3rd edition 82.09.15

MANUAL 165

UHF BAND

AP 2000 MOBILE

Contents AP 2000, UHF

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Technical Data AP 2ooo Series UHF

General:

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

Frequency range:	4o6-432 MHz and 45o-47o MHz
Principle:	Digital frequency synthesizer
Number of channels:	Max. 8O or 16O at 12,5 kHz
Channel spacing:	25 kHz, 2O 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, 24 V and 12 V chassis positive operation. A 22o V AC supply is available too.
Supply voltage varations:	1o,8 V to 15,6 V
Operation Temperature:	% 25°C to + 6O°C
Frequency stability:	typ. ± 3 ppm for the above specified temperature and supply voltage variations
Loudspeaker:	External 4 Ω
Microphone:	1 kΩ condenser microphone or 2oo Ω dynamic close talk micro-phone with push-button
Antenna impedance:	5o Ω
Power consumption:	At 13,2 V reception approx. o,4 A transmission { 25 W approx. 7,5 A { 6 W " 2,o A

Receiver:

Sensitivity:	typ. o,4 µV ($\frac{1}{2}$ E.M.F.) for 2o dB SINAD.
Adjacent channel sensitivity:	typ. 72 dB (CEPT Method)
Spurious and image rejection:	typ. 82 dB (CEPT Method)
Intermodulation attenuation:	typ. 72 dB (CEPT Method)
Undesired conducted power:	typ. o,5 nW
Deemphasis:	Following 6 dB per octave curve from o,3 to 3 KHz within + 1-3 dB relative level at looo Hz
Audio output power:	3 watts into 4 Ω at lo per cent distortion, 13,2 V supply voltage.
Output for microtelephone:	1 mW in 3oo Ω
Hum and noise:	typ. 45 dB (CEPT Method)
Function of limiter:	Less than 1 dB varation in output voltage for RF-input levels between 1 µV and loo mV EMF.

Transmitter:

	6 W ± o,5 dB, lo W - 1 + o,5 dB from ± 25°C to + 6o°C and supply voltages between lo,8 V and 15,6 V with external PA: lo-25 W + O dB ± 2 dB from ± 25°C to 6o°C and supply voltages between 10,8 V and 15,6 V
Spurious outputs and harmonics:	typ. each less than 2oo nW into 50 Ω
Adjacent channel power:	typ. 82 dB below the output power.
Frequency deviation:	Max. ± 5 kHz.
Preemphasis:	Following 6 dB per octave curve from O,3 to 3 kHz within + 1 - 3 dB relative level at looo Hz.
Harmonic distortion:	typ. 1 per cent at ± 3 kHz deviation and looo Hz modulation frequency.
Hum and noise:	typ. 45 dB relative ± 3 kHz deviation and looo Hz modulation frequency (CEPT Method).

Technical description for AP 2000 UHF

Receiver (Fig. 1)

Aerial switch (75624-4E2)
for sets with ext. PA (75627-4E2)

The aerial switch is made by a relay, while TR 1, D 1 and D 2 makes a forward power sensing circuit for the transmitter. This circuit is used for power regulation.

RF-amplifier and 1st mixer (80082-3E2)

The RF-amplifier consists of transistor Q 1, Q 2 and the helicoils L 2 to L 5 to give the necessary selectivity. The mixer transistor Q 4 converts the RF signal to 21,4 MHz. The oscillator injection is amplified in Q 3 and coupled to the mixer by a double tuned stripline filter. The oscillator frequency is: F_{Rx} + 21,4 MHz. Matching of the mixer output impedance to the crystalfilter is made by the tuned circuit L 6.

21,4 MHz and 455 kHz IF for 20 kHz, 25 kHz channel spacing (75076-3E2) and (21,4 MHz and 227,5 kHz for 12,5 kHz channel spacing (78152-3E2)).

The 21,4 MHz 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 MHz to the low IF 455 kHz (227,5 kHz). 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 section feeds the signal to IC 2, which is an integrated 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 (80073-2E2)

The AF signal passes through the squelch gate Q 1, to the volume control circuit. Here, the diodes D 2, D 3 and D 4 acts as an electronic attenuator regulated by the diode current. This circuit is also used for external AF-blocking. IC 1 amplifies the signal and R 9 and C 7 make the deemphasis. An integrated AF output amplifier is used for the 3 W loudspeaker output.

Rettet:

AP-RADIOTELEFON A/S

Technical description for AP 2000 UHF Receiver

Tegn.: 26-3-76 AC

Kontr.: 1-4-76 CHB

Tegn. nr.: 80139-4E2

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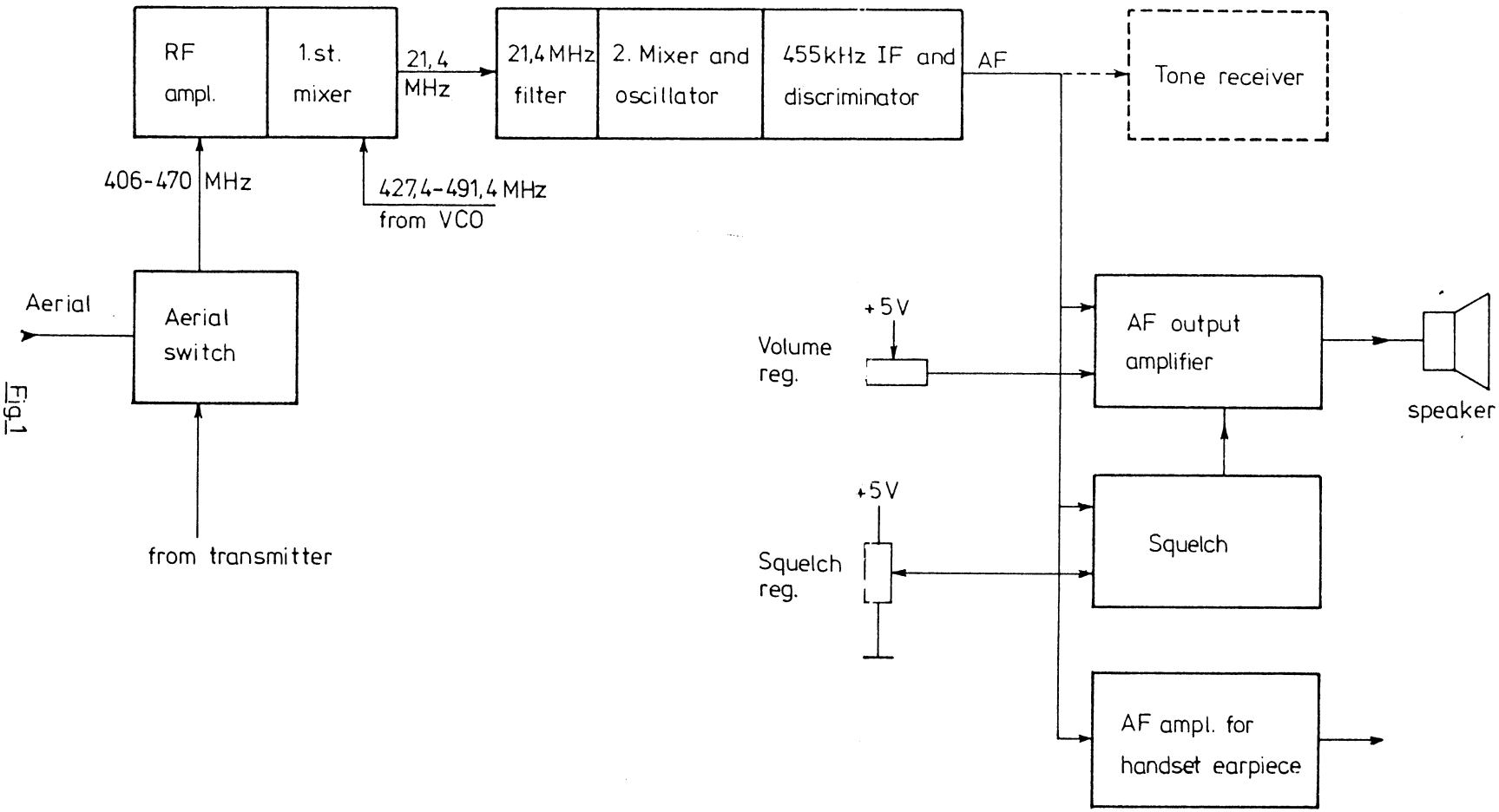


Fig.1

The transistors Q 2 and Q 3 makes the handset earpiece amplifier with C 12 and R 22 as deemphasis. The squelch circuit consists o of a 10 kHz tuned high pass filter Q 4, a noise amplifier Q 5 followed by a detector D 9 and D 10. With increasing noise level on the AF-input the voltage at the negative side on C 20 will decrease from + 5V. Getting lower than the squelch reg. voltage at the inverting input pin 2, on IC 1 which the comparator IC 1 switches from an output voltage of ca. + 4 V to 0 V and thus blocking the AF-output through the switch Q 1.
In the key control circuit Q 7 and Q 8 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.

Transmitter (Fig. 2)

Transmitter mixer and amplifier (80084-3E2)

Because the VCO has a frequency 21,4 MHz higher than the operating Rx-frequency, this is fed to the transmitter mixer and converted to the desired transmitting frequency.
The necessary 21,4 MHz signal (for simplex operation) comes from a combined crystal oscillator/doubler and modulator (80090-2E2). For good suppression of VCO and 21,4 MHz injection the Tx-mixer is a balanced transistor type. The two amplifier stages Q 3 and Q 4, together with helicoils L 2 to L 5, give further suppression of unwanted sidebands and necessary amplification to reach an output of approx. 40 mV.

6-10 W power amplifier (75510-4E2)

This power amplifier consists of three stages Q 1, Q 2 and Q 3, where the output level can be regulated by varying the supply voltage for Q 1 and Q 2. The regulation voltage is taken, from the forward power sensing circuit. Situated on print board B 58.

10-25 W power amplifier (75627-4E2)

This amplifier consists of one stage Q 1, and is driven from the 6-10 W amplifier. The output of Q 1 goes through a forward power-sensing circuit to the aerial switch. The output is adjustable with R 2.

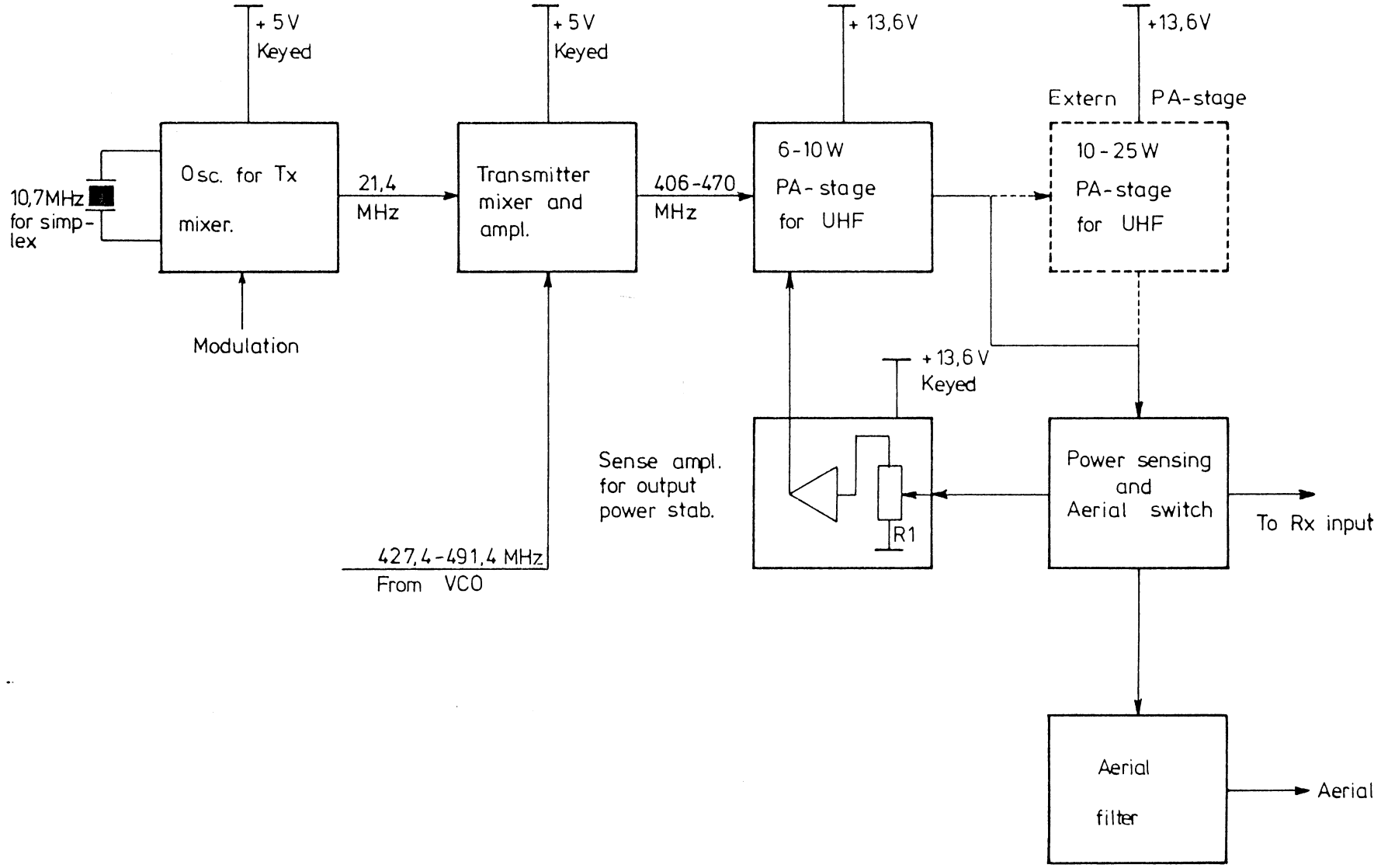
Rettet:

AP-RADIOTELEFON A/S

Technical decription for AP2000 UHF

Transmitter

Fig.2



Tegn.: 26-3-75 AC

Kontr.: 1-4-76 CHB

Page: 4

Tegn. nr.: 80139-4E2

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

From the power-sensing a DC voltage propotional 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 a lower output voltage for the supply of Q 1 and Q 2 (75510-4E2), thus reducing the drive level. This will act in the following manner:
For low supply voltage (~11 V) the output power will increase with increasing supply voltage, and the output reaches the desired value it will be constant for further increase in the supply voltage. The output level for supply voltages greater than approx. 13 V is adjustable with R 2 on print board B 59 for power outputs between 10-25 W and R 1 on print board B 57 for power outputs between 6-10 W. 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 6-10 W stage and the 10-25 W stage are supplied independent of the key.

Aerial filter (75623-4E2)

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 sensivities. Using the less sensitive input 2 (terminal 3), the mic. switch terminal carries +5 V 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 limits the AF signal prior to pre-emphasis, thereby reducing the peak deviation caused by AF signals 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 VCXO is used for modulation.

FREQUENCY SYNTHESIZER CIRCUIT

Basic phase locked loop operation

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

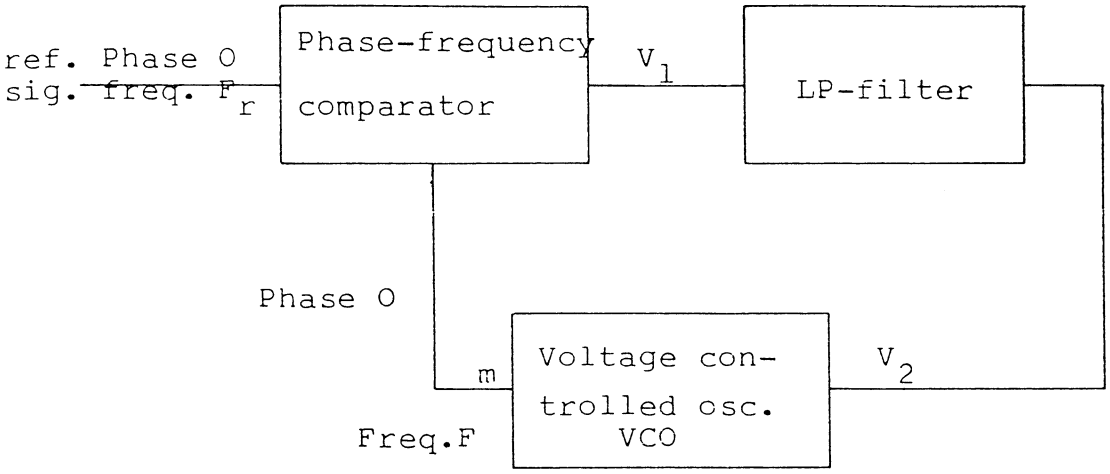


Fig. 1 Basic phase locked loop

Phase-frequency comparator with three-state output

If both input signals have identical frequencies but different phases, with signal F_O leading signal F_r, the comparator output will be low for the time equal to the phase difference If signal F_O lags siganl F_r, the output will be high for the same time. In between the output will be in a three-state condition, and the voltage on the capacitor of an RC filter connected at this point will have some intermidiate value. When used in a phase locked loop, this value will adjust the VCO frequency by reducing the phase difference between F_O and F_r to zero.

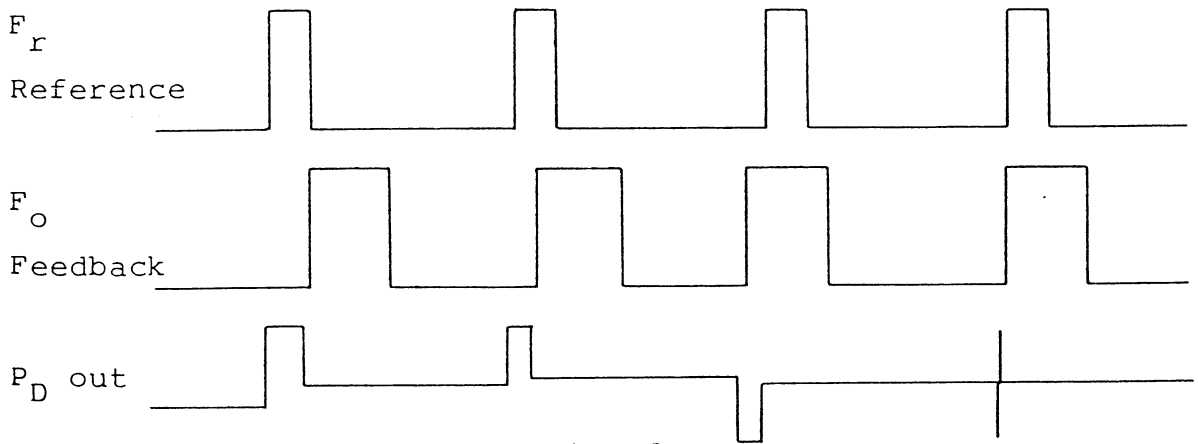


Fig. 2

If the signals have different frequencies, the output signal will be high when signal F_o has a lower frequency than signal F_r, and low otherwise.

A multichannel synthesizer (Fig.3)

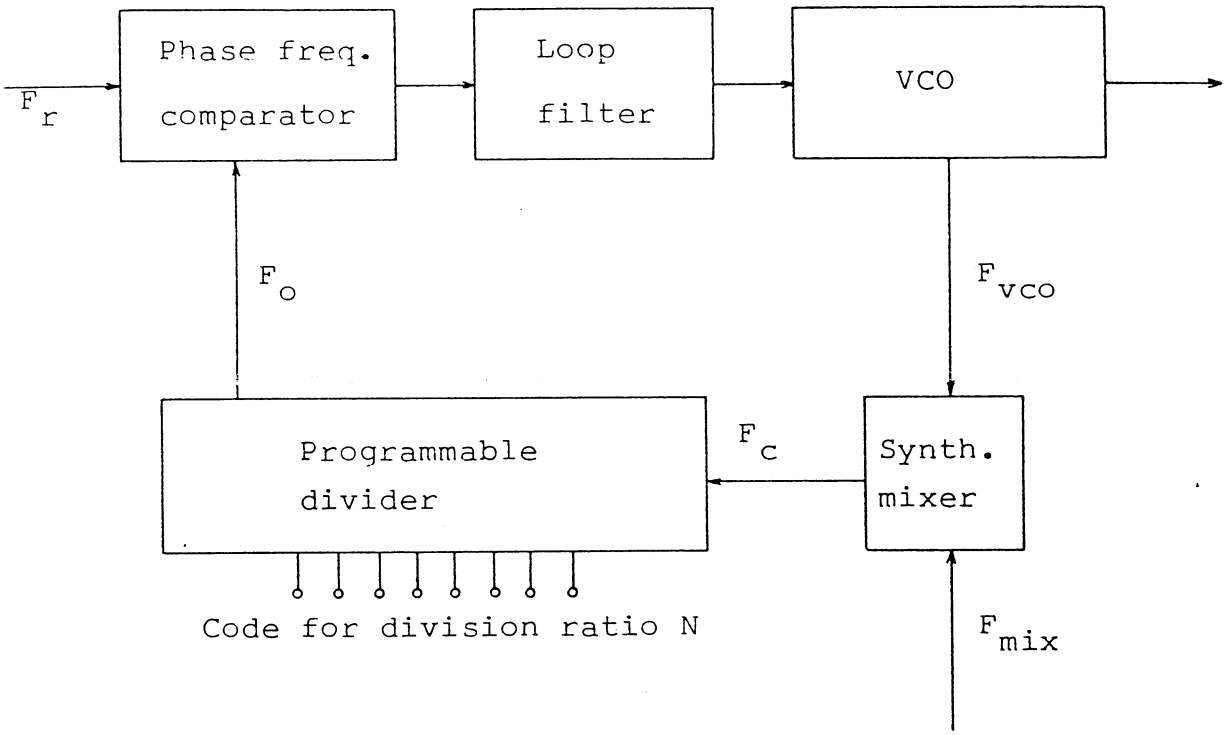


Fig. 3 Synthesizer loop

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_o are equal and the phase difference is zero. $F_o = F_r$ (2). The programmable divider divides frequency F_c with a number N, which can be selected by a binary code. $F_c = N \times F_o$ (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 (Fig. 4)

Synthesizer and VCXO (80090-2E2)

The synthesizer oscillator Q 1 and Q 2 with crystal X 1 produces the reference frequency for the programmable divider. The crystal frequency is about 20 MHz and the tuned circuits L 1 and L 3 are tuned to 4 x 20 = 80 MHz which is fed to the mixer Q 3. The VCO signal goes through the dual gate MOS-transistor Q 5 which gives high backward isolation but no amplification. Reaching the base of Q 3 the VCO signal is mixed with the sixth harmonic of the 80 MHz to give an output signal of 3,2 - 5,2 MHz. This signal is fed through a low pass filter and after amplification in Q 4 it reaches the input of the programmable divider in IC 1. The division ratio N is the binary number on the nine code lines. The numbers on the code lines correspond to the binary value of each line. The 256 code line can be set by a strap on the print board, and the other 8 code lines can be set from the frontsection.

The 12,5, 2o or 25 kHz reference frequency is made by the build in oscillator in IC 1 and crystal X 2 which is 6,4 MHz for 12,5 and 25 kHz spacing and 5,12 MHz for 20 kHz spacing. A programmable divider can be set to divide by 256 or 512 to reach the desired frequency.

The output from the phasecomperator (pin 4 on IC 1) goes through the loopfilter formed by R 29, R 30 and C 42. The capacitor holds the charging voltage when the phase comparator is in three-state between the phase pulses which are very narrow when the loop is in lock. Diode D 2 is used to clamp the control voltage thus preventing too great VCO frequency excursions when the loop is out of lock.

A build-in lock detector in IC 1 gives negative going pulses on pin 28 when the lopp is out of lock. The collector of Q 6 goes high and remains high because of C 41. Q 7 goes low and blocks the TX-oscillator. When the loop goes in lock the pulses disappears, Q 6 and Q 7 goes of and disables the Tx blocking.

The TX oscillator is formed by Q 8, Q 9 and crystal X 3. For simplex operation the necessary output frequency is 21,4 MHz. X3 is 10,7 MHz as the oscillator acts as a doubler.

Rettet:

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Figure for synthesizer description, UHF
25 (20) 12,5 kHz

Fig. 4

Tegn. nr.: 80140-4E2

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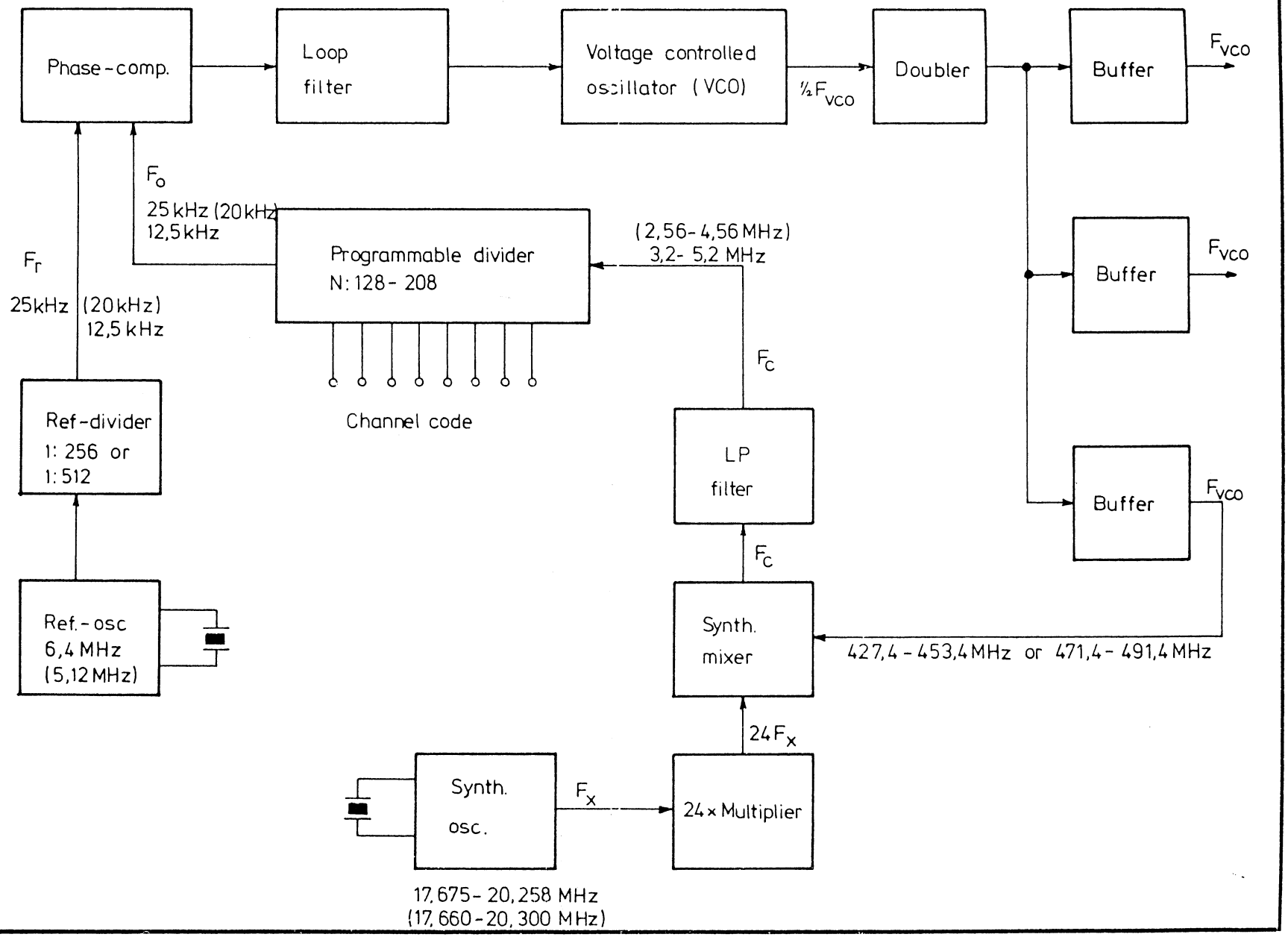
Tegn.: 2-6-77 AC

Kontr.:



At the same time the oscillator is modulated by the tuning diode D 4. IC 2 acts as an amplifier and voltage doubler to get enough modulation voltage for the tuning diode. The frequency can be adjusted by L 5.

Voltage controlled oscillator (80075-3E2)

The oscillator consists of Q 1, tuned by C1 which is transformed into an inductor by help of a quarter wave transmission-line, and the varicap. diodes D 1 and D 2. The varicap. voltage is controlled by the synthesizer.
The oscillator is buffered by the wideband stage Q 2 which is followed by a balanced wideband doubler stage Q 3 and Q 4.
The output stage Q 5 provides 1 mW on pin 3.
The output stage Q 6 provides 0,5 mW on pin 4.
The output stage Q 7 provides 4 mW on pin 5.
The VCO frequency range tuned by C 1 goes from 390 to 530 MHz.
For lower frequencies a parallel capacitor 8,2 pF is mounted.

Channel code

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

$$F_{VCO} = 24\ F_x + N \times 0{,}025\ (0{,}020)\ \text{MHz where 128 N 208.}$$

The VCO frequency $F_m = 24\ F_x + N\ 0{,}025\ (0{,}020) - 21{,}4$ MHz (5)
Here N is the division ratio and F_x is the synthesizer mixer crystal. F_x is found from the drawings 75499-4E2, 75500-4E2 and 76312-4E2. For a single channel set you can choose between two standard crystals beeing equally good. Considering a multichannel set, in most cases only one standard crystal will fit the desired frequency range.

1. Computation examble of the receiver frequency for 25 kHz set:

Known is: Crystal frequency F_x and channel code.

Examble: $F_x = 19{,}675$ MHz

Code: 1 0 0 1 0 0 1 1

Division ratio N = 128 + 16 + 2 + 1 = 147

Using equation (5):

$F_{Rx} = 24 \times 19{,}675 + (147 \times 0{,}025) - 21{,}4 = 454{,}475$ MHz

2. Computation of the channel code:

Known is: Crystal frequency F_x and desired receiver frequency F_{Rx}.

Rearranging equation (5) gives

$$N = \frac{F_{Rx} - 24\ F_x + 21,4}{0,025}$$

Examble: F_x = 19,675 MHz,

$N = (455,625 - 24 \times 19,675 + 21,4)/0,025 = 193$

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

Channel code 1 1 0 0 0 0 0 1

Note: Because of the special syntehsizer oscillator circuit, it has been necessary to specify the crystal X 1 with a parallel capacity of 15 pF. If you use a crystal specified with 30 pF parallel capacity, the frequency should be about 250 ppm lower than the standard frequency given on the drawings 75499-4E2, 75500-4E2 and 76321-4E2.
Exactly the same procedure is used when the set is intended for 20 kHz channel spacing.
The synthesizer mixer X-tal for 20 kHz spacing is found on the drawing: 77105-4E2, 77106-4E2, 77107-4E2, 77194-4E2, 77195-4E2 and 77196-4E2.

Channel code for 12,5 kHz set

The division ratio $N = \frac{F_{Rx} - 24\ F_x + 21,4}{0,0125}$

Examble: F_x = 19,675 MHz, F_{Rx} = 455,625 MHz

$$N = \frac{455,625 - 24 \times 19,625 + 21,4}{0,0125} = 386$$

$N = (256) + 128 + 0 + 0 + 0 + 0 + 0 + 2 + 0$

Channel code 1 1 0 0 0 0 0 1 0

Crystal frequencies for 12,5 kHz spacing is found in drawings:

DIVISION RATIO AND CHANNELCODE

12,5 kHz channel spacing

The division ratio N corresponds to the 9 - bit channel code in this way.

Bit number	9	8	7	6	5	4	3	2	1
Value of each bit	256	128	64	32	16	8	4	2	1
Example: channel code=	1	0	1	0	0	0	0	0	1
N = 321	256	+ 0	+64	+ 0	+ 0	+ 0	+ 0	+ 0	+ 1

Logic 1 = +5 Volts. Logic 0 = 0 Volts

Div. ratio	Channel code								
N	256	128	64	32	16	8	4	2	1
256	1	0	0	0	0	0	0	0	0
257	1	0	0	0	0	0	0	0	1
258	1	0	0	0	0	0	0	1	0
259	1	0	0	0	0	0	0	1	1
260	1	0	0	0	0	0	1	0	0
261	1	0	0	0	0	0	1	0	1
262	1	0	0	0	0	0	1	1	0
263	1	0	0	0	0	0	1	1	1
264	1	0	0	0	0	1	0	0	0
265	1	0	0	0	0	1	0	0	1
266	1	0	0	0	0	1	0	1	0
267	1	0	0	0	0	1	0	1	1
268	1	0	0	0	0	1	1	0	0
269	1	0	0	0	0	1	1	0	1
270	1	0	0	0	0	1	1	1	0
271	1	0	0	0	0	1	1	1	1
272	1	0	0	0	1	0	0	0	0
273	1	0	0	0	1	0	0	0	1
274	1	0	0	0	1	0	0	1	0
275	1	0	0	0	1	0	0	1	1
276	1	0	0	0	1	0	1	0	0
277	1	0	0	0	1	0	1	0	1
278	1	0	0	0	1	0	1	1	0
279	1	0	0	0	1	0	1	1	1
280	1	0	0	0	1	1	0	0	0
281	1	0	0	0	1	1	0	0	1
282	1	0	0	0	1	1	0	1	0
283	1	0	0	0	1	1	0	1	1
284	1	0	0	0	1	1	1	0	0
285	1	0	0	0	1	1	1	0	1
286	1	0	0	0	1	1	1	1	0
287	1	0	0	0	1	1	1	1	1
288	1	0	0	1	0	0	0	0	0
289	1	0	0	1	0	0	0	0	1
290	1	0	0	1	0	0	0	1	0
291	1	0	0	1	0	0	0	1	1
292	1	0	0	1	0	0	1	0	0
293	1	0	0	1	0	0	1	0	1
294	1	0	0	1	0	0	1	1	0
295	1	0	0	1	0	0	1	1	1

Div. ratio	Channel code								
N	256	128	64	32	16	8	4	2	1
296	1	0	0	1	0	1	0	0	0
297	1	0	0	1	0	1	0	0	1
298	1	0	0	1	0	1	0	1	0
299	1	0	0	1	0	1	0	1	1
300	1	0	0	1	0	1	1	0	0
301	1	0	0	1	0	1	1	0	1
302	1	0	0	1	0	1	1	1	0
303	1	0	0	1	0	1	1	1	1
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323	1	0	1	0	0	0	0	1	1
324	1	0	1	0	0	0	1	0	0
325	1	0	1	0	0	0	1	0	1
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332	1	0	1	0	0	1	1	0	0
333	1	0	1	0	0	1	1	0	1
334	1	0	1	0	0	1	1	1	0
335	1	0	1	0	0	1	1	1	1
336	1	0	1	0	1	0	0	0	0

Div. ratio	Channel code								
N	256	128	64	32	16	8	4	2	1
337	1	0	1	0	1	0	0	0	1
338	1	0	1	0	1	0	0	1	0
339	1	0	1	0	1	0	0	1	1
340	1	0	1	0	1	0	1	0	0
341	1	0	1	0	1	0	1	0	1
342	1	0	1	0	1	0	1	1	0
343	1	0	1	0	1	0	1	1	1
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359	1	0	1	1	0	0	1	1	1
360	1	0	1	1	0	1	0	0	0
361	1	0	1	1	0	1	0	0	1
362	1	0	1	1	0	1	0	1	0
363	1	0	1	1	0	1	0	1	1
364	1	0	1	1	0	1	1	0	0
365	1	0	1	1	0	1	1	0	1
366	1	0	1	1	0	1	1	1	0
367	1	0	1	1	0	1	1	1	1
368	1	0	1	1	1	0	0	0	0
369	1	0	1	1	1	0	0	0	1
370	1	0	1	1	1	0	0	1	0
371	1	0	1	1	1	0	0	1	1
372	1	0	1	1	1	0	1	0	0
373	1	0	1	1	1	0	1	0	1
374	1	0	1	1	1	0	1	1	0
375	1	0	1	1	1	0	1	1	1
376	1	0	1	1	1	1	0	0	0
377	1	0	1	1	1	1	0	0	1

Div. ratio	Channel code								
N	256	128	64	32	16	8	4	2	1
378	1	0	1	1	1	1	0	1	0
379	1	0	1	1	1	1	0	1	1
380	1	0	1	1	1	1	1	0	0
381	1	0	1	1	1	1	1	0	1
382	1	0	1	1	1	1	1	1	0
383	1	0	1	1	1	1	1	1	1
384	1	1	0	0	0	0	0	0	0
385	1	1	0	0	0	0	0	0	1
386	1	1	0	0	0	0	0	1	0
387	1	1	0	0	0	0	0	1	1
388	1	1	0	0	0	0	1	0	0
389	1	1	0	0	0	0	1	0	1
390	1	1	0	0	0	0	1	1	0
391	1	1	0	0	0	0	1	1	1
392	1	1	0	0	0	1	0	0	0
393	1	1	0	0	0	1	0	0	1
394	1	1	0	0	0	1	0	1	0
395	1	1	0	0	0	1	0	1	1
396	1	1	0	0	0	1	1	0	0
397	1	1	0	0	0	1	1	0	1
398	1	1	0	0	0	1	1	1	0
399	1	1	0	0	0	1	1	1	1
400	1	1	0	0	1	0	0	0	0
401	1	1	0	0	1	0	0	0	1
402	1	1	0	0	1	0	0	1	0
403	1	1	0	0	1	0	0	1	1
404	1	1	0	0	1	0	1	0	0
405	1	1	0	0	1	0	1	0	1
406	1	1	0	0	1	0	1	1	0
407	1	1	0	0	1	0	1	1	1
408	1	1	0	0	1	1	0	0	0
409	1	1	0	0	1	1	0	0	1
410	1	1	0	0	1	1	0	1	0
411	1	1	0	0	1	1	0	1	1
412	1	1	0	0	1	1	1	0	0
413	1	1	0	0	1	1	1	0	1
414	1	1	0	0	1	1	1	1	0
415	1	1	0	0	1	1	1	1	1
416	1	1	0	1	0	0	0	0	0

Rettet: 15-2-77 NC

AP-RADIOTELEFON A/S

Standard crystals for AP 2000 low UHF band
low range: 1 for channel ending with
00, 25, 50, 75 kHz

Tegn. nr.: 75499-4E2

Tegn.: 30-10-75 EH

Kontr.: 30-10-75 CHB

Stykl. nr.:

25 kHz Channel spacing

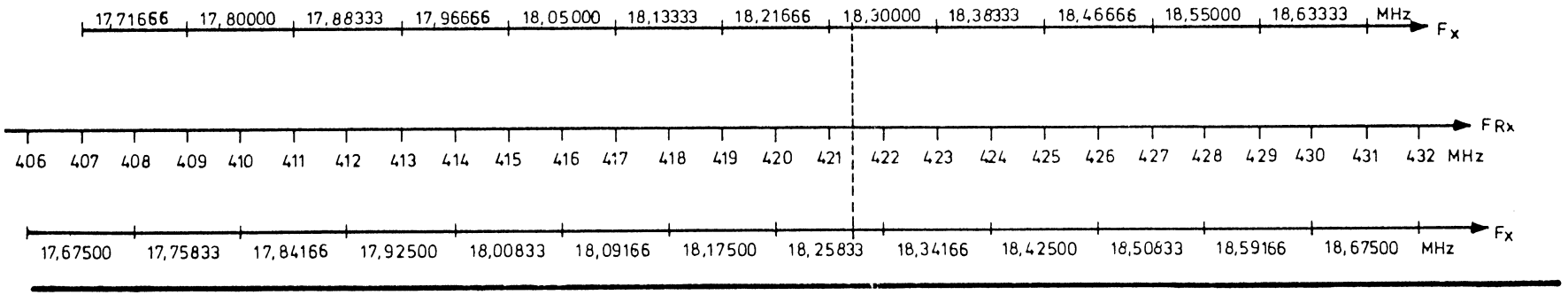
SPECIFICATION for Quartz Crystal Unit AP 25

Mode of operation: F_{Rx} higher than or equal to F_{Tx}

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,025}$

Example:
Known receiver freq. = 421,375 MHz
Found from the table F_x = 18,25833 MHz
Claculated N = 183,0032 as N is an integer the decimal places are deleted so N = 183.



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

Rettet: 15-2-77 NC

AP-RADIOTELEFON A/S

Standard crystals for AP 2000
UHF band, medium range: 2. For channels ending with 00, 25, 50, 75 khz

25 kHz Channel spacing

Tegn.: 27-10-76 AC
Kontr.: 27-10-76 CHB
Stykl. nr.:
Tegn. nr.: 76312-4E2

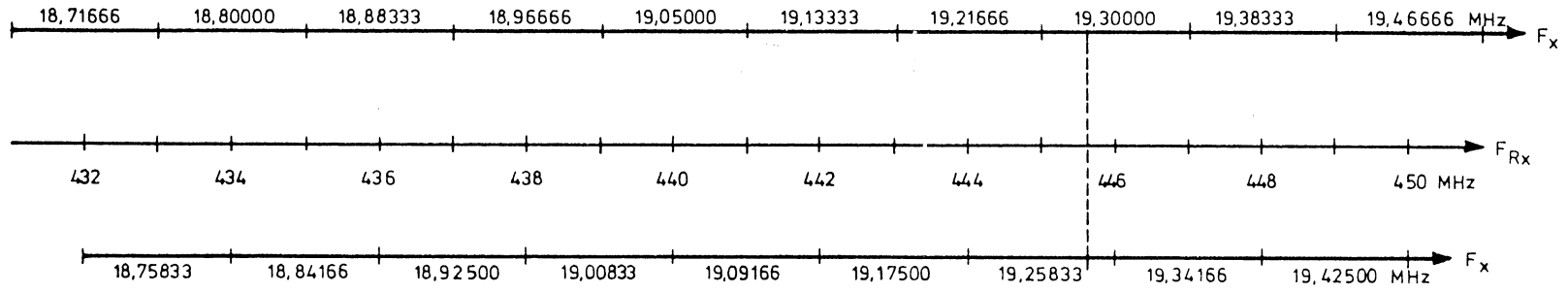
SPECIFICATION
for Quartz Crystal Unit
AP 25

Mode of operation: F_{Rx} higher than or equal to F_{Tx}

1. Mode of operation : AT-Fundamental
2. Holder : HC-42/U
3. Frequency range : 10-22 MHz
4. Resonance : Parallel (15 pF)
5. Calibration tolerance : ± 10 ppm at 25°C
6. Temperature tolerance : ± 5 ppm ⅞ 20°C to + 70°C
7. Drive level : 1 mW
8. Equivalent series resistance : Max. 40 Ω
9. Marking : AP 25 frequency in MHz

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,025}$

Example:
Known receiver freq. = 445,650 MHz
Found from the table F_x = 19,25833 MHz
Calculated N = 194,0032 as N is an integer the decimal places are deleted so N = 194.



Transmitter mixer oscillator

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 ⅞ 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} mix. = 10,7 + $\frac{F_{Rx} - F_{Tx}}{2}$ Spec. AP 22

Rettet: 29.2.'76 AC
15-2-77 NC

AP-RADIOTELEFON A/S

Standard crystals for AP2000
UHF band, high range: 3. For channels ending with 00, 25, 50, 75 kHz

25kHz Channel spacing

Tegn.: 30-10-75 EH
Kontr.: 30-10-75 CHB
Stykl. nr.:
Tegn. nr.: 75500-4E2

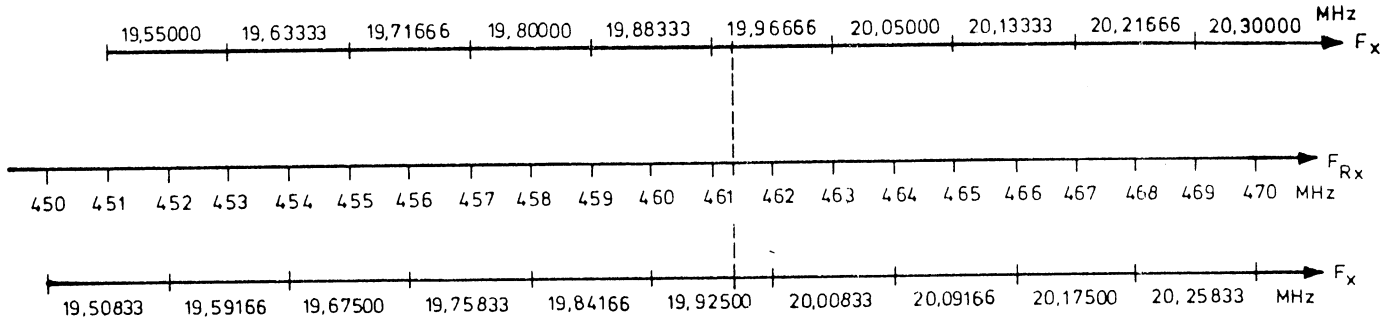
Mode of operation: F_{Rx} higher than or equal to F_{Tx}

SPECIFICATION
for Quartz Crystal Unit
AP 25

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,025}$

Example:
Known receiver freq. = 461,325 MHz
Found from the table F_x = 19,96666 MHz
Calculated N = 141,0064 as N is an integer the decimal places are deleted so N = 141.



Transmitter mixer oscillator

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

Rettet: 15-2-77 NC

AP-RADIOTELEFON A/S

Standard crystals for AP2000 UHF band low range: 1 for channels ending with 00,20,40,60,80 kHz

20kHz Channel spacing

Tegn.: 3-2-77 AC

Kontr.: CHB

Stykl. nr.:

Tegn. nr.: 77105-4E2

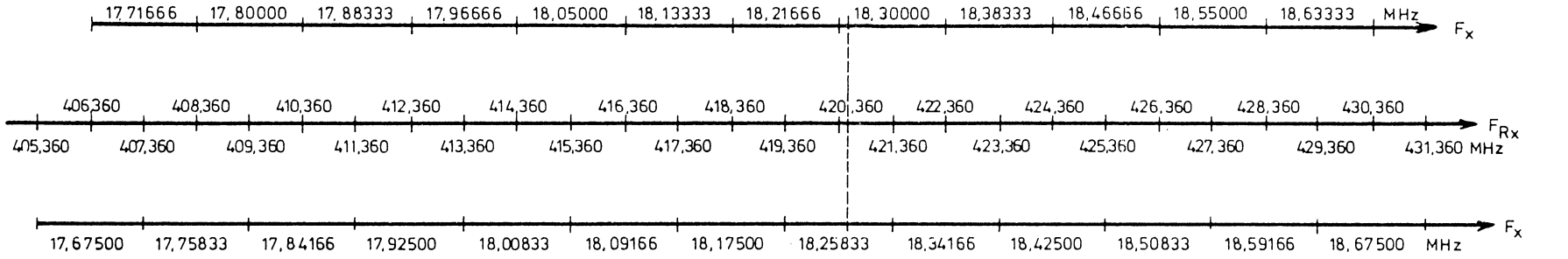
SPECIFICATION for Quartz Crystal Unit AP 25

Mode of operation: F_{Rx} higher than or equal to F_{Tx}

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,020}$

Example:
Known receiver freq. = 420,460 MHz
Found from the table F_x = 18,25833 MHz
Calculated N = 183,004 as N is an integer the decimal places are deleted so N = 183.



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

Rettet:

AP-RADIOTELEFON A/S

Standard crystals for AP 2000 UHF band
low range: 1 for channels ending with
10,30,50,70,90, kHz

20kHz Channel spacing

Tegn.: 13-5-77 HJ
Kontr.:
Stykl. nr.:
Tegn. nr.: 77196-4E2

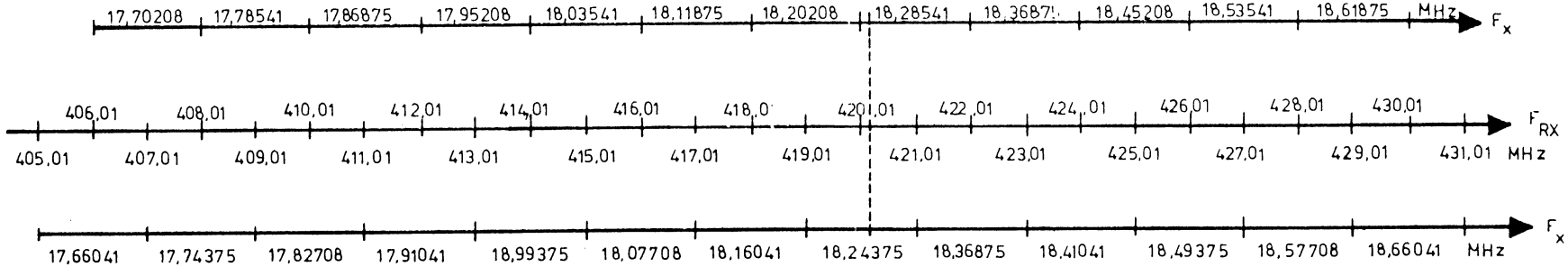
SPECIFICATION
for Quartz Crystal Unit
AP 25

Mode of operation: F_{Rx} higher than or equal to F_{Tx}

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,020}$

Example:
Known receiver freq. = 420,460 MHz
Found from the table F_x = 18,25833 MHz
Calculated N = 183,004 as N is an integer
the decimal places are deleted so N = 183.



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

Rettet: 15-2-77 NC

AP-RADIOTELEFON A/S

Standard crystals for AP 2000 UHF band
medium range: 2 for channels ending with
00,20,40,60,80 kHz

20 kHz Channel spacing

Tegn.: 7-2-77 AC

Stykl. nr.:

Kontr.: CHB

Tegn. nr.: 77106 - 4E2

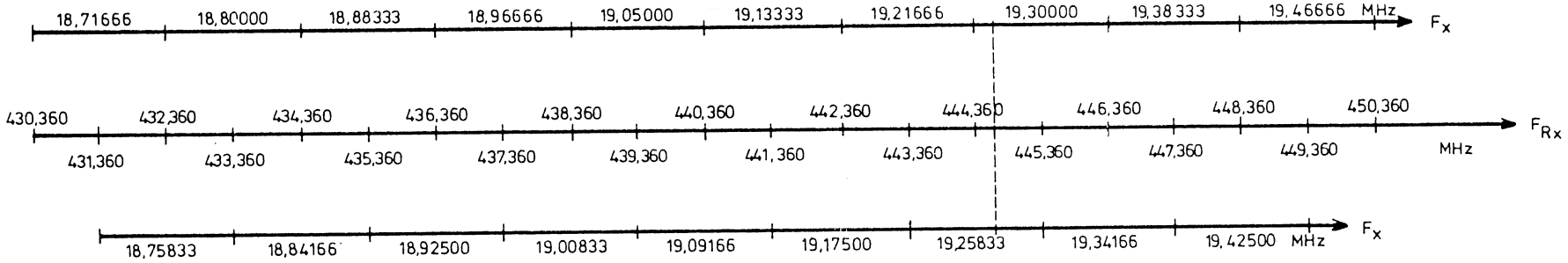
SPECIFICATION
for Quartz Crystal Unit
AP 25

Mode of operation: F_{Rx} higher than or equal to F_{Tx}

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,020}$

Example:
Known receiver freq. = 444,680 MHz
Found from the table F_x = 19,25833 MHz
Calculated N = 194,004 as N is an integer
the decimal places are deleted so N = 194.



Transmitter mixer oscillator

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

Rettet:

AP-RADIOTELEFON A/S

Standard crystals for AP2000 UHF band
medium range: 2 for channels ending with
10,30,50,70,90 kHz

20 kHz Channel spacing

Tegn.: 13-5-77 H.J.

Kontr.:

Stykl. nr.:

Tegn. nr.: 77195-4E2

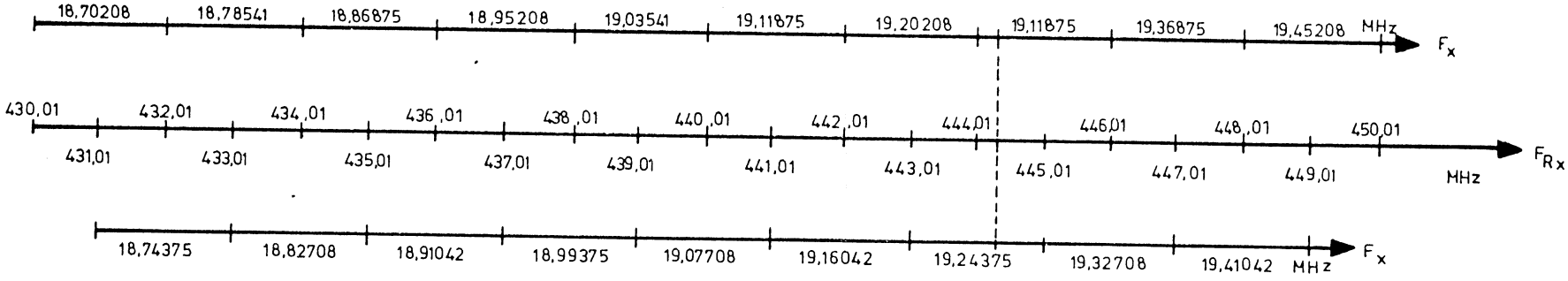
SPECIFICATION
for Quartz Crystal Unit
AP 25

Mode of operation: F_{Rx} higher than or equal to F_{Tx}

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24 \cdot F_x}{0,020}$

Example:
Known receiver freq. = 444,680 MHz
Found from the table F_x = 19,25833 MHz
Calculated N = 194,004 as N is an integer
the decimal places are deleted so N = 194.



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

Rettet: 15-2-77 NC

AP-RADIOTELEFON A/S

Standard crystals for AP 2000 UHF-band high range: 3 for channels ending with 00,20,40,60,80 kHz

20kHz Channel spacing

Tegn.: 7-2-77 AC

Kontr.: CHB

Stykl. nr.:

Tegn. nr.: 77107-4E2

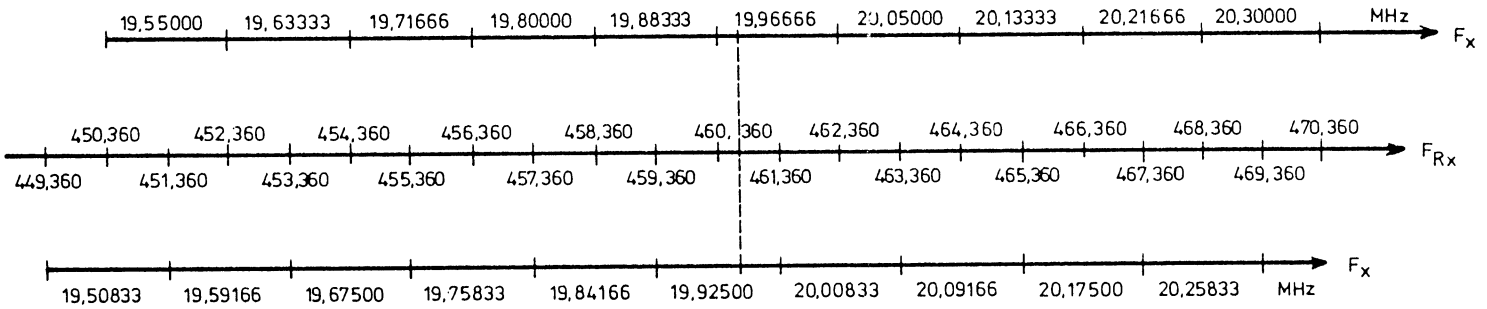
Mode of operation: F_{Rx} higher than or equal to F_{Tx}

SPECIFICATION
for Quartz Crystal Unit
AP 25

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,020}$

Example:
Known receiver freq. = 460,620 MHz
Found from the table F_x = 19,96666 MHz
Calculated N = 141,008 as N is an integer
the decimal places are deleted so N = 141.



Transmitter mixer oscillator

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

Rettet: 26-6-78 LT/AC

AP-RADIOTELEFON A/S

Standard crystals for AP 2000 UHF-band high range: 3 for channels ending with 10,30,50,70,90 kHz

20kHz Channel spacing

Tegn.: 13-5-77 HJ

Kontr.:

Stykl. nr.:

Tegn. nr.: 77194-4E 2

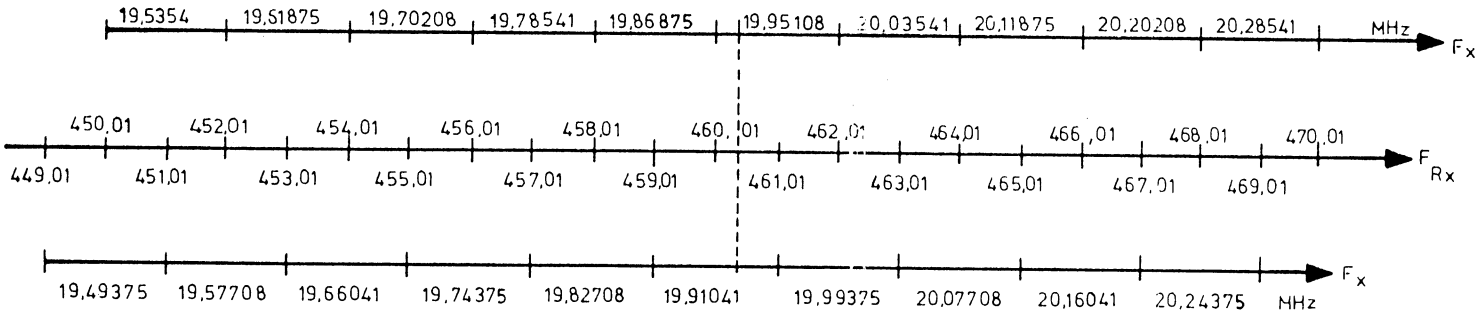
SPECIFICATION
for Quartz Crystal Unit
AP 25

Mode of operation: F_{Rx} higher than or equal to F_{Tx}

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,020}$

Example:
Known receiver freq. = 460,620 MHz
Found from the table F_x = 19,96666 MHz
Calculated N = 141,008 as N is an integer
the decimal places are deleted so N = 141.



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

Rettet:

AP-RADIOTELEFON A/S

Standard crystals for AP 2000 low UHF band
low range: 1

12,5kHz Channel spacing

Tegn.: 23-10-80 AMC

Kontr.:

Stykl. nr.:

Tegn. nr.: 80142-4E2

SPECIFICATION
for Quartz Crystal Unit
AP 25

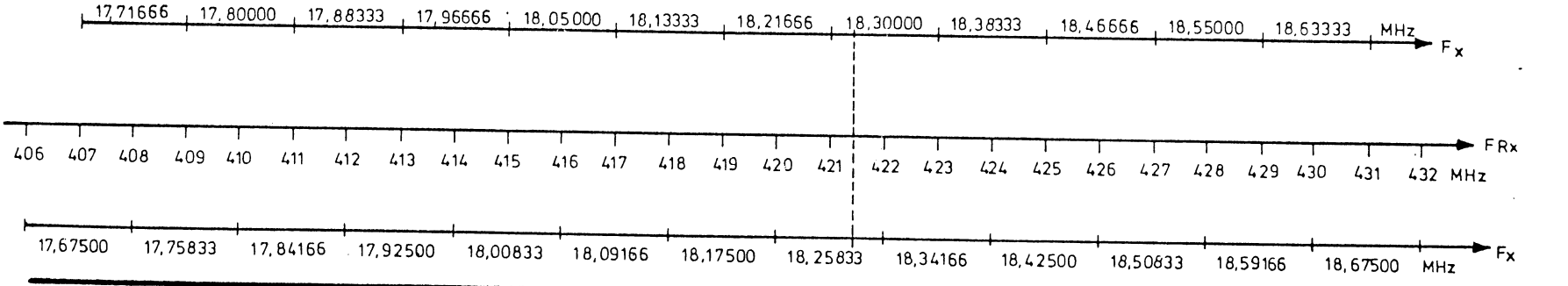
Mode of operation: F_{Rx} higher than or equal to F_{Tx}

1. Mode of operation : AT-Fundamental
2. Holder : HC-42/U
3. Frequency range : 10-22 MHz
4. Resonance : Parallel (15 pF)
5. Calibration tolerance : ± 10 ppm at 25°C
6. Temperature tolerance : ± 5 ppm ⅔ 20°C to + 70°C
7. Drive level : 1 mW
8. Equivalent series resistance : Max. 40Ω
9. Marking : AP 25 frequency in MHz

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,0125}$

Examble:

Known receiver freq. = 421,375 MHz
Found from the table F_x = 18,25833 MHz
Calculated N = 366,0064 as N is an integer
the decimal places are deleted so N = 366.



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 ⅔ 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} mix. = 10,7 + $\frac{F_{Rx} - F_{Tx}}{2}$ Spec. AP 22

Rettet:

AP-RADIOTELEFON A/S

Standard crystals for AP 2000
UHF band, medium range: 2.

12,5 kHz Channel spacing

Tegn.:23-10-80 AMC

Kontr.:

Stykl. nr.:

Tegn. nr.: 80143-4E2

SPECIFICATION
for Quartz Crystal Unit
AP 25

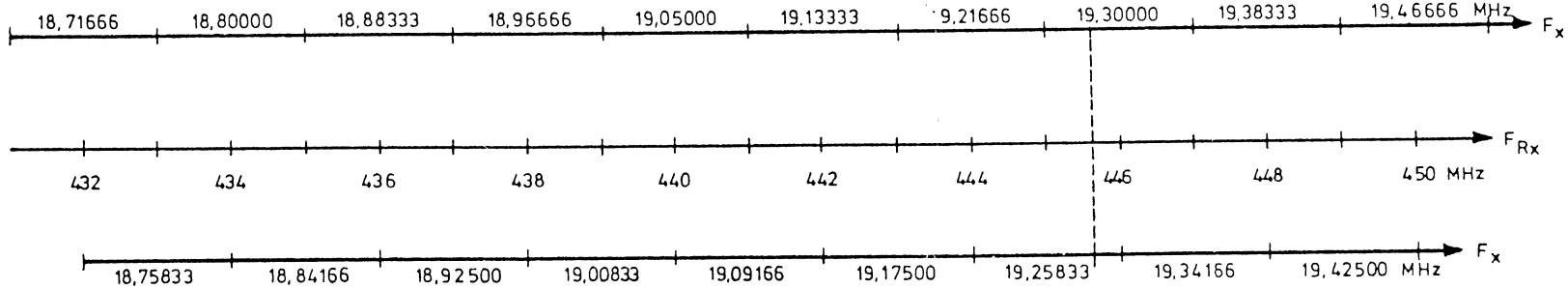
Mode of operation: F_{Rx} higher than or equal to F_{Tx}

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

Division ratio $N = \frac{F_{Rx} + 21,4 - 24\ F_x}{0,0125}$

Examble:

Known receiver freq. = 461,325 MHz
Found from the table F_x = 19,96666 MHz
Calculated N = 282,0128 as N is an integer
the decimal places are deleted so N = 282.



Transmitter mixer oscillator

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

Tuning instruction for UHF

1. Tuning of the synthesizer circuit (print C 92)

Connect a high input resistance DC-voltmeter to TP 1. By tuning coils L 1 and L 3 to max., a reading of approx. 1,5 V should be obtained.

If the set contains more than one channel, turn channel selector to a channel with frequency in the middle of the used band. Check the channel code with a voltmeter at point 1, 2,....64, 128. Point 256 must be strapped low in 20 and 25 kHz sets. The strap is removed in 12,5 kHz sets. Check also the code for channel spacing. See drawing number 80090-2E2.

Turn C 27 (on print C 84) to minimum capacity. Connect a 500 Mhz counter to point 5 (on print C 84) and adjust C 1 (on print C 84) to about the right frequency (F_{Rx} + 21,4 MHz). Then adjust C 27 to max. DC at TP 1 (on print C 84).

Now connect a DC voltmeter to point 10 and key the transmitter. Turn C 1 slowly and when the loop is in lock the voltage on point 10 is high (approx. 3,5 V) and low otherwise.

When lock is achieved fine adjust C 1 to 3 V DC on point 7.

For multichannel sets turn the channel selector to lowest and highest frequency and check that the loop still goes in lock. The loop voltage have to lie between 2 and 4 V.

With the counter connected to point 3 adjust C 3 to get the exact frequency (F_{Rx} + 21,4 MHz).

Connect the counter to point 11 and key the transmitter. Adjust L 5 to get exact frequency of 2 x X 3.

22 Tuning of the receiver

A. 21,4 MHz and 455 kHz IF (print board B 01)

Connect a 21,4 MHz sweep generator (a 10,7 MHz sweep generator normally contains sufficient second harmonics to be used on 21,4 MHz) to point TP 2 on the RF and mixer print board C 85 and the (DC) probe on point TP 1 on the print board B 01. adjust L 6 (print board C 85) and L 1 (print board B 01) for minimum ripple. L 2 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 amplifier print board C 79) and adjust L 4 in the IF to max. discriminator slope and the best linearity.

B. RF amplifier and mixer (print board C 85)

With the voltmeter on TP 1 the capacitors C 11 and C 12 are adjusted to max. deflection (approx. 1,5 V DC). With the signal generator connected to the receiver input, and C 1 set to minimum capacity, L 2, L 3, L 4 and L 5 are now tuned to give optimum sensitivity. At last C 1 and L 2 are alternately tuned until best sensitivity is obtained.

C. AF-amplifier (print board C 79)

Adjust the output level for the handset earpiece to 60 mW with potmeter R 29 (3,5 kHz dev., 1 kHz mod.). IF Tx blocking of earpiece is wanted D 8 is mounted and point G and H connected. Point A and B are internal connected but can be separated for optional use. When point C and D are connected the earpiece ampl. is not depending on the volume control. This will happen if piont D and E are connected instead. In this case C 12 must be replaced by 68 pF and R 26 set to a value where the amplifier is not saturating.

Alternative method tuning of Rx front and IF without a sweep generator.

Adjust C 11 and C 12 as described under 'B'. Tune the RF-signal generator either to 21,4 MHz or to the receiving frequency and connect it to TP 2 in the RF-amplifier. The horizontal deflection voltage from an oscilloscope should be used to modulate (FM) the signal generator. Now the IF can be tuned as previously described. By connecting the signal generator (tuned to the receiving frequency) 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. TX - VCXO (print board C 92)

Connect a counter to point 11 and adjust L 5 to obtain the exact frequency of 2 x X 3.

B. Tx-mixer and amplifier (print board C 86)

If X 3 > 10,7 MHz C 3 have to be removed. Tune L 1 to max. DC on TP 1 (approx. 1 V). Connect a wattmeter (50 Ω, 0,1 W range) to pin 4 and key the transmitter.

L 2, L 3 and L 4 is now adjusted to get max. DC on TP 3. Adjust L 5 to get max. reading on the wattmeter. Finally a slight tuning of L2, L 3, L 4 and L 5 should be done in order to get max. output power approx. 30-40 mW.

C. 6-10 W PA-stage (print board B 45)

Turn the power regulation potmeter R 1 counterclockwise to get the output power stabilization out of function. Connect a wattmeter(50 Ω, 10 W) to the test installation output and set the supply voltage to 12,0 V. Now tune C 2, C 5, C 6, C 10, C 11 C 15 and C 16 to max. output power.

Finally the tuning should be repeated once or twice in order to get the max. possible output power approx. 12 W. The potmeter R 1 on print board B 57 will adjust the output power for any desired value between 6-10 W.

D. 10-25 W PA-stage (print board B 59 extern PA-stage)

Push the radio into the power cassette, connect the wattmeter (50 Ω, 25 W) and adjust C 1, C 2, C 8 and C 9 to max. output power with a supply voltages of 12,0 V. In-crease the supply voltage to 13,6 V and turn the potmeter R 2 on print board B 59 clockwise until the power decreases to the desired value. Check the power regulation by varying the supply voltage from 10,8 V to 16,0 V. In the case of 25 W set, the output power may be a little less than 25 W at supply voltages below 13,2 V, but for voltages from 13,2 V and up the output power shall be held constantly on 25 W.

E. Modulation amplifier C 61

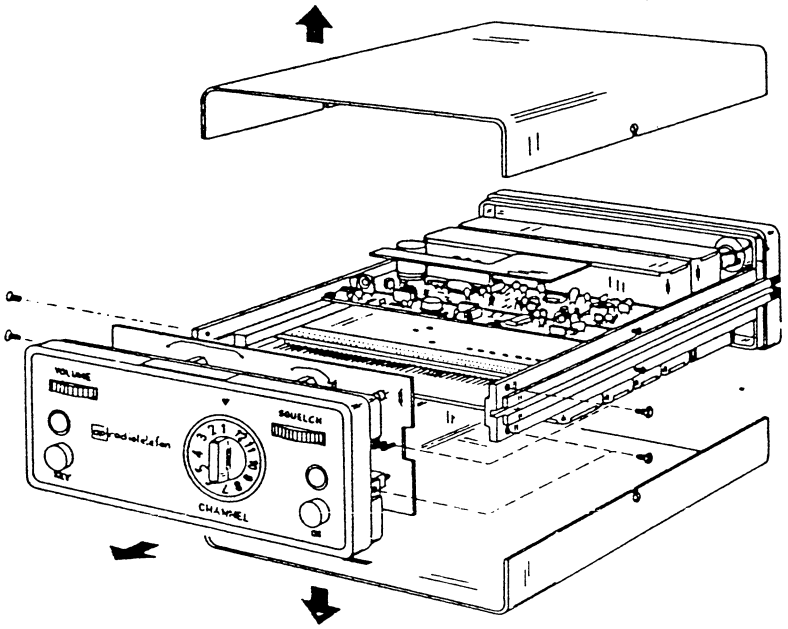
Connect a modulation meter to the transmitter low output impedance generator to the microphone input 1 (term. 1). Set all three potentiometers to their centre posistions, and adjust the tonegenerator to give an output level of 20 mV at 1 kHz. Adjust potentiometer R 35 to give $\pm$ 5 kHz deviation on the modulation meter. Set the tonegenerator to 1 kHz, 2 mV, and adjust potentiometer R 10 for a deviation of 3 kHz. Repeat the procedure to check and adjust R 35 and R 10 if necessary.

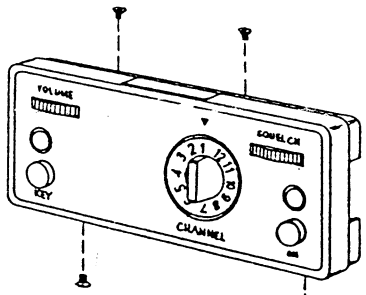
If the station is equipped with a handset, R 35 is adjusted to ± 5 kHz with an input level of 4 V at 1 kHz.
When the generator is adjusted to give 1 kHz 400 mV, R 5 is adjusted to give a deviation of ± 3 kHz.
This covers the 25 kHz version.
With respect to the 20 kHz version, use the same procedure but read:

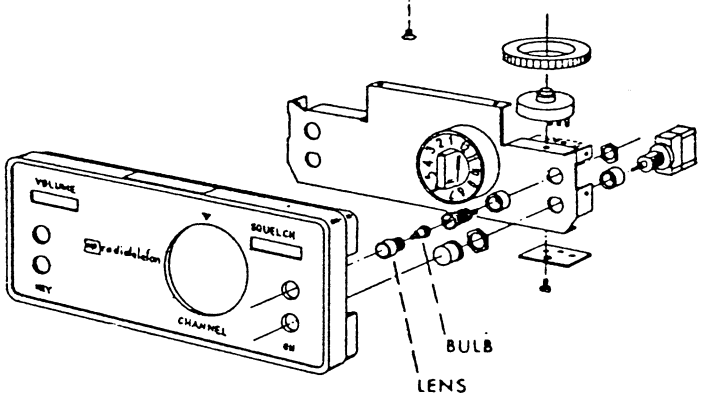
4 kHz in place of 5 kHz and
2,4 kHz in place of 3 kHz.

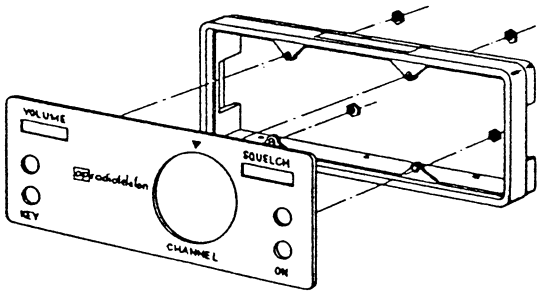
And with respect to the 12,5 kHz version, use the same procedure but read:

2,5 kHz in place of 5 kHz and
1,5 kHz in place of 3 kHz.

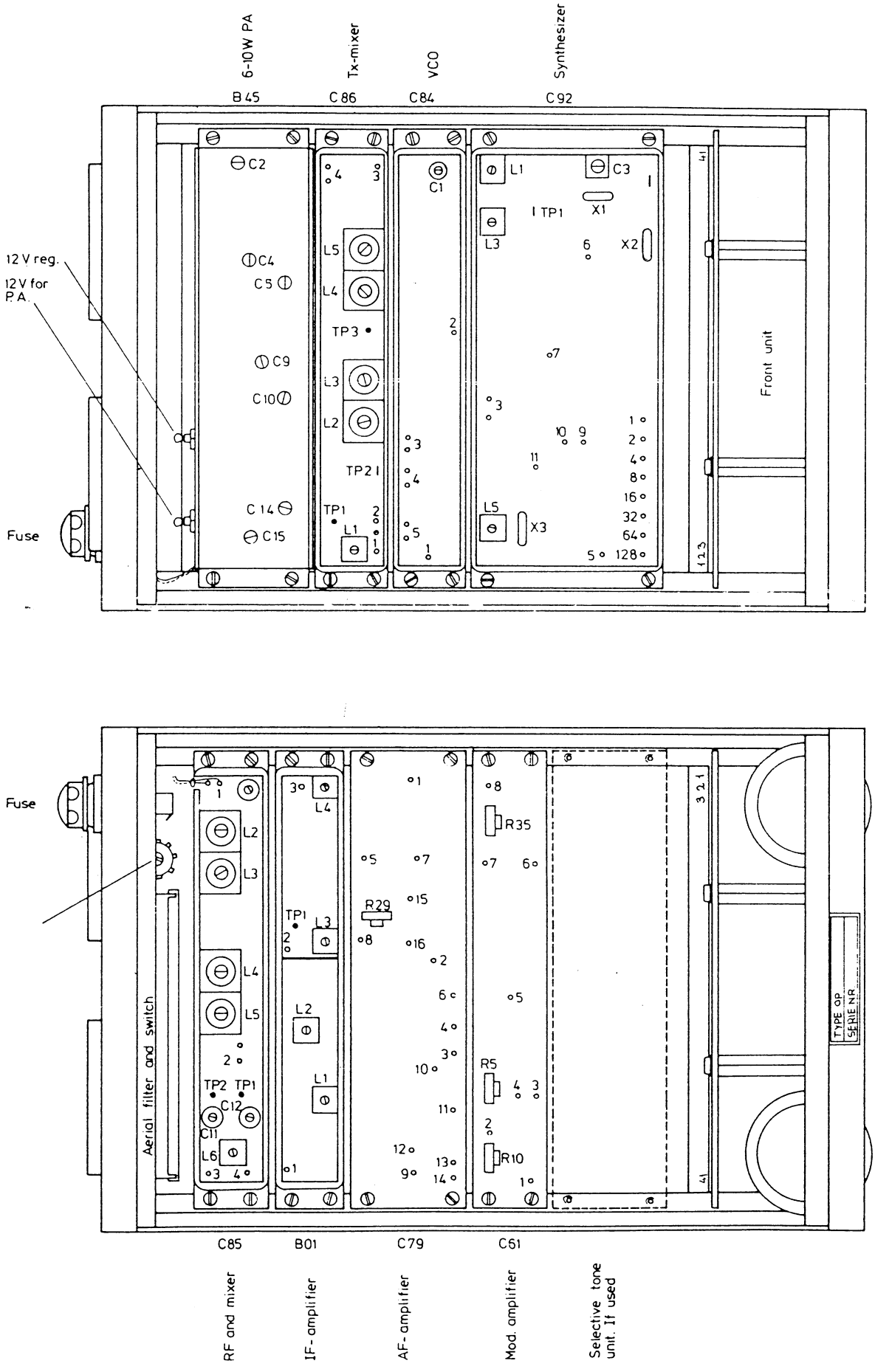




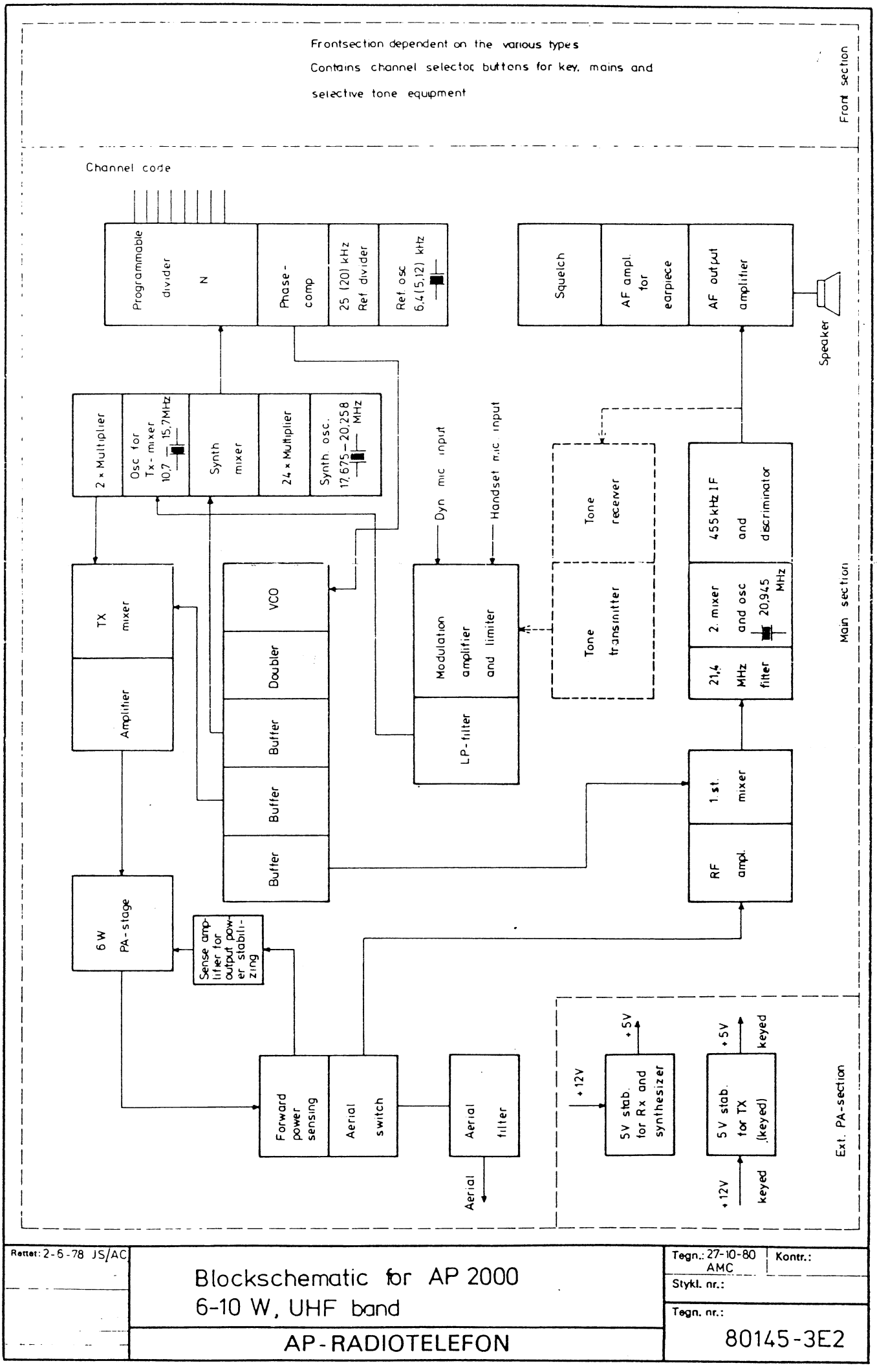




Rettet: 29-11-76 HJ	Disassembling of AP 2000	Tegn.: 10-8-76 AC	Kontr.:
		Stykl. nr.:	
	AP-RADIOTELEFON 1/5	Tegn. nr.: 76218 - 4M2	



Rettet:	Interior view of AP 2000, 6-10 W UHF	Tegn.: 24-10-80 AMC | Kontr.:
		Stykl. nr.:
	AP-RADIOTELEFON	Tegn. nr.: 80137-3E2



Rettet: 2-6-78 JS/AC

Blockschematic for AP 2000
6-10 W, UHF band

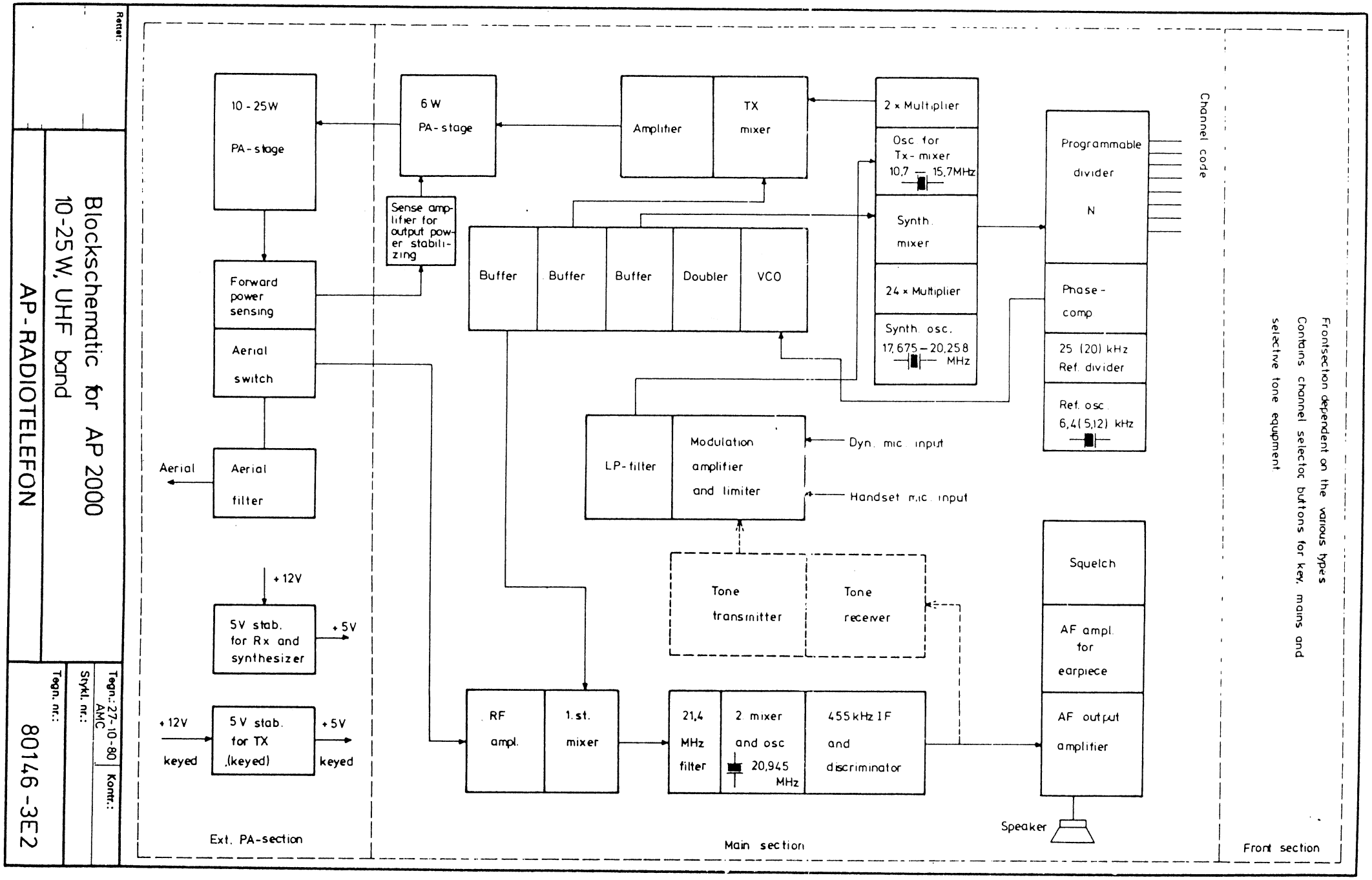
AP-RADIOTELEFON

Tegn.: 27-10-80 AMC

Kontr.:

Stykl. nr.:

Tegn. nr.: 80145-3E2


Rettet:
Blockschematic for AP 2000
10-25W, UHF band
AP-RADIOTELEFON
Tegn.: 27-10-80 AMC
Kontr.:
Stykl. nr.:
Tegn. nr.:
80146-3E2
10 - 25W PA-stage
6 W PA-stage
Amplifier
TX mixer
2 x Multiplier
Osc for Tx-mixer 10,7 — 15,7MHz
Synth. mixer
24 x Multiplier
Synth. osc. 17,675 — 20,258 MHz
Programmable divider N
Phase-comp
25 (20) kHz Ref. divider
Ref. osc. 6,4 (5,12) kHz
Channel code
Sense amplifier for output power stabilizing
Buffer
Buffer
Buffer
Doubler
VCO
Forward power sensing
Aerial switch
Aerial
Aerial filter
LP-filter
Modulation amplifier and limiter
Dyn. mic. input
Handset mic. input
+12V
5V stab. for Rx and synthesizer
+5V
+12V
keyed
5 V stab. for TX (keyed)
+5V
keyed
Tone transmitter
Tone receiver
Squelch
AF ampl. for earpiece
AF output amplifier
Speaker
RF ampl.
1.st. mixer
21,4 MHz filter
2. mixer and osc
20,945 MHz
455 kHz IF and discriminator
Frontsection dependent on the various types
Contains channel selector buttons for key, mains and selective tone equipment
Ext. PA-section
Main section
Front section

Rettet:

AP-RADIOTELEFON

RF mixer UHF for AP 2000

Print board C85A1 -

Tegn.: BC

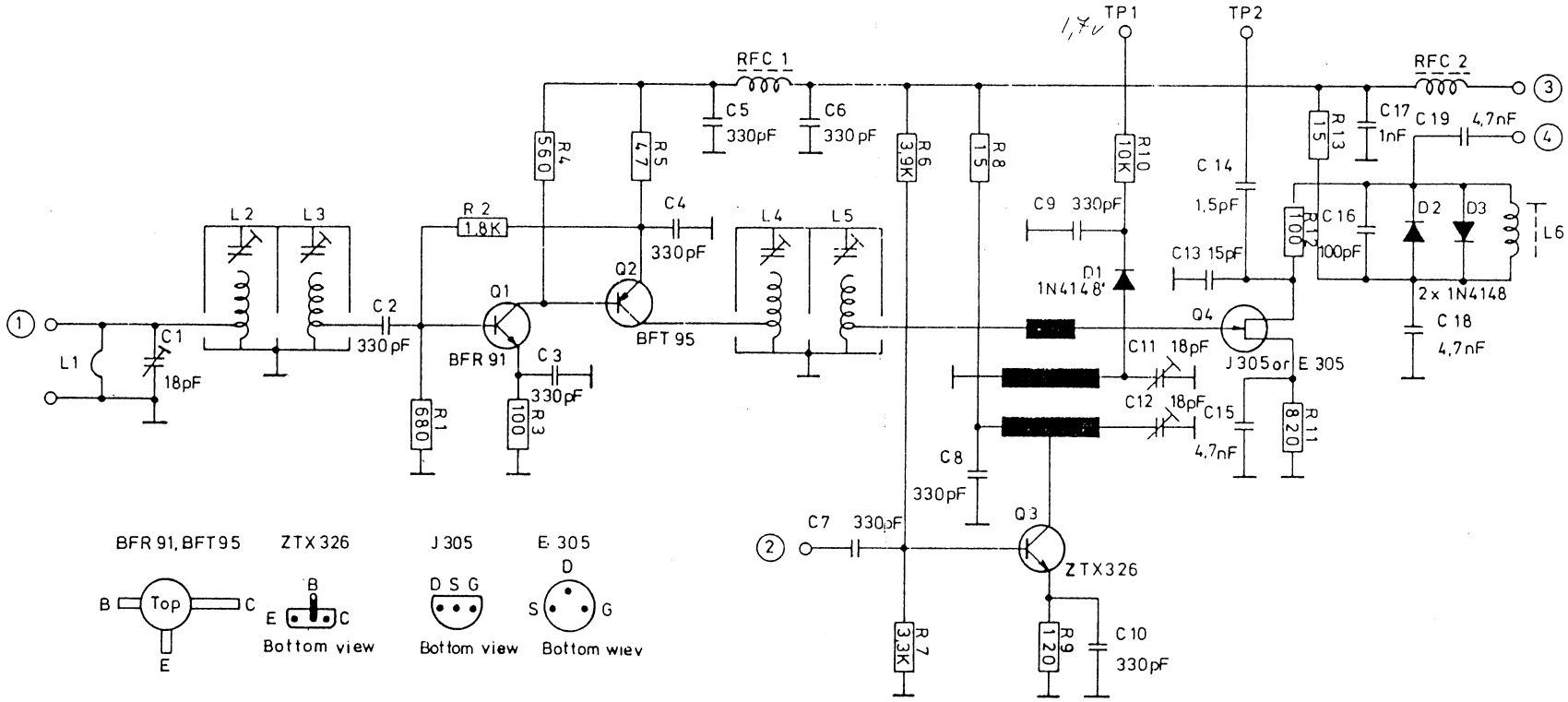
19-6-80

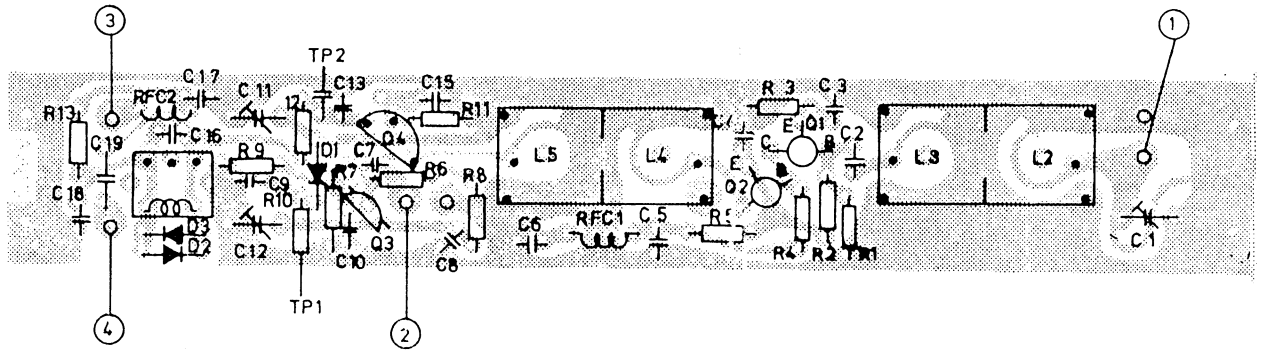
Kontr.:

Stykl. nr.:

Tegn. nr.:

80082-3E2





AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-281	680 Ω 1/8 W
R2	13-286	1,8 KΩ "
R3	13-271	100 Ω "
R4	13-280	560 Ω "
R5	13-267	47 Ω "
R6	13-290	3,9 KΩ "
R7	13-289	3,3 KΩ "
R8	13-261	15 Ω "
R9	13-272	120 Ω "
R10	13-295	10 KΩ "
R11	13-282	820 Ω "
R12	13-271	100 Ω "
R13	13-261	15 Ω "
C1	19-336	18 pF Trim.
C2	11-406	330 pF Ker.
C3	11-406	330 pF "
C4	11-406	330 pF "
C5	11-406	330 pF "
C6	11-406	330 pF "
C7	11-406	330 pF "
C8	11-406	330 pF "
C9	11-406	330 pF "
C10	11-406	330 pF "
C11	19-336	18 pF Trim.
C12	19-336	18 pF "
C13	11-381	15 pF Ker.
C14	11-362	1,5 pF "
C15	11-416	4,7 nF "
C16	11-401	100 pF "
C17	11-409	1 nF "
C18	11-416	4,7 nF "
C19	11-415	4,7 nF "
D1	04-062	1N4148
D2	04-062	1N4148
D3	04-062	1N4148

Nr.	Kode	Data
Q1	19-116	BFR91
Q2	19-110	BFT95
Q3	19-115	ZTX326
Q4	19-083	J305
RFC1	25-009	75290-4E2
RFC2	25-009	75290-4E2
L2		
L3	25-083	Helix sp. 80089-4
L4	80-047	Helix hus 80047-4
L5		
L6	25-012	75293-4E2

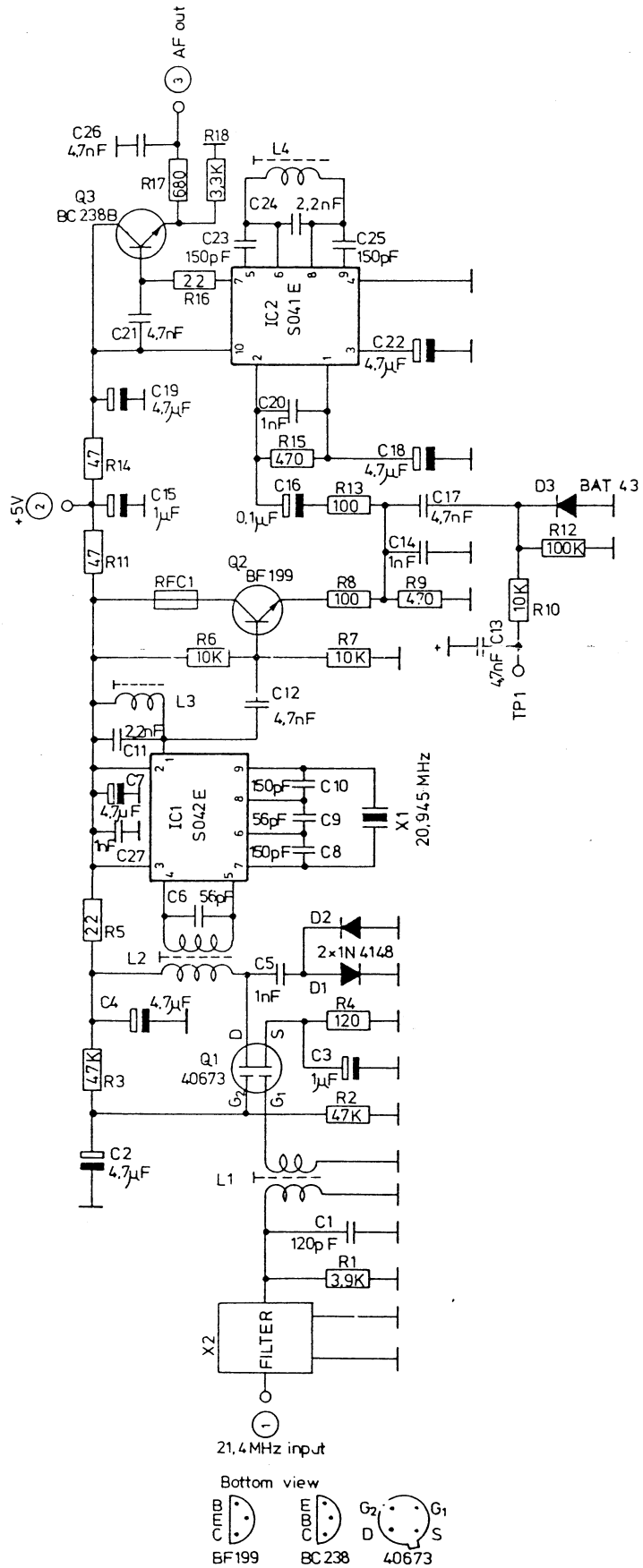
RF mixer UHF for AP 2000
Print board C 85 A1
Tilhører tegn. nr.: 80082-3E2

Rettet:
.

Tegn.:

Kontr.:

Stykl. nr.:
80082-4S2



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

Rettet: 8-5-78 JH/AC 27-2-79 AMC/LB 14-3-80 OS 21-8-80 OS/AMC 289/83 11-1-83 LB	21,4 MHz IF Print B01C1 and B01C3	Tegn.: 28-2-75 AC | Kontr.: Stykl. nr.: Tegn. nr.: 75076-3E2
	AP-RADIOTELEFON	

AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-290	3,9 KΩ 1/8W CR 16
R2	13-302	47 KΩ " "
R3	13-302	47 KΩ " "
R4	13-272	120 Ω " "
R5	13-263	22 Ω " "
R6	13-295	10 KΩ " "
R7	13-295	10 KΩ " "
R8	13-271	100 Ω " "
R9	13-279	470 Ω " "
R10	13-295	10 KΩ " "
R11	13-267	47 Ω " "
R12	13-306	100 KΩ " "
R13	13-271	100 Ω " "
R14	13-267	47 Ω " "
R15	13-279	470 Ω " "
R16	13-263	22 Ω " "
R17	13-281	680 Ω " "
R18	13-289	3,3 KΩ " "
C1	11-403	120 pF Ker.
C2	11-504	4,7 µF/10V Tant.
C3	11-502	1 µF/35V "
C4	11-504	4,7 µF/10V "
C5	11-409	1 nF Ker.
C6	11-396	56 pF "
C7	11-504	4,7 µF/10V Tant.
C8	11-413	150 pF N750 Ker.
C9	11-396	56 pF Ker.
C10	11-413	150 pF N750 Ker.
C11	11-461	2,2 nF MKM
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.

Nr.	Kode	Data
C19	11-504	4,7 µF/10V Tant.
C20	11-409	1 nF Ker.
C21	11-416	4,7 nF "
C22	11-504	4,7 µF/10V Tant.
C23	11-404	150 pF Ker.
C24	11-461	2,2 nF MKM
C25	11-404	150 pF Ker.
C26	11-416	4,7 nF "
C27	11-409	1 nF "
D1	04-062	1N4148
D2	04-062	1N4148
D3	04-047	BAT 43
Q1	19-128	40673
Q2	19-104	BF199
Q3	19-093	BC238B
IC1	09-007	SO42E
IC2	09-006	SO41E
L1		75282-4E2
L2		75281-4E2
L3		75280-4E2
L4		75279-4E2
X1	11-815	AP 22 20,945 Mhz
X2	11-854	21,4 Mhz
X2	11-857	21,4 Mhz
RFC-1	06-001	Ferritperle-Philips

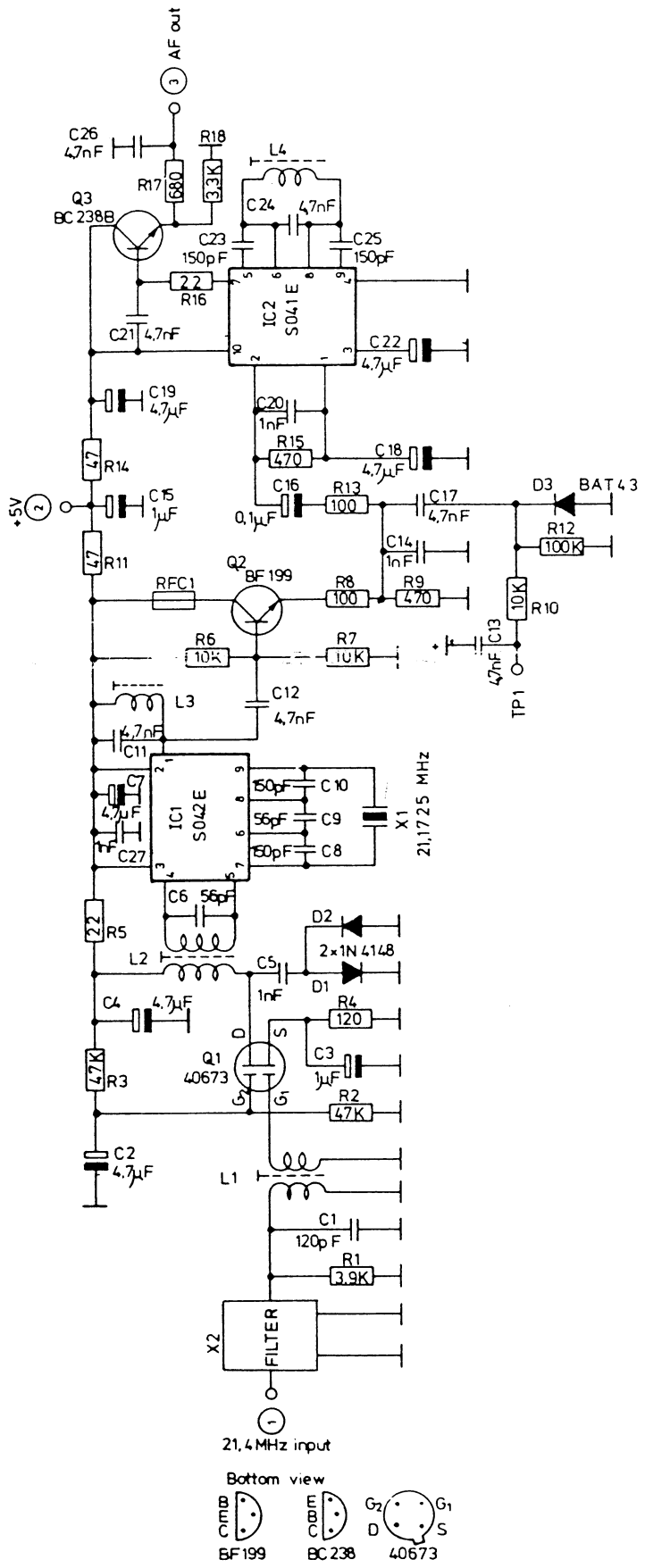
21,4 MHz IF
Print B 01 C 1 and B 01 C3
Tilhører tegn. nr.: 75076-3E2

Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 75076-4S2



Rettet: 27-2-79 AC/ 289/83 11-1-83 LB	21,4 MHz IF 12,5 kc band width Print B01C2	Tegn.. 20-10-78 BC / Kontr.: Stykl. nr.: Tegn. nr.: 78152-3E2
	AP-RADIOTELEFON	

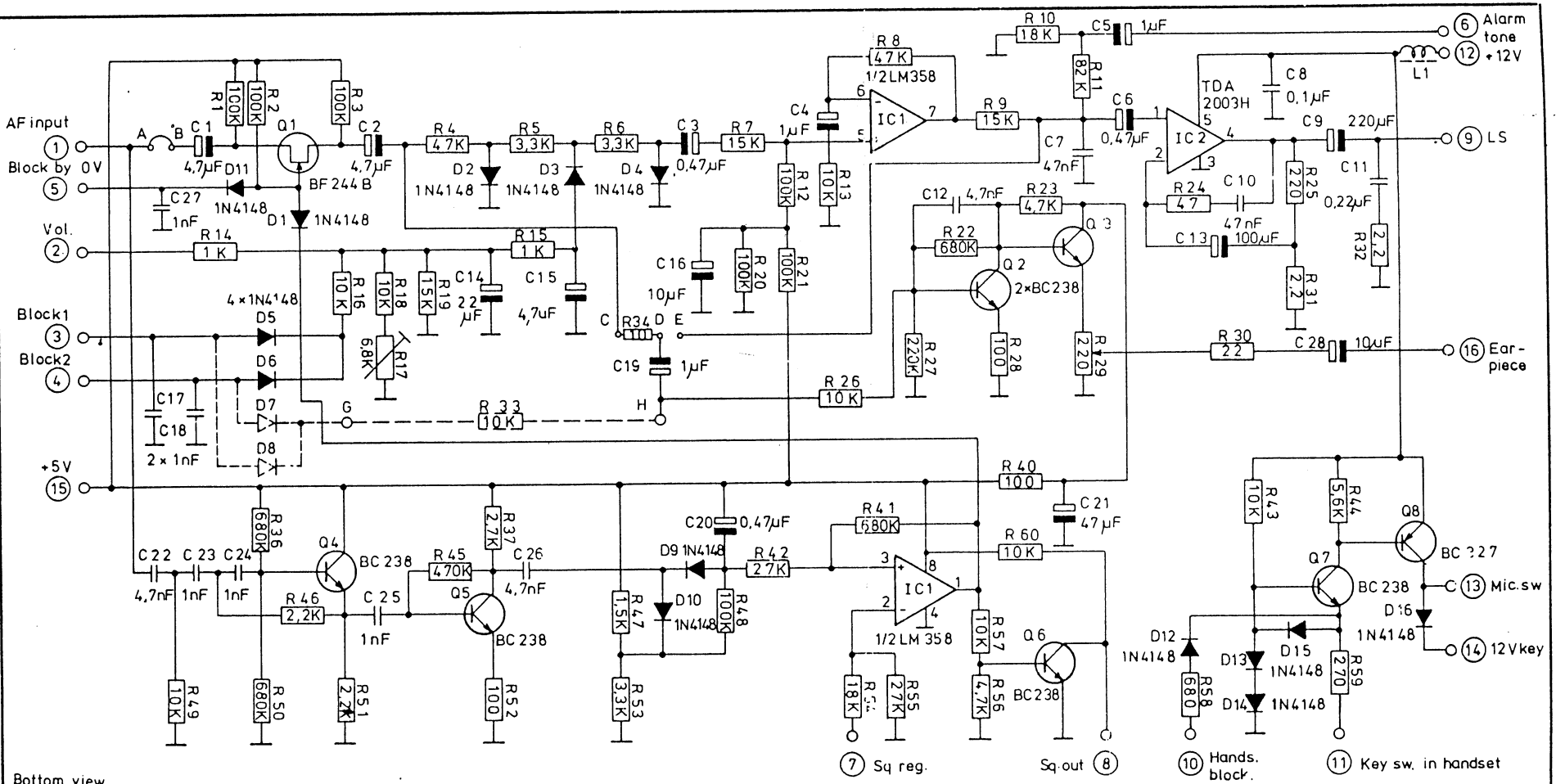
Rettet: 9-4-81LBu
4-5-81 LB
2-7-81 LB
7-10-81 LB
28-10-81 LB

AP-RADIOTELEFON

AF and squelch
Print board C79D1

Tegn.: BC
9-6-80
Stykl.nr.:
Kontr.:

Tegn. nr.: 80073 - 3E2



AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
1	13-306	100 KΩ 1/8 W CR16			
R2	13-306	100 KΩ " "	R40	13-271	100 Ω 1/8 W CR16
R3	13-306	100 KΩ " "	R41	13-311	680 KΩ " "
R4	13-302	47 KΩ " "	R42	13-313	27 KΩ " "
R5	13-289	3,3 KΩ " "	R43	13-295	10 KΩ " "
R6	13-289	3,3 KΩ " "	R44	13-292	5,6 KΩ " "
R7	13-297	15 KΩ " "	R45	13-315	470 KΩ " "
R8	13-302	47 KΩ " "	R46	13-287	2,2 KΩ " "
R9	13-297	15 KΩ " "	R47	13-285	1,5 KΩ " "
R10	13-298	18 KΩ " "	R48	13-306	100 KΩ " "
R11	13-305	82 KΩ " "	R49	13-295	10 KΩ " "
R12	13-306	100 KΩ " "	R50	13-311	680 KΩ " "
R13	13-295	10 KΩ " "	R51	13-287	2,2 KΩ " "
R14	13-283	1 KΩ " "	R52	13-271	100 Ω " "
R15	13-283	1 KΩ " "	R53	13-289	3,3 KΩ " "
R16	13-295	10 KΩ " "	R54	13-298	18 KΩ " "
R17	13-662	6,8 KΩ NTC 642	R55	13-313	27 KΩ " "
R18	13-295	10 KΩ 1/8 W CR16	R56	13-291	4,7 KΩ " "
R19	13-297	15 KΩ " "	R57	13-295	10 KΩ " "
R20	13-306	100 KΩ " "	R58	13-281	680 Ω " "
R21	13-306	100 KΩ " "	R59	13-276	270 Ω " "
R22	13-311	680 KΩ " "	R60	13-295	10 KΩ " "
R23	13-291	4,7 KΩ " "			
R24	13-267	47 Ω " "	C1	11-504	4,7 µF 10 V Tant.
R25	13-275	220 Ω " "	C2	11-504	4,7 µF 10 V "
R26	13-295	10 KΩ " "	C3	11-501	0,47 µF 35 V "
R27	13-309	220 KΩ " "	C4	11-502	1 µF 35 V "
R28	13-271	100 Ω " "	C5	11-502	1 µF 35 V "
R29	19-266	220 Ω Trim.	C6	11-501	0,47 µF 35 V "
R30	13-263	22 Ω 1/8 W CR16	C7	11-493	47 nF MKH
R31	13-347	2,2 Ω 1/4 W CR25	C8	11-490	0,1 µF "
R32	13-347	2,2 Ω " "	C9	05-024	220 µF 16 V Ellyt
			C10	11-493	47 nF MKH
R34	13-259	10 Ω " "	C11	11-497	0,22 µF MKT
R36	13-311	680 KΩ " "	C12	11-416	4,7 nF Ker.
R37	13-288	2,7 KΩ " "	C13	11-510	100 µF 3 V Tant.
			C14	11-507	22 µF 16 V "

AF and squelch
Print board C79D1
Tilhører tegn. nr.: 80073-3E2

Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 80073-4S2

AP-RADIOTELEFON

Nr.	Kode	Data
C15	11-504	4,7 µF/10 V Tant.
C16	11-506	10 µF 25 V "
C17	11-409	1 nF Ker.
C18	11-409	1 nF "
C19	11-502	1 µF 35 V Tant.
C20	11-501	0,47 µF 35 V "
C21	11-509	47 µF 6,3V "
C22	11-416	4,7 nF Ker.
C23	11-409	1 nF "
C24	11-409	1 nF "
C25	11-409	1 nF "
C26	11-416	4,7 nF "
C27	11-409	1 nF "
C28	11-506	10 µF 25 V Tant.
D1	04-062	1N4148
D2	04-062	1N4148
D3	04-062	1N4148
D4	04-062	1N4148
D5	04-062	1N4148
D6	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	19-087	BF244B
Q2	19-093	BC238
Q3	19-093	BC238
Q4	19-093	BC238
Q5	19-093	BC238

Nr.	Kode	Data
Q6	19-093	BC238
Q7	19-093	BC238
Q8	19-095	BC327
L1	25-009	RFC
IC1	09-080	LM358
IC2	09-210	TDA2003H

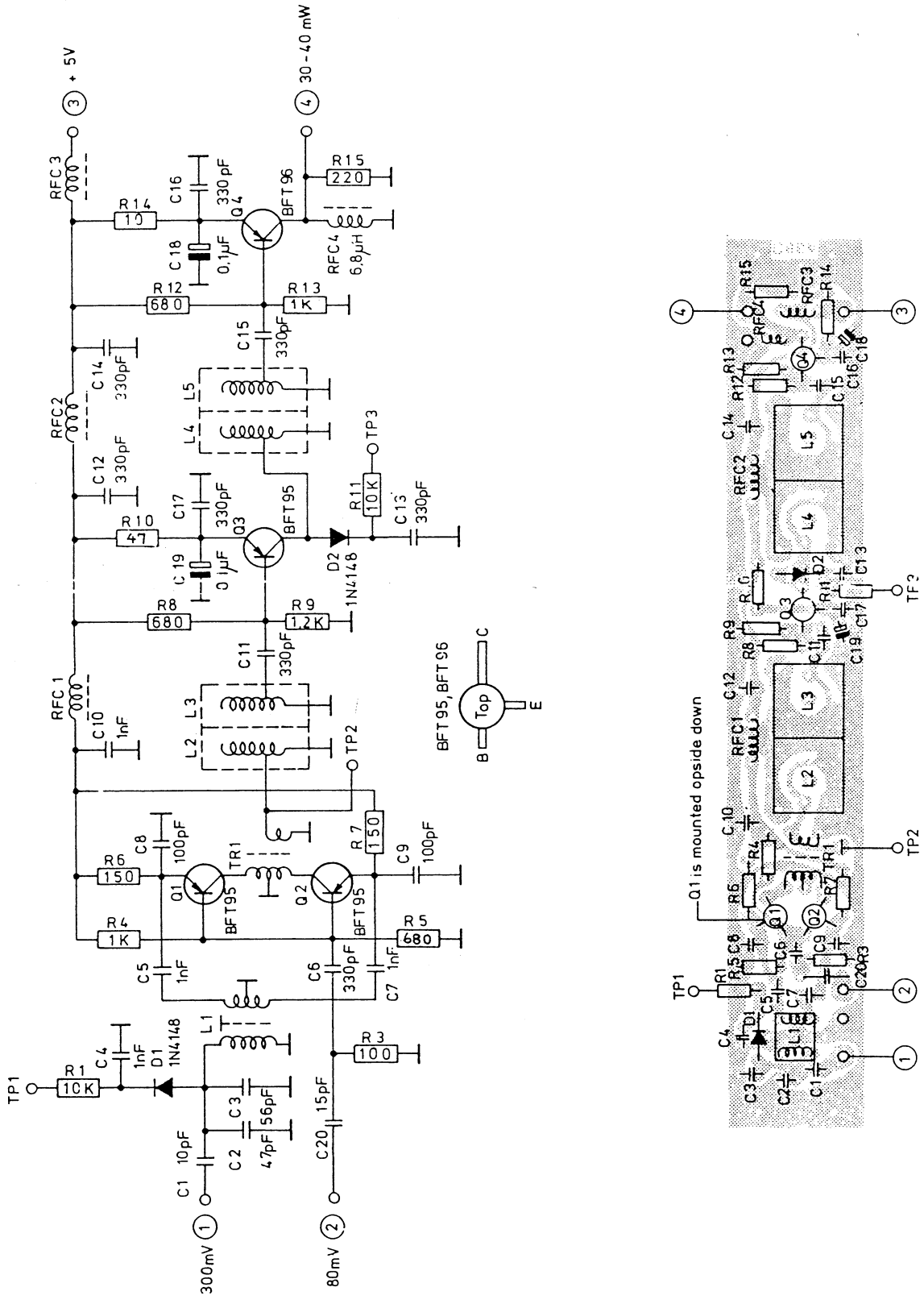
AF and squelch
Print board C79D1
Tilhører tegn. nr.: 80073-3E2

Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 80073-4S2



Rettet 9 - 2 - 81 JH 11 - 9 - 81 LB 2 - 8 - 82 LB 2 - 9 - 82 LB 11 - 16 - 82 JH/AS	Tx-mixer UHF for AP 2000 Print board C 86 A1 AP-RADIOTELEFON	Tegn.: BC Kontr.: JH Stykl. nr.: Tegn. nr.: 80084-3E2

AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-295	10 KΩ 1/8 W
R2		
R3	13-271	100 Ω 1/8 W
R4	13-283	1 KΩ 1/8 W
R5	13-281	680 Ω 1/8 W
R6	13-273	150 Ω 1/8 W
R7	13-273	150 Ω 1/8 W
R8	13-281	680 Ω 1/8 W
R9	13-284	1,2 KΩ 1/8 W
R10	13-267	47 Ω 1/8 W
R11	13-295	10 KΩ 1/8 W
R12	13-281	680 Ω 1/8 W
R13	13-283	1 KΩ 1/8 W
R14	13-259	10 Ω 1/8 W
R15	13-275	220 Ω 1/8 W
C1	11-376	10 pF Ker.
C2	11-394	47 pF "
C3	11-396	56 pF "
C4	11-409	1 nF "
C5	11-409	1 nF "
C6	11-406	330 pF "
C7	11-409	1 nF "
C8	11-401	100 pF "
C9	11-401	100 pF "
C10	11-409	1 nF "
C11	11-406	330 pF "
C12	11-406	330 pF "
C13	11-406	330 pF "
C14	11-406	330 pF "
C15	11-406	330 pF "
C16	11-406	330 pF "
C17	11-406	330 pF "
C18	11-500	0,1 µF Tant.
C19	11-500	0,1 µF "
C20	11-465	15 pF Ker. N150 2 modul.

Nr.	Kode	Data
D1	04-062	1N4148
D2	04-062	1N4148
Q1	19-110	BFT 95
Q2	19-110	BFT 95
Q3	19-110	BFT 95
Q4	19-076	BFT 96
L1	25-066	76009
L2		
L3	25-083	Helix sp. 80089-4
L4	80-047	Helix hus 80047-4
L5		
RFC1	25-009	75290-4E2
RFC2	25-009	"
RFC3	25-009	"
RFC4	04-114	6,8 µH 74016-4E
TR1	25-102	82305-4E2

Tx-mixer UHF for AP 2000
Print board C 86 A1
Tilhører tegn. nr.: 80084-3E2

Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 80084-4S2

Rettet: 2-6-78 JS/AC

AP-RADIOTELEFON A/S

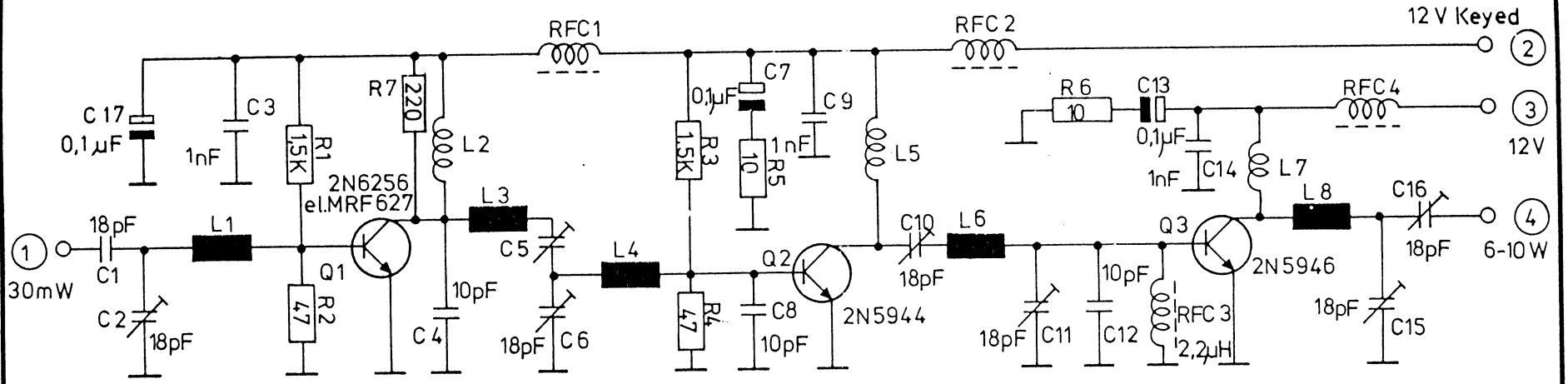
6-10W PA UHF B 45A1

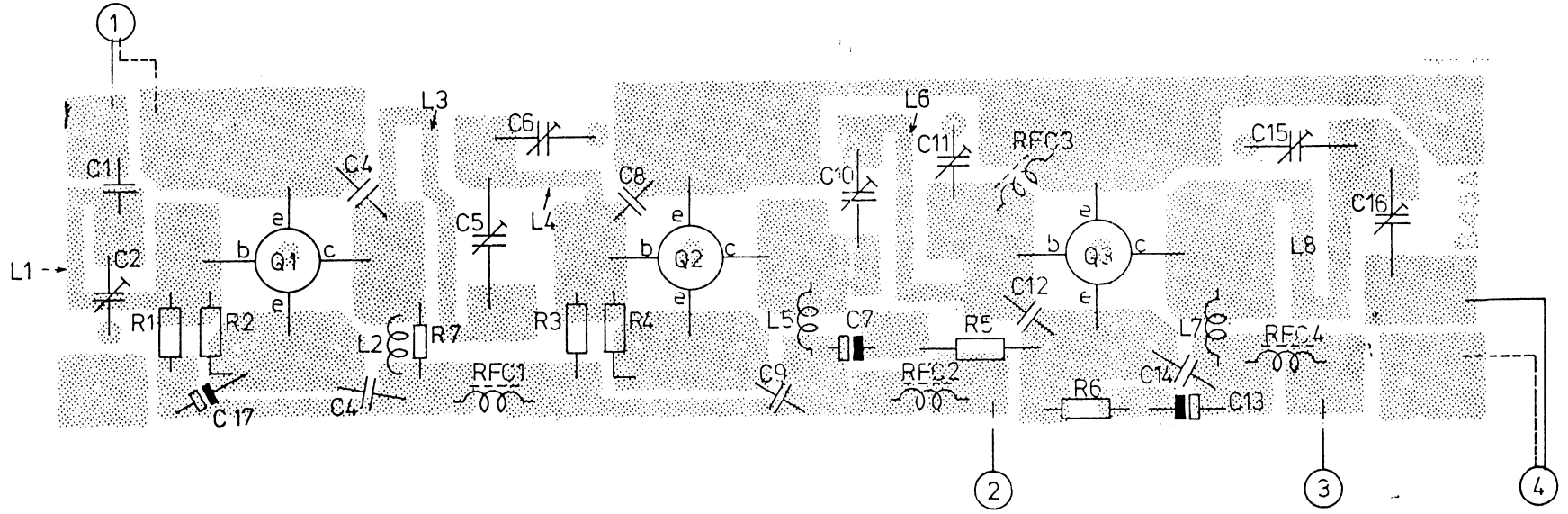
Tegn.: 31-10-75 EH

Kontr.:

Styki. nr.:

Tegn. nr.: 75510-4E2





AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-285	1,5 KΩ 1/8W CR 16
R2	13-267	47 Ω " "
R3	13-285	1,5 KΩ " "
R4	13-267	47 Ω " "
R5	13-259	10 Ω " "
R6	13-259	10 Ω " "
R7	13-362	220 Ω ¼W CR 25
C1	11-434	18 pF Ker.
C2	19-330	18 pF Trim.
C3	11-409	1 nF Ker.
C4	11-376	10 pF "
C5	19-330	18 pF Trim.
C6	19-330	18 pF "
C7	11-500	0,1 µF Tant.
C8	11-376	10 pF Ker.
C9	11-409	1 nF "
C10	19-330	18 pF Trim.
C11	19-330	18 pF "
C12	11-376	10 pF Ker.
C13	11-500	0,1 µF Tant.
C14	11-409	1 nF Ker.
C15	19-330	18 pF Trim.
C16	19-330	18 pF "
C17	11-500	0,1 µF Tant.
Q1	19-123	MRF627
Q2	19-162	2N5944
Q3	19-163	2N5946
L2		75615-4E2
L5		75619-4E2
L7		75619-4E2

Nr.	Kode	Data
RFC 1		75290-4E2
RFC 2		75290-4E2
RFC 3		75290-4E2
RFC 4		75290-4E2

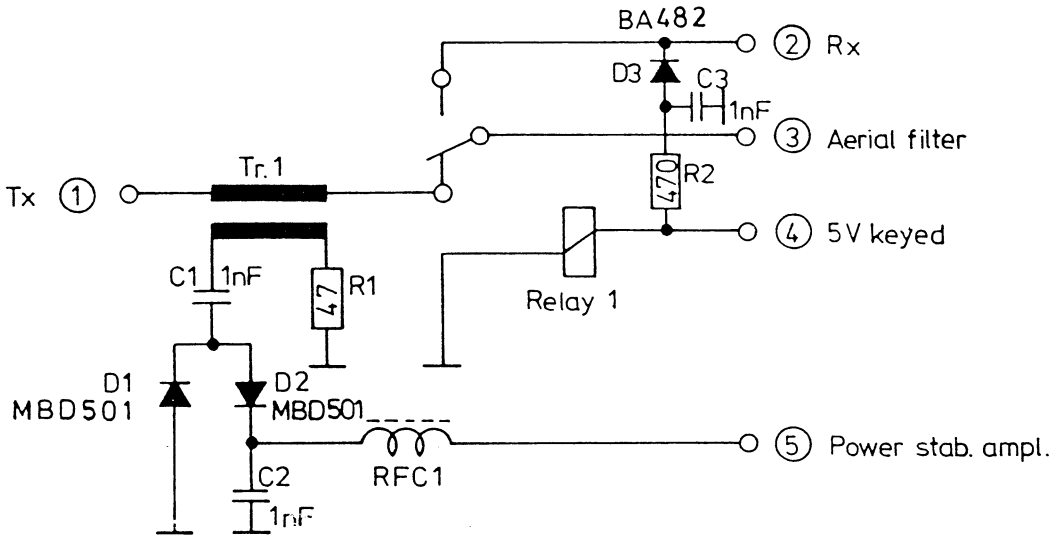
6-10 W, PA-stage UHF
Print-board B 45 A 1
Tilhører tegn. nr.: 75510-4E2

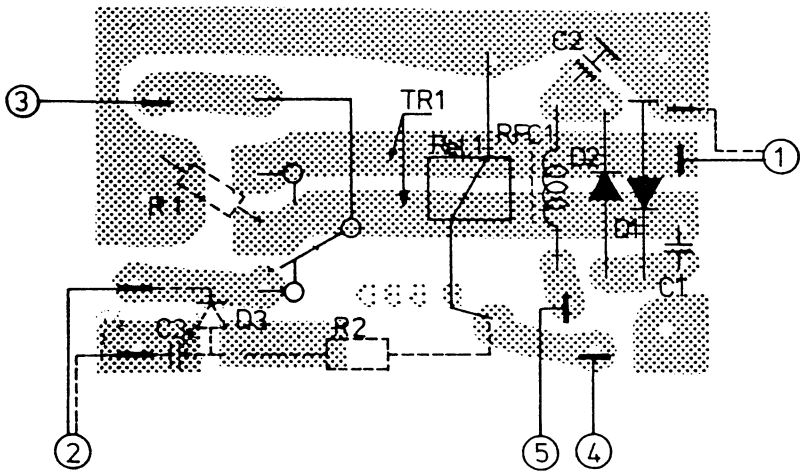
Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 75510-4S2





Rettet: 8-2-77 JH/AC 2-6-78 JS/AC 10-11-81 LB 5-11-82 LB	6-10 W aerial switch and power detector for UHF. Print board B58D1	Tegn.: 29-12-75 AC	Kontr.:
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.: 75624-4E2	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-356	47 Ω $\frac{1}{4}$ W CR 25			
R2	13-366	470 Ω " " " "			
C1	11-409	1 nF Ker.			
C2	11-409	1 nF "			
C3	11-409	1 nF "			
D1	04-019	MBD501			
D2	04-019	MBD501			
D3	04-008	BA482			
RFC 1		75290-4E2			
Rel. 1	17-058	W-4K 115 Ω			

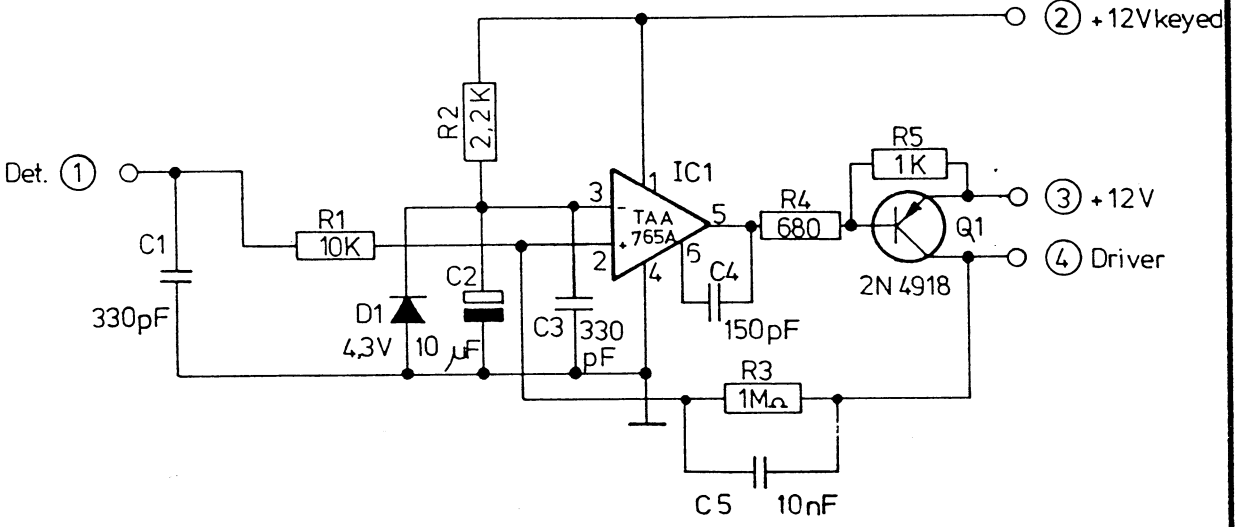
6-10W aerial switch and power detector Print board B 58 D 1
Tilhører tegn. nr.: 75624-4E2 .

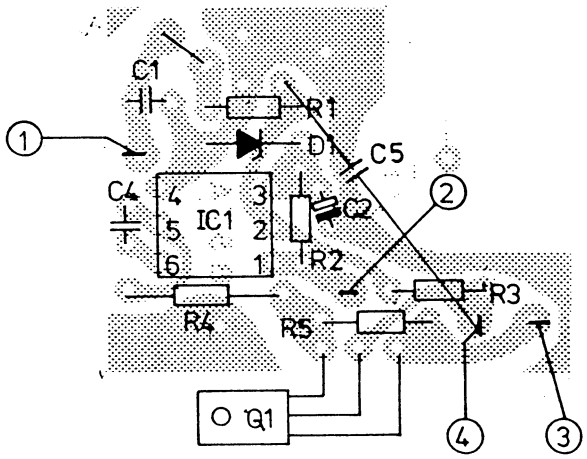
Rettet:

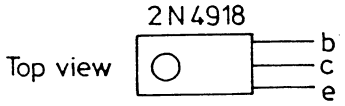
Tegn.:

Kontr.:

Stykl. nr.: 75624-4S2







Rettet: 21-4-77 BJ/AC 16-3-79 BJ	Sense amplifier for output power stabilizing of external PA Print board B57B 2	Tegn.: 3-11-76 AC	Kontr.:
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.: 76325-4E2	

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-295	10 KΩ 1/8W CR 16			
R2	13-287	2,2 KΩ " "			
R3	13-312	1 MΩ " "			
R4	13-368	680 Ω $\frac{1}{4}$ W CR 25			
R5	13-283	1 KΩ 1/8W CR 16			
C1	11-406	330 pF Ker.			
C2	11-506	10 µF/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			

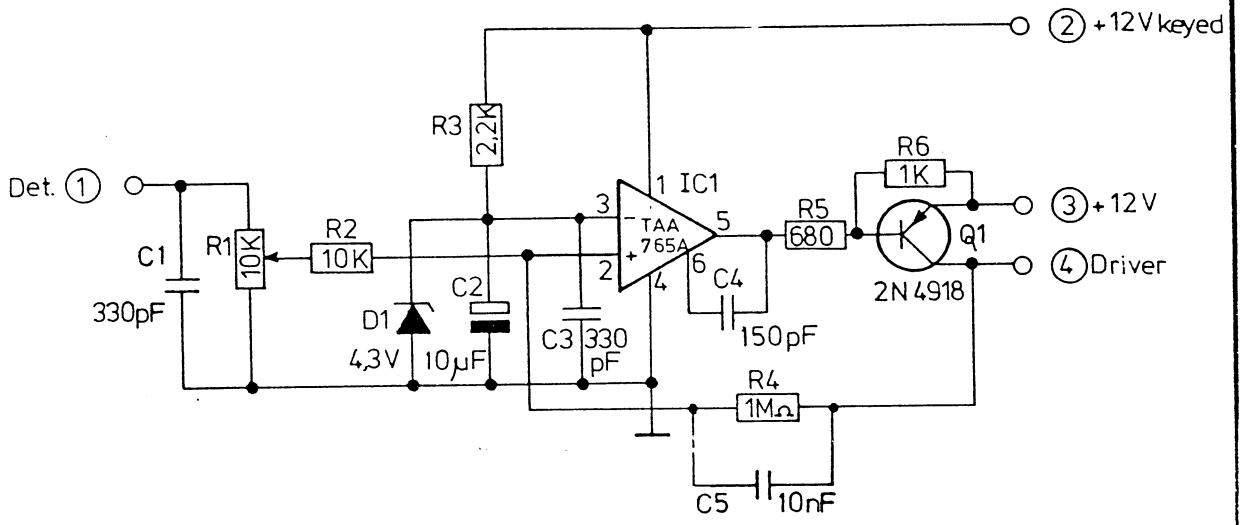
Sense amplifier for output power stabilizing of external PA. Print board B 57 B 2

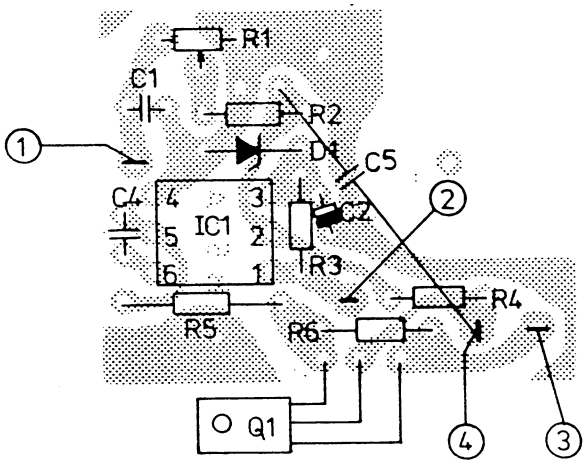
Tilhører tegn. nr.: 76325-4E2

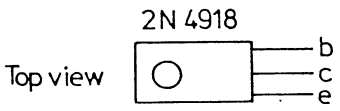
Tegn.:

Kontr.:

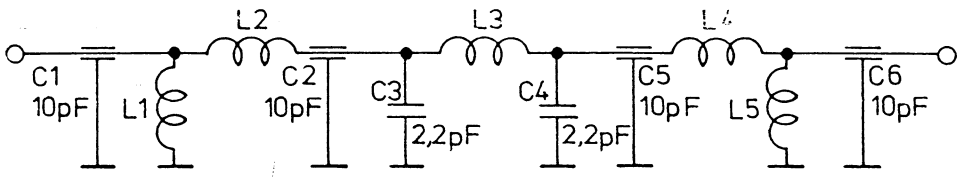
Stykl. nr.: 76325-4S2



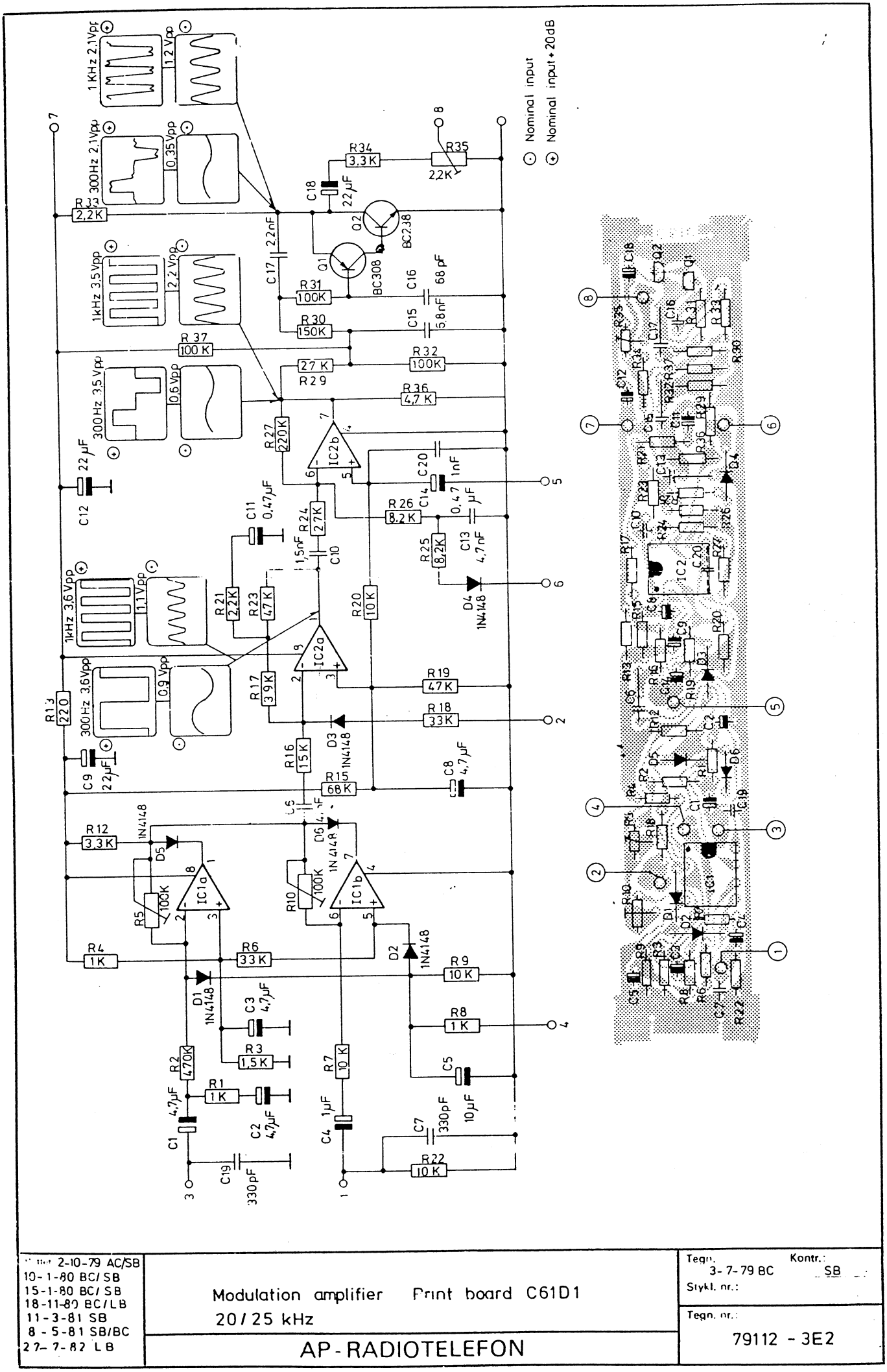




Rettet: 21-4-77 JH/ac 16-3-79 BJ	Sense amplifier for output power stabilizing of internal PA. Print board B 57 B 1	Tegn.: 29-12-75 AC Kontr.: Stykl. nr.:
	AP-RADIOTELEFON A/S	Tegn. nr.: 75622-4E2



Rettet:	Aerialfilter UHF	Tegn.: 29-12-75 NC-AC	Kontr.:
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.: 75623-4E2	



2-10-79 AC/SB 10-1-80 BC/SB 15-1-80 BC/SB 18-11-80 BC/LB 11-3-81 SB 8-5-81 SB/BC 27-7-82 LB	Modulation amplifier Print board C61D1 20/25 kHz	Tegn. 3-7-79 BC Kontr. SB Stykl. nr.: Tegn. nr.: 79112 - 3E2
	AP-RADIOTELEFON	

AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-283	1 KΩ 1/8W CR16
R2	13-315	470 KΩ " "
R3	13-285	1,5 KΩ " "
R4	13-283	1 KΩ " "
R5	19-263	100 KΩ Trim.
R6	13-300	33 KΩ 1/8W CR16
R7	13-295	10 KΩ " "
R8	13-283	1 KΩ " "
R9	13-295	10 KΩ " "
R10	19-263	100 KΩ Trim.
R11		
R12	13-289	3,3 KΩ 1/8W CR16
R13	13-275	220 Ω " "
R14		
R15	13-304	68 KΩ " "
R16	13-297	15 KΩ " "
R17	13-301	39 KΩ " "
R18	13-300	33 KΩ " "
R19	13-302	47 KΩ " "
R20	13-295	10 KΩ " "
R21	13-287	2,2 KΩ " "
R22	13-295	10 KΩ " "
R23	13-302	47 KΩ " "
R24	13-313	27 KΩ " "
R25	13-294	8,2 KΩ " "
R26	13-294	8,2 KΩ " "
R27	13-309	220 KΩ " "
R28		
R29	13-313	27 KΩ " "
R30	13-308	150 KΩ " "
R31	13-306	100 KΩ " "
R32	13-306	100 KΩ " "
R33	13-287	2,2 KΩ " "
R34	13-289	3,3 KΩ " "
R35	19-255	2,2 KΩ Trim.
R36	13-291	4,7 KΩ 1/8W CR16
R37	13-306	100 KΩ " "

Nr.	Kode	Data
C1	11-504	4,7 µF/10V Tant.
C2	11-504	4,7 µF/10V Tant.
C3	11-504	4,7 µF/10V Tant.
C4	11-502	1 µF/35V Tant.
C5	11-506	10 µF/25V Tant.
C6	11-493	47 nF MKH
C7	11-406	330 pF Ker.
C8	11-504	4,7 µF/10V Tant.
C9	11-507	22 µF/16V Tant.
C10	11-471	1,5 nF Ker.
C11	11-501	0,47 µF/35V Tant.
C12	11-507	22 µF/16V Tant.
C13	11-477	4,7 nF Poly.
C14	11-501	0,47 µF/35V Tant.
C15	11-478	6,8 nF Poly
C16	11-397	68 pF N750 Ker.
C17	11-486	2,2 nF MKH
C18	11-507	22 µF/16V Tant.
C19	11-406	330 pF Ker.
C20	11-409	1 nF Ker.
D1	04-062	1N4148
D2	04-062	1N4148
D3	04-062	1N4148
D4	04-062	1N4148
D5	04-062	1N4148
D6	04-062	1N4148
Q1	19-084	BC308B
Q2	19-117	BC238
IC1	09-080	LM358N
IC2	09-080	LM358N

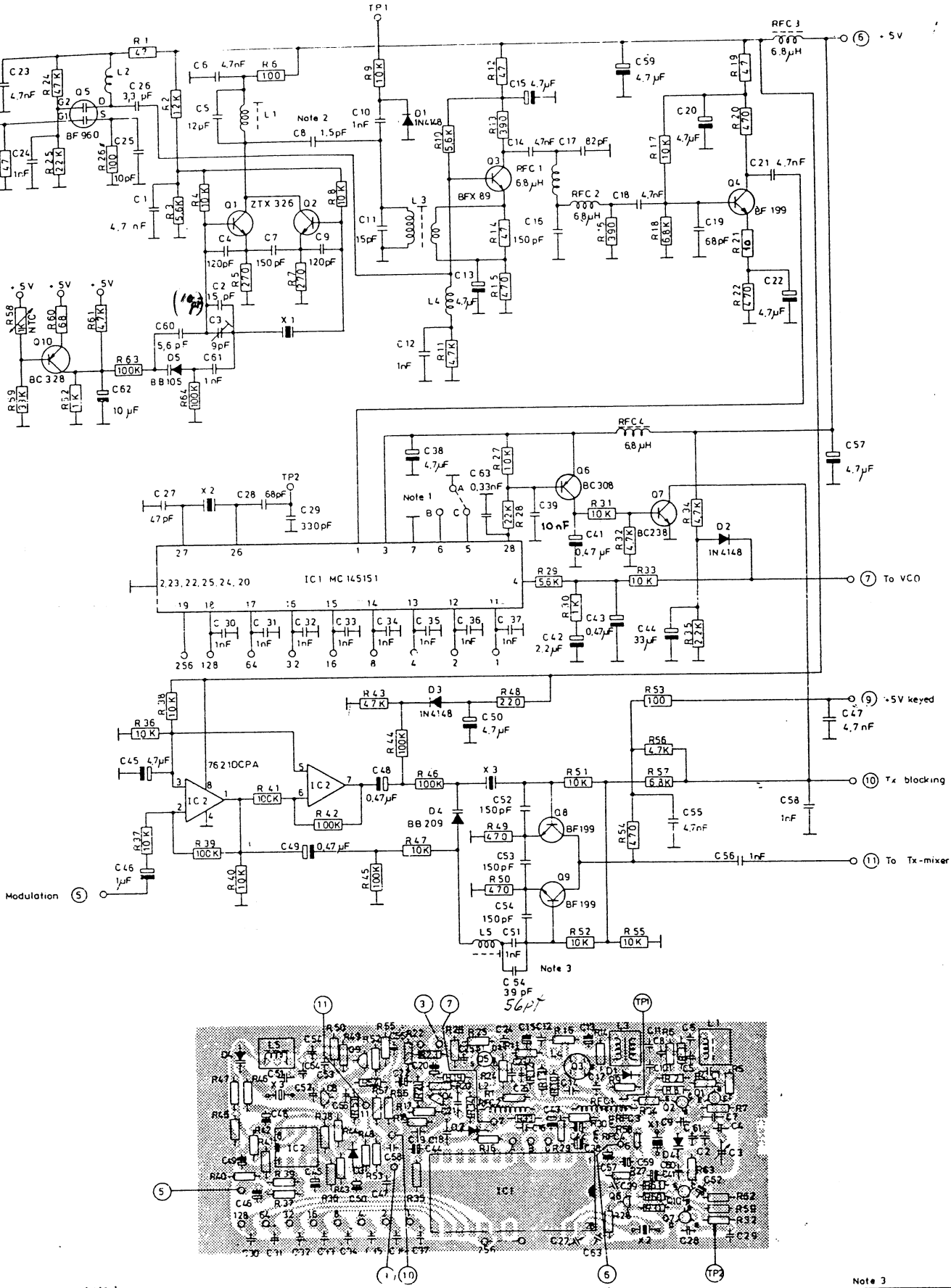
Modulation amplifier
Print board C61D1
Tilhører tegn. nr.: 79112-3E2

Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 79112-4S2

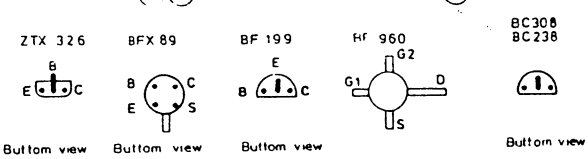


Note 1

Channel spacing	Point A - C	x 2	Version
25 kHz	Connected	6,4MHz	C 92 C1,3
20 kHz	Connected	6,12MHz	C 92 C2
12,5 kHz	Open	5,4MHz	C 92 C1,3

Note 2

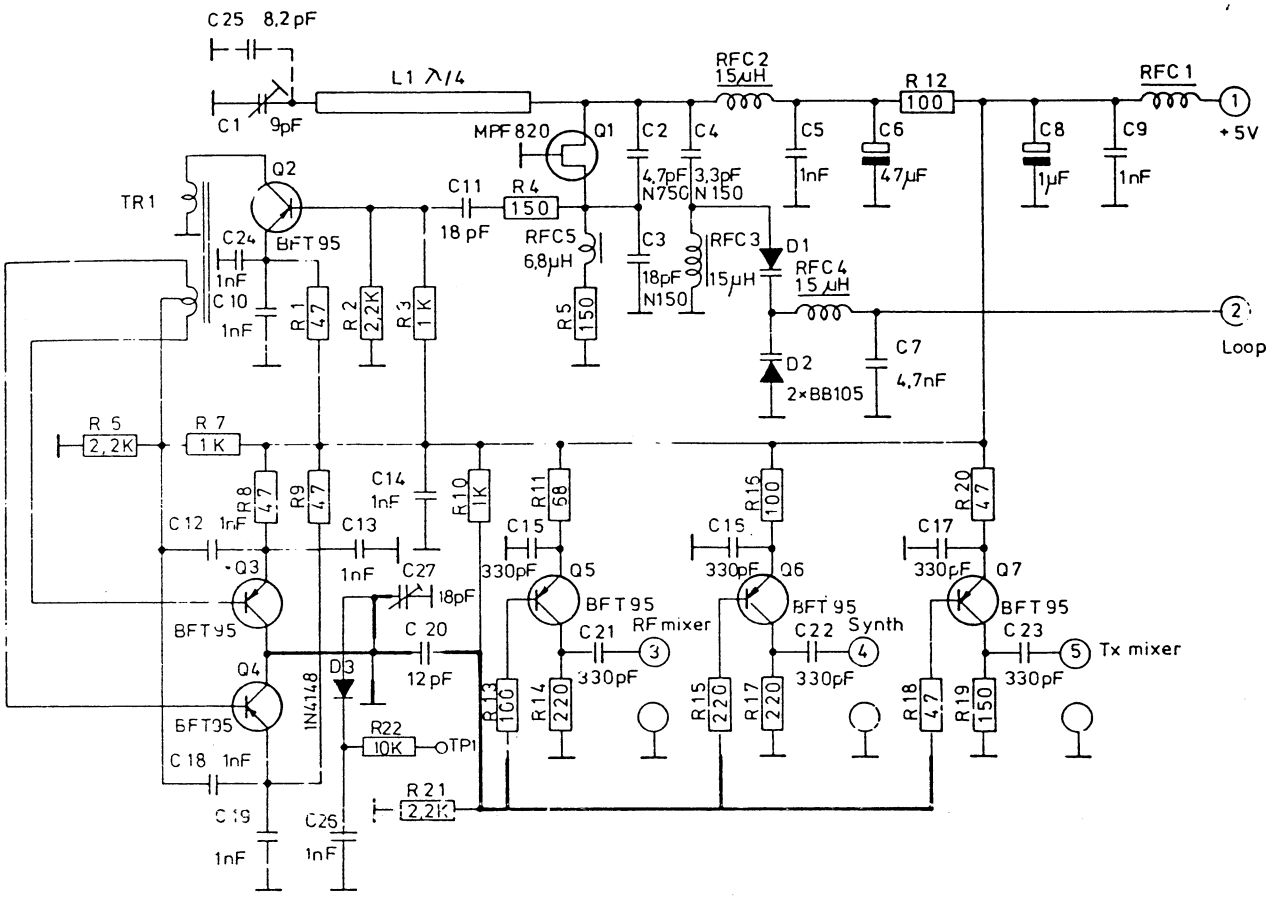
Version	C 5	C 8	C 11
C 92 C1,2	12 pF	1,5 pF	15 pF
C 92 C 3	15 pF	2,2 pF	18 pF

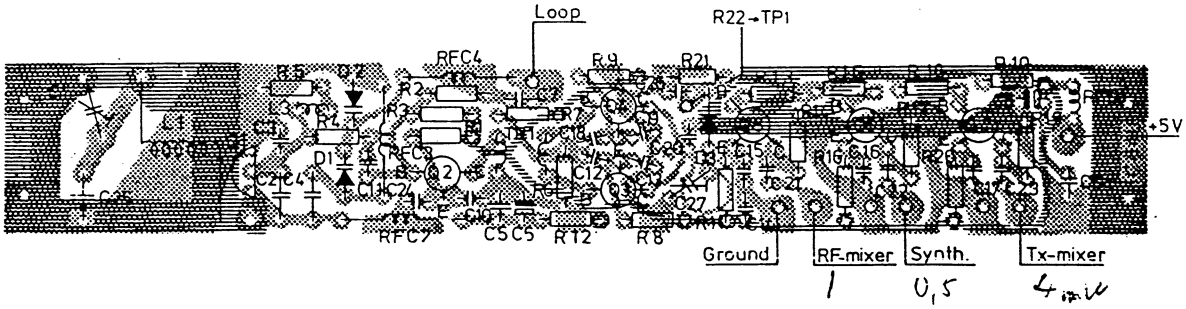


Note 3

Frequency of X3	C 51	C 64
X3 < 10,7 MHz	mount.	mount
10,7MHz <X3 <15,2MHz	not mount.	mount.
X3 > 15,2MHz	not mount.	27 pF

Rettet	Synthesizer and Tx-VCXO AP 2000 UHF	Tegn. BC Kontr. JH 22-7-80
6-2 81 JH 20-11-81 PH 7-12-81 BH 13-1-82 PH 12-5-82 LBy/AS 23-8-82 LBy	Print board C 92 C 1,2,3	
	AP-RADIOTELEFON A/S	Tegn nr 80090-2E2





Type	C 25	VCO-range
1	Not mounted	415 to 520 MHz
2	mounted	370 to 420 MHz

R: 7-11-80 AC/BJ 18-2-81 BC/BJ	VCO AP 2000 UHF Print board C84B1,2	Tegn: BC 16-06-80 Kontr. BJ 16-06-80 Skala:
	AP-RADIOTELEFON	Tegn nr. 80075-3E2

AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-267	47 Ω 1/8 W CR16
R2	13-287	2,2 KΩ " "
R3	13-283	1 KΩ " "
R4	13-273	150 Ω " "
R5	13-273	150 Ω. " "
R6	13-287	2,2 KΩ " "
R7	13-283	1 KΩ " "
R8	13-267	47 Ω " "
R9	13-267	47 Ω " "
R10	13-283	1 KΩ " "
R11	13-269	68 Ω " "
R12	13-271	100 Ω " "
R13	13-271	100 Ω " "
R14	13-275	220 Ω " "
R15	13-275	220 Ω " "
R16	13-271	100 Ω " "
R17	13-275	220 Ω " "
R18	13-267	47 Ω " "
R19	13-273	150 Ω " "
R20	13-267	47 Ω " "
R21	13-287	2,2 KΩ " "
R22	13-295	10 KΩ " "
C1	19-328	9 pF Tec. Trim.
C2	11-369	4,7 pF N750 400V
C3	11-434	18 pF ker.
C4	11-367	3,3 pF N150 400V
C5	11-409	1 nF ker.
C6	11-509	47 µF/6,3V tant.
C7	11-416	4,7 nF ker.
C8	11-502	1 µF/35V tant.
C9	11-409	1 nF ker.
C10	11-409	1 nF "
C11	11-434	18 pF "
C12	11-409	1 nF "
C13	11-409	1 nF "
C14	11-409	1 nF "

Nr.	Kode	Data
C15	11-406	330 pF ker.
C16	11-406	330 pF "
C17	11-406	330 pF "
C18	11-409	1 nF "
C19	11-409	1 nF "
C20	11-379	12 pF "
C21	11-406	330 pF "
C22	11-406	330 pF "
C23	11-406	330 pF "
C24	11-409	1 nF "
C25	11-423	8,2 pF NPO 400V
C26	11-409	1 nF ker.
C27	19-336	18 pF Dau
D1	04-009	BB105G
D2	04-009	BB105G
D3	04-062	1N4148
Q1	19-135	MPF 820
Q2	19-110	BFT 95/BFQ 23
Q3	19-110	BFT 95/BFQ 23
Q4	19-110	BFT 95
Q5	19-110	BFT 95
Q6	19-110	BFT 95
Q7	19-110	BFT 95
L1	25-085	λ/4 coaxlinie 80044-4E2
RFC1	25-009	75290-4E2
RFC2	04-109	15 µH Philips
RFC3	04-109	15 µH Philips
RFC4	04-109	15 µH Philips
RFC5	04-114	6,8 µH 74016-4
TR1	25-008	75289-4E2

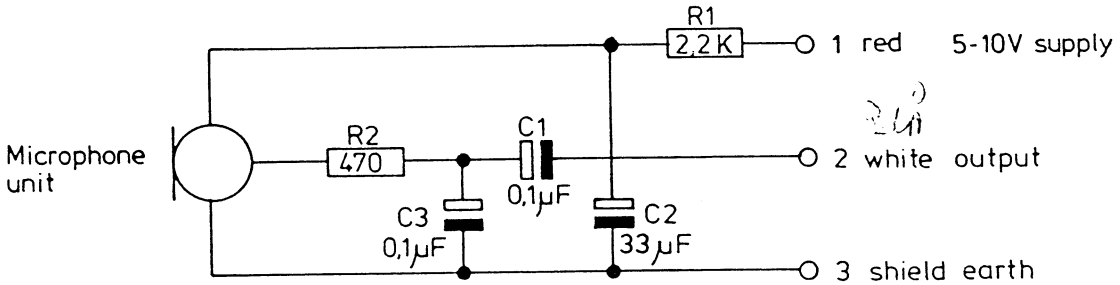
VCO AP 2000 UHF
Print board C 84 B 2
Tilhører tegn. nr.: 80075-3E2

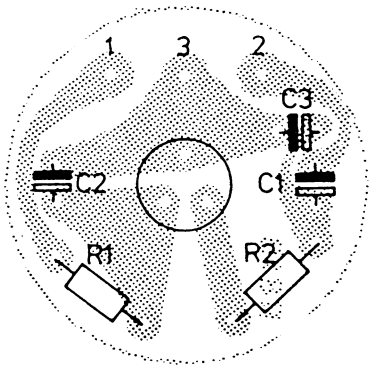
Rettet:

Tegn.:

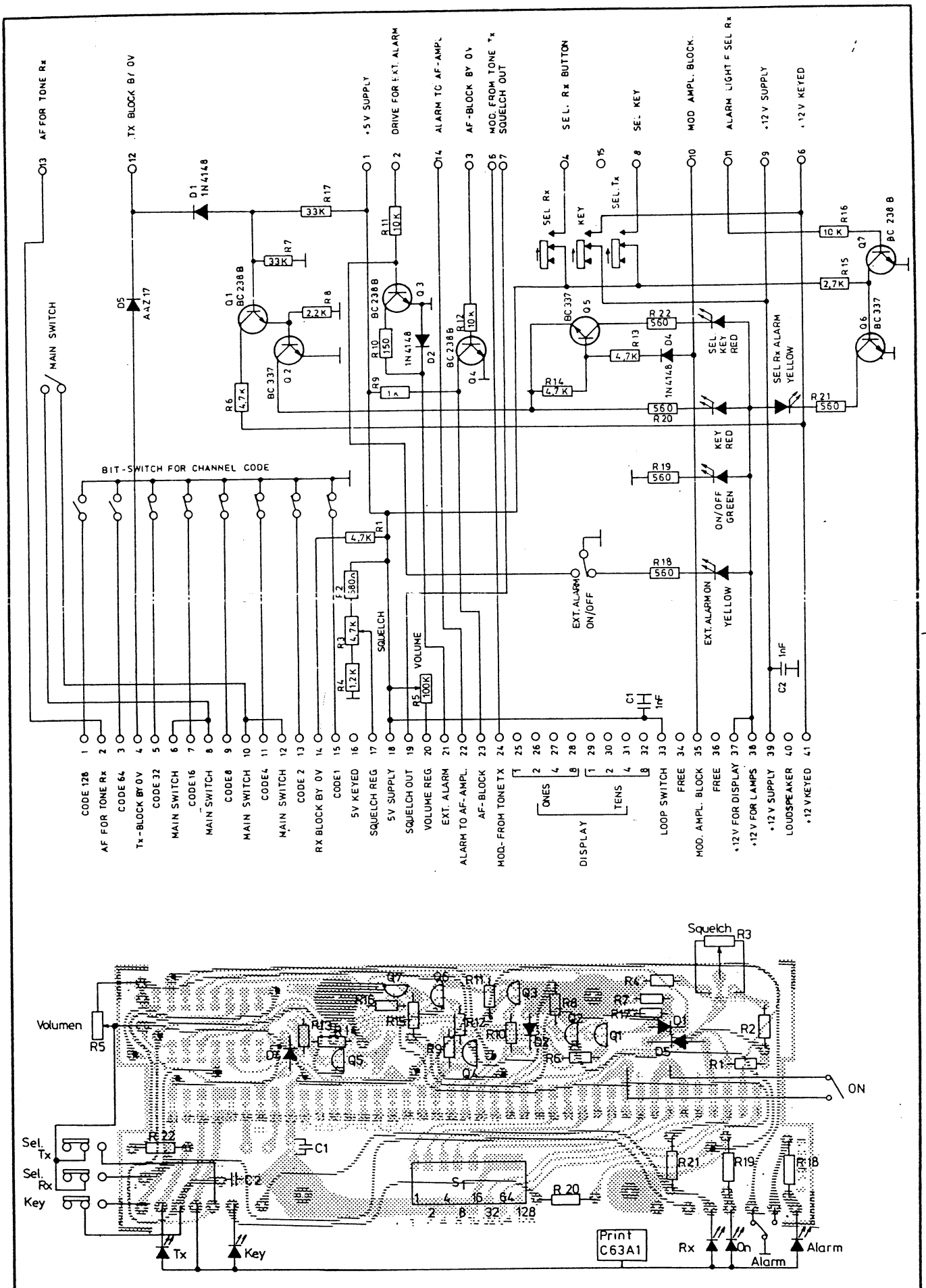
Kontr.:

Stykl. nr.: 80075-





Rettet:		Tegn.: 4-3-77 AC	Kontr.:
25-5-77 LT/AC 13-10-80 LB/AMC	Microphone 213-020 Print board B 81 B1	Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.: 77127-4E2	



Retter 30-9-75 LT/AC 8-6-77 JH/AC 8-2-78 LT/AMC 5-7-79 JH/BC 1-8-79 JH/BC	CONTROL CIRCUIT FOR 1 CHANNEL, FRONTSECTION 04 PRINT B 20E1	Tegn.: 13.-2.-75 NC Kontr.: 13.-2.-75 LT Stykl. nr.:
	AP-RADIOTELEFON	Tegn. nr.: 75083-3E2

AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-291	4,7 KΩ 1/8 W CR16
R2	13-281	680 Ω " "
R3	16-022	4,7 KΩ Potm. "
R4	13-284	1,2 KΩ 1/8 W CR16
R5	16-023	100 KΩ Lin. Potm.
R6	13-291	4,7 KΩ 1/8 W CR16
R7	13-300	33 KΩ " "
R8	13-287	2,2 KΩ " "
R9	13-283	1 KΩ " "
R10	13-273	150 Ω " "
R11	13-295	10 KΩ " "
R12	13-295	10 KΩ " "
R13	13-291	4,7 KΩ " "
R14	13-291	4,7 KΩ " "
R15	13-288	2,7 KΩ " "
R16	13-295	10 KΩ " "
R17	13-300	33 KΩ " "
R18	13-367	560 Ω 1/4 W CR25
R19	13-367	560 Ω " "
R20	13-367	560 Ω " "
R21	13-367	560 Ω " "
R22	13-367	560 Ω " "
C1	11-409	1 nF Ker.
C2	11-409	1 nF Ker.
D1	04-062	1N4148
D2	04-062	1N4148
D4	04-062	1N4148
D5	04-002	AAZ17
Q1	19-093	BC238B
Q2	19-096	BC337
Q3	19-093	BC238B
Q4	19-093	BC238B
Q5	19-096	BC337

Nr.	Kode	Data
Q6	19-096	BC337
Q7	19-093	BC238B

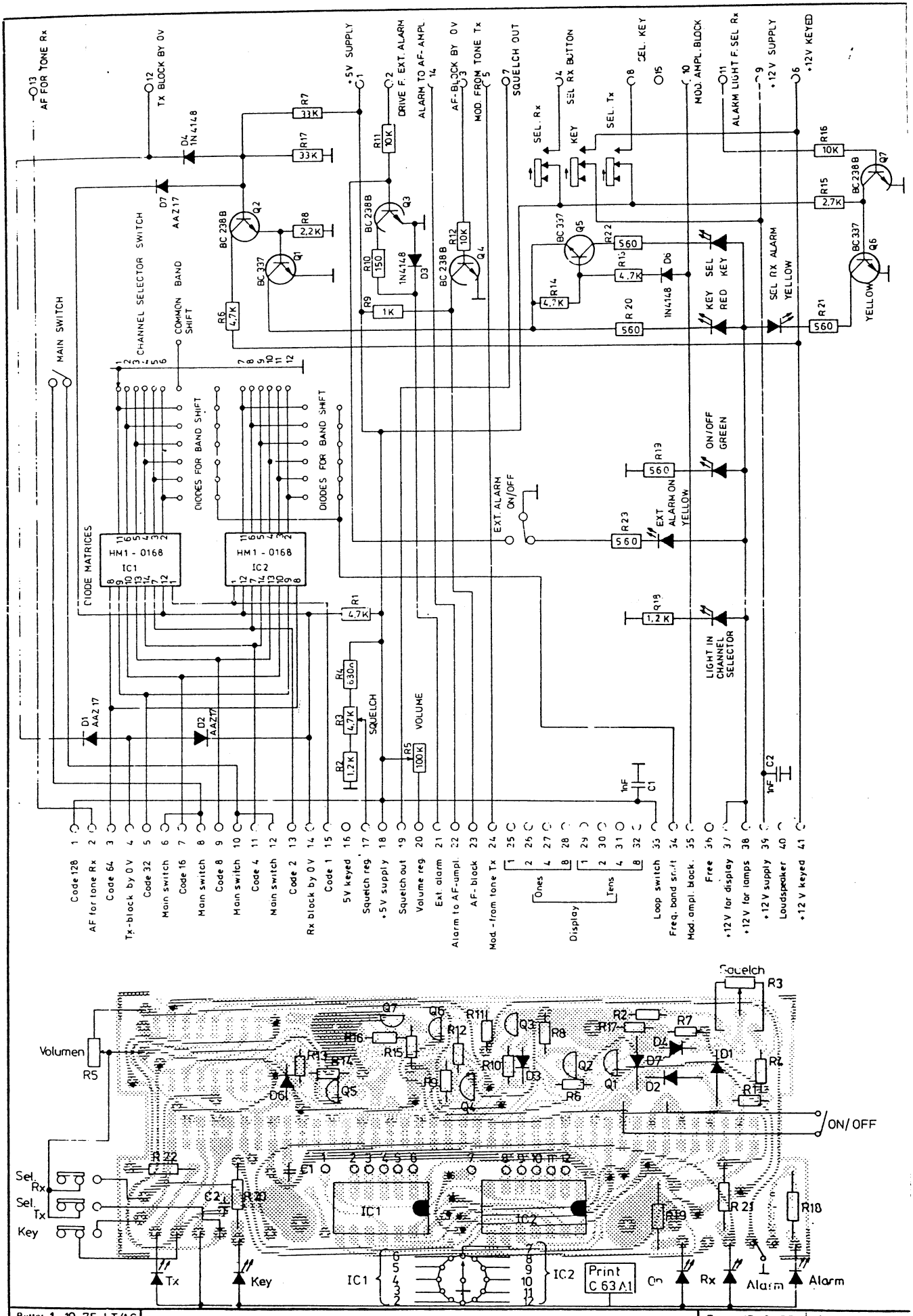
Control circuit for 1 channel
Frontsection 04 Print B2OE1
Tilhører tegn. nr.: 75083-3E2

Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 75083-4S2



Retter 1-10-75 LT/AC 14-4-77 LT/AC 8-6-77 JH/AC 26-1-78 LT/AMC 30-7-79 MO 31 7 79 JH/BC	CONTROL CIRCUIT FOR 12 CHANNELS, FRONTSECTION 11 PRINT C 47 A1+C 63 A AP-RADIOTELEFON	Tegn. 15-6-75 AC Kontr.: Stykl. nr.: Tegn. nr.: 75084-3E2

AP-RADIOTELEFON

Nr.	Kode	Data
R1	13-291	4,7 KΩ 1/8 W CR16
R2	13-284	1,2 KΩ " "
R3	16-022	4,7 KΩ Potm.
R4	13-281	680 Ω 1/8 W CR16
R5	16-023	100 KΩ Lin.Potm.
R6	13-291	4,7 KΩ 1/8 W CR16
R7	13-300	33 KΩ " "
R8	13-287	2,2 KΩ " "
R9	13-283	1 KΩ " "
R10	13-273	150 Ω " "
R11	13-295	10 KΩ " "
R12	13-295	10 KΩ " "
R13	13-291	4,7 KΩ " "
R14	13-291	4,7 KΩ " "
R15	13-288	2,7 KΩ " "
R16	13-295	10 KΩ " "
R17	13-300	33 KΩ " "
R18	13-284	1,2 KΩ " "
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

Nr.	Kode	Data
Q3	19-093	BC238B
Q4	19-093	BC238B
Q5	19-096	BC337
Q6	19-096	BC337
Q7	19-093	BC238B
IC1	09-067	HM1-0168
IC2	09-067	HM1-0168

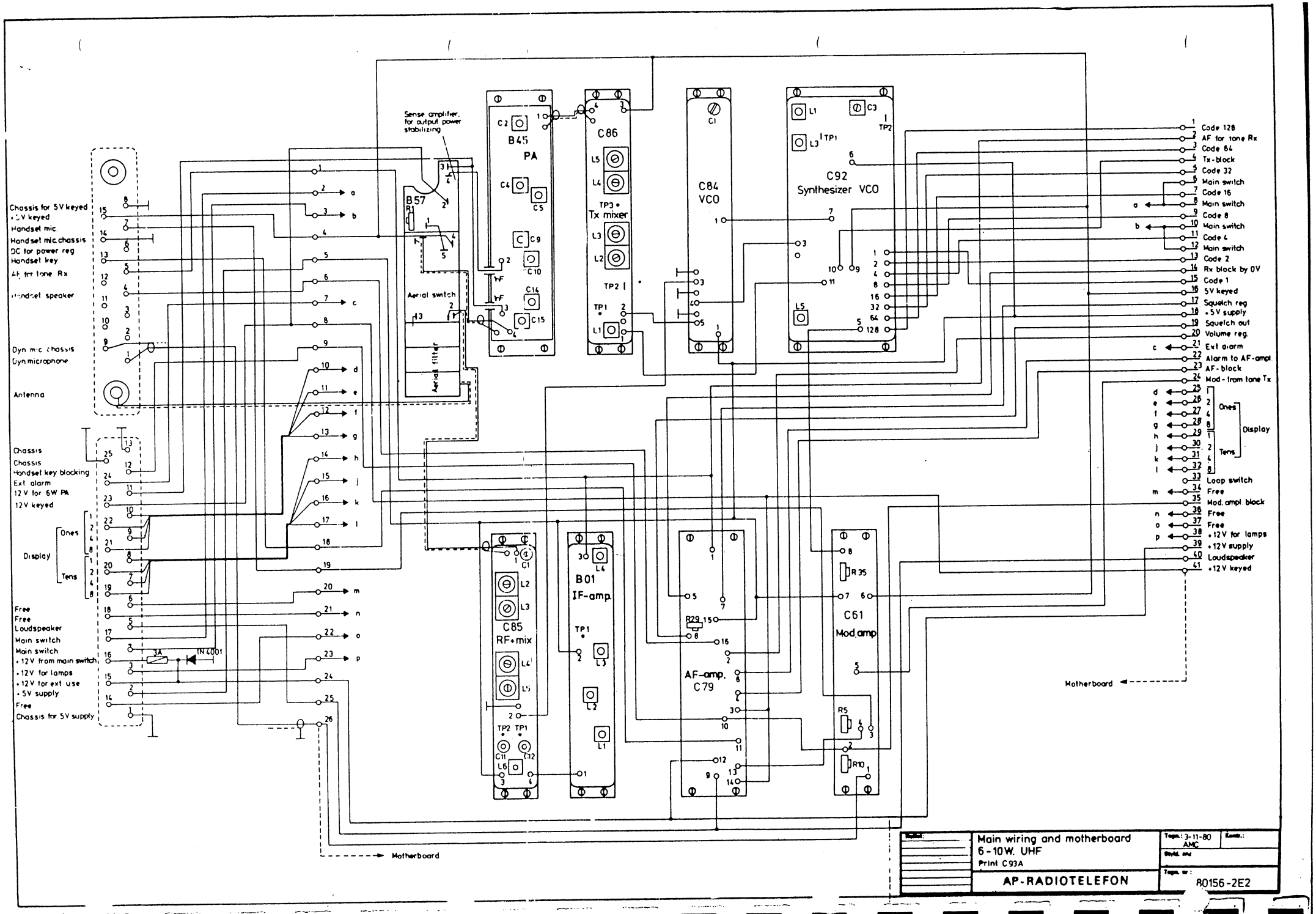
Control circuit for 12 channel
Frontsection 11 Print C47+C63
Tilhører tegn. nr.: 75084-3E2

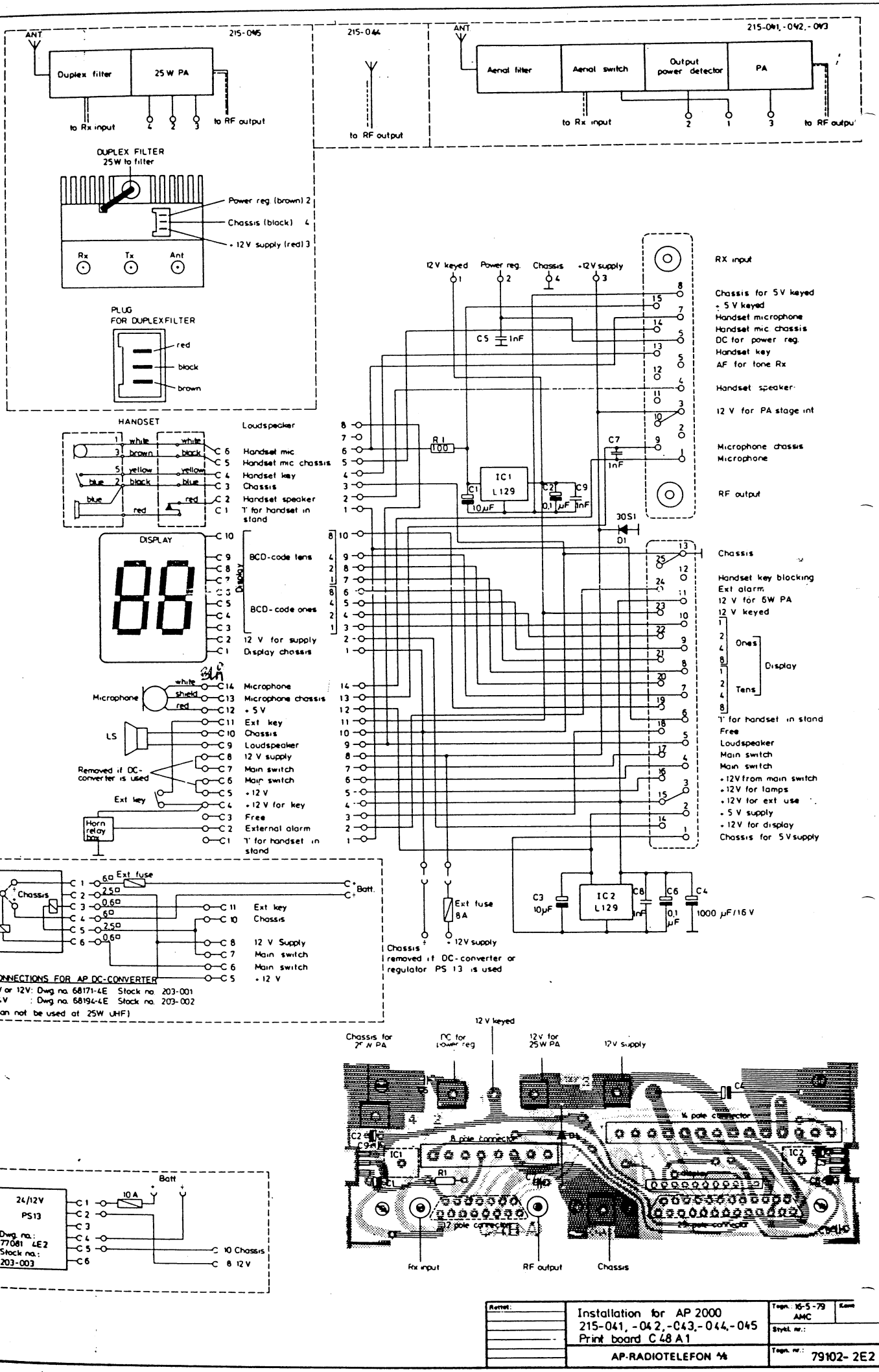
Rettet:

Tegn.:

Kontr.:

Stykl. nr.: 75084-4S2


Chassis for 5V keyed
+5V keyed
Handset mic.
Handset mic.chassis
DC for power reg
Handset key
AF for tone Rx
Handset speaker
Dyn mic chassis
Dyn microphone
Antenna
Chassis
Chassis
Handset key blocking
Ext alarm
12 V for 6W PA
12V keyed
Display
Ones
Tens
Free
Free
Loudspeaker
Main switch
Main switch
+12V from main switch
+12V for lamps
+12V for ext use
+5V supply
Free
Chassis for 5V supply
3A
IN4001
Sense amplifier, for output power stabilizing
B57
Aerial switch
Aerial filter
B45
PA
C86
TP3
Tx mixer
C84
VCO
C92
Synthesizer VCO
TP1
TP2
C85
RF+mix
B01
IF-amp.
AF-amp.
C79
C61
Mod.amp
R35
R29
R5
R10
Motherboard
Code 128
AF for tone Rx
Code 64
Tx-block
Code 32
Main switch
Code 16
Main switch
Code 8
Main switch
Code 4
Main switch
Code 2
Rx block by 0V
Code 1
5V keyed
Squelch reg
+5V supply
Squelch out
Volume reg.
Ext alarm
Alarm to AF-ampl
AF-block
Mod-from tone Tx
Ones
Tens
Display
Loop switch
Free
Mod.ampl. block
Free
Free
+12V for lamps
+12V supply
Loudspeaker
+12V keyed
Motherboard
Main wiring and motherboard
6-10W. UHF
Print C93A
AP-RADIOTELEFON
Tegn.: 3-11-80
AMC
80156-2E2



Rettet:	Installation for AP 2000 215-041, -042, -043, -044, -045 Print board C 48 A 1	Tegn. 16-5-79 AMC	Kontr.
		Stykl. nr.:	
	AP-RADIOTELEFON A/S	Tegn. nr.:	79102-2E2

AP-RADIOTELEFON

Nr.	Kode	Data	Nr.	Kode	Data
R1	13-359	100 Ω CR25 1/4W			
C1	11-506	10 µF/25V Tant.			
C2	11-500	0,1 µF/35V "			
C3	11-506	10 µF/25V "			
C4	05-030	1000 µF/16V El.lyt			
C5	11-409	1 nF Ker.			
C6	11-500	0,1 µF/35V Tant.			
C7	11-409	1 nF Ker.			
C8	11-409	1 nF "			
C9	11-409	1 nF "			
`1	04-040	30S1			

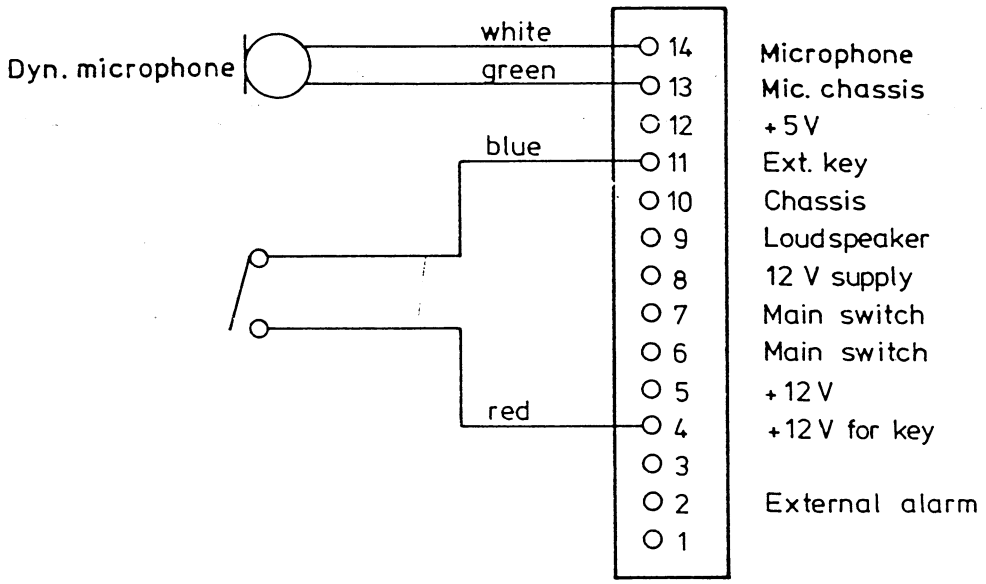
Installation for AP 2000
Print board C 48 A1
Tilhører tegn. nr.: 79102-2E2

Rettet:

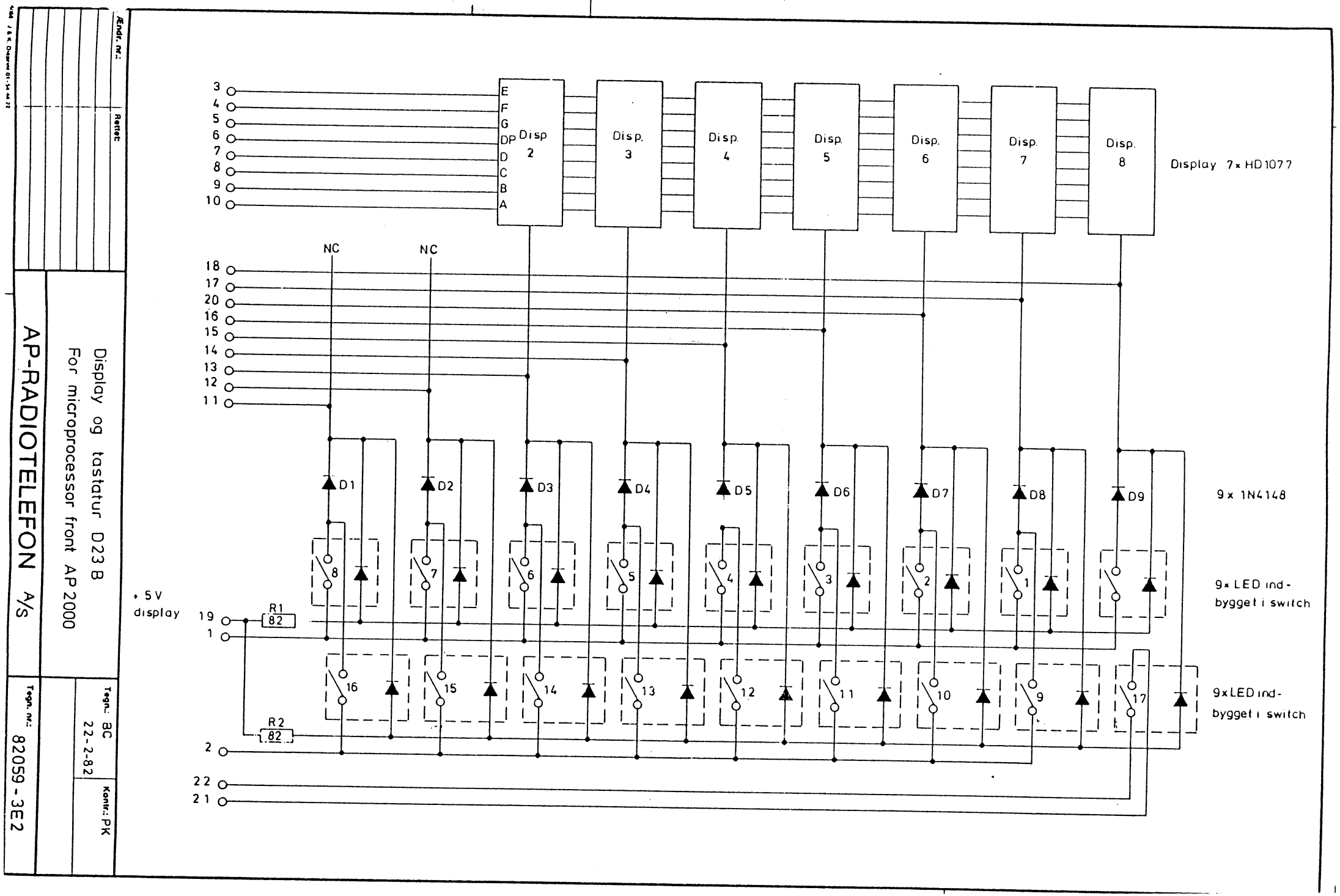
Tegn.:

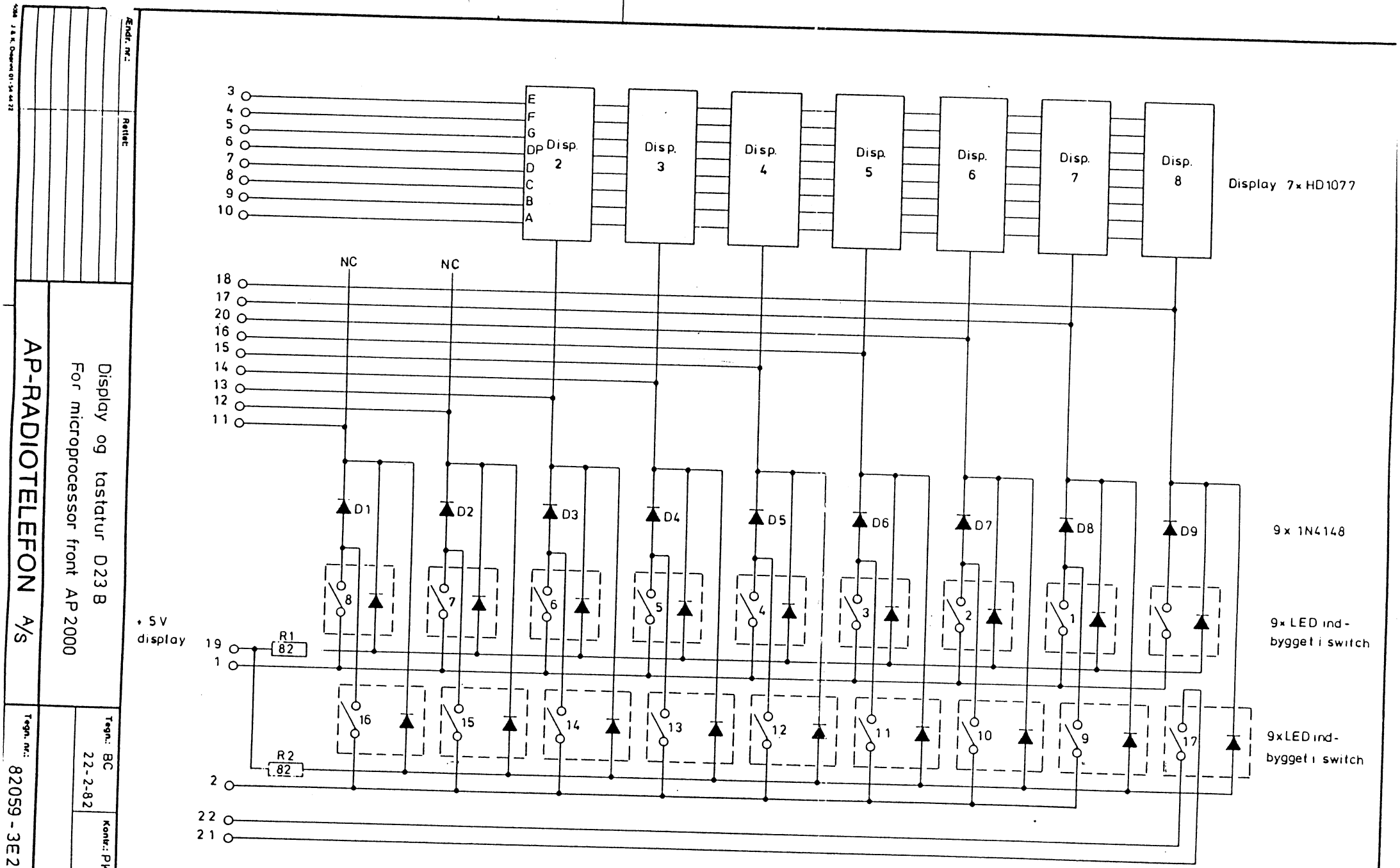
Kontr.:

Stykl. nr.: 79102-2E2



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


Ændr. nr.:
Rettet
AP-RADIOTELEFON A/S
Display og tastatur D23 B
For microprocessor front AP 2000
Tegn.: BC
22-2-82
Kontr.: PK
Tegn. nr.: 82059-3E2
Disp 2
Disp. 3
Disp. 4
Disp. 5
Disp. 6
Disp. 7
Disp. 8
E
F
G
DP
D
C
B
A
Display 7 x HD1077
NC
NC
D1
D2
D3
D4
D5
D6
D7
D8
D9
9 x 1N4148
9 x LED ind-
bygget i switch
9 x LED ind-
bygget i switch
+ 5 V
display
R1
82
R2
82



Ændr. nr.:

Rettet:

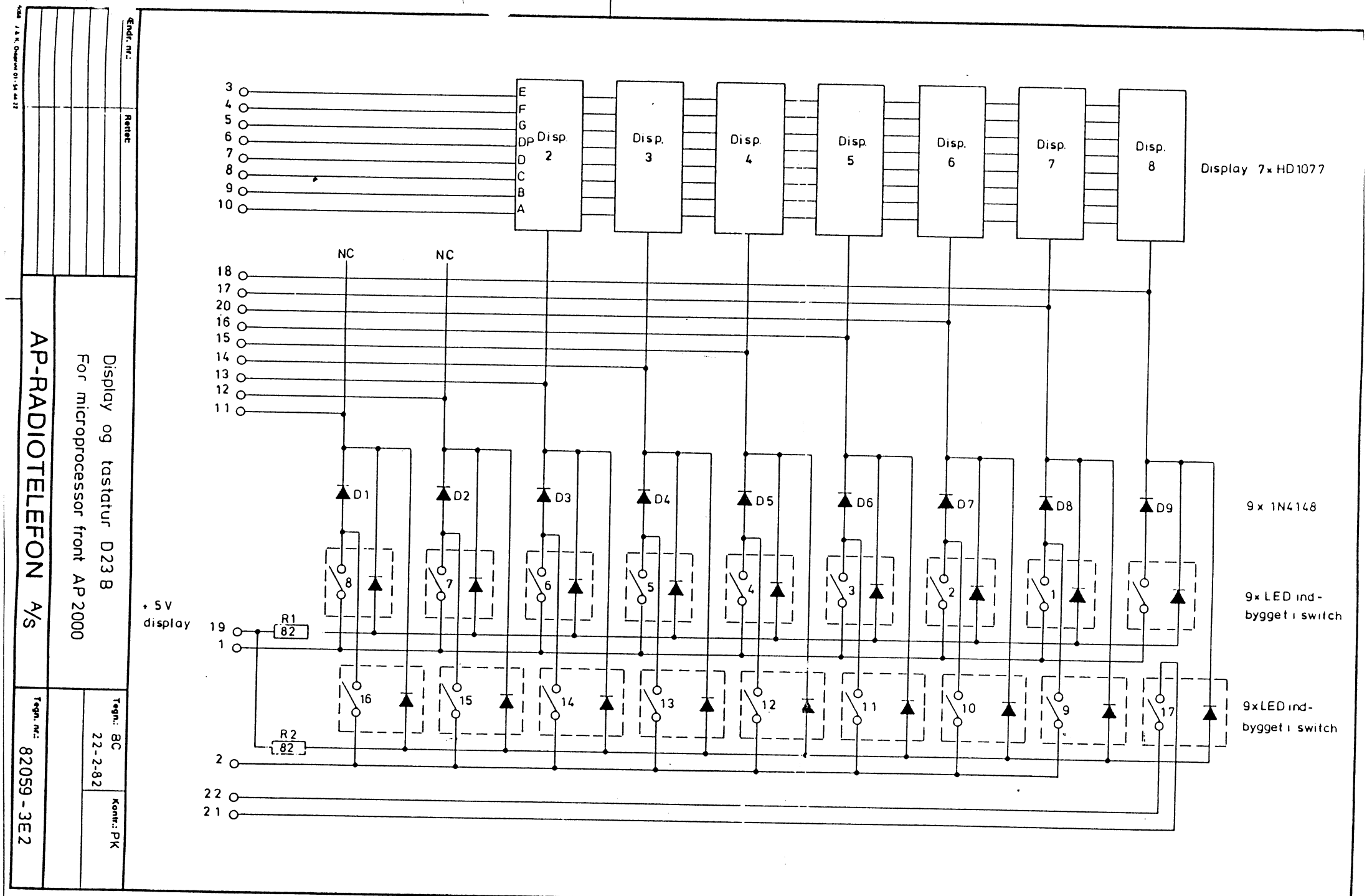
AP-RADIOTELEFON A/S

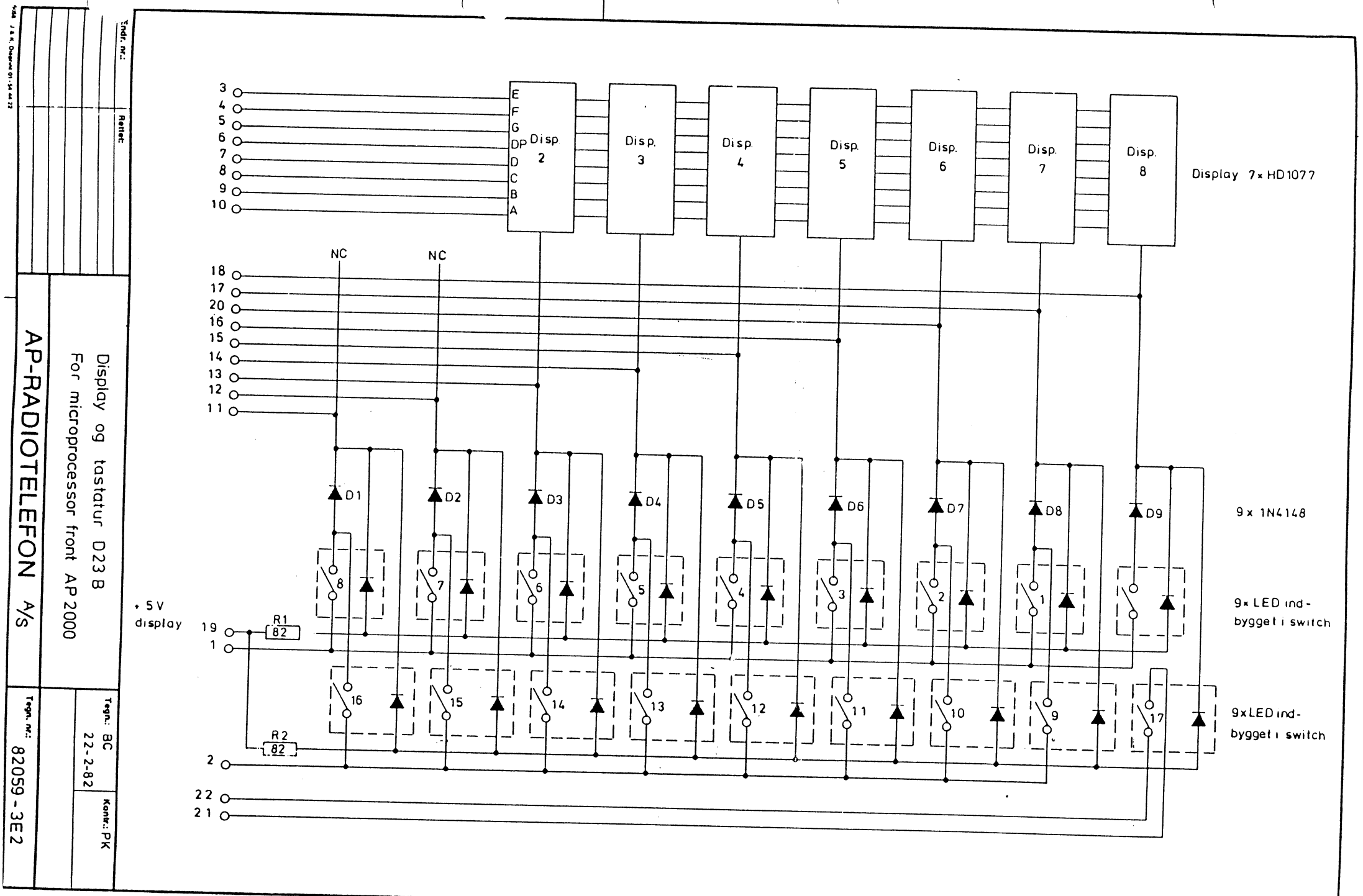
Display og tastatur D23 B
For microprocessor front AP 2000

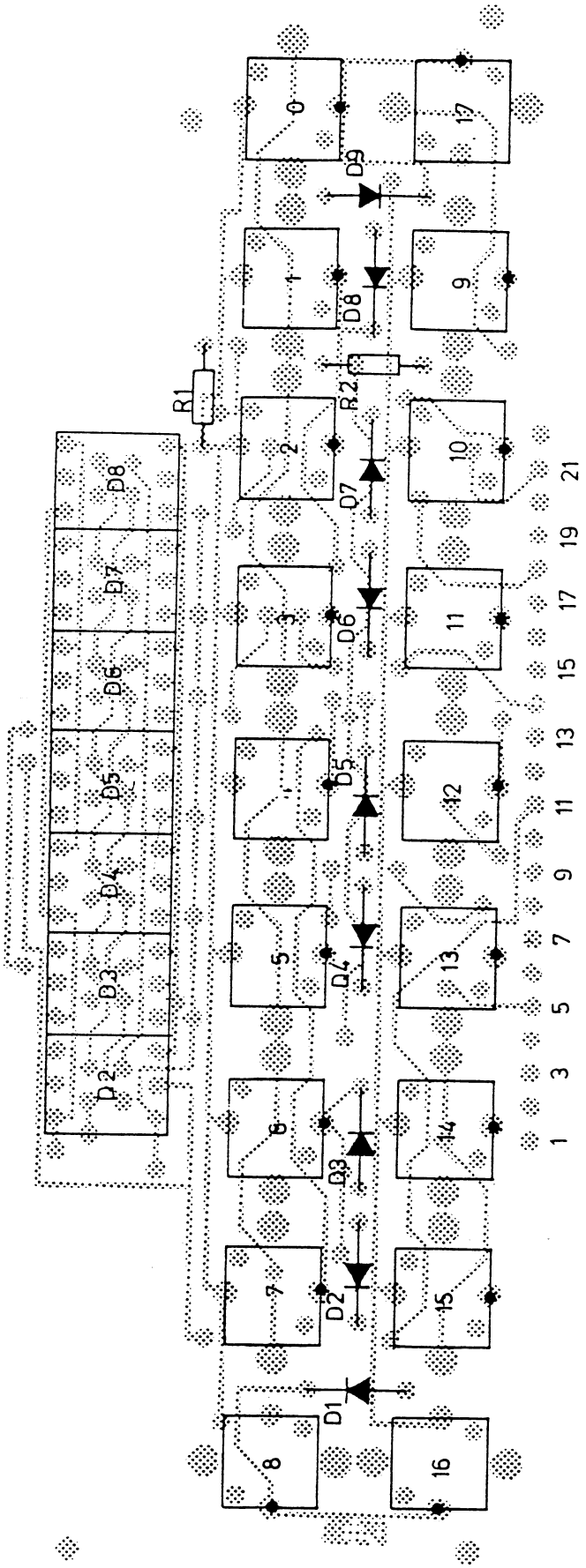
Tegn.: BC
22-2-82

Kontr.: PK

Tegn. nr.: 82059-3E2


Endr. nr.:
Rettet
AP-RADIOTELEFON A/S
Display og tastatur D23 B
For microprocessor front AP2000
Tegn.: BC
22-2-82
Kontr.: PK
Tegn. nr.: 82059-3E2
Disp. 2
Disp. 3
Disp. 4
Disp. 5
Disp. 6
Disp. 7
Disp. 8
Display 7x HD1077
E
F
G
DP
D
C
B
A
NC
NC
D1
D2
D3
D4
D5
D6
D7
D8
D9
9 x 1N4148
9x LED ind-
byggetiswitch
9x LED ind-
byggetiswitch
+5V
display
R1
82
R2
82


Ændr. nr.:
Rettet
AP-RADIOTELEFON A/s
Display og tastatur D23 B
For microprocessor front AP 2000
Tegn.: BC
22-2-82
Kontr.: PK
Tegn. nr.: 82059-3E2
3
4
5
6
7
8
9
10
E
F
G
DP
D
C
B
A
Disp 2
Disp 3
Disp 4
Disp 5
Disp 6
Disp 7
Disp 8
Display 7x HD1077
NC
NC
18
17
20
16
15
14
13
12
11
D1
D2
D3
D4
D5
D6
D7
D8
D9
9 x 1N4148
8
7
6
5
4
3
2
1
9x LED ind-
bygget i switch
+5V
display
19
1
R1
82
16
15
14
13
12
11
10
9
17
9xLED ind-
bygget i switch
R2
82
2
22
21



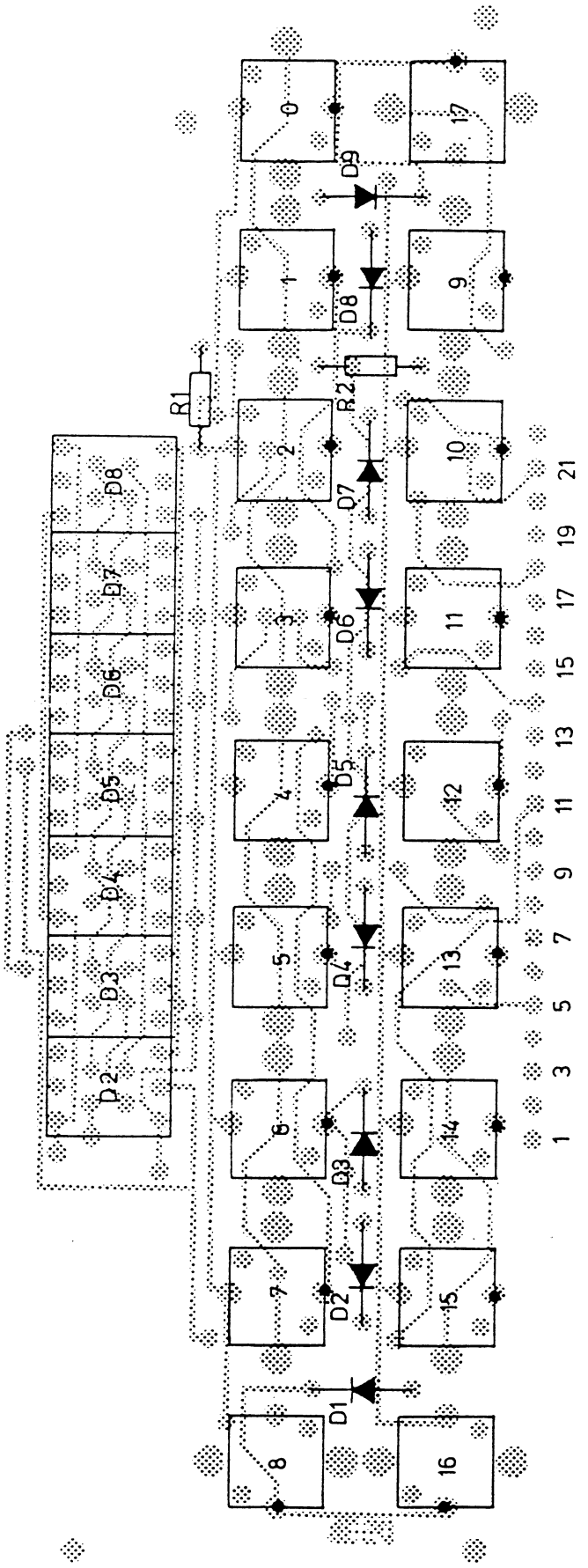
Ændr. nr.:	Rettet:

Display og tastatur D 23 B
For microprocessor front AP 2000

Tegn.: AMS 82-08-19 | Kontr.: PK 82-08-24

AP-RADIOTELEFON A/S

Tegn. nr.: 82059 - 4E2



Ændr. nr.:	Rettet:

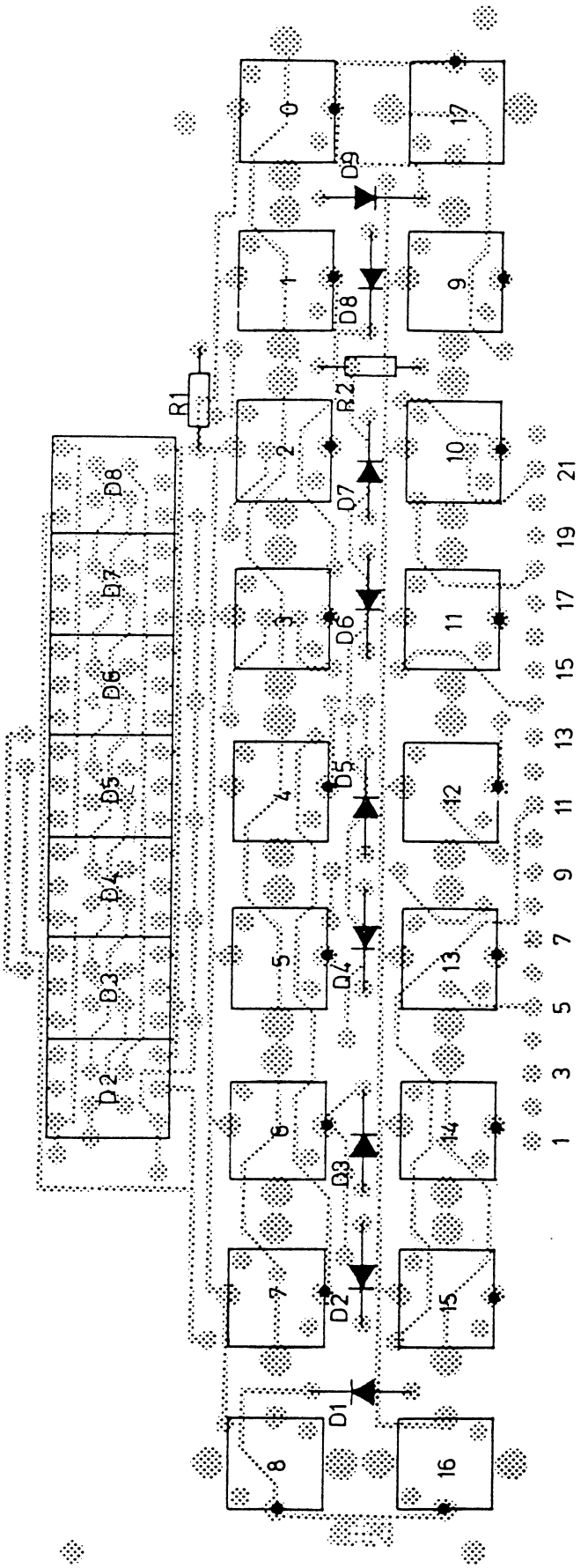
Display og tastatur D 23 B
For microprocessor front AP 2000

Tegn.: AMS 82-08-19 | Kontr.: PK 82-08-24

AP-RADIOTELEFON A/S

Tegn. nr.: 82059 - 4E2

n05A J & K Diaprint 01 54 44 22



Ændr. nr.:	Rettet:

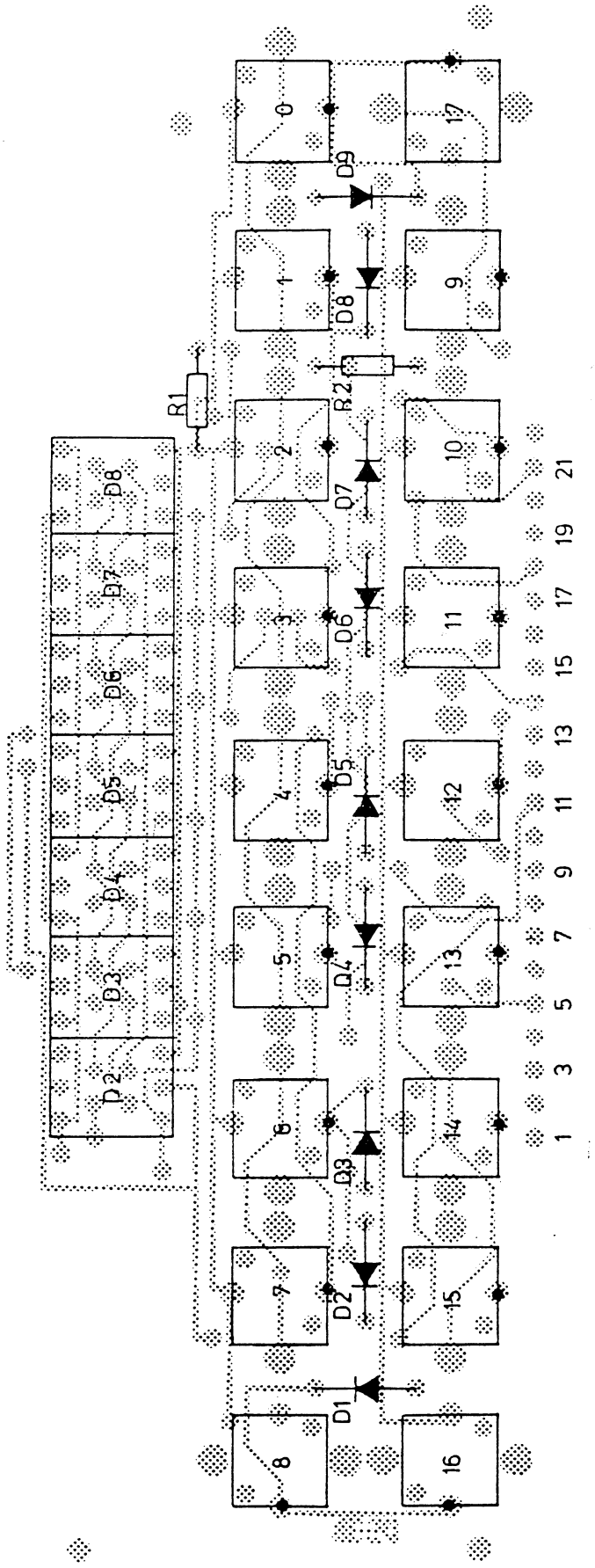
Display og tastatur D 23 B
For microprocessor front AP 2000

Tegn.: AMS 82-08-19

Kontr.: PK 82-08-24

AP-RADIOTELEFON A/S

Tegn. nr.: 82059 - 4E2



Ændr. nr.:	Rettet:

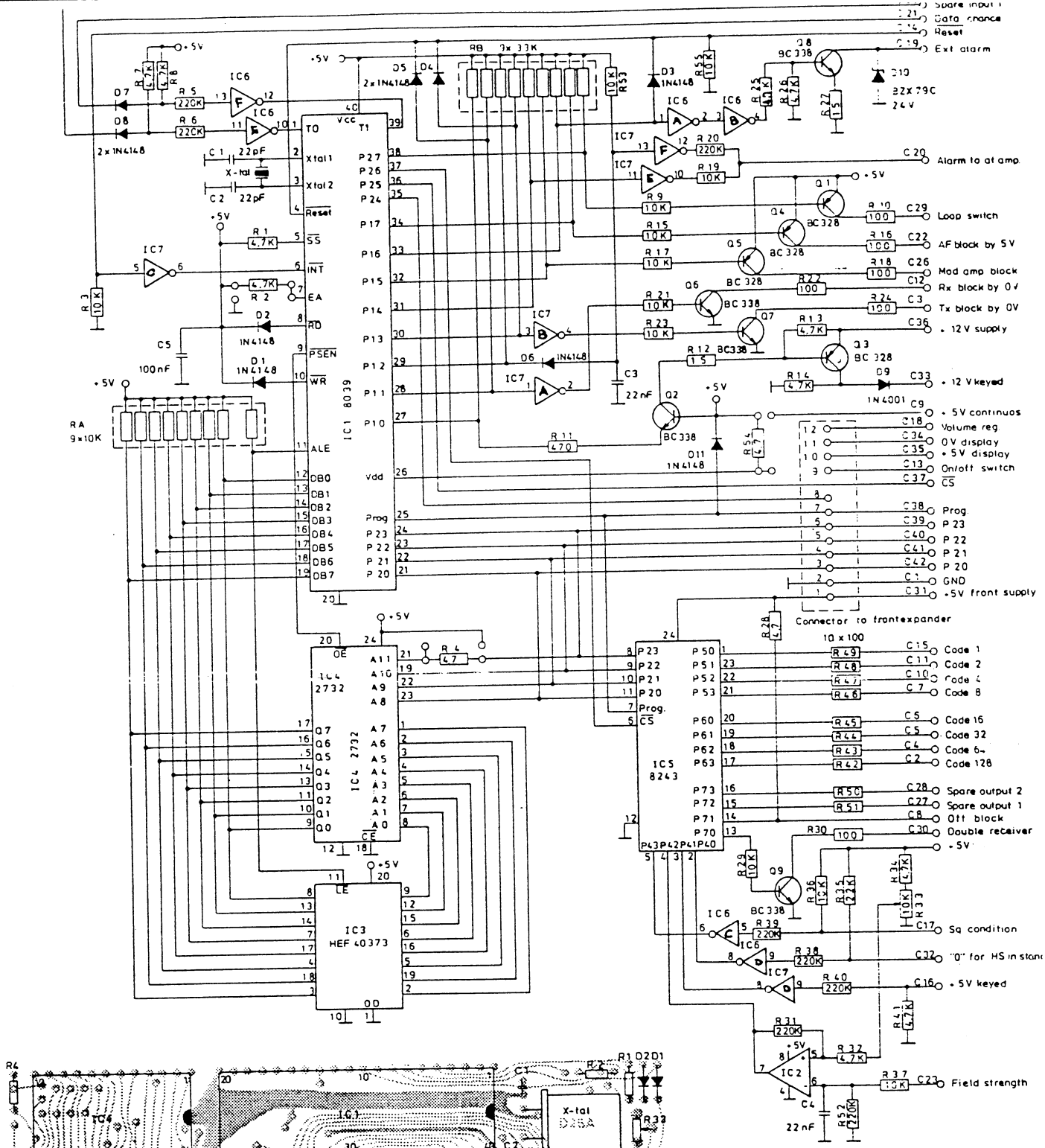
Display og tastatur D 23 B
For microprocessor front AP 2000

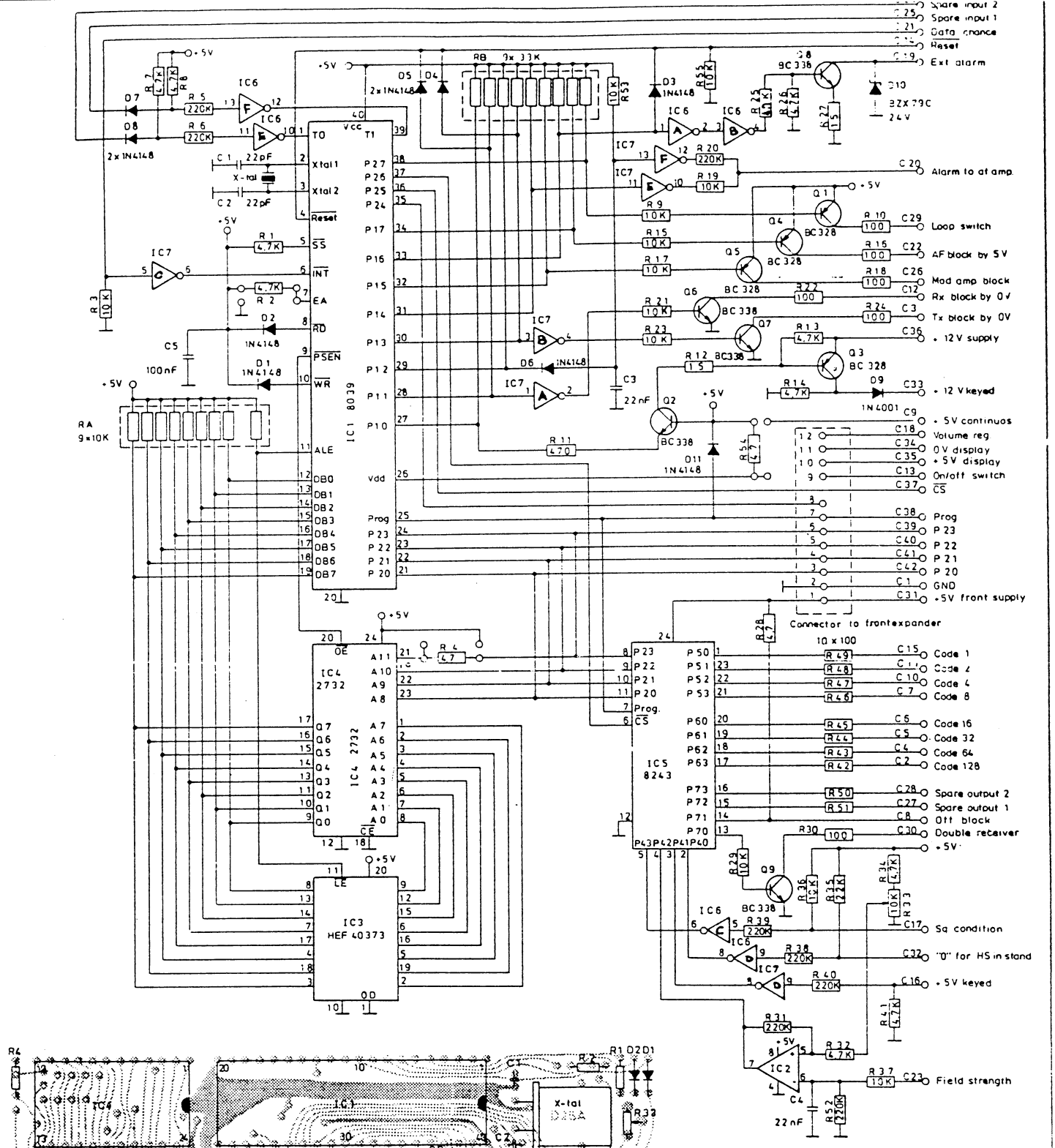
AP-RADIOTELEFON A/S

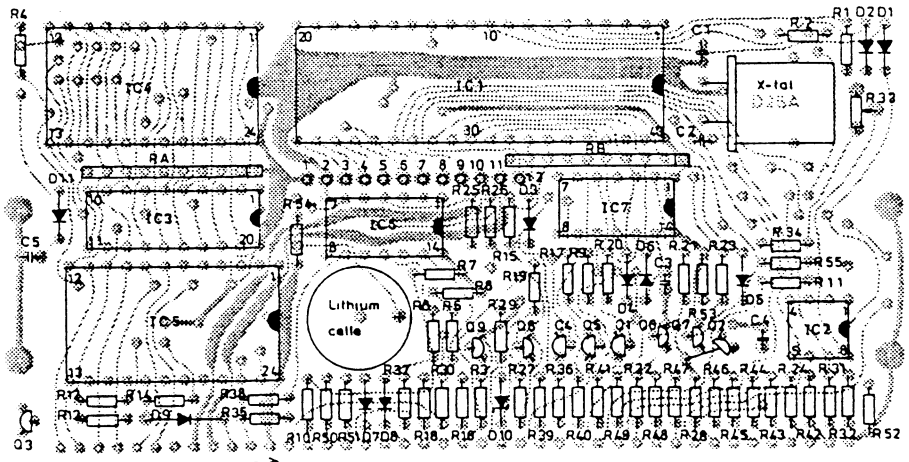
Tegn.: AMS 82-08-19

Kontr.: PK 82-08-24

Tegn. nr.: 82059 - 4E2


IC1 8039
IC4 2732
IC3 HEF 40373
IC5 8243
IC2
IC6 = IC7 = HEF 40106
Connector to frontexpander
10 x 100
Lithium cell
X-tal D25A
Computerprint D 25 A
Microprocessor front AP2000
ap radioteleion a/s
Tegn.: BC
12-5-82
Tegn. nr.: 82100-

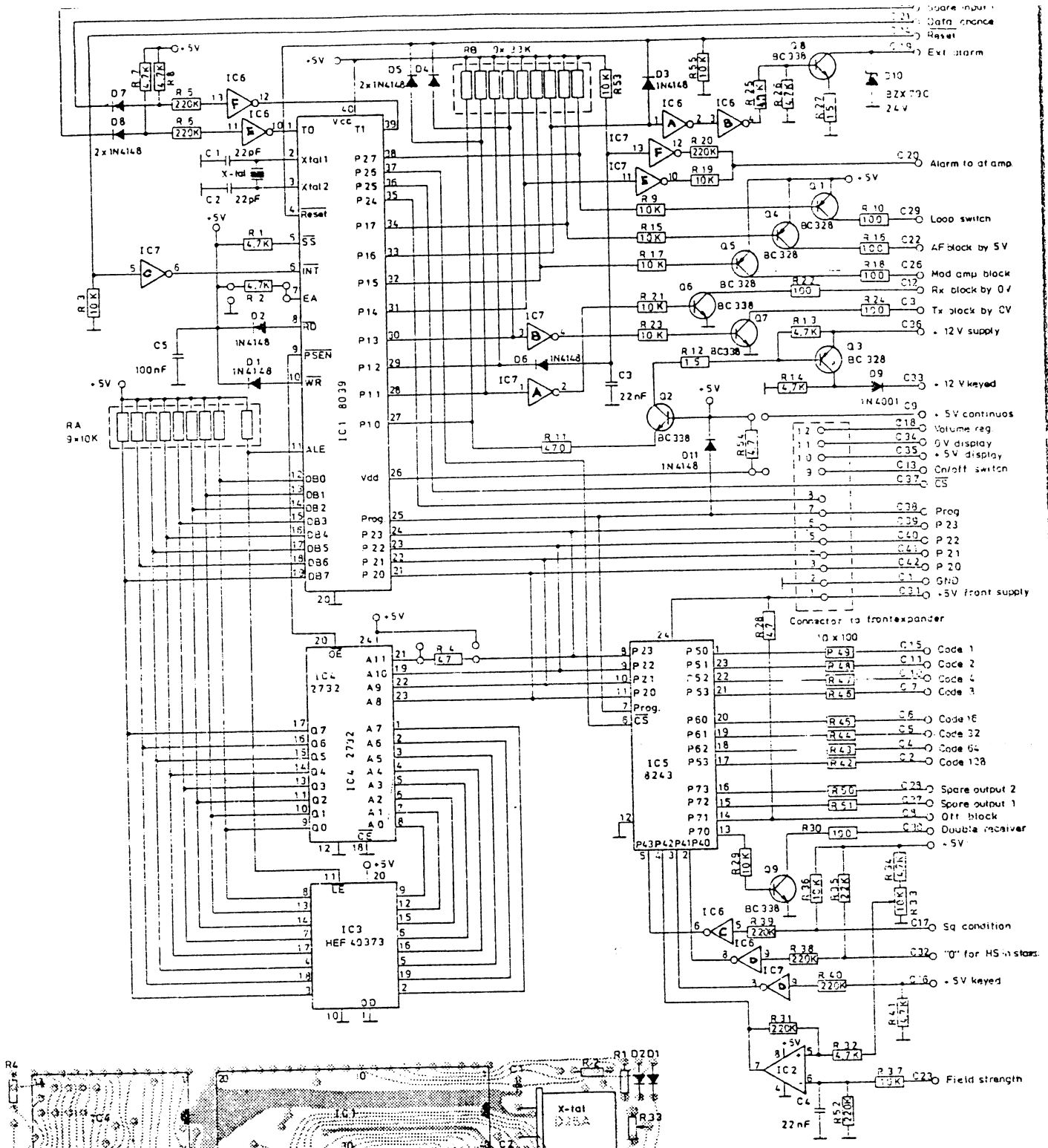


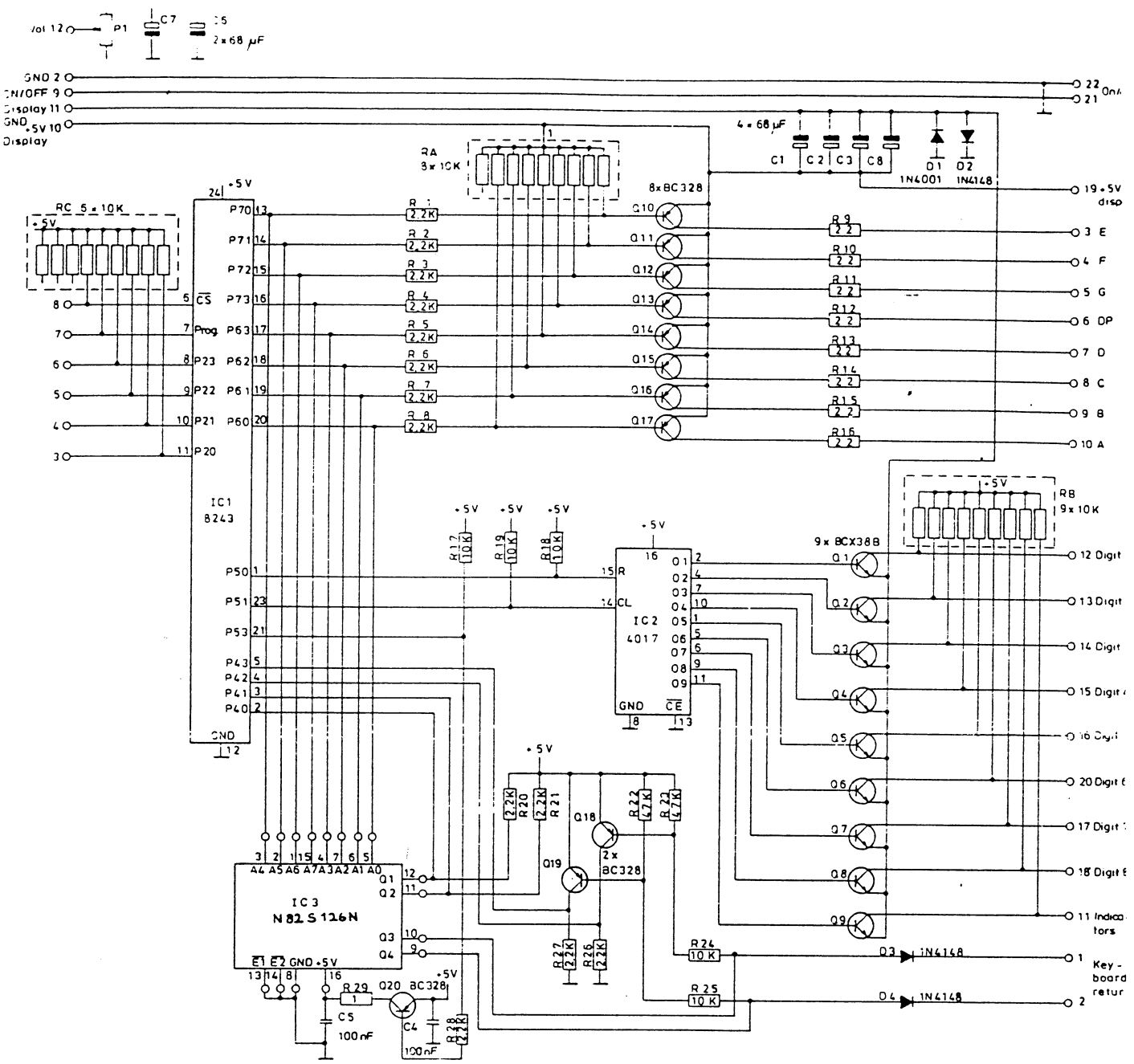


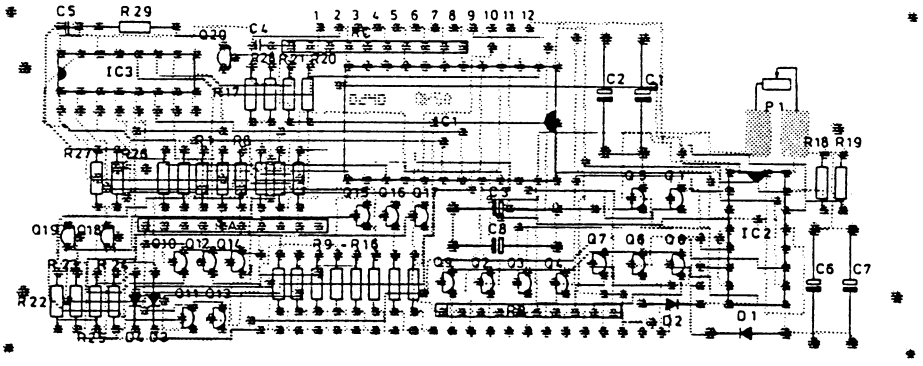
IC6 = IC7 = HEF 40106

42 P 20
41 P 21
40 P 22
39 P 23
38 Prog
37 CS
36 + 12 V supply
35 + 5 V display
34 0 V display
33 + 12 V keyed
32 0 for HS in stand
31 + 5 V front supply
30 Double receiver
29 Loop switch
28 Spare output 2
27 Spare output 1
26 Modul amp block
25 Spare input 1
24 Spare input 2
23 Field strength
22 AF block by 5V
21 Data chance
20 Alarm to af amp
19 Ext alarm
18 Volume reg
17 Squelch cond
16 + 5V keyed
15 Code 1
14 Reset
13 On/off switch
12 Rx block by 0V
11 Code 2
10 Code 4
9 + 5V cont
8 Off block
7 Code 8
6 Code 16
5 Code 32
4 Code 64
3 Tx block by 0V
2 Code 128
1 GND

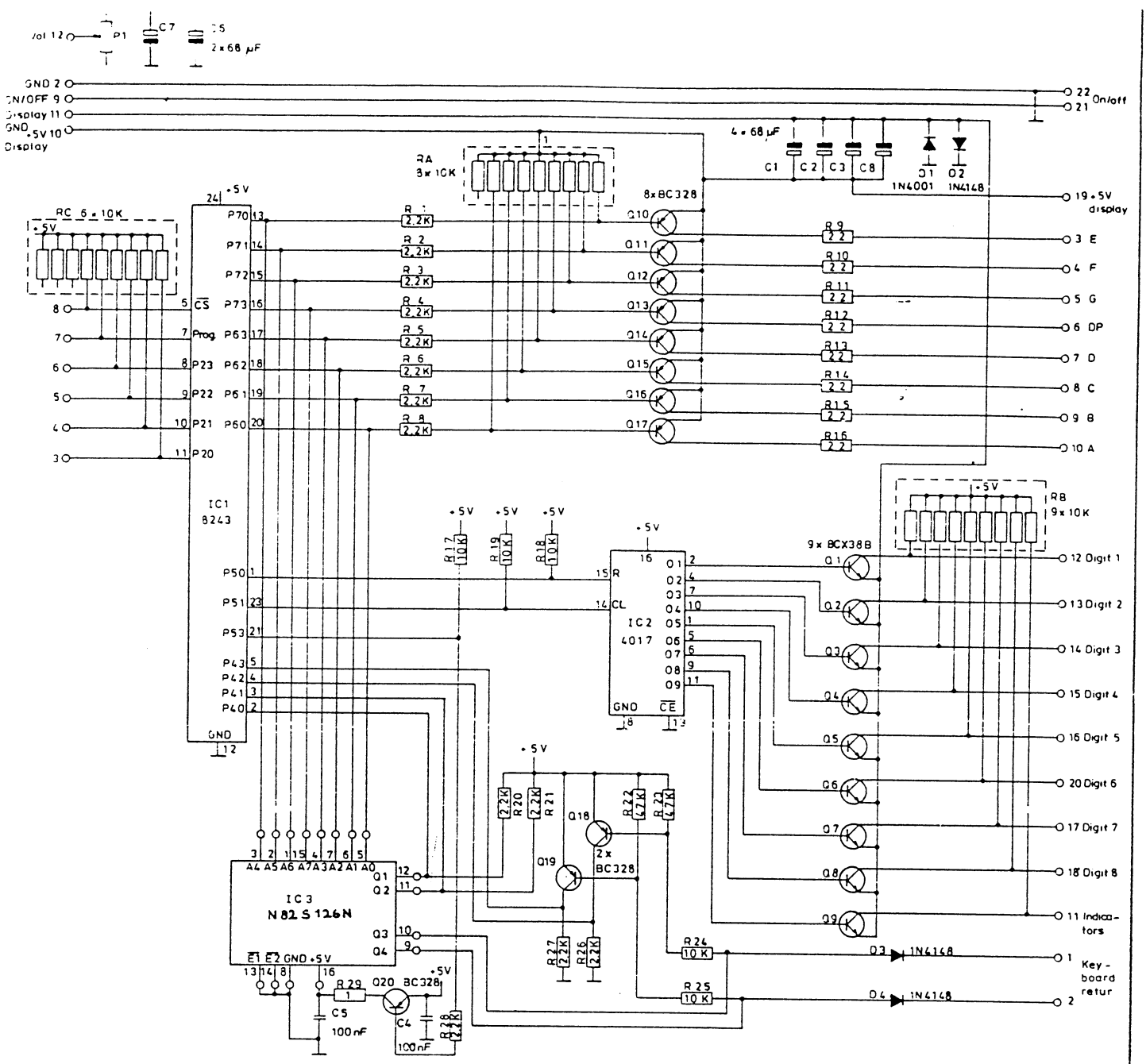
Ændr. nr.:	Rettet:	Computerprint D 25 A Microprocessor front AP 2000	Tegn.: BC 12-5-82	Kontr.: POK
		ap radiotelefon a/s	Tegn. nr.: 82100-2E2	

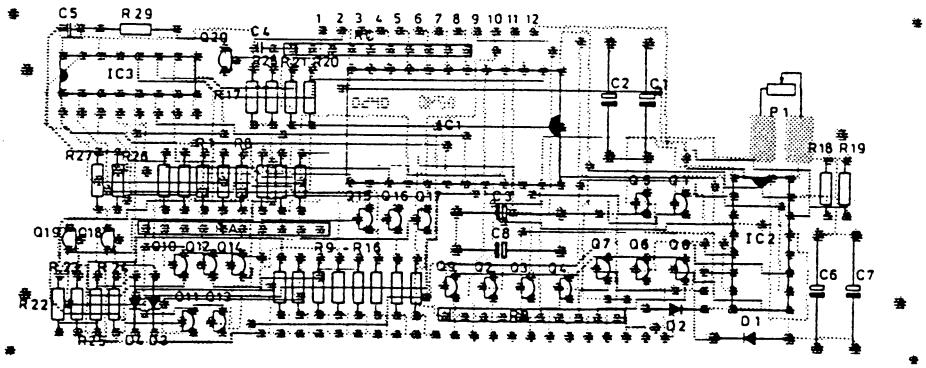

IC1 8039
IC4 2732
IC3 HEF 40373
IC5 8243
IC6 HEF 40106
IC7 HEF 40106
IC2
Lithium cell
X-tal
Computerprint D 25A
Microprocessor front AP2000
ap radiotelefoon cvs
82100-2E



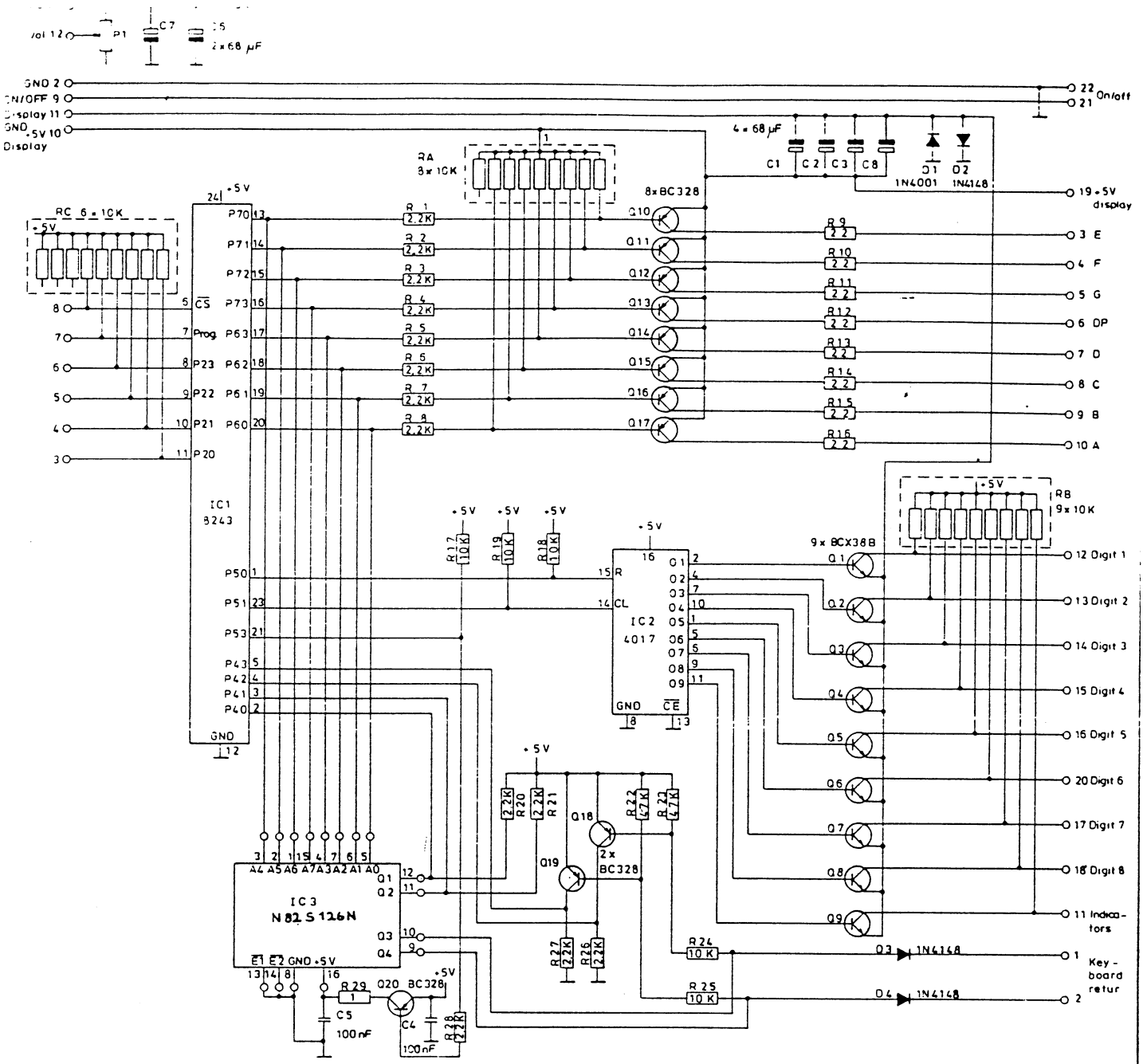


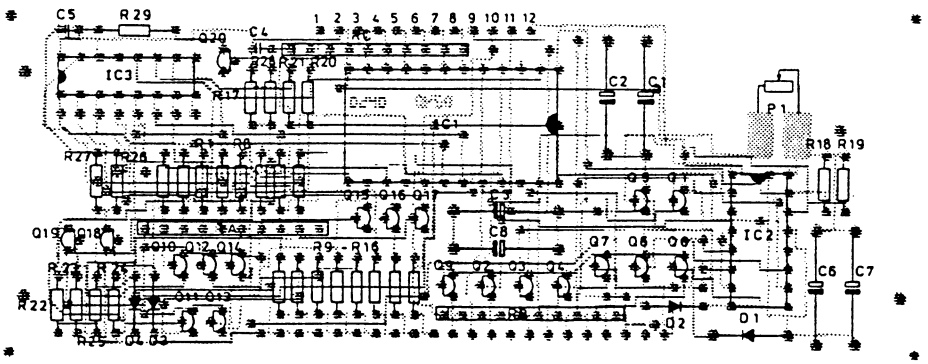
Ændr. nr.:	Rettet 7-5-82 PK	Expander print D24E Kodeplug print D27A Microprocessor front AP 2000	Tegn.: BC Kontr.: PK
		ap radiotelefon a/s	Tegn. nr.: 82106-2E2



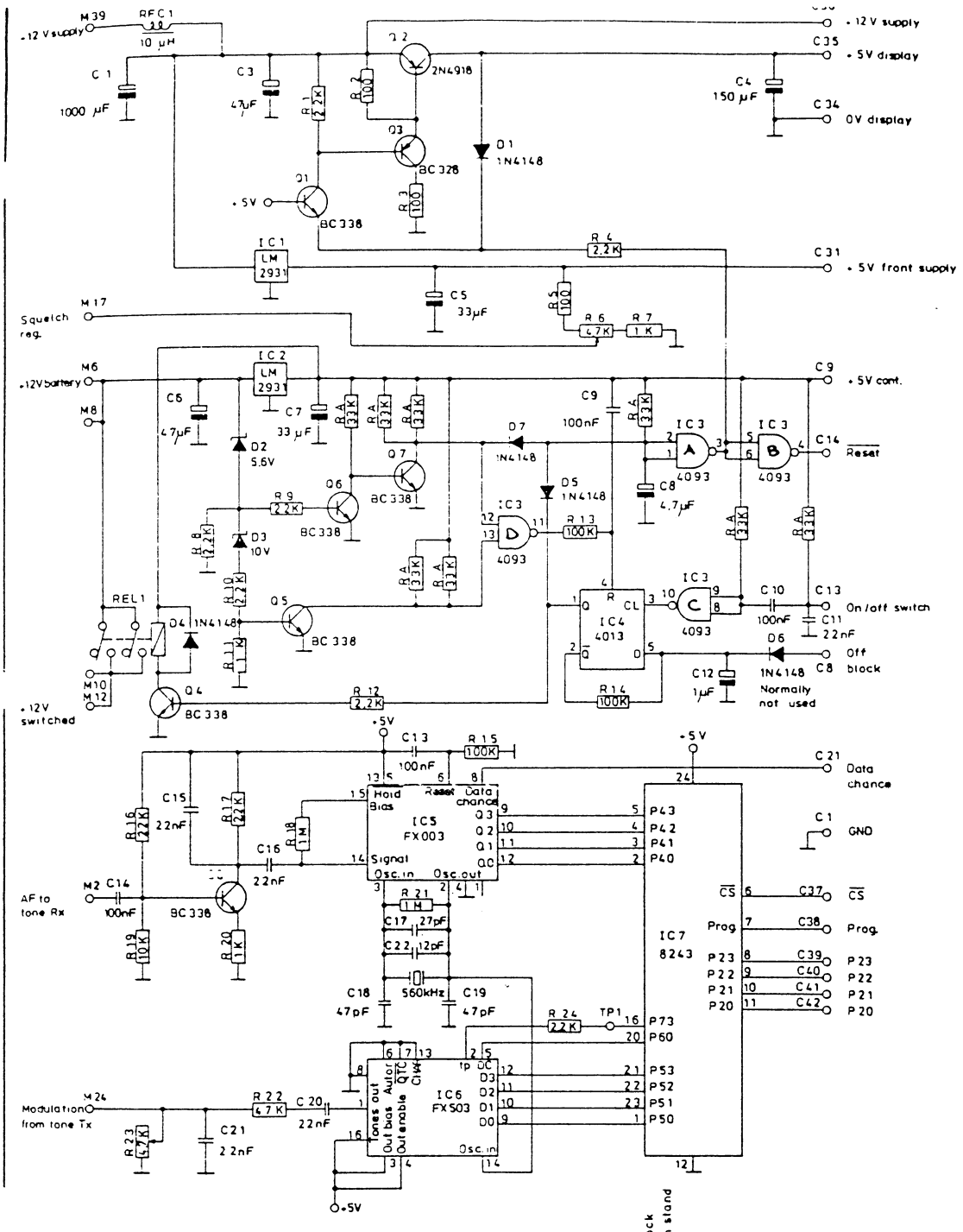


Ændr. nr.:	Rettet 7-5-82 PK	Expander print D26E Kodeplug print D27A Microprocessor front AP 2000	Tegn.: BC Kontr.: PK
		ap radiotelefon a/s	Tegn. nr.: 82 106-2E2

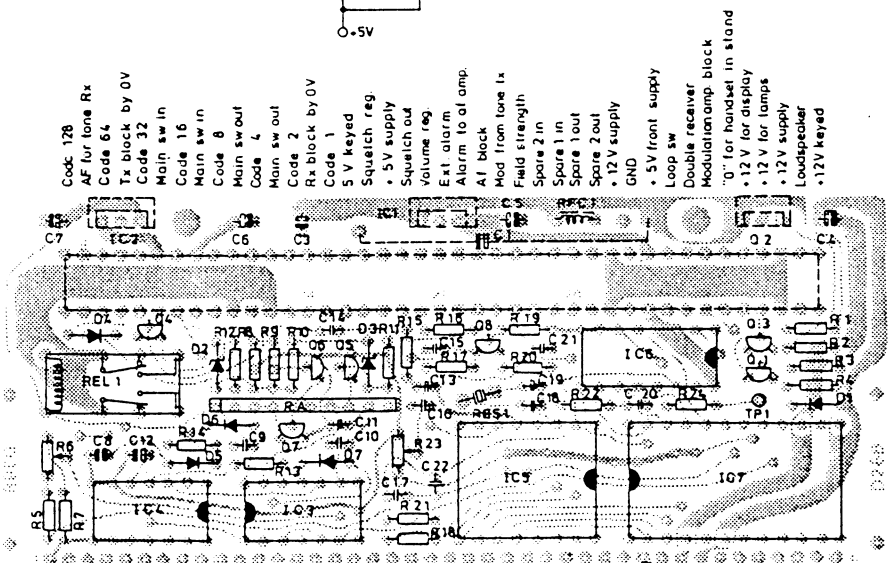




Ændr. nr.:	Rettet 7-5-82 PK	Expander print 024E Kodeplug print 027A Microprocessor front AP 2000	Tegn.: BC Kontr.: PK
		ap radiotelefon a/s	Tegn. nr.: 82 106-2E2



M1 C2 Code 128
M3 C4 Code 64
M4 C3 Tx block by 0V
M5 C5 Code 32
M7 C6 Code 16
M9 C7 Code 8
M11 C10 Code 4
M13 C11 Code 2
M14 C12 Rx block by 0V
M15 C15 Code 1
M16 C16 5 V keyed
M19 C17 Sq. out
M20 C18 Volume reg.
M21 C19 Ext alarm
M22 C20 Alarm to af amp
M23 C22 AF block by 5V
M25 C23 Field strength
M26 C24 Spare input 2
M27 C25 Spare input 1
M28 C27 Spare output 1
M29 C28 Spare output 2
M30 + 12 V supply
M31 C1 GND
M32 +5V front supply
M33 C29 Loop switch
M34 C30 Double receiver
M35 C26 Mod amp. block
M36 C32 "0" for handset in stand
M41 C33 + 12 V keyed

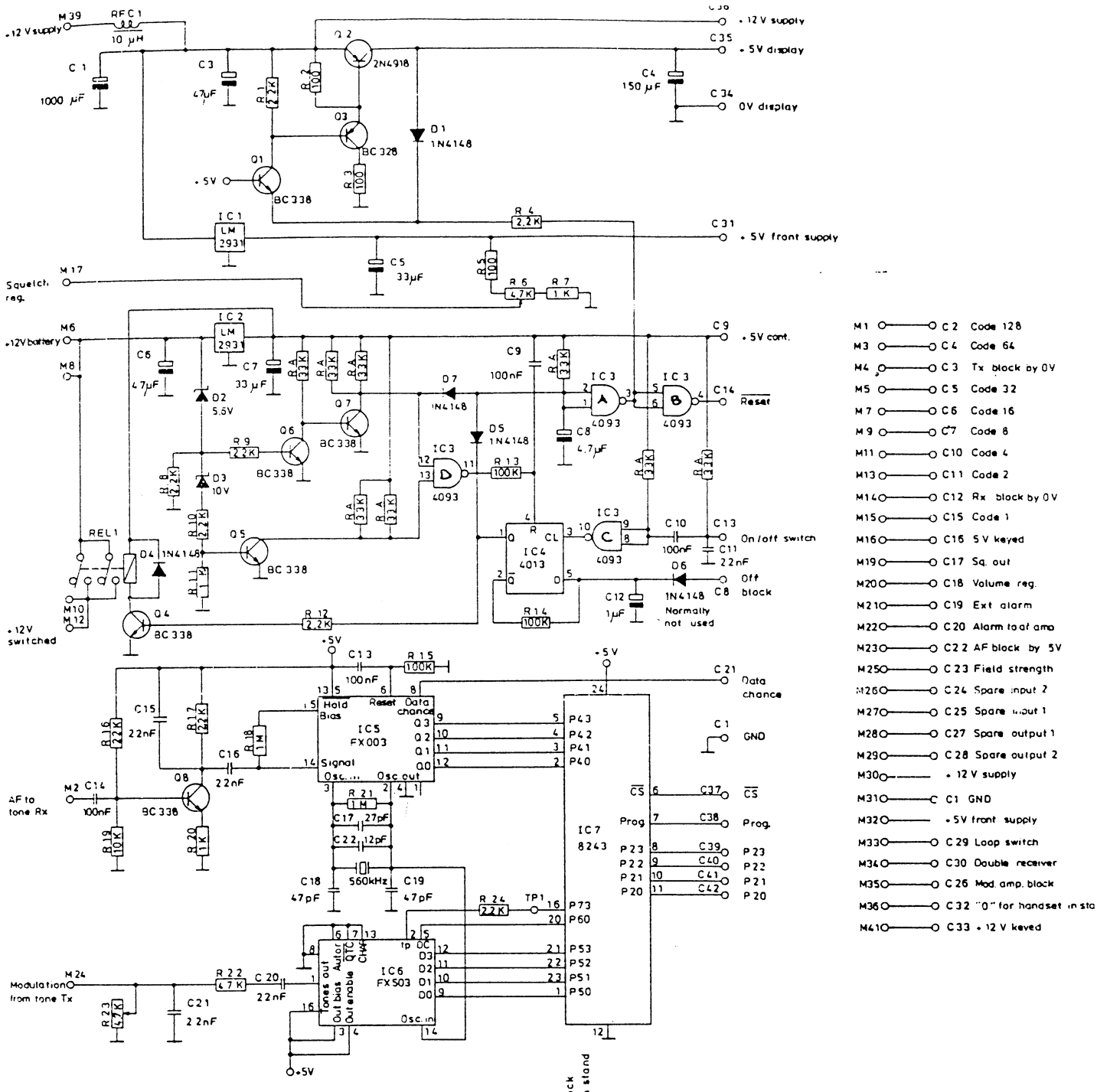


1 GND
2 Code 128
3 Tx block by 0V
4 Code 64
5 Code 32
6 Code 16
7 Code 8
8 Off block
9 + 5V cont
10 Code 4
11 Code 2
12 Rx block by 0V
13 On/off switch
14 Reset
15 Code 1
16 5V keyed
17 Squelch out
18 Volume reg
19 Ext alarm
20 Alarm to af amp
21 Data chance
22 AF block
23 Field strength
24 Spare 2 in
25 Spare 1 in
26 Modulat amp block
27 Spare 1 out
28 Spare 2 out
29 Loop SW
30 Double receiver
31 + 5V front supply
32 "0" for handset in
33 + 12 V keyed
34 GND display
35 + 5V display
36 + 12 V supply
37 CS
38 Prog
39 P23
40 P22
41 P21
42 P20

IC5 = FX003QC for CCIR tonereceiver D26B1
FX003QZ for ZVEI tonereceiver D26B2

IC6 = FX503C for CCIR tonetransmitter D26B1
FX503Z for ZVEI tonetransmitter D26B2

Ændr. nr.:	Rettet 21-6-82 POK	Toneprint D 26B Microprocessor front AP 2000	Tegn.: BC 3-5-82 / Kontr.: POK 3-5-82
		ap radiotelefon a/s	Tegn. nr.: 82098-2E2

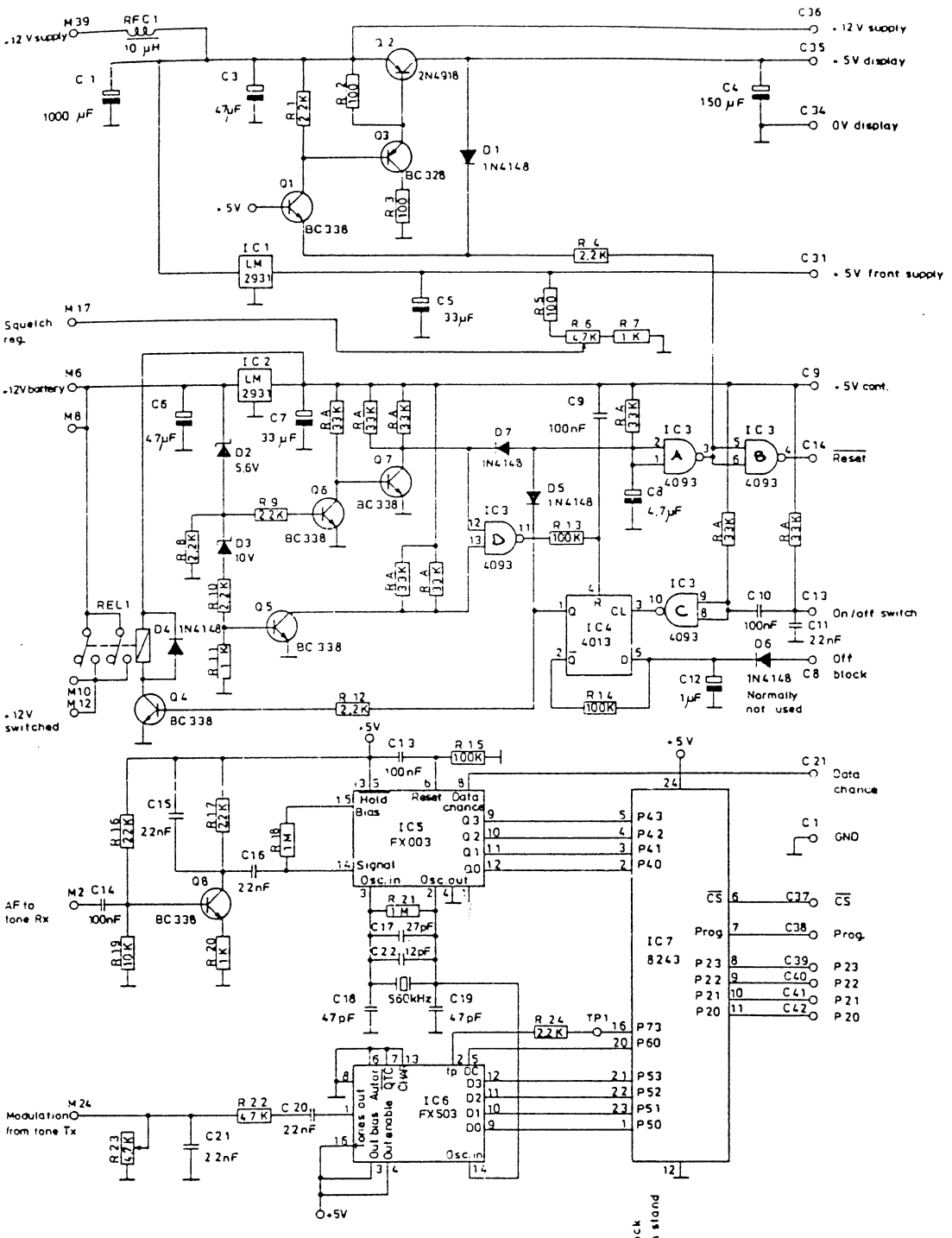


M1 — C2 Code 128
M3 — C4 Code 64
M4 — C3 Tx block by 0V
M5 — C5 Code 32
M7 — C6 Code 16
M9 — C7 Code 8
M11 — C10 Code 4
M13 — C11 Code 2
M14 — C12 Rx block by 0V
M15 — C15 Code 1
M16 — C16 5V keyed
M19 — C17 Sq. out
M20 — C18 Volume reg.
M21 — C19 Ext alarm
M22 — C20 Alarm to al amp
M23 — C22 AF block by 5V
M25 — C23 Field strength
M26 — C24 Spare input 2
M27 — C25 Spare input 1
M28 — C27 Spare output 1
M29 — C28 Spare output 2
M30 — +12 V supply
M31 — C1 GND
M32 — +5V front supply
M33 — C29 Loop switch
M34 — C30 Double receiver
M35 — C26 Mod. amp. block
M36 — C32 "0" for handset in sta
M41 — C33 +12 V keyed

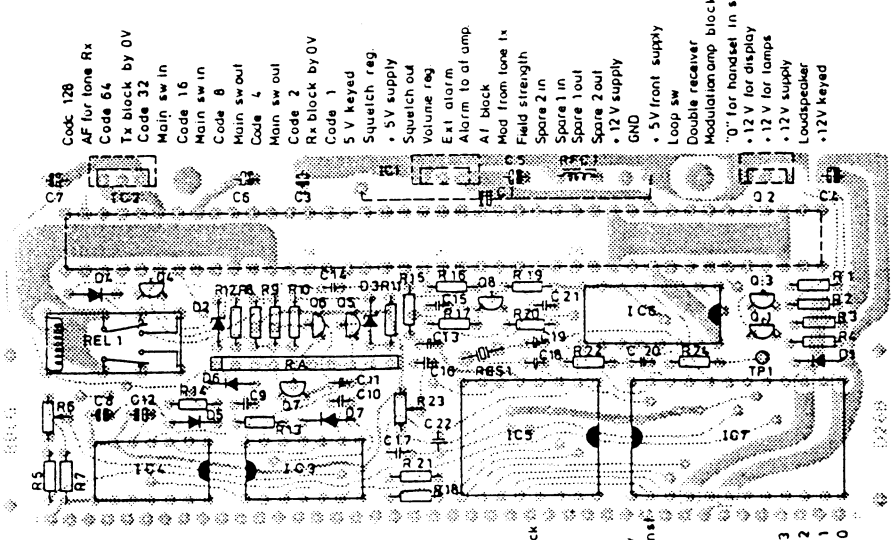
IC5 = FX003QC for CCIR tonereceiver D26 8
FX003QZ for ZVEI tonereceiver D26 8

IC6 = FX503C for CCIR tonetransmitter D26
FX503Z for ZVEI tonetransmitter D26

Ændr. nr.:	Rettet 21-6-82 POK	Toneprint D 268 Microprocessor front AP 2000	Tegn.: BC 3-5-82 / Kontr.: 3-5
		ap radiotelefon a/s	Tegn. nr.: 82098-



M1	C 2 Code 128
M3	C 4 Code 64
M4	C 3 Tx block by 0V
M5	C 5 Code 32
M7	C 6 Code 16
M9	C 7 Code 8
M11	C 10 Code 4
M13	C 11 Code 2
M14	C 12 Rx block by 0V
M15	C 15 Code 1
M16	C 16 5 V keyed
M19	C 17 Sq. out
M20	C 18 Volume reg.
M21	C 19 Ext alarm
M22	C 20 Alarm to af amp
M23	C 22 AF block by 5V
M25	C 23 Field strength
M25	C 24 Spare input 2
M27	C 25 Spare input 1
M28	C 27 Spare output 1
M29	C 28 Spare output 2
M30	+ 12 V supply
M31	C 1 GND
M32	+ 5V front supply
M33	C 29 Loop switch
M34	C 30 Double receiver
M35	C 26 Mod. amp. block
M36	C 32 "0" for handset in stand
M41	C 33 + 12 V keyed

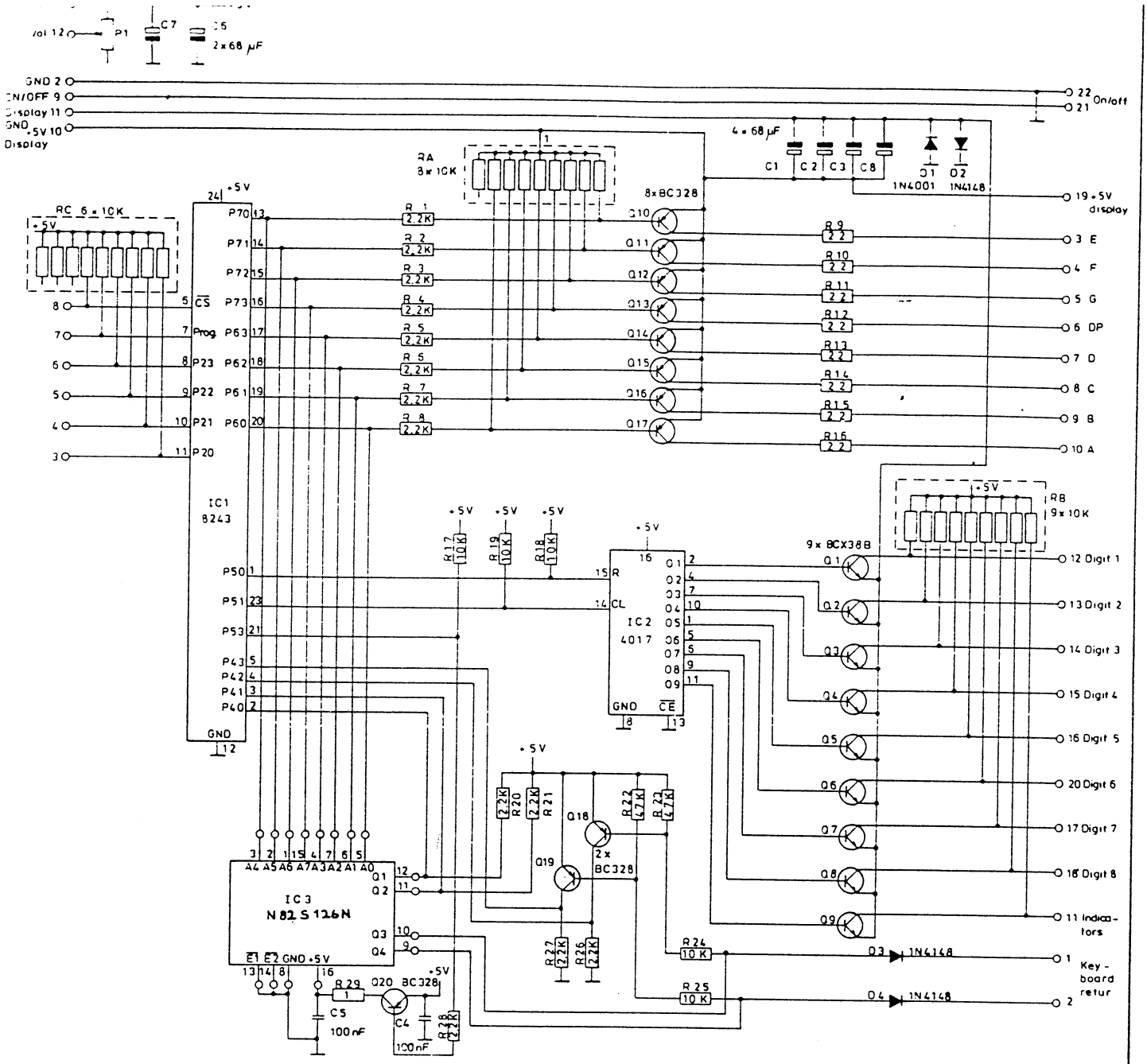


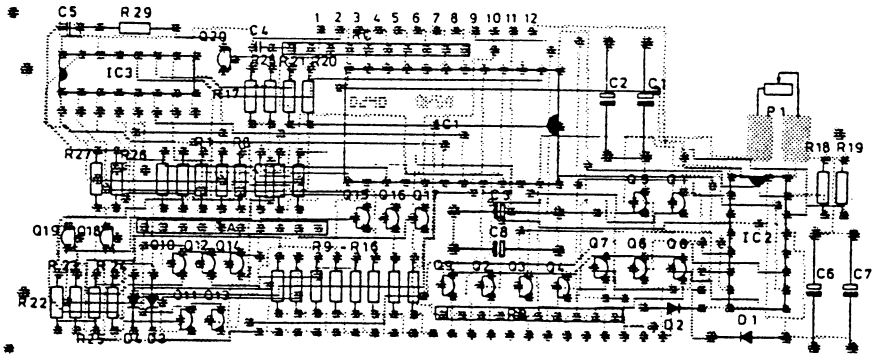
IC5 = FX003QC for CCIR tonereceiver D26 81
FX003QZ for ZVEI tonereceiver D26 82

IC6 = FX503C for CCIR tonetransmitter D26 81
FX503Z for ZVEI tonetransmitter D26 82

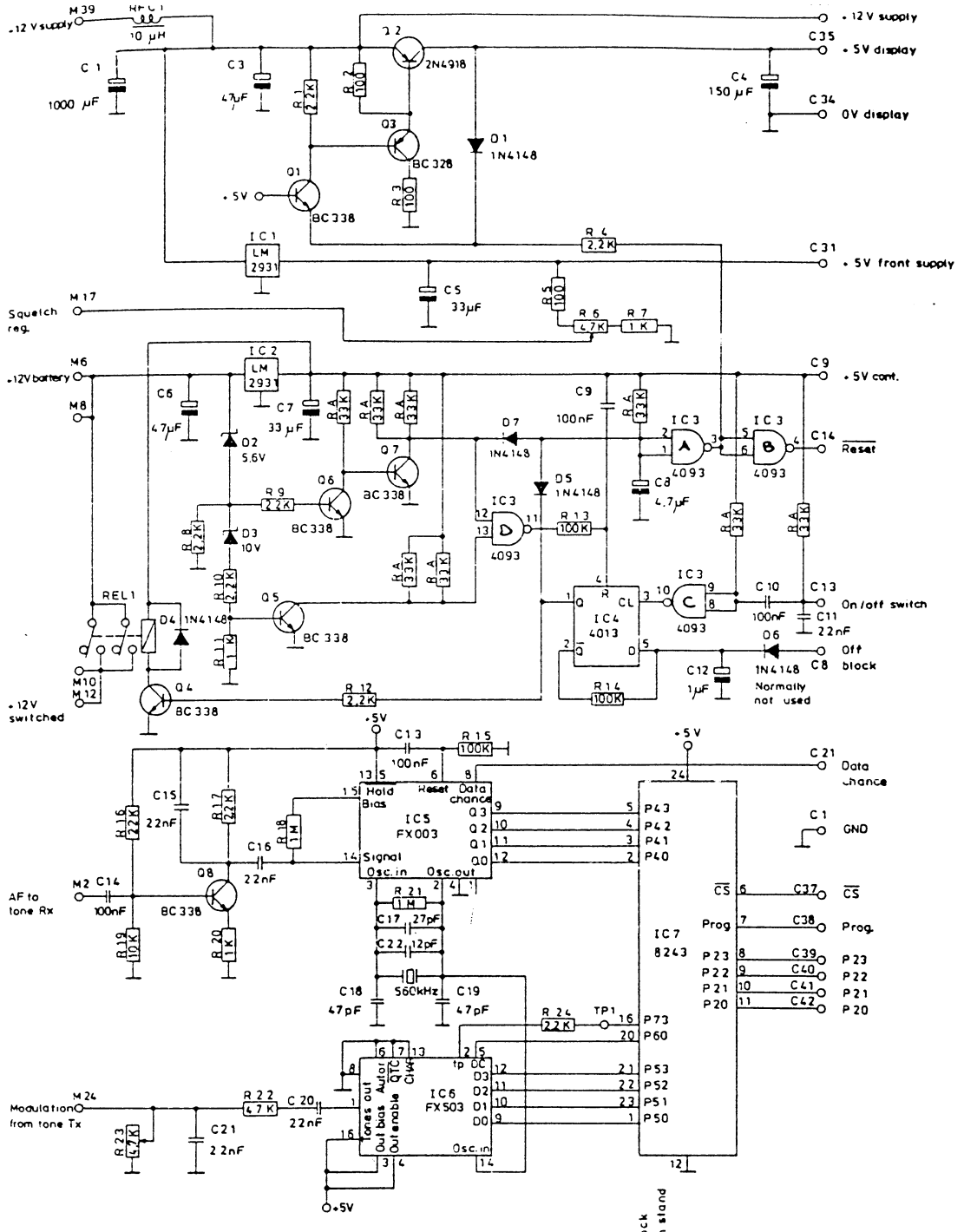
1 GND	15 Code 1	29 Loop SW	
2 Code 128	16 5V keyed	30 Double receiver	
3 Tx block by 0V	17 Squelch out	31 + 5V front supply	
4 Code 64	18 Volume reg	32 "0" for handset inst	
5 Code 32	19 Ext alarm	33 + 12 V keyed	
6 Code 16	20 Alarm to af amp	34 GND display	
7 Code 8	21 Data chance	35 + 5V display	
8 Off block	22 AF block	36 + 12V supply	
9 + 5V cont	23 Field strength	37 $\overline{CS}$	39 P 23
10 Code 4	24 Spare 2 in	38 Prog	40 P 22
11 Code 2	25 Spare 1 in		41 P 21
12 Rx block by 0V	26 Modulat amp block		42 P 20
13 On/off switch	27 Spare 1 out		
14 Reset	28 Spare 2 out		

Ændr. nr.:	Rettet 21-6-82 POK	Toneprint D 268 Microprocessor front AP 2000	Tegn.: BC 3-5-82 / Kontr.: PO 3-5-8
		ap radiotelefon a/s	Tegn. nr.: 82098-2E

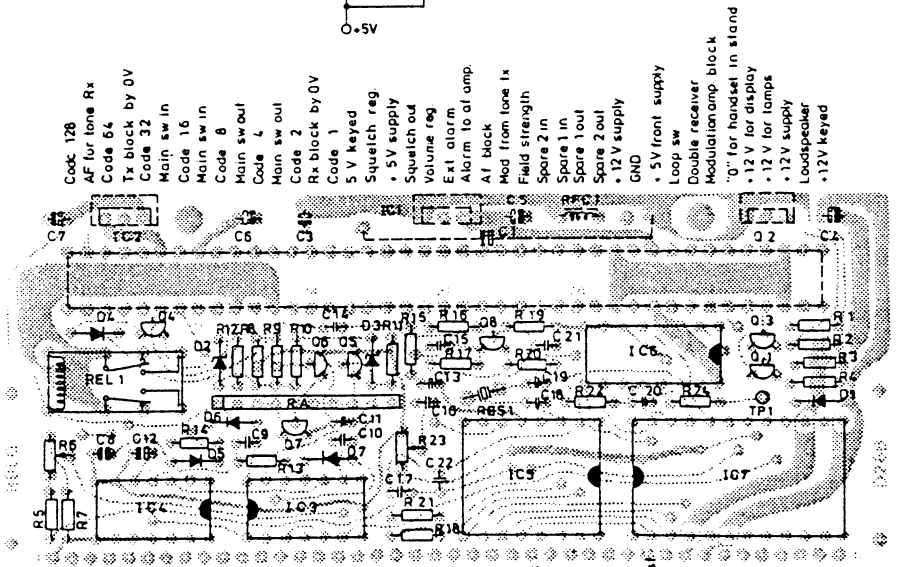




Ændr. nr.:	Rederet 7-5-82 PK	Expander print D24E Kodeplug print D27A Microprocessor front AP 2000	Tegn.: BC Kontr.: PK
		ap radiotelefon a/s	Tegn. nr.: 82106-2E2



M1	C 2	Code 128
M3	C 4	Code 64
M4	C 3	Tx block by 0V
M5	C 5	Code 32
M7	C 6	Code 16
M9	C 7	Code 8
M11	C 10	Code 4
M13	C 11	Code 2
M14	C 12	Rx block by 0V
M15	C 15	Code 1
M16	C 16	5V keyed
M19	C 17	Sq. out
M20	C 18	Volume reg.
M21	C 19	Ext alarm
M22	C 20	Alarm to af amp
M23	C 22	AF block by 5V
M25	C 23	Field strength
M26	C 24	Spare input 2
M27	C 25	Spare input 1
M28	C 27	Spare output 1
M29	C 28	Spare output 2
M30		+ 12 V supply
M31	C 1	GND
M32		+5V front supoly
M33	C 29	Loop switch
M34	C 30	Double receiver
M35	C 26	Mod. amp. block
M36	C 32	"0" for handset in stan
M41	C 33	+ 12 V keyed

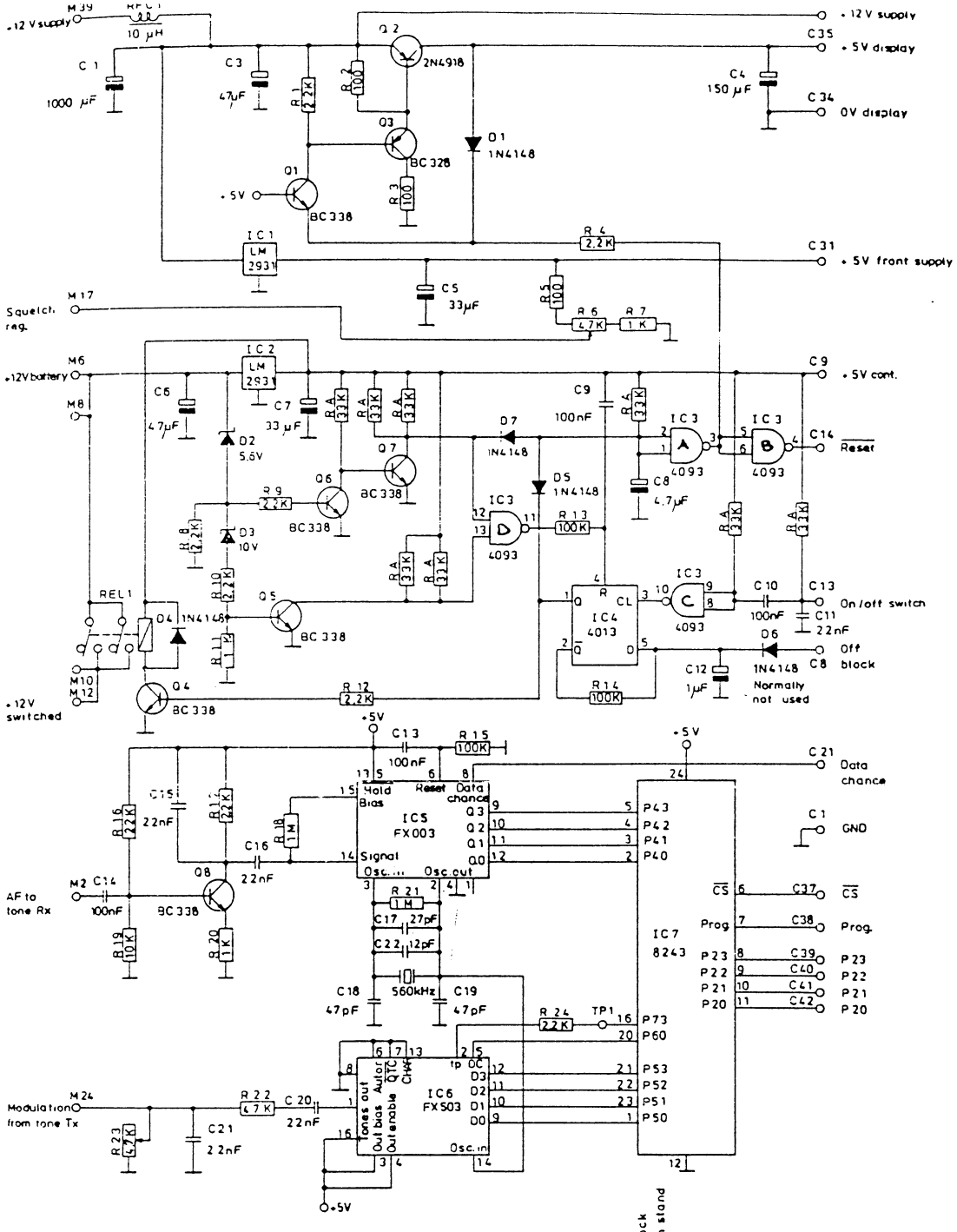


IC5 = FX003QC for CCIR tonereceiver D 26 84
FX003QZ for ZVEI tonereceiver D 26 82

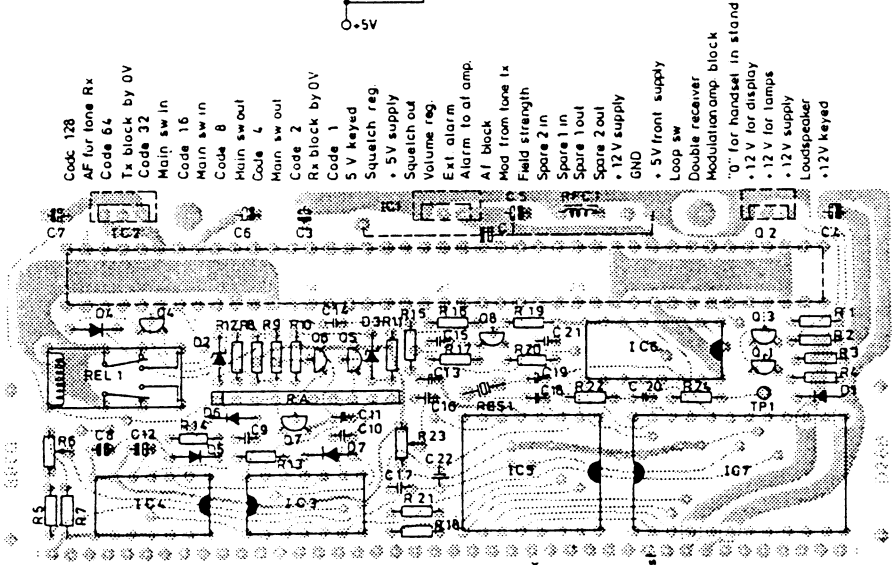
IC6 = FX503C for CCIR tonetransmitter D 26 8
FX503Z for ZVEI tonetransmitter D 26 8

1 GND	39 P23
2 Code 128	40 P22
3 Tx block by 0V	41 P21
4 Code 64	42 P20
5 Code 32	
6 Code 16	
7 Code 8	
8 Off block	
9 + 5V cont	
10 Code 4	
11 Code 2	
12 Rx block by 0V	
13 On/off switch	
14 Reset	
15 Code 1	
16 5V keyed	
17 Squelch out	
18 Volume reg	
19 Ext alarm	
20 Alarm to af amp	
21 Data chance	
22 AF block	
23 Field strength	
24 Spare 2 in	
25 Spare 1 in	
26 Modulat amp block	
27 Spare 1 out	
28 Spare 2 out	
29 Loop SW	
30 Double receiver	
31 + 5V front supply	
32 "0" for handset in st	
33 + 12 V keyed	
34 GND display	
35 + 5V display	
36 + 12 V supply	
37 CS	
38 Prog	

Ændr. nr.:	Redset 21-6-82 POK	Toneprint D 268 Microprocessor front AP 2000	Tegn.: BC 3-5-82 / Kontr.: P 3-5-
		ap radiotelefon a/s	Tegn. nr.: 82098 - 26



M1 C2 Code 128
M3 C4 Code 64
M4 C3 Tx block by 0V
M5 C5 Code 32
M7 C6 Code 16
M9 C7 Code 8
M11 C10 Code 4
M13 C11 Code 2
M14 C12 Rx block by 0V
M15 C15 Code 1
M16 C16 5V keyed
M19 C17 Sq. out
M20 C18 Volume reg.
M21 C19 Ext alarm
M22 C20 Alarm to af amp
M23 C22 AF block by 5V
M25 C23 Field strength
M26 C24 Spare input 2
M27 C25 Spare input 1
M28 C27 Spare output 1
M29 C28 Spare output 2
M30 +12 V supply
M31 C1 GND
M32 +5V front supply
M33 C29 Loop switch
M34 C30 Double receiver
M35 C26 Mod. amp. block
M36 C32 "0" for handset in sta
M41 C33 +12 V keyed

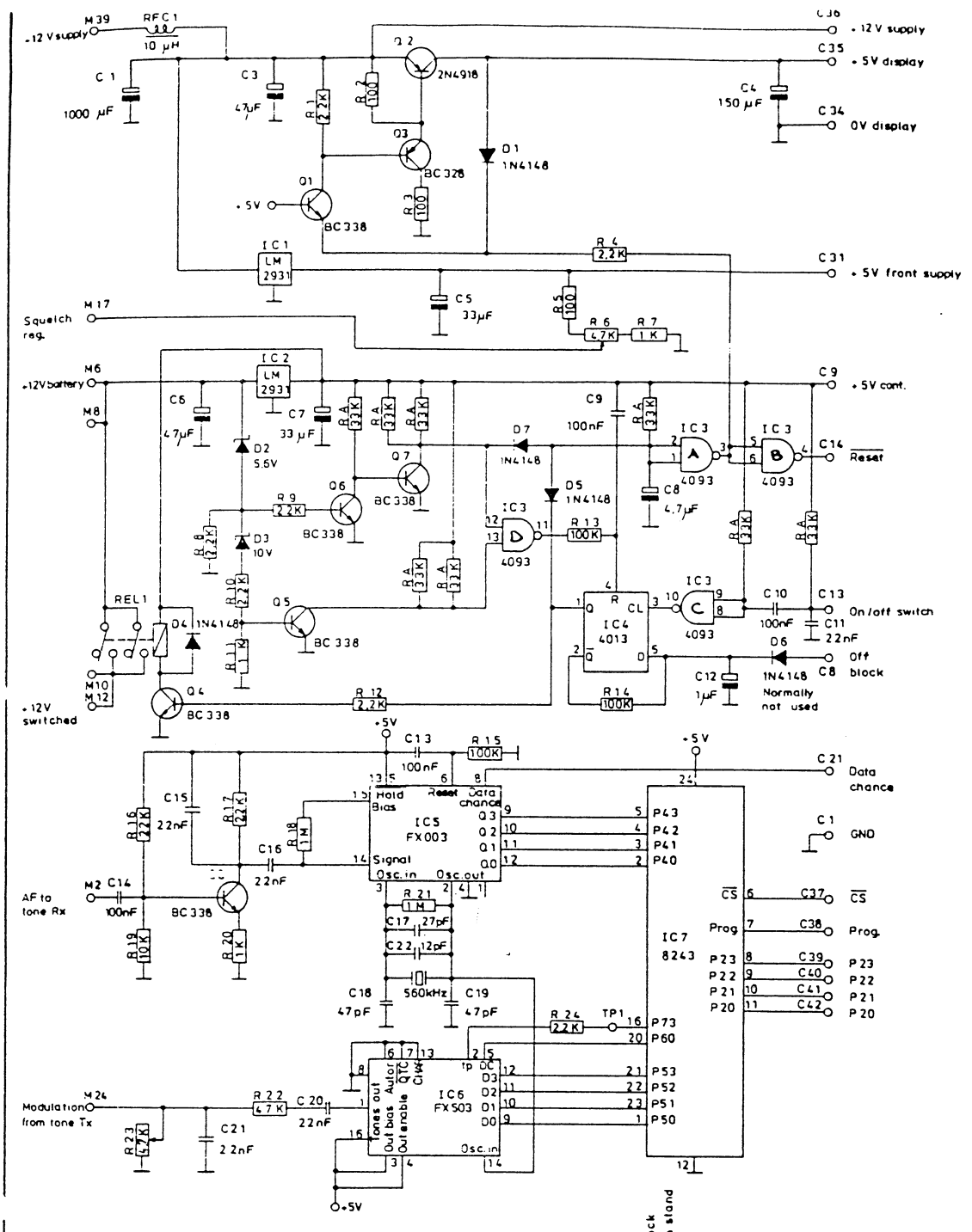


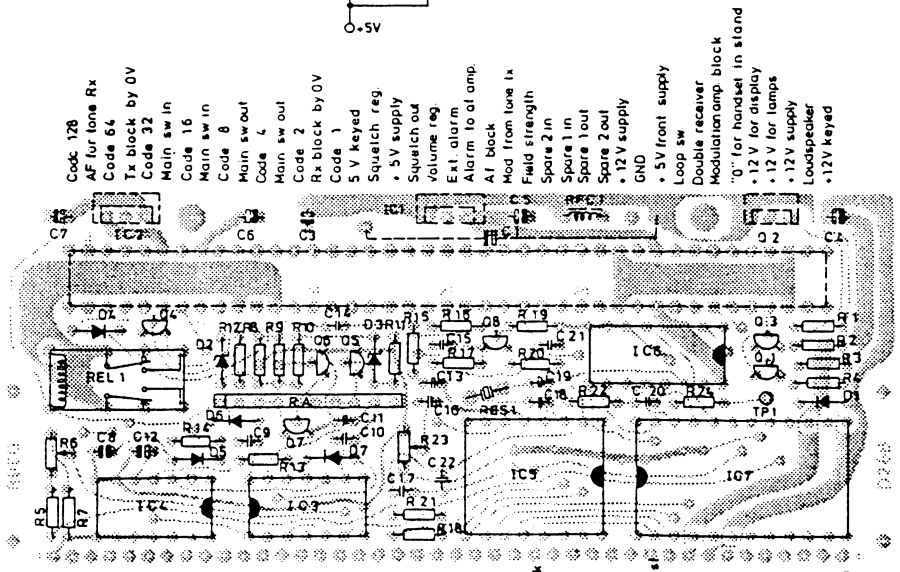
IC5 = FX003QC for CCIR tonereceiver D26
FX003QZ for ZVEI tonereceiver D26

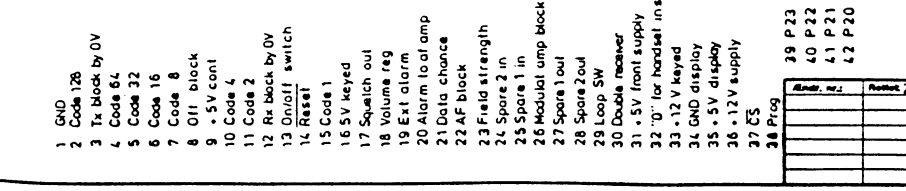
IC6 = FX503C for CCIR tonetransmitter D26
FX503Z for ZVEI tonetransmitter D26

1 GND
2 Code 128
3 Tx block by 0V
4 Code 64
5 Code 32
6 Code 16
7 Code 8
8 Off block
9 +5V cont
10 Code 4
11 Code 2
12 Rx block by 0V
13 On/off switch
14 Reset
15 Code 1
16 5V keyed
17 Squelch out
18 Volume reg
19 Ext alarm
20 Alarm to af amp
21 Data chance
22 AF block
23 Field strength
24 Spare 2 in
25 Spare 1 in
26 Modulat amp block
27 Spare 1 out
28 Spare 2 out
29 Loop SW
30 Double receiver
31 +5V front supply
32 "0" for handset in st
33 +12 V keyed
34 GND display
35 +5V display
36 +12V supply
37 CS
38 Prog
39 P23
40 P22
41 P21
42 P20

Ændr. nr.:	Rettet 21-6-82 POK	Toneprint D 26B Microprocessor front AP 2000	Tegn.: BC 3-5-82	Kontr.: 3-5
		ap radiotelefon a/s	Tegn. nr.: 82098-2	



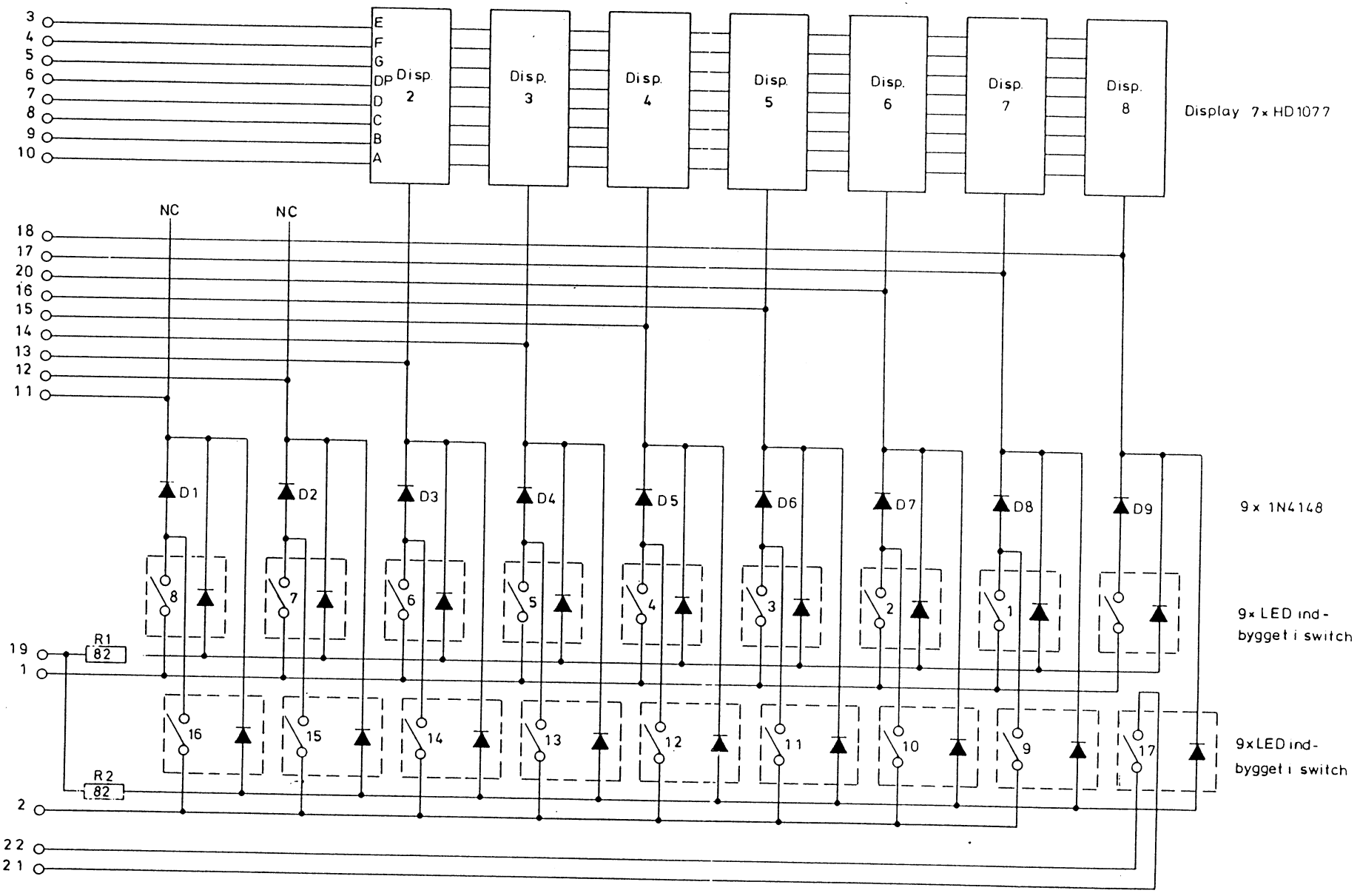




IC5 = FX003QC for CCIR tonereceivar D26 84
FX003QZ for ZVEI tonereceiver D26 82

IC6 = FX503C for CCIR tonetransmitter D268
FX503Z for ZVEI tonetransmitter D26

Ændr. nr.:	Revision 21-6-82 POK	Toneprint D 268 Microprocessor front AP 2000	Tegn.: BC 3-5-82 / Kontr.: P 3-5-
		ap radiotelefon a/s	Tegn. nr.: 82098-26



Ændr. nr.:

Rettet

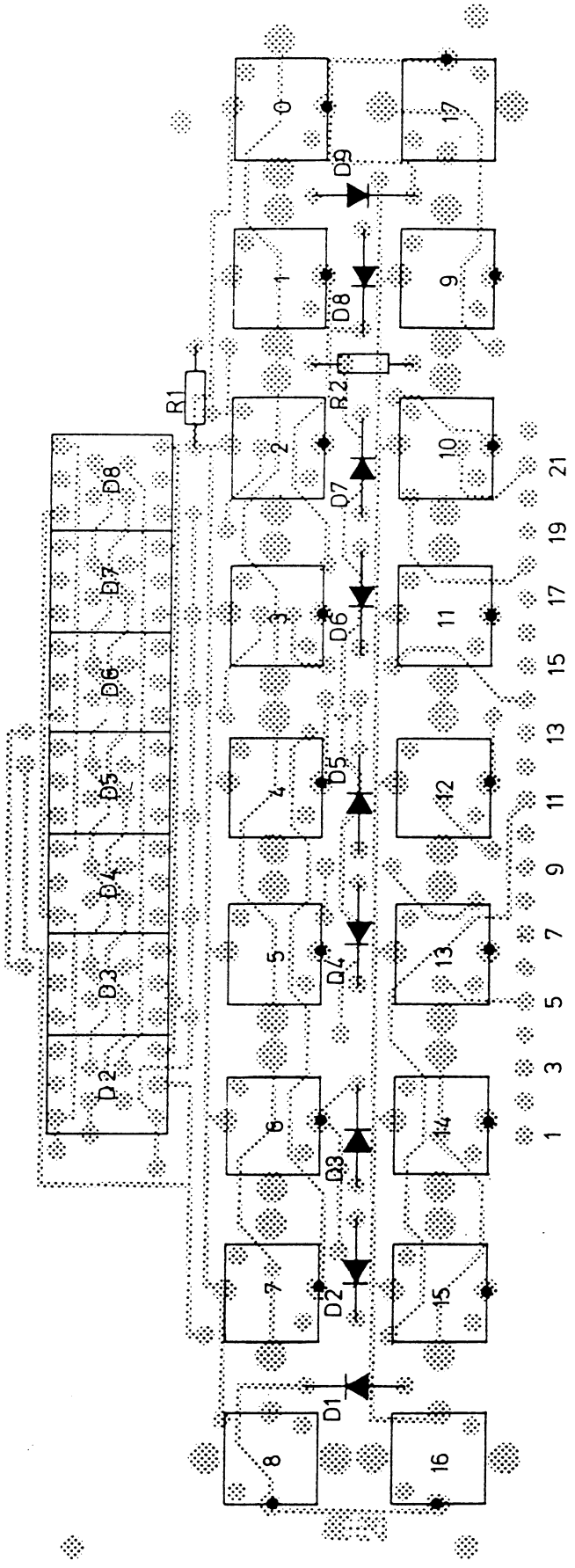
AP-RADIOTELEFON A/S

Display og tastatur D23 B
For microprocessor front AP 2000

Tegn. nr.: 82059-3E2

Tegn.: BC 22-2-82

Kontr.: PK



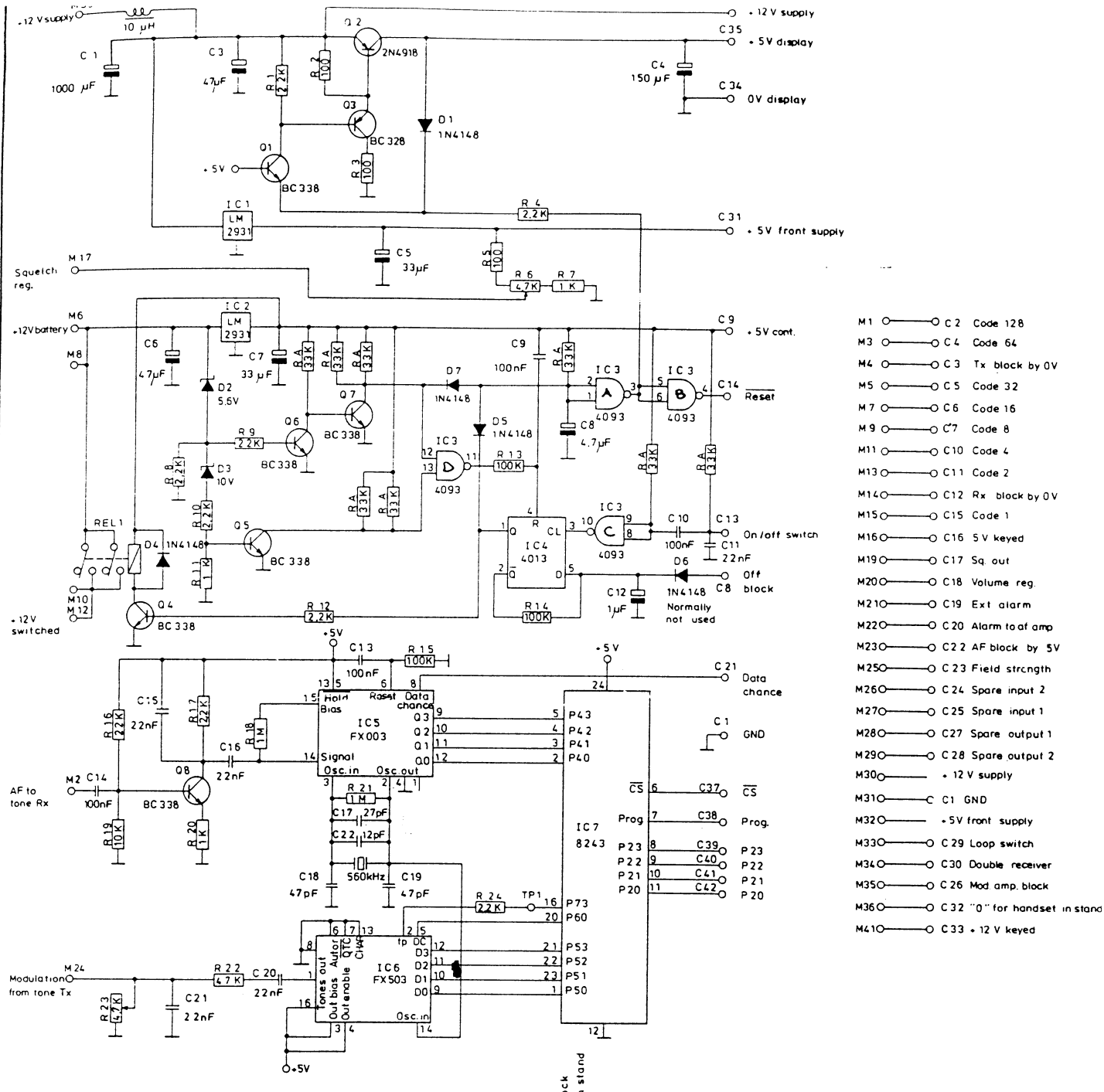
Ændr. nr.:	Rettet:

Display og tastatur D 23 B
For microprocessor front AP 2000

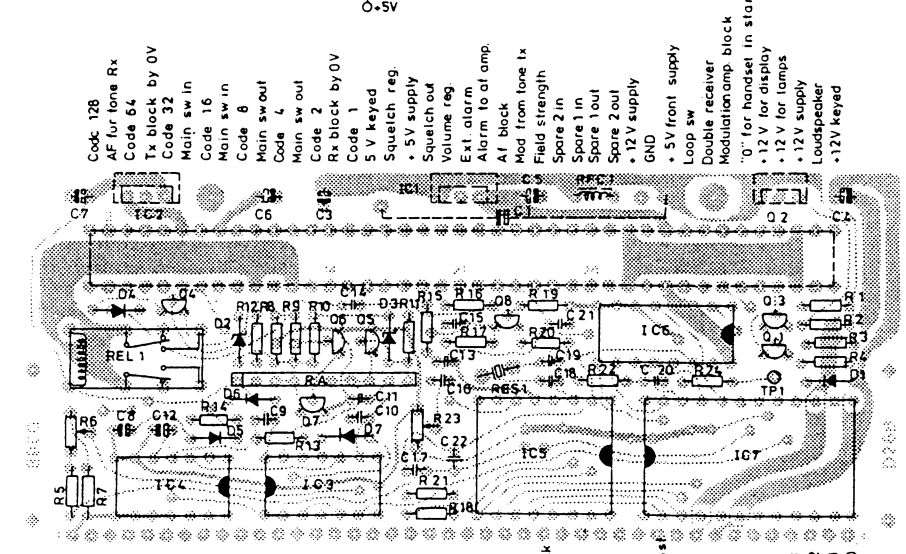
Tegn.: AMS 82-08-19 | Kontr.: PK 82-08-24

AP-RADIOTELEFON A/S

Tegn. nr.: 82059 - 4E2



M1 — C2 Code 128
M3 — C4 Code 64
M4 — C3 Tx block by 0V
M5 — C5 Code 32
M7 — C6 Code 16
M9 — C7 Code 8
M11 — C10 Code 4
M13 — C11 Code 2
M14 — C12 Rx block by 0V
M15 — C15 Code 1
M16 — C16 5V keyed
M19 — C17 Sq. out
M20 — C18 Volume reg.
M21 — C19 Ext alarm
M22 — C20 Alarm to af amp
M23 — C22 AF block by 5V
M25 — C23 Field strength
M26 — C24 Spare input 2
M27 — C25 Spare input 1
M28 — C27 Spare output 1
M29 — C28 Spare output 2
M30 — + 12 V supply
M31 — C1 GND
M32 — +5V front supply
M33 — C29 Loop switch
M34 — C30 Double receiver
M35 — C26 Mod. amp. block
M36 — C32 "0" for handset in stand
M41 — C33 + 12 V keyed

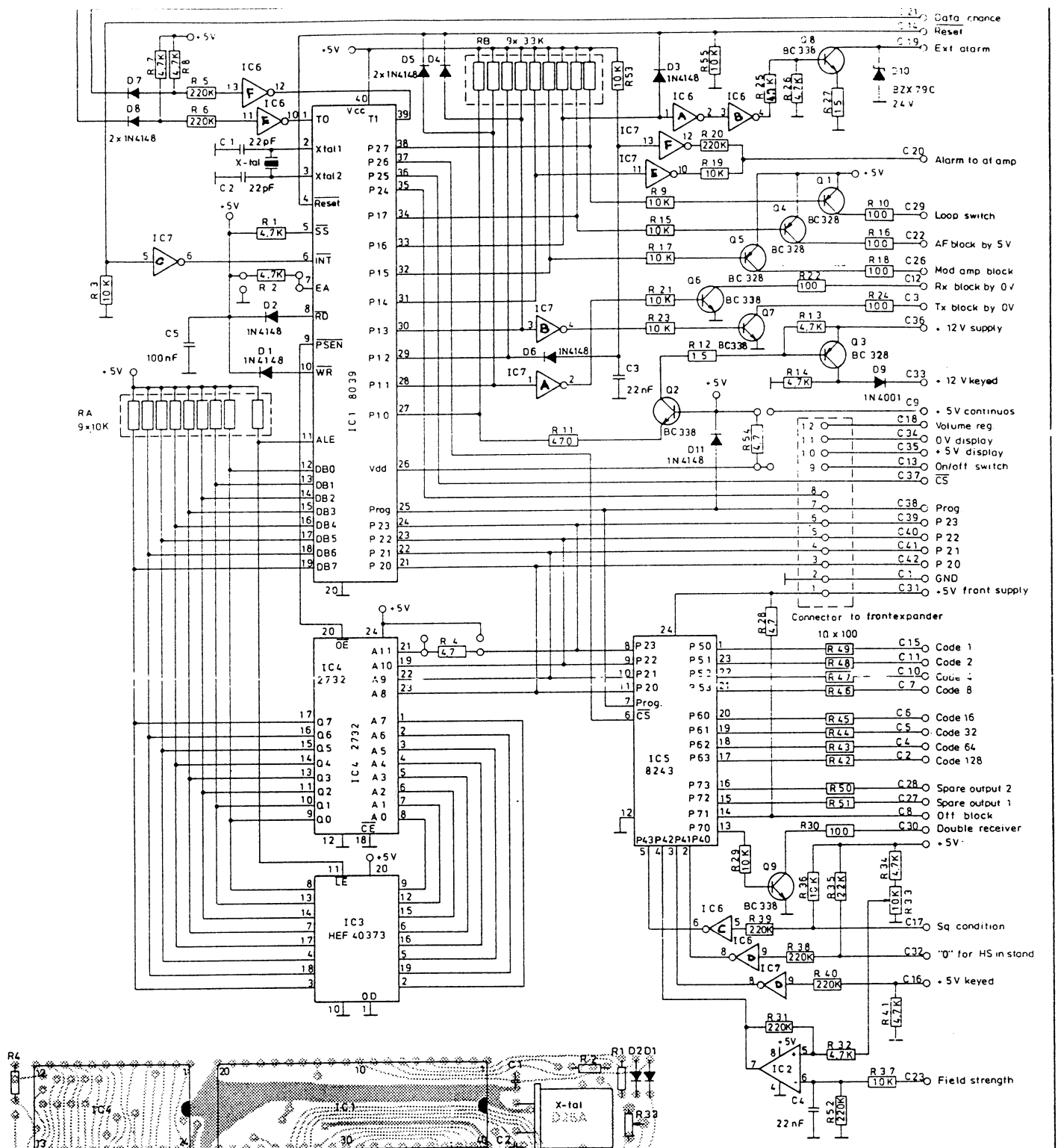


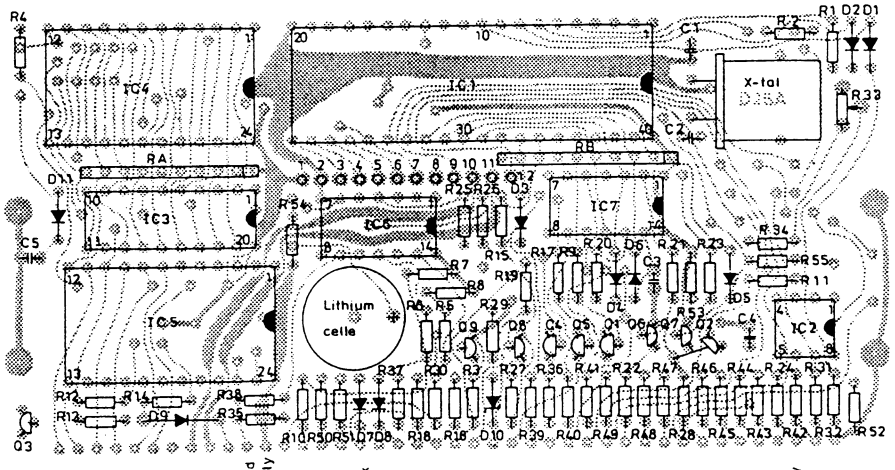
IC5 = FX003QC for CCIR tonereceiver D26B1
FX003QZ for ZVEI tonereceiver D26B2

IC6 = FX503C for CCIR tonetransmitter D26B1
FX503Z for ZVEI tonetransmitter D26B2

1 GND
2 Code 128
3 Tx block by 0V
4 Code 64
5 Code 32
6 Code 16
7 Code 8
8 Off block
9 + 5V cont
10 Code 4
11 Code 2
12 Rx block by 0V
13 On/off switch
14 Reset
15 Code 1
16 5V keyed
17 Squelch out
18 Volume reg
19 Ext alarm
20 Alarm to af amp
21 Data chance
22 AF block
23 Field strength
24 Spare 2 in
25 Spare 1 in
26 Modulat amp block
27 Spare 1 out
28 Spare 2 out
29 Loop SW
30 Double receiver
31 +5V front supply
32 "0" for handset in st.
33 +12 V keyed
34 GND display
35 +5V display
36 +12 V supply
37 CS
38 Prog
39 P23
40 P22
41 P21
42 P20

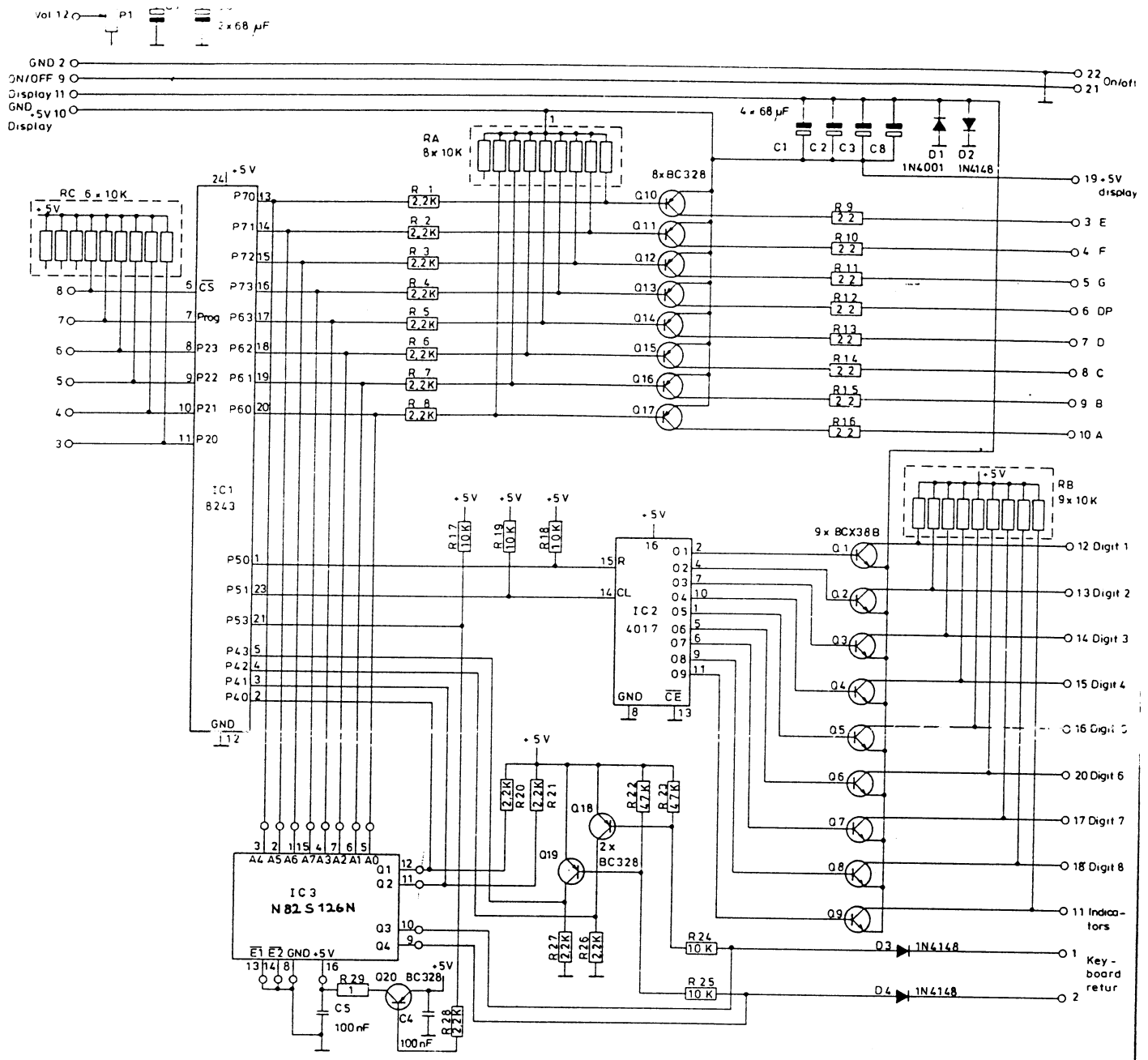
Ændr. nr.:	Rettet 21-6-82 POK	Toneprint D 26B	Tegn.: BC 3-5-82	Kontr.: POK 3-5-82
		Microprocessor front AP 2000		
		ap radiotelefon a/s	Tegn. nr.: 82098-2E2	

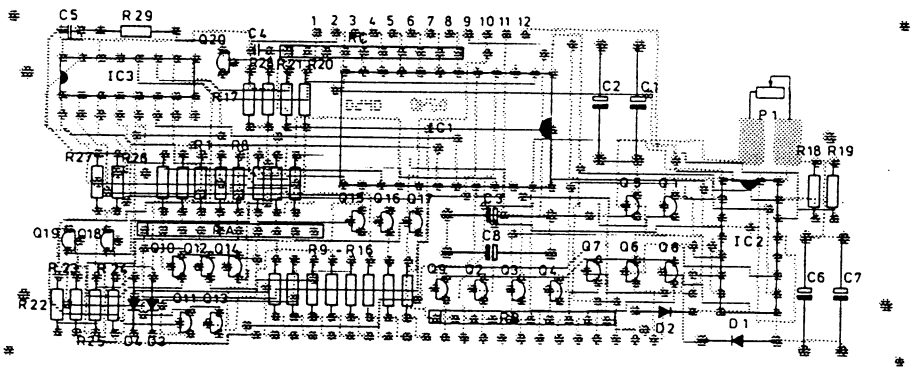




42 P 20
41 P 21
40 P 22
39 P 23
38 Prog
37 $\overline{CS}$
36 + 12 V supply
35 + 5 V display
34 0V display
33 + 12V keyed
32 "0" for HS in stand
31 + 5 V front supply
30 Double receiver
29 Loop switch
28 Spare output 2
27 Spare output 1
26 Modul amp block
25 Spare input 1
24 Spare input 2
23 Field strength
22 AF block by 5V
21 Data chance
20 Alarm loaf amp
19 Ext alarm
18 Volume reg
17 Squelch cond
16 + 5V keyed
15 Code 1
14 Reset
13 On/off switch
12 Rx block by 0V
11 Code 2
10 Code 4
9 + 5V cont
8 Off block
7 Code 8
6 Code 16
5 Code 32
4 Code 64
3 Tx block by 0V
2 Code 128
1 GND

Ændr. nr.:	Rettet:	Computerprint D 25A	Tegn.: BC 12-5-82	Kontr.: POK
		Microprocessor front AP2000		
		ap radiotelefon a/s	Tegn. nr.: 82100-2E2	





Ænder. nr.:	Rettet 7 - 6 - 82 PK

Expander print D24E
Kodeplug print D27A
Microprocessor front AP 2000

ap radiotelefon a/s

Tegn.: BC | Kontr.: PK

Tegn. nr.: 82 106-2E2