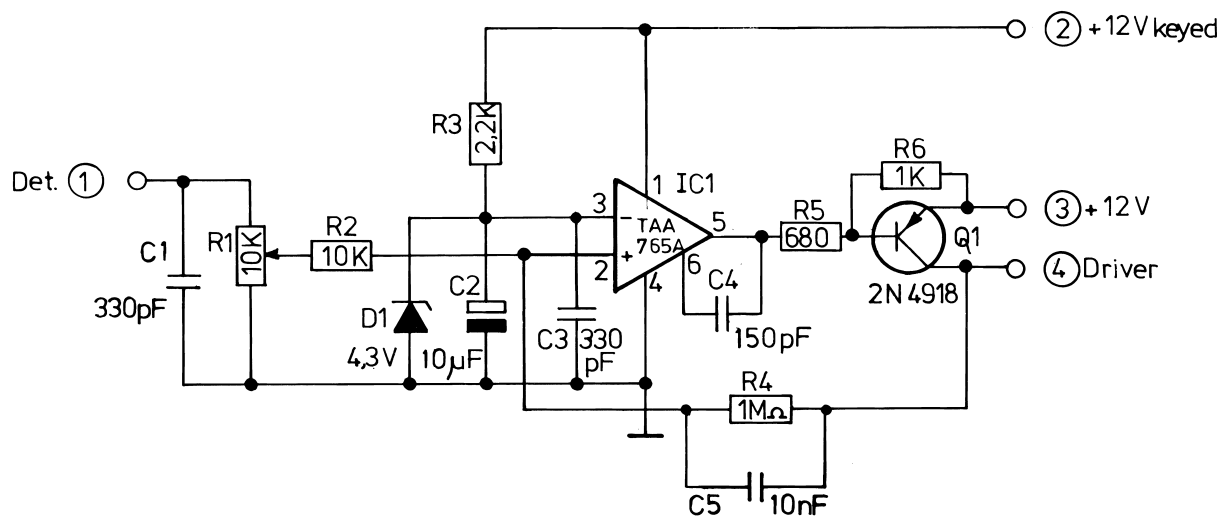
Rettet:	10-25 W internal PA 2m Print B 79 A 1 AP-RADIOTELEFON ½	Tegn.: 27-10-76 H.J. Stykl. nr.: Tegn. nr.:	Kontr.: 76307- 4E 2
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AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-267	47 Ω 1/8 W	RFC		
R2	13-285	1,5 k Ω "	1		75290-4E2
R3	13-259	10 Ω "	RFC		
R4	13-267	47 Ω "	2		75290-4E2
R5	13-259	10 Ω "	RFC		
R6	13-275	220 Ω "	3		75290-4E2
R7	13-259	10 Ω "	RFC		
C1	11-373	6,8 pF Ker.	4		75290-4E2
C2	19-334	50 pF Trim.	RFC		
C3	11-376	10 pF Ker.	5		75290-4E2
C4	11-502	1 μ F/35 V Tant.			
C5	11-409	1 nF Ker.			
C6	11-381	15 pF "			
C7	19-334	50 pF Trim.			
C8	11-502	1 μ F/35 V Tant.			
C9	11-409	1 nF Ker.			
C10	11-387	22 pF "			
C11	19-334	50 pF Trim			
C12	11-502	1 μ F/35 V Tant.			
C13	11-394	47 pF Ker.			
C14	11-394	47 pF "			
C15	11-409	1 nF "			
C16	19-334	50 pF Trim.			
C17	19-334	50 pF "			
Q1	19-121	BLY 87 c			
Q2	19-122	BLY 88 c			
Q3	19-111	BLY 89 c			
L1		75320-4E2			
L2		75320-4E2			
L3		75318-4E2			
L4		75320-4E2			
L5		75318-4E2			
L6		75320-4E2			
L7		75318-4E2			
10-25 W internal PA 2 m Print board B 79A 1 Tilhører tegn. nr.: 76307-4E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div> <div>Stykl. nr.: 76307-4S2</div>



Rettet: 15-6-78 JS/AC	Thermal protection of 10-25 W internal PA Print board B80A 1	Tegn.: 5-11 -76 AC	Kontr.:
		Stykl. nr.:	
		Tegn. nr.:	
		76328 - 4E2	
	AP-RADIOTELEFON 1/5		



Rettet: 21-4-77 JH/pc
16-3-79 BJ

Sense amplifier for output power stabilizing of
internal PA. Print board B 57 B 1

AP-RADIOTELEFON 1/2

Tegn.: 29-12-75
AC

Kontr.:

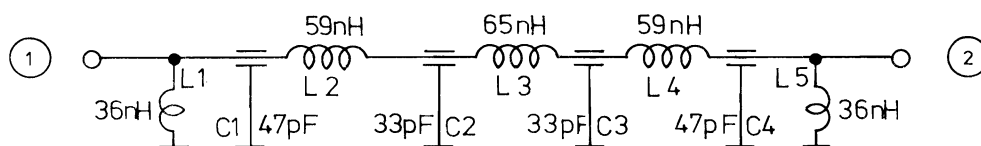
Stykl. nr.:

Tegn. nr.:

75622-4E2

AP-RADIOTELEFON

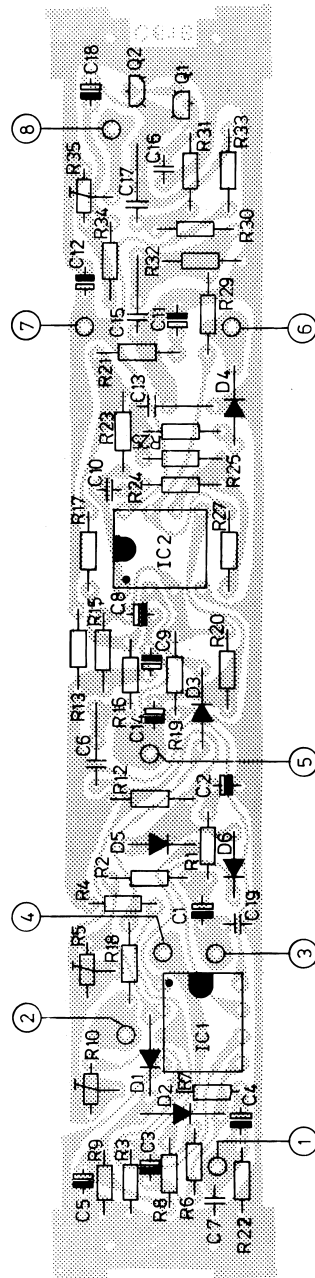
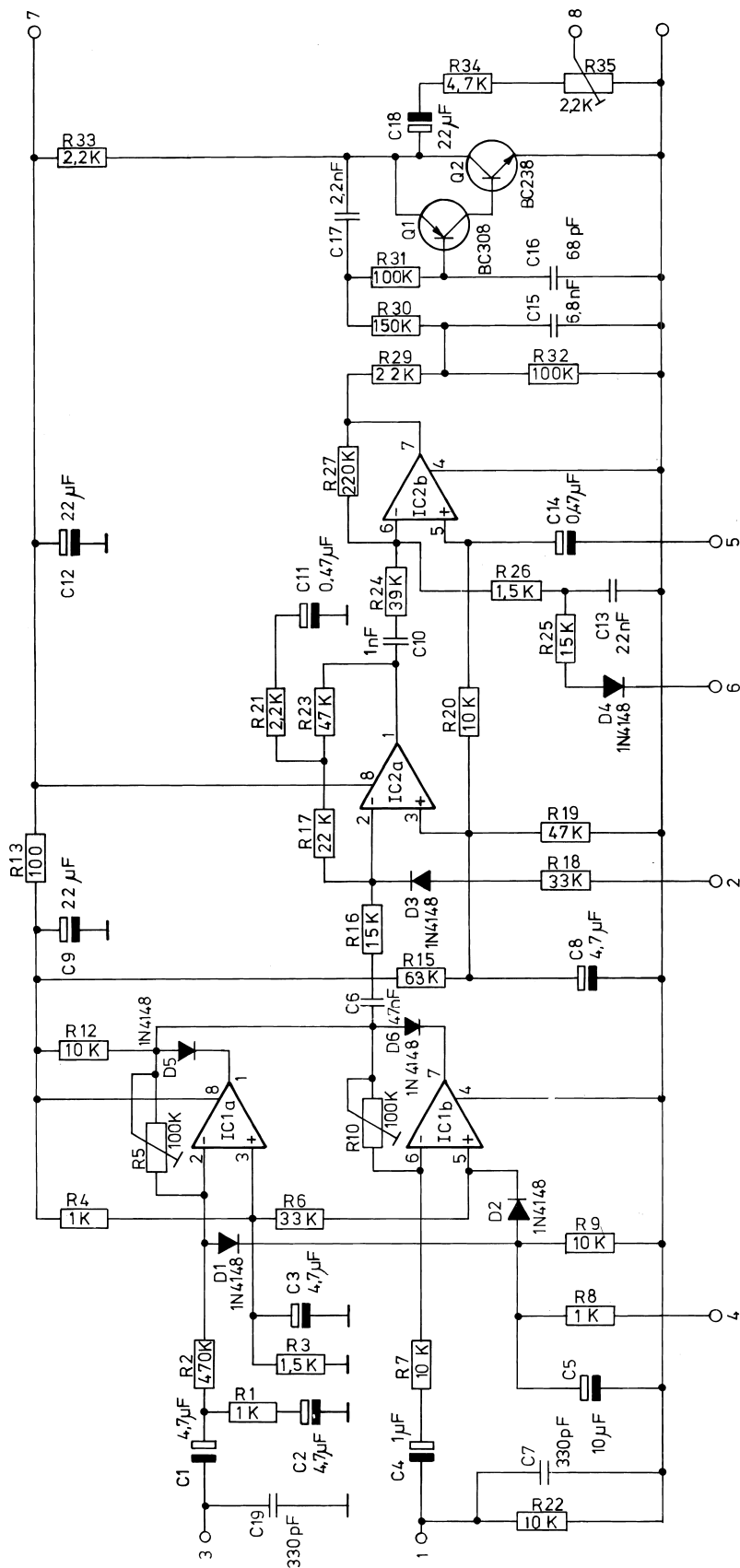
Nr.	Kode	Data	Nr.	Kode	Data
R1	19-258	10 K Ω Trim.			
R2	13-295	10 K Ω 1/8W CR 16			
R3	13-287	2,2 K Ω " "			
R4	13-312	1 M Ω " "			
R5	13-368	680 Ω $\frac{1}{4}$ W CR 25			
R6	13-283	1 K Ω 1/8W CR 16			
C1	11-406	330 pF Ker.			
C2	11-506	10 μ F/25V Tant.			
C3	11-406	330 pF Ker.			
C4	11-404	150 pF "			
C5	11-481	10 nF Pol.			
D1	04-045	4,3 V Zener			
Q1	19-176	2N4918			
IC1	09-003	TAA765A			
Sense amplifier for output power stabilizing of internal PA Print board B 57B 1 Tilhører tegn. nr.: 75622-4E2			Tegn.: Kontr.: Stykl. nr.: 75622-4S2		



Rettet:	Aerial filter for 2 m	Tegn.: 9-1-75 AC	Kontr.:
		Stykl. nr.:	
		Tegn. nr.:	75016-4E2
		AP-RADIOTELEFON 1/2	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
C1	11-450	47 pF feed-thru Philips 2222 700 03479			
C2	11-449	33 pF feed-thru Philips 2222 700 03339			
C3	11-449	33 pF feed-thru Philips 2222 700 03339			
C4	11-450	47 pF feed-thru Philips 2222 700 03479			
L1		75325-4E2			
L2		75322-4E2			
L3		75321-4E2			
L4		75322-4E2			
L5		75325-4E2			
Aerial filter for 2m			Rettet:		Tegn.:
Tilhører tegn. nr.: 75016-4E2					Kontr.:
					Stykl. nr.: 75016-4S2



Retter: 2-10-79 AC/SB
10-1-80 BC/SB
15-1-80 BC/SB

Modulation amplifier Print board C61C1

AP-RADIOTELEFON

Tegn.: 3-7-79 BC

Kontr.:

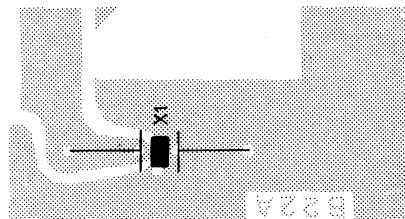
Stykl. nr.:

Tegn. nr.:

79112 - 3E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-283	1 K Ω 1/8 W CR16	C1	11-504	4,7 μ F/10 V Tant.
R2	13-315	470 K Ω " "	C2	11-504	4,7 μ F/10 V Tant.
R3	13-285	1,5 K Ω " "	C3	11-504	4,7 μ F/10 V Tant.
R4	13-283	1 K Ω " "	C4	11-502	1 μ F/35 V Tant.
R5	19-263	100 K Ω Trim.	C5	11-506	10 μ F/25 V Tant.
R6	13-300	33 K Ω 1/8 W CR16	C6	11-493	47 nF MKH
R7	13-295	10 K Ω " "	C7	11-406	330 pF Ker.
R8	13-283	1 K Ω " "	C8	11-504	4,7 μ F/10 V Tant.
R9	13-295	10 K Ω " "	C9	11-507	22 μ F/16 V Tant.
R10	19-263	100 K Ω Trim.	C10	11-409	1 nF Ker.
R11			C11	11-501	0,47 μ F/35 V Tant.
R12	13-295	10 K Ω 1/8 W CR16	C12	11-507	22 μ F/16 V Tant.
R13	13-271	100 Ω " "	C13	11-489	22 nF MKH
R14			C14	11-501	0,47 μ F/35 V Tant.
R15	13-304	68 K Ω " "	C15	11-488	6,8 nF MKH
R16	13-297	15 K Ω " "	C16	11-397	68 pF N750 Ker.
R17	13-299	22 K Ω " "	C17	11-486	2,2 nF MKH
R18	13-300	33 K Ω " "	C18	11-507	22 μ F/16V Tant.
R19	13-302	47 K Ω " "	C19	11-406	330 pF Ker.
R20	13-295	10 K Ω " "	D1	04-062	1N4148
R21	13-287	2,2 K Ω " "	D2	04-062	1N4148
R22	13-295	10 K Ω " "	D3	04-062	1N4148
R23	13-302	47 K Ω " "	D4	04-062	1N4148
R24	13-301	39 K Ω " "	D5	04-062	1N4148
R25	13-297	15 K Ω " "	D6	04-062	1N4148
R26	13-285	1,5 K Ω " "			
R27	13-309	220 K Ω " "	Q1	19-084	BC 308B
R28			Q2	19-117	BC 238
R29	13-299	22 K Ω " "			
R30	13-308	150 K Ω " "	IC1	09-080	LM 358N
R31	13-306	100 K Ω " "	IC2	09-080	LM 358N
R32	13-306	100 K Ω " "			
R33	13-287	2,2 K Ω " "			
R34	13-291	4,7 K Ω " "			
R35	19-255	2,2 K Ω Trim.			
Modulation amplifier Print board C 61 C1 Tilhører tegn. nr.: 79112-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 79112-4S2



75062-3E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-295	10 KΩ 1/8WCR16	R38	13-302	47 KΩ 1/8WCR16
R2	13-295	10 KΩ " "	R39	13-306	100 KΩ " "
R3	13-279	470 Ω " "	R40	13-287	2,2 KΩ " "
R4	13-307	120 KΩ " "	R41	13-299	22 KΩ " "
R5	13-283	1 KΩ " "	R42	13-291	4,7 kΩ " "
R6	13-275	220 Ω " "	R43	13-271	100 Ω " "
R7	13-295	10 KΩ " "	R44	13-382	10 KΩ 1/4 W CR25
R8	13-295	10 KΩ " "			
R9	13-295	10 KΩ " "	C1	11-385	22 pF Ker
R10	13-295	10 KΩ " "	C2	11-416	4,7 nF "
R11	13-295	10 KΩ " "	C3	11-416	4,7 nF "
R12	13-295	10 KΩ " "	C4	11-404	150 pF "
R13	13-295	10 KΩ " "	C5	11-409	1 nF "
R14	13-295	10 KΩ " "	C6	11-409	1 nF "
R15	13-271	100 Ω " "	C7	11-409	1 nF "
R16	13-271	100 Ω " "	C8	11-409	1 nF "
R17	13-271	100 Ω " "	C9	11-409	1 nF "
R18	13-271	100 Ω " "	C10	11-409	1 nF "
R19	13-271	100 Ω " "	C11	11-409	1 nF "
R20	13-271	100 Ω " "	C12	11-409	1 nF "
R21	13-271	100 Ω " "	C13	11-416	4,7 nF "
R22	13-271	100 Ω " "	C14	11-504	4,7 μF/10V Tant
R23	13-259	10 Ω " "	C15	11-416	4,7 nF Ker
R24	13-283	1 KΩ " "	C16	11-481	10 nF Pol.
R25	13-283	1 KΩ " "	C17	11-478	6,8 nF "
R26	13-291	4,7 KΩ " "	C18	11-476	2,2 nF "
R27	13-291	4,7 KΩ " "	C19	11-508	33 μF/10V Tant
R28	13-291	4,7 KΩ " "	C20	11-504	4,7 μF/10V "
R29	13-299	22 KΩ " "	C21	11-409	1 nF Ker
R30	13-299	22 KΩ " "	C22	11-401	100 pF "
R31	13-271	100 Ω " "	C23	11-504	4,7 μF/10V Tant
R32	13-287	2,2 KΩ " "	C24	11-394	47 pF Ker
R33	13-295	10 KΩ " "	C25	11-409	1 nF "
R34	13-299	22 KΩ " "	C26	11-444	560 pF "
R35	13-313	27 KΩ " "	C27	11-504	4,7 μF/10V Tant
R36	13-287	2,2 KΩ " "	C28	11-444	560 pF Ker.
R37	13-300	33 KΩ " "	C29	11-509	47 μF/6,3VTant.
Synthesizer logic				Tegn.:	Stykl. nr.:
Print board B 17 C 1-B 22 C 1				Kontr.:	75062-4S 2
Tilhører tegn. nr.: 75062-3E					

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data				
Q1	19-093	BC 238B							
Q2	19-093	BC 238B							
Q3	19-093	BC 238B							
Q4	19-093	BC 238B							
Q5	19-093	BC 238B							
IC1	09-077	SN74LS02N							
IC2	09-052	SN74193N							
IC3	09-076	SN74LS193N							
IC4	09-008	MC4044P							
IC5	09-003	TAA765A							
IC6	09-078	SN74LS93N							
RFC1	04-114	74016-4E							
X1	11-816	AP 21 400 Khz							
Synthesizer logic Print board B 17C 1+B 22 C 1 Tilhører tegn. nr.: 75062-3E 2			<table><tr><td>Tegn.:</td><td>Stykl. nr.:</td></tr><tr><td>Kontr.:</td><td>75062-4S 2</td></tr></table>			Tegn.:	Stykl. nr.:	Kontr.:	75062-4S 2
Tegn.:	Stykl. nr.:								
Kontr.:	75062-4S 2								

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-295	10 KΩ 1/8WCR16	R38	13-302	47 KΩ 1/8WCR16
R2	13-295	10 KΩ " "	R39	13-306	100 KΩ " "
R3	13-279	470 Ω " "	R40	13-287	2,2 KΩ " "
R4	13-307	120 KΩ " "	R41	13-299	22 KΩ " "
R5	13-283	1 KΩ " "	R42	13-291	4,7 kΩ " "
R6	13-275	220 Ω " "	R43	13-271	100 Ω " "
R7	13-295	10 KΩ " "	R44	13-382	10 KΩ 1/4 W CR25
R8	13-295	10 KΩ " "			
R9	13-295	10 KΩ " "	C1	11-385	22 pF Ker
R10	13-295	10 KΩ " "	C2	11-416	4,7 nF "
R11	13-295	10 KΩ " "	C3	11-416	4,7 nF "
R12	13-295	10 KΩ " "	C4	11-404	150 pF "
R13	13-295	10 KΩ " "	C5	11-409	1 nF "
R14	13-295	10 KΩ " "	C6	11-409	1 nF "
R15	13-271	100 Ω " "	C7	11-409	1 nF "
R16	13-271	100 Ω " "	C8	11-409	1 nF "
R17	13-271	100 Ω " "	C9	11-409	1 nF "
R18	13-271	100 Ω " "	C10	11-409	1 nF "
R19	13-271	100 Ω " "	C11	11-409	1 nF "
R20	13-271	100 Ω " "	C12	11-409	1 nF "
R21	13-271	100 Ω " "	C13	11-416	4,7 nF "
R22	13-271	100 Ω " "	C14	11-504	4,7 μF/10V Tant
R23	13-259	10 Ω " "	C15	11-416	4,7 nF Ker
R24	13-283	1 KΩ " "	C16	11-481	10 nF Pol.
R25	13-283	1 KΩ " "	C17	11-478	6,8 nF "
R26	13-291	4,7 KΩ " "	C18	11-476	2,2 nF "
R27	13-291	4,7 KΩ " "	C19	11-508	33 μF/10V Tant
R28	13-291	4,7 KΩ " "	C20	11-504	4,7 μF/10V "
R29	13-299	22 KΩ " "	C21	11-409	1 nF Ker
R30	13-299	22 KΩ " "	C22	11-401	100 pF "
R31	13-271	100 Ω " "	C23	11-504	4,7 μF/10V Tant
R32	13-287	2,2 KΩ " "	C24	11-394	47 pF Ker
R33	13-295	10 KΩ " "	C25	11-409	1 nF "
R34	13-299	22 KΩ " "	C26	11-409	1 nF "
R35	13-313	27 KΩ " "	C27	11-504	4,7 μF/10V Tant
R36	13-287	2,2 KΩ " "	C28	11-444	560 pF Ker.
R37	13-300	33 KΩ " "	C29	11-509	47 μF/6,3VTant.

Synthesizer logic

Print board B 17 C2 and B 22 C1

Tilhører tegn. nr.: 77201-3E2

Tegn.:

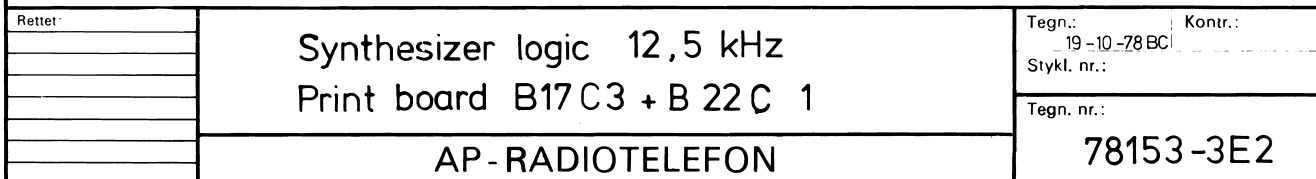
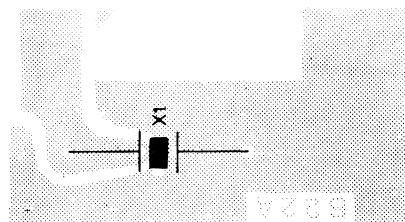
Kontr.:

Stykl. nr.:

77201-4S2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
Q1	19-093	BC 238B			
Q2	19-093	BC 238B			
Q3	19-093	BC 238B			
Q4	19-093	BC 238B			
Q5	19-093	BC 238B			
IC1	09-077	SN74LS02N			
IC2	09-052	SN74193N			
IC3	09-076	SN74LS193N			
IC4	09-008	MC4044P			
IC5	09-003	TAA765A			
IC6	09-078	SN74LS93N			
RFC1	04-114	74016-4E			
X1	11-816	AP 21 320 Khz			
Synthesizer logic Print board B 17 02 01 0 00 01 Tilhører tegn. nr.: 77300-012			Tegn.: Kontr.: Stykl. nr.: 77201-4S2		

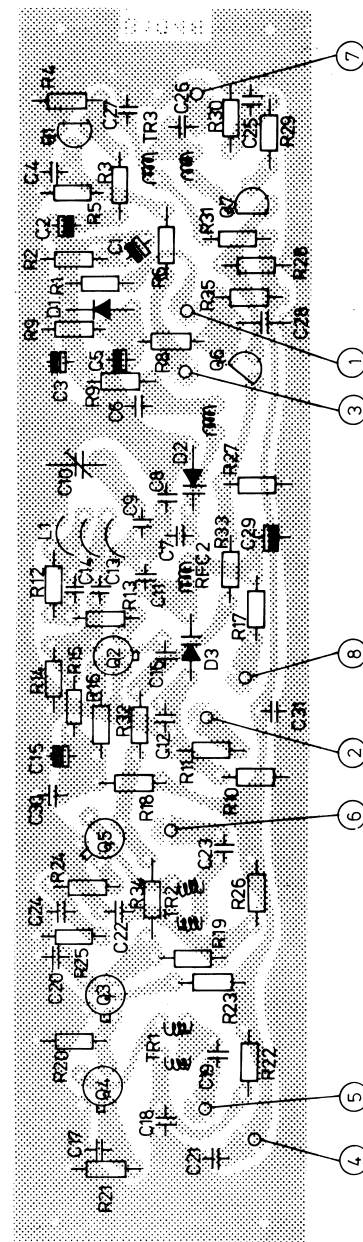
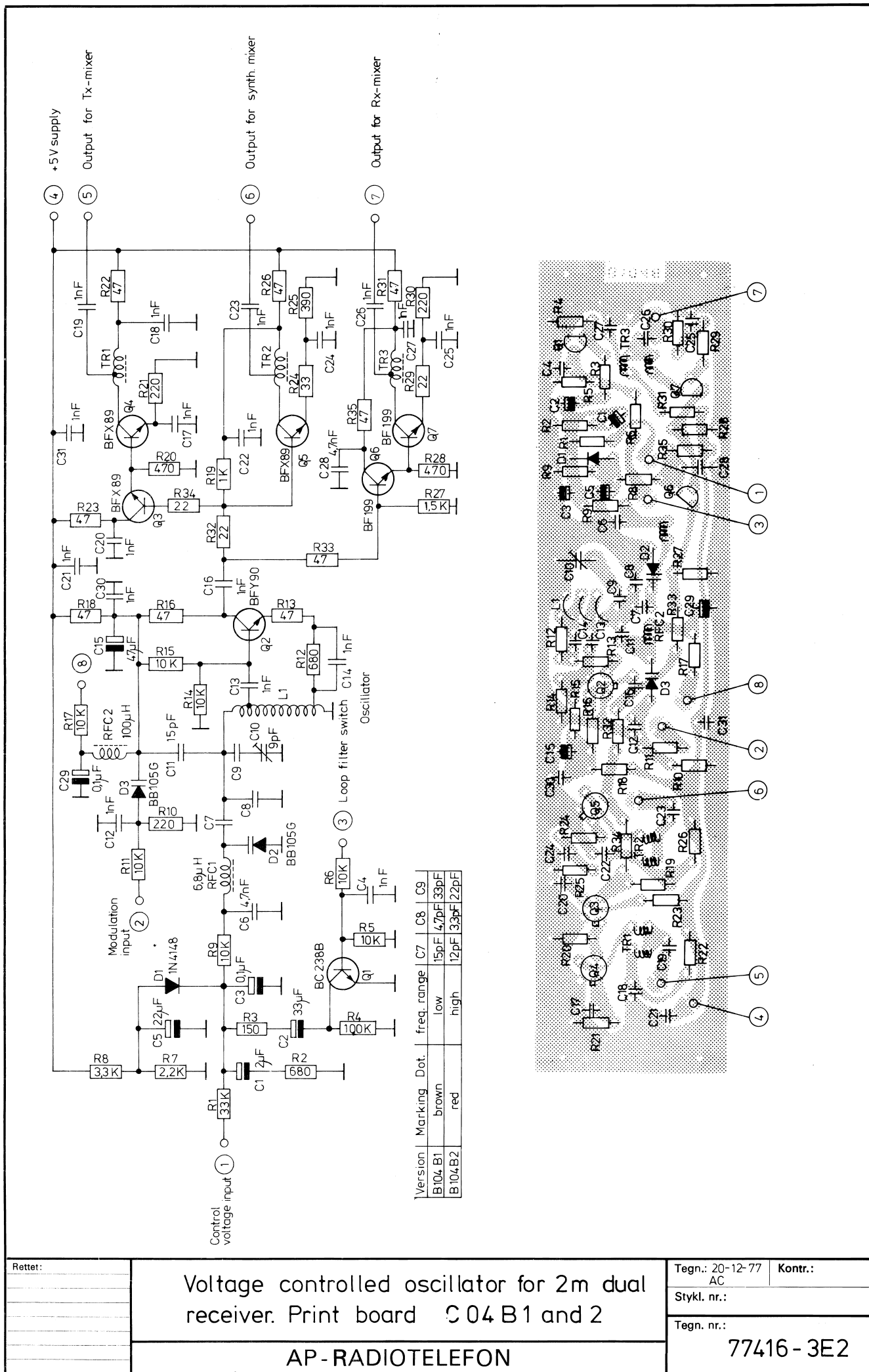


AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-295	10 KΩ 1/8WCR16	R38	13-302	47 KΩ 1/8WCR16
R2	13-295	10 KΩ " "	R39	13-306	100 KΩ " "
R3	13-279	470 Ω " "	R40	13-287	2,2 KΩ " "
R4	13-307	120 KΩ " "	R41	13-299	22 KΩ " "
R5	13-283	1 KΩ " "	R42	13-291	4,7 kΩ " "
R6	13-275	220 Ω " "	R43	13-271	100 Ω " "
R7	13-295	10 KΩ " "	R44	13-382	10 KΩ 1/4 W CR25
R8	13-295	10 KΩ " "			
R9	13-295	10 KΩ " "	C1	11-385	22 pF Ker
R10	13-295	10 KΩ " "	C2	11-416	4,7 nF "
R11	13-295	10 KΩ " "	C3	11-416	4,7 nF "
R12	13-295	10 KΩ " "	C4	11-404	150 pF "
R13	13-295	10 KΩ " "	C5	11-409	1 nF "
R14	13-295	10 KΩ " "	C6	11-409	1 nF "
R15	13-271	100 Ω " "	C7	11-409	1 nF "
R16	13-271	100 Ω " "	C8	11-409	1 nF "
R17	13-271	100 Ω " "	C9	11-409	1 nF "
R18	13-271	100 Ω " "	C10	11-409	1 nF "
R19	13-271	100 Ω " "	C11	11-409	1 nF "
R20	13-271	100 Ω " "	C12	11-409	1 nF "
R21	13-271	100 Ω " "	C13	11-416	4,7 nF "
R22	13-271	100 Ω " "	C14	11-504	4,7 μF/10V Tant
R23	13-259	10 Ω " "	C15	11-416	4,7 nF Ker
R24	13-283	1 KΩ " "	C16	11-481	10 nF Pol.
R25	13-283	1 KΩ " "	C17	11-478	6,8 nF "
R26	13-291	4,7 KΩ " "	C18	11-476	2,2 nF "
R27	13-291	4,7 KΩ " "	C19	11-508	33 μF/10V Tant
R28	13-291	4,7 KΩ " "	C20	11-504	4,7 μF/10V "
R29	13-299	22 KΩ " "	C21	11-409	1 nF Ker
R30	13-299	22 KΩ " "	C22	11-401	100 pF "
R31	13-271	100 Ω " "	C23	11-504	4,7 μF/10V Tant
R32	13-287	2,2 KΩ " "	C24	11-394	47 pF Ker
R33	13-295	10 KΩ " "	C25	11-412	2,2 nF "
R34	13-299	22 KΩ " "	C26	11-409	1 μF "
R35	13-313	27 KΩ " "	C27	11-504	4,7 μF/10V Tant
R36	13-287	2,2 KΩ " "	C28	11-444	560 pF Ker.
R37	13-300	33 KΩ " "	C29	11-509	47 μF/6,3V Tant
Synthesizer logic				Tegn.:	Stykl. nr.:
Print board B 17 C 3 B 22 C 1				Kontr.:	78153-4S2
Tilhører tegn. nr.: 78153-3E2					

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
Q1	19-093	BC 238B			
Q2	19-093	BC 238B			
Q3	19-093	BC 238B			
Q4	19-093	BC 238B			
Q5	19-093	BC 238B			
IC1	09-077	SN74LS02N			
IC2	09-052	SN74193N			
IC3	09-076	SN74LS193N			
IC4	09-008	MC4044P			
IC5	09-003	TAA765A			
IC6	09-078	SN74LS93N			
RFC1	04-114	74016-4E			
X1	11-816	AP 21 200 Khz			
Synthesizer logic Print board B 17C 3+B 22 C 1 Tilhører tegn. nr.: 78153-3E2			Tegn.: Kontr.: Stykl. nr.: 78153-4S2		



AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-300	33 KΩ 1/8W CR 16	C1	11-503	2,2 μF/25V tant.
R2	13-281	680 Ω " "	C2	11-508	33 μF/10V "
R3	13-273	150 Ω " "	C3	11-500	0,1 μF/35V "
R4	13-306	100 KΩ " "	C4	11-409	1 nF ker.
R5	13-295	10 KΩ " "	C5	11-507	22 μF/16V tant.
R6	13-295	10 KΩ " "	C6	11-416	4,7 nF ker.
R7	13-287	2,2 KΩ " "	C7	11-381	15 pF "
R8	13-289	3,3 KΩ " "	C8	11-368	4,7 pF "
R9	13-295	10 KΩ " "	C9	11-390	33 pF "
R10	13-275	220 Ω " "	C10	19-328	9 pF AT5273 tec.
R11	13-295	10 KΩ " "	C11	11-381	15 pF ker.
R12	13-281	680 Ω " "	C12	11-409	1 nF "
R13	13-267	47 Ω " "	C13	11-409	1 nF "
R14	13-295	10 KΩ " "	C14	11-409	1 nF "
R15	13-295	10 KΩ " "	C15	11-509	47 μF/6,3V tant.
R16	13-267	47 Ω " "	C16	11-409	1 nF ker.
R17	13-295	10 KΩ " "	C17	11-409	1 nF "
R18	13-267	47 Ω " "	C18	11-409	1 nF "
R19	13-283	1 KΩ " "	C19	11-409	1 nF "
R20	13-279	470 Ω " "	C20	11-409	1 nF "
R21	13-275	220 Ω " "	C21	11-409	1 nF "
R22	13-267	47 Ω " "	C22	11-409	1 nF "
R23	13-267	47 Ω " "	C23	11-409	1 nF "
R24	13-265	33 Ω " "	C24	11-409	1 nF "
R25	13-278	390 Ω " "	C25	11-409	1 nF "
R26	13-267	47 Ω " "	C26	11-409	1 nF "
R27	13-285	1,5 KΩ " "	C27	11-409	1 nF "
R28	13-279	470 Ω " "	C28	11-416	4,7 nF "
R29	13-263	22 Ω " "	C29	11-500	0,1 μF/35V tant.
R30	13-275	220 Ω " "	C30	11-409	1 nF ker.
R31	13-267	47 Ω " "	C31	11-409	1 nF "
R32	13-263	22 Ω " "			
R33	13-267	47 Ω " "	D1	04-062	1N4148
R34	13-267	22 Ω " "	D2	04-009	BB105G
R35	13-267	47 Ω " "	D3	04-009	BB105G
VCO for 2 m dual receiver Print board C 04 B1 Tilhører tegn. nr.: 77416-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 77416-4S2

AP-RADIOTELEFON

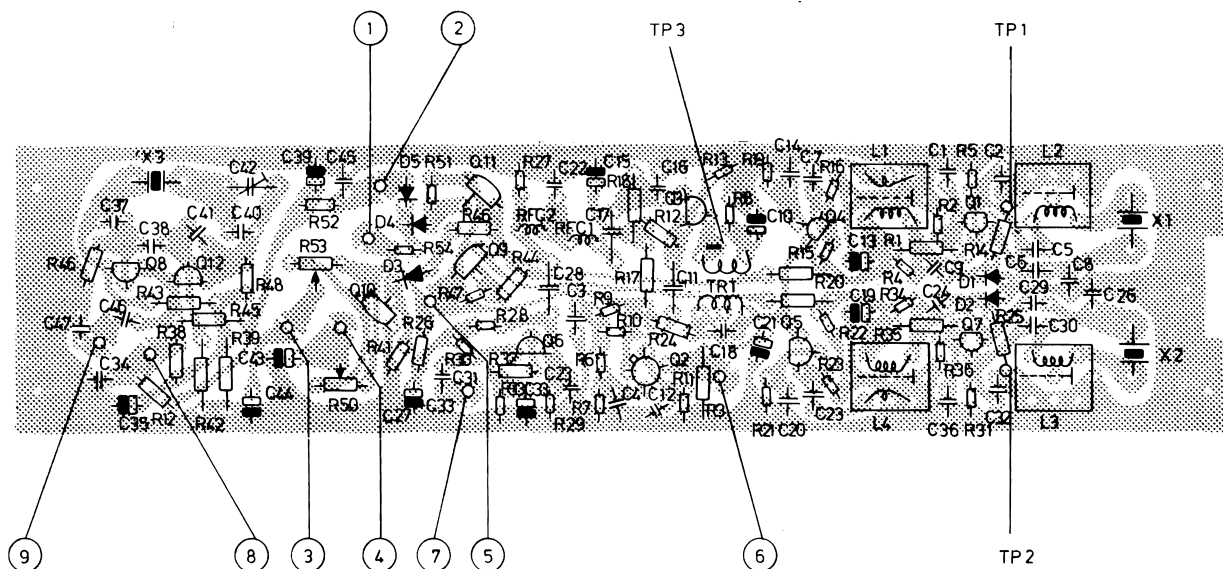
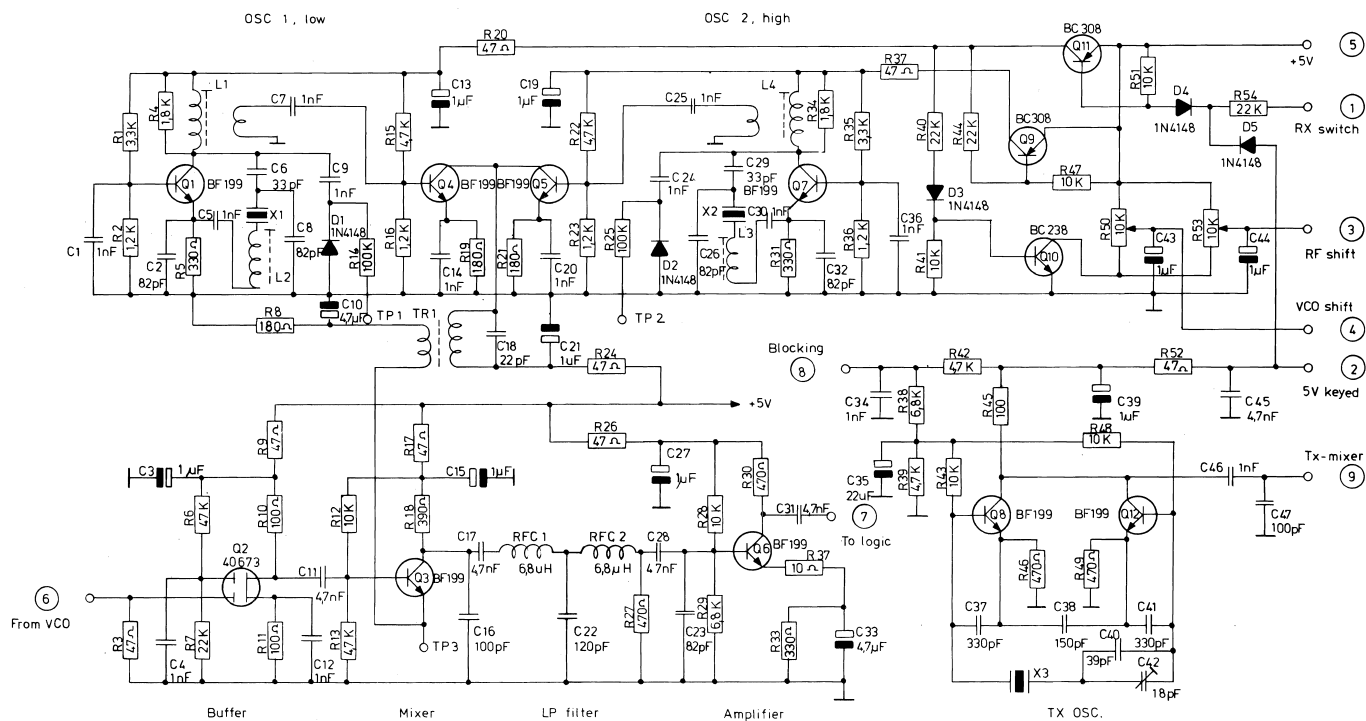
Nr.	Kode	Data	Nr.	Kode	Data
Q1	19-093	BC 238 B			
Q2	19-105	BFY 90			
Q3	19-102	BFX 89			
Q4	19-102	BFX 89			
Q5	19-102	BFX 89			
Q6	19-104	BF 199			
Q7	19-104	BF 199			
L1		75288-4E2			
TR1		75291-4E2			
TR2		75291-4E2			
TR3		75291-4E2			
RFC 1	04-114	74016-4E (L 235)			
RFC 2	04-117	100 μ H			
VCO for 2 m dual receiver. Print board C 04 B1 Tilhører tegn. nr.: 77416-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 77416-4S2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-300	33 KΩ 1/8W CR 16	C1	11-503	2,2 μF/25V tant.
R2	13-281	680 Ω " "	C2	11-508	33 μF/10V "
R3	13-273	150 Ω " "	C3	11-500	0,1 μF/35V "
R4	13-306	100 KΩ " "	C4	11-409	1 nF ker.
R5	13-295	10 KΩ " "	C5	11-507	22 μF/16V tant.
R6	13-295	10 KΩ " "	C6	11-416	4,7 nF ker.
R7	13-287	2,2 KΩ " "	C7	11-379	12 pF "
R8	13-289	3,3 KΩ " "	C8	11-366	3,3 pF "
R9	13-295	10 KΩ " "	C9	11-385	22 pF "
R10	13-275	220 Ω " "	C10	19-328	9 pF AT5273 tec.
R11	13-295	10 KΩ " "	C11	11-381	15 pF ker.
R12	13-281	680 Ω " "	C12	11-409	1 nF "
R13	13-267	47 Ω " "	C13	11-409	1 nF "
R14	13-295	10 KΩ " "	C14	11-409	1 nF "
R15	13-295	10 KΩ " "	C15	11-509	47 μF/6,3V tant.
R16	13-267	47 Ω " "	C16	11-409	1 nF ker.
R17	13-295	10 KΩ " "	C17	11-409	1 nF "
R18	13-267	47 Ω " "	C18	11-409	1 nF "
R19	13-283	1 KΩ " "	C19	11-409	1 nF "
R20	13-279	470 Ω " "	C20	11-409	1 nF "
R21	13-275	220 Ω " "	C21	11-409	1 nF "
R22	13-267	47 Ω " "	C22	11-409	1 nF "
R23	13-267	47 Ω " "	C23	11-409	1 nF "
R24	13-265	33 Ω " "	C24	11-409	1 nF "
R25	13-278	390 Ω " "	C25	11-409	1 nF "
R26	13-267	47 Ω " "	C26	11-409	1 nF "
R27	13-285	1,5 KΩ " "	C27	11-409	1 nF "
R28	13-279	470 Ω " "	C28	11-416	4,7 nF "
R29	13-263	22 Ω " "	C29	11-500	0,1 μF/35V tant.
R30	13-275	220 Ω " "	C30	11-409	1 nF ker.
R31	13-267	47 Ω " "	C31	11-409	1 nF "
R32	13-263	22 Ω " "			
R33	13-267	47 Ω " "	D1	04-062	1N4148
R34	13-267	22 Ω " "	D2	04-009	BB105G
R35	13-267	47 Ω " "	D3	04-009	BB105G
VCO for 2 m dual receiver Print board C 04 B2 Tilhører tegn. nr.: 77416-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 77416-4S2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
Q1	19-093	BC 238 B			
Q2	19-105	BFY 90			
Q3	19-102	BFX 89			
Q4	19-102	BFX 89			
Q5	19-102	BFX 89			
Q6	19-104	BF 199			
Q7	19-104	BF 199			
L1		75288-4E2			
TR1		75291-4E2			
TR2		75291-4E2			
TR3		75291-4E2			
RFC- 1	04-114	74016-4E (L 235)			
RFC- 2	04-117	100 μ H			
VCO for 2 m dual receiver. Print board C 04 B2 Tilhører tegn. nr.: 77416-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 77416-4S2



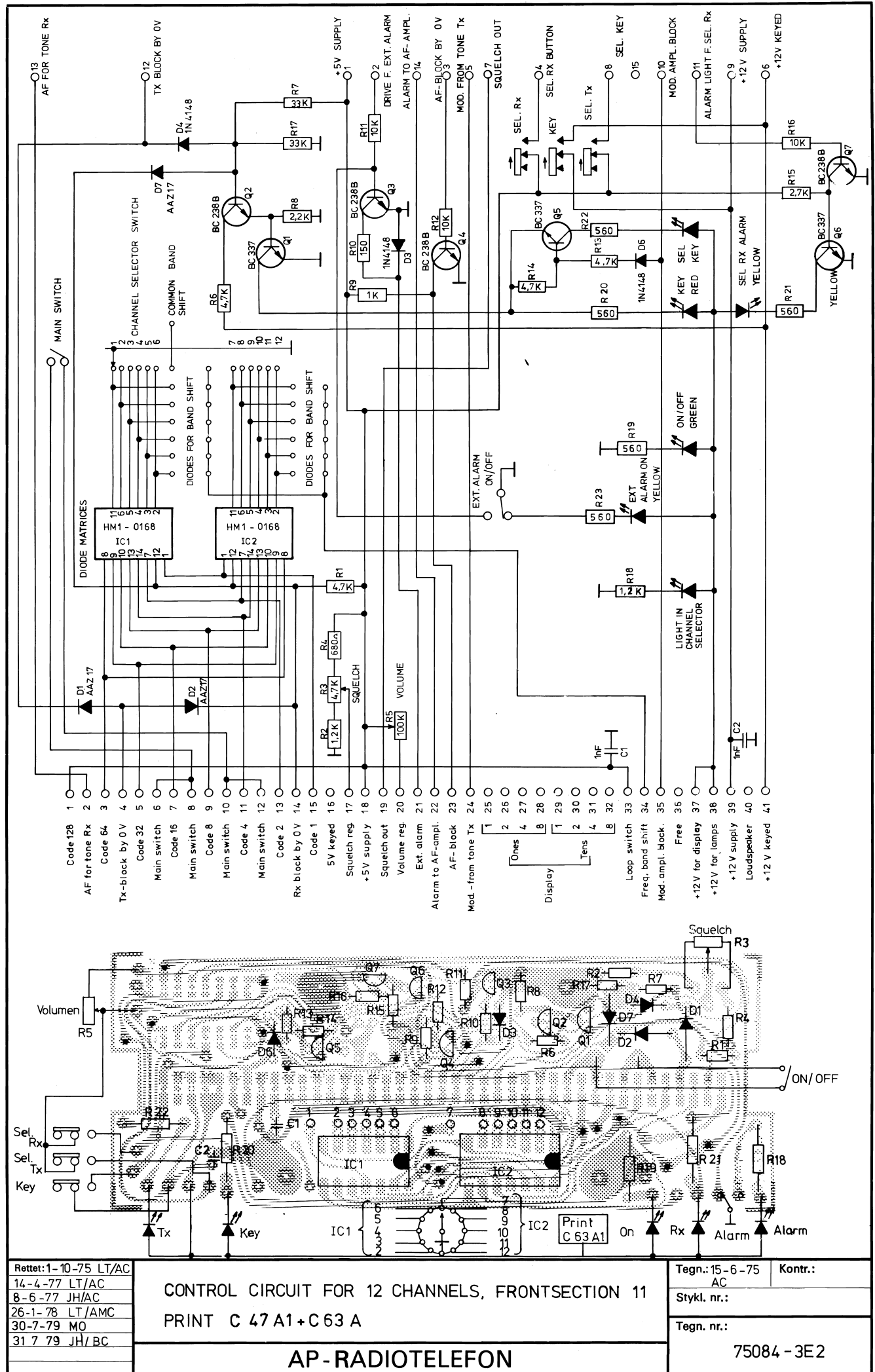
Revizor: 4-8-78 JH/AC	Synthesizer oscillators+mixer and TX oscillator for 2m with dual receiver. Print C05A1		Techn.: 4-1-78 HJ	Konstr.: JH
7-2-78 JH/AMC			Styl.: nr.:	
19-2-78 JH/BC			Techn. nr.:	78001-2E2
7-1-80 JH/BC	AP-RADIOTELEFON ½			

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-289	3,3 KΩ 1/8 W CR16	R37	13-267	47 Ω 1/8 W CR16
R2	13-284	1,2 KΩ " "	R38	13-293	6,8 KΩ " "
R3	13-267	47 Ω " "	R39	13-291	4,7 KΩ " "
R4	13-286	1,8 KΩ " "	R40	13-299	22 KΩ " "
R5	13-277	330 Ω " "	R41	13-295	10 KΩ " "
R6	13-302	47 KΩ " "	R42	13-291	4,7 KΩ " "
R7	13-299	22 KΩ " "	R43	13-295	10 KΩ " "
R8	13-274	180 Ω " "	R44	13-299	22 KΩ " "
R9	13-267	47 Ω " "	R45	13-271	100 Ω " "
R10	13-271	100 Ω " "	R46	13-279	470 Ω " "
R11	13-271	100 Ω " "	R47	13-295	10 KΩ " "
R12	13-295	10 KΩ " "	R48	13-295	10 KΩ " "
R13	13-291	4,7 KΩ " "	R49	13-279	470 Ω " "
R14	13-306	100 KΩ " "	R50	19-271	10 KΩ Trim.
R15	13-291	4,7 KΩ " "	R51	13-295	10 KΩ 1/8 W CR16
R16	13-284	1,2 KΩ " "	R52	13-267	47 Ω " "
R17	13-267	47 Ω " "	R53	19-271	10 KΩ Trim.
R18	13-278	390 Ω " "	R54	13-299	22 KΩ 1/8 W CR16
R19	13-274	180 Ω " "			
R20	13-267	47 Ω " "	C1	11-409	1 nF Ker
R21	13-274	180 Ω " "	C2	11-399	82 pF "
R22	13-291	4,7 KΩ " "	C3	11-502	1 μF/35V Tant
R23	13-284	1,2 KΩ " "	C4	11-409	1 nF Ker.
R24	13-267	47 Ω " "	C5	11-409	1 nF "
R25	13-306	100 KΩ " "	C6	11-428	33 pF "
R26	13-267	47 Ω " "	C7	11-409	1 nF "
R27	13-279	470 Ω " "	C8	11-399	82 pF "
R28	13-295	10 KΩ " "	C9	11-409	1 nF "
R29	13-293	6,8 KΩ " "	C10	11-504	4,7 μF/10 V Tant
R30	13-279	470 Ω " "	C11	11-416	4,7 nF Ker
R31	13-277	330 Ω " "	C12	11-409	1 nF "
R32	13-259	10 Ω " "	C13	11-502	1 μF/35V Tant
R33	13-277	330 Ω " "	C14	11-409	1 nF Ker
R34	13-286	1,8 KΩ " "	C15	11-502	1 μF/35 V Tant
R35	13-289	3,3 KΩ " "	C16	11-401	100 pF Ker
R36	13-284	1,2 KΩ " "	C17	11-416	4,7 nF "
Synthesizer oscillators+mixer and TX osc. for 2m with dual receiver. Print C 05 A1 Tilhører tegn. nr.: 78001-2E2					<div>Tegn.: HJ</div> <div>Kontr.: JH</div> <div>Stykl. nr.: 78001-4E2</div>

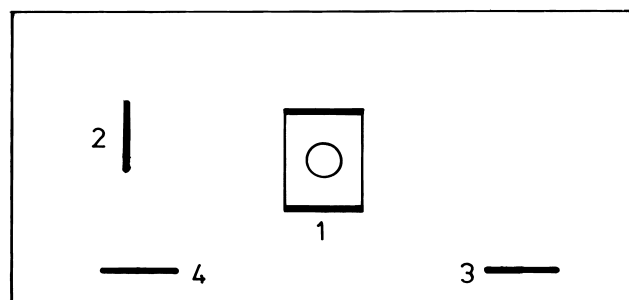
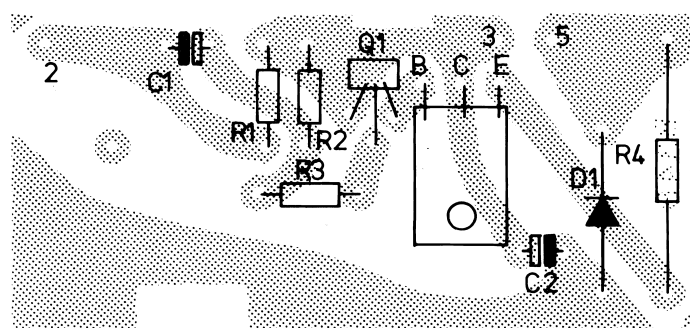
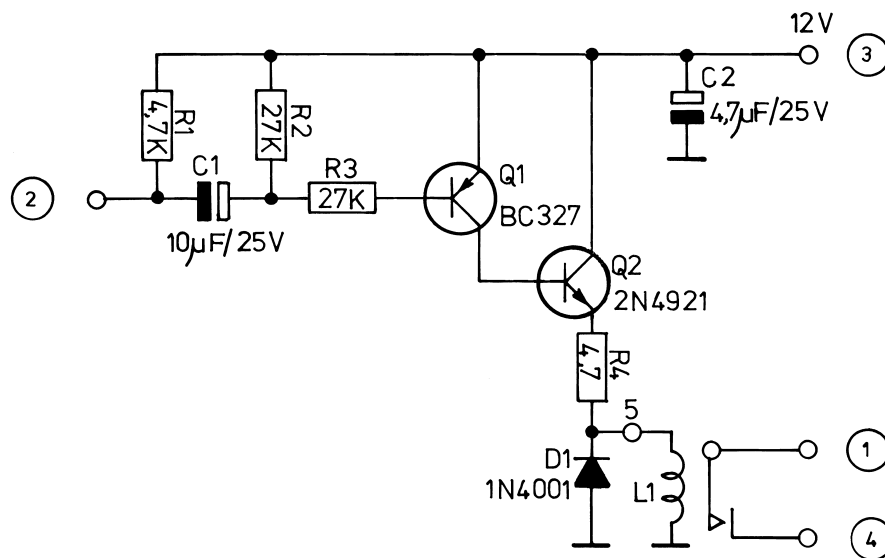
AP-RADIOTELEFON

Nr.	Kode	Data		Nr.	Kode	Data	
C18	11-385	22 pF	Ker	Q1	19-104	BF 199	
C19	11-502	1 μ F/35 V	Tant	Q2	19-128	40673	
C20	11-409	1 nF	Ker	Q3	19-104	BF 199	
C21	11-502	1 μ F/35 V	Tant	Q4	19-104	BF 199	
C22	11-403	120 pF	Ker	Q5	19-104	BF 199	
C23	11-399	82 pF	"	Q6	19-104	BF 199	
C24	11-409	1 nF	"	Q7	19-104	BF 199	
C25	11-409	1 nF	"	Q8	19-104	BF 199	
C26	11-399	82 pF	"	Q9	19-084	BC 308 B E-Line	
C27	11-502	1 μ F/35 V	Tant	Q10	19-117	BC 238 B E-Line	
C28	11-416	4,7 nF	Ker	Q11	19-084	BC 308 B E-Line	
C29	11-428	33 pF	"	Q12	19-104	BF 199	
C30	11-409	1 nF	"				
C31	11-416	4,7 nF	"	L1		75294-4E2	
C32	11-399	82 pF	"	L2		75293-4E2	
C33	11-504	4,7 μ F/10 V	Tant	L3		75293-4E2	
C34	11-409	1 nF	Ker	L4		75294-4E2	
C35	11-507	22 μ F/16 V	Tant				
C36	11-409	1 nF	Ker	TR1		75289-4E2	
C37	11-430	330 pF	"				
C38	11-404	150 pF	"	RFC			
C39	11-502	1 μ F/35 V	Tant	1	04-114	6,8 μ H 74016-4E	
C40	11-393	39 pF	Ker	RFC			
C41	11-430	330 pF	"	2	04-114	6,8 μ H 74016-4E2	
C42	19-330	18 pF	Trim				
C43	11-502	1 μ F/35 V	Tant	X1		Frequency depen-	
C44	11-502	1 μ F/35 V	"	X2		dent on desired	
C45	11-416	4,7 nF	Ker			band.Spec.AP20	
C46	11-409	1 nF	"	X3		Frequency depen-	
C47	11-401	100 pF	"			dent on mode of	
						operation.	
D1	04-062	1N4148				(Simplex,duplex etc)	
D2	04-062	1N4148				Spec.AP22	
D3	04-062	1N4148					
D4	04-062	1N4148					
D5	04-062	1N4148					
Synthesizer oscillators+mixer and TX osc. for 2m with dual receiver.Print C 05 A1 Tilhører tegn. nr.: 78001-2E2						Tegn.: HJ Kontr.: JH	Stykl. nr.: 78001-4S2



AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-291	4,7 K Ω 1/8 W CR16	Q3	19-093	BC238B
R2	13-284	1,2 K Ω " "	Q4	19-093	BC238B
R3	16-022	4,7 K Ω Potm.	Q5	19-096	BC337
R4	13-281	680 Ω 1/8 W CR16	Q6	19-096	BC337
R5	16-023	100 K Ω Lin.Potm.	Q7	19-093	BC238B
R6	13-291	4,7 K Ω 1/8 W CR16			
R7	13-300	33 K Ω " "	IC1	09-067	HM1-0168
R8	13-287	2,2 K Ω " "	IC2	09-067	HM1-0168
R9	13-283	1 K Ω " "			
R10	13-273	150 Ω " "			
R11	13-295	10 K Ω " "			
R12	13-295	10 K Ω " "			
R13	13-291	4,7 K Ω " "			
R14	13-291	4,7 K Ω " "			
R15	13-288	2,7 K Ω " "			
R16	13-295	10 K Ω " "			
R17	13-300	33 K Ω " "			
R18	13-284	1,2 K Ω " "			
R19	13-367	560 Ω 1/4 W CR25			
R20	13-367	560 Ω " "			
R21	13-367	560 Ω " "			
R22	13-367	560 Ω " "			
R23	13-367	560 Ω " "			
C1	11-409	1 nF Ker.			
C2	11-409	1 nF Ker.			
D1	04-002	AAZ17			
D2	04-002	AAZ17			
D3	04-062	1N4148			
D4	04-062	1N4148			
	04-062	1N4148			
D7	04-002	AAZ17			
Q1	19-096	BC337			
Q2	19-093	BC238B			
Control circuit for 12 channel Frontsection 11 Print C47+C63 Tilhører tegn. nr.: 75084-3E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 75084-4S2



Relay box

Rettet: 23-3-76 AC/LT

Extern timing for hornrelay
Print board B 34 B 1

AP-RADIOTELEFON ½

Tegn.: 21-4-75
AC

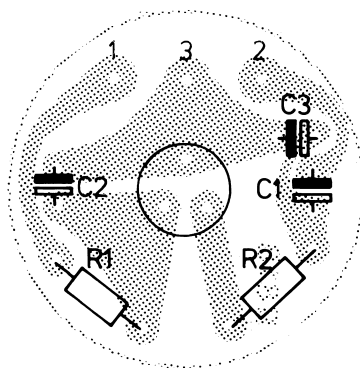
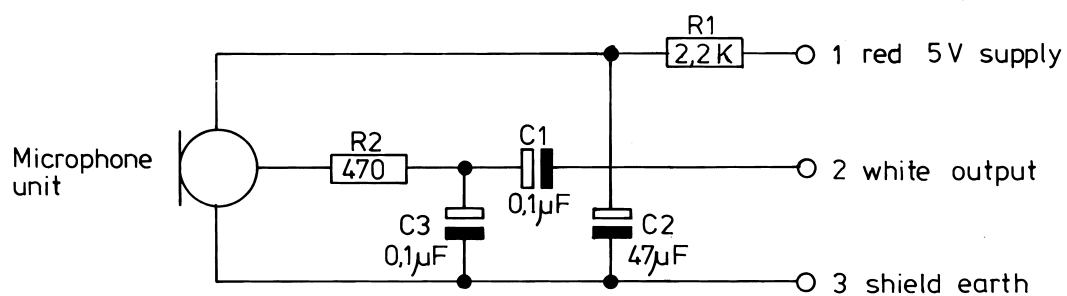
Kontr.: 21-4-75
TJ

Stykl. nr.: 75169-4S2

Tegn. nr.: 75169-4E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-291	4,7 K Ω 1/8W CR16			
R2	13-313	27 K Ω " "			
R3	13-313	27 K Ω " "			
R4	13-687	4,7 Ω 6 W Dale			
C1	11-506	10 μ F/25V Tant.			
C2	11-505	4,7 μ F"25V "			
D1	04-060	1N4001			
Q1	19-095	BC327			
Q2	19-175	2N4921			
L1	17-054	Relæ 274-10			
Extern timing hornrelay Print board B 34 B 1 Tilhører tegn. nr.: 75169-4E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 75169-4S2



Rettet:

25-5-77 LT/AC

Microphone 213-020

Print board B 81 B1

Tegn.: 4-3-77
AC

Kontr.:

Stykl. nr.:

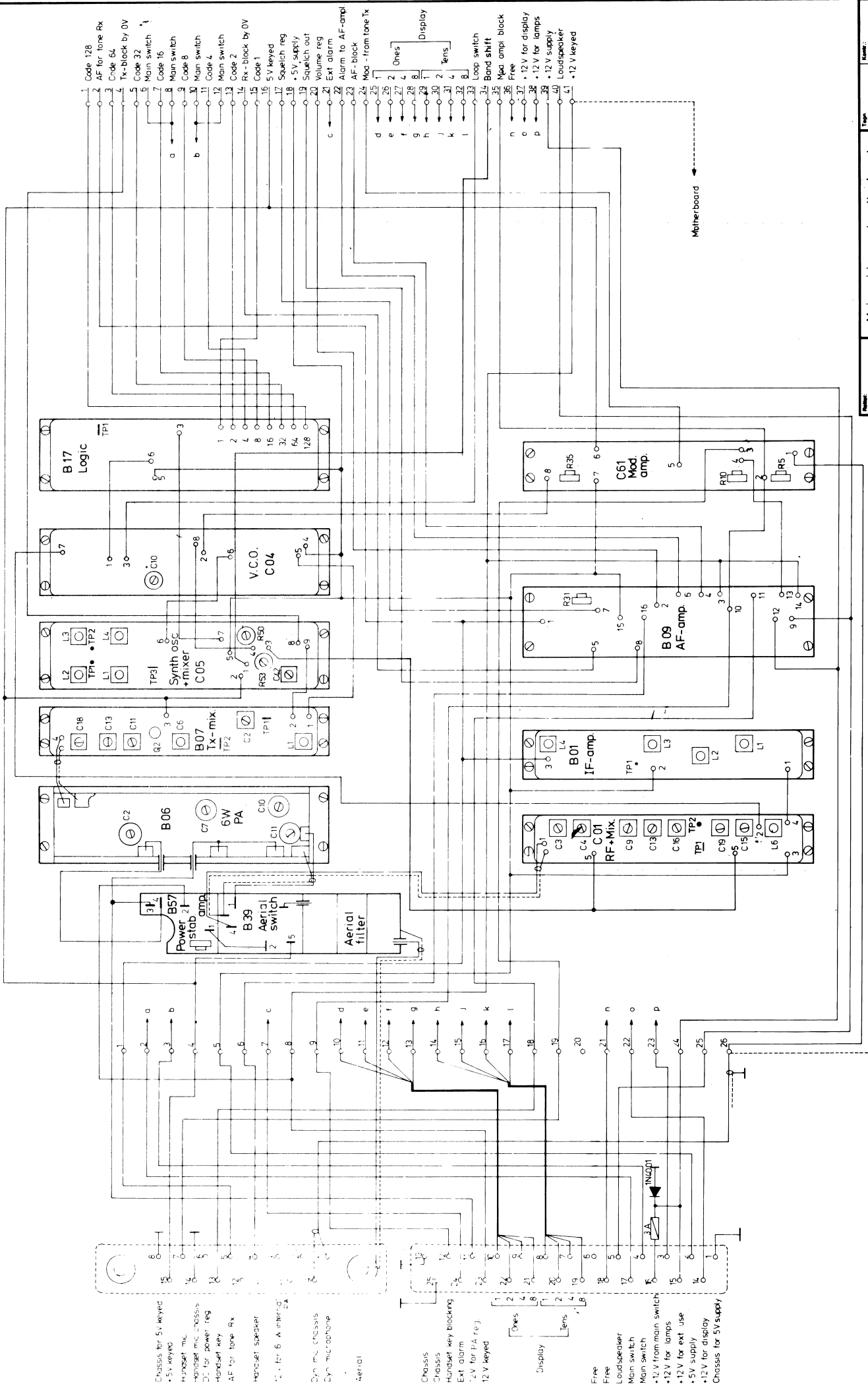
Tegn. nr.:

77127-4E2

AP-RADIOTELEFON 1/5

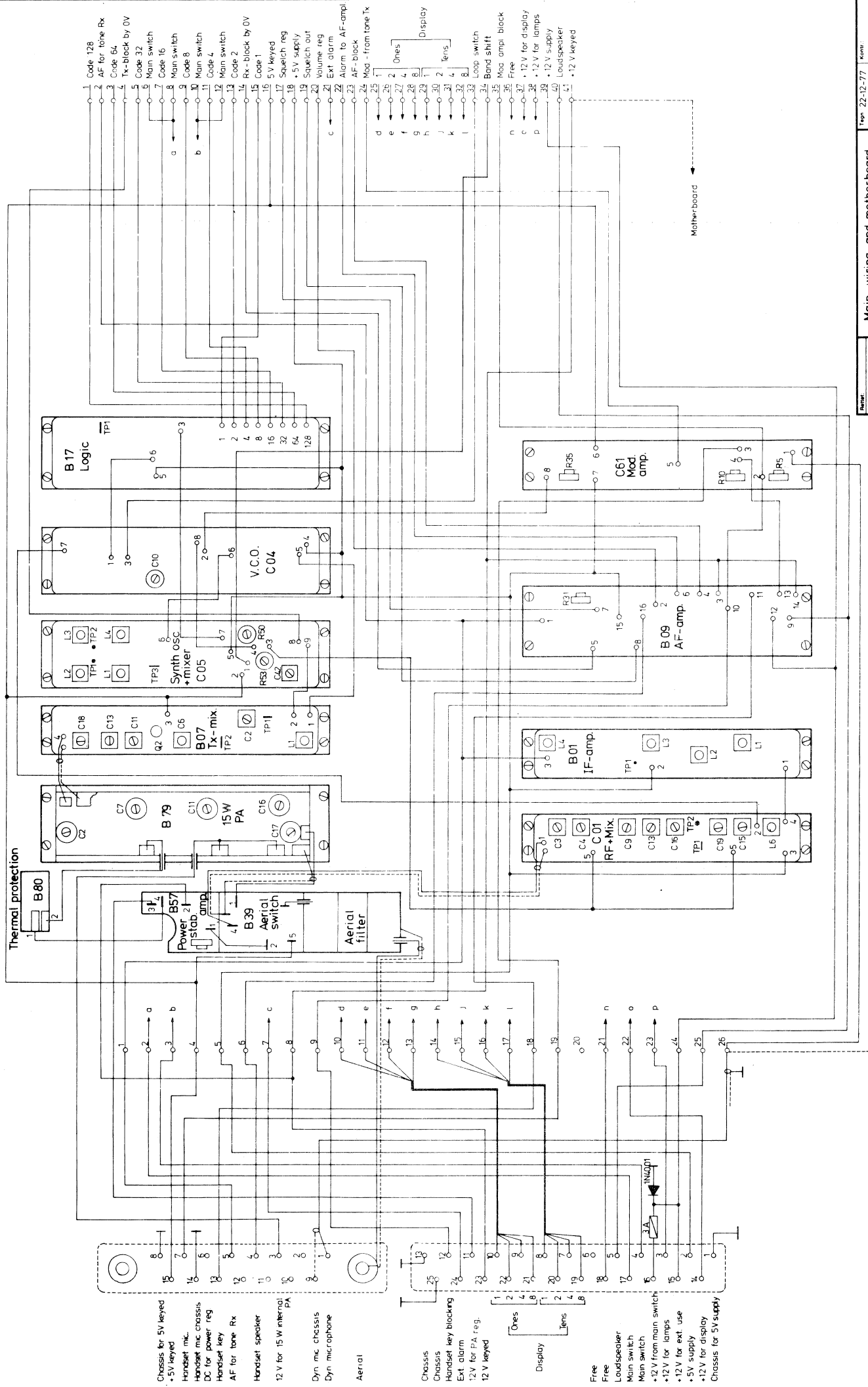
AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-287	2,2 K Ω 1/8W CR 16			
R2	13-279	470 Ω " "			
C1	11-500	0,1 μ F/35 V tant.			
C2	11-509	47 μ F/6,3 V "			
C3	11-500	0,1 μ F/35 V "			
	13-062	Mic. EM-10LB			
Microphone 213-020 Print board B 81 B1 Tilhører tegn. nr.: 77127-4E2			Rettet:		<div>Tegn.:</div> <div>Kontr.:</div>
					Stykl. nr.: 77127-4S2



Part	13-2-78 H.L.	Rev.	U.S.
Page	1	Page	1
Main wiring and motherboard 6W Continuous, 2m, with Print C03A-1 dual receiver			
AP-RADIOTELEFON 78038-2E2			

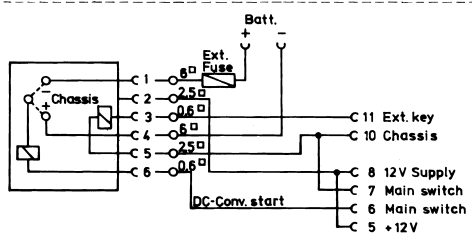
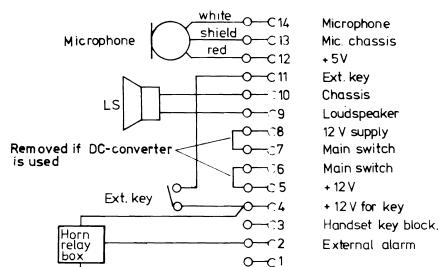
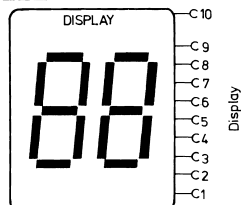
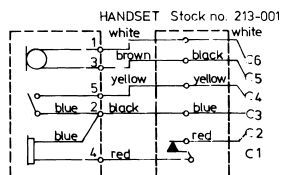
Motherboard



Main wiring and motherboard
10-25W intermittent. 2m. with
dual receiver
Print C 03 A

77417-2E2

Mother board



Connections for AP DC-Converter
 6V or 12V: Dwg.no 68171/4 Stock no. 203-001
 24V: Dwg.no. 68194/4 Stock no. 203-002
 (Can not be used at 25W UHF)

Handset mic.
 Handset mic. chassis
 Handset key
 Chassis
 Handset speaker
 '1' for handset in stand

BCD-code tens
 Display
 BCD-code ones
 12 V Supply
 Display chassis

Microphone
 Mic. chassis
 +5V
 Ext. key
 Chassis
 Loudspeaker
 12 V supply
 Main switch
 Main switch
 +12V
 +12V for key
 Handset key block.
 External alarm

Chassis - +12V Supply
 Removed if DC-converter or
 regulator PS 13 is used

RX input

Chassis for 5V keyed
 +5V keyed
 Handset microphone
 Handset mic. chassis
 Handset key

Handset speaker
 12 V for internal PA-stage

Mic. chassis
 Microphone

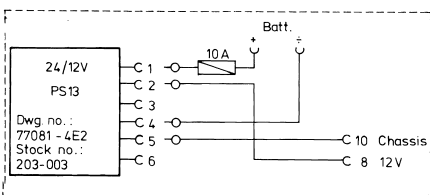
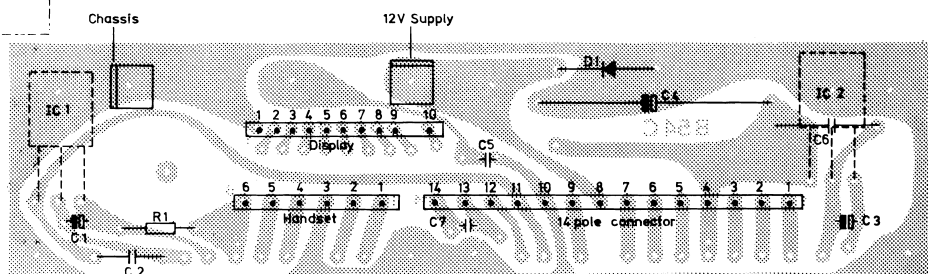
RF output

Chassis

Ext. alarm
 12 V for 6W PA.
 12 V keyed

Ones
 Tens
 Display

'1' for handset in stand
 Free
 Loudspeaker
 Main switch
 Main switch
 +12V from main switch
 +12V for lamps
 +12V for ext. use
 +5V supply
 +12V for display
 Chassis for 5V supply



Retter:
 6-9-76 LT/NC
 16-3-77 TP/AC
 4-5-77 TP/AC
 7-6-77 BJ/AC

Installation for AP 2000
 with internal PA-stage
 Print board B54C2

AP-RADIOTELEFON

Tegn.: 14-2-75
 AC

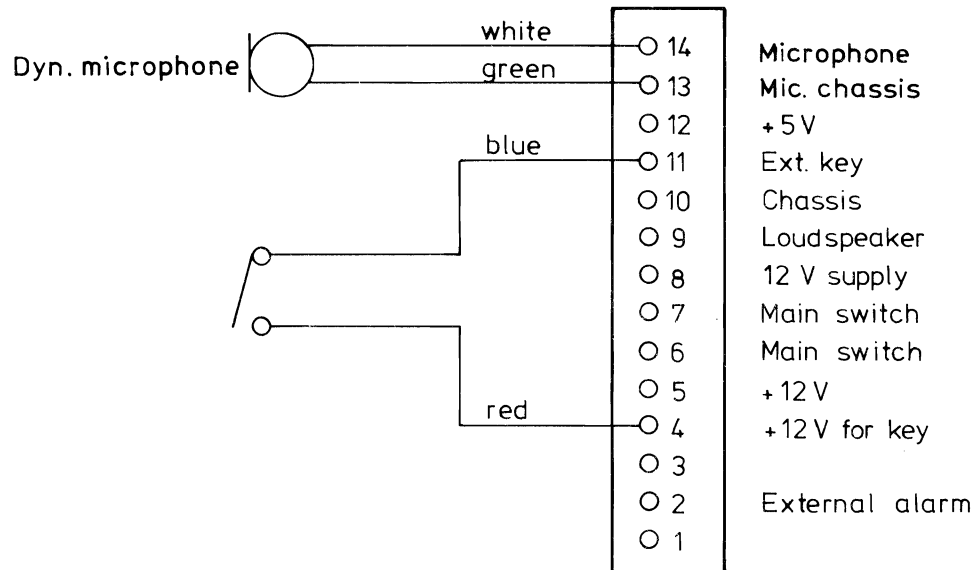
Stykt. nr.:

Tegn. nr.:

75061-2E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-359	100 Ω $\frac{1}{4}$ W CR 25			
C1	11-506	10 μ F/25V Tant.			
C2	11-353	0,1 μ F Laco			
C3	11-506	10 μ F/25V Tant.			
C4	05-030	1000 μ F/16V Elko			
C5	11-353	0,1 μ F Laco			
C6	11-409	1 nF ker.			
D1	04-040	30S1			
IC1	09-081	TDA 1405			
IC2	09-081	TDA 1405			
Installation for AP 2000 int. Print board B 54 C 2 PA Tilhører tegn. nr.: 75061-2E2			Rettet:		Tegn.: Kontr.:
					Stykl. nr.: 75061-4S2



Rettet:	Installation for close talk microphone, AP 2000	Tegn.: 4 - 11 - 76 AC	Kontr.:
		Stykl. nr.:	
	AP-RADIOTELEFON 1/2	Tegn. nr.: 76327-4E2	