

# DANMAR RT 210

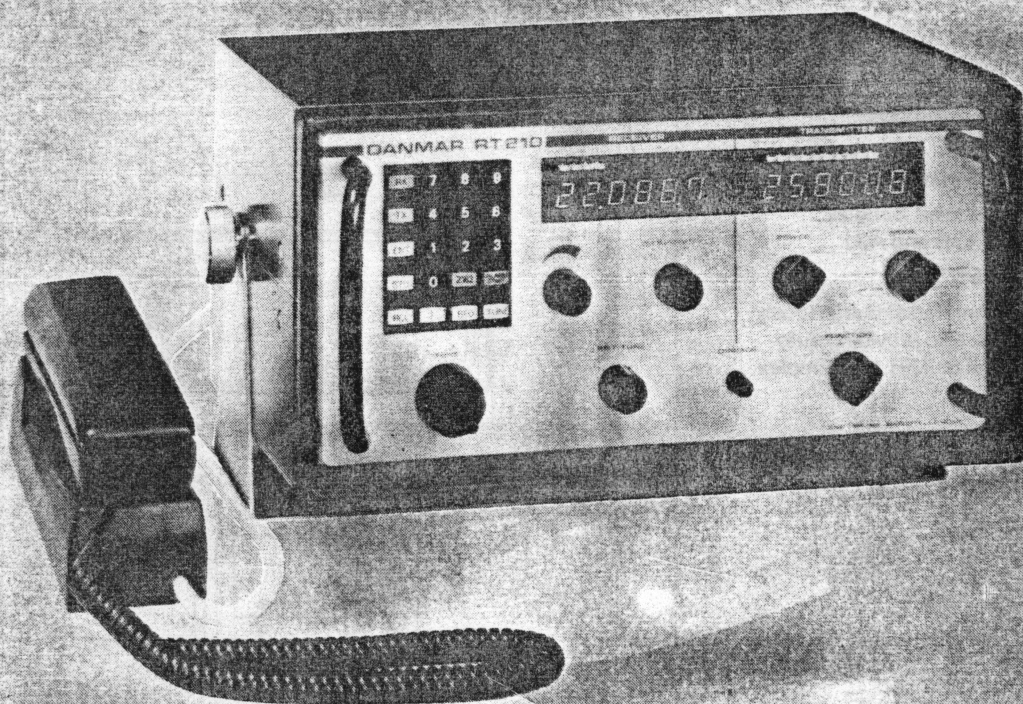
MICROPROCESSOR CONTROLLED

SSB MF/HF

RADIOTELEPHONE

400 WATT P.E.P.

1.6 TO 28 MHz



## PRELIMINARY



### DANISH COMMUNICATION SYSTEM A/S

INDUSTRIMARKEN 11. DK-9530 STØVRING. DENMARK

PHONE (08)371922. TELEX: 69840 dacosy dk. CABLES: DACOSYS

## TECHNICAL DATA

### GENERALLY

Freq. presentations:	Two 6-digit LED displays
Freq. accuracy:	Better than 40 Hz Short term (15 min.) 20 Hz
Operating modes:	Duplex, Semiduplex, Simplex F1, A1, A3A, A3H and A3J
Operating temp.:	-10°C to +55°C
2182 KHz selection:	By keyboard entered simultaneously for TX and RX, also providing auto- matic selection of A3H and Simplex modes.
Power supply:	21.6-45 V.d.c. External a.c. power supply with auto- matic change-over to d.c.
Weight:	20 kg

### TRANSMITTER:

Output power:	400 W P.E.P. - Option 200 W P.E.P.
Power reduction:	Full - ½ - ¼ - Low
Frequency range:	1.6 to 28 MHz
Transmitter freqs.:	Maximum 400 programable channels or free frequency selection in 100 Hz steps
Antenna requirements:	7-20 metres
Antenna tuning:	Fully automatic
Two-tone alarm:	Incorporated

### RECEIVER:

Frequency range:	100 KHz to 29.999 MHz
Frequency tuning:	Tuning in 10 Hz steps. The Hz per revolution ratio increases with the rotation speed of the knob
Sensitivity:	AM: 3 µV for 10 dB S/N CW/SSB: 1 µV for 10 dB S/N
Audio output:	3.5 W into 4 Ω to external loud- speaker

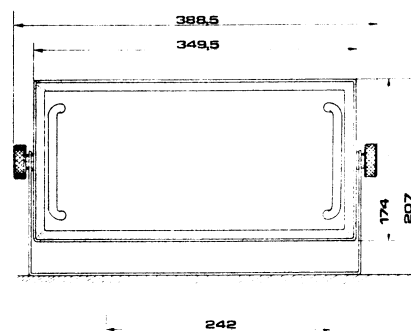
*Above specifications are subject to change without notice.*

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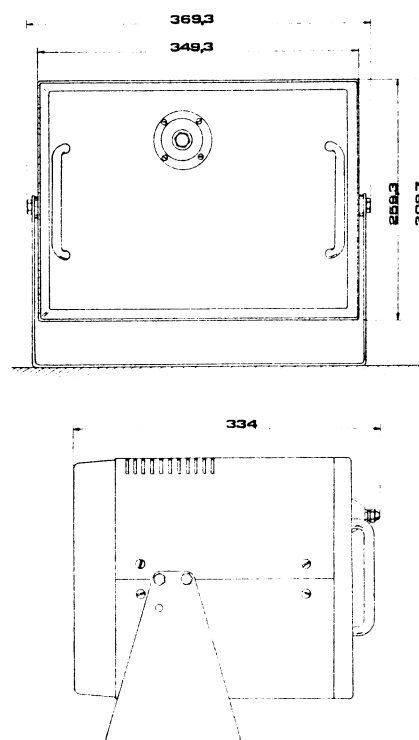
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## DIMENSIONS

### RT210



### T210





## I N S T A L L A T I O N   I N S T R U C T I O N S

### RT 210

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1.     Install the RT 210
2.     Mount the junction box by RT 210.
3.     Mount the microtelephone cradle.
4.     Mount the external loudspeaker.
5.     Install T210. The distance to RT 210 must be maximum 50 metres.
6.     Mount the junction box.
7.     Mount the TRANSMITTER ANTENNA. Lead the feeder to the antenna horn on T210.
8.     Mount COPPER BAND - must be 18 cm wide.
9.     Mount the RECEIVER ANTENNA. Lead feeder to the antenna bushing on RT 210 marked REC.ANT.
10.    Connect multicable from the RT 210 junction box to the T210 junction box.

NB! Max. 50 metres.

The cable must be 0.35 mm<sup>2</sup> pair-twisted with screen.

(Please see the page with cable connections for junction boxes).

11.    Connect coax cable e.g. RG58 between the RT 210 connector PL259 marked TRANS and the T210 connector PL259.
12.    Remove the bottom cover on T210.  
      Connect supply cables between battery and T210.

Screw terminal with 3 x black cables = - (minus)

Screw terminal with 3 x red cables    = + (plus)

NB! The power consumption by supply voltage 26 volt is app.  
      30 Amp.

13.    Check that all above points have been carried out correctly.
14.    Switch on the RT 210 - function switch in position RX - ignore ERROR 31.

The receiver is checked by following the operating instructions.

Other ERRORS - please see the error table.

1)  VOLUME

2) Sensitivity fully clockwise = max. sensitivity.

3) Ant. Tune is turned to maximum on RX bargraph, when a station is received.

4) Tune button for continuously variable station search.

15. Turn FUNCTION SWITCH into position SX .

The ANTENNA TUNER starts tuning a transmit frequency e.g. 2182 KHz.

When the tuning is terminated:

- 1) Press digit 5 till the display shows A.cal - 30.000.0 which it will do after about 15 secs.
- 2) Press digit 1 briefly. Hereafter the display starts counting downwards.

The impedance of the transmitter antenna is now being measured, and the result is stored in the computer.

When the counting is terminated, the receiver/transmitter display will return to the most recently keyed frequency.

16. Dismount the top and bottom covers on T210.

17. Dismount the front.

18. The antenna feeder is connected to the antenna wire in T210 (plug placed on the antenna horn).

19. Press the red 2182 button. The tuner starts. After finished tuning, continue with point 20. - If errors are displayed, repeat 19.

20. Next to the variometer on the relay driver print, the DIL switches placed opposite the switched on light diodes must be switched on, and the DIL switches placed opposite the switched off light diodes must be switched off.

With the LEVER of the toggle switch tilted towards the middle of the tuner, check that the light diodes remain unchanged.

Tilt back the LEVER of the toggle switch (towards the end of the tuner).



21. The red tape-marking sent with the equipment is glued onto the print next to the wheel on the variometer coil.  
  
Also the aluminium wheel on the variable capacitor is marked with tape opposite the red tape on the tune motor for the drive capacitor.
22. Tilt the toggle switch towards the middle once more.  
  
Press the key ENT. The tuner must hereby tune to the exact same setting as that shown by the red marks. If this is not the case, repeat points 19 to 22.
23. Tilt back the toggle switch towards the end of the tuner.
24. In case of tuner failure on the frequency 2182 KHz, the newly marked setting must be selected manually.
25. Check the equipment on all bands.  
  
Make a test call to a coast station.

RT 210CABLE BETWEEN JUNCTION BOXES

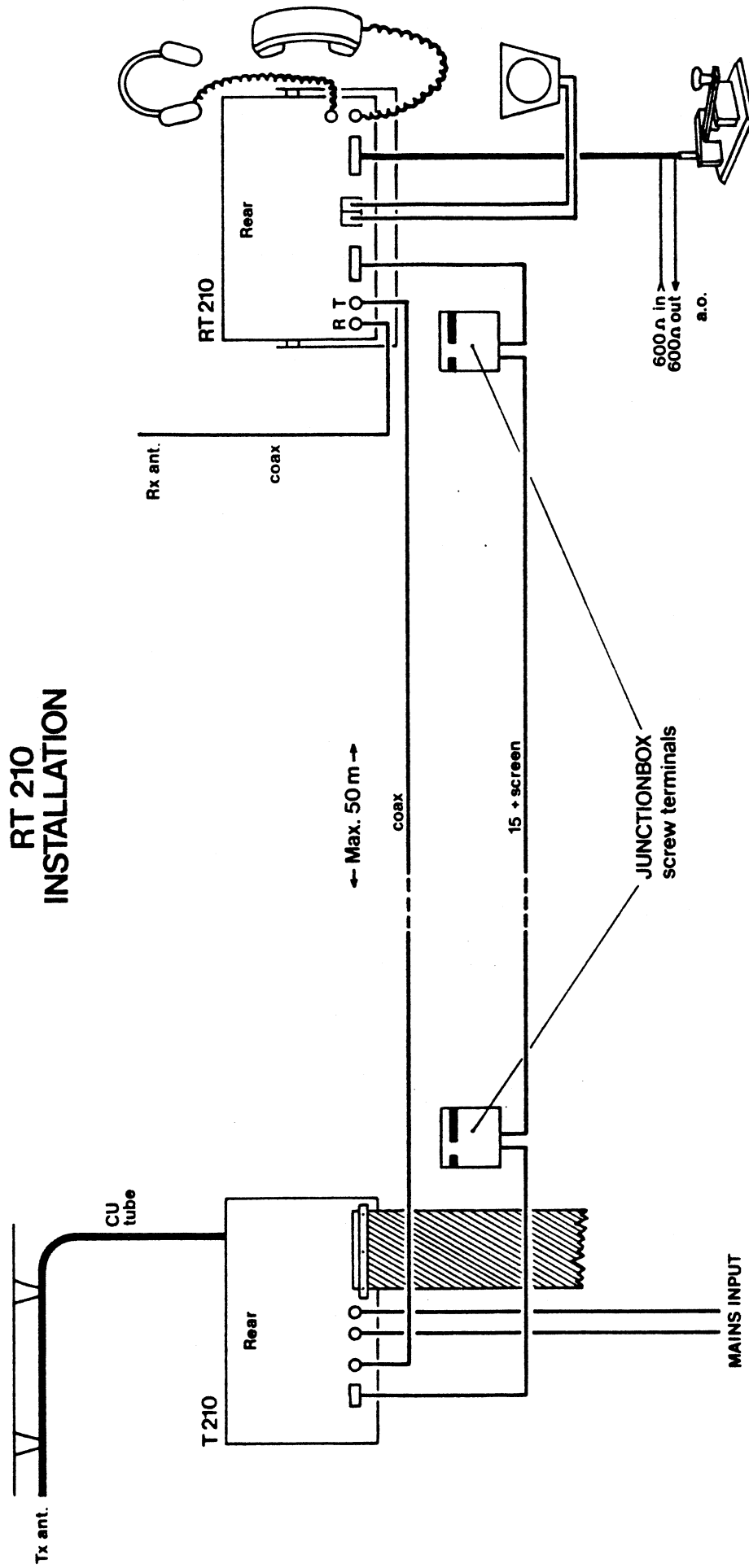
15	white	X	blue
14	blue	X	white
13	white	X	green
12	orange	X	red
11	white	X	orange
10	blue	X	red
9	screen		
8	white	X	grey
7	grey	X	white
6	green	X	white
5	red	X	orange
4	orange	X	white
3	red	X	blue
2	white	X	brown
1	brown	X	white

The remaining loose wires are to be connected to terminals 3, 4, 5 in both junction boxes.

X = twisted with



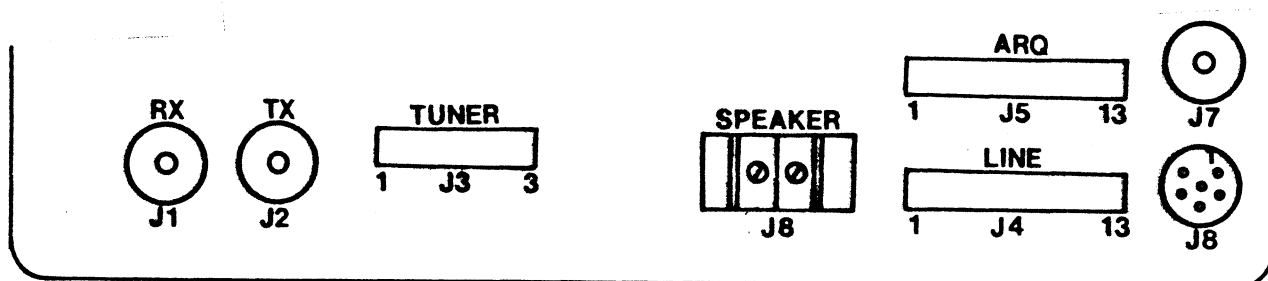
# RT 210 INSTALLATION



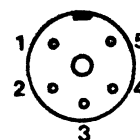
# Danish Communication Systems A/S

## REAR CONNECTION

RT 210

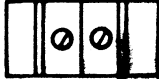


CONNECTOR	PIN	FUNCTION	CONN. TO
J5	1		
	2		
	3		
	4		
	5	F1 B. KEY	J4 5
	6	RX MUTE	J4 6
	7		
	8		
	9		
	10		
	11	AF LINE OUTPUT	J4 11
	12	AF LINE OUTPUT	J4 12
	13	AF LINE OUTPUT	J4 13
	14	AND	J4 14
	15	SERIES SIGN.	
	16	SERIES SIGN.	
	17		
	18		
	19		
	20		
	21		
	22		
	23	AF LINE INPUT	
	24	AF LINE INPUT	
	25	AF LINE INPUT	
J6	1	GND MIC	2080/J
	2	MIC	2080/J
	3	GND EARPIECE	2080/J
	4	EARPIECE	2080/J
	5	TX KEY	2080/J





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CONNECTOR	PIN	FUNCTION	CONN. TO
J7	1	HEADPHONE	<div> <div>1 2</div>  </div>
	2	HEADPHONE	
J8	1	SPEAKER	
	2	SPEAKER	
J3	1	ON/OFF	
	2	ON/OFF	
	3	+15V	
	4	+ 5V	
	5	+ 8V	
	6	KEYLINE TO TUNER	
	7	SERIAL INPUT	
	8	SERIAL INPUT	
	9	NC	
	10	GND (15V)	
	11	GND (5V)	
	12	GND (8V)	
	13	NC	
	14	SERIAL OUT	
	15	SERIAL OUT	
J4	1	+12V	2090
	2	LINE ON	2080/J
	3	TX KEY	2080/J
	4	CW KEY	2080/J
	5	FIB KEY	2080/J
	6	RX MUTE	2080/J
	7		
	8		
	9		
	10		
	11	AF LINE OUT	2080/J
	12	AF LINE OUT	2080/J
	13	AF LINE OUT	2080/J
	14	GND	20900
	15	HEADPHONE	2080/J
	16	HEADPHONE	2080/J
	17	SPEAKER HIGH	2080/J
	18	SPEAKER LOW	2080/J
	19	SERIAL SIGN	
	20	SERIAL SIGN	
	21		
	22		
	23	AF LINE IN	2080/J
	24	AF LINE IN	2080/J
	25	AF LINE IN	2080/J

RT 210 OPERATING INSTRUCTIONS

1. SWITCH ON: Turn function sw to RX - Sx or Dx.
2. If no error occurs, the display shows 2182.
3. Should there be fault(s) in the system, the display will show an error code which refers to RT 210 ERROR CODE SCHEMATIC.
4.
  - A. To select an RX frequency, press the RX key.
  - B. Thereafter select a frequency by using the keyboard.
  - C. Then press ENT to enter the frequency.
  - D. The set-up can now be stored.
  - E. First press STO. Then press RX. Next select a storage location number between 1 and 100.
  - F. Then press ENT to enter the frequency into the storage.
5. The same procedure applies to the TX frequency selection.
6. The RX and the TX set-ups can also be stored as a pair. In this case both RX and TX must be set-up before one of the location numbers is entered into the storage.
7. The storage capability is 100 pairs of RX and TX set-ups.
8. To recall a frequency the procedure is as follows:
  - A. Press RCL and the wanted storage location number.
  - B. Press ENT and the displays show the selected frequency pair (RX and TX).
  - C. To recall either an RX or a TX frequency from the storage:  
  
Press RCL. Thereafter press RX or TX and the storage number.  
  
Finally press ENT.



## Danish Communication Systems A/S

- D. The selected frequency is now displayed in either the TX or the RX display.
- E. If the storage location is an invalid number (>100), the display will show ERROR 2 for invalid location number in STO/RCL.
- F. If the wanted RX location number is empty, the display shows ERROR 4 .
- G. If the wanted TX location number is empty, the display shows ERROR 5 .

### 9. RX FUNCTIONS:

- A. To select TUNE press TUNE and the tuning knob is activated.
- B. When the knob is turned slowly, the frequency changes in 10 Hz steps.

When the knob is turned at a faster pace, the frequency is changed in three stages.

If the tune key is pressed once more, the tune function is inhibited again.

- C. In position A1A the tuning knob acts as BFO control.

To activate this function, press the BFO knob. If pressed again, the function is released.

### 10. To select 2182 press the RED BUTTON marked 2182.

Both displays show 2182, and the decimal points start flashing.

In position 2182 the mode is automatically set for H3E MODE and FULL PWR.

Operation of the power and the mode switches has no effect.

To release press ENT and the set returns to normal operation. The decimal point will not flash.

11.

MODE SWITCH FUNCTIONS:

- A. In position ANT GND the antenna is grounded in the PA box T210.
- B. In position ANT OPEN the antenna is left open.
- C. In position J3E the set operates in USB mode.
- D. In position H3E the set operates in SSB FULL CARRIER.
- E. IN POSITION F1B the set operates in TELEX MODE and the 600 ohm line input is selected.

Furthermore, the power reduction does not allow selection of FULL PWR.

The "RED" is displayed in the TX window.

- F. In position A1A the set operates in CW mode.
- G. In position R3E the set operates in SSB MODE REDUCED CARRIER.

12.

ALARM OPERATION:

- A. In position TEST ALARM the set can be tested to check that the PA and the Tuner operate correctly.

When ALARM START is pressed, the built-in dummy load is switched on.

The ANT CURRENT INDICATOR shows that there is RF power at the antenna tuner output.

At the same time the antenna is grounded so that no incidental distress call can be transmitted.

- B. DISTRESS OPERATION:

1. Select 2182 by pressing the "2182" key.
2. Set mode switch in position SEND ALARM.
3. Press the ALARM START key and the alarm will operate for 45 seconds.  
(The alarm can be stopped by repressing the "ALARM START" key).
4. When the alarm stops, the distress procedure can be continued.

13.

**POWER SWITCH OPERATION:**

The power switch allows the operator:

1. to select **FULL PWR** (400 W PEP) except in F1B and A1A.
2. to select **1/2 PWR**
3. to select **1/4 PWR**      the "RED" is turned on
4. to select **LOW PWR**

## SYNTHESIZER

### 002.2045

The RX synthesizer supplies the receiver 002.2060 with the injection signal to 1st mixer.

The frequency range lies from 71,420 MHz to 101,420 MHz in 10 Hz steps.

The synthesizer is built up by means of 3 loops.

#### LOOP 1

The transistor T9 oscillates in the range 54,045 to 63,495 MHz depending on the division number of the loop. The oscillator frequency is amplified by T8 and T7 from where the signal is fed into the pre-scaler IC10. In IC10 the signal is divided by 32 or by 33 and is hereafter fed into the PLL circuit IC6. The reference frequency to IC6 is 9 MHz which is fed into IC6 through the amplifier stage T16 in +20 dBm level.

The transistors T12, T13, and T14 make out the loop filter, which supplies the capacity diodes D3, D4 with VCO voltage. The division number of the loop is a 12 bit code programmed from the microprocessor.

#### LOOP 2

The output from LOOP 1 is divided by the N3 divider consisting of IC11 dividing by 20, IC12 dividing by 5, IC14 dividing by 5, and IC15 dividing by 5 giving a total division of 2500.

Output frequency f3 of IC5 lies in the range 21,6-25,4 KHz and is used as input to PD2 in LOOP 2.

The LOOP is built up around a voltage controlled X-tal oscillator (VCXO), which oscillates at 9,015 KHz  $\pm$  3 KHz. The oscillator transistor is T17.

The VCXO frequency f3 is fed into a mixer IC22, where it is mixed with the 9 MHz reference frequency fo, supplied from a temperature compensated X-tal oscillator (TCXO) X1.

The difference frequency F6 is fed into a Smith-Trigger IC17 and on to PD2 IC16. Output from PD2 is fed into a loop filter IC20.

## Danish Communication Systems A/S

The loop filter output voltage is feeding capacitor diode D9 thereby controlling the VCXO frequency  $f_4$ .

To ensure sufficient pulling range of the VCXO, the loop filter IC20 supply voltage is derived from the Smith-Trigger IC17 which is rectified by D5, D6, supplying IC20 with +20V.

### LOOP 3

LOOP 3 is a 20 KHz loop. The reference frequency of LOOP 3 is the sum of LOOP 1 and LOOP 2.

The oscillator is built up around T23. Coils -maximum 5 - are connected to the drain of T23. The connection is controlled by the microprocessor which by means of an octantal flip-flop makes a transistor conduct and supply the oscillator with voltage. The voltage can be supplied through one or more coils. The frequency range of the oscillator is hereby changed in 5 bands:

Band 1	-	75,	MHz
Band 2	-	80,5	MHz
Band 3	-	83,5	MHz
Band 4	-	90,5	MHz
Band 5	-	97,5	MHz

This division is called COARSE-TUNING.

The oscillator frequency is amplified by T22. The signal is fed from the drain coil of T22 into the receiver module and, furthermore, into T21 where it is amplified and thereafter fed into the pre-scaler IC26 and into the PLL circuit IC24. The division number of IC24 is programmed from the microprocessor.

All 3 loops have an out of lock detector notifying the microprocessor when the loop is out of lock.

The programming of the loops is controlled by the microprocessor. Through IC18 and IC19 the microprocessor enables each loop. At the same time the microprocessor codes the division number into the latch of the loop through data D0-D7. The next loop is hereafter programmed in the same way.

EXCITER

02.2040 C

The AF connection takes place via 3 inputs. These are opened by the processor depending on the selected mode.

The transistor T1 mutes the 600 ohm line input.  
The transistor T2 mutes the microphone input.  
The transistor T3 mutes the ALARM tone input.

The AF signal is fed into pin 2 on IC1A from where it is fed into pin 4 on IC2. IC2 is an audio compressor, which starts attenuating when the output signal on pin 8 is approx. 200 mV rms. The compressor ensures that the AF signal does not exceed the 200 mV.

The AF signal is fed from pin 8 on IC2 into IC1B. The amplification of IC1B is adjusted with R23 to maximum output voltage without the signal being distorted at any time.

The signal is fed from pin 7 on IC1B into the mixer IC4. IC4 is a double balanced high level mixer, the injection signal of which is 9 MHz and comes from the TCXO. The 9 MHz residual carrier is outbalanced with the potentiometer P2.

The product from the mixer contains both side bands. The carrier is attenuated by minimum 43 dB. Should the modulation frequency be 1.7 KHz, the mixer will produce two frequencies - 9001,700 KHz and 8998,300 KHz.

In position USB the USB filter allows only the upper side band - 9000,350 KHz to 9002,700 KHz to pass.

In position LSB the LSB filter allows only the lower side band 8999,650 KHz to 8997,300 KHz to pass.

The filters allow only side bands of minimum 350 Hz to maximum 2700 Hz to pass.

### CARRIER RE-INSERTION/SUMMING AMPLIFIER

The signal is fed from the USB/LSB filters into the summing amplifier T10, T11 where the carrier is reinserted in mode H3E, R3E and A1A. The mode switch latch IC8 is controlled by the microprocessor.

In mode J3E D34 is on and D41 is off.

By turning D34 on, 9 MHz is grounded via C104 and as D41 is off, no 9 MHz will reach the summing amplifier.

In mode H3E D31 and D41 are on.

The 9 MHz carrier level is set by resistors R137, R138 and R139 ensuring a carrier level between -4,5 dB and -6 dB.

In mode R3E D32 and D41 are on.

The 9 MHz carrier level is set by resistors R137, R138 and R139 ensuring a carrier level between -16 and -20 dB.

In mode A1A D33 and D41 are on.

The 9 MHz carrier level is set by resistors R140 and R141.

The control bit that turns D33 on will also turn T7 off thereby closing the AF-MODE SWITCH IC3 contact pin 11 to pin 10. This will ground the AF input to the balanced mixer IC4.

In the A1A mode keying takes place by turning the TX-SWITCH T15, T16 on.

### POWER SWITCH

The signal from the summing amplifier is fed into amplifier T12. The gain of T17 is controlled by the microprocessor.

The microprocessor software is programmed to match an exciter to a specific power amplifier. Gain of T17 is controlled as a function of frequency to ensure a constant output power over the frequency range 1.6-30 MHz.

Gain adjustment is accomplished by selecting resistors R81, R84 and R86.

## OUTPUT POWER CONTROL

Output power can be controlled by selecting one of four T-attenuators:

FULL	POWER	D17, D21 on	400 W PEP
1/2	POWER	D18, D22 on	200 W PEP
1/4	POWER	D19, D23 on	100 W PEP
LOW	POWER	D20, D24 on	25 W PEP

Power is selected on the front plate but when OVERHEATING, ANT-CAL, TUNING or LOW SWR occur, the microprocessor automatically sets the POWER SWITCH to LOW POWER.

## 1st MIXER

The signal from the power switch is fed into the 1st mixer IC6 - a double balanced high level mixer.

The injection signal comes from the 100 Hz loop. The frequency is approximately 61 MHz.

The mixing provides 70 MHz. This signal makes out the 1st IF which is directed through a 70 MHz X-tal filter FL3.

## 2nd MIXER

The signal from FL3 is fed into IC7, the 2nd mixer, where it is mixed with the injection signal from the 10 KHz loop. This signal lies between 71.6 MHz and 101.0 MHz.

The product from the mixer is directed through an 8-pole low-pass filter with an intersection frequency of 30 MHz.

## DRIVER

The signal from the low-pass filter is fed into the DRIVER amplifier T13-T14.



WIDEBAND AMPLIFIER

The signal from the driver amplifier is fed into the wideband amplifier T5. (Located on the backplate of the RT210 unit).

The wideband amplifier output level is +28 to 30 dBm across 50 ohm.

This signal is fed to the POWER UNIT 02.2050 in the T210 unit.

RECEIVER 002.2064

The antenna signal from the BANDS UNIT 002.2067 is directed through an elliptic low-pass filter CH4, CH5 with a cut-off frequency of 30 MHz. From this filter the signal is led through a conventional diode limiter D7, D8, D9, D10 and is thereafter fed into the 1st Mixer IC1. The mixer is a double balanced high level mixer, which converts the antenna signal into a "fixed" frequency - 1st IF - of 71,42 MHz. The injection signal to the mixer is produced by the RX synthesizer unit 002.2066. The frequency range is 71,42 to 101,42 MHz in 10 Hz steps.

This mixer type has a high intercept point - typically +25 to +30 dBm which indicates its capability of handling strong signals without producing unwanted products. The mixer has, furthermore, a low noise figure which ensures a good receiver sensitivity.

From the mixer the 71,42 MHz signal is led through a low-pass filter with a cut-off frequency of 72 MHz. This filter consists of CH1, CH2, CH3, C12, C13. This also forms an impedance matching circuit to the X-tal filter. The centre frequency of the X-tal filter is 71,42 MHz and the band width is 6 KHz.

The high IF frequency gives the receiver a good image selectivity and reduces the spurious number.

The signal from the X-tal filter is fed into the 2nd mixer IC2 where it is converted into 580 KHz -2nd IF. This mixer type is identical to the 1st mixer. The injection to the 2nd mixer is 72 MHz. The 580 KHz signal is fed through diode switches D1, D3, D5 and into one of the IF filters, which determines the band width of the receiver. The filters may be the following: AM filter - 6 KHz bw, USB - upper side band - 3 KHz bw. The 3rd filter may be an LSB - lower side band - 3 KHz bw or an FSK - CW filter.

The filters are connected by diode switches which are controlled from the microprocessor.

The 580 KHz signal is fed into the IF amplifiers IC1 and IC3 which are monolithic circuits. Each of these has a maximum GAIN of 60 dB and a built-in gain regulation which can be regulated 60 dB with a DC voltage.

The output of IC3 is connected to L10 from where the 580 KHz signal is fed into the AM detector IC3 where the AF information is separated from the 580 KHz. The AF signal is fed into the AM/SSB switches and further on to the AF amplifier.

### AGC REGULATION

The 580 KHz IF signal is fed to the AGC DETECTOR/AMPLIFIER IC3, T9, T10 and IC4.

Output from IC4 pin 1 is the AGC DC voltage controlling the gain of IF amplifiers IC1 and IC2.

Max gain is obtained with an AGC voltage of 0 V DC on IC1 and IC2 pin 5.

The AGC voltage is also fed to IC4 pin 5, the S-meter amplifier.

The AGC ensures a constant output from the IF amplifier IC2.

AGC regulation may be switched off by turning IC3 on.

Manual gain regulation can be made by RF-Regulator potentiometer P2.

The 580 KHz are fed from the output of IC2 through a band-pass filter L9 and into IC3.

IC3 is a product detector, which in SSB - A1 "restores" the missing carrier.

The IF signal is mixed with a very constant frequency of 580 KHz. The AF signal is the product of this mixing, and this signal is fed into the AM/SSB switch. The frequency used for the mixing comes from IC3.

IC3 contains an oscillator in which L7, C33, C34, D4 form the frequency determining circuit. The oscillator signal is fed into IC2 pin 8 where it is frequency and phase locked at 9 MHz reference frequency -TCXO. IC2 is programmed from the micro-processor to make the oscillator in IC3 oscillate at 580.000 KHz in USB. The transistors T8, T9, T10 form an integrating circuit, which makes the pulses from the PLL circuit - IC2 - give a DC voltage to the capacity diode D4. D4 makes the oscillator oscillate at exactly 580.000 KHz.

The 580 KHz are mixed with the IF frequency in IC3. In USB mode the IF frequency lies from 580,350 KHz to 582,700 KHz and in LSB mode from 579,650 KHz to 577,300 KHz.

The difference between the 580 KHz and the IF signal makes out the AF signal.

The AF signal is fed from the output - pin 1 of IC10 - into IC11, which is connected to a line transformer. The output voltage from the transformer is 0 dBm in 600 ohm. The output level is adjustable with the trimming potentiometer P3.

From the output on IC10 the AF signal is also connected to the

volume control. From here the signal passes on to IC12. IC12 is output amplifier capable of supplying 3 Watt into 4 ohm.

The output of IC12 is connected to the loudspeaker connection through a relay contact.

A high on the base of T15 connects the loudspeaker. The head-phone is always connected.

CARRIER SYNTHESIZER

The carrier synthesizer board 03.2066 also contains the circuit for generating the 72 MHz injection signal for the receiver 2nd mixer.

The 72 MHz injection signal is derived by multiplication of the 9 MHz TCXO signal.

Transistor T1 is a buffer amplifier.

Transistors T2,T3 is a multiplier, multiplying by 4, giving a 36 MHz output.

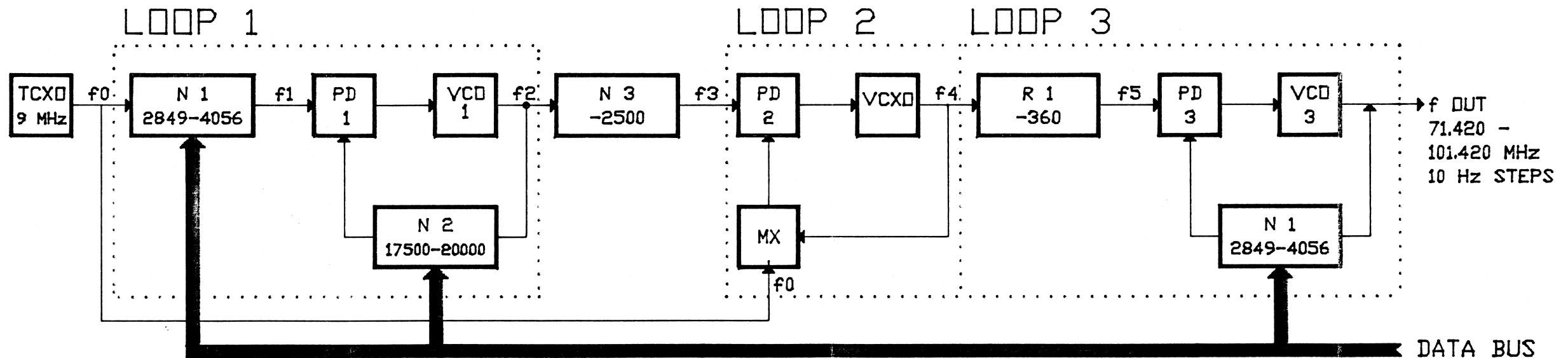
L2, C1 and L3, C14 is a 36 MHz bandpass-filter.

Transistors T4, T5 is a multiplier, multiplying by 2, giving a 72 MHz output.

L5, C18 and L6, C21 is a 72 MHz bandpass-filter.

72 MHz injection signal is fed via a coax cable to the 2nd mixer of the receiver.

# RT210 RECIEVER SYNTHESIZER.



$$f_{OUT} = 10 \times N_2 + 25 \text{ KHz} \times N_1$$

$$f_1 = \frac{f_0}{N_1} \quad f_2 = f_1 \times N_2 \quad f_3 = \frac{f_2}{N_3} \quad f_4 = f_0 + f_3 \quad f_5 = \frac{f_4}{R_1} \quad f_{out} = f_5 \times N_1$$

Beregning af  $N_1$   $N_2$  for givet  $f_{OUT}$

$$N_1 = \text{INT} \left[ \frac{f_{OUT} - 0,175 \text{ MHz}}{25 \text{ KHz}} \right]$$

$$N_2 = \text{INT} \left[ \frac{f_{OUT} - 25 \text{ KHz} \times N_1}{10} \right]$$

MODE

J3E

H3E

F1B

A1A

R3E

$f_{OUT}$

$f_6$

$f_6$

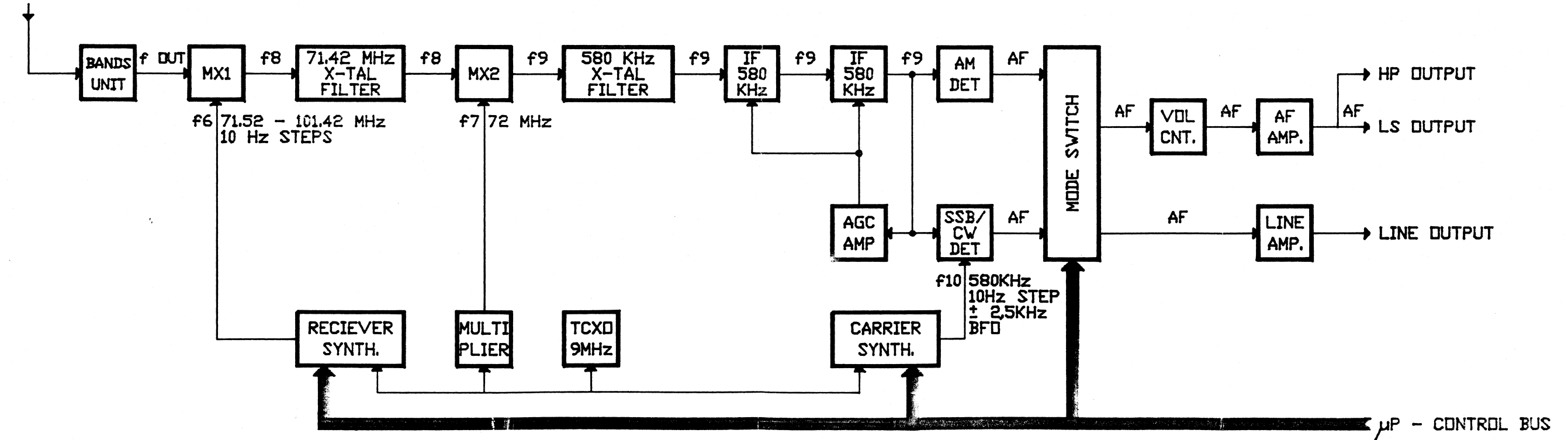
$f_6 - 1,5 \text{ KHz}$

$f_6 - 1,5 \text{ KHz}$

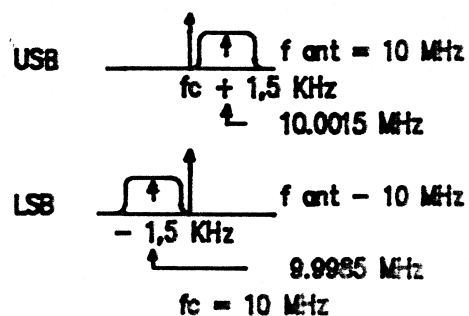
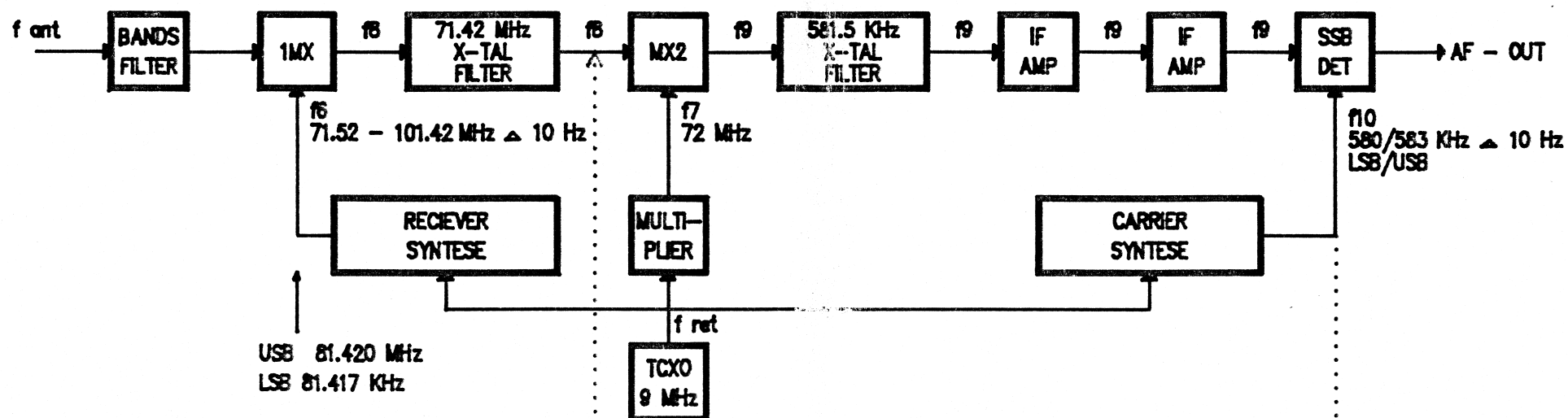
$f_6$

# RT210 RECIEVER BLOCK DIAGRAM

f OUT 0,1 - 30 MHz

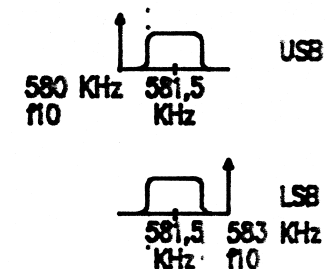
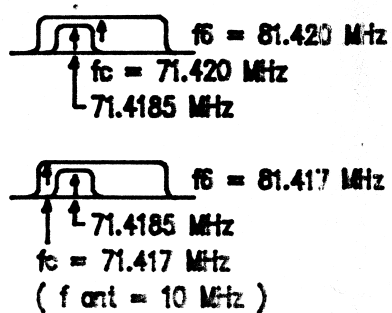


# RT210 RECIEVER FREQ. ORGANISATION USB/LSB



$$\text{USB } f_6_{\text{USB}} = f_{ant} + 71.42 \text{ MHz}$$

$$\text{LSB } f_6 = f_6_{\text{USB}} - 3 \text{ KHz}$$

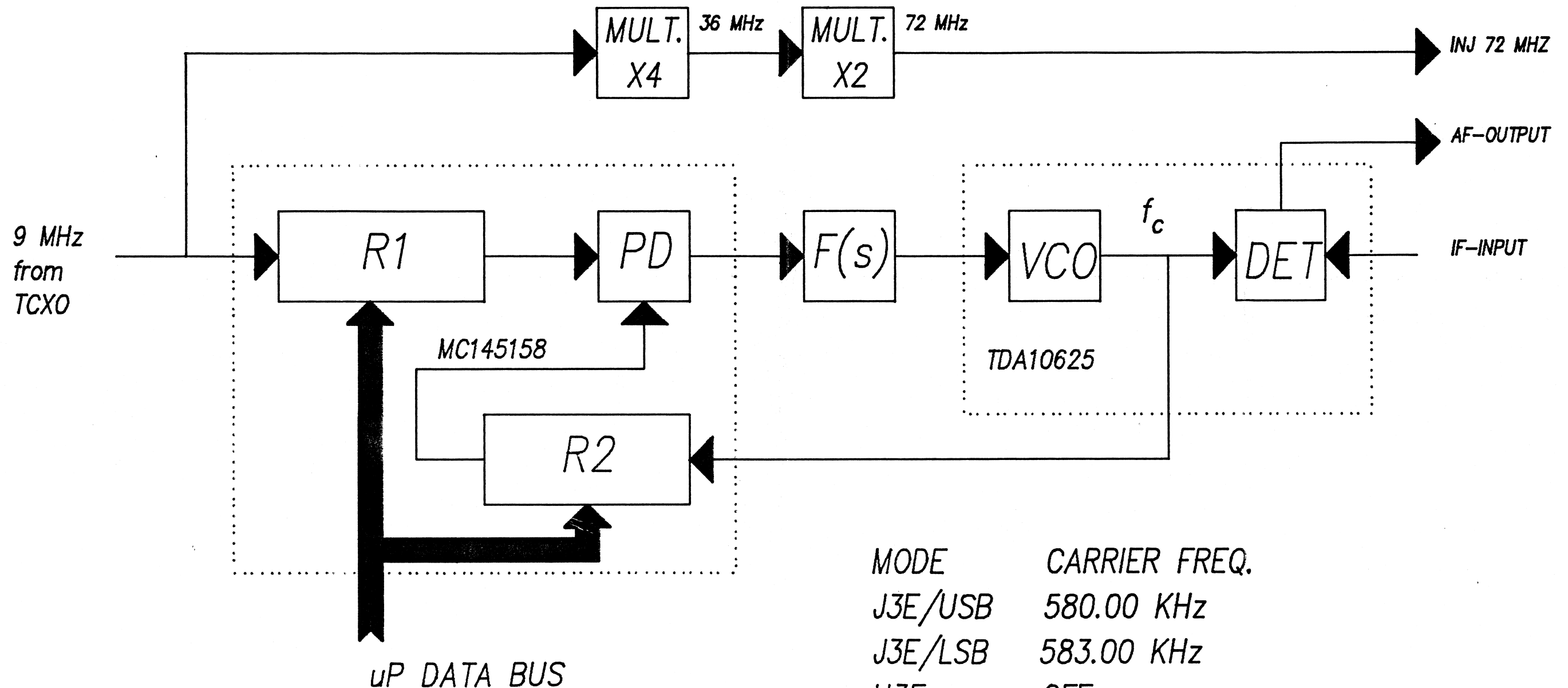


$$f_{10_{\text{USB}}} = 580 \text{ KHz USB}$$

$$f_{10_{\text{LSB}}} = f_{10_{\text{USB}}} + 3 \text{ KHz} = 583 \text{ KHz}$$

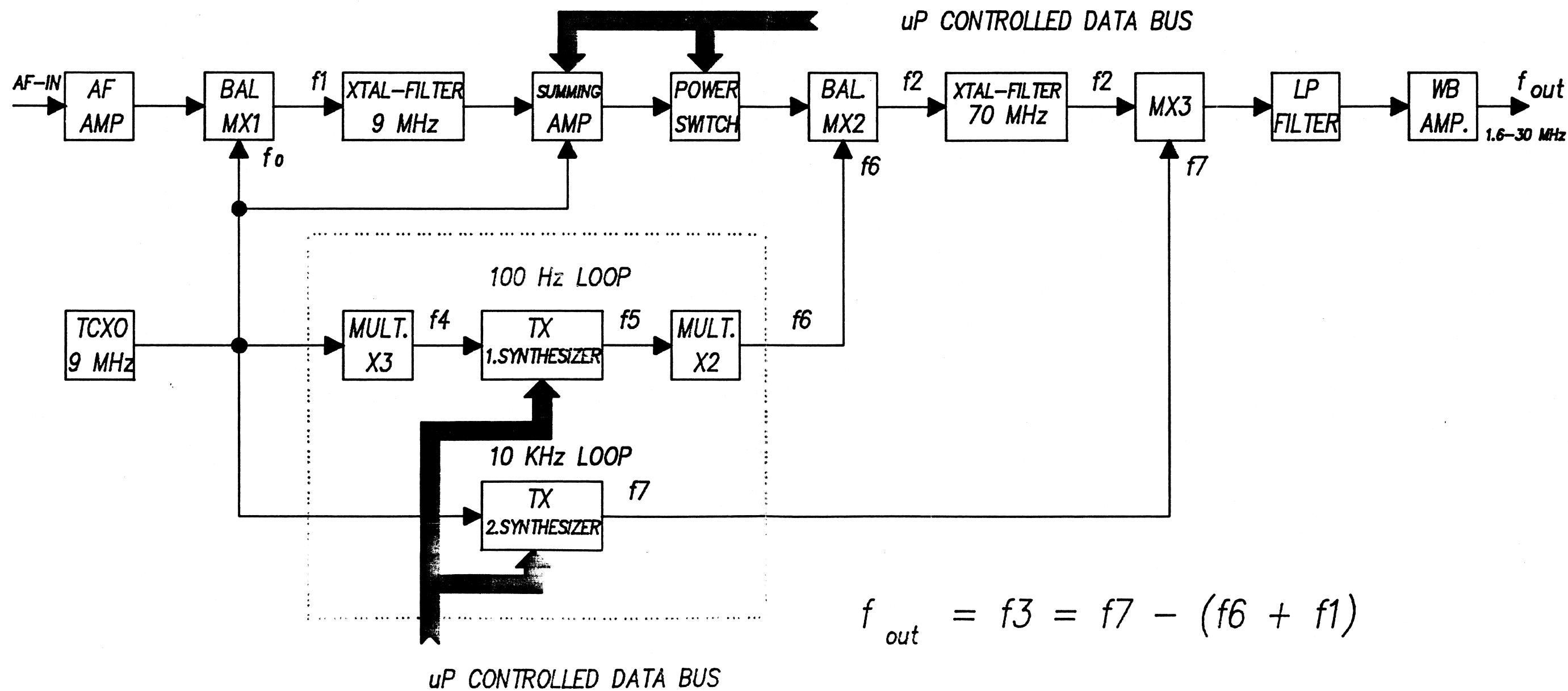


# RT210 CARRIER SYNTHESIZER.

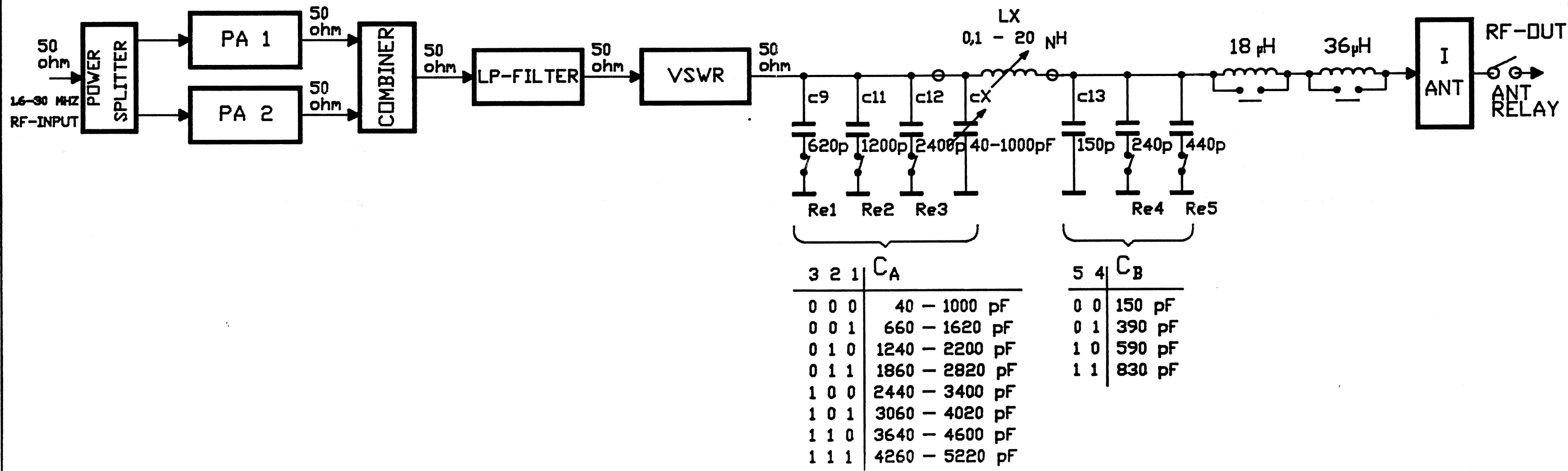


MODE	CARRIER FREQ.
J3E/USB	580.00 KHz
J3E/LSB	583.00 KHz
H3E	OFF
F1B	580.00 KHz
A1A	581.50 KHz (BFO) $\pm 2.5$ KHz
R3E	580.00 KHz

# RT210 EXCEITER



# RT210 POWER AMP.-TUNER BLOCK DIAGRAM.

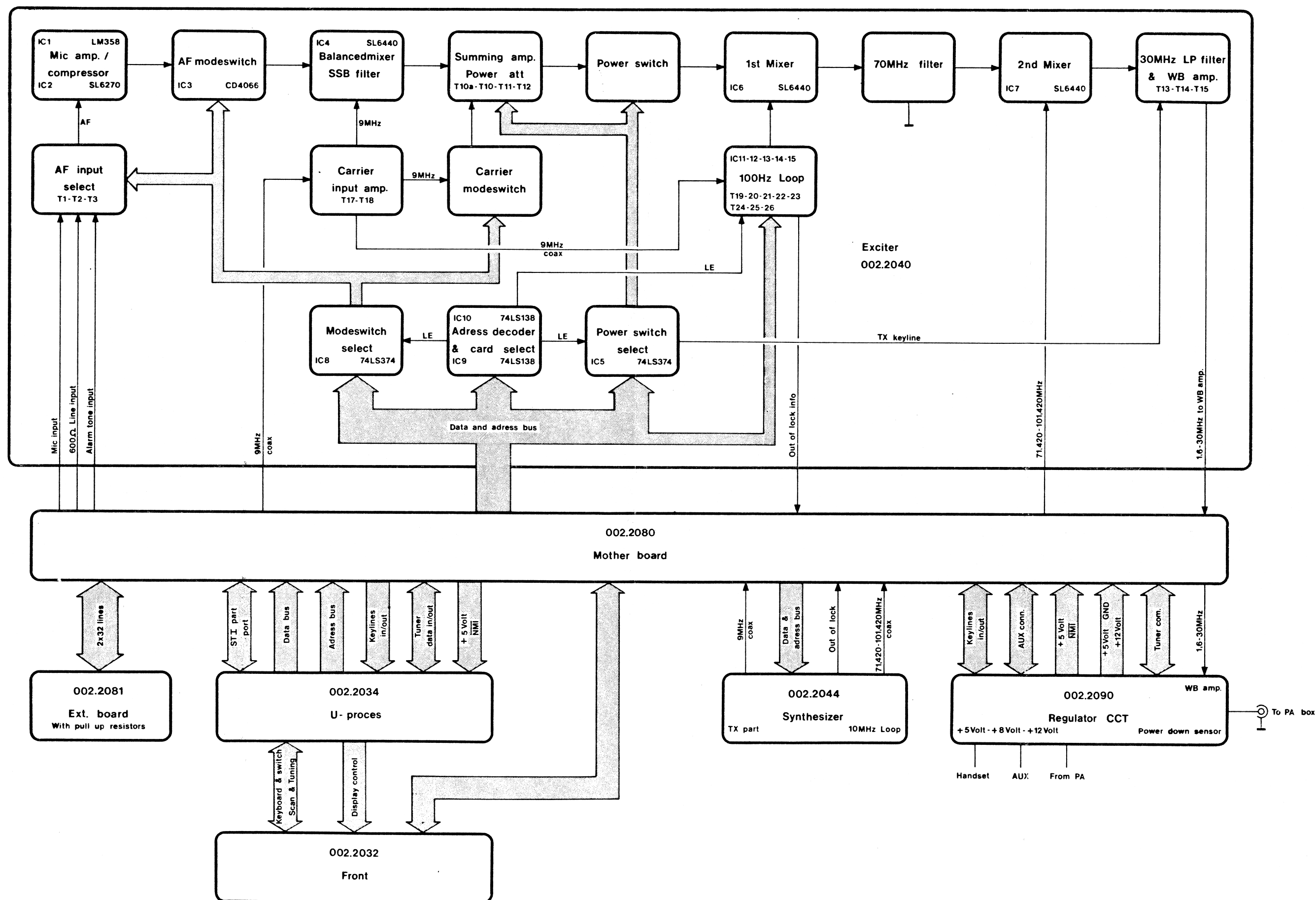


RT 210 ERROR CODE

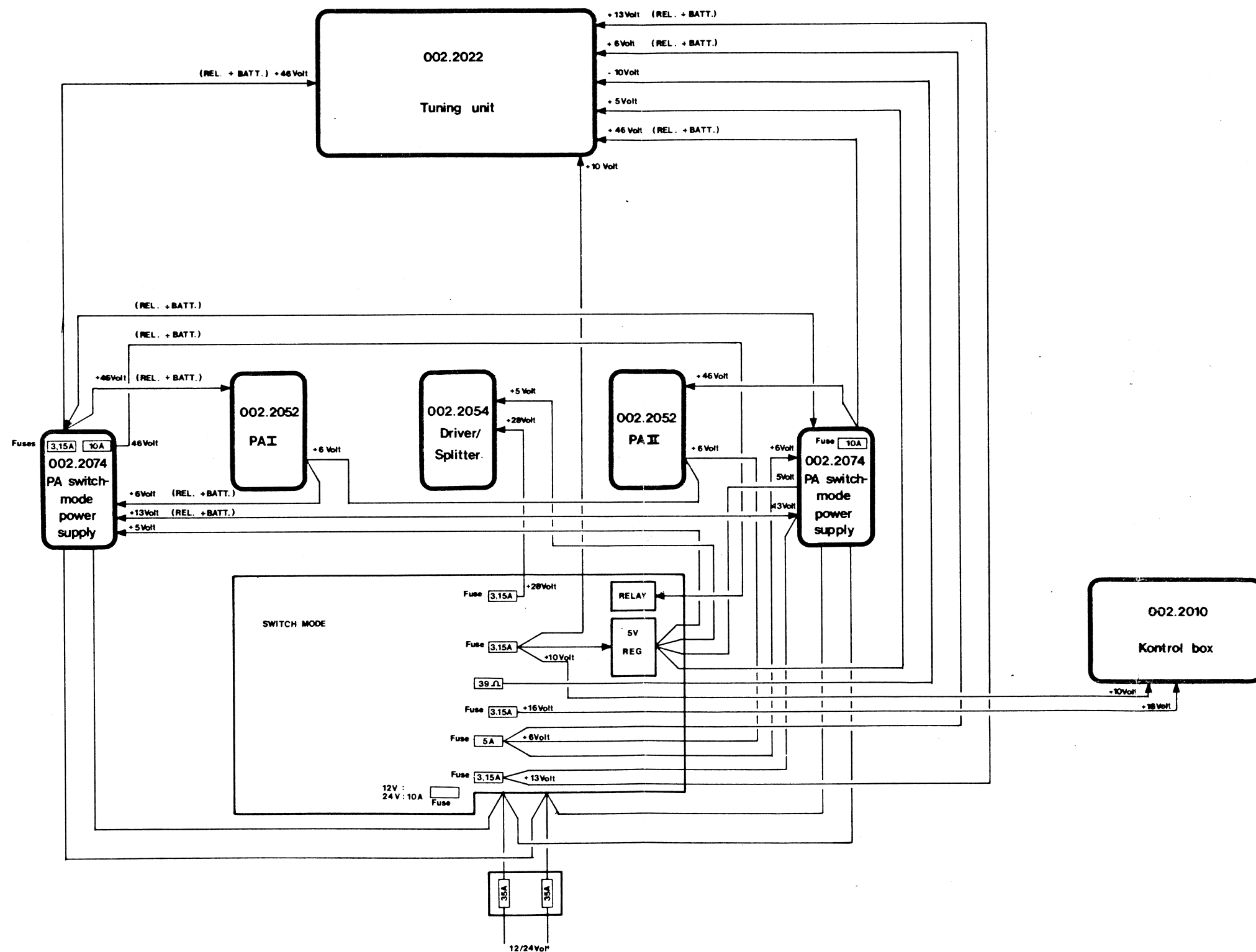
ERROR 20	=	COMMUNICATION ERROR
ERROR 21	=	COMMUNICATION BREAK
ERROR 22	=	INVALID COMMAND REC
ERROR 23	=	BUFFER OVERFLOW
ERROR 27	=	STI ERROR
ERROR 30	=	RAM CHANNEL/LOCATION ERROR
ERROR 31	=	TUNER PREDATA ERROR
ERROR 32	=	POWER UP/DAWN ERROR
ERROR 33	=	MPU WATCHDOG ERROR
ERROR 34	=	MPU INTERRUPT WATCHDOG ERROR
ERROR 40	=	TUNER WILL NOT RETURN TO STARTING POS.
ERROR 41	=	TUNING TIME OUT
ERROR 42	=	TUNE ERROR
ERROR 43	=	PREDATA ERROR
ERROR 44	=	POWER FAIL
ERROR 45	=	SWR ERROR
ERROR 46	=	TUNER OVERHEAT
ERROR 47	=	TUNER RESET
ERROR 50	=	SYNTHESIZER LOCK ERROR
ERROR 60	=	KEY SCAN ERROR
ERROR 61	=	MODE/PWR/FUNCTION ERROR
ERROR 62	=	INTERRUPT ERROR
ERROR 63	=	TIMER ERROR
ERROR 64	=	STACK POINTER ERROR
ERROR 70	=	ILLEGAL BAND UNIT
ERROR 71	=	ILLEGAL RECIVER
ERROR 72	=	ILLEGAL SYNTHESIZER
ERROR 73	=	ILLEGAL EXCITER

# RT 210 ERROR CODE

HELP	Ø	=	INVALID MODE
HELP	1	=	INVALID KEY
HELP	2	=	INVALID CHANNEL/LOCATION NO
HELP	3	=	INVALID RX/TX FREQUENCY IN MODE
HELP	4	=	RECALLED RX CHANNEL/LOCATION ENPTY
HELP	5	=	RECALLED TX CHANNEL/LOCATION EMPTY
HELP	6	=	TX KEY BLOCK
HELP	7	=	MODE/FREQUENCY CONFLICT

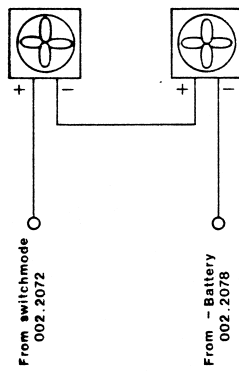


Block diagram for TX unit  
Drawing no. 001.0436

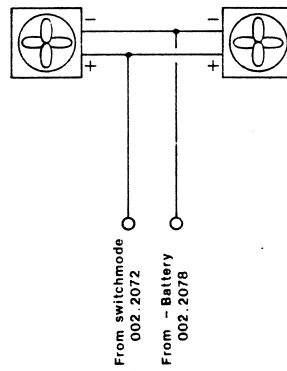


Fuse and voltage diagram  
Drawing no. 001.0438

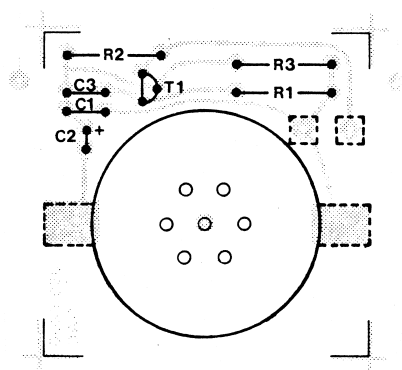
### 24Volt Blowers



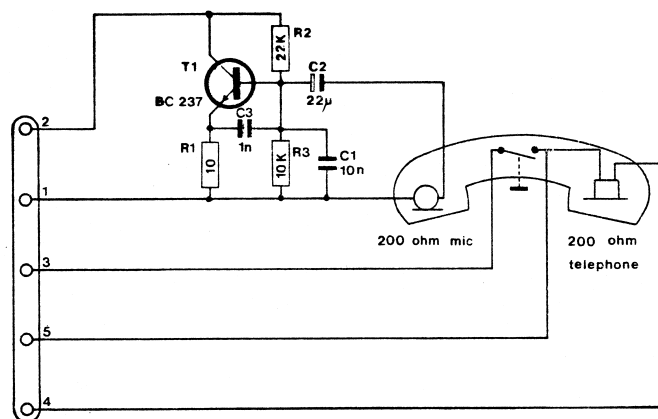
### 48Volt Blowers







**Microtelephone**  
**Layout no. 33.0820**



**Handset**

**Drawing no. 001.0401A**

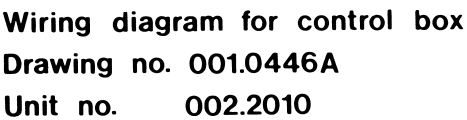
**Unit no. 002.2005**

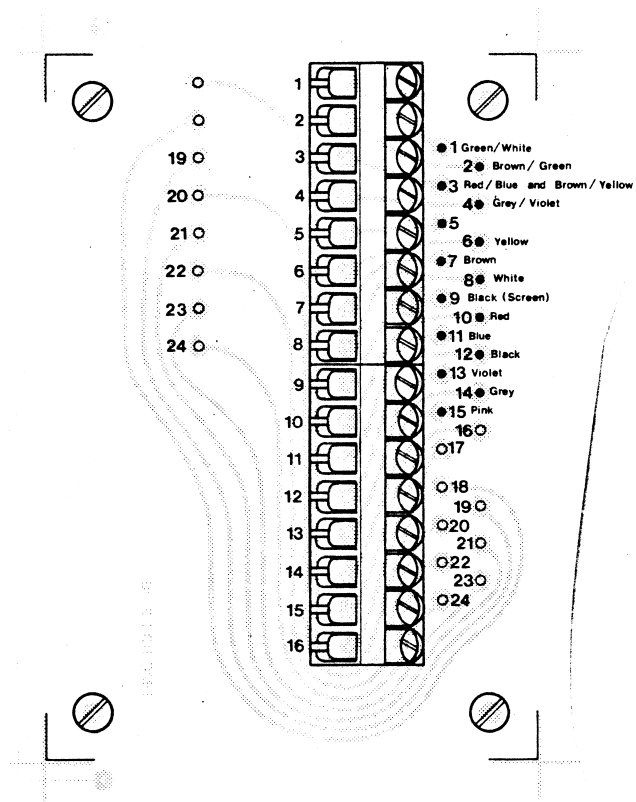
**PC.Board no. 003.0820**

**Layout no 33.0820**

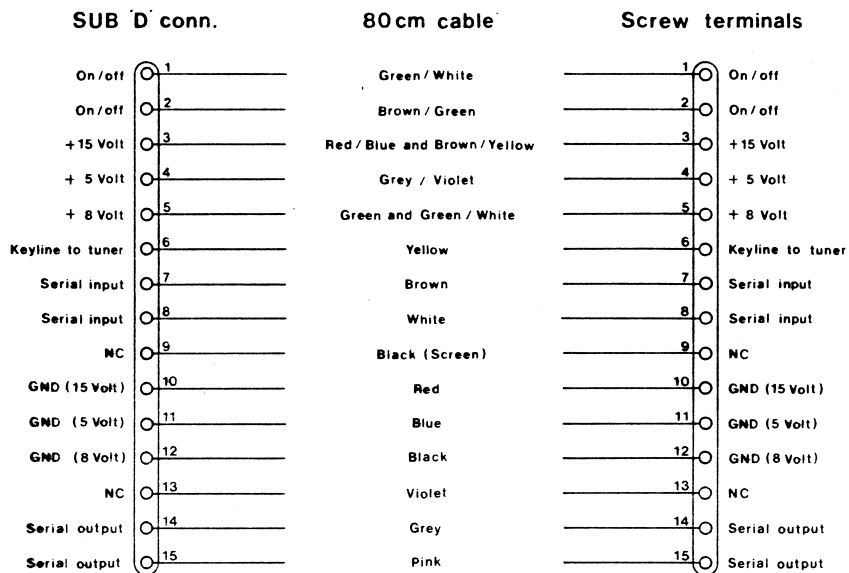
# Handset Unit no. 002.2005

R1	Resistor	10 Ohm	1/3W	5%	01.125
R2	Resistor	22 Kohm	1/3W	5%	01.165
R3	Resistor	10 Kohm	1/3W	5%	01.161
C1	Capacitor, cer	10 nF	30V		14.907
C2	Capacitor, tantal	22 uF	16V		13.129
C3	Capacitor, cer	1 nF	40V		14.902
T1	Transistor	BC 237B			32.101





Junctionbox  
Layout no. 33.2016 -1



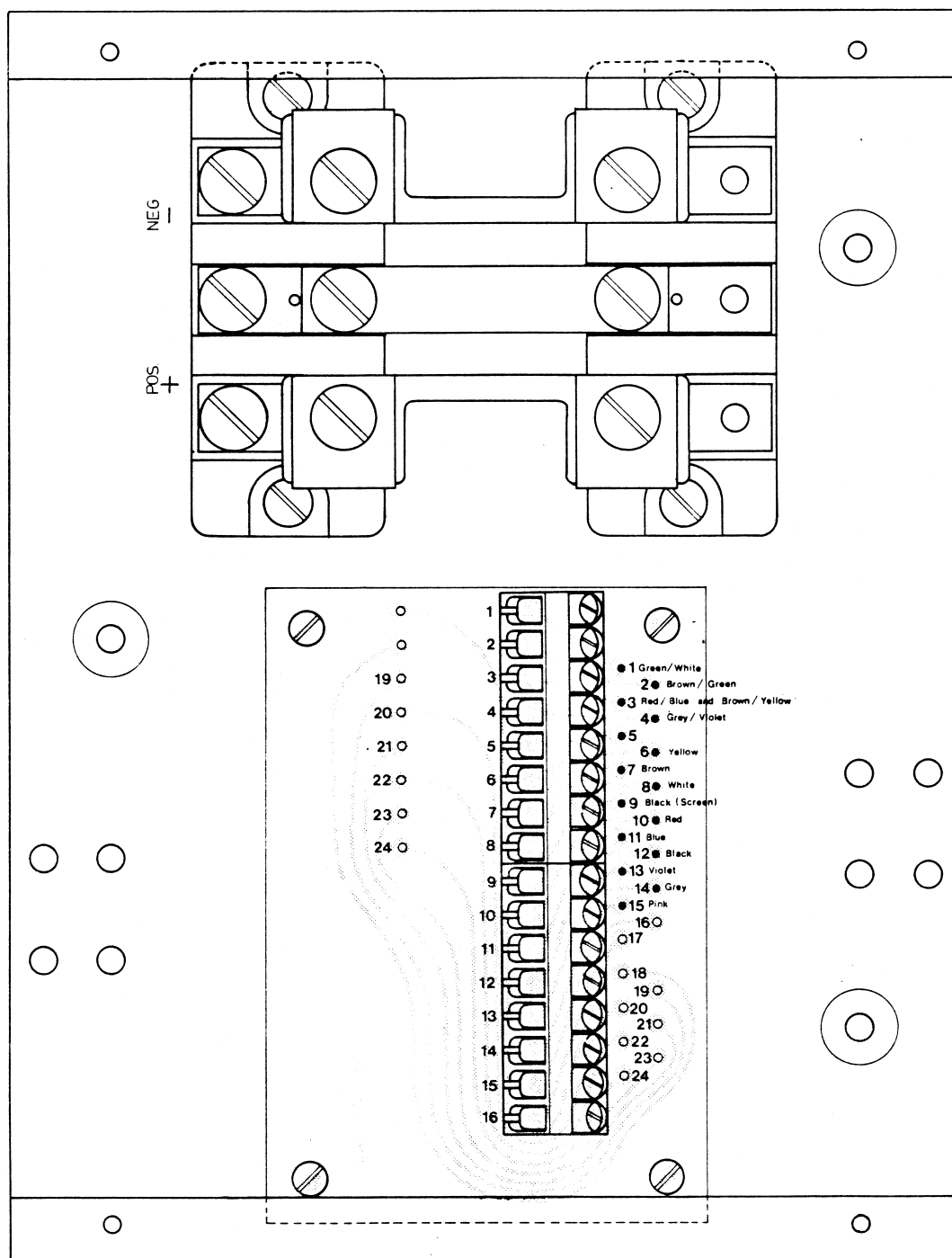
Junctionbox

Drawing no. 001.0402

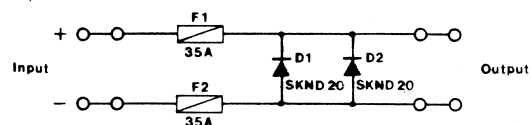
Unit no. 002.2016

PC. Board no. 003.2016

Layout no. 33.2016-1



**Junctionbox**  
**Layout no. 33.2016-2**



SUB 'D' conn.	80cm cable	Screw terminals
On/off 1	Green / White	1 On/off
On/off 2	Brown / Green	2 On/off
+15 Volt 3	Red / Blue and Brown / Yellow	3 +15 Volt
+ 5 Volt 4	Grey / Violet	4 + 5 Volt
+ 8 Volt 5	Green and Green / White	5 + 8 Volt
Keyline to tuner 6	Yellow	6 Keyline to tuner
Serial input 7	Brown	7 Serial input
Serial input 8	White	8 Serial input
NC 9	Black (Screen)	9 NC
GND (15 Volt) 10	Red	10 GND (15 Volt)
GND (5 Volt) 11	Blue	11 GND (5 Volt)
GND (8 Volt) 12	Black	12 GND (8 Volt)
NC 13	Violet	13 NC
Serial output 14	Grey	14 Serial output
Serial output 15	Pink	15 Serial output

Junctionbox

Drawing no. 001.0429

Unit no. 002.2014

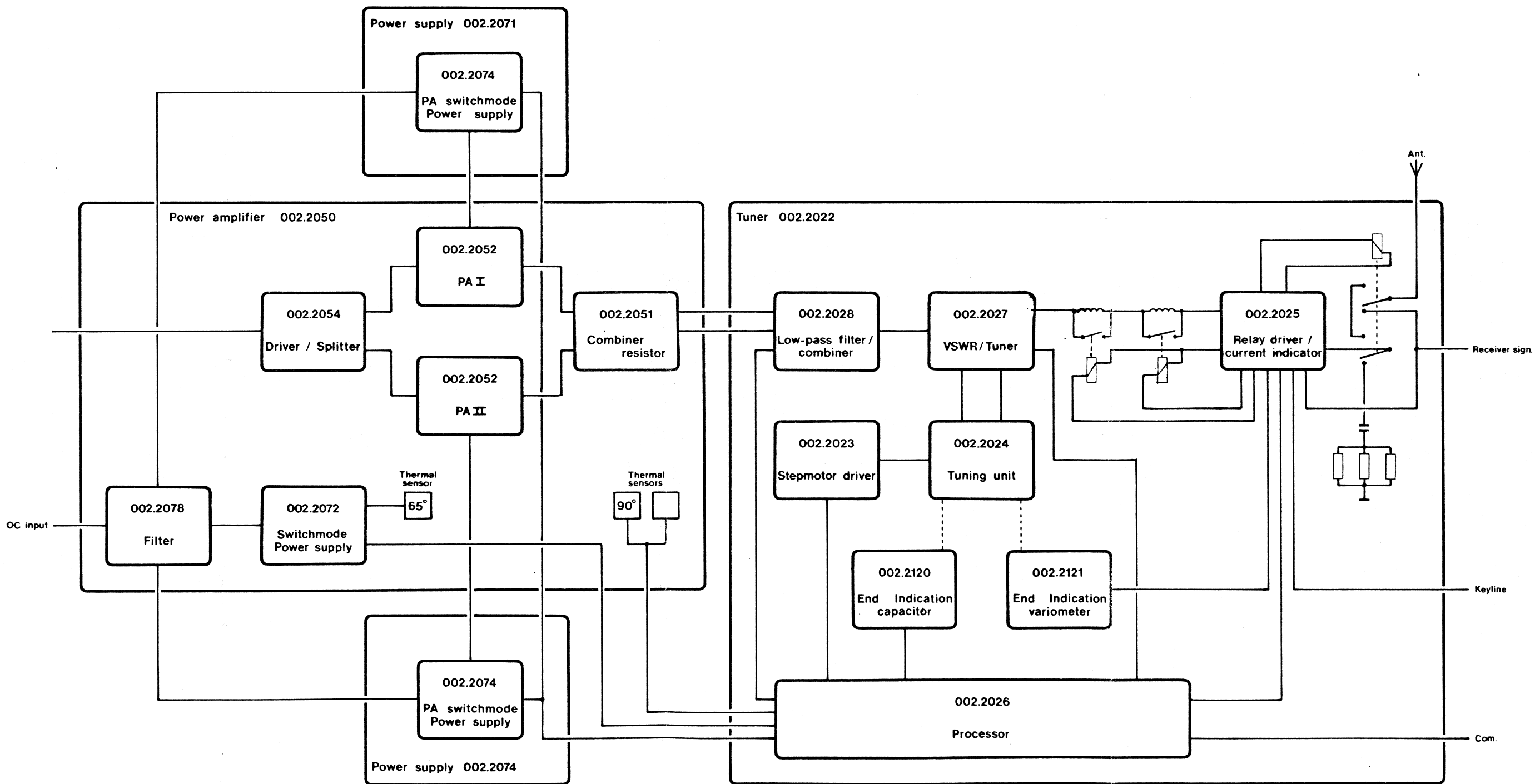
PC. Board no. 003.2016

Layout no. 33.2016-2

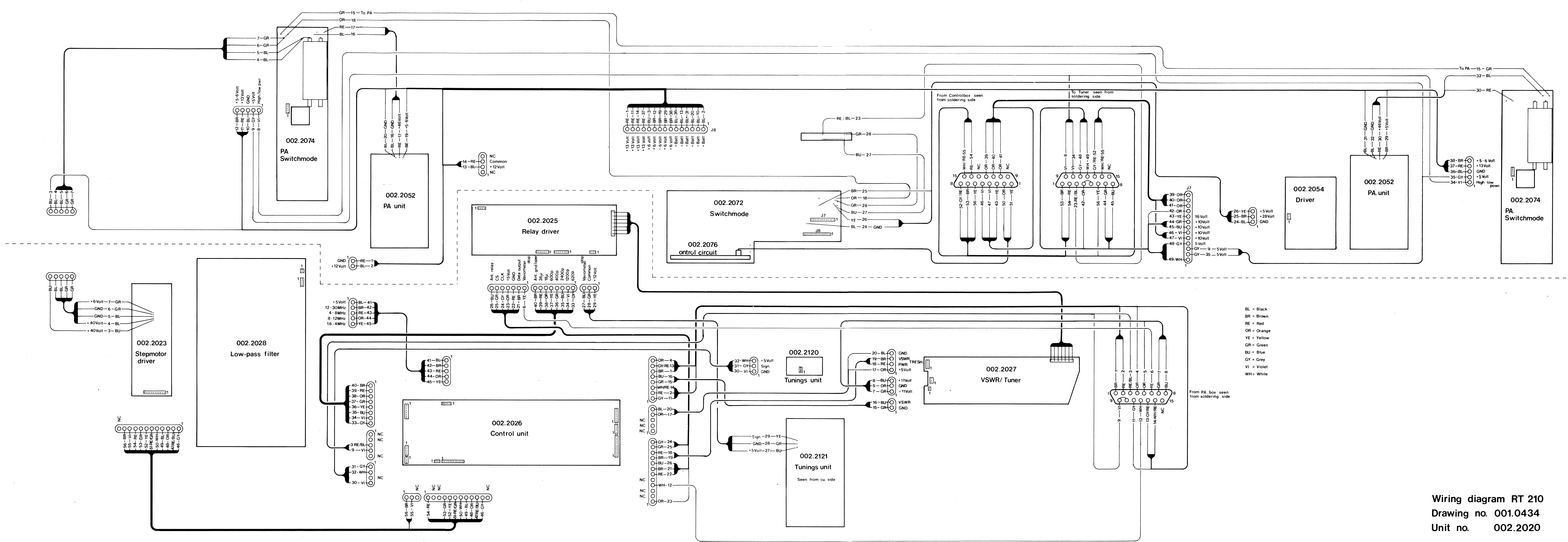


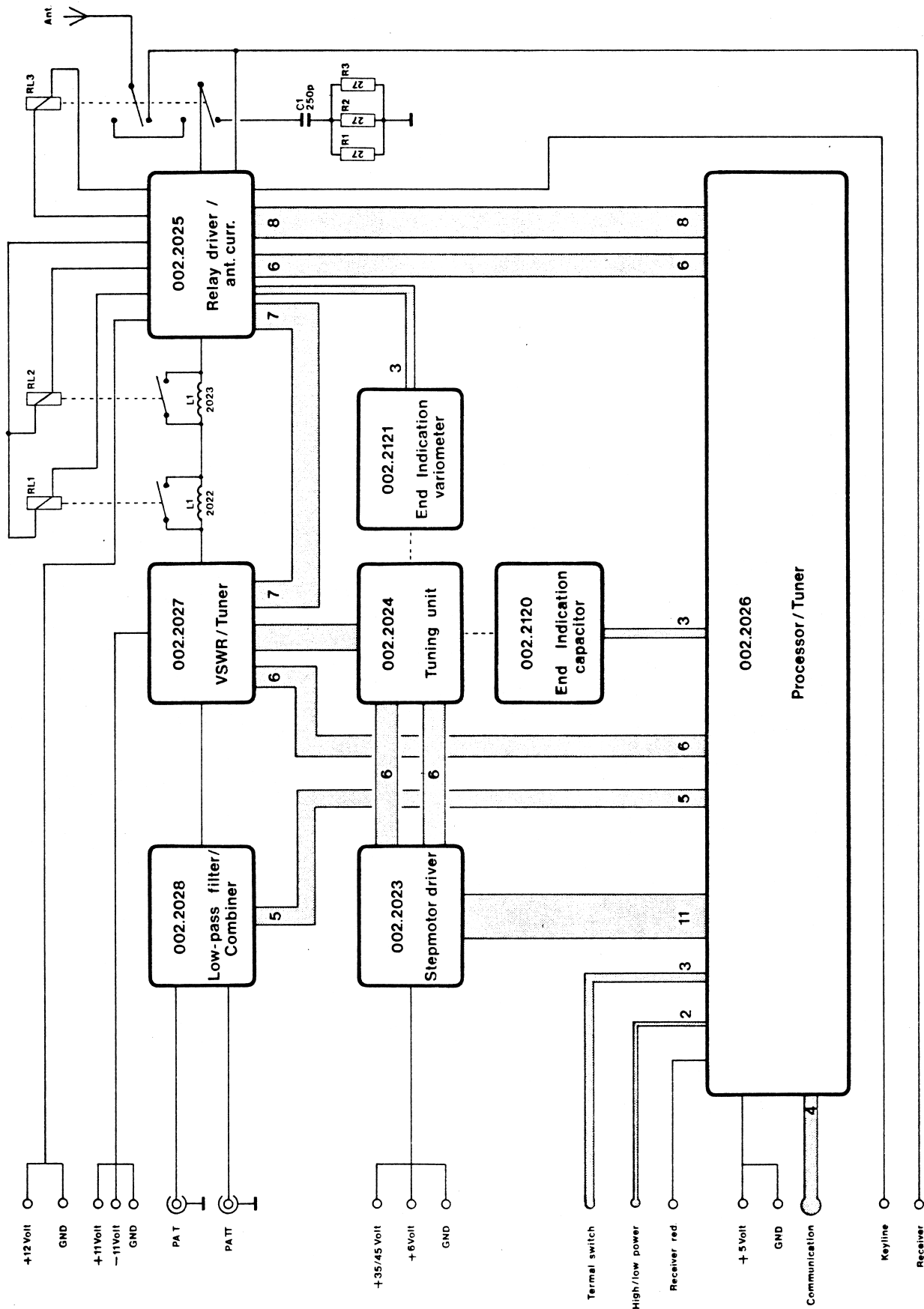
**Junction box    Unit no. 002.2014**

D1-2	Diode	SKND 20	38.111
F1-2	Fuse	35A	55.424

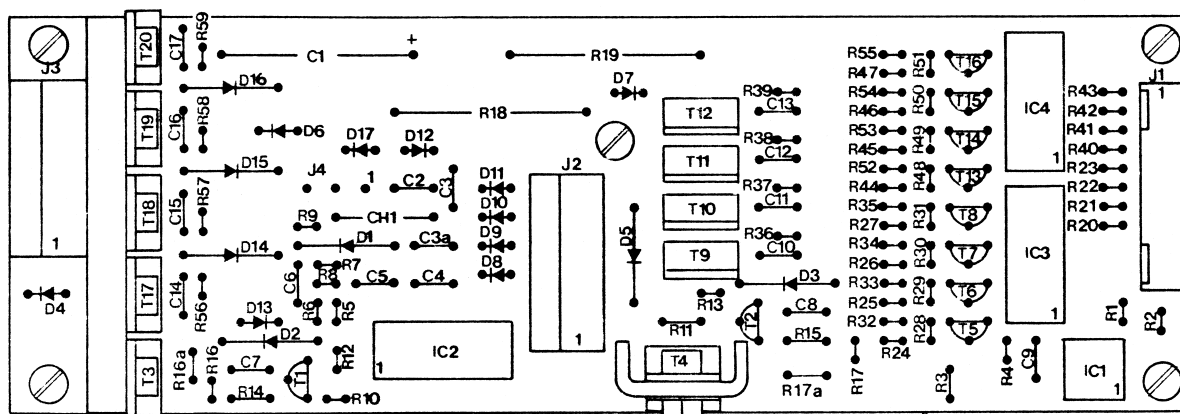


Block diagram for PA box  
Drawing no. 001.0431  
Unit no. 002.2020

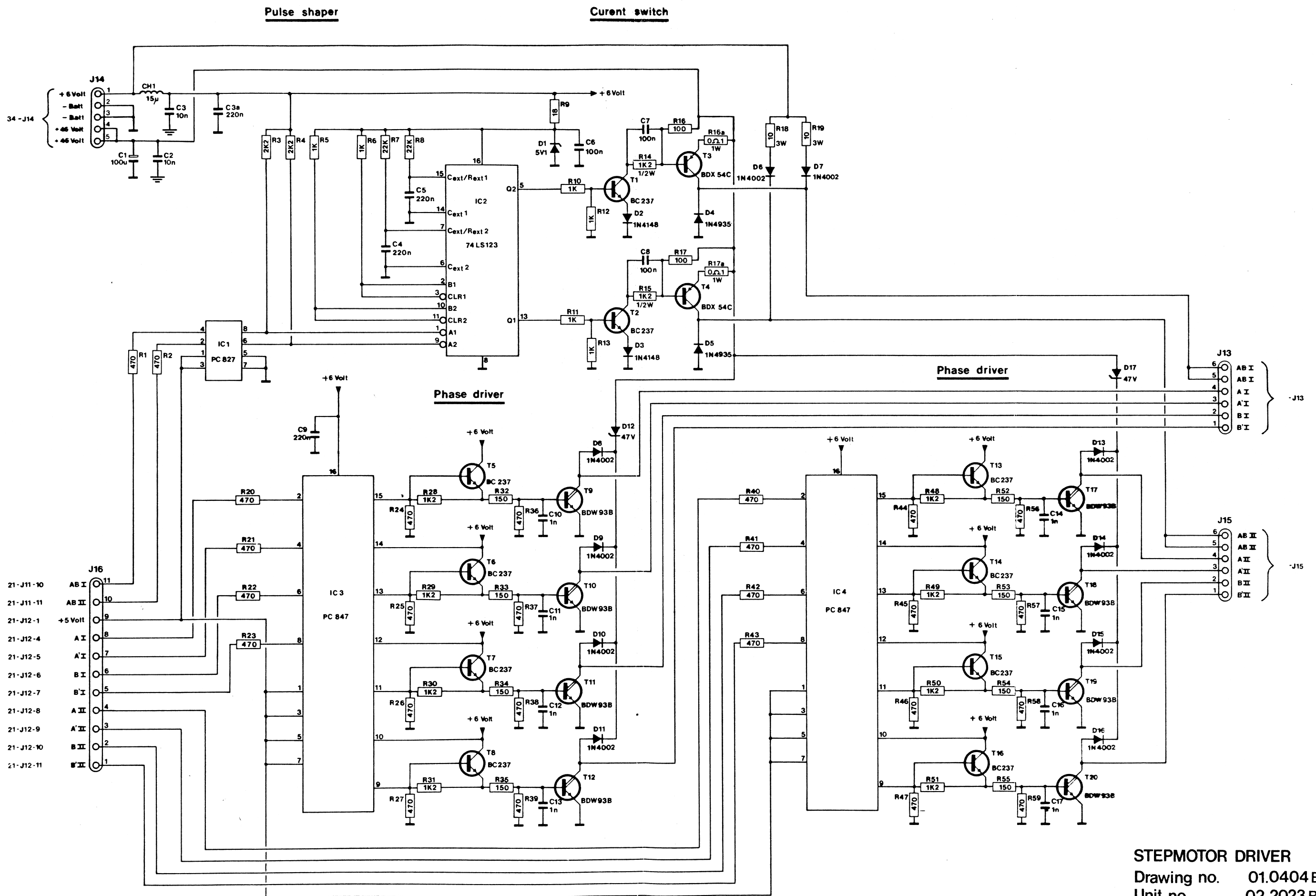




Block diagram for Tuner  
Drawing no. 001.0403  
Unit no. 002.2022



**STEPMOTOR DRIVER**  
 Layout no. 33.2023 B



STEPMOTOR DRIVER  
 Drawing no. 01.0404B  
 Unit no. 02.2023B  
 PC. Board no. 03.2023B  
 Layout no. 33.2023B

STEPMOTOR DRIVER UNIT NO. 02.2023B

Circuit Board

03.2023B

Cabling stp. modr.

05.2023

R1-2	Resistor	470 Ohm	1/3W	5%	01.245
R3-4	Resistor	2.2 Kohm	1/3W	5%	01.253
R5-6	Resistor	1 Kohm	1/3W	5%	01.249
R7-8	Resistor	22 Kohm	1/3W	5%	01.265
R9	Resistor	18 Ohm	1/3W	5%	01.228
R10-13	Resistor	1 Kohm	1/3W	5%	01.249
R14-15	Resistor	1.2 Kohm	1/3W	5%	01.350
R16	Resistor	120 Ohm	1/3W	5%	01.238
R16a	Resistor	0.1 Ohm	1/3W	5%	01.401
R17	Resistor	120 Ohm	1/3W	5%	01.238
R17a	Resistor	0.1 Ohm	1/3W	5%	01.401
R18-19	Resistor	10 Ohm	3W	5%	02.225
R20-27	Resistor	470 Ohm	1/3W	5%	01.245
R28-31	Resistor	1.2 Kohm	1/3W	5%	01.250
R32-35	Resistor	150 Ohm	1/3W	5%	01.239
R36-47	Resistor	470 Ohm	1/3W	5%	01.245
R48-51	Resistor	1.2 Kohm	1/3W	5%	01.250
R52-55	Resistor	150 Ohm	1/3W	5%	01.239
R56-59	Resistor	470 Ohm	1/3W	5%	01.245

C1	Capacitor, ellyt	100 uF	63V		12.637
C2-3	Capacitor, cer	10 nF	30V		14.907
C3a-5	Capacitor, pol	220 nF	63V		11.840
C6	Capacitor, cer	100 nF	63V		14.913
C7-8	Capacitor, pol	100 nF	63V		11.836
C9	Capacitor, pol	220 nF	63V		11.840
C10-17	Capacitor, cer	1 nF	40V		14.902

CH1	Choke	15 uH			22.102
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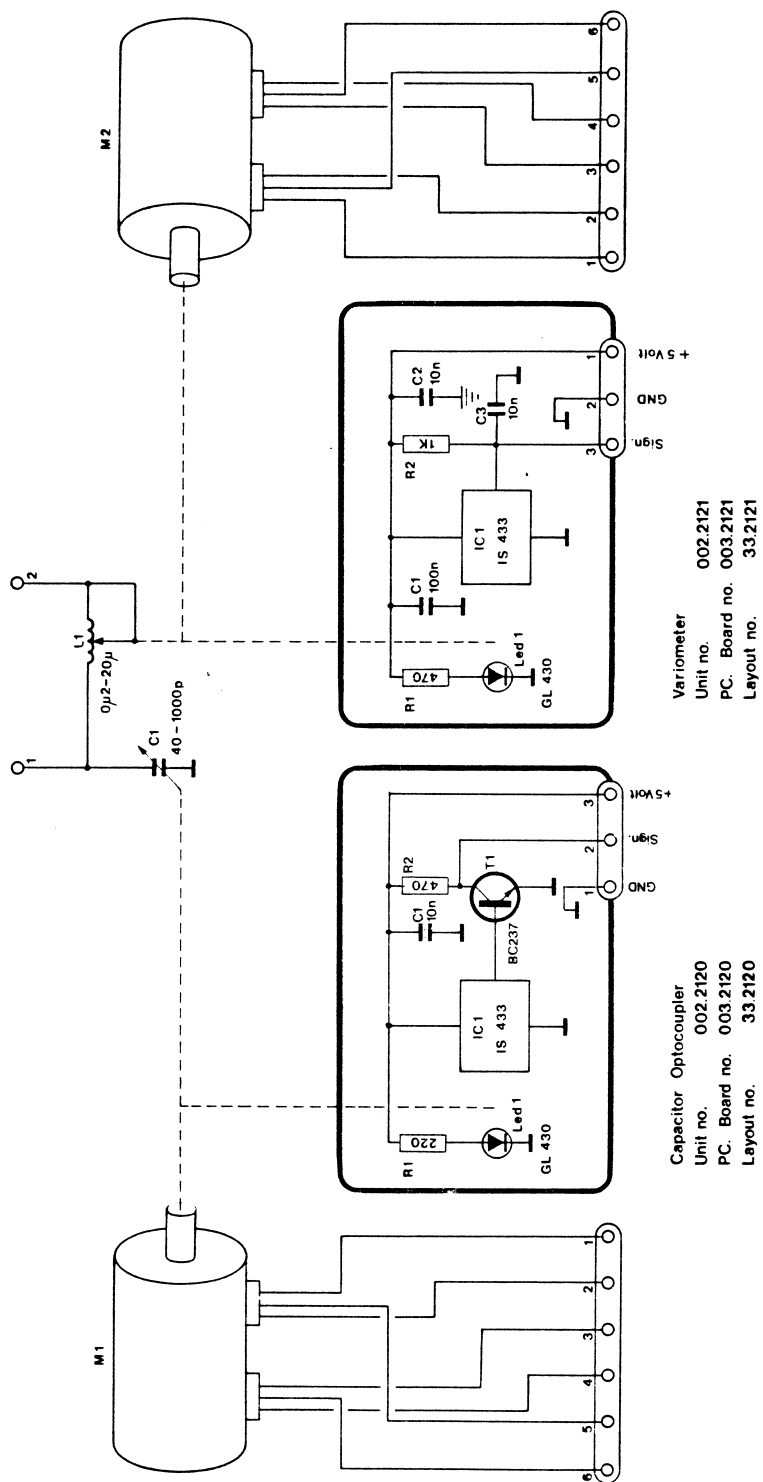
T1-2	Transistor	BC 237B			32.101
T3-4	Transistor	BDX 54C			30.117
T5-8	Transistor	BC 237B			32.101
T9-12	Transistor	BDW 93B			30.109
T13-16	Transistor	BC 237B			32.101
T17-20	Transistor	BDW 93B			30.109

IC1	Integrated Circuit	OPTO PC827			39.807
IC2	Integrated Circuit	74LS 123			36.171
IC3-4	Integrated Circuit	OPTO PC847			39.809

# Danish Communication Systems A/S

D1	Diode, zener	5.1V	0.4W	39.707
D2-3	Diode,	1N4148		39.103
D4	Diode,	1N4935		38.115
D5	Diode,	1N4935		38.115
D6-11	Diode,	1N4002		38.103
D12	Diode, zener	47V		39.712
D13-16	Diode,	1N4002		38.103
D17	Diode, zener	47V		39.712
	Mica washer			34.907
	Nipple			34.908
	Bracket			65.631
	Stay 4x5			70.401
	11 pol. Connector with lock			80.817
	6 pol. Connector with lock			80.819
	Heat sink for stepm. module 2023			83.238
	Heat sink			83.241
	Nut 3 MG			90.301
	Screw 3x6 CHJ F.-Z.			90.314
	Screw 3x8 CHJ F.-Z.			90.315

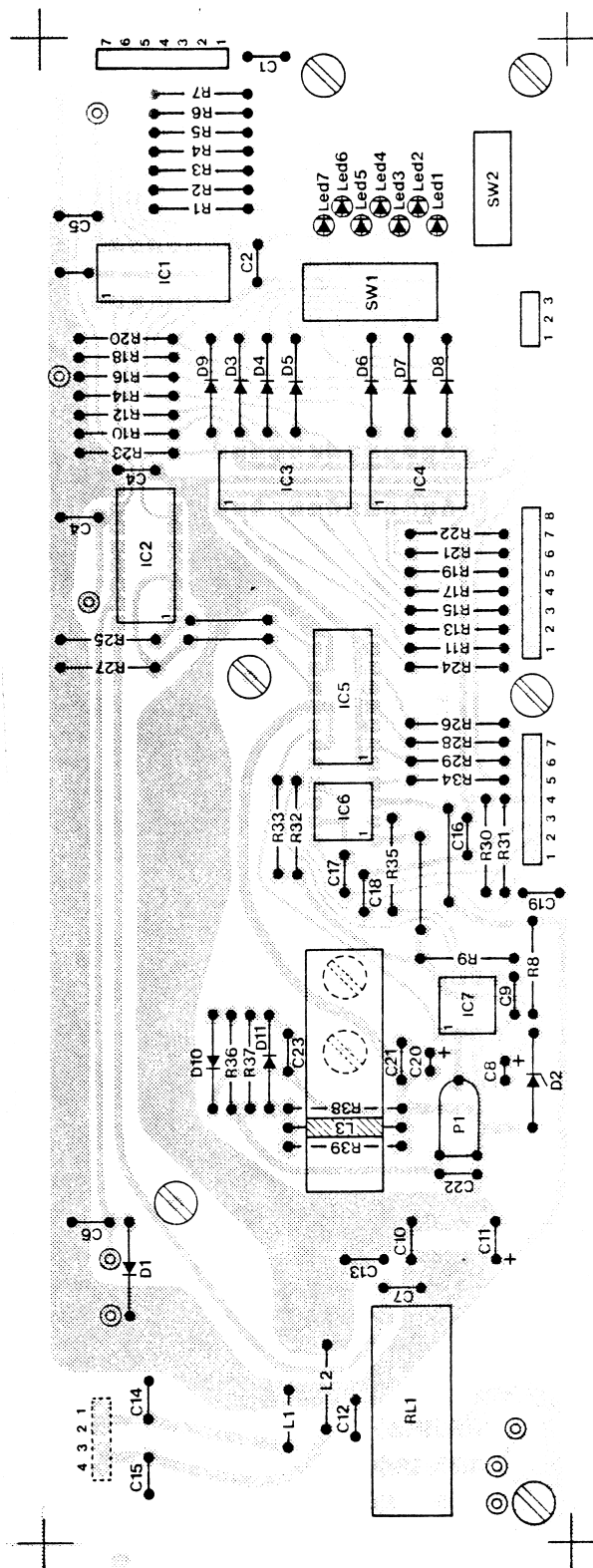




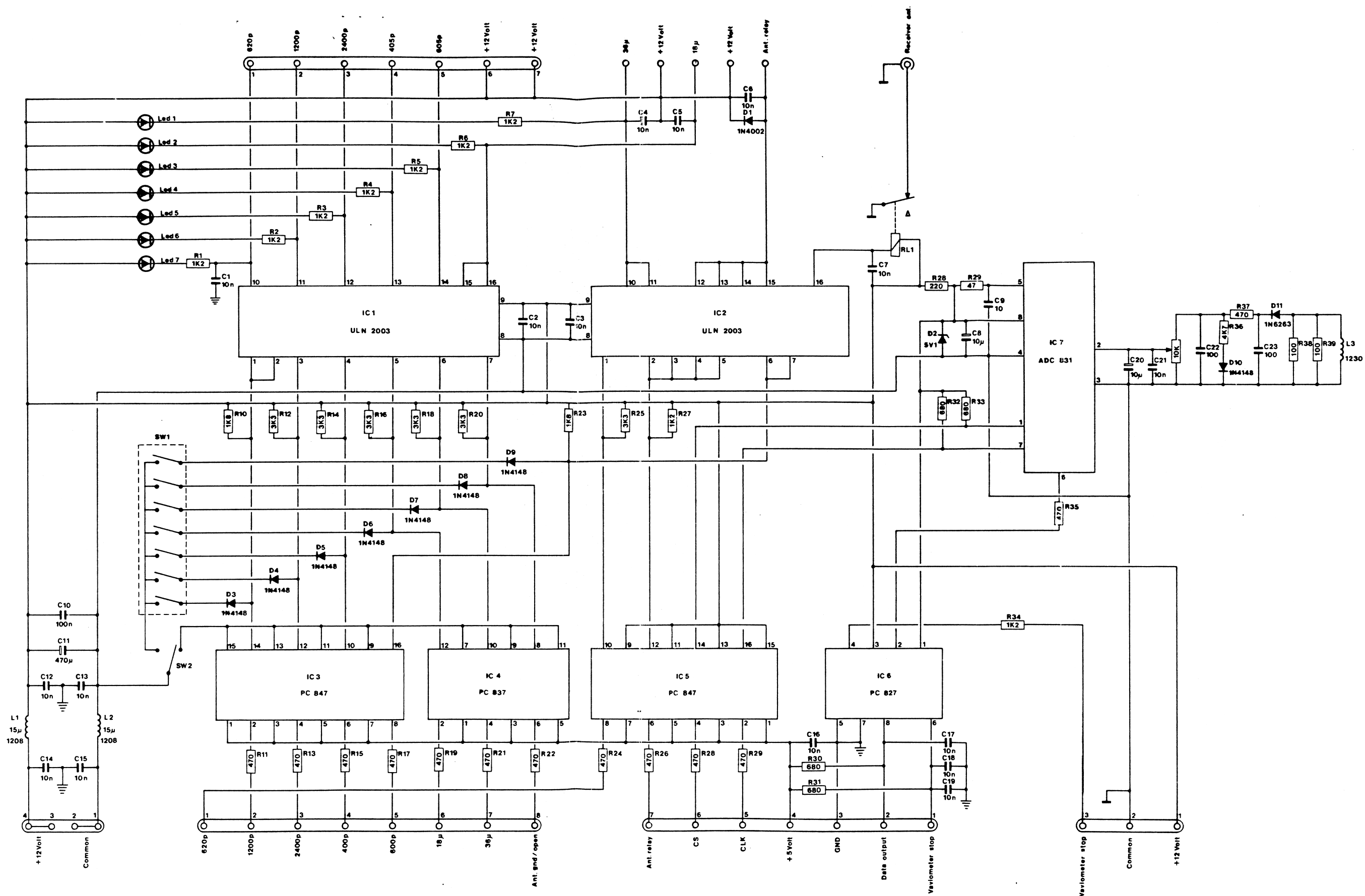
Tunings unit

Drawing no. 001.0410A

Unit no. 002.2024



Relay driver  
Layout no. 33.2025



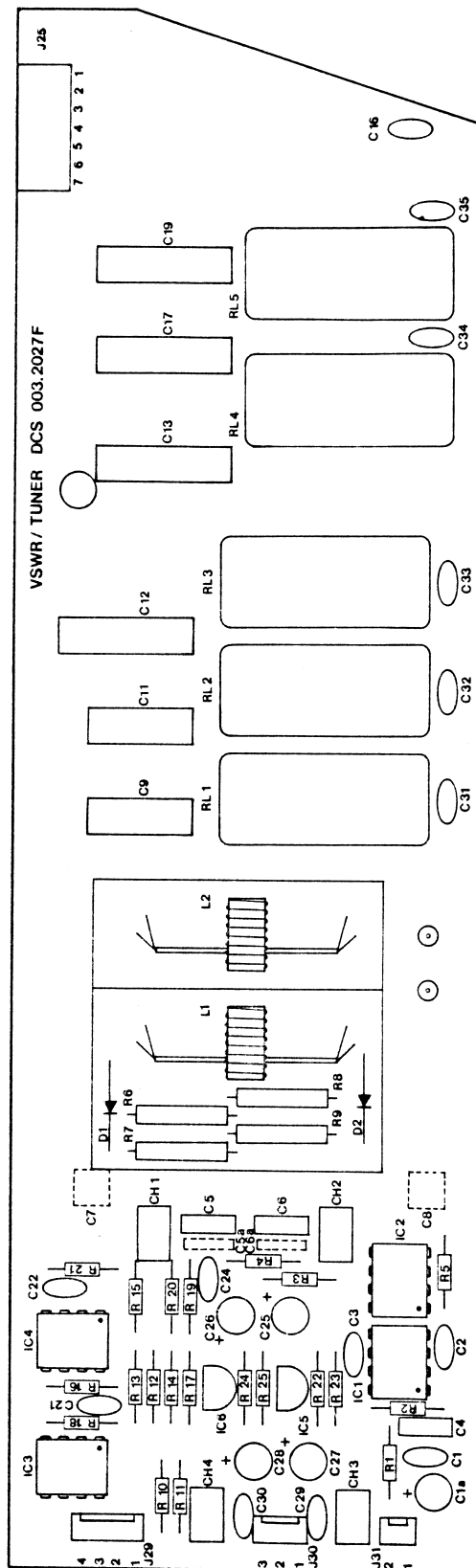
Relay driver  
 Drawing no. 001.0405  
 Unit no. 002.2025  
 PC. Board no. 003.2025B  
 Layout no. 33.2025

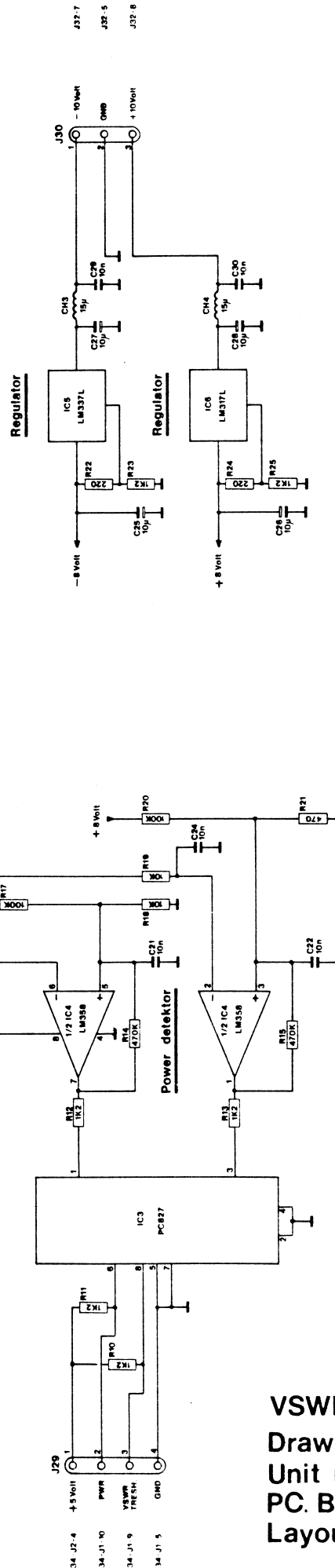
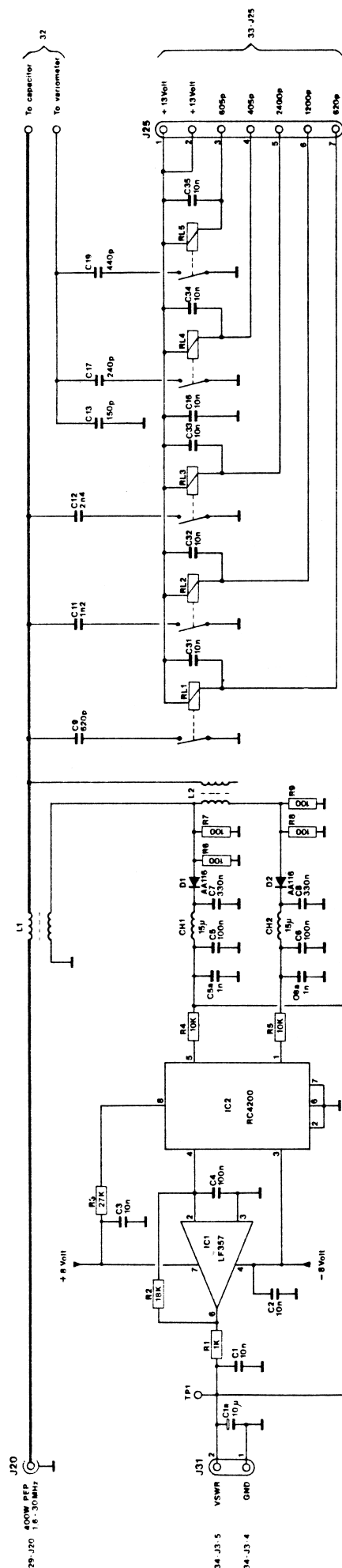
LED 1	Light Diode	red	39.305
LED 2	Light Diode	red	39.305
LED 3	Light Diode	red	39.305
LED 4	Light Diode	red	39.305
LED 5	Light Diode	red	39.305
LED 6	Light Diode	red	39.305
LED 7	Light Diode	red	39.305

SW1	Switch	Dual Switch	88.203
SW2	Switch	Toggle Switch	88.101

L1-2	Coil		004.1208
L3	Coil		004.1230

VSWR / TUNER  
Layout no. 33.2027 F





## VSWR/TUNER

**Drawing no. 01.0407 F**

Unit no. 02.2027 F

PC. Board no. 03.2027 F

Layout no 33.2027 F

## VSWR/TUNER UNIT NO. 002.2027F

## Circuit board

03.2027F

R1	Resistor	1 Kohm	1/3W	5%	01.149
R2	Resistor	18 Kohm	1/3W	5%	01.164
R3	Resistor	27 Kohm	1/3W	5%	01.166
R4-5	Resistor	10 Kohm	1/3W	5%	01.161
R6-9	Resistor	100 Ohm			06.106
R10-13	Resistor	1,2 Kohm	1/3W	5%	01.150
R14-15	Resistor	470 Kohm	1/3W	5%	01.181
R16	Resistor	10 Kohm	1/3W	5%	01.161
R17	Resistor	100 Kohm	1/3W	5%	01.173
R18-19	Resistor	10 Kohm	1/3W	5%	01.161
R20	Resistor	100 Kohm	1/3W	5%	01.173
R21	Resistor	470 Kohm	1/3W	5%	01.145
R22	Resistor	220 Ohm	1/3W	5%	01.141
R23	Resistor	1,2 Kohm	1/3W	5%	01.150
R24	Resistor	220 Ohm	1/3W	5%	01.141
R25	Resistor	1,2 Kohm	1/3W	5%	01.150

P1 Resistor, pre-set

C1	Capacitor, cer	10 nF	30V	14.907
C1a	Capacitor, ellyt	10 uF		12.865
C2-3	Capacitor, cer	10 nF	30V	14.907
C4	Capacitor, cer	100 nF	63V	14.913
C5-6	Capacitor, poly	100 nF	63V	11.836
C5a-6a	Capacitor, chip	1 nF	100V	15.401
C7-8	Capacitor, chip	330 nF		15.407
C9	Capacitor, cer	620 pF	1KV	15.419
C10	Not used			
C11	Capacitor, cer	1,2 nF	1KV	15.420
C12	Capacitor, cer	2,4 nF	1KV	15.421
C13	Capacitor, cer	150 pF	3KV	15.423
C14-15	Not used			
C16	Capacitor, cer	10 nF	30V	14.904
C17	Capacitor, cer	240 pF	3KV	15.424
C18	Not used			
C19	Capacitor, cer	440 pF	3KV	15.425
C20	Not used			
C21-22	Capacitor, cer	10 nF	30V	14.907
C23	Not used			
C24	Capacitor, cer	10 nF	30V	14.907
C25-28	Capacitor, ellyt	10 uF	63V	12.865
C29-35	Capacitor, cer	10 nF	30V	14.907

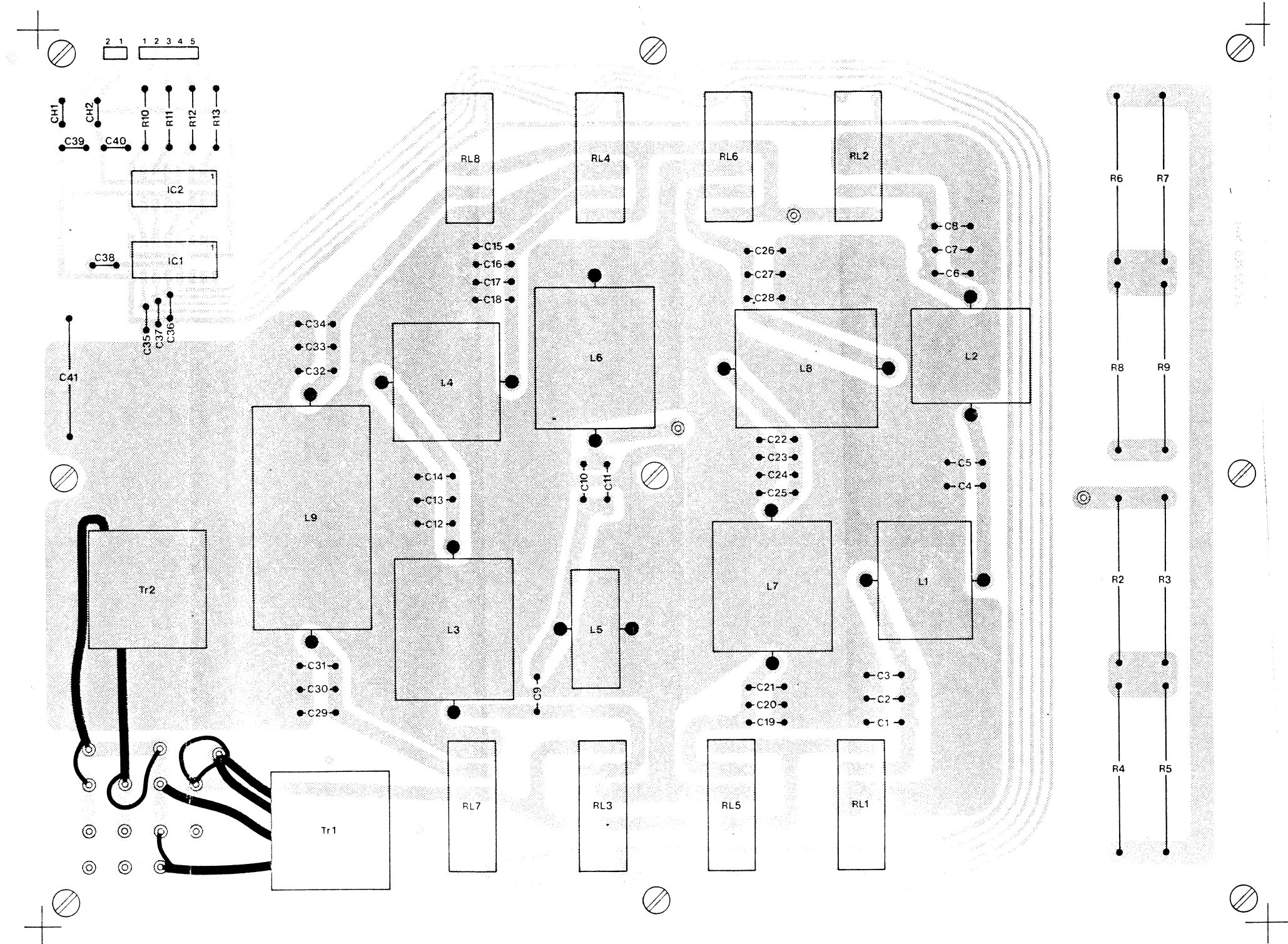
CH1-4 Choke

15 uH

22.226

L1-2 Coil

04.2025

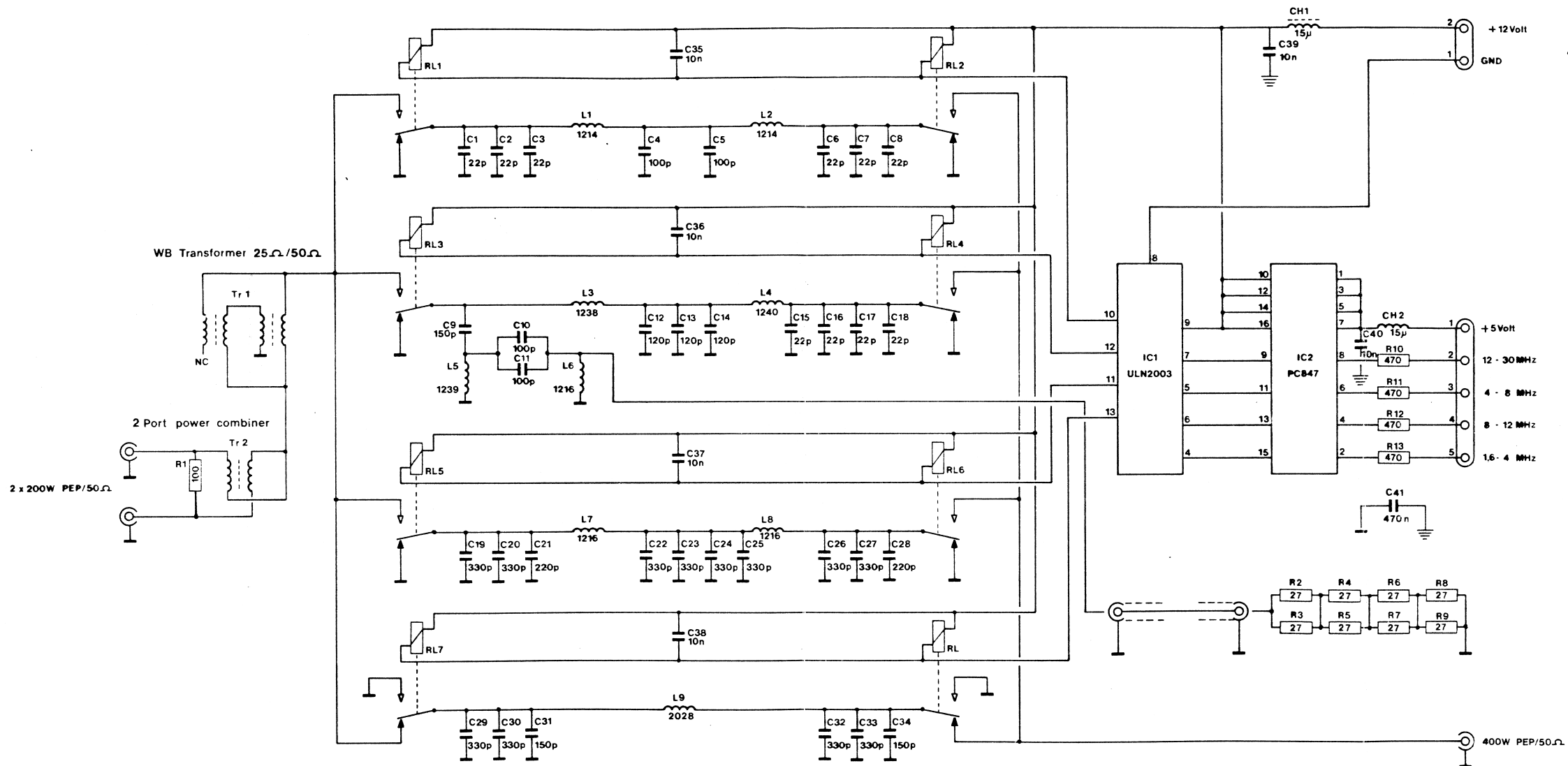


Low-pass filter  
Layout no. 33.2028



DANISH COMMUNICATION SYSTEMS A/S

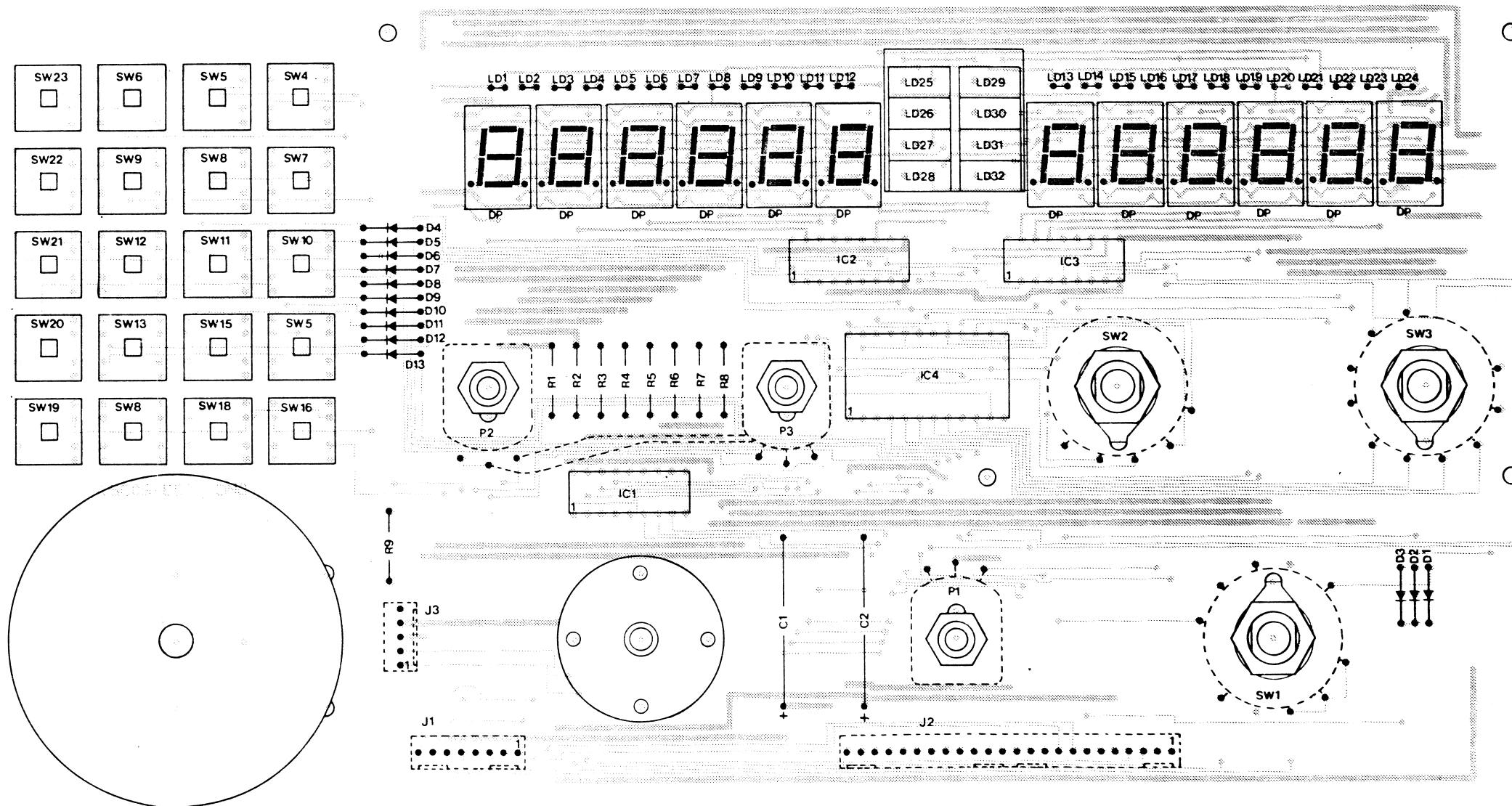
RL1-5	Relay	SPST	16A	27.128
D1-2	Diode	AA116		39.102
IC1	Integrated circuit	LF 357N		35.114
IC2	Integrated circuit	RC 4200		36.513
IC3	Integrated circuit	PC 827		39.807
IC4	Integrated circuit	LM 358N		35.112
IC5	Integrated circuit	LM 337		35.136
IC6	Integrated circuit	LM 317		35.135
J25	Connector			80.651
J29	Connector			80.655
J30	Connector			80.653
J31	Connector			80.651
Shell box				65.477
Stoy				70.402
Pin				80.603
Screw				90.317
Strip				67.239
Cabling				05.2025
Cabling				05.2026



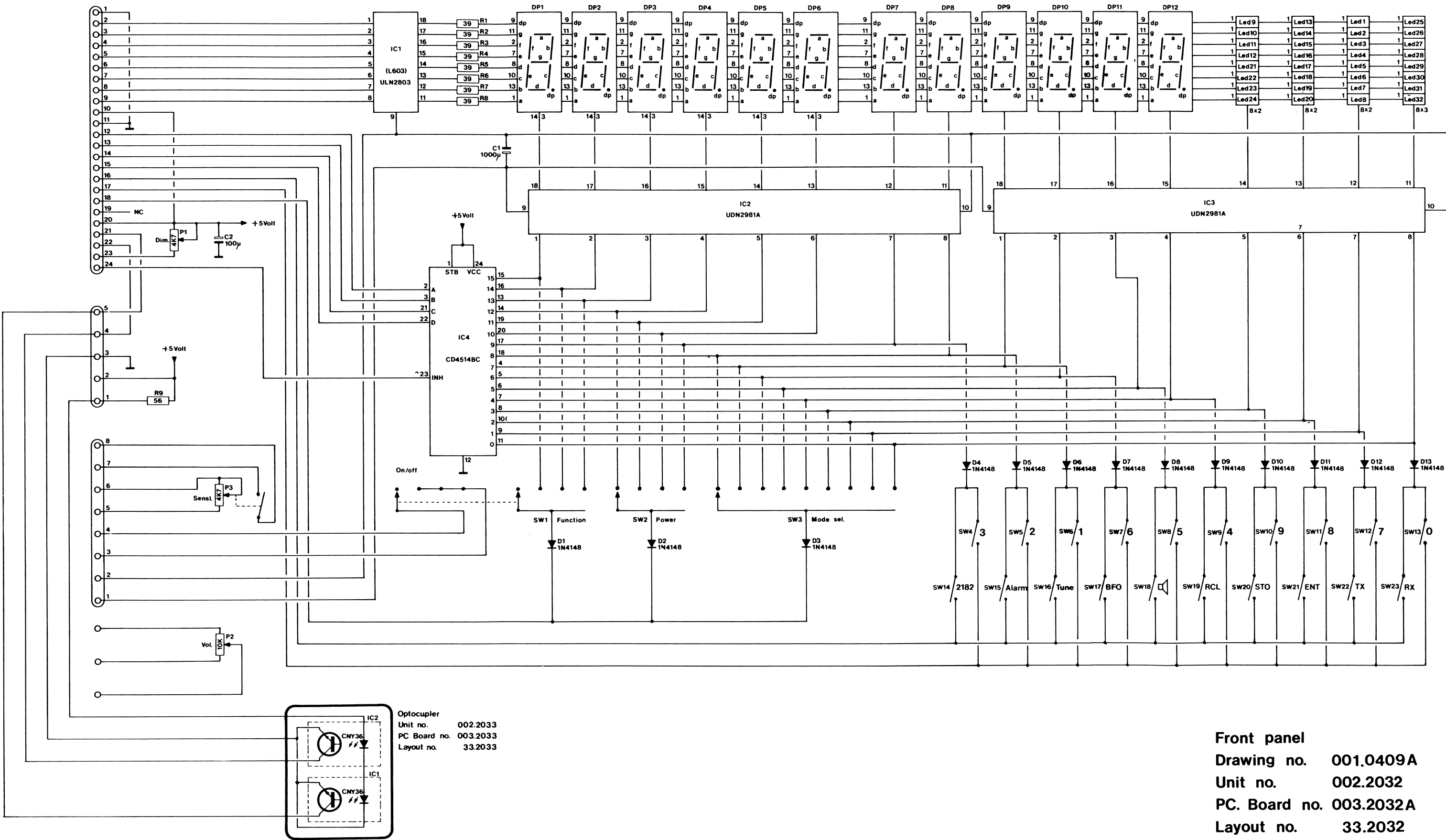
Low-pass filter  
 Drawing no. 001.0408  
 Unit no. 002.2028  
 PC. Board no. 003.2028B  
 Layout no. 33.2028

# Low pass filter Unit no.002.2028

R1	Resistor	100 Ohm			
R2-9	Resistor	27 Ohm	6W	5%	02.399
R10-13	Resistor	470 Ohm	1/3W	5%	01.145
C1-3	Capacitor, cer	22 pF	1KV		15.210
C4-5	Capacitor, cer	100 pF	1KV		15.203
C6-8	Capacitor, cer	22 pF	1KV		15.210
C9	Capacitor, cer	150 pF	1KV		15.205
C10-11	Capacitor, cer	100 pF	1KV		15.203
C12-14	Capacitor, cer	120 pF	1KV		15.204
C15-18	Capacitor, cer	22 pF	1KV		15.210
C19-20	Capacitor, cer	330 pF	1KV		15.208
C21	Capacitor, cer	220 pF	1KV		15.206
C22-27	Capacitor, cer	330 pF	1KV		15.208
C28	Capacitor, cer	220 pF	1KV		15.206
C29-30	Capacitor, cer	330 pF	1KV		15.208
C31	Capacitor, cer	150 pF	1KV		15.205
C32-33	Capacitor, cer	330 pF	1KV		15.208
C34	Capacitor, cer	150 pF	1KV		15.205
C35-40	Capacitor, cer	10 nF	30V		14.907
C41	Capacitor, sty	470 nF	100V		11.533
CH1-2	Choke	15 uH	0.6A		22.118
RL1-8	Relay	15A	12V		27.124
IC1	Integrated Circuit	ULN2003A			35.122
IC2	Integrated Circuit	OPTO PC 847			39.809
L1-2	Coil				004.1214
L3	Coil				004.1238
L4	Coil				004.1240
L5	Coil				004.1239
L6-8	Coil				004.1216
L9	Coil				004.2028

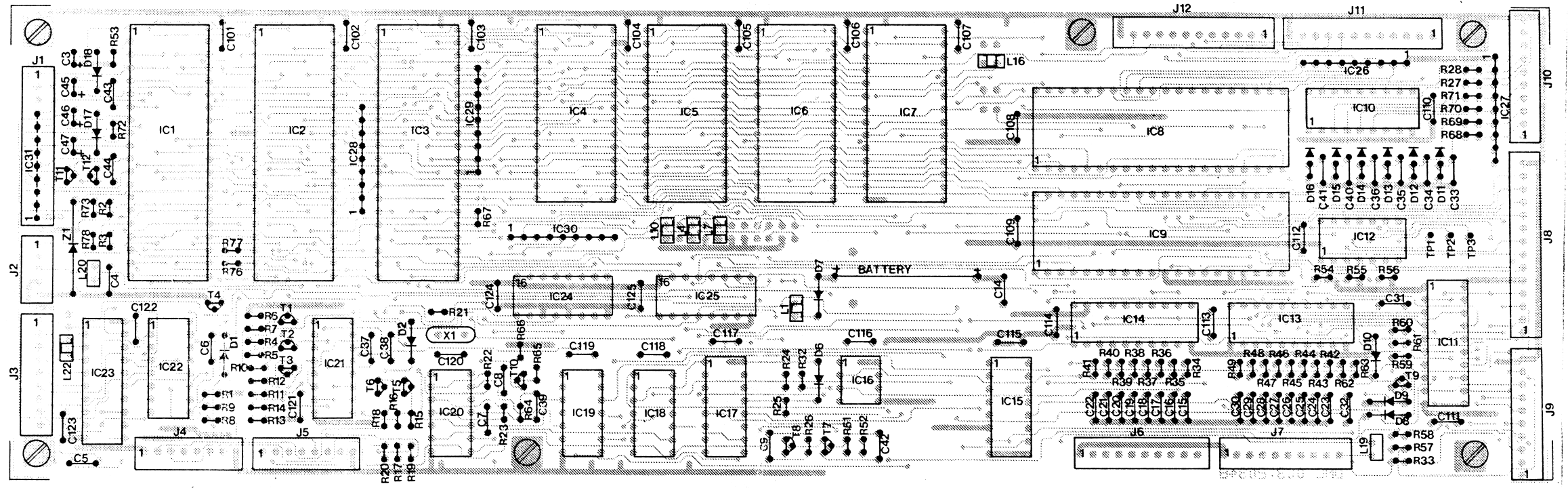


Front panel  
Layout no. 33.2032



Optocoupler  
Unit no. 002.2033  
PC Board no. 003.2033  
Layout no. 33.2033

Front panel  
Drawing no. 001.0409A  
Unit no. 002.2032  
PC. Board no. 003.2032A  
Layout no. 33.2032



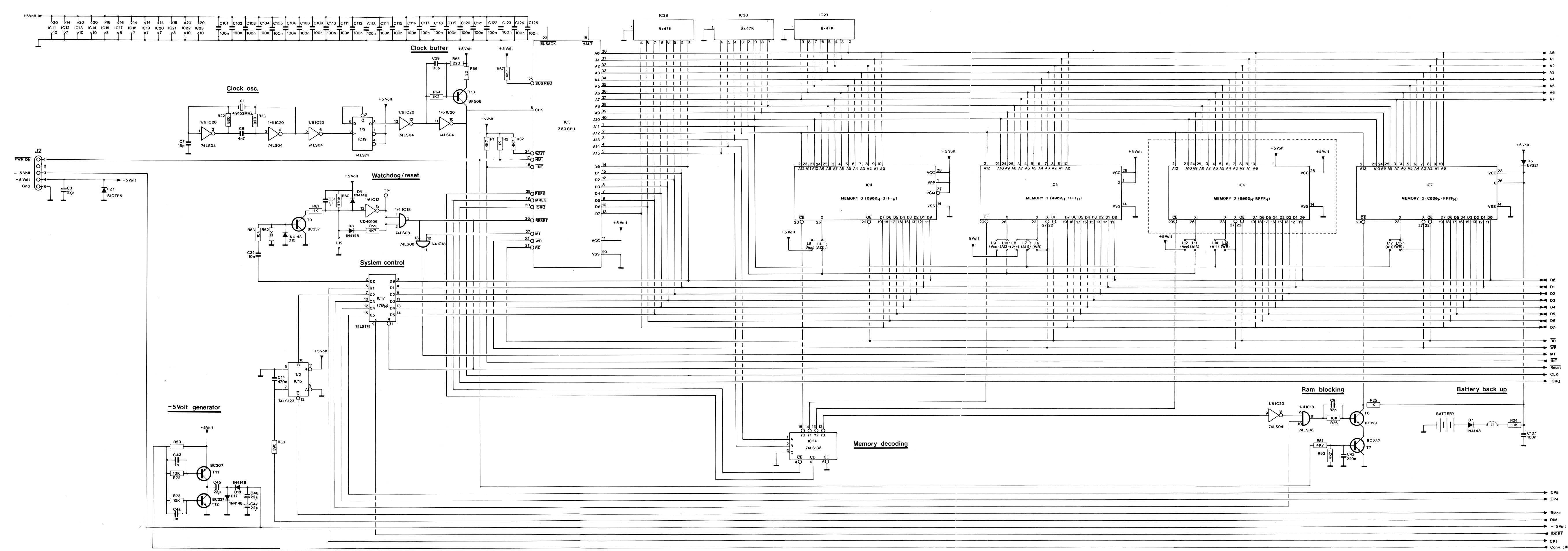
Micro-processor  
Layout no. 33.2034C

## Front panel Unit no. 002.2032

R1-8	Resistor	39 ohm	1/3W	5%	01.132
R9	Resistor	56 ohm	1/3W	5%	01.134
P1	Resistor	4.7 Kohm	preset		05.219
P2	Resistor	10 Kohm	preset		05.220
P3	Resistor	4.7 Kohm	preset		05.221
C1	Capacitor, ellyt	1000 uF	10V		12.150
C2	Capacitor, ellyt	100 uF	16V		12.237
IC1	Integrated Circuit	TR ARRAY L603			35.130
IC2-3	Integrated Circuit	UDN 2981A			35.131
IC4	Integrated Circuit	CD 4514BCH			36.514
DP1-12	Display				36.201
D1-13	Diode	1N4148			39.103
LD1-24	Light Diode	red			39.313
LD25-32	Light Diode	red			39.310
SW1	Switch				86.145
SW2	Switch				86.146
SW3	Switch				86.144
SW4-24	Switch				86.351

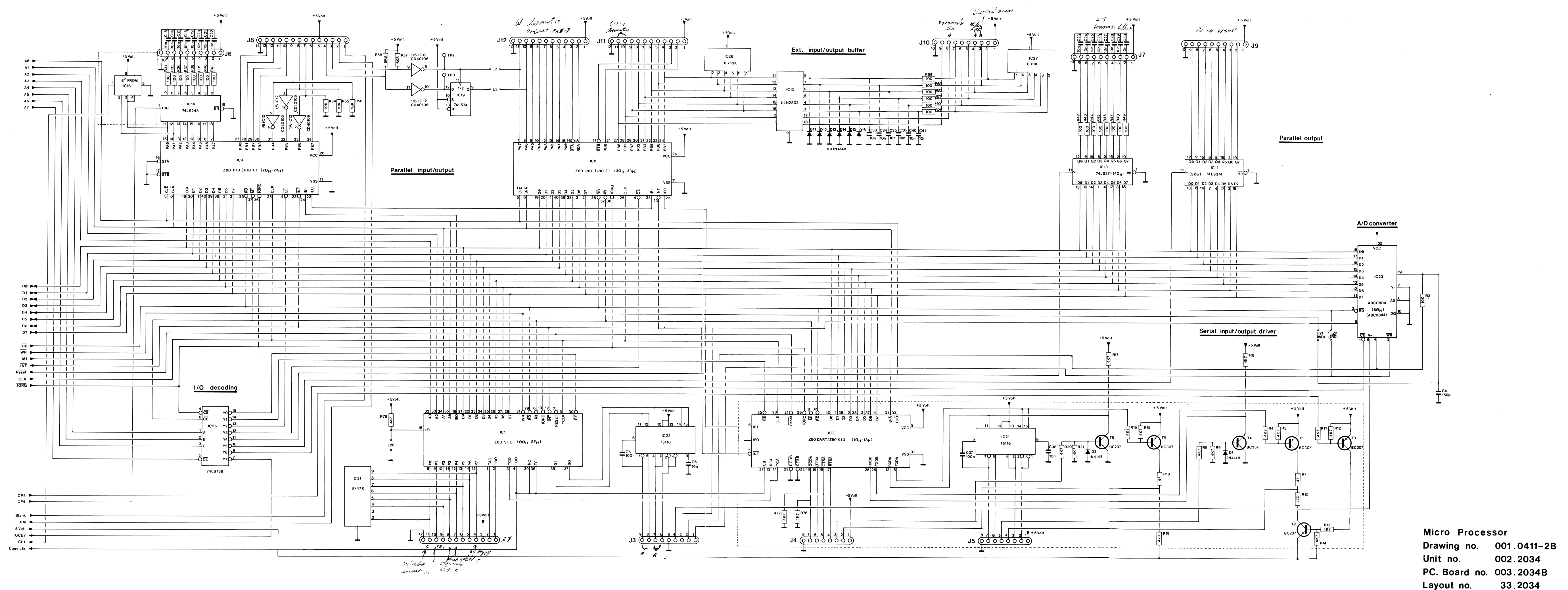
## Optocoupler Unit no. 002.2033

IC1-2	Integrated Circuit	CNY 36			39.810
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Micro Processor  
Drawing no. 001.0411-1B  
Unit no. 002.2034  
PC. Board no. 003.2034B  
Layout no. 33.2034



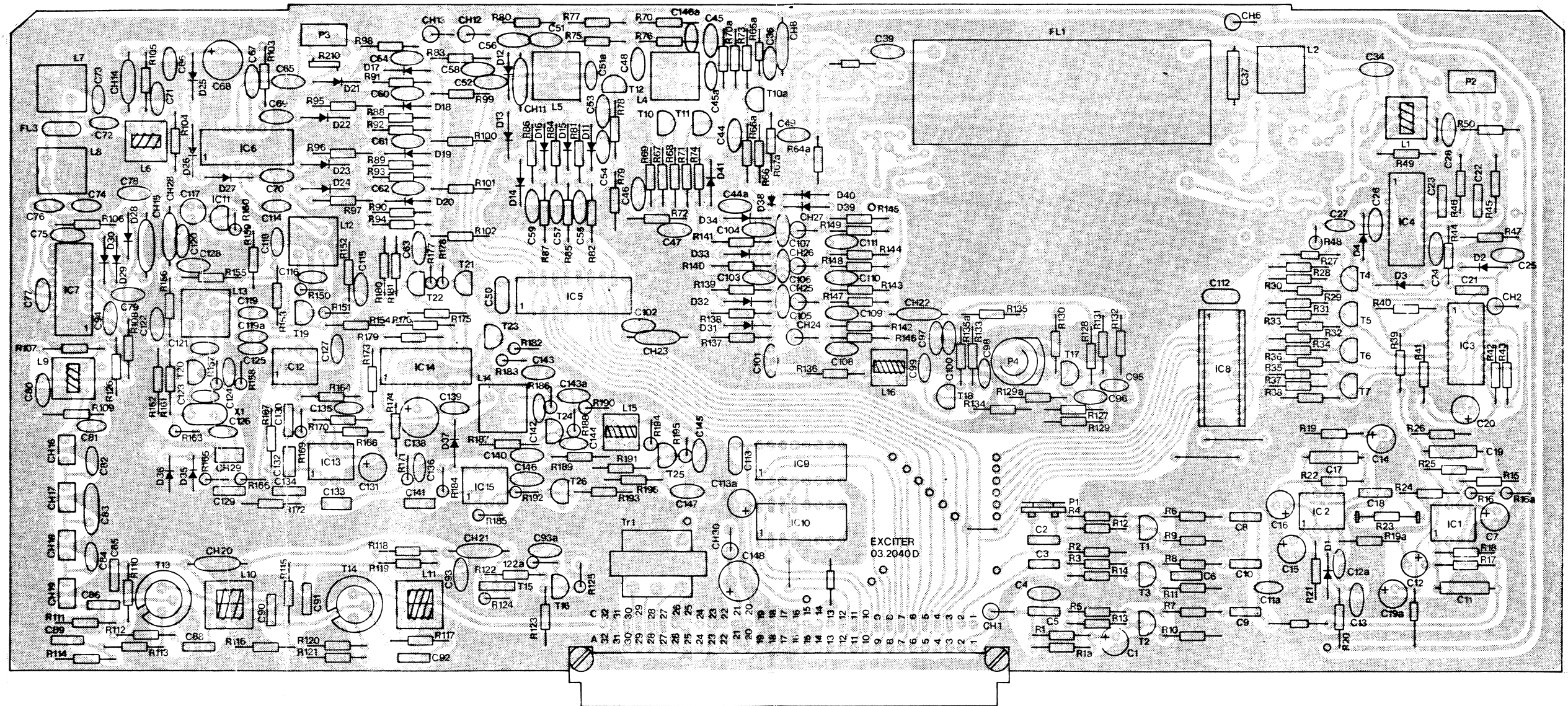


# Micro-processor Unit no. 002.2034C

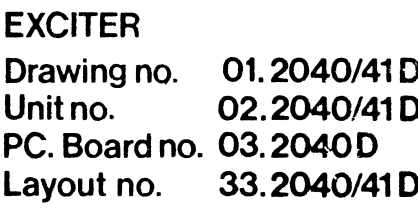
R1	Resistor	4.7 Kohm	1/3W	5%	01.257
R2	Resistor	1 Kohm	1/3W	5%	01.249
R3	Resistor	10 Kohm	1/3W	5%	01.261
R4-6	Resistor	4.7 Kohm	1/3W	5%	01.257
R7	Resistor	47 Ohm	1/3W	5%	01.233
R8-9	Resistor	4.7 Kohm	1/3W	5%	01.257
R10	Resistor	470 Ohm	1/3W	5%	01.245
R11-17	Resistor	4.7 Kohm	1/3W	5%	01.257
R18	Resistor	47 Ohm	1/3W	5%	01.233
R19	Resistor	470 Ohm	1/3W	5%	01.245
R20-21	Resistor	4.7 Kohm	1/3W	5%	01.257
R22-23	Resistor	820 Ohm	1/3W	5%	01.248
R24	Resistor	10 Kohm	1/3W	5%	01.261
R25	Resistor	1 Kohm	1/3W	5%	01.249
R26	Resistor	1 Kohm	1/3W	5%	01.261
R27-28	Resistor	100 Ohm	1/3W	5%	01.237
R29	Not Used				
R30	Not Used				
R31	Not Used				
R32	Resistor	4.7 Kohm	1/3W	5%	01.257
R33	Resistor	390 Ohm	1/3W	5%	01.244
R34-49	Resistor	100 Ohm	1/3W	5%	01.237
R50	Not Used				
R51-52	Resistor	4.7 Kohm	1/3W	5%	01.257
R53	Not Used				
R54-56	Resistor	10 Kohm	1/3W	5%	01.261
R57-58	Resistor	6.8 Kohm	1/3W	5%	01.259
R59	Resistor	4.7 Kohm	1/3W	5%	01.257
R60	Resistor	470 Kohm	1/3W	5%	01.281
R61	Resistor	1 Kohm	1/3W	5%	01.249
R62-63	Resistor	10 Kohm	1/3W	5%	01.261
R64	Resistor	1.2 Kohm	1/3W	5%	01.250
R65	Resistor	220 Ohm	1/3W	5%	01.241
R66	Resistor	22 Ohm	1/3W	5%	01.229
R67	Resistor	4.7 Kohm	1/3W	5%	01.257
R68-69	Resistor	100 Ohm	1/3W	5%	01.237
R70	Not Used				
R71	Not Used				
R72-73	Resistor	10 Kohm	1/3W	5%	01.261
R74	Not Used				
R75	Not Used				
R76-78	Resistor	4.7 Kohm	1/3W	5%	01.257
C1	Not Used				
C2	Not Used				
C3	Capacitor, ellyt	22 uF	16V		12.807
C4	Capacitor, cer	150 pF	63V		14.339
C5	Capacitor, cer	100 nF	63V		14.913
C6	Capacitor, cer	10 nF	30V		14.907
C7	Capacitor, cer	15 pF			14.127
C8	Capacitor, cer	4.7 nF		10%	14.357
C9	Capacitor, cer	82 pF	25V		14.336
C10	Not Used				
C11	Not Used				
C12	Not Used				
C13	Not Used				

C14	Capacitor, poly	0.47 uF	63V	11.844
C15-30	Capacitor, cer	10 nF	30V	14.907
C31	Capacitor, poly	1 uF	63V	11.848
C32-36	Capacitor, cer	10 nF	30V	14.907
C37	Capacitor, cer	100 nF	63V	14.913
C38	Capacitor, cer	10 nF	30V	14.907
C39	Capacitor, cer	33 pF		14.131
C40-41	Capacitor, cer	10 nF	30V	14.907
C42	Capacitor, poly	0.22 uF	63V	11.840
C43	Not Used			
C44	Not Used			
C45-47	Capacitor, ellyt	22 uF	16V	12.807
C48-100	Not Used			
C101-125	Capacitor, cer	100 nF	63V	14.913
T1	Transistor	BC 307		32.102
T2	Transistor	BC 237B		32.101
T3	Transistor	BC 307		32.102
T4	Transistor	BC 237B		32.101
T5	Transistor	BC 307		32.102
T6-7	Transistor	BC 237B		32.101
T8	Transistor	BF 199		33.102
T9	Transistor	BC 237B		32.101
T10	Transistor	BF 506		33.108
T11	Transistor	BC 307		32.102
T12	Transistor	BC 237B		32.101
IC1				
IC2	Integrated Circuit	Z80 DART 28470		36.507
IC3	Integrated Circuit	280 CPU 8400		36.508
IC4				
IC5				
IC6				
IC7				
IC8-9	Integrated Circuit	Z80 P10 8420		36.509
IC10				
IC11	Integrated Circuit	74LS374		36.189
IC12	Integrated Circuit	74C14		36.191
IC13	Integrated Circuit	74LS374		36.189
IC14	Integrated Circuit	74LS245		36.194
IC15	Integrated Circuit	74LS123		36.171
IC16	Integrated Circuit	E PROM 27.128		36.827
IC17	Integrated Circuit	74LS174		36.195
IC18	Integrated Circuit	SN 74LS08		36.149
IC19	Integrated Circuit	SN 74LS74 AN		36.178
IC20	Integrated Circuit	74LS04		36.183
IC21-22	Integrated Circuit	75.116		35.121
IC23	Integrated Circuit	ADC 804 LCN		36.511
IC24-25	Integrated Circuit	74LS138		36.172
IC26	SIL	6x10 Kohm		
IC27	SIL	6x1 Kohm		
IC28	SIL	8x47 Kohm		
IC29	SIL	8x47 Kohm		
IC30	SIL	8x47 Kohm		
IC31	SIL	8x47 Kohm		

D1-2	Diode	1N4148	39.103
D3	Not Used		
D4	Not Used		
D5	Not Used		
D6	Diode	BYS 21	38.114
D7-17	Diode	1N4148	39.103
Z1		ZORB 5V	39.801
X1		4.9152 MHz	50.150







EXCITER UNIT No 002.2040  
WITHOUT USB/LSB

Circuit Board						03.2040 D
R1	Resistor	1 Kohm	1/3W	5%		01.149
R1a	Resistor	220 Ohm	1/3W	5%		01.141
R2	Resistor	5.6 Kohm	1/3W	5%		01.158
R3	Resistor	220 Kohm	1/3W	5%		01.177
R4	Resistor	10 Kohm	1/3W	5%		01.161
R5	Resistor	33 Kohm	1/3W	5%		01.167
R6-8	Resistor	3.9 Kohm	1/3W	5%		01.156
R9-14	Resistor	5.6 Kohm	1/3W	5%		01.158
R15	Resistor	22 Kohm	1/3W	5%		01.165
R16	Resistor	18 Kohm	1/3W	5%		01.264
R16a	Resistor	2.2 Kohm	1/3W	5%		01.253
R17	Resistor	47 Kohm	1/3W	5%		01.169
R18	Resistor	1.5 Kohm	1/3W	5%		01.151
R19	Resistor	22 Kohm	1/3W	5%		01.165
R19a	Resistor	10 Kohm	1/3W	5%		01.161
R20	Resistor	270 Ohm	1/3W	5%		01.142
R21	Resistor	1 Mohm	1/3W	5%		01.185
R22	Resistor	1 Kohm	1/3W	5%		01.149
R23	Resistor	Selected in final test				
R24	Resistor	10 Kohm	1/3W	5%		01.161
R25	Resistor	470 Kohm	1/3W	5%		01.181
R26	Resistor	1.5 Kohm	1/3W	5%		01.151
R27-38	Resistor	10 Kohm	1/3W	5%		01.161
R39	Resistor	1 Kohm	1/3W	5%		01.149
R40	Resistor	56 Ohm	1/3W	5%		01.134
R41	Resistor	220 Ohm	1/3W	5%		01.141
R42	Resistor	270 Ohm	1/3W	5%		01.142
R43	Resistor	470 Kohm	1/3W	5%		01.181
R44	Resistor	10 Kohm	1/3W	5%		01.161
R45-46	Resistor	22 Kohm	1/3W	5%		01.165
R47	Resistor	1 Kohm	1/3W	5%		01.149
R48	Resistor	5.6 Kohm	1/3W	5%		01.258
R49	Resistor	220 Ohm	1/3W	5%		01.141
R50	Resistor	27 Ohm	1/3W	5%		01.130
R51-64	Not used					
R64a	Resistor	560 Ohm	1/3W	5%		01.146
R65	Not used					
R65a	Resistor	5.6 Kohm	1/3W	5%		01.158
R66	Resistor	100 Kohm	1/3W	5%		01.173
R66a	Resistor	5.6 Kohm	1/3W	5%		01.158
R67	Resistor	10 Kohm	1/3W	5%		01.161
R67a	Resistor	15 Kohm	1/3W	5%		01.163
R68	Resistor	39 Ohm	1/3W	5%		01.132
R69	Resistor	180 Ohm	1/3W	5%		01.140
R70	Resistor	100 Ohm	1/3W	5%		01.137
R70a	Resistor	470 Ohm	1/3W	5%		01.145
R71	Resistor	39 Ohm	1/3W	5%		01.132
R72	Resistor	180 Ohm	1/3W	5%		01.140
R73	Resistor	15 Kohm	1/3W	5%		01.163
R74-75	Resistor	10 Kohm	1/3W	5%		01.161
R76	Resistor	3.9 Kohm	1/3W	5%		01.156

# Danish Communication Systems A/S

R77	Resistor	100 Ohm	1/3W	5%	01.137
R78	Resistor	180 Ohm	1/3W	5%	01.140
R79	Resistor	100 Ohm	1/3W	5%	01.137
R80	Resistor	1 Kohm	1/3W	5%	01.149
R81	Resistor	1.5 Kohm	1/3W	5%	01.151
R82-83	Resistor	220 Ohm	1/3W	5%	01.141
R84	Resistor	820 Ohm	1/3W	5%	01.148
R85	Resistor	220 Ohm	1/3W	5%	01.141
R86	Resistor	390 Ohm	1/3W	5%	01.144
R87	Resistor	220 Ohm	1/3W	5%	01.141
R88	Resistor	6.8 Ohm	1/3W	5%	01.123
R89	Resistor	10 Ohm	1/3W	5%	01.125
R90	Resistor	18 Ohm	1/3W	5%	01.128
R91	Resistor	560 Ohm	1/3W	5%	01.146
R92	Resistor	220 Ohm	1/3W	5%	01.141
R93	Resistor	120 Ohm	1/3W	5%	01.138
R94	Resistor	68 Ohm	1/3W	5%	01.135
R95	Resistor	6.8 Ohm	1/3W	5%	01.123
R96	Resistor	10 Ohm	1/3W	5%	01.125
R97	Resistor	18 Ohm	1/3W	5%	01.128
R98-102	Resistor	220 Ohm	1/3W	5%	01.141
R103	Resistor	1 Kohm	1/3W	5%	01.149
R104	Resistor	220 Ohm	1/3W	5%	01.141
R105	Resistor	27 Ohm	1/3W	5%	01.130
R106	Resistor	1 Kohm	1/3W	5%	01.149
R107	Resistor	220 Ohm	1/3W	5%	01.141
R108	Resistor	27 Ohm	1/3W	5%	01.130
R109	Resistor	56 Ohm	1/3W	5%	01.134
R110	Resistor	3.3 Kohm	1/3W	5%	01.155
R111	Resistor	1 Kohm	1/3W	5%	01.149
R112	Resistor	180 Ohm	1/3W	5%	01.140
R113	Resistor	15 Ohm	1/3W	5%	01.127
R114	Resistor	82 Ohm	1/3W	5%	01.136
R115	Resistor	4.7 Kohm	1/3W	5%	01.157
R116	Resistor	1 Kohm	1/3W	5%	01.149
R117	Resistor	270 Ohm	1/3W	5%	01.142
R118-121	Resistor	22 Ohm	1/3W	5%	01.129
R122	Resistor	470 Ohm	1/3W	5%	01.145
R122a	Resistor	470 Ohm	1/3W	5%	01.245
R123	Resistor	5.6 Kohm	1/3W	5%	01.158
R124	Resistor	1 Kohm	1/3W	5%	01.249
R125	Resistor	5.6 Kohm	1/3W	5%	01.258
R126-127	Resistor	56 Ohm	1/3W	5%	01.134
R128	Resistor	6.8 Kohm	1/3W	5%	01.159
R129	Resistor	1.8 Kohm	1/3W	5%	01.152
R130	Resistor	220 Ohm	1/3W	5%	01.141
R131	Resistor	22 Ohm	1/3W	5%	01.129
R132	Resistor	270 Ohm	1/3W	5%	01.142
R133	Resistor	1.8 Kohm	1/3W	5%	01.152
R134	Resistor	6.8 Kohm	1/3W	5%	01.159
R135	Resistor	560 Ohm	1/3W	5%	01.146
R135a	Resistor	100 Ohm	1/3W	5%	01.137
R136	Resistor	220 Ohm	1/3W	5%	01.141
R137	Resistor	82 Ohm	1/3W	5%	01.136
R138	Resistor	56 Ohm	1/3W	5%	01.134
R139	Resistor	18 Ohm	1/3W	5%	01.128



# Danish Communication Systems A/S

R140-141	Resistor	56 Ohm	1/3W	5%	01.134
R142-145	Resistor	4.7 Kohm	1/3W	5%	01.157
R146-149	Resistor	1.8 Kohm	1/3W	5%	01.152
R150	Resistor	22 Ohm	1/3W	5%	01.229
R151	Resistor	10 Ohm	1/3W	5%	01.225
R152	Resistor	1 Kohm	1/3W	5%	01.149
R153	Resistor	18 Kohm	1/3W	5%	01.164
R154	Resistor	5.6 Kohm	1/3W	5%	01.158
R155-156	Resistor	390 Ohm	1/3W	5%	01.144
R157	Resistor	10 Ohm	1/3W	5%	01.225
R158	Resistor	1 Kohm	1/3W	5%	01.249
R159	Resistor	1.5 Kohm	1/3W	5%	01.251
R160	Resistor	270 Ohm	1/3W	5%	01.242
R161	Resistor	18 Kohm	1/3W	5%	01.164
R162	Resistor	5.6 Kohm	1/3W	5%	01.158
R163	Resistor	5.6 Kohm	1/3W	5%	01.258
R164	Resistor	4.7 Kohm	1/3W	5%	01.157
R165-166	Resistor	22 Kohm	1/3W	5%	01.265
R167	Resistor	2.2 Kohm	1/3W	5%	01.153
R168	Resistor	390 Ohm	1/3W	5%	01.144
R169	Resistor	100 Kohm	1/3W	5%	01.273
R170	Resistor	3.3 Kohm	1/3W	5%	01.155
R171	Resistor	3.3 Kohm	1/3W	5%	01.255
R172	Resistor	100 Kohm	1/3W	5%	01.173
R173-174	Resistor	3.3 Kohm	1/3W	5%	01.155
R175-176	Resistor	2.2 Kohm	1/3W	5%	01.153
R177-178	Resistor	5.6 Kohm	1/3W	5%	01.258
R179	Resistor	2.2 Kohm	1/3W	5%	01.153
R180-181	Resistor	5.6 Kohm	1/3W	5%	01.158
R182-183	Resistor	5.6 Kohm	1/3W	5%	01.258
R184	Resistor	220 Ohm	1/3W	5%	01.241
R185	Resistor	47 Kohm	1/3W	5%	01.269
R186	Resistor	100 Ohm	1/3W	5%	01.237
R187	Resistor	150 Ohm	1/3W	5%	01.139
R188	Resistor	22 Kohm	1/3W	5%	01.265
R189	Resistor	2.2 Kohm	1/3W	5%	01.153
R190	Resistor	100 Ohm	1/3W	5%	01.237
R191	Resistor	100 Ohm	1/3W	5%	01.137
R192	Resistor	4.7 Kohm	1/3W	5%	01.257
R193	Resistor	4.7 Kohm	1/3W	5%	01.157
R194	Resistor	330 Ohm	1/3W	5%	01.243
R195	Resistor	15 Kohm	1/3W	5%	01.263
R196	Resistor	2.2 Kohm	1/3W	5%	01.253
R197-209	Not used				
R210	Resistor, NTC	40 Ohm			03.101
P1	Resistor, preset	1 Kohm			04.355
P2	Resistor, preset	5 Kohm			04.208
P3	Resistor, preset	500 Ohm			04.207
P4	Resistor, preset	250 Ohm			04.144
C1	Capacitor, ellyt	10 uF	63V		12.865
C2-3	Capacitor, pol	100 nF	63V		11.836
C4	Capacitor, cer	10 nF	30V		14.907
C5	Capacitor, pol	100 nF	63V		11.836

# Danish Communication Systems A/S

C6	Capacitor, pol	1.5 nF	63V		11.815
C7	Capacitor, ellyt	10 uF	63V		12.865
C8-10	Capacitor, pol	100 nF	63V		11.836
C11	Capacitor, sty	100 pF		5%	10.125
C11a	Capacitor, cer	1 nF	40V		14.902
C12	Capacitor, ellyt	10 uF	63V		12.865
C12a	Capacitor, cer	1 nF	40V		14.902
C13	Capacitor, cer	10 nF	30V		14.907
C14	Capacitor, ellyt	10 uF	63V		12.865
C15	Capacitor, ellyt	47 uF	16V		12.809
C16	Capacitor, ellyt	10 uF	63V		12.865
C17	Capacitor, sty	1 nF		5%	10.149
C18	Capacitor, pol	100 nF	63V		11.836
C19	Capacitor, sty	22 pF		5%	10.109
C19a-20	Capacitor, ellyt	10 uF	63V		12.865
C21	Capacitor, pol	100 nF	63V		11.836
C22-23	Capacitor, pol	10 nF	63V		11.824
C24-26	Capacitor, cer	10 nF	30V		14.907
C27	Capacitor, cer	1 nF	40V		14.902
C28	Capacitor, cer	10 nF	30V		14.907
C29	Not used				
C30	Not used				
C31-33	Not used				
C34	Capacitor, cer	10 nF	30V		14.907
C35	Not used				
C36	Capacitor, cer	10 nF	30V		14.907
C37	Capacitor, sty	150 pF		5%	10.129
C38	Not used				
C39	Capacitor, cer	10 nF	30V		14.907
C40-42	Not used				
C43	Not used				
C44-44a	Capacitor, cer	10 nF	30V		14.907
C45	Capacitor, cer	10 nF	30V		14.907
C45a	Capacitor, cer	56 pF			16.367
C46	Capacitor, cer	10 nF	30V		14.907
C46a	Capacitor, cer	1 nF	40V		14.902
C47-49	Capacitor, cer	10 nF	30V		14.907
C50	Capacitor, cer	100 nF	63V		14.913
C51	Capacitor, cer	10 nF	30V		14.907
C51a	Capacitor, cer	56 pF			16.367
C52-67	Capacitor, cer	10 nF	30V		14.907
C68	Capacitor, ellyt	100 uF	25V		12.831
C69-71	Capacitor, cer	10 nF	30V		14.907
C72	Capacitor, cer	6.8 pF			14.123
C73	Capacitor, cer	4.7 pF			14.121
C74	Capacitor, cer	6.8 pF			14.123
C75	Capacitor, cer	10 nF	30V		14.907
C76	Capacitor, cer	8.2 pF			14.124
C77-80	Capacitor, cer	10 nF	30V		14.907
C81	Capacitor, cer	22 pF			14.129
C82	Capacitor, cer	150 pF	63V		14.339
C83	Capacitor, cer	180 pF	63V		14.340
C84	Capacitor, cer	150 pF	63V		14.339
C85-86	Capacitor, pol	100 nF	63V		11.836
C87	Not used				
C88-92	Capacitor, pol	100 nF	63V		11.836

# Danish Communication Systems A/S

C93-93a	Capacitor, cer	10 nF	30V	14.907
C94-97	Capacitor, cer	10 nF	30V	14.907
C98	Capacitor, cer	22 pF		14.129
C99	Capacitor, cer	56 pF		16.367
C100-111	Capacitor, cer	10 nF	30V	14.907
C112-113	Capacitor, cer	100 nF	63V	14.913
C113a	Capacitor, ellyt	10 uF	63V	12.865
C114	Capacitor, cer	1 nF	40V	14.902
C115	Capacitor, cer	10 nF	30V	14.907
C116	Capacitor, cer	8.2 pF		14.124
C117	Capacitor, ellyt	22 uF	40V	12.847
C118	Capacitor, cer	1 nF	40V	14.902
C119	Capacitor, cer	8.2 pF		14.124
C119a	Capacitor, cer	1 nF	40V	14.902
C120	Capacitor, cer	10 nF	30V	14.907
C121	Capacitor, cer	8.2 pF		14.124
C122	Capacitor, cer	10 nF	30V	14.907
C123-124	Capacitor, cer	120 pF	N750	14.339
C125-127	Capacitor, cer	1 nF	40V	14.902
C128	Capacitor, cer	10 nF	30V	14.907
C129	Capacitor, pol	10 nF	63V	11.824
C130	Capacitor, pol	22 nF	63V	11.828
C131	Capacitor, ellyt	47 uF	16V	12.809
C132-133	Capacitor, pol	330 nF	63V	11.842
C134	Capacitor, pol	22 nF	63V	11.828
C135-136	Capacitor, cer	1 nF	40V	14.902
C137	Not used			
C138	Capacitor, ellyt	100 uF	25V	12.831
C139	Capacitor, cer	1 nF	40V	14.902
C140	Capacitor, cer	10 nF	30V	14.907
C141	Capacitor, pol	150 nF	63V	11.838
C142	Capacitor, cer	68 pF		16.369
C143-143a	Capacitor, cer	10 nF	30V	14.907
C144	Capacitor, cer	1 nF	40V	14.902
C145-147	Capacitor, cer	10 nF	30V	14.907
C148	Capacitor, ellyt	100 uF	25V	12.831
CH1	Choke	15 uH		22.226
CH2	Choke	15 uH		22.226
CH3-5	Not used			
CH6	Choke	15 uH		22.226
CH7	Not used			
CH8	Choke	15 uH		22.102
CH9	Not used			
CH10	Not used			
CH11	Choke	15 uH		22.102
CH12-13	Choke	15 uH		22.226
CH14-15	Choke	15 uH		22.102
CH16	Choke	0.33 uH		22.206
CH17-18	Choke	0.47 uH		22.208
CH19	Choke	0.33 uH		22.206
CH20	Choke	15 uH		22.102
CH21	Choke	15 uH		22.226
CH22-23	Choke	15 uH		22.102

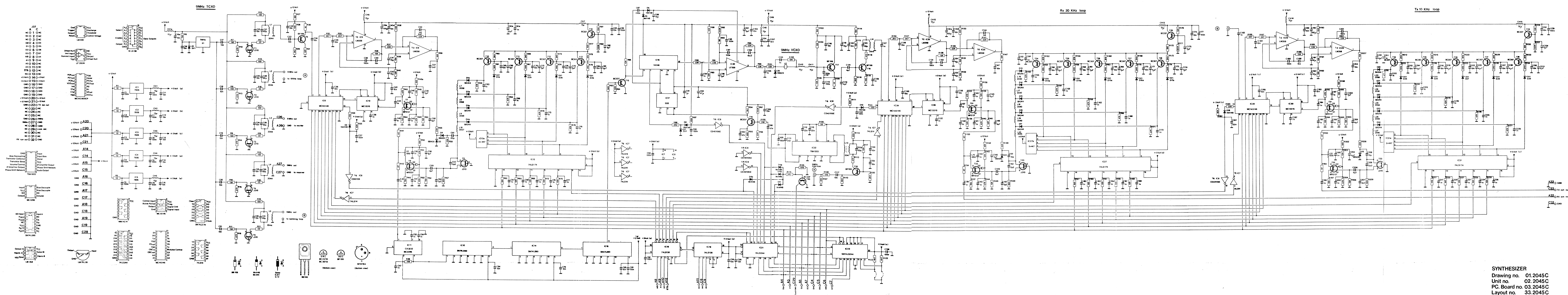
# Danish Communication Systems A/S

CH24-27	Choke	15 uH		22.226
CH28	Choke	15 uH		22.102
CH29	Choke	1.8 uH		22.215
CH30	Choke	15 uH		22.102
TR1	Trafo			26.124
T1-7	Transistor	BC237		32.101
T8-9	Not used			
T10	Transistor	BF199		33.102
T10a	Transistor	BC307		32.102
T11-12	Transistor	BF199		33.102
T13-14	Transistor	BF W 16A		33.107
T15	Transistor	BD140		30.102
T16	Transistor	BC237		32.101
T17	Transistor	BF199		33.102
T18	Transistor	BC237		32.101
T19-20	Transistor	BF199		33.102
T21-23	Transistor	BC237		32.102
T24-25	Transistor	BF199		33.102
T26	Transistor	BC237		32.101
IC1	Integrated Circuit	LM358		35.112
IC2	Integrated Circuit	SL6270		35.111
IC3	Integrated Circuit	CD4066		36.157
IC4	Integrated Circuit	SL6440		35.125
IC5	Integrated Circuit	74LS374		36.189
IC6-7	Integrated Circuit	SL6440		35.125
IC8	Integrated Circuit	74LS374		36.189
IC9-10	Integrated Circuit	74LS138		36.172
IC11	Integrated Circuit	LM317		35.135
IC12	Integrated Circuit	MC12015		36.505
IC13	Integrated Circuit	LF355		35.115
IC14	Integrated Circuit	MC145158		36.515
IC15	Integrated Circuit	LM555		35.105
D1	Diode zener	5.1V	0.4W	39.707
D2-4	Diode	1N4148		39.103
D5-10	Not used			
D11	Diode	BA244		39.101
D12-14	Diode	1N4148		39.103
D15-24	Diode	BA244		39.101
D25-30	Diode	1N4148		39.103
D31-34	Diode	BA244		39.101
D35-36	Diode cap.	BB105		39.403
D37	Diode	1N4148		39.103
D38-40	Diode zener	6.8V		39.709
D41	Diode	1N4148		39.103
X1	Crystal	30.5 MHz		50.152
FL1	Filter	Crystal 8998.5 KHz		50.215

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FL2	Not used		
FL3	Filter	Crystal 70 MHz	50.217
L1	Coil		004.1202
L2	Coil		004.2043
L3	Not used		
L4-5	Coil		004.1200
L6	Coil		004.1202
L7-8	Coil		004.2041
L9	Coil		004.1202
L10-11	Coil		004.1207
L12-13	Coil		004.0256
L14	Coil		004.2045
L15-16	Coil		004.1200
EXC	Cabling		05.2040
	Screening can	10x10	47.103
	PCB-Injector-Ejector		62.241
	Connector 64 pole ERO		80.141
	Plug		80.408
	Heat Sink		83.308
	Nut 2,6 brass F.N.		90.201
	Screw 2,6 x 10 CHJ F.Z.		90.271
	Tracking Pin	T1575-01	96.107







SYNTHESIZER UNIT No 002.2045 C

Circuit Board					03.2045C
R1-5	Resistor	39 Ohm	1/3W	5%	01.132
R6	Resistor	150 Ohm	1/3W	5%	01.139
R7-11	Resistor	150 Ohm	1/3W	5%	01.239
R12-16	Resistor	270 Ohm	1/3W	5%	01.242
R17-21	Resistor	22 Ohm	1/3W	5%	01.229
R22-26	Resistor	100 Ohm	1/3W	5%	01.237
R27	Resistor	100 Ohm	1/3W	5%	01.137
R28	Resistor	15 Kohm	1/3W	5%	01.163
R29	Resistor	2.2 Kohm	1/3W	5%	01.153
R30	Resistor	1 Kohm	1/3W	5%	01.249
R31	Resistor	100 Ohm	1/3W	5%	01.237
R32-33	Resistor	2.7 Kohm	1/3W	5%	01.154
R34	Resistor	220 Ohm	1/3W	5%	01.141
R35	Resistor	82 Kohm	1/3W	5%	01.172
R36	Resistor	15 Kohm	1/3W	5%	01.163
R37-38	Resistor	22 Kohm	1/3W	5%	01.165
R39-40	Resistor	10 Kohm	1/3W	5%	01.161
R41-42	Resistor	47 Ohm	1/3W	5%	01.133
R43	Resistor	470 Ohm	1/3W	5%	01.145
R44-45	Resistor	100 Ohm	1/3W	5%	01.137
R46	Resistor	1.8 Kohm	1/3W	5%	01.152
R47	Resistor	22 Kohm	1/3W	5%	01.165
R48	Resistor	12 Kohm	1/3W	5%	01.162
R48a	Resistor	100 Ohm	1/3W	5%	01.137
R49	Resistor	47 Kohm	1/3W	5%	01.169
R50	Resistor	100 Ohm	1/3W	5%	01.137
R51	Resistor	27 Kohm	1/3W	5%	01.166
R52	Resistor	47 Kohm	1/3W	5%	01.169
R53-54	Resistor	15 Kohm	1/3W	5%	01.163
R55	Resistor	10 Kohm	1/3W	5%	01.161
R56	Resistor	22 Kohm	1/3W	5%	01.165
R57	Resistor	820 Ohm	1/3W	5%	01.148
R58	Resistor	22 Kohm	1/3W	5%	01.265
R59	Resistor	47 Kohm	1/3W	5%	01.169
R60	Resistor	3.9 Kohm	1/3W	5%	01.156
R61	Resistor	5.6 Kohm	1/3W	5%	01.258
R62	Resistor	100 Ohm	1/3W	5%	01.137
R63	Resistor	47 Kohm	1/3W	5%	01.169
R64	Not used				
R65	Resistor	100 Ohm	1/3W	5%	01.137
R66	Resistor	3.9 Kohm	1/3W	5%	01.156
R67	Resistor	5.6 Kohm	1/3W	5%	01.258
R68	Resistor	100 Ohm	1/3W	5%	01.137
R69	Not used				
R70	Resistor	47 Kohm	1/3W	5%	01.169
R71	Not used				
R72	Resistor	100 Ohm	1/3W	5%	01.137
R73	Resistor	3.9 Kohm	1/3W	5%	01.156
R74	Resistor	5.6 Kohm	1/3W	5%	01.258



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R75	Resistor	100	Ohm	1/3W	5%	01.137
R76	Resistor	47	Kohm	1/3W	5%	01.169
R77	Resistor	100	Ohm	1/3W	5%	01.137
R78	Resistor	3.9	Kohm	1/3W	5%	01.156
R79	Resistor	5.6	Kohm	1/3W	5%	01.258
R80	Not used					
R81	Resistor	10	Kohm	1/3W	5%	01.161
R82	Resistor	100	Kohm	1/3W	5%	01.173
R83-84	Resistor	5.6	Kohm	1/3W	5%	01.158
R85	Resistor	10	Kohm	1/3W	5%	01.161
R86	Resistor	2.2	Kohm	1/3W	5%	01.153
R87	Resistor	82	Kohm	1/3W	5%	01.172
R88	Resistor	22	Kohm	1/3W	5%	01.165
R89-90	Resistor	10	Kohm	1/3W	5%	01.161
R91	Resistor	22	Kohm	1/3W	5%	01.165
R92	Resistor	100	Kohm	1/3W	5%	01.173
R93	Resistor	1	Mohm	1/3W	5%	01.185
R94	Resistor	2.7	Kohm	1/3W	5%	01.154
R95	Resistor	680	Ohm	1/3W	5%	01.147
R96	Resistor	22	Kohm	1/3W	5%	01.165
R97	Resistor	100	Kohm	1/3W	5%	01.173
R98-99	Resistor	22	Kohm	1/3W	5%	01.165
R100	Resistor	39	Kohm	1/3W	5%	01.168
R101	Resistor	33	Kohm	1/3W	5%	01.167
R102	Resistor	10	Kohm	1/3W	5%	01.161
R103	Resistor	100	Ohm	1/3W	5%	01.137
R104-105	Resistor	12	Kohm	1/3W	5%	01.162
R106	Resistor	56	Ohm	1/3W	5%	01.134
R107	Resistor	220	Ohm	1/3W	5%	01.141
R108	Resistor	1.5	Kohm	1/3W	5%	01.151
R109	Resistor	1	Kohm	1/3W	5%	01.149
R110	Resistor	560	Ohm	1/3W	5%	01.146
R111	Resistor	82	Kohm	1/3W	5%	01.172
R112	Resistor	220	Ohm	1/3W	5%	01.141
R113	Resistor	470	Ohm	1/3W	5%	01.145
R114	Resistor	100	Ohm	1/3W	5%	01.137
R115	Resistor	15	Kohm	1/3W	5%	01.163
R116	Resistor	2.2	Kohm	1/3W	5%	01.153
R117	Resistor	15	Kohm	1/3W	5%	01.163
R118	Resistor	470	Ohm	1/3W	5%	01.145
R119	Resistor	100	Ohm	1/3W	5%	01.137
R120	Resistor	2.2	Kohm	1/3W	5%	01.153
R121	Resistor	220	Ohm	1/3W	5%	01.141
R122-123	Resistor	4.7	Kohm	1/3W	5%	01.157
R124	Resistor	2.7	Kohm	1/3W	5%	01.154
R125-126	Resistor	5.6	Kohm	1/3W	5%	01.158
R127	Resistor	2.7	Kohm	1/3W	5%	01.154
R128	Resistor	15	Kohm	1/3W	5%	01.163
R129-130	Resistor	22	Kohm	1/3W	5%	01.165
R131-132	Resistor	10	Kohm	1/3W	5%	01.161
R133-134	Resistor	47	Ohm	1/3W	5%	01.133
R135	Resistor	470	Ohm	1/3W	5%	01.145
R136-138	Resistor	100	Ohm	1/3W	5%	01.137
R139	Resistor	12	Kohm	1/3W	5%	01.162
R140	Resistor	47	Kohm	1/3W	5%	01.169
R141	Resistor	22	Kohm	1/3W	5%	01.165

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R142	Resistor	100 Ohm	1/3W	5%	01.137
R143	Resistor	12 Kohm	1/3W	5%	01.162
R144	Resistor	47 Kohm	1/3W	5%	01.169
R145-146	Resistor	15 Kohm	1/3W	5%	01.163
R147	Resistor	10 Kohm	1/3W	5%	01.161
R148	Resistor	22 Kohm	1/3W	5%	01.165
R149	Resistor	820 Ohm	1/3W	5%	01.148
R150	Resistor	47 Kohm	1/3W	5%	01.169
R151	Not used				
R152	Resistor	3.9 Kohm	1/3W	5%	01.156
R153	Resistor	5.6 Kohm	1/3W	5%	01.258
R154	Resistor	47 Kohm	1/3W	5%	01.169
R155	Resistor	3.9 Kohm	1/3W	5%	01.156
R156	Resistor	5.6 Kohm	1/3W	5%	01.258
R157	Resistor	100 Ohm	1/3W	5%	01.137
R158	Resistor	47 Kohm	1/3W	5%	01.169
R159	Not used				
R160-161	Resistor	100 Ohm	1/3W	5%	01.137
R162	Resistor	3.9 Kohm	1/3W	5%	01.156
R163	Resistor	5.6 Kohm	1/3W	5%	01.258
R164	Not used				
R165	Resistor	100 Ohm	1/3W	5%	01.137
R166	Resistor	47 Kohm	1/3W	5%	01.169
R167	Not used				
R168	Resistor	100 Ohm	1/3W	5%	01.137
R169	Resistor	3.9 Kohm	1/3W	5%	01.156
R170	Resistor	5.6 Kohm	1/3W	5%	01.258
R171	Resistor	47 Kohm	1/3W	5%	01.169
R172	Resistor	100 Ohm	1/3W	5%	01.137
R173	Resistor	3.9 Kohm	1/3W	5%	01.156
R174	Resistor	5.6 Kohm	1/3W	5%	01.258
R175	Not used				
R176	Resistor	10 Kohm	1/3W	5%	01.161
R177	Resistor	100 Kohm	1/3W	5%	01.173
R178	Not used				
R179	Not used				
R180	Not used				
R181	Not used				
R182	Resistor	82 Kohm	1/3W	5%	01.172
R183	Not used				
R184	Not used				
R185	Resistor	220 Ohm	1/3W	5%	01.141
R186-187	Resistor	2.7 Kohm	1/3W	5%	01.154
R188	Resistor	15 Kohm	1/3W	5%	01.163
R189-190	Resistor	22 Kohm	1/3W	5%	01.165
R191-192	Resistor	10 Kohm	1/3W	5%	01.161
R193-194	Resistor	47 Ohm	1/3W	5%	01.133
R195	Resistor	470 Ohm	1/3W	5%	01.145
R196-198	Resistor	100 Ohm	1/3W	5%	01.137
R199	Resistor	12 Kohm	1/3W	5%	01.162
R200	Resistor	47 Kohm	1/3W	5%	01.169
R201	Resistor	22 Kohm	1/3W	5%	01.165
R202	Resistor	100 Ohm	1/3W	5%	01.137
R203	Resistor	12 Kohm	1/3W	5%	01.162
R204	Resistor	47 Kohm	1/3W	5%	01.169
R205-206	Resistor	15 Kohm	1/3W	5%	01.163

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R207	Resistor	10 Kohm	1/3W	5%	01.161
R208	Resistor	22 Kohm	1/3W	5%	01.165
R209	Resistor	820 Ohm	1/3W	5%	01.148
R210	Resistor	47 Kohm	1/3W	5%	01.169
R211	Not used				
R212	Resistor	3.9 Kohm	1/3W	5%	01.156
R213	Resistor	5.6 Kohm	1/3W	5%	01.258
R214	Resistor	47 Kohm	1/3W	5%	01.169
R215	Resistor	3.9 Kohm	1/3W	5%	01.156
R216	Resistor	5.6 Kohm	1/3W	5%	01.258
R217	Resistor	100 Ohm	1/3W	5%	01.137
R218	Resistor	47 Kohm	1/3W	5%	01.169
R219	Not used				
R220-221	Resistor	100 Ohm	1/3W	5%	01.137
R222	Resistor	3.9 Kohm	1/3W	5%	01.156
R223	Resistor	5.6 Kohm	1/3W	5%	01.258
R224	Not used				
R225	Resistor	100 Ohm	1/3W	5%	01.137
R226	Resistor	47 Kohm	1/3W	5%	01.169
R227	Not used				
R228	Resistor	100 Ohm	1/3W	5%	01.137
R229	Resistor	3.9 Kohm	1/3W	5%	01.156
R230	Resistor	5.6 Kohm	1/3W	5%	01.258
R231	Resistor	47 Kohm	1/3W	5%	01.169
R232	Resistor	100 Ohm	1/3W	5%	01.137
R233	Resistor	3.9 Kohm	1/3W	5%	01.156
R234	Resistor	5.6 Kohm	1/3W	5%	01.258
R235	Not used				
R236	Resistor	10 Kohm	1/3W	5%	01.161
R237	Resistor	100 Kohm	1/3W	5%	01.173

C1-10	Capacitor, poly	100 nF	63V	11.836
C11-15	Capacitor, poly	10 nF	63V	11.824
C16-26+16a	Capacitor, cer	10 nF	30V	14.907
C27-31	Capacitor, cer	82 pF	25V	14.336
C32-36	Capacitor, cer	10 nF	30V	14.907
C37	Capacitor, poly	150 nF	63V	11.838
C38	Capacitor, poly	100 nF	63V	11.836
C39	Capacitor, cer	1 nF	40V	14.902
C39a	Capacitor, ellyt	100 uF	25V	12.831
C40	Capacitor, poly	15 nF	63V	11.826
C40a	Capacitor, cer	10 nF	30V	14.907
C41-42	Capacitor, ellyt	10 uF	40V	12.845
C43	Capacitor, cer	10 nF	30V	14.907
C44-52	Capacitor, cer	1 nF	40V	14.902
C53	Capacitor, poly	1.5 nF	63V	11.815
C54	Capacitor, cer	1 nF	40V	14.902
C55-56	Capacitor, ellyt	4.7 uF	50V	12.843
C57	Capacitor, poly	2.2 nF	63V	11.817
C58-59	Capacitor, cer	4.7 pF	400y	14.121
C60	Capacitor, cer	2.2 pF		14.117
C60a	Capacitor, ellyt	4.7 uF	50V	12.843
C61	Capacitor, cer	82 pF	25V	14.336
C61a	Capacitor, cer	1 nF	40V	14.902

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C62	Capacitor, cer	6.8 pF	400V	14.123
C63	Capacitor, cer	1 nF	40V	14.902
C64-65	Capacitor, cer	10 nF	30V	14.907
C66	Capacitor, ellyt	4.7 uF	50V	12.843
C67-69	Capacitor, cer	1 nF	40V	14.902
C70	Capacitor, cer	10 nF	30V	14.907
C71	Capacitor, cer	1 nF	40V	14.902
C72	Capacitor, ellyt	4.7 uF	50V	12.843
C73-74	Capacitor, cer	1 nF	40V	14.902
C75-76	Capacitor, cer	10 nF	30V	14.907
C77	Capacitor, cer	1 nF	40V	14.902
C78	Capacitor, ellyt	4.7 uF	50V	12.843
C79	Capacitor, cer	1 nF	40V	14.902
C80	Capacitor, cer	10 nF	30V	14.907
C81-82	Capacitor, ellyt	4.7 uF	50V	12.843
C83	Capacitor, cer	10 nF	30V	14.907
C84	Capacitor, poly	100 nF	63V	11.836
C85	Capacitor, cer	10 nF	30V	14.907
C86	Capacitor, poly	100 nF	63V	11.836
C87	Capacitor, poly	220 nF	63V	11.840
C88	Capacitor, cer	100 nF	63V	14.913
C89	Capacitor, ellyt	10 uF	40V	12.845
C90	Capacitor, cer	100 nF	63V	14.913
C91	Capacitor, poly	1 uF	63V	11.848
C92	Capacitor, poly	150 nF	63V	11.838
C93	Capacitor, ellyt	47 uF	35V	12.849
C94	Capacitor, cer	1 nF	40V	14.902
C95	Capacitor, ellyt	4.7 uF	50V	12.843
C96-97	Capacitor, poly	100 nF	63V	11.836
C98-99	Capacitor, cer	10 nF	30V	14.907
C100	Capacitor, poly	47 nF	63V	11.832
C101	Capacitor, ellyt	4.7 uF	50V	12.843
C102	Capacitor, poly	4.7 nF	63V	11.820
C103	Capacitor, cer	10 nF	30V	14.907
C104	Capacitor, poly	100 nF	63V	11.836
C105	Capacitor, cer	1 nF	40V	14.902
C106-107	Capacitor, cer	10 nF	30V	14.907
C108	Capacitor, poly	47 nF	63V	11.832
C109	Capacitor, poly	100 nF	63V	11.836
C110	Capacitor, cer	1 nF	40V	14.902
C111	Capacitor, poly	3.3 nF	63V	11.819
C112-113	Capacitor, poly	22 nF	63V	11.828
C114-115	Capacitor, sty	150 pF	5%	10.129
C116-117	Capacitor, cer	10 nF	30V	14.907
C118	Capacitor, ellyt	10 uF	40V	12.845
C119	Capacitor, cer	4.7 pF	400V	14.121
C120	Capacitor, cer	10 nF	30V	14.907
C121	Capacitor, cer	4.7 pF	400V	14.121
C122	Capacitor, poly	150 nF	63V	11.838
C122a-123	Capacitor, cer	82 pF	25V	14.336
C124-125	Capacitor, cer	10 nF	30V	14.907
C126-127	Capacitor, cer	1 nF	40V	14.902
C128	Capacitor, cer	100 nF	63V	14.913
C129-130	Capacitor, cer	10 nF	30V	14.907
C131	Capacitor, poly	100 nF	63V	11.836
C132	Capacitor, cer	1 nF	40V	14.902

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C132a	Capacitor, ellyt	100 uF	25V	12.831
C133	Capacitor, poly	15 nF	63V	11.826
C133a	Capacitor, cer	10 nF	30V	14.907
C134-135	Capacitor, ellyt	10 uF	40V	12.845
C136	Capacitor, cer	10 nF	30V	14.907
C137-143	Capacitor, cer	1 nF	40V	14.902
C144	Capacitor, poly	1.5 nF	63V	11.815
C145-146	Capacitor, ellyt	4.7 uF	50V	12.843
C147	Capacitor, cer	10 nF	30V	14.907
C148-149	Capacitor, cer	4.7 pF	400V	14.121
C150	Capacitor, cer	2.2 pF		14.117
C151	Capacitor, cer	10 pF	400V	14.125
C152	Capacitor, cer	2.2 pF		14.117
C153	Capacitor, ellyt	4.7 uF	50V	12.843
C154-155	Capacitor, cer	1 nF	40V	14.902
C156	Capacitor, cer	10 nF	30V	14.907
C157	Capacitor, ellyt	4.7 uF	50V	12.843
C158	Capacitor, cer	1 nF	40V	14.902
C159	Capacitor, cer	10 nF	30V	14.907
C160	Capacitor, cer	1 nF	40V	14.902
C161	Capacitor, ellyt	4.7 uF	50V	12.843
C162-164	Capacitor, cer	1 nF	40V	14.902
C165	Capacitor, cer	10 nF	30V	14.907
C166	Capacitor, ellyt	4.7 uF	50V	12.843
C167-169	Capacitor, cer	1 nF	40V	14.902
C170	Capacitor, cer	10 nF	30V	14.907
C171	Capacitor, ellyt	4.7 uF	50V	12.843
C172	Capacitor, cer	1 nF	40V	14.902
C173	Capacitor, cer	10 nF	30V	14.907
C174-175	Capacitor, ellyt	4.7 uF	50V	12.843
C176	Capacitor, cer	10 nF	30V	14.907
C177	Capacitor, poly	100 nF	63V	11.836
C178	Not used			
C179	Not used			
C180	Not used			
C181	Not used			
C182	Capacitor, poly	150 nF	63V	11.838
C183	Capacitor, cer	1 nF	40V	14.902
C184-185	Capacitor, cer	10 nF	30V	14.907
C186	Capacitor, poly	100 nF	63V	11.836
C187	Capacitor, cer	1 nF	40V	14.902
C188	Capacitor, poly	15 nF	63V	11.826
C189	Capacitor, cer	10 nF	30V	14.907
C190	Capacitor, ellyt	100 uF	25V	12.831
C191-192	Capacitor, ellyt	10 uF	40V	12.845
C193	Capacitor, cer	10 nF	30V	14.907
C194-200	Capacitor, cer	1 nF	40V	14.902
C201	Capacitor, poly	10 nF	63V	11.824
C202-203	Capacitor, ellyt	4.7 uF	50V	12.843
C204	Capacitor, cer	10 nF	30V	14.907
C205-206	Capacitor, cer	4.7 pF	400V	14.121
C207	Capacitor, cer	2.2 pF		14.117
C208	Capacitor, cer	12 pF	400V	14.126
C209	Capacitor, cer	2.2 pF		14.117
C210	Capacitor, ellyt	4.7 uF	50V	12.843
C211-212	Capacitor, cer	1 nF	40V	14.902

# Danish Communication Systems A/S

C213	Capacitor, cer	10 nF	30V	14.907
C214	Capacitor, ellyt	4.7 uF	50V	12.843
C215	Capacitor, cer	1 nF	40V	14.902
C216	Capacitor, cer	10 nF	30V	14.907
C217	Capacitor, cer	1 nF	40V	14.902
C218	Capacitor, ellyt	4.7 uF	50V	12.843
C219-221	Capacitor, cer	1 nF	40V	14.902
C222	Capacitor, cer	10 nF	30V	14.907
C223	Capacitor, ellyt	4.7 uF	50V	12.843
C224-226	Capacitor, cer	1 nF	40V	14.902
C227	Capacitor, cer	10 nF	30V	14.907
C228	Capacitor, ellyt	4.7 uF	50V	12.843
C229	Capacitor, cer	1 nF	40V	14.902
C230	Capacitor, cer	10 nF	30V	14.907
C231	Capacitor, ellyt	4.7 uF	50V	12.843
C232	Capacitor, cer	10 nF	30V	14.907
C233	Not used			
C234	Capacitor, ellyt	4.7 uF	50V	12.843
C235	Capacitor, poly	100 nF	63V	11.836
CH1-15	Choke	15 uH		22.226
T1-5	Transistor	J 310		34.107
T6	Transistor	BF 199		33.102
T7-8	Transistor	BF 981		34.117
T9	Transistor	J 310		34.107
T10-13	Transistor	BC 307		32.102
T14-16	Transistor	BC 237B		32.101
T17-19	Transistor	BF 199		33.102
T20	Transistor	BC 237B		32.101
T21-22	Transistor	BF 981		34.117
T23	Transistor	J 310		34.107
T24-28	Transistor	BC 307		32.102
T29	Transistor	BC 237B		32.101
T30	Not used			
T31-32	Transistor	BF 981		34.117
T33	Transistor	J 310		34.107
T34-38	Transistor	BC 307		32.102
T39	Transistor	BC 237B		32.101
IC1-5	Integrated Circuit	LM 78L05	5V	35.216
IC6	Integrated Circuit	MC 145146		36.504
IC7	Integrated Circuit	75LS14		36.193
IC8	Integrated Circuit	MM 74C14		36.191
IC9	Integrated Circuit	LM 358N		35.112
IC10	Integrated Circuit	MC 12015		36.505
IC11	Integrated Circuit	MC 3396		35.218
IC12	Integrated Circuit	SN 74LS90		36.118
IC13	Integrated Circuit	74LS174		36.195
IC13a	SIL	4x4 K7		07.544
IC14-15	Integrated Circuit	SN 74LS90		36.118
IC16	Integrated Circuit	MC 14046	BCP	36.166
IC17	Integrated Circuit	UA 555		35.105
IC18-19	Integrated Circuit	74LS138		36.172

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IC20	Integrated Circuit	LF 355		35.115
IC21	Integrated Circuit	74LS244		36.192
IC22	Integrated Circuit	TBA 120S		35.104
IC23	Integrated Circuit	74LS244		36.192
IC24	Integrated Circuit	MC 1451 46		36.504
IC25	Integrated Circuit	LM358N		35.112
IC26	Integrated Circuit	MC 1205		36.505
IC27	Integrated Circuit	74LS174		36.195
IC27a	SIL	5x4 K7		07.544
IC28	Integrated Circuit	MC145146		36.504
IC29	Integrated Circuit	LM358N		35.112
IC30	Integrated Circuit	MC12015		36.505
IC31	Integrated Circuit	74LS174		36.195
IC31a	SIL	5x4 K7		07.544

D1	Diode	zener	9V1	39.717
D1a	Diode	BA244		39.101
D1b	Diode	zener	5V1	39.707
D2	Diode	1N4148		39.103
D2a	Diode	BA244		39.101
D2b	Diode	zener	5V1	39.707
D3	Diode	BB 409		39.406
D3a	Diode	BA244		39.101
D3b	Diode	zener	5V1	39.707
D4	Diode	BB 409		39.406
D4a	Diode	BA244		39.101
D4b	Diode	zener	5V1	39.707
D5-6	Diode	1N4148		39.103
D7	Diode	zener	5V1	39.707
D8-8a	Diode	1N4148		39.103
D9	Diode	BB609		39.404
D10-11	Diode	1N4148		39.103
D11a-11b	Diode	1N4148		39.103
D12	Diode	BB 409		39.406
D13-17	Diode	BA 244		39.101
D13a-17a	Diode	zener	5V1	39.707
D18	Diode	1N4148		39.103
D19	Diode	BB 409		39.406
D20-24	Diode	BA 244		39.101
D25-29	Diode	zener	5V1	39.707

X1	Crystal	TCXO		50.214
X2	Crystal	9.025 MHz		50.155

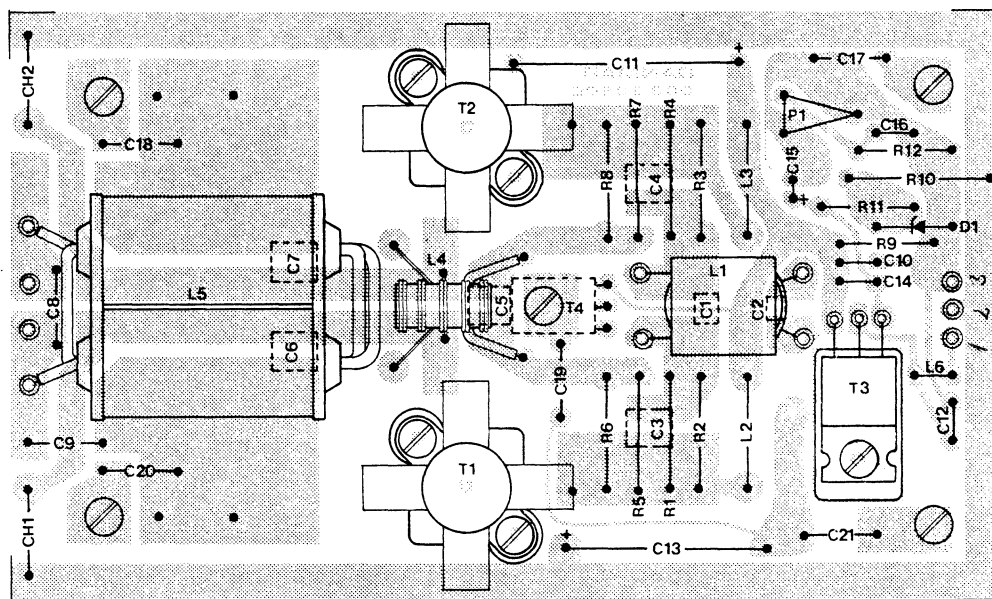
L1-5	Coil			4.2044
L6	Coil			4.1200
L7-9	Coil			4.2058
L10	Coil			4.2057
L11	Not used			
L12	Not used			
L13	Coil			4.2047
L14	Coil			4.2044
L15	Coil			4.1200

Danish Communication Systems A/S

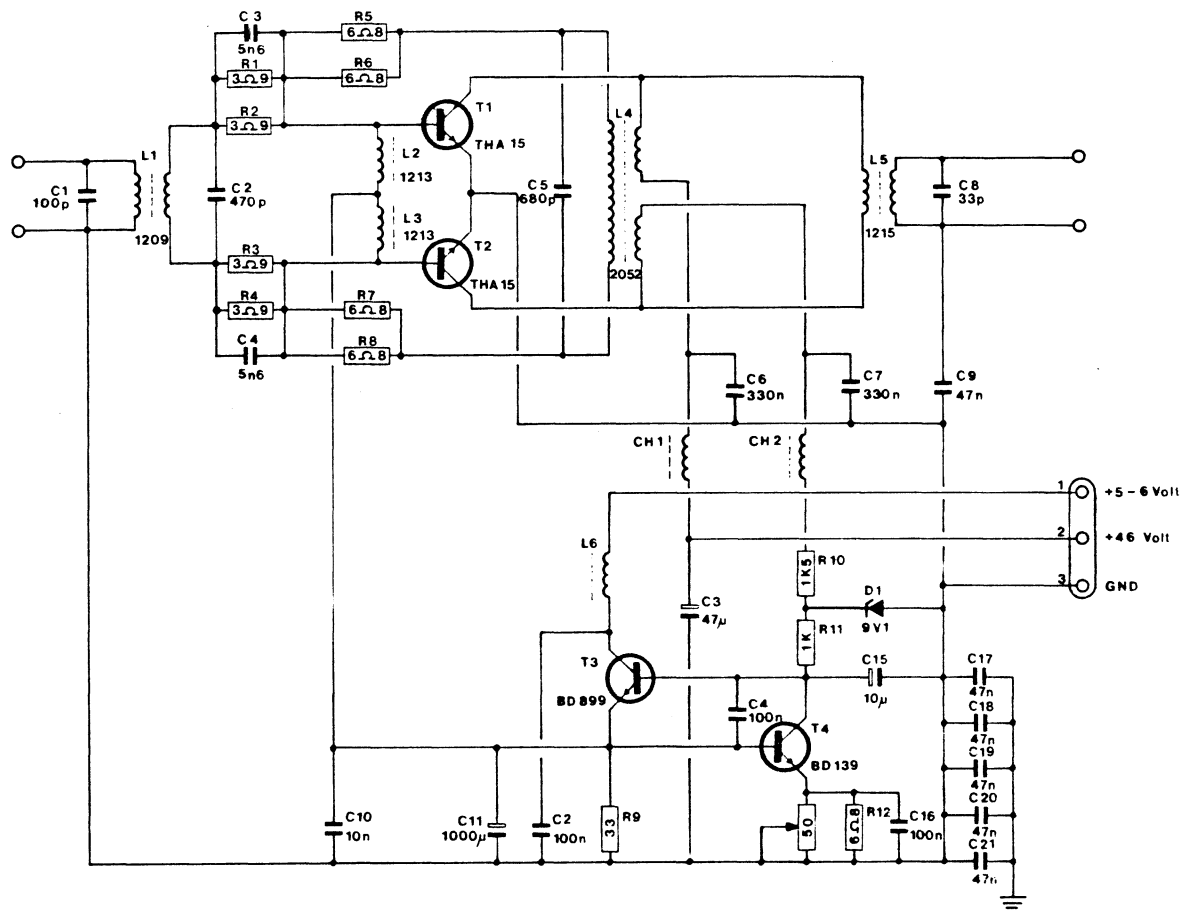
L16-19	Coil	4.2040
L20	Coil	4.2046
L21	Not used	
L22	Coil	4.1200
L23-26	Coil	4.2056
L27	Coil	4.2046

PCB-Injector/Ejector	62.241
Shell box	65.635
Shell box	65.636
Cover for shell box No 65.635	65.637
Cover for shall box No 65.636	65.638
Spring	67.602
Connector	80.141
Pin	80.602
Nut	90.201
Screw	90.271
Strip	104.103





PA. Unit  
Layout no. 33.2050



PA unit

Drawing no. 001.0415

Unit no. 002.2052

PC. Board no. 003.2050

Layout no. 33.2050

## PA. Unit Unit no. 002.2052

R1-4	Resistor	3.9 Ohm	1W	06.124
R5-8	Resistor	6.8 Ohm		06.104
R9	Resistor	33 Ohm	1/3W 5%	01.131
R10	Resistor	1.5 Kohm	0.6W	06.129
R11	Resistor	1 Kohm	1/3W 5%	01.149
R12	Resistor	Selected in final test		

P1	Resistor, pre set	50 Ohm		04.136
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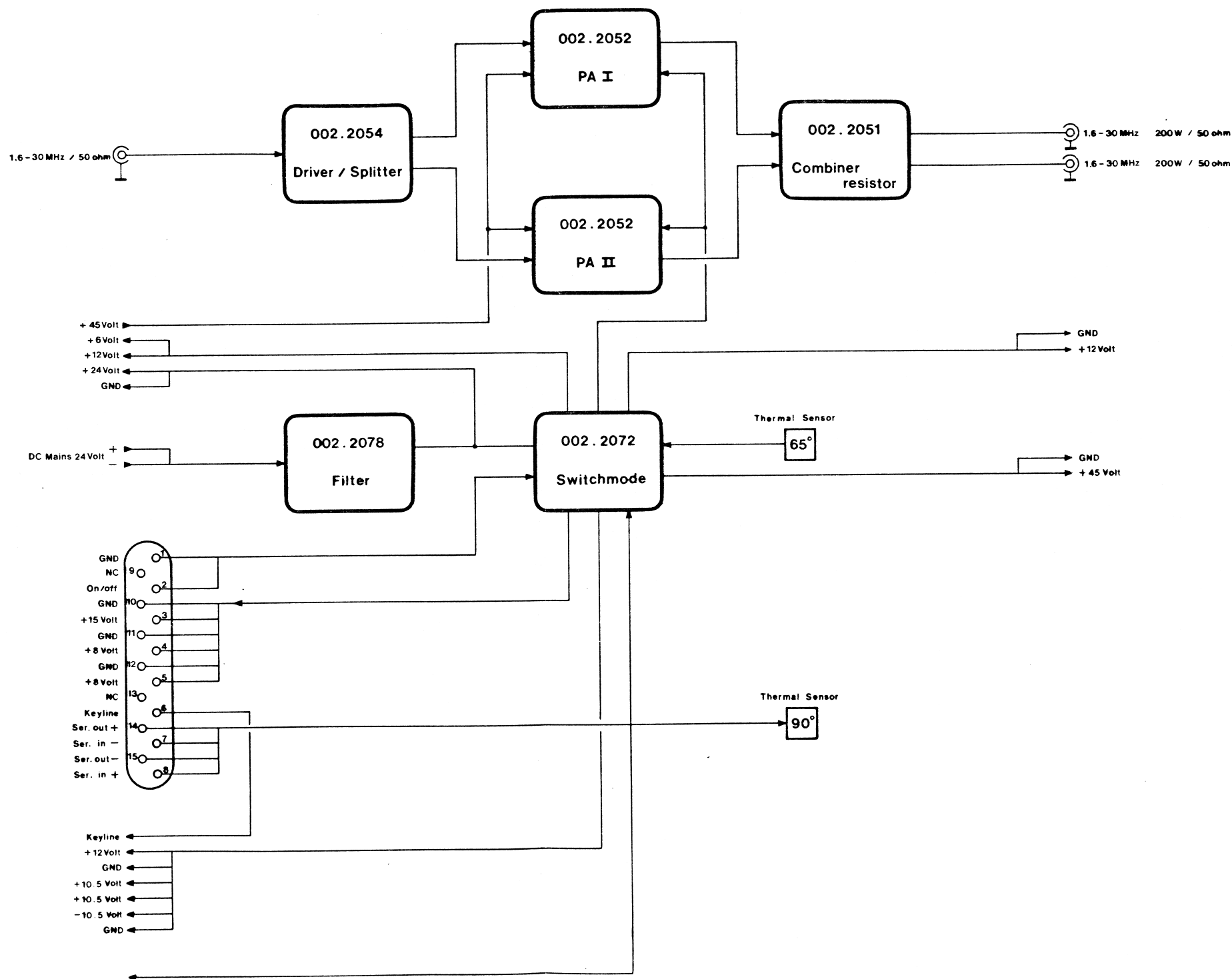
C1	Capacitor, chip	100 pF		15.404
C2	Capacitor, chip	470 pF		15.410
C3-4	Capacitor, chip	5.6 nF		15.408
C5	Capacitor, chip	680 pF		15.409
C6-7	Capacitor, chip	330 nF		15.407
C8	Capacitor, cer	33 pF	1KV	15.202
C9	Capacitor, poly	47 nF	6V	11.221
C10	Capacitor, cer	10 nF	30V	14.907
C11	Capacitor, ellyt	1000 uF		12.149
C12	Capacitor, poly	0.1 uF	63V	11.836
C13	Capacitor, ellyt	47 uF	63V	12.633
C14	Capacitor, poly	0.1 uF	63V	11.836
C15	Capacitor, ellyt	10 uF	63V	12.865
C16	Capacitor, poly	0.1 uF	63V	11.836
C17-21	Capacitor, poly	47 nF		11.221
C22	Capacitor, chip	150 pF	150V	15.422

T1-2	Transistor	THA 15		31.117
T3	Transistor	BD 899		30.109
T4	Transistor	BD 139		30.100

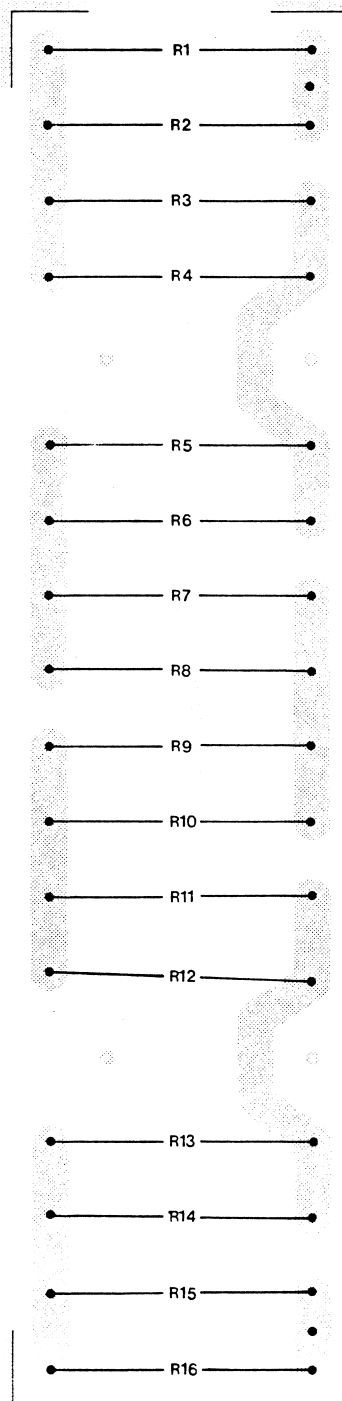
D1	Diode, zener	9.1V		39.717
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L1	Coil			04.1209
L2-3	Coil			04.1213
L4-5	Coil			04.2052
L6	Coil	15 uH		22.226

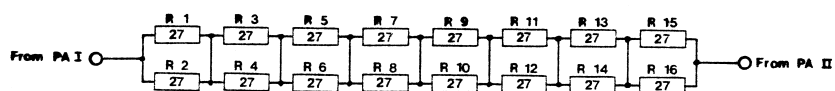
CH1-2	Choke			41.108
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Block diagram for PA unit  
 Drawing no. 001.0433  
 Unit no. 002.2050



**Combiner resistor**  
**Layout no. 33.2051**



**Combiner resistor**

**Drawing no. 001.0414**

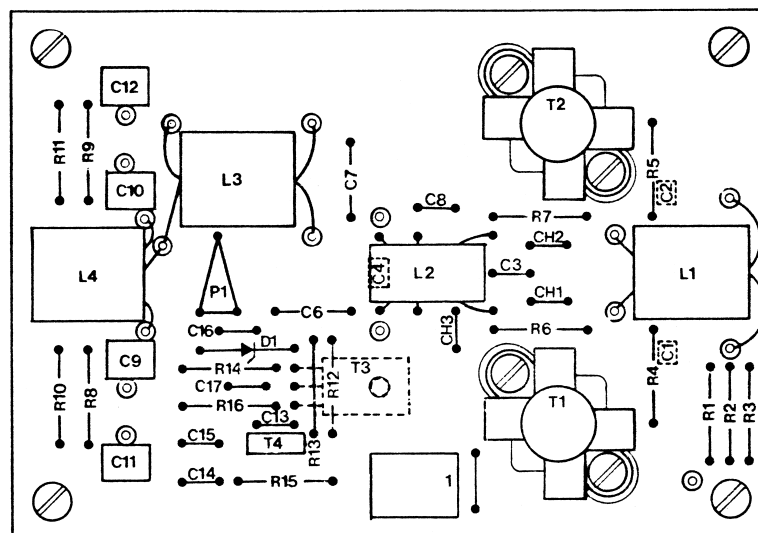
**Unit no. 002.2051**

**PC. Board no. 003.2051**

**Layout no. 33.2051**

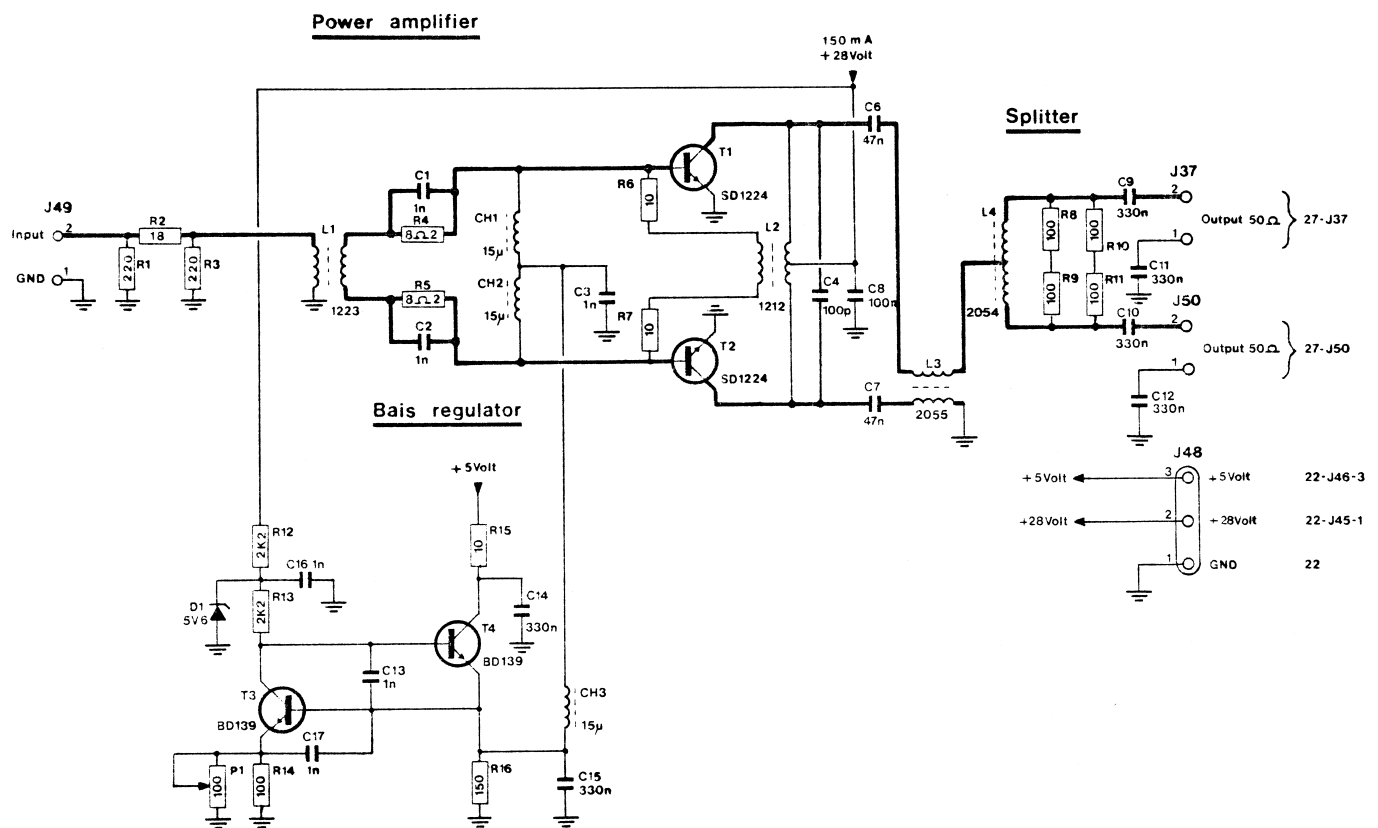
## Combiner resistor Unit no. 002.2051

R1	Resistor	27 Ohm	6W	02.399
R2	Resistor	27 Ohm	6W	02.399
R3	Resistor	27 Ohm	6W	02.399
R4	Resistor	27 Ohm	6W	02.399
R5	Resistor	27 Ohm	6W	02.399
R6	Resistor	27 Ohm	6W	02.399
R7	Resistor	27 Ohm	6W	02.399
R8	Resistor	27 Ohm	6W	02.399
R9	Resistor	27 Ohm	6W	02.399
R10	Resistor	27 Ohm	6W	02.399
R11	Resistor	27 Ohm	6W	02.399
R12	Resistor	27 Ohm	6W	02.399
R13	Resistor	27 Ohm	6W	02.399
R14	Resistor	27 Ohm	6W	02.399
R15	Resistor	27 Ohm	6W	02.399
R16	Resistor	27 Ohm	6W	02.399
PCB	PC Board			003.2051



**Driver**  
**Layout no. 33.2054 F**





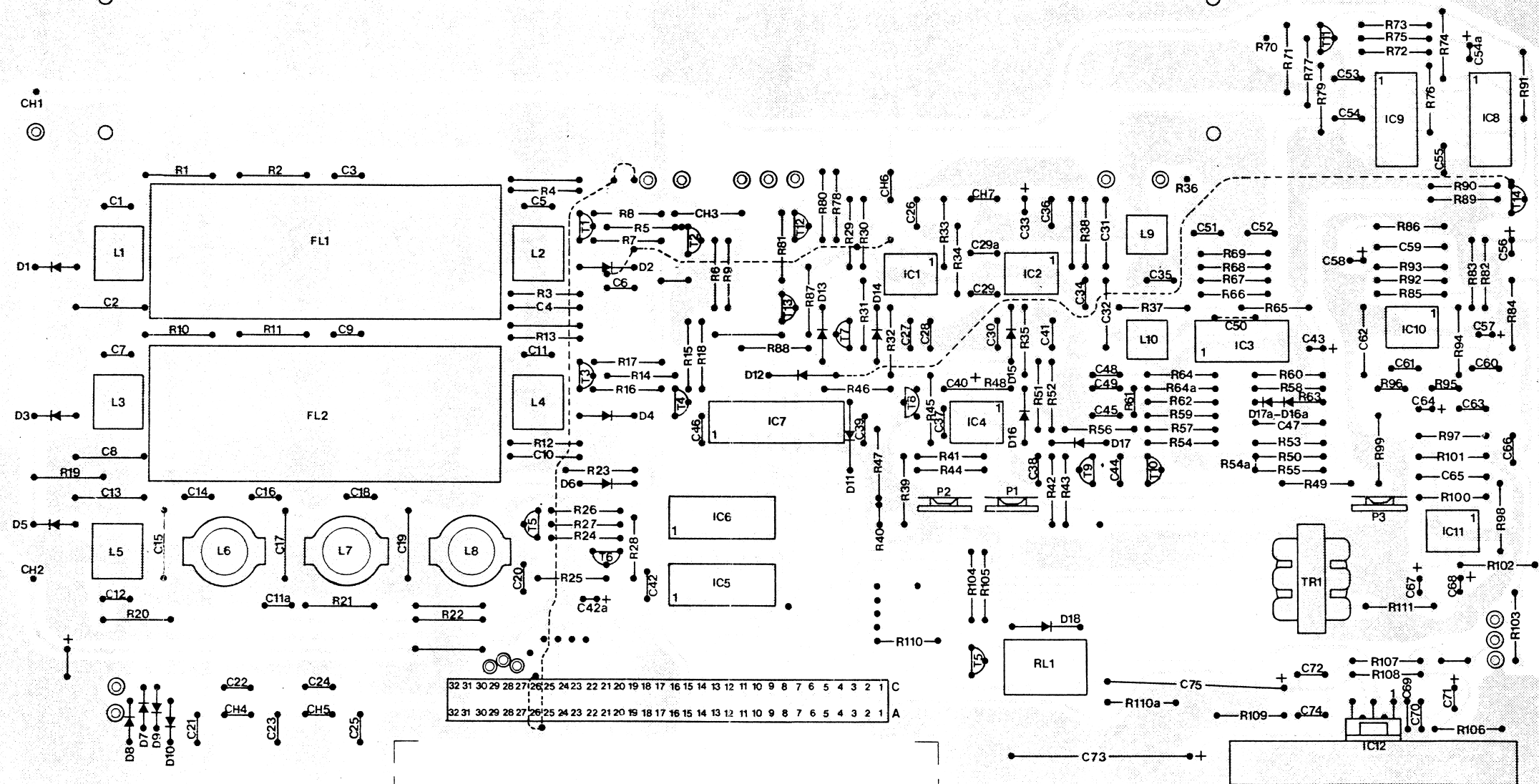
## DRIVER

Drawing no. 001.0416 F  
 Unit no. 002.2054 F  
 PC. Board no. 003.2054 F  
 Layout no. 33.2054 F

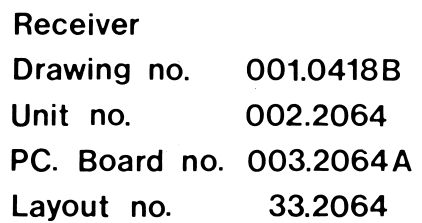
# Danish Communication Systems A/S

## DRIVER UNIT NO. 002.2054F

Circuit Board						03.2054F
R1	Resistor	220 Ohm	1/3W	5%		01.141
R2	Resistor	18 Ohm	1/3W	5%		01.128
R3	Resistor	220 Ohm	1/3W	5%		01.141
R4-5	Resistor	8.2 Ohm	1/3W	5%		01.124
R6-7	Resistor	10 Ohm	1/3W	5%		01.125
R8-11	Resistor, Carbon	100 Ohm				06.106
R12-13	Resistor	2.2 Kohm	1/3W	5%		01.153
R14	Resistor	100 Ohm	1/3W	5%		01.137
R15	Resistor	10 Ohm	1/3W	5%		01.125
R16	Resistor	150 Ohm	1/3W	5%		01.139
P1	Resistor, pre set	100 Ohm				04.137
C1-2	Capacitor, chip	1 nF	100V			15.401
C3	Capacitor, cer	1 nF	40V	-20/+80%		14.902
C4	Capacitor, chip	100 pF	100V			15.404
C5	Not used					
C6-7	Capacitor, pol	47 nF				11.221
C8	Capacitor, pol	100 nF	63V			11.836
C9-12	Capacitor, chip	330 nF				15.407
C13	Capacitor, cer	1 nF	40V	-20/+80%		14.902
C14-15	Capacitor, pol	330 nF	63V			11.842
C16-17	Capacitor, cer	1 nF	40V	-20/+80%		14.902
CH1-3	Choke	15 uH				22.226
T1-2	Transistor	SD1224-10				31.118
T3-4	Transistor	BD139-10				30.100
L1	Coil					004.1223
L2	Coil					004.1212
L3	Coil					004.2055
L4	Coil					004.2054
D1	Diode	Zener	5,6V	4W		39.718
	Cabling Driver					05.2054
	Pin 1x4 5x6					80.602
	Connector 3-pole with lock					80.701
	Tracking pin T1575-01					96.107



Receiver  
Layout no. 33.2064



# Receiver Unit no. 002.2064

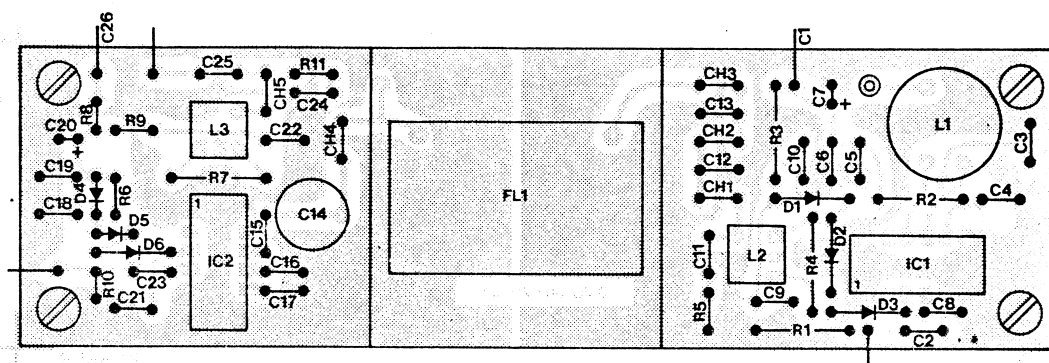
R1	Resistor	2.2 Kohm	1/3W	5%	01.153
R2	Resistor	10 Kohm	1/3W	5%	01.161
R3	Resistor	2.2 Kohm	1/3W	5%	01.153
R4	Resistor	4.7 Kohm	1/3W	5%	01.157
R5	Resistor	10 Kohm	1/3W	5%	01.161
R6	Resistor	5.6 Kohm	1/3W	5%	01.158
R7	Resistor	27 Ohm	1/3W	5%	01.130
R8	Resistor	2.2 Kohm	1/3W	5%	01.153
R9	Resistor	5.6 Kohm	1/3W	5%	01.158
R10	Resistor	2.2 Kohm	1/3W	5%	01.153
R11	Resistor	10 Kohm	1/3W	5%	01.161
R12	Resistor	2.2 Kohm	1/3W	5%	01.153
R13	Resistor	4.7 Kohm	1/3W	5%	01.157
R14	Resistor	10 Kohm	1/3W	5%	01.161
R15	Resistor	5.6 Kohm	1/3W	5%	01.158
R16	Resistor	27 Ohm	1/3W	5%	01.130
R17	Resistor	2.2 Kohm	1/3W	5%	01.153
R18	Resistor	5.6 Kohm	1/3W	5%	01.158
R19	Resistor	1 Kohm	1/3W	5%	01.149
R20	Resistor	2.2 Kohm	1/3W	5%	01.153
R21	Resistor	10 Kohm	1/3W	5%	01.161
R22-23	Resistor	4.7 Kohm	1/3W	5%	01.157
R24	Resistor	10 Kohm	1/3W	5%	01.161
R25	Resistor	5.6 Kohm	1/3W	5%	01.158
R26	Resistor	27 Ohm	1/3W	5%	01.130
R27	Resistor	2.2 Kohm	1/3W	5%	01.153
R28	Resistor	5.6 Kohm	1/3W	5%	01.158
R29	Resistor	10 Kohm	1/3W	5%	01.161
R30	Resistor	2.2 Kohm	1/3W	5%	01.153
R31	Resistor	1.5 Kohm	1/3W	5%	01.151
R32	Resistor	6.8 Kohm	1/3W	5%	01.159
R33-34	Resistor	1 Kohm	1/3W	5%	01.149
R35	Resistor	10 Kohm	1/3W	5%	01.161
R36	Resistor	1 Kohm	1/3W	5%	01.149
R37	Resistor	47 Kohm	1/3W	5%	01.169
R38	Resistor	100 Ohm	1/3W	5%	01.137
R39	Resistor	10 Kohm	1/3W	5%	01.161
R40	Resistor	47 Kohm	1/3W	5%	01.269
R41	Resistor	150 Kohm	1/3W	5%	01.175
R42	Resistor	2.2 Kohm	1/3W	5%	01.153
R43	Resistor	4.7 Kohm	1/3W	5%	01.157
R44	Resistor	47 Kohm	1/3W	5%	01.169
R45-47	Resistor	10 Kohm	1/3W	5%	01.161
R48	Resistor	4.7 Kohm	1/3W	5%	01.157
R49-50	Resistor	5.6 Kohm	1/3W	5%	01.158
R51	Resistor	1 Kohm	1/3W	5%	01.149
R52	Resistor	1 Mohm	1/3W	5%	01.185
R53-54	Resistor	33 Kohm	1/3W	5%	01.167
R54a	Resistor	1 Kohm	1/3W	5%	01.249
R55	Resistor	150 Ohm	1/3W	5%	01.139
R56	Resistor	6.8 Kohm	1/3W	5%	01.159
R57	Resistor	10 Kohm	1/3W	5%	01.161
R58	Resistor	15 Kohm	1/3W	5%	01.163

R59	Resistor	1.5 Kohm	1/3W	5%	01.151
R60	Resistor	1 Kohm	1/3W	5%	01.149
R61	Resistor	10 Kohm	1/3W	5%	01.261
R62	Resistor	150 Ohm	1/3W	5%	01.139
R63	Resistor	1 Kohm	1/3W	5%	01.149
R64	Resistor	4.7 Kohm	1/3W	5%	01.157
R64a	Resistor	10 Kohm	1/3W	5%	01.161
R65	Resistor	100 Ohm	1/3W	5%	01.137
R66	Resistor	1 Kohm	1/3W	5%	01.149
R67	Resistor	5.6 Kohm	1/3W	5%	01.158
R68-69	Resistor	22 Kohm	1/3W	5%	01.165
R70	Resistor	47 Kohm	1/3W	5%	01.169
R71	Resistor	22 Kohm	1/3W	5%	01.165
R72-73	Resistor	100 Kohm	1/3W	5%	01.173
R74	Resistor	4.7 Kohm	1/3W	5%	01.157
R75-76	Resistor	100 Kohm	1/3W	5%	01.173
R77	Resistor	10 Kohm	1/3W	5%	01.161
R78	Resistor	27 Ohm	1/3W	5%	01.130
R79	Resistor	10 Kohm	1/3W	5%	01.161
R80	Resistor	2.2 Kohm	1/3W	5%	01.153
R81	Resistor	10 Kohm	1/3W	5%	01.161
R82-83	Resistor	22 Kohm	1/3W	5%	01.165
R84	Resistor	100 Ohm	1/3W	5%	01.137
R85	Resistor	100 Kohm	1/3W	5%	01.173
R86	Resistor	1 Kohm	1/3W	5%	01.149
R87-88	Resistor	5.6 Kohm	1/3W	5%	01.158
R89-90	Resistor	10 Kohm	1/3W	5%	01.161
R91	Resistor	4.7 Kohm	1/3W	5%	01.157
R92	Resistor	22 Kohm	1/3W	5%	01.165
R93	Resistor	1 Kohm	1/3W	5%	01.149
R94	Resistor	8.2 Kohm	1/3W	5%	01.160
R95-96	Resistor	27 Kohm	1/3W	5%	01.266
R97-98	Resistor	47 Kohm	1/3W	5%	01.169
R99	Resistor	1 Kohm	1/3W	5%	01.149
R100	Resistor	8.2 Kohm	1/3W	5%	01.160
R101	Resistor	1 Kohm	1/3W	5%	01.149
R102	Resistor	100 Ohm	1/3W	5%	01.137
R103	Resistor	10 Kohm	1/3W	5%	01.161
R104-105	Resistor	5.6 Kohm	1/3W	5%	01.158
R106	Resistor	2.2 Ohm	1/3W	5%	01.117
R107	Resistor	47 Ohm	1/3W	5%	01.133
R108	Resistor	150 Ohm	1/3W	5%	01.139
R109	Resistor	1 Ohm	1/3W	5%	01.113
R110	Resistor	68 Ohm	1/3W	5%	01.135
R110a	Resistor	1 Kohm	1/3W	5%	01.149
R111	Resistor	68 Ohm	1/3W	5%	01.135
P1-3	Resistor	5 Kohm	Preset		04.357
C1	Capacitor, poly	47 nF	63V		11.832
C2	Capacitor, sty	220 pF		5%	10.133
	Capacitor, sty	1 nF		5%	10.149
C3	Capacitor, poly	47 nF	63V		11.832
C4	Capacitor, sty	220 pF		5%	10.133
	Capacitor, sty	1 nF		5%	10.149
C5-7	Capacitor, poly	47 nF	63V		11.832
C8	Capacitor, sty	220 pF		5%	10.133
	Capacitor, sty	1 nF		5%	10.149

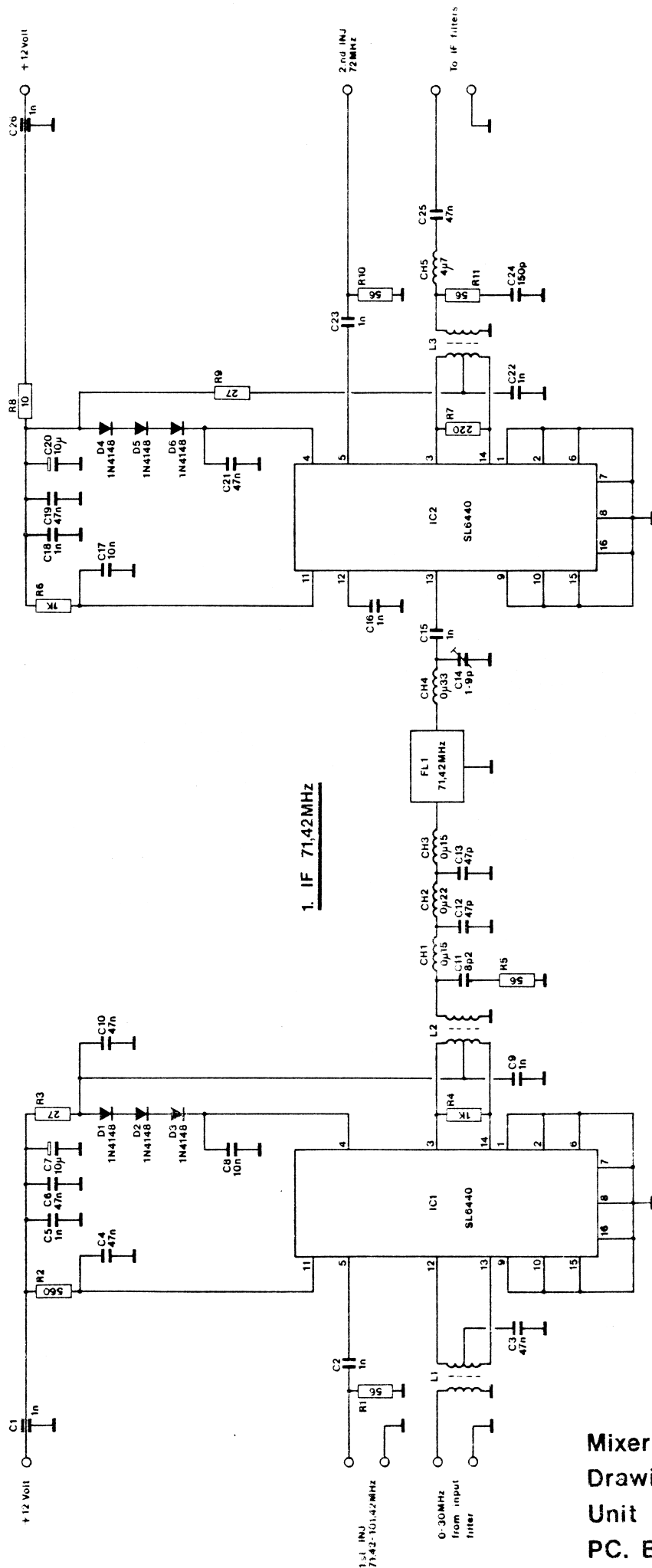
C9	Capacitor, poly	47 nF	63V		11.832
C10	Capacitor, sty	220 pF		5%	10.133
	Capacitor, sty	1 nF		5%	10.149
C11-12	Capacitor, poly	47 nF	63V		11.832
C13	Capacitor, sty	1 nF		5%	10.149
C14	Capacitor, cer	15 pF			14.127
C15	Capacitor, sty	1 nF		5%	10.149
C16	Capacitor, cer	6.8 pF			14.123
C17	Capacitor, sty	1 nF		5%	10.149
C18	Capacitor, cer	8.2 pF			14.124
C19	Capacitor, sty	1 nF		5%	10.149
C20	Capacitor, poly	47 nF	63V		11.832
C21	Capacitor, cer	68 pF			16.369
C22	Capacitor, cer	15 pF			14.127
C23	Capacitor, cer	150 pF	63V		14.339
C24	Capacitor, cer	15 pF			14.127
C25	Capacitor, cer	68 pF			16.369
C26-28	Capacitor, poly	47 nF	63V		11.832
C29-29a	Capacitor, cer	1 nF	40V		14.902
C30	Capacitor, poly	47 nF	63V		11.832
C31-32	Capacitor, cer	1 nF	40V		14.902
C33	Capacitor, lyt	10 uF	40V		12.845
C34	Capacitor, poly	100 nF	63V		11.836
C35-36	Capacitor, poly	47 nF	63V		11.832
C37	Capacitor, cer	10 nF	30V		14.907
C38-39	Capacitor, poly	47 nF	63V		11.832
C40	Capacitor, lyt	4700 nF	40V		12.420
C41	Capacitor, poly	1 uF	63V		11.848
C42	Capacitor, cer	100 nF	63V		14.913
C42a-43	Capacitor, lyt	10 uF	40V		12.845
C44	Capacitor, poly	220 nF	63V		11.840
C45	Capacitor, cer	10 nF	30V		14.907
C46	Capacitor, cer	100 nF	63V		14.913
C47	Capacitor, sty	1 nF		5%	10.149
C48	Capacitor, poly	47 nF	63V		11.832
C49	Capacitor, cer	10 nF	30V		14.907
C50	Capacitor, cer	4.7 nF		10%	14.357
C51-52	Capacitor, poly	2.2 nF	63V		11.817
C53-54	Capacitor, poly	100 nF	63V		11.836
C54a	Capacitor, lyt	22 uF	40V		12.847
C55	Capacitor, poly	220 nF	63V		11.840
C56	Capacitor, lyt	22 uF	40V		12.847
C57-58	Capacitor, lyt	10 uF	40V		12.845
C59	Capacitor, sty	100 pF		5%	10.125
C60	Capacitor, poly	4.7 nF	63V		11.820
C61	Capacitor, poly	3.3 nF	63V		11.819
C62	Capacitor, sty	390 pF		5%	10.139
C63	Capacitor, poly	470 nF	63V		11.844
C64	Capacitor, lyt	10 uF	40V		12.845
C65	Capacitor, sty	100 pF		5%	10.125
C66	Capacitor, poly	100 nF	63V		11.836
C67-68	Capacitor, lyt	10 uF	40V		12.845
C69-70	Capacitor, cer	1 nF	40V		14.902
C71	Capacitor, lyt	100 uF	25V		12.831
C72	Capacitor, poly	47 nF	63V		11.832
C73	Capacitor, lyt	1000 uF	16V		12.249

C74	Capacitor, poly	100 nF	63V	11.836
C75	Capacitor, lyt	1000 uF	16V	12.249
CH1-3	Choke	15 uH	0.6A	22.102
CH4-5	Choke	0.33 uH		22.206
CH6	Choke	15 uH		22.226
CH7	Choke	330 uH		22.242
TR1	Transformer	600 Ohm		26.124
RL1	Relay		12V	27.112
T1	Transistor	BC 307		32.102
T2	Transistor	BC 237B		32.101
T3	Transistor	BC 307		32.102
T4	Transistor	BC 237B		32.102
T6-9	Transistor	BC 237B		32.101
T10	Transistor	BC 307		32.102
T11	Transistor	BC 237B		32.101
T12	Transistor	BC 307		32.102
T13-15	Transistor	BC 237B		32.101
IC1-2	Integrated Circuit	MC 1350		35.137
IC3	Integrated Circuit	T.Array CA3086		35.134
IC4	Integrated Circuit	LM 358N		35.112
IC5-6	Integrated Circuit	74LS138		36.172
IC7	Integrated Circuit	74LS374		36.189
IC8	Integrated Circuit	74C14		36.191
IC9	Integrated Circuit	CD4066CN		36.157
IC10	Integrated Circuit	LM358N		35.112
IC11	Integrated Circuit	UA 741		35.106
IC12	Integrated Circuit	TDA 2002A		35.108
D1-6	Diode	BA 244		39.101
D7-18	Diode	1N4148		39.103
FL1-2	X Fil	F580 1U		50.201
L1-8	Coil			4.0112
L9	Coil	5961		23.109
L10	Coil	5876		23.104





Mixer unit  
Layout no. 33.2065



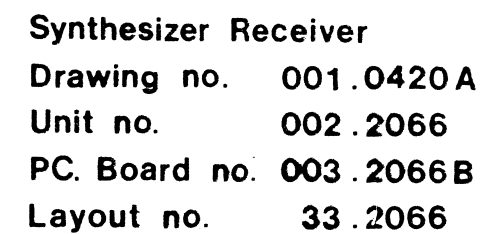
Mixer unit

Drawing no. 001.0419A

Unit no. 002.2065

PC. Board no. 003.2065A

Layout no. 33.2065

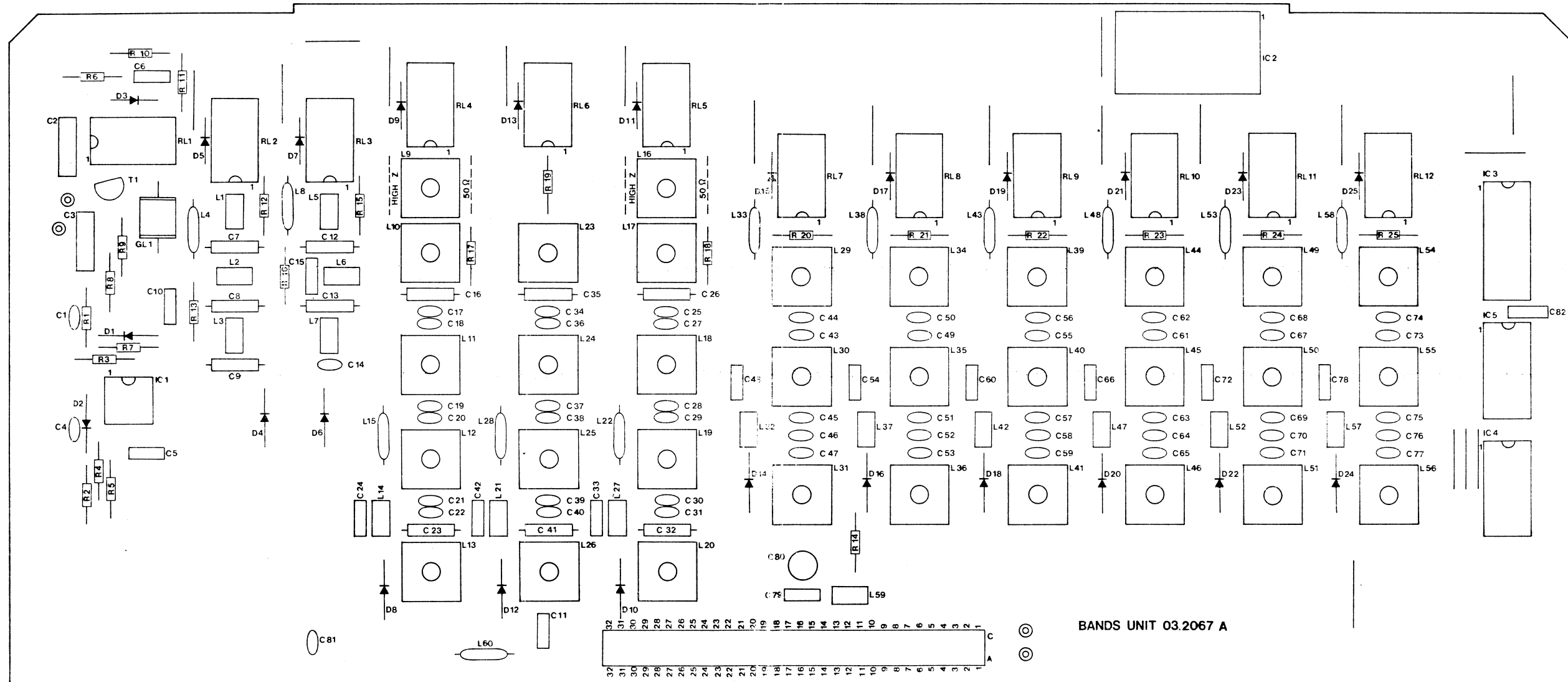


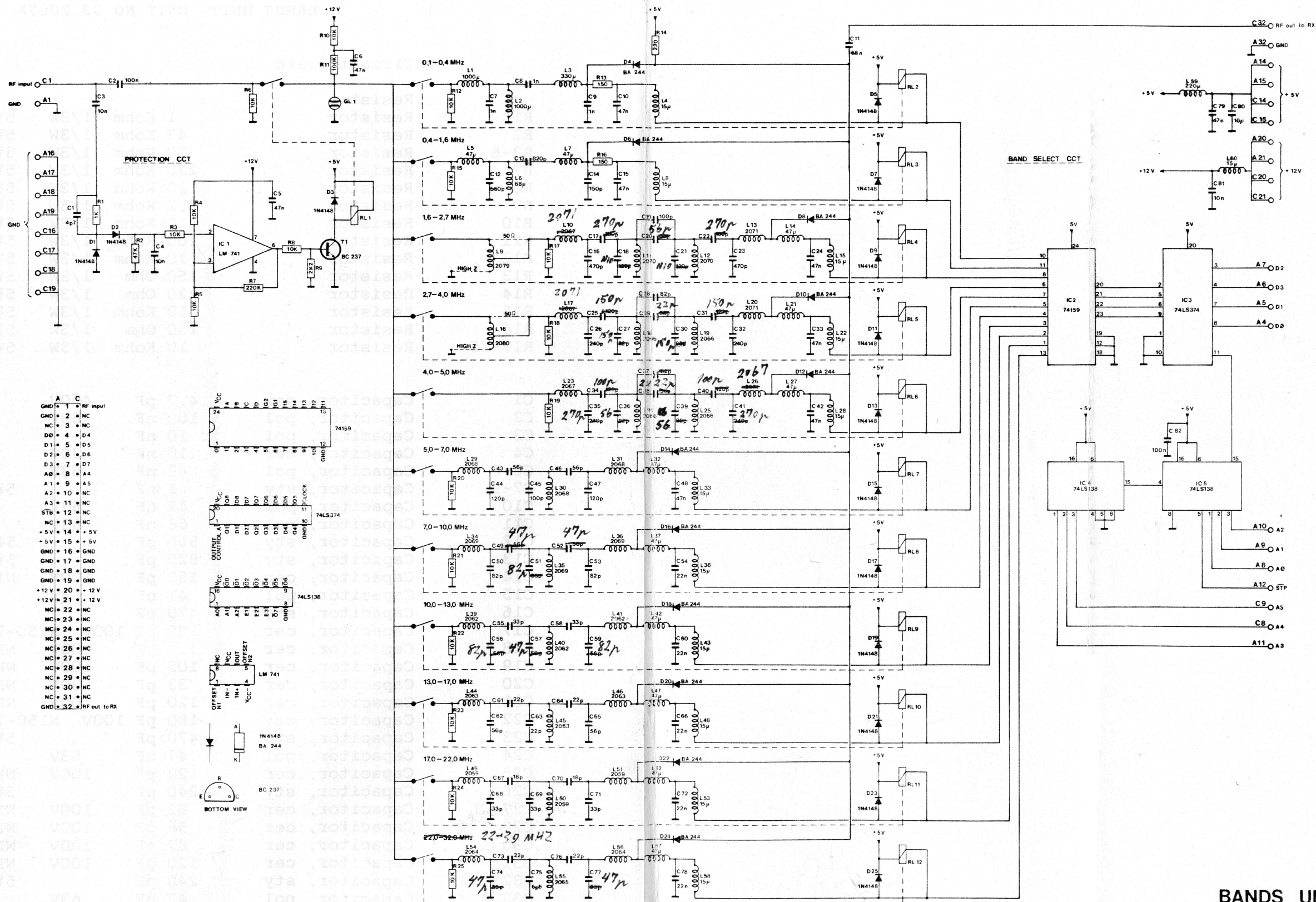
# Synth. Receiver Unit no. 002.2066

R1	Resistor	47 Ohm	1/3W	5%	01.133
R2	Resistor	100 Ohm	1/3W	5%	01.237
R3	Resistor	6.8 Kohm	1/3W	5%	01.159
R4	Resistor	3.9 Kohm	1/3W	5%	01.156
R5	Resistor	100 Ohm	1/3W	5%	01.137
R6	Resistor	330 Ohm	1/3W	5%	01.243
R7	Resistor	15 Ohm	1/3W	5%	01.127
R8	Resistor	470 Ohm	1/3W	5%	01.145
R9	Resistor	3.3 Kohm	1/3W	5%	01.155
R10-11	Resistor	100 Ohm	1/3W	5%	01.137
R12	Resistor	22 Ohm	1/3W	5%	01.129
R13	Resistor	3.3 Kohm	1/3W	5%	01.155
R14-15	Resistor	82 Ohm	1/3W	5%	01.236
R16	Resistor	82 Ohm	1/3W	5%	01.136
R17-18	Resistor	100 Ohm	1/3W	5%	01.137
R19-20	Resistor	10 Kohm	1/3W	5%	01.261
R21	Resistor	1 Kohm	1/3W	5%	01.249
R21a	Resistor	2.2 Kohm	1/3W	5%	01.253
R22-24	Resistor	5.6 Kohm	1/3W	5%	01.158
R25	Resistor	5.6 Kohm	1/3W	5%	01.258
R26	Resistor	2.2 Kohm	1/3W	5%	01.153
R27	Resistor	5.6 Kohm	1/3W	5%	01.158
R28	Resistor	5.6 Kohm	1/3W	5%	01.258
R29-31	Resistor	5.6 Kohm	1/3W	5%	01.158
R32	Resistor	2.2 Kohm	1/3W	5%	01.153
R33-34	Resistor	1 Kohm	1/3W	5%	01.149
R35	Resistor	10 Kohm	1/3W	5%	01.161
R36	Resistor	100 Ohm	1/3W	5%	01.137
R37	Resistor	680 Ohm	1/3W	5%	01.247
R38	Resistor	120 Ohm	1/3W	5%	01.238
R39	Resistor	22 Kohm	1/3W	5%	01.265
R40	Resistor	3.3 Kohm	1/3W	5%	01.155
R41	Resistor	22 Kohm	1/3W	5%	01.265

C1-3	Capacitor, cer	120 pF	N750	14.338
C4	Capacitor, cer	1 nF	40V	14.902
C5	Capacitor, cer	82 pF	25V	14.336
C6-10	Capacitor, cer	10 nF	30V	14.907
C11	Capacitor, cer	68 pF		16.369
C12	Capacitor, cer	10 nF	30V	14.907
C13	Capacitor, cer	1 pF	250V	14.113
C14	Capacitor, cer	68 pF		16.369
C15	Capacitor, cer	10 nF	30V	14.907
C16-17	Capacitor, cer	1 nF	40V	14.902
C18	Capacitor, cer	10 pF		14.125
C19	Capacitor, cer	1 pF	250V	14.113
C20	Capacitor, cer	1 nF	40V	14.902
C21	Capacitor, cer	15 pF		14.127
C22	Capacitor, ellyt	10 uF	40V	12.845
C23-26	Capacitor, gen	1 nF		15.502
C26a	Capacitor, pol	47 nF	63V	11.832
C27	Capacitor, cer	1 nF	40V	14.902
C27a	Capacitor, ellyt	10 uF	40V	12.845
C28	Capacitor, cer	10 nF	30V	14.907
C28a	Capacitor, cer	1 nF	40V	14.902
C29	Capacitor, ellyt	100 uF	25V	12.831

C30-32	Capacitor, cer	1 nF	40V		14.902
C33	Capacitor, sty	820 pF		5%	10.147
C34	Capacitor, pol	47 nF	63V		11.832
C35	Capacitor, ellyt	10 uF	40V		12.845
C36	Capacitor, pol	47 nF	63V		11.832
C37	Capacitor, ellyt	10 uF	40V		12.845
C38	Capacitor, cer	10 nF	30V		14.907
C39	Capacitor, pol	100 nF	63V		11.836
C40	Capacitor, gen	1 nF			15.502
C41	Capacitor, pol	47 nF	63V		11.832
C42	Capacitor, ellyt	10 uF	40V		12.845
C43	Capacitor, gen	1 nF			15.502
CH1-2	Choke	1.2 uH			22.213
CH3	Choke	15 uH	0.6A		22.102
T1-6	Transistor	BF199			33.102
T7-10	Transistor	BC237B			32.101
IC1	Integrated Circuit	LM78L05			35.216
IC2	Integrated Circuit	MC145158			36.515
IC3	Integrated Circuit	TDA 10625			36.517
D1-3	Diode	1N4148			39.103
D4	Diode, cap	BB209			39.404
L1	Coil				004.1202
L2	Coil				004.2060
L3	Coil				004.2061
L4	Coil				004.1202
L5	Coil				004.2060
L6	Coil				004.2061
L7	Coil				23.105





**BANDS UNIT**

Drawing no. 01.2067

Unit no. 02.2067

PC. Board no. 03.2067

Layout no. 33.2067

## BANDS UNIT UNIT NO 02.2067A

## Circuit board

03.2067A

	Resistor				01.001
R1	Resistor	1 Kohm	1/3W	5%	01.149
R2	Resistor	47 Kohm	1/3W	5%	01.169
R3-6	Resistor	10 Kohm	1/3W	5%	01.161
R7	Resistor	220 Kohm	1/3W	5%	01.177
R8	Resistor	10 Kohm	1/3W	5%	01.161
R9	Resistor	2,2 Kohm	1/3W	5%	01.153
R10	Resistor	10 Kohm	1/3W	5%	01.161
R11	Resistor	100 Kohm	1/3W	5%	01.173
R12	Resistor	10 Kohm	1/3W	5%	01.161
R13	Resistor	150 Ohm	1/3W	5%	01.139
R14	Resistor	220 Ohm	1/3W	5%	01.141
R15	Resistor	10 Kohm	1/3W	5%	01.161
R16	Resistor	150 Ohm	1/3W	5%	01.139
R17-25	Resistor	10 Kohm	1/3W	5%	01.161
C1	Capacitor, cer	4,7 pF	400V		14.121
C2	Capacitor, pol	100 nF	63V		11.225
C3	Capacitor, pol	10 nF			11.313
C4	Capacitor, cer	10 nF	30V		14.907
C5-6	Capacitor, pol	47 nF	63V		11.832
C7-9	Capacitor, sty	1 nF		5%	10.149
C10	Capacitor, pol	47 nF	63V		11.832
C11	Capacitor, pol	68 nF	63V		11.834
C12	Capacitor, sty	560 pF		5%	10.143
C13	Capacitor, sty	820 pF		5%	10.147
C14	Capacitor, cer	150 pF	100V	N150	14.584
C15	Capacitor, pol	47 nF	63V		11.832
C16	Capacitor, sty	470 pF			10.141
C17	Capacitor, cer	180 pF	100V	N150-750	14.585
C18	Capacitor, cer	100 pF	100V	NPO	14.583
C19	Capacitor, cer	100 pF	100V	NPO	14.582
C20	Capacitor, cer	33 pF	100V	NPO	14.576
C21	Capacitor, cer	120 pF	100V	NPO	14.583
C22	Capacitor, cer	180 pF	100V	N150-750	14.585
C23	Capacitor, sty	470 pF		5%	10.141
C24	Capacitor, pol	47 nF	63V		11.832
C25	Capacitor, cer	120 pF	100V	NPO	14.583
C26	Capacitor, sty	240 pF		5%	10.134
C27-28	Capacitor, cer	82 pF	100V	NPO	14.581
C29	Capacitor, cer	56 pF	100V	NPO	14.579
C30	Capacitor, cer	82 pF	100V	NPO	14.581
C31	Capacitor, cer	120 pF	100V	NPO	14.583
C32	Capacitor, sty	240 pF		5%	10.134
C33	Capacitor, pol	47 nF	63V		11.832
C34	Capacitor	120 pF	100V	NPO	14.583
C35	Capacitor, sty	240 pF		5%	10.134
C36-37	Capacitor, cer	82 pF	100V	NPO	14.581



# Danish Communication Systems A/S

C38	Capacitor, cer	56 pF	100V	NPO	14.579
C39	Capacitor, cer	82 pF	100V	NPO	14.581
C40	Capacitor, cer	120 pF	100V	NPO	14.583
C41	Capacitor, sty	240 pF		5%	10.134
C42	Capacitor, pol	47 nF	63V		11.832
C43	Capacitor, cer	56 pF	100V	NPO	14.579
C44	Capacitor, cer	120 pF	100V	NPO	14.583
C45	Capacitor, cer	100 pF	100V	NPO	14.582
C46	Capacitor, cer	56 pF	100V	NPO	14.579
C47	Capacitor, cer	120 pF	100V	NPO	14.583
C48	Capacitor, pol	47 nF	63V		11.832
C49	Capacitor, cer	56 pF	100V	NPO	14.579
C50	Capacitor, cer	82 pF	100V	NPO	14.581
C51-52	Capacitor, cer	56 pF	100V	NPO	14.579
C53	Capacitor, cer	82 pF	100V	NPO	14.581
C54	Capacitor, pol	22 nF	63V		11.828
C55	Capacitor, cer	33 pF	100V	NPO	14.576
C56-57	Capacitor, cer	56 pF	100V	NPO	14.579
C58	Capacitor, cer	33 pF	100V	NPO	14.576
C59	Capacitor, cer	56 pF	100V	NPO	14.579
C60	Capacitor, pol	22 nF	63V		11.828
C61	Capacitor, cer	22 pF	100V	NPO	14.574
C62	Capacitor, cer	56 pF	100V	NPO	14.579
C63-64	Capacitor, cer	22 pF	100V	NPO	14.574
C65	Capacitor, cer	56 pF	100V	NPO	14.579
C66	Capacitor, pol	22 nF	63V		11.828
C67	Capacitor, cer	18 pF	100V	NPO	14.573
C68-69	Capacitor, cer	33 pF	100V	NPO	14.576
C70	Capacitor, cer	18 pF	100V	NPO	14.573
C71	Capacitor, cer	33 pF	100V	NPO	14.576
C72	Capacitor, pol	22 nF	63V		11.828
C73	Capacitor, cer	22 pF	100V	NPO	14.574
C74	Capacitor, cer	33 pF	100V	NPO	14.576
C75	Capacitor, cer	6,8 pF	100V	NPO	14.568
C76	Capacitor, cer	22 pF	100V	NPO	14.574
C77	Capacitor, cer	33 pF	100V	NPO	14.576
C78	Capacitor, pol	22 nF	63V		11.828
C79	Capacitor, pol	47 nF	63V		11.832
C80	Capacitor, ellyt	10 uF	40V		12.845
C81	Capacitor, poly	10 nF			11.313
C82	Capacitor, poly	100 nF	63V		11.836

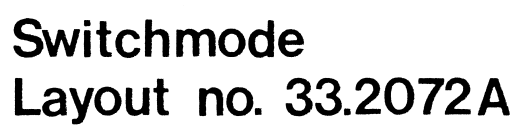
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D4	Diode	BA244		39.101
D5	Diode	1N4148		39.103
D6	Diode	BA244		39.101
D7	Diode	1N4148		39.103
D8	Diode	BA244		39.101
D9	Diode	1N4148		39.103
D10	Diode	BA244		39.101
D11	Diode	1N4148		39.103
D12	Diode	BA244		39.101
D13	Diode	1N4148		39.103
D14	Diode	BA244		39.101
D15	Diode	1N4148		39.103

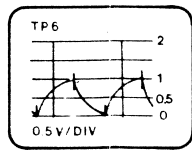
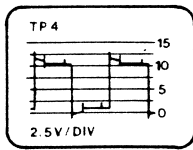
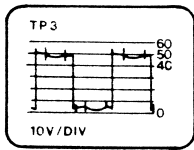
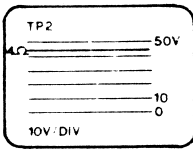
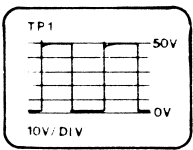
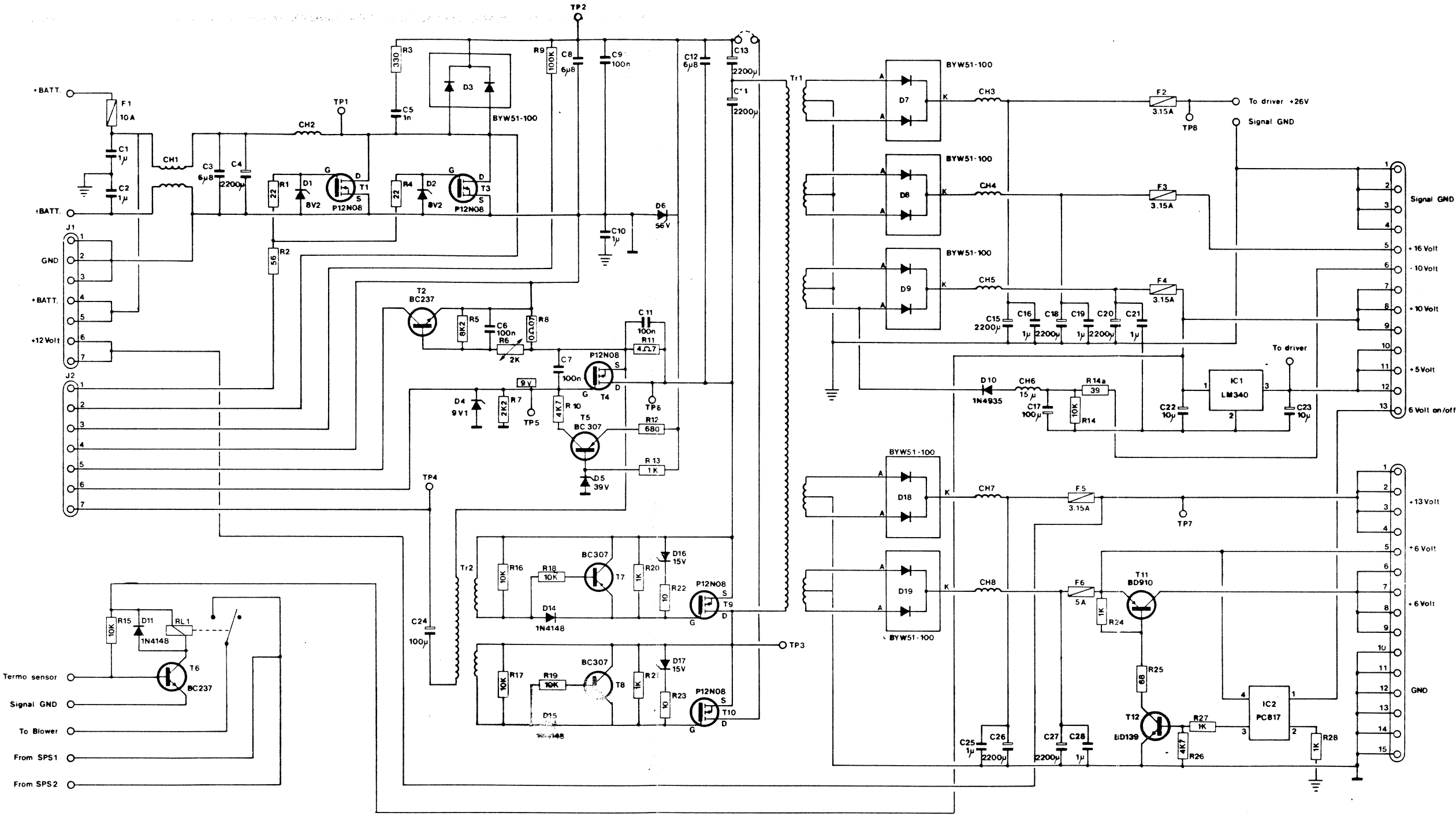
# Danish Communication Systems A/S

D16	Diode	BA244	39.101
D17	Diode	1N4148	39.103
D18	Diode	BA244	39.101
D19	Diode	1N4148	39.103
D20	Diode	BA244	39.101
D21	Diode	1N4148	39.103
D22	Diode	BA244	39.101
D23	Diode	1N4148	39.103
D24	Diode	BA244	39.101
D25	Diode	1N4148	39.103
L1-2	Coil drossel	1000 uH	22.248
L3	Coil drossel	330 uH	22.242
L4	Coil drossel	15 uH	22.102
L5	Coil drossel	47 uH	22.232
L6	Coil drossel	68 uH	22.234
L7	Coil drossel	47 uH	22.232
L8	Coil drossel	15 uH	22.102
L9	Coil		04.2079
L10	Coil		04.2071
L11-12	Coil		04.2070
L13	Coil		04.2071
L14	Coil drossel	47 uH	22.232
L15	Coil drossel	15 uH	22.102
L16	Coil		04.2080
L17	Coil		04.2066
L18-19	Coil		04.2066
L20	Coil		04.2066
L21	Coil drossel	47 uH	22.232
L22	Coil drossel	15 uH	22.102
L23	Coil		04.2067
L24-25	Coil		04.2066
L26	Coil		04.2071
L27	Coil drossel	47 uH	22.232
L28	Coil drossel	15 uH	22.102
L29-31	Coil		04.2068
L32	Coil drossel	47 uH	22.232
L33	Coil drossel	15 uH	22.102
L34-36	Coil		04.2069
L37	Coil drossel	47 uH	22.232
L38	Coil drossel	15 uH	22.102
L39-41	Coil		04.2062
L42	Coil drossel	47 uH	22.232
L43	Coil drossel	15 uH	22.102
L44-46	Coil		04.2063
L47	Coil drossel	47 uH	22.232
L48	Coil drossel	15 uH	22.102
L49-51	Coil		04.2059
L52	Coil drossel	47 uH	22.232
L53	Coil drossel	15 uH	22.102
L54	Coil		04.2064
L55	Coil		04.2065
L56	Coil		04.2064
L57	Coil drossel	47 uH	22.232
L58	Coil drossel	15 uH	22.102

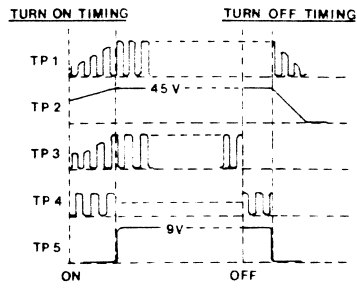
# Danish Communication Systems A/S

L59	Coil drossel	220 uH	22.240
L60	Coil drossel	15 uH	22.102
T1	Transistor	BC 237B	32.101
RL1-12	Relay	5V	27.125
IC1	Integrated Circuit	LM741	35.106
IC2	Integrated Circuit	74159	36.196
IC3	Integrated Circuit	74LS374	36.189
IC4-%	Integrated Circuit	74LS138	36.172
GL1	Clow lamp		55.102
PCB-Injector-Ejector			62.241
Connector 64 pol.			80.141
Pin 1x4 5x6			80.602
Nut 2,6			90.201
Screw 2,6x10			90.271





45V MEASURED WITH DC VOLTMETER



Switchmode  
 Drawing no. 001.0421A  
 Unit no. 002.2072  
 PC. Board no. 003.2072 B  
 Layout no. 33.2072A

# Switchmode Unit no. 002.2072

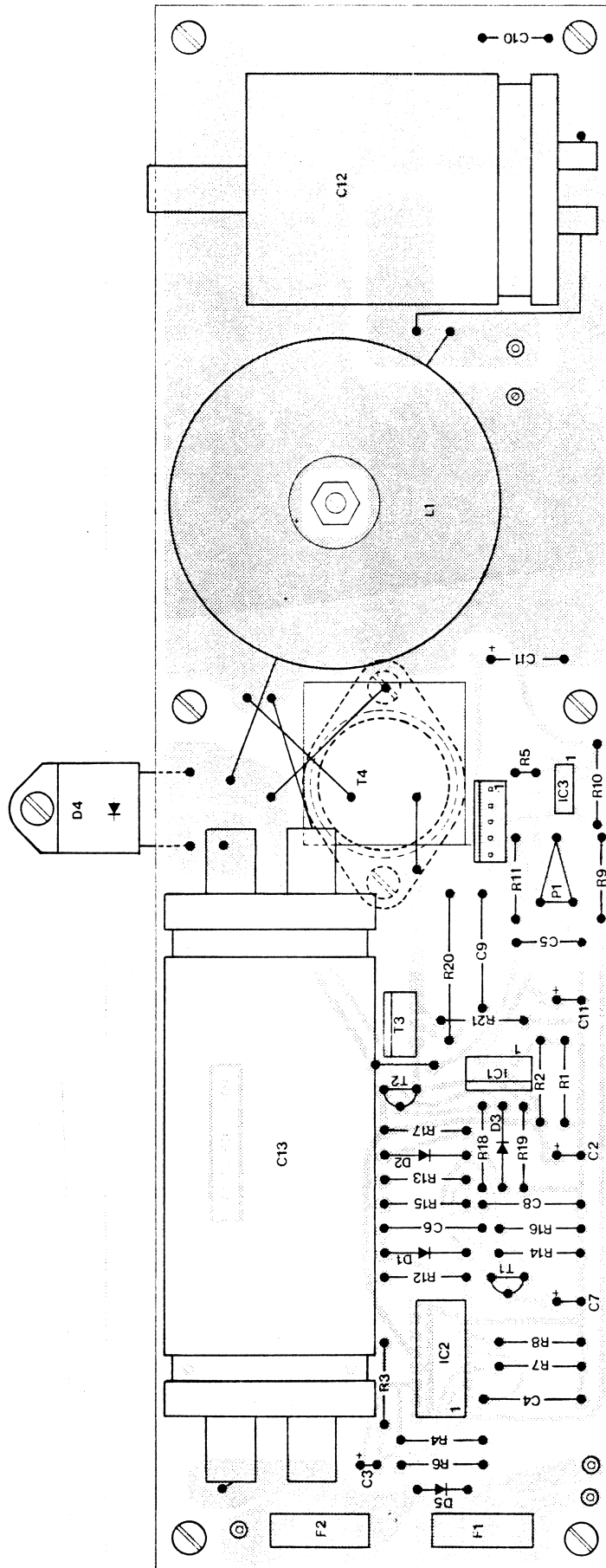
R1	Resistor	22 Ohm	1/3W	5%	01.129
R2	Resistor	56 Ohm	1/3W	5%	01.134
R3	Resistor	330 Ohm	1/3W	5%	01.243
R4	Resistor	22 Ohm	1/3W	5%	01.129
R5	Resistor	8.2 Kohm	1/3W	5%	01.260
R6	Resistor	2 Kohm	NTC KTY 10B		03.105
R7	Resistor	2.2 Kohm	1/3W	5%	01.253
R8	Resistor	0.1 Ohm	5W	2%	06.127
R9	Resistor	100 Kohm	1/3W	5%	01.173
R10	Resistor	4.7 Kohm	1/3W	5%	01.257
R11	Resistor	4.7 Ohm	3W	5%	02.221
R12	Resistor	680 Ohm	1/3W	5%	01.247
R13	Resistor	1 Kohm	1/3W	5%	01.149
R14	Resistor	10 Kohm	1/3W	5%	01.261
R14a	Resistor	39 Ohm	3W	5%	02.232
R15-19	Resistor	10 Kohm	1/3W	5%	01.261
R20-21	Resistor	1 Kohm	1/3W	5%	01.249
R22-23	Resistor	10 Ohm	1/3W	5%	01.225
R24	Resistor	1 Kohm	1/3W	5%	01.249
R25	Resistor	68 Ohm	1/2W	5%	01.335
R26	Resistor	4.7 Kohm	1/3W	5%	01.257
R27	Resistor	1 Kohm	1/3W	5%	01.149
R28	Resistor	1 Kohm	1/3W	5%	01.249

C1-2	Capacitor, poly	1 uF	100V	MKT	11.251
C3	Capacitor, poly	6.8 uF	100V		11.250
C4	Capacitor, ellyt	2200 uF	35V		12.857
C5	Capacitor, styro	1 nF		5%	10.149
C6-7	Capacitor, cer	100 nF	63V		14.913
C8	Capacitor, poly	6.8 uF	100V		11.250
C9	Capacitor, cer	100 nF	63V		14.913
C10	Capacitor, poly	1 uF	100V	MKT	11.251
C11	Capacitor, cer	100 nF	63V		14.913
C12	Capacitor, poly	6.8 uF	100V		11.250
C13-15	Capacitor, ellyt	2200 uF	35V		12.857
C16	Capacitor, poly	1 uF	63V		11.848
C17	Capacitor, ellyt	100 uF	25V		12.831
C18	Capacitor, ellyt	2200 uF	35V		12.857
C19	Capacitor, poly	1 uF	63V		11.848
C20	Capacitor, ellyt	2200 uF	35V		12.857
C21	Capacitor, poly	1 uF	63V		11.848
C22-23	Capacitor, ellyt	10 uF	40V		12.845
C24	Capacitor, ellyt	100 uF	25V		12.831
C25	Capacitor, poly	1 uF	63V		11.848
C26-27	Capacitor, ellyt	2200 uF	35V		12.857
C28	Capacitor, poly	1 uF	63V		11.848

CH1	Choke				04.2077
CH2	Choke				04.1571
CH3-5	Choke				04.2075
CH6	Choke	15 uF			22.226
CH7-8	Choke				04.2076

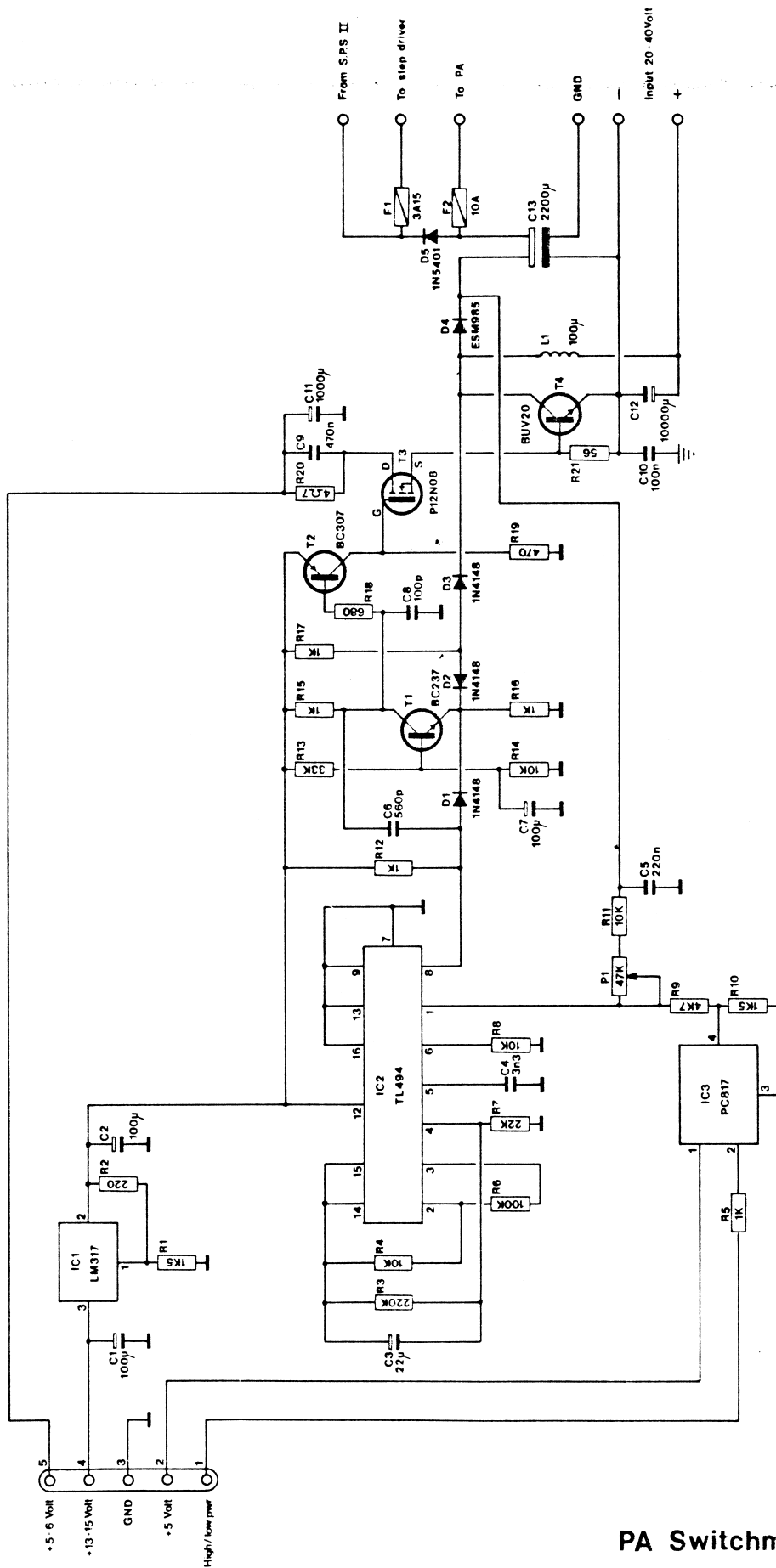
RL1	Relay		12V		27.112
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T1	Transistor	P12N08		34.115
T2	Transistor	BC237B		32.101
T3-4	Transistor	P12N08		34.115
T5	Transistor	BC307		32.102
T6	Transistor	BC237B		32.101
T7-8	Transistor	BC 307		32.102
T9-10	Transistor	P12N08		34.115
T11	Transistor	BD910		30.119
T12	Transistor	BD139		30.101
IC1	Integrated Circuit	LM 340T-S		35.205
IC2	Integrated Circuit	OPTO PC817		39.804
D1-2	Diode, zener	8.2V	0.4W	39.708
D3	Diode	BYW 51-100		38.113
D4	Diode, zener	9.1V		39.717
D5	Diode, zener	39V	3W	39.715
D6	Diode, zener	56V		39.720
D7-9	Diode	BYW 51-100		38.113
D10	Diode	1N4935		38.115
D11	Diode	1N4148		39.103
D12	Not used			
D13	Not used			
D14-15	Diode	1N4148		39.103
D16-17	Diode, zener	15V	0.4W	39.714
D18-19	Diode	BYW 51-100		38.113
F1	Fuse	10A	5x20	55.420
F2-5	Fuse	3.15A		55.421
F6	Fuse	5A	5x20	55.410
TR1	Trafo			26.133
TR2	Trafo			04.2072



PA Switchmode  
Layout no. 33.2074





## PA Switchmode

Drawing no. 001.0422A

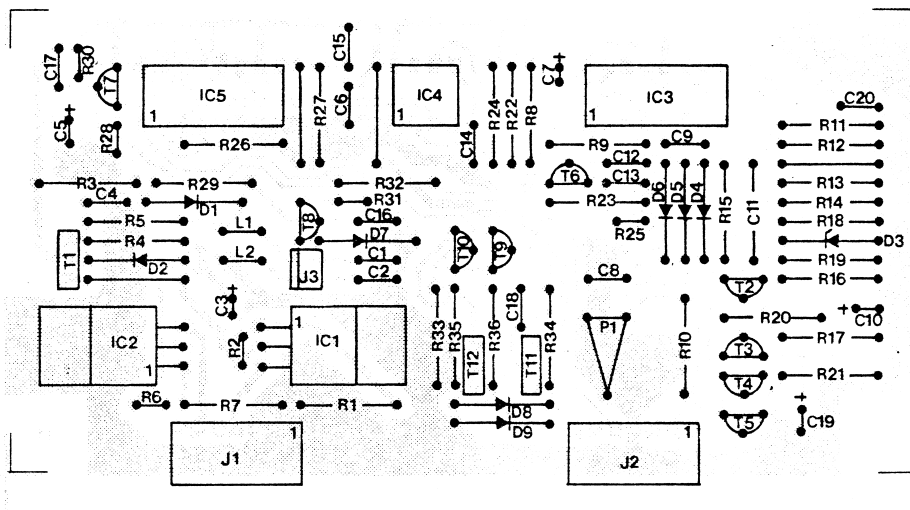
Unit no. 002.2074

PC. Board no. 003.2074

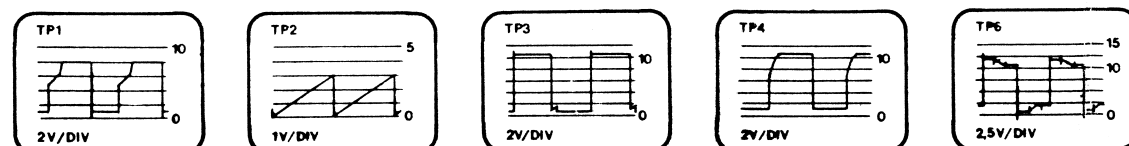
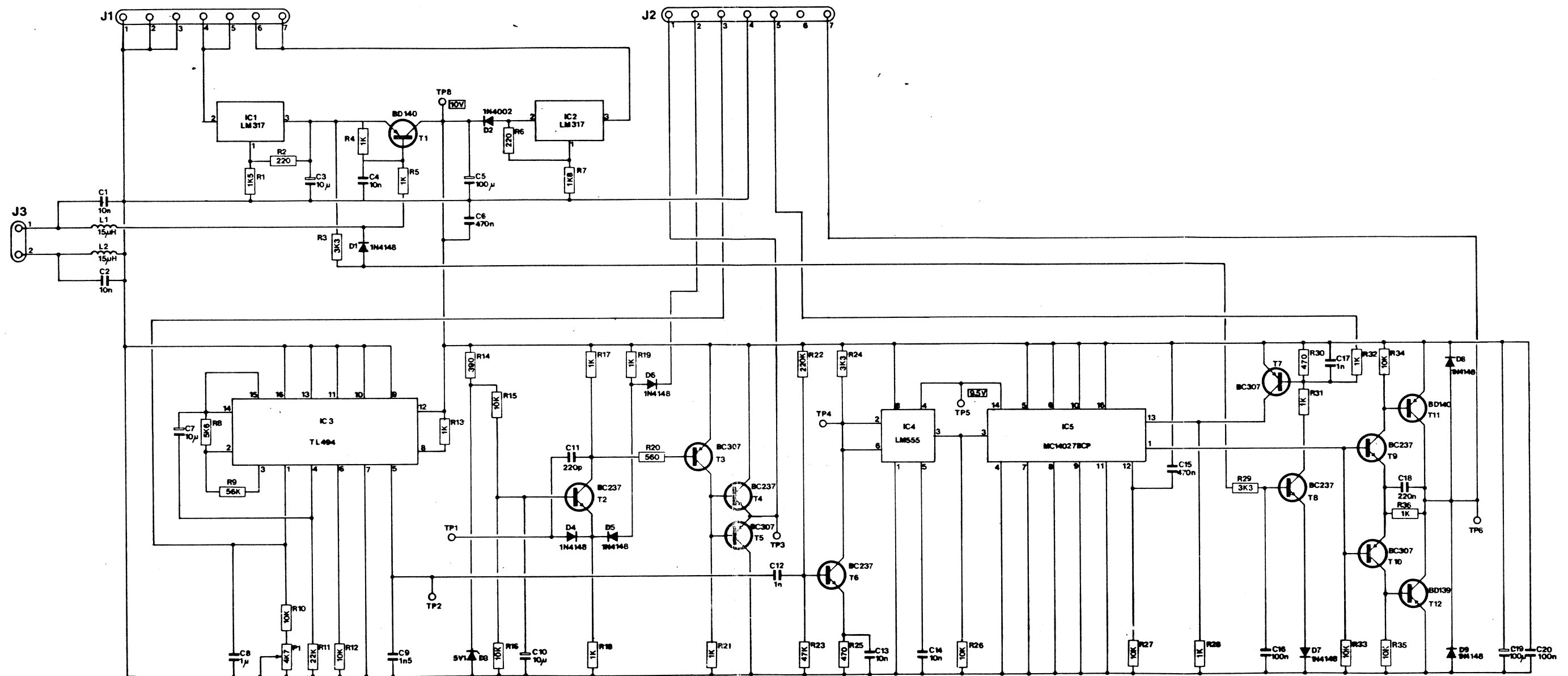
Layout no. 33.2074

# PA Switchmode Unit no. 002.2074

R1	Resistor	1.5 Kohm	1/3W	5%	01.151
R2	Resistor	220 Ohm	1/3W	5%	01.141
R3	Resistor	220 Kohm	1/3W	5%	01.177
R4	Resistor	10 Kohm	1/3W	5%	01.161
R5	Resistor	1 Kohm	1/3W	5%	01.249
R6	Resistor	100 Kohm	1/3W	5%	01.173
R7	Resistor	22 Kohm	1/3W	5%	01.165
R8	Resistor	10 Kohm	1/3W	5%	01.161
R9	Resistor	4.7 Kohm	1/3W	5%	01.157
R10	Resistor	1.5 Kohm	1/3W	5%	01.151
R11	Resistor	10 Kohm	1/3W	5%	01.161
R12	Resistor	1 Kohm	1/3W	5%	01.149
R13	Resistor	33 Kohm	1/3W	5%	01.167
R14	Resistor	10 Kohm	1/3W	5%	01.161
R15-17	Resistor	1 Kohm	1/3W	5%	01.149
R18	Resistor	680 Ohm	1/3W	5%	01.147
R19	Resistor	470 Ohm	1/3W	5%	01.145
R20	Resistor	4.7 Ohm	3W		02.221
R21	Resistor	56 Ohm	1/3W	5%	01.134
P1	Resistor, pre set	47 Kohm			04.169
C1-2	Capacitor, ellyt	100 uF	25V		12.831
C3	Capacitor, ellyt	22 uF	25V		12.827
C4	Capacitor, styro	3.3 nF		5%	10.161
C5	Capacitor, poly	220 nF			11.229
C6	Capacitor, styro	560 pF		5%	10.143
C7	Capacitor, ellyt	100 uF	25V		12.831
C8	Capacitor, styro	100 pF		5%	10.125
C9	Capacitor, poly		100V		11.533
C10	Capacitor, poly	100 nF			11.725
C11	Capacitor, ellyt	1000 uF	35V		12.856
C12	Capacitor, ellyt	10000 uF	40V		12.461
C13	Capacitor, ellyt	2200 uF	100V		12.653
T1	Transistor	BC237B			32.101
T2	Transistor	BC307			32.102
T3	Transistor	MPT 1224			34.115
T4	Transistor	BUV 20			30.113
IC1	Integrated Circuit	LM317 T			35.208
IC2	Integrated Circuit	TL 494 CN			35.214
IC3	Integrated Circuit	OPTP PC817			39.804
D1-3	Diode	1N4148			39.103
D4	Diode	ESM985			38.117
D5	Diode	1N5401			38.102
F1	Fuse	3A			55.421
F2	Fuse	10A	5x20		55.420
PCB	PC Board				003.2074
	Wiring				004.2074



Control circuit  
Layout no. 33.2077



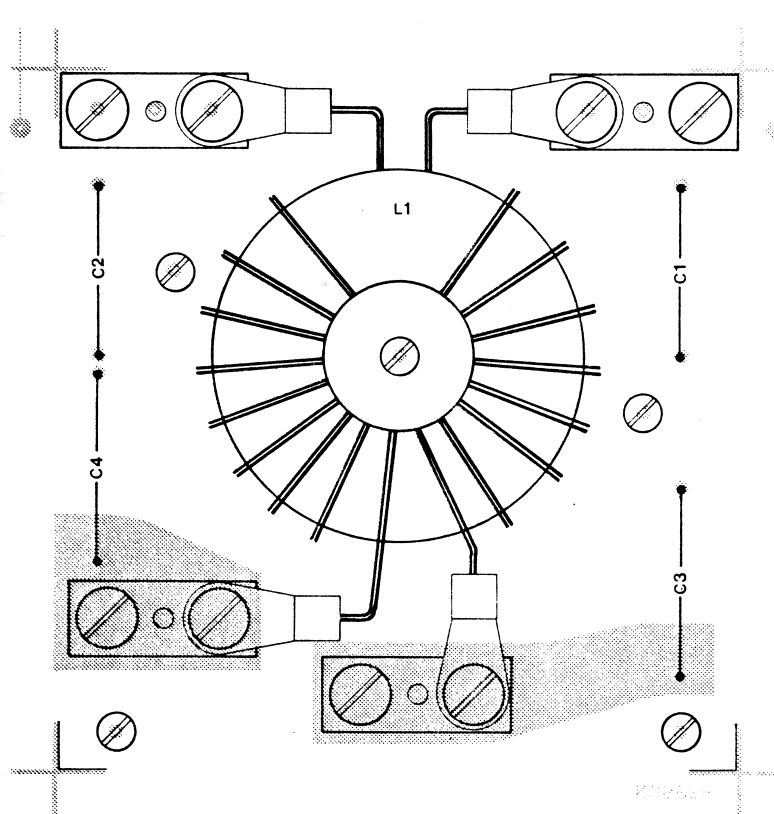
DC VOLTAGE SHOWN IN  

Control Circuit  
 Drawing no. 001.406  
 Unit no. 002.2077  
 PC. Board no. 003.2077  
 Layout no. 33.2077

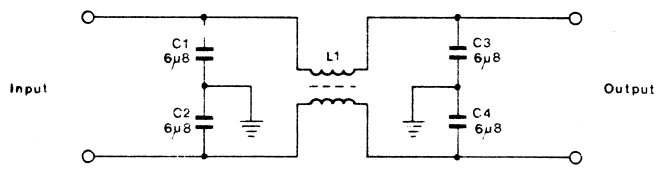
# Control circuit Unit no. 002.2077

R1	Resistor	1.5 Kohm	1/3W	5%	01.151
R2	Resistor	220 Ohm	1/3W	5%	01.241
R3	Resistor	3.3 Kohm	1/3W	5%	01.155
R4-5	Resistor	1 Kohm	1/3W	5%	01.149
R6	Resistor	220 Ohm	1/3W	5%	01.241
R7	Resistor	1.8 Kohm	1/3W	5%	01.152
R8	Resistor	5.6 Kohm	1/3W	5%	01.158
R9	Resistor	56 Kohm	1/3W	5%	01.170
R10	Resistor	10 Kohm	1/3W	5%	01.161
R11	Resistor	22 Kohm	1/3W	5%	01.165
R12	Resistor	10 Kohm	1/3W	5%	01.161
R13	Resistor	1 Kohm	1/3W	5%	01.149
R14	Resistor	390 Ohm	1/3W	5%	01.144
R15-16	Resistor	10 Kohm	1/3W	5%	01.161
R17-19	Resistor	1 Kohm	1/3W	5%	01.149
R20	Resistor	560 Ohm	1/3W	5%	01.146
R21	Resistor	1 Kohm	1/3W	5%	01.149
R22	Resistor	220 Kohm	1/3W	5%	01.177
R23	Resistor	47 Kohm	1/3W	5%	01.169
R24	Resistor	3.3 Kohm	1/3W	5%	01.155
R25	Resistor	470 Ohm	1/3W	5%	01.245
R26-27	Resistor	10 Kohm	1/3W	5%	01.161
R28	Resistor	1 Kohm	1/3W	5%	01.249
R29	Resistor	3.3 Kohm	1/3W	5%	01.155
R30	Resistor	470 Ohm	1/3W	5%	01.245
R31	Resistor	1 Kohm	1/3W	5%	01.249
R32	Resistor	1 Kohm	1/3W	5%	01.149
R33-35	Resistor	10 Kohm	1/3W	5%	01.161
R36	Resistor	1 Kohm	1/3W	5%	01.149
P1	Resistor, pre set	5 Kohm			04.157
C1-2	Capacitor, cer	10 nF	30V		14.907
C3	Capacitor, ellyt	10 uF	40V		12.845
C4	Capacitor, cer	10 nF	30V		14.907
C5	Capacitor, ellyt	100 uF	25V		12.831
C6	Capacitor, poly	0.47 uF	63V		11.844
C7	Capacitor, ellyt	10 uF	40V		12.845
C8	Capacitor, poly	1 uF	63V		11.848
C9	Capacitor, poly	1.5 nF	63V		11.815
C10	Capacitor, ellyt	10 uF	40V		12.845
C11	Capacitor, styro	220 pF		5%	10.133
C12	Capacitor, cer	1 nF	40V		14.902
C13-14	Capacitor, cer	10 nF	30V		14.907
C15	Capacitor, poly	0.47 uF	63V		11.844
C16	Capacitor, cer	100 nF	63V		14.913
C17	Capacitor, cer	1 nF	40V		14.902
C18	Capacitor, poly	0.22 uF	63V		11.840
C19	Capacitor, ellyt	100 uF	25V		12.831
C20	Capacitor, poly	0.1 uF	63V		11.836
L1-2	Choke	15 uH			22.226

T1	Transistor	BD 140		30.102
T2	Transistor	BC 237B		32.101
T3	Transistor	BC 307		32.102
T4	Transistor	BC 237B		32.101
T5	Transistor	BC 307		32.102
T6	Transistor	BC 237B		32.101
T7	Transistor	BC 307		32.102
T8-9	Transistor	BC 237B		32.101
T10	Transistor	BC 307		32.102
T11	Transistor	BD 140		30.102
T12	Transistor	BD 139		30.101
IC1-2	Integrated Circuit	LM 317T		35.208
IC3	Integrated Circuit	TL 494 CN		35.214
IC4	Integrated Circuit	UA 555		35.105
IC5	Integrated Circuit	MC 14027 BCP		36.197
D1	Diode	1N4148		39.103
D2	Diode	1N4002		38.103
D3	Diode, zener	5.1V	0.4W	39.707
D4-9	Diode	1N4148		39.103
J1-2		7-pole		80.814
J3		2-pole		80.651



**Filter**  
**Layout no. 33.2078**



### Battery filter

Drawing no. 001.0424

Unit no. 002.2078

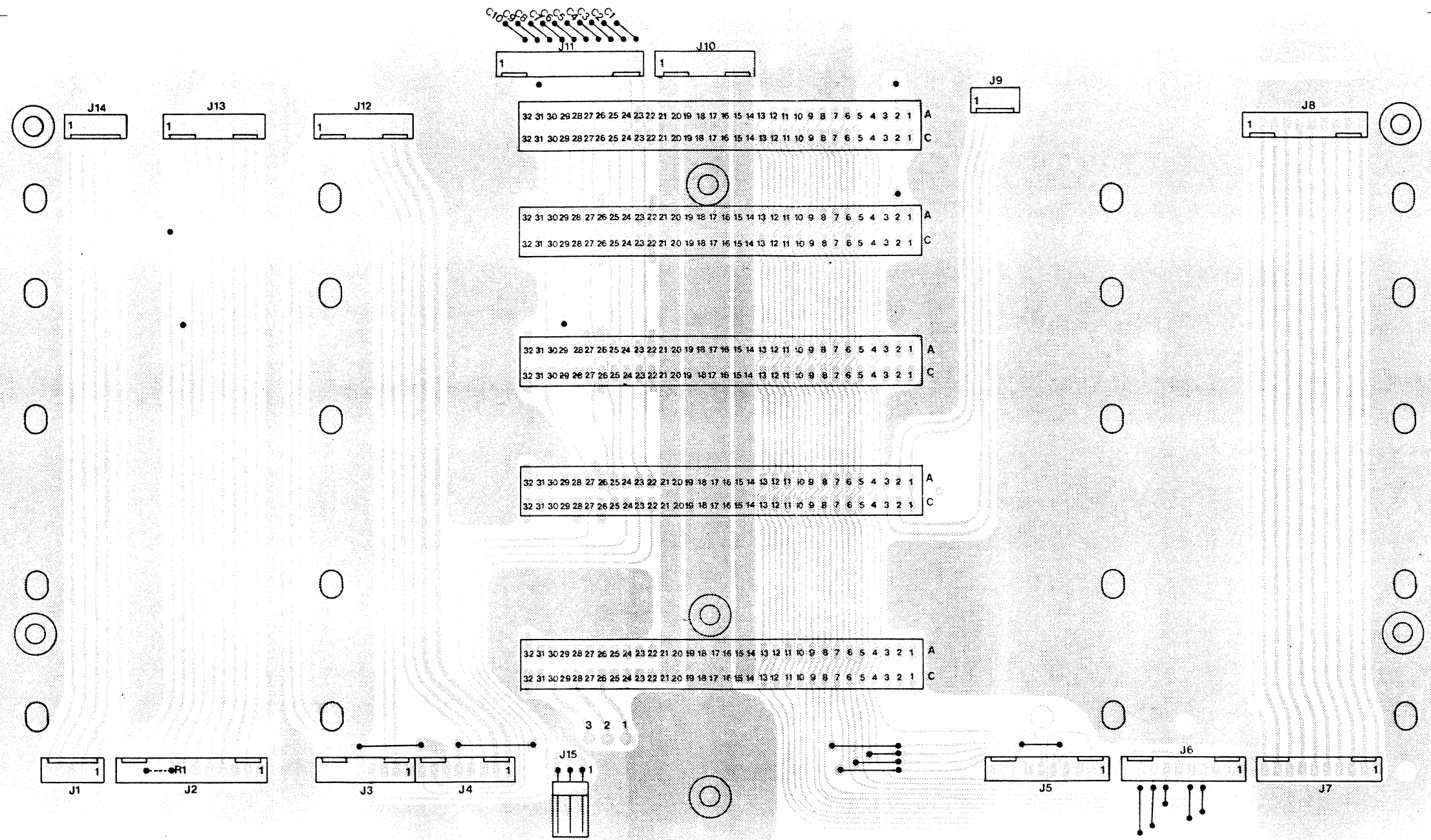
PC. Board no. 003.2078

Layout no. 33.2078

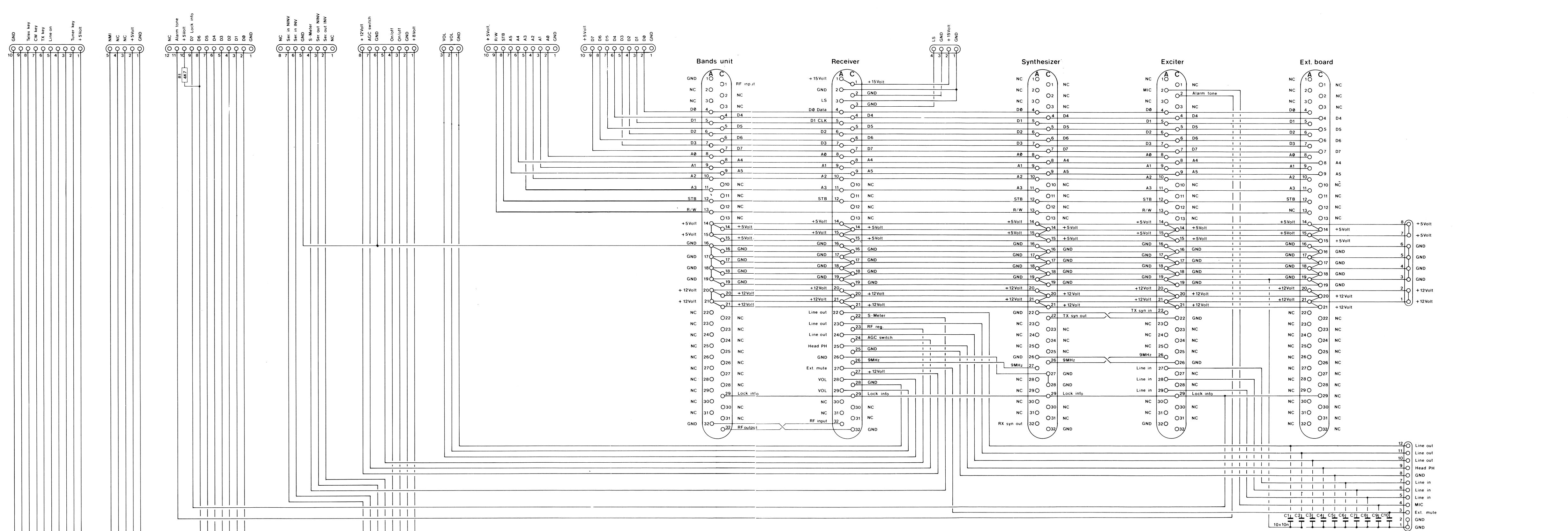


## Filter      Unit no. 002.2078

C1-4	Capacitor	6.8 uF	100V	11.250
L1	Coil			04.2078



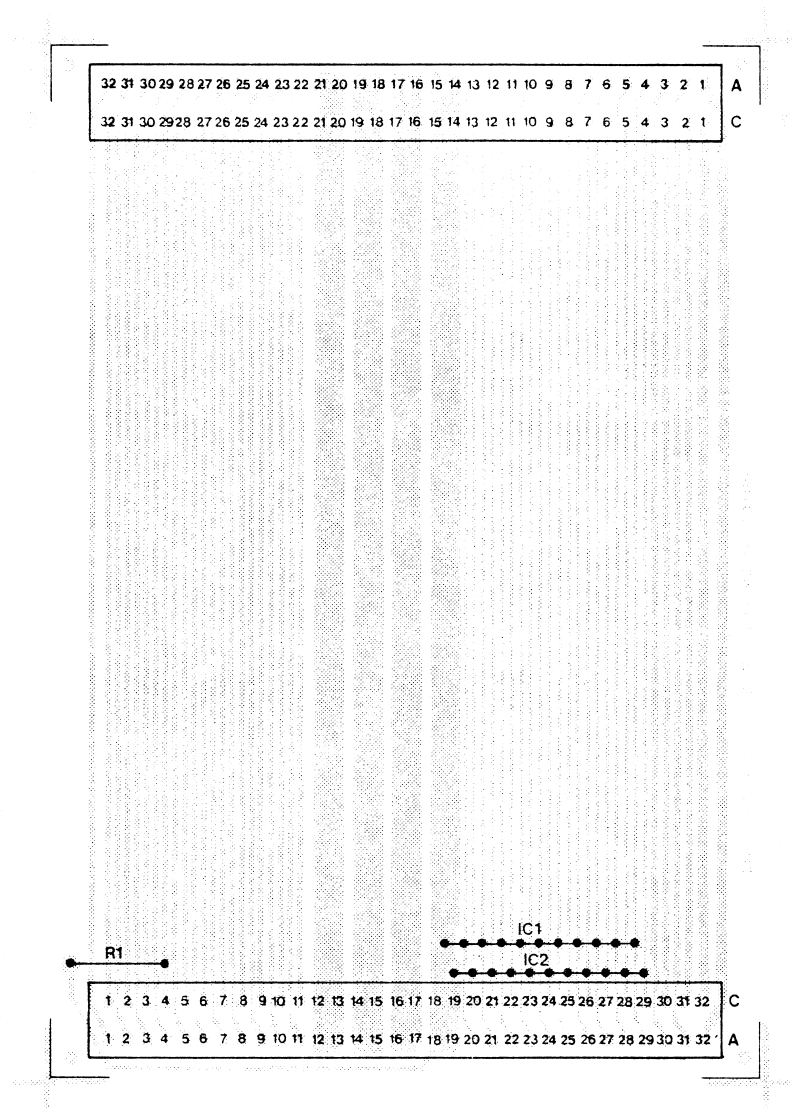
Mother board  
Layout no. 33.2080



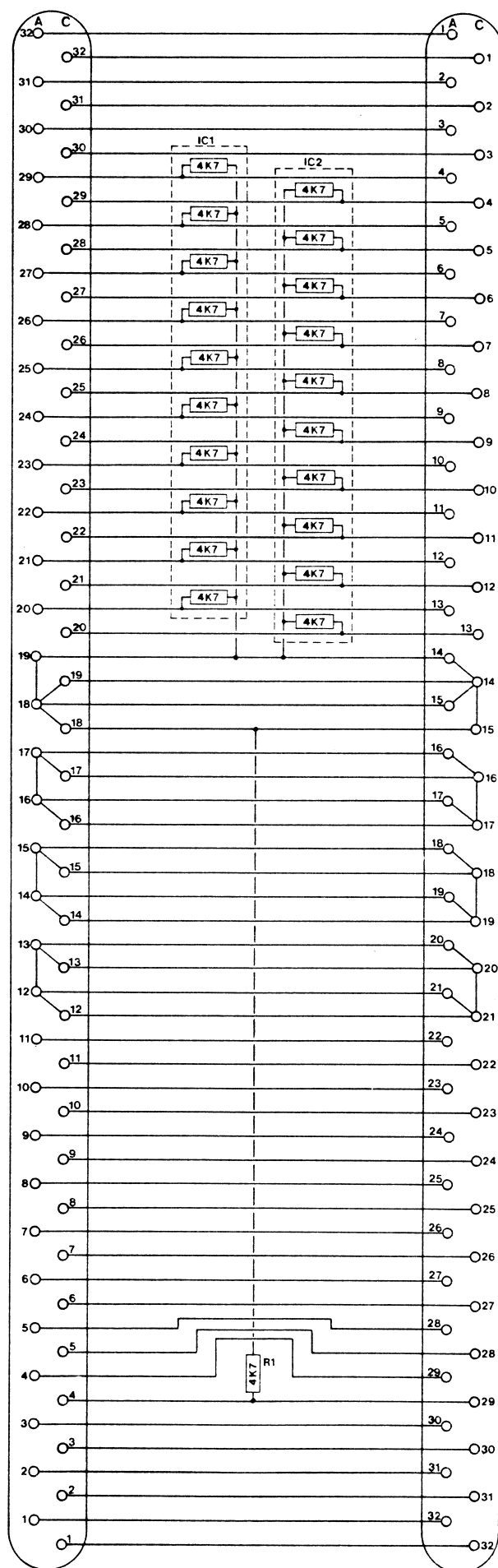
Motherboard  
Drawing no. 001.0425A  
Unit no. 002.2080  
PC. Board no. 003.2080  
Layout no. 33.2080

# Mother board Unit no. 002.2080

R1	Resistor	4.7 Kohm	1/3W	5%	01.157
C1-10	Capacitor	10 nF			14.907



Extension board  
Layout no. 33.2081



Extensionboard

Drawing no. 001.0426

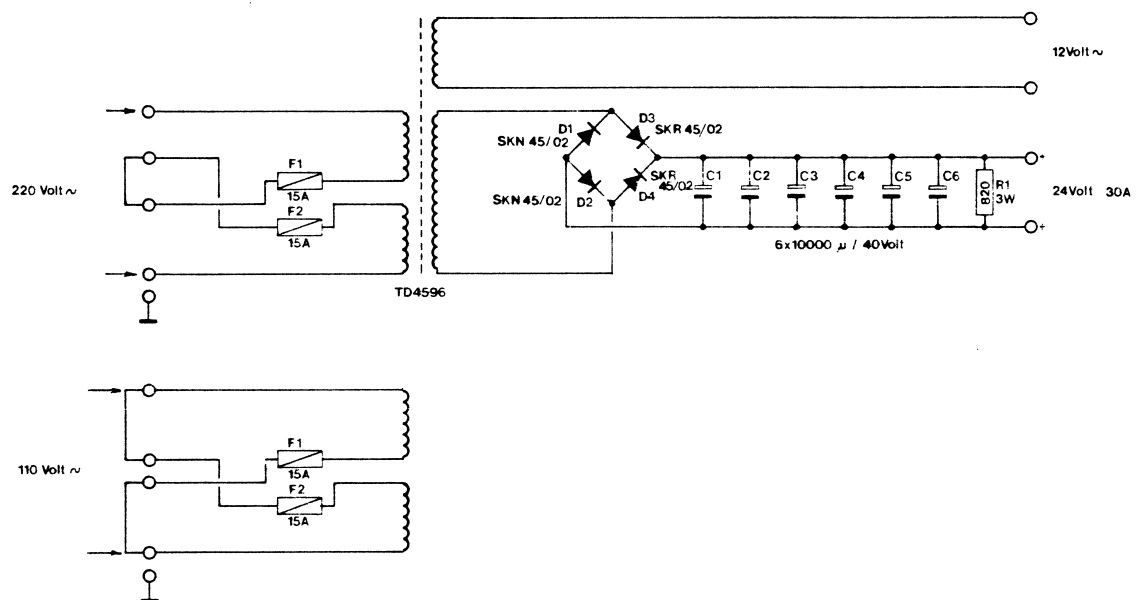
Unit no. 002.2081

PC. Board no. 003.2081

Layout no. 33.2081

## Ext. board    Unit no. 002.2081

R1	Resistor	4.7 Kohm	1/3W	5%	01.157
IC1-2	Resistors	10 x 4.7 Kohm			06.126

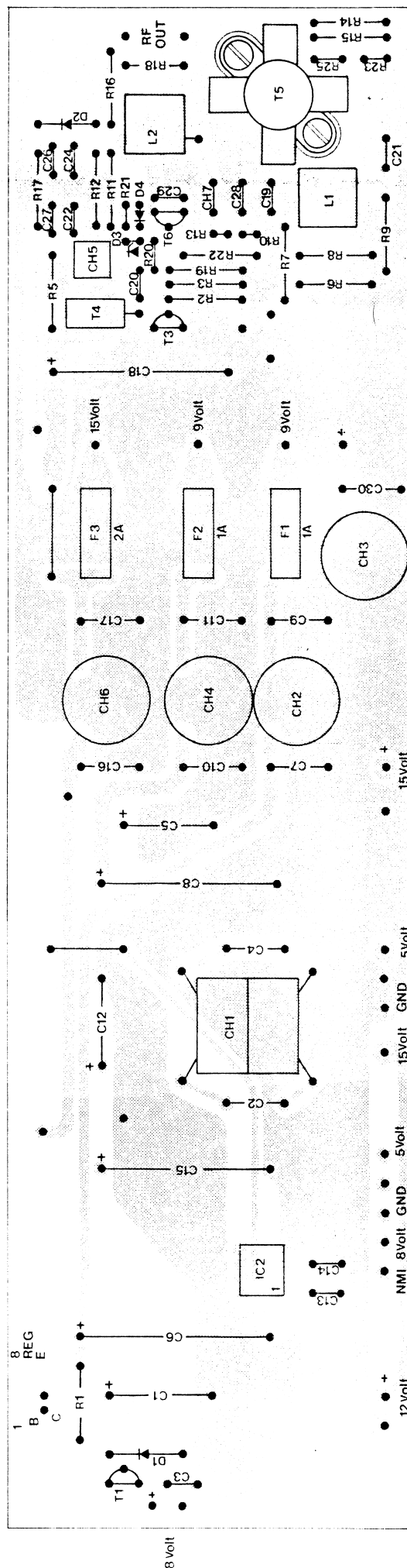


Power supply P 210  
Drawing no. 001.0432  
Unit no. 002.2085

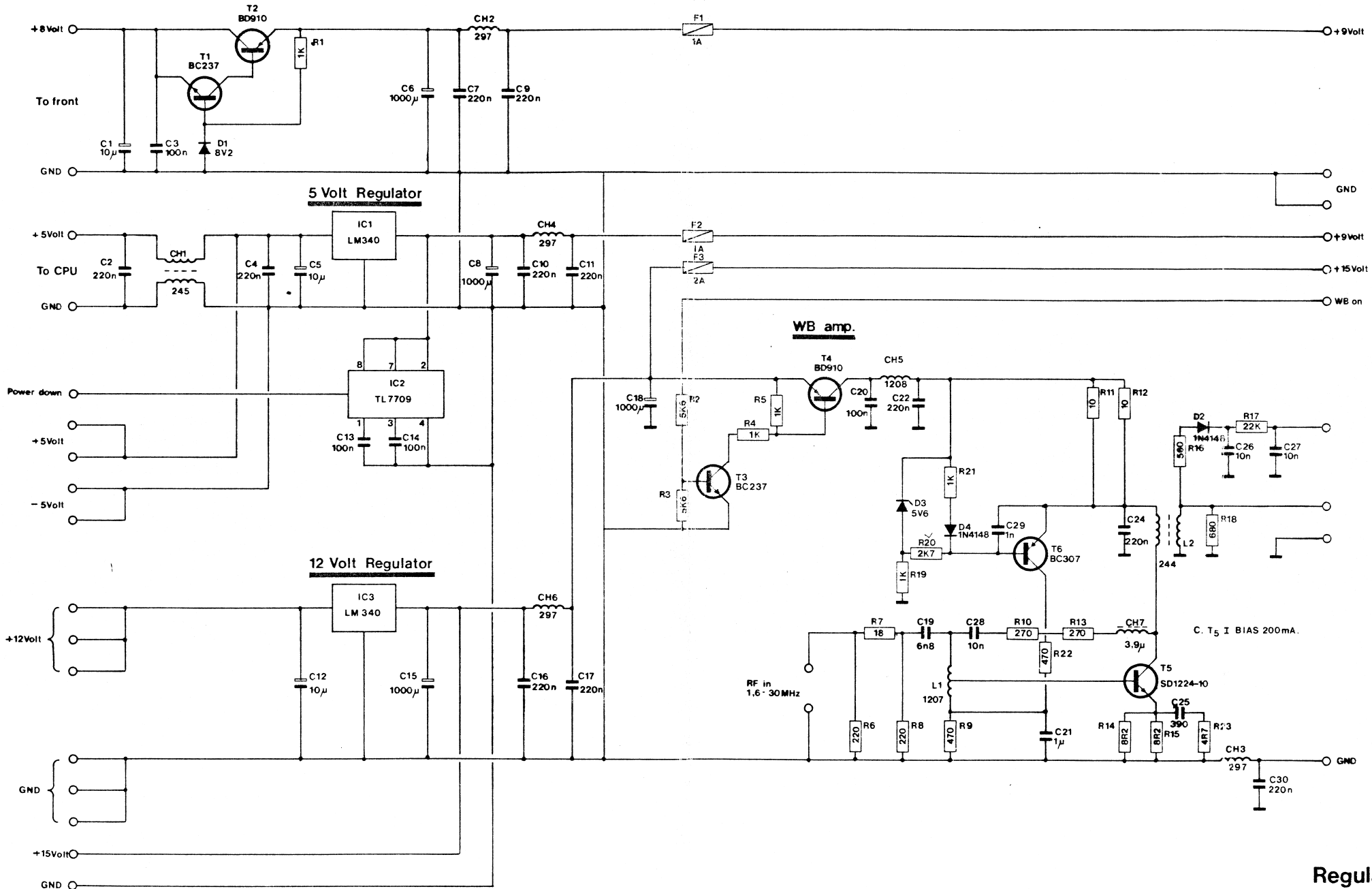


## Power supply Unit no. 002.2085

R1	Resistor	330 ohm	3W	5%	02.243
C1-6	Capacitor, ellyt	10000 uF	40V		12.461
TR	Trafo	TD 4596			26.131
D1-2	Diode	SKN 45/02			38.107
D3-4	Diode	SKR 45/02			38.108
F1-2	Fuse	15A	6.3x32		55.412



Regulator CCT  
Layout no. 33.2090



Regulator CCT

Drawing no. 001.0427A

Unit no. 002.2090

PC Board no. 003.2090A

Layout no. 33.2090

# Regulator CCT Unit no. 002.2090

R1	Resistor	1 Kohm	1/3W	5%	01.149
R2-3	Resistor	5.6 Kohm	1/3W	5%	01.158
R4-5	Resistor	1 Kohm	1/3W	5%	01.149
R6	Resistor	220 Ohm	1/3W	5%	01.141
R7	Resistor	18 Ohm	1/3W	5%	01.128
R8	Resistor	220 Ohm	1/3W	5%	01.141
R9	Resistor	470 Ohm	1/3W	5%	01.145
R10	Resistor	270 Ohm	1/3W	5%	01.242
R11-12	Resistor	10 Ohm	1/3W	5%	01.125
R13	Resistor	270 Ohm	1/3W	5%	01.242
R14-15	Resistor	8.2 Ohm	1/3W	5%	01.124
R16	Resistor	560 Ohm	1/3W	5%	01.146
R17	Resistor	22 Kohm	1/3W	5%	01.165
R18	Resistor	680 Ohm	1/3W	5%	01.147
R19	Resistor	1 Kohm	1/3W	5%	01.149
R20	Resistor	2.7 Kohm			01.254
R21	Resistor	1 Kohm	1/3W	5%	01.249
R22	Resistor	470 Ohm	1/3W	5%	01.145
R23	Resistor	4.7 Ohm	1/3W	5%	01.121

C1	Capacitor, ellyt	10 uF	16V		12.225
C2	Capacitor, pol	220 nF			11.229
C3	Capacitor, pol	0.1 uF			11.836
C4	Capacitor, pol	220 nF			11.229
C5	Capacitor, ellyt	10 uF	16V		12.225
C6	Capacitor, ellyt	1000 uF	16V		12.249
C7	Capacitor, pol	220 nF			11.229
C8	Capacitor, ellyt	1000 uF	16V		12.249
C9-11	Capacitor, pol	220 nF			11.229
C12	Capacitor, ellyt	10 uF	16V		12.225
C13-14	Capacitor, pol	0.1 uF	63V		11.836
C15	Capacitor, ellyt	1000 uF	16V		12.249
C16-17	Capacitor, pol	220 nF			11.229
C18	Capacitor, ellyt	1000 uF	16V		12.249
C19	Capacitor, pol	6.8 nF	63V		11.822
C20	Capacitor, pol	0.1 uF			11.836
C21	Capacitor, pol	1 uF	63V		11.848
C22	Capacitor, pol	0.22 uF			11.840
C23	Not used				
C24	Capacitor, pol	0.22 uF			11.840
C25	Capacitor, sty	390 pF		5%	10.139
C26-27	Capacitor, cer	10 nF	30V		14.907
C28	Capacitor, pol	10 nF	63V		11.824
C29	Capacitor, cer	1 nF	40V		14.902
C30	Capacitor, pol	220 nF			11.229

CH1	Choke
CH2	Choke
CH3	Choke
CH4	Choke
CH5	Choke
CH6	Choke
CH7	Choke

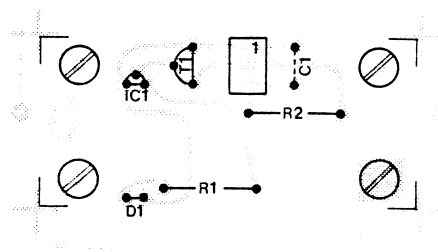
T1	Transistor	BC237		32.101
T2	Transistor	BD910		30.119
T3	Transistor	BC237		32.101
T4	Transistor	BD910		30.119
T5	Transistor	MRF476		31.110
T6	Transistor	BC307		32.102

IC1	Integrated Circuit	LM340		35.204
IC2	Integrated Circuit	TL7709		35.132
IC3	Integrated Circuit	LM340		35.204

D1	Diode, zener	8.2V	0.4W	39.708
D2	Diode	1N4148		39.103
D3	Diode, zener	5.6 V	4W	39.718
D4	Diode	1N4148		39.103

F1-2	Fuse	1A		55.422
F3	Fuse	2A	5x20	55.422

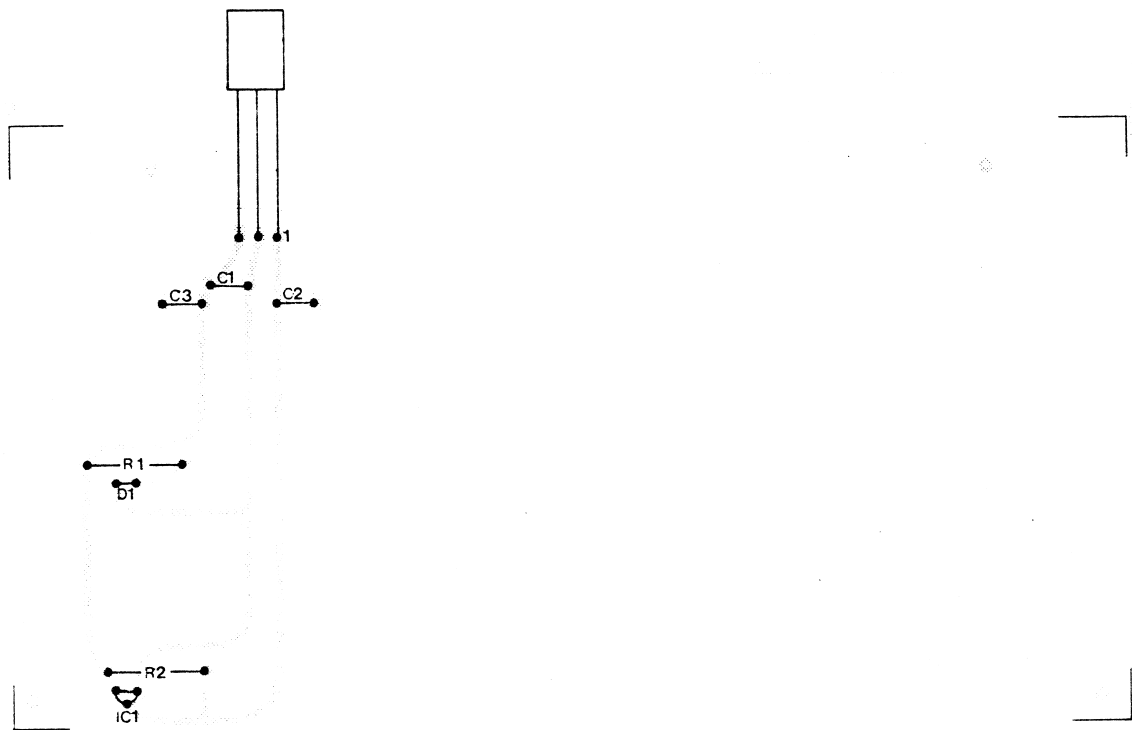
L1	Coil			004.0245
L2	Coil			004.1207



Capacitor optocoupler  
Layout no. 33.2120

# Cap. Optocoupler Unit no. 002.2120

R1	Resistor	220 Ohm	1/3W	5%	01.141
R2	Resistor	470 Ohm	1/3W	5%	01.145
C1	Capacitor, cer	10 nF	30V		14.907
T1	Transistor	BC 237B			32.101
D1	Diode	GL 430			39.805
IC1	Integrated Circuit	SW IS433			39.806



**Variometer**  
**Layout no. 33.2121**



# Variometer Unit no. 002.2121

R1	Resistor	470 Ohm	1/3W	5%	01.145
R2	Resistor	1 Kohm	1/3W	5%	01.149
C1	Capacitor, poly	0.1 uF	63V		11.836
C2-3	Capacitor, cer	10 nF	30V		14.907
D1	Diode	GL430			39.805
IC1	Integrated Circuit	SW IS433			39.806