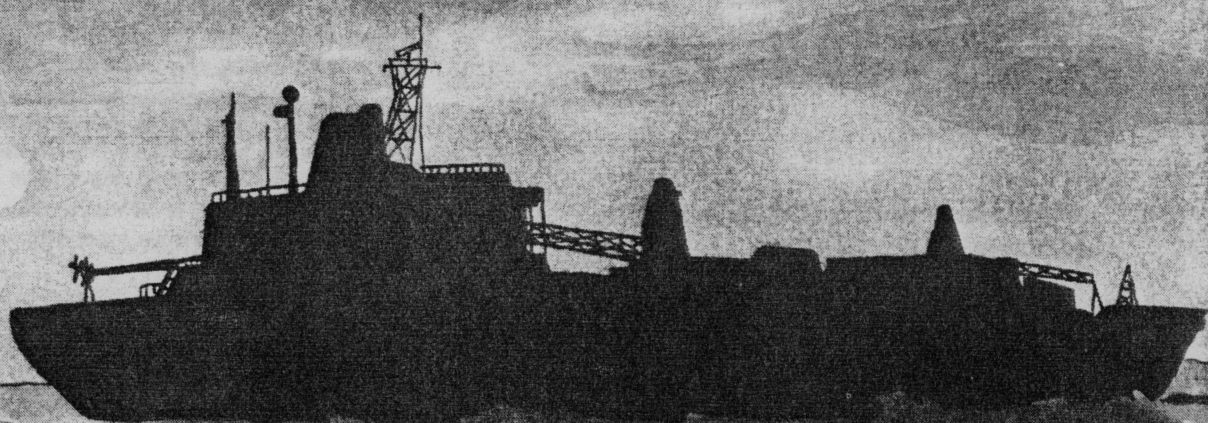


# DANMAR RT 210

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

# SSB Radiotelephone RT210

The World's most advanced SSB Radiotelephone Equipment for Maritime and Point-to-Point communication covering frequencies from 1.6 to 28 MHz.

The RT 210 is designed for use on compulsorily or voluntarily fitted vessels and complies with the SOLAS 74 conventions and the ITU Radio Regulations. It meets the CEPT specifications and the national requirements.

The RT 210 consists of 2 units. The Control Unit contains the complete receiver, the exciter and the microprocessor. The Transmitter Unit contains the solid state power amplifier for 400 or 200 W PEP, the power supply and the automatic antenna tuning unit.

Both units are housed in a nylon-coated steel cabinet.

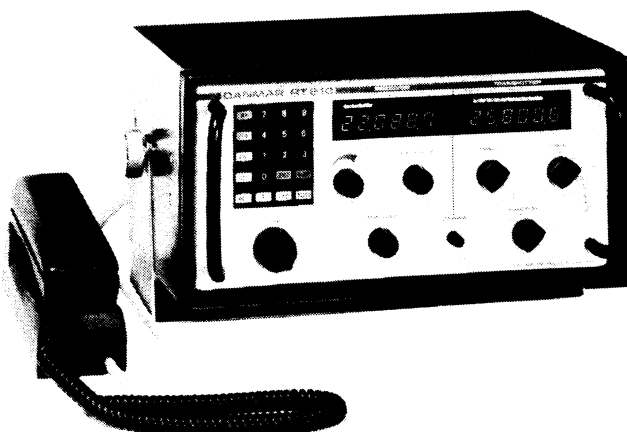
The 100% transistorisation results in an extremely low power consumption.

The RT 210 has no "STAND-BY" position. When the Function Switch is in transmitting position, the transmitter is instantly ready.

- ★ Microprocessor controlled
- ★ 400w PEP output
- ★ Keyboard selection
- ★ Fully synthesized with 100 Hz resolution
- ★ Memory for 80 pairs of frequencies
- ★ Continuously variable receiver from 100 KHz to 30 MHz
- ★ 600 ohm balanced line input/output
- ★ Built-in two-tone alarm generator
- ★ Fully duplex operation
- ★ Built-in self-check facility
- ★ Low power consumption
- ★ Built-in dummy load
- ★ Built-in automatic antenna tuner
- ★ Extremely small dimensions

## CONTROL UNIT

Both the transmitting and the receiving frequencies are keyed on the keyboard and are indicated on an LED display. The Control Unit is available in two versions. One version has a built-in PROM programable for up to 400 frequencies. In case a non-programmed transmitting frequency is keyed, the display will give an error code. The other version has a decadic synthesis which permits frequency setting with 100 Hz steps and thereby full selection of all MF/HF frequencies in steps of 100 Hz in all maritime bands or full frequency coverage from 1.6 to 29.999 MHz.

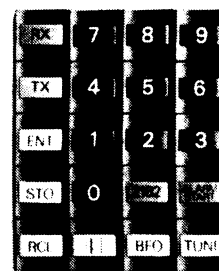


The keyboard permits the operator to program up to 80 pairs of frequencies with his busiest receiving and transmitting frequency pairs and to recall each pair with a few key operations. The programmed frequencies will be stored for several years, even when the equipment is switched off.

Each time the equipment is switched on, the microprocessor will start checking the circuits. In case of fault, a fault code indication will be displayed. The service technician can start the fault-finding by keying a code on the keyboard.

The Control Unit is built up of plug-in modules which can be easily replaced hence expediting service.

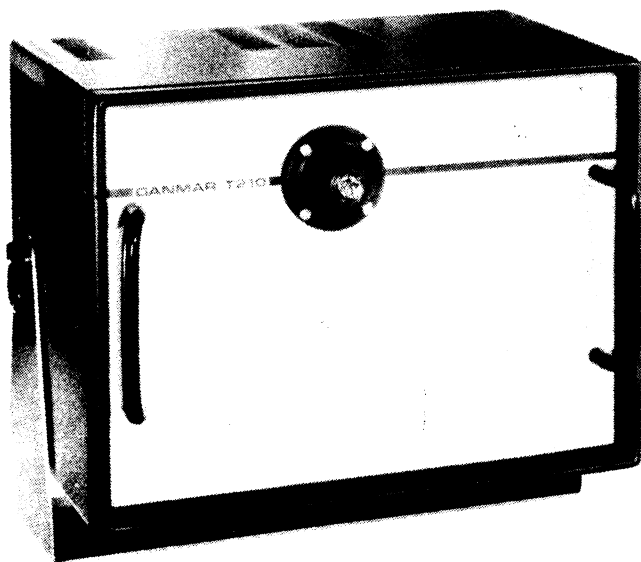
*Keyboard.*



## TRANSMITTER UNIT

This unit contains the power amplifier, the power supply and the automatic antenna tuning system.

The antenna tuning system starts tuning when the transmitting frequency has been entered. The fine tuning starts at the moment when the microtelephone is removed from the cradle.

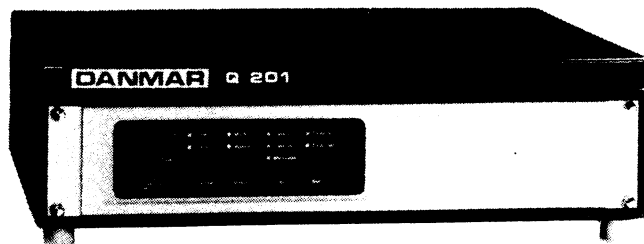


The power supply unit operates at voltages between 21.6 and 45 V.d.c. The output power is constant within the whole voltage variation range. To make the antenna installation most efficient, the transmitter unit can be mounted at a distance of up to 50 metres from the Control Unit.

If there should be a fault in the antenna installation - detached antenna, short-circuited antenna, or too short (broken) antenna - the transmitter will not be damaged or stop transmitting. The fully transistorized output stage will adjust the output to a suitable level and go on transmitting.

## OPTIONS

- ★ 200 or 400 W P.E.P.
- ★ Programmable transmitter
- ★ Higher stability TCXO
- ★ LSB/USB
- ★ 10.5 - 45 V.d.c.
- ★ 90 - 145/175 - 290 V.a.c.
- ★ 12 V.d.c. version (200 W only)
- ★ Battery charger



- ★ Reliable and simple operation
- ★ User programmability
- ★ 24 hours unattended operation
- ★ SITOR operation
- ★ Up to 64.000 character text memory
- ★ Comprehensive file manager and text editor
- ★ Interface to Baudot and ASCII equipment
- ★ Full RX/TX control by simple, adjustable interface
- ★ Flexible mark and space frequencies
- ★ Dual bandpass filter tracking and dynamic threshold control
- ★ Cabinet version

The Q201 Radiotelex Modem provides automatic ARQ/FEC communication in Maritime and Point-to-Point applications. It fulfils all relevant CCIR recommendations.

The Q201 recognizes individual and group calls with automatic reception and transmission of messages. The unit is very flexible with user control of all relevant functions. Parameters selected during installation are stored permanently in the computer. Any later modification can be carried out directly from the keyboard.

The Q201 can be programmed for any combination of mark and space frequencies in the audio band from 1 KHz to 3 KHz. The demodulator features  $\pm 100$  Hz tracking range. It is designed with due respect for the HF medium and compensates for selective fading by adaptive threshold control. A special bit-slicing technique is used to correct multi-path distortion.

The Q201 includes a large text memory of 16.000 characters, expandable up to 64.000 characters with optional battery back-up. An effective file handler and a text editor gives the Q201 word processing facilities.

## 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:

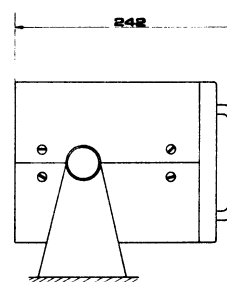
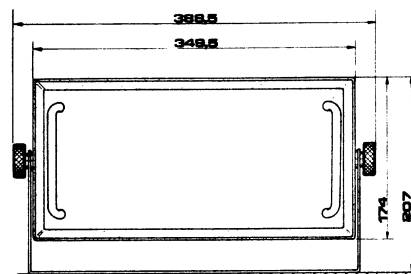
Frequency range:	100 KHz to 29.999 MHz
Frequency tuning:	Tuning in 10 Hz steps. The Hz per revolution ratio increases with the rotation speed of the knob
Sensitivity:	AM: 3 µV for 10 dB S/N CW/SSB: 1 µV for 10 dB S/N
Audio output:	3.5 W into 4 Ω to external loud- speaker

*Above specifications are subject to change without notice.*

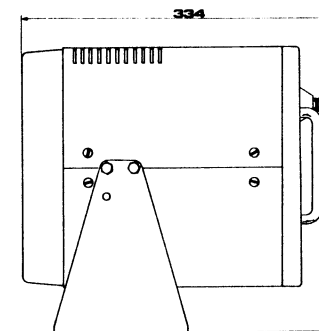
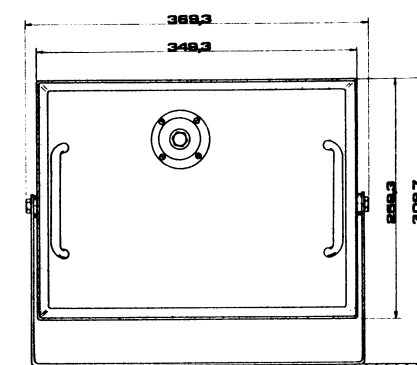
Your Authorized Danmar Dealer is:

## 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

- 
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 RT210 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 RT210 marked REC. ANT.
  10.    Connect multicable from the RT210 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.  
      (Pls see the page with cable connections for junction boxes)
  11.    Connect coax cable E.g. RG 58 between the RT210 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 approx. 30 Amp.
  13.    Check that all above points have been carried out correctly.

14. Switch on the RT210 - Function Switch in position RX - ignore ERROR 31.

The receiver is checked by following the Operating Instructions.  
Other ERRORS - Pls 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.

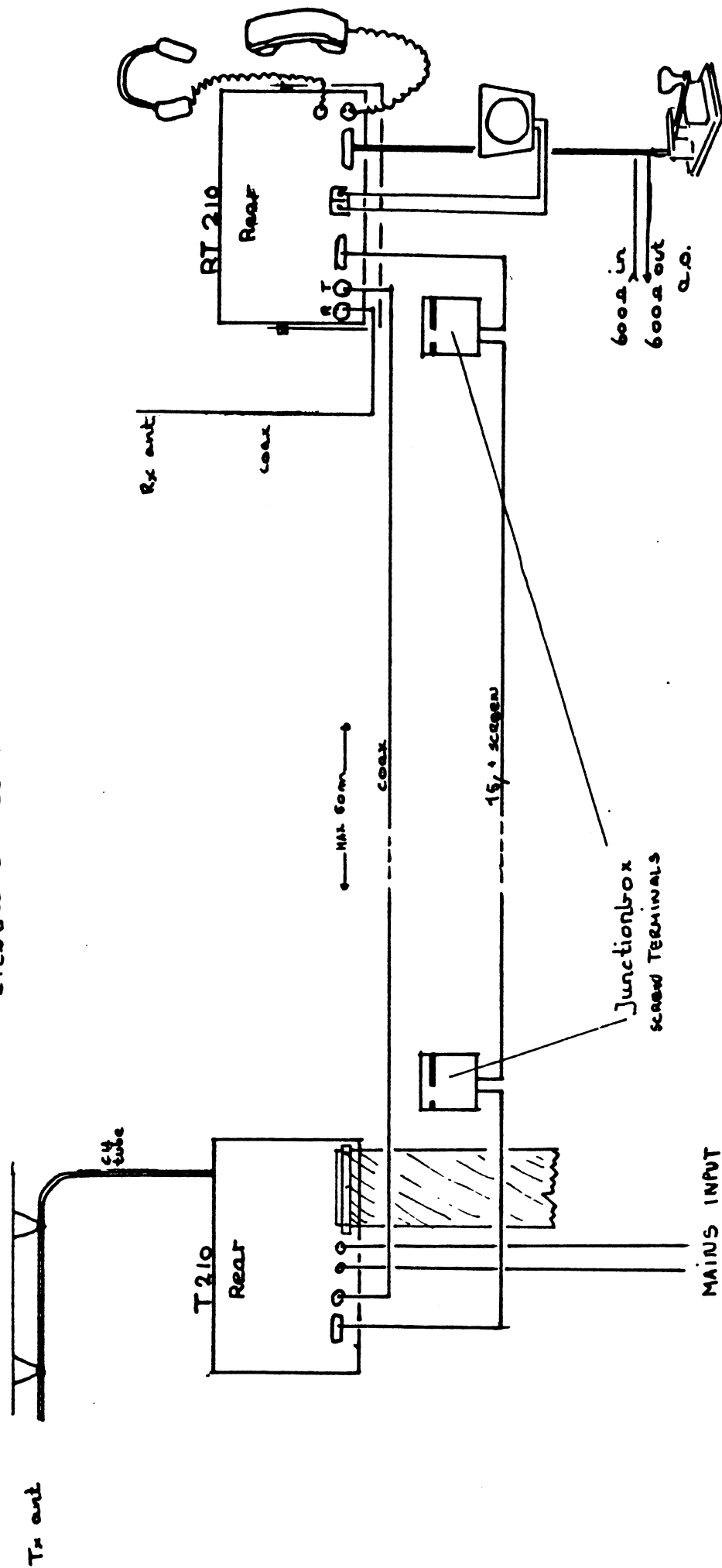
23. Tilt back the toggle switch towards the end of the tuner.

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 210





RT 210

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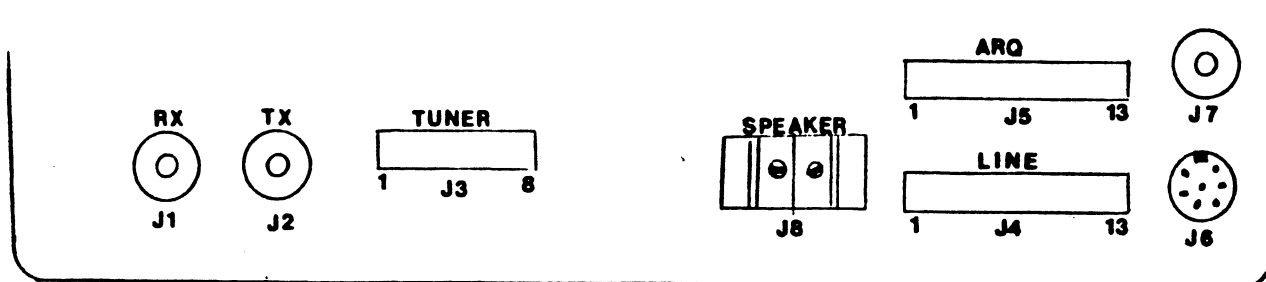
CABLE BETWEEN JUNCTION BOXES

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

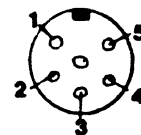
THE REMAINING LOOSE WIRES ARE TO BE CONNECTED TO TERMINALS  
3, 4, 5 IN BOTH JUNCTION BOXES.

I - twisted with

REAR CONNECTION  
RT210

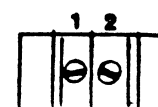


CONNECTOR	PIN	FUNCTION	CONN. TO
J5	1		
	2		
	3		
	3		
	5	F1 B. KEY	J4 # 5
	6	RX MUTE	J4 # 6
	7		
	8		
	9		
	10		
	11	AF LINE OUTPUT	J4 # 11
	12	AF LINE OUTPUT	J4 # 12
	13	AF LINE OUTPUT	J4 # 13
	14	AND	J4 # 14
	15	SERIES SIGN.	
	16	SERIES SIGN.	
	17		
	18		
	19		
	20		
	21		
	22		
	23	AF LINE INPUT	
	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
J7	1	HEADPHONE	JACK PLUG
	2	HEADPHONE	



CONNECTOR	PIN	FUNCTION	CONN. TO
J8			

1	SPEAKER
2	SPEAKER




---

J3	1	ON/OFF	
	2	ON/OFF	
	3	+15V	REG 12V
	4	+ 5 V	REG 5V
	5	+ 8 V	REG 8V
	6	KEYLINE TO TUNER	2080/J
	7	SERIAL INPUT	2080/J
	8	SERIAL INPUT	2080/J
	9	NC	
	10	GND (15V)	REG 12V
	11	GND (5V)	REG 5V
	12	GND (8V)	REG 8V
	13	NC	
	14	SERIAL OUT	2080/J
	15	SERIAL OUT	2080/J

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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	2090
	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

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## RT 210 OPERATING INSTRUCTIONS

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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)
  - 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 No 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 operated 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                                     | } the "RED" indicator is turned on. |
| 3. to select 1/4 PWR                                     |                                     |
| 4. to select LOW PWR                                     |                                     |

## SYNTHESIZER

002.2066

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 T15 oscillates in the range 54,045 - 63,495 MHz depending on the division number of the loop. The oscillator frequency is amplified by T16 from where the signal is fed into the pre-scaler IC2. In IC2 the signal is divided by 32 or by 33 and is hereafter fed into the PLL circuit IC1. The reference frequency to IC1 is 9 MHz which is fed into IC1 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 with VCO voltage. The division number of the loop is a 12 bit code programmed from the microprocessor.

### LOOP 2

The frequency from LOOP 1 is led from the transistor T16 to the pre-scaler IC3 and the divider IC4. The total division number of IC3 and IC4 is from 3565 to 5065. The frequency from IC4 lies in the range 10.6 KHz to 17.8 KHz. This signal is amplified by T17 and is thereafter fed into IC5.

LOOP 2 is built up around an X-tal oscillator which oscillates at 9,015 MHz  $\pm$  3 KHz. The oscillator-transistor is T19.

The 9,015  $\pm$  MHz signal is fed from the emitter into IC7 where it is mixed with the 9 MHz from the TCXO.

The difference signal is led from IC7 to the transistor T18 where it is amplified and thereafter passed on to IC6 coupled as Schmidt-Trigger. The signal is fed from pin 3 on IC6 into IC5 where it is compared in frequency and phase with the frequency from LOOP 1.

IC5 has a built-in phase detector which supplies pulses to IC8. IC8 is a loop filter supplying a DC voltage to the capacity diode which controls the X-tal oscillator frequency. The transistor T20 amplifies the 9,015 MHz  $\pm$  3 KHz signal before the signal is fed into LOOP 3.

### 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 T2. Coils - maximum 5 - are connected to the drain of T2. 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 T3. The signal is fed from the Drain coil of T3 into the receiver module and, furthermore, into T4 where it is amplified and thereafter fed into the pre-scaler IC10 and into the PLL circuit IC9. The division number of IC9 is programmed from the microprocessor.

IC4 gets the same programming.

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 IC13 and IC14 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.

IC15 gives the lock information from the loops to the microprocessor.



## EXCITER

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 R24 to maximum output voltage without the signal being distorted at any time.

The signal is fed from pin 7 on IC1B into the mixer IC3. IC3 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.

The signal is fed from the USB/LSB filters into a diode switch controlled attenuator. The diodes D9 to D12 are controlled from the microprocessor.

The diode D9 conducts in position SSB - J3E.

The signal will pass through the capacitors C35-37 without being attenuated.

The diode D10 conducts in position R3E.

The signal passes through the voltage divider R45-R46-R47 before being directed through C36-37. The signal is attenuated by 1 dB.

The diode D11 conducts in position AM H3E.

The signal passes through the voltage divider R45-R46-R47 where it is attenuated by 6 dB.

The diode D12 conducts in position CW - A1A.

The capacitor C34 will prevent signals from passing.

## CARRIER REINSERTION

The microprocessor will reinsert the missing carrier in the various emission modes.

The carrier level is controlled by IC4. The diodes D13-D16 are connected alternately in the various modes. The attenuator consists of R61, R62, R63, R64, R65. The carrier level is adjusted to the correct ratio with the potentiometer P3.

Diode D16 is switched on in position J3E-SSB, resulting in the carrier being attenuated through the voltage divider R64, R65, C49 by at least 43 dB in relation to the output signal.

D14 is switched on in position R3E. The carrier level is attenuated by 18 dB in relation to the output signal.

D13 is switched on in position H3E-AM. The carrier level is attenuated through the voltage divider R61, R62, R63 by 6 dB in relation to the output signal.

D15 is switched on in position A1A-CW. The carrier level is attenuated by R64, R65.

## SUM AMPLIFIER

The side-band and the carrier in the ratio described above are added up in the sum amplifier.

The signal from the attenuator is fed into the base of T8.  
The carrier from the attenuator is fed into the base of T7.  
The sum of these two signals is fed into T9.

The signal is amplified by T9 and is thereafter fed into the power switch. T9 has an adjustable amplification. The processor is capable of connecting three resistors in parallel to R86 - the EMITTER RESISTOR. The result is that the amplification is adjusted in 1 dB steps. IC5 connects the three resistors through D17-D19.

Through IC5 the processor selects the four output levels - FULL POWER - 1PWR - 1/4 PWR - LOW POWER. The diodes D23-D30 connect the attenuators. The signal from the Power Switch can be adjusted with P4.

## 1st MIXER

The signal from the Power Switch is fed into the 1st Mixer IC8 - 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 IC9, 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 wide-band amplifier T17-T18. The output level is 5 watt in 50 ohm. This signal is fed into the Power Unit 002.2050.

RECEIVER 002.2064

The antenna signal from the BANDS UNIT 002.2062 is directed through an elliptic low-pass filter L1, L2 with a cut-off frequency of 30 MHz. From this filter the signal is led through a conventional diode limiter D1-D4 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 - 101.42 MHz in 10 Hz steps.

This mixer type has a high intercept point - typically +25 - +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 L7, L8, L9, C14-16. This forms also 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 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 IC3 and IC4 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 IC4 is connected to L26 from where the 580 KHz signal is fed into the transistor T27 and is amplified there. The signal passes on to the AM detector 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.

The AM detector gives a DC voltage when the 580 KHz signal is rectified. By strong antenna signals the DC voltage is high. When there is no antenna signal, the DC voltage is 0 volt.

This DC voltage is fed into T26, which starts conducting and creates a voltage drop across R122. Also T25 conducts resulting in a DC voltage being fed through D19 and into the base of T23.



With P2 T23 is already adjusted to conduct. The regulation "RF GAIN" will be parallel across P2 and with "RF GAIN" turned fully clockwise this switches ON T23 completely.

With "RF GAIN" turned fully anticlockwise the signal strength makes T23 conduct and feed a DC voltage, which is depending on the signal strength, into IC3 and IC4. This voltage reduces the amplification of the 580 KHz.

This AGC - automatic gain control - ensures a constant output from IC4 and prevents blocking. The AGC regulation may be FAST or SLOW. the transistor T24 is driven on when the knob is in SLOW position. Hereby 47 uF is connected to the AGC regulation. This causes a time delay of the AGC.

In position FAST reception of SSB gives a strong regulation of the AGC, and this makes the AF signal "jerk". The AGC knob in position SLOW prevents this.

IC11 is connected to the AGC voltage and is S-meter amplifier. The amplification of IC11 can be "preset" with P1.

The 580 KHz are fed from the output of IC4 through a band-pass filter and into IC5.

IC5 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 IC5.

IC5 contains i.a. an oscillator in which L28/C83,D16 forms the frequency determining circuit. The oscillator signal is fed into IC6 pin 8 where it is frequency and phase locked at 9 MHz reference frequency - TCXO. IC6 is programmed from the microprocessor to make the oscillator in IC5 oscillate at 580.000 KHz in USB/LSB mode. The transistors T19, T20, T21 form an integrating circuit, which makes the pulses from the PLL circuit - IC6 - give a DC voltage to the capacity diode D16. D16 makes the oscillator oscillate at exactly 580.000 KHz.

The 580 KHz are mixed with the IF frequency in IC5. 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. In SSB-CW mode T17 gets a high on the base and is thereby switched on. This makes T18 switch on also. The result is that IC5 gets a 12 volt voltage which is the supply voltage of IC5.

T17 and T18 are switched off in position AM.

In position SSB/CW the DC voltage from T18 switches on the muting transistor T16, which prevents the AF signal from the AM detector from reaching IC8A. The SSB transistor is switched off which enables the AF signal from IC5 to reach IC8A unimpeded.

In position SSB T15 mutes the AF signal from IC5. T16 is switched off, and this enables the AF signal from the AM detector to reach IC8A unimpeded.

The AF signal is fed from the output - Pin 1 of IC8A - into IC8B, 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.

From the output on IC8A the AF signal is also connected to the volume control. From here the signal passes on to IC7. IC7 is output amplifier capable of supplying 3 Watt into 4 ohm.

The output of IC7 is connected to the loudspeaker connection through a relay contact.

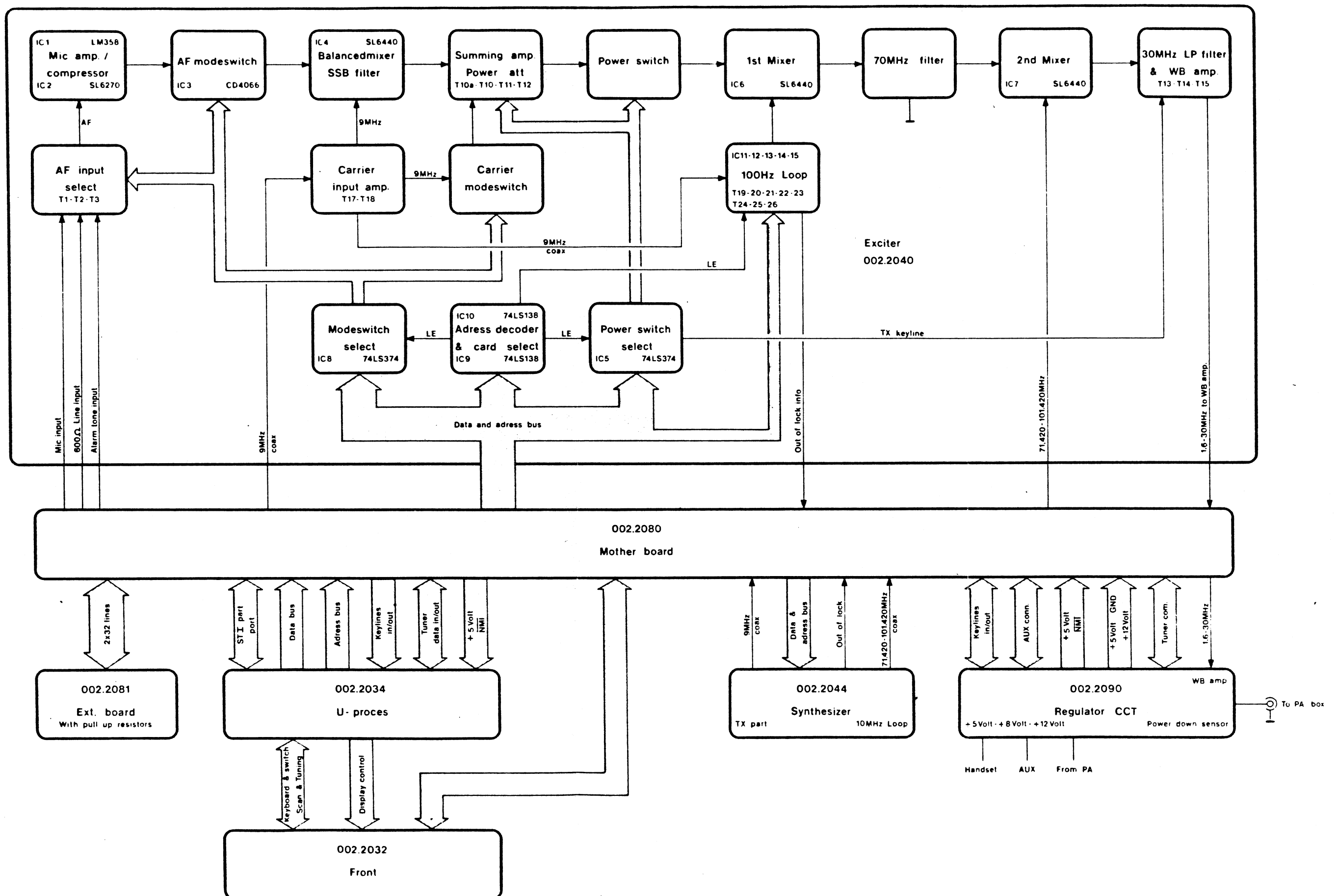
A high on the base of T22 connects the loudspeaker. The headphone is always connected.

RT 210 ERROR CODE

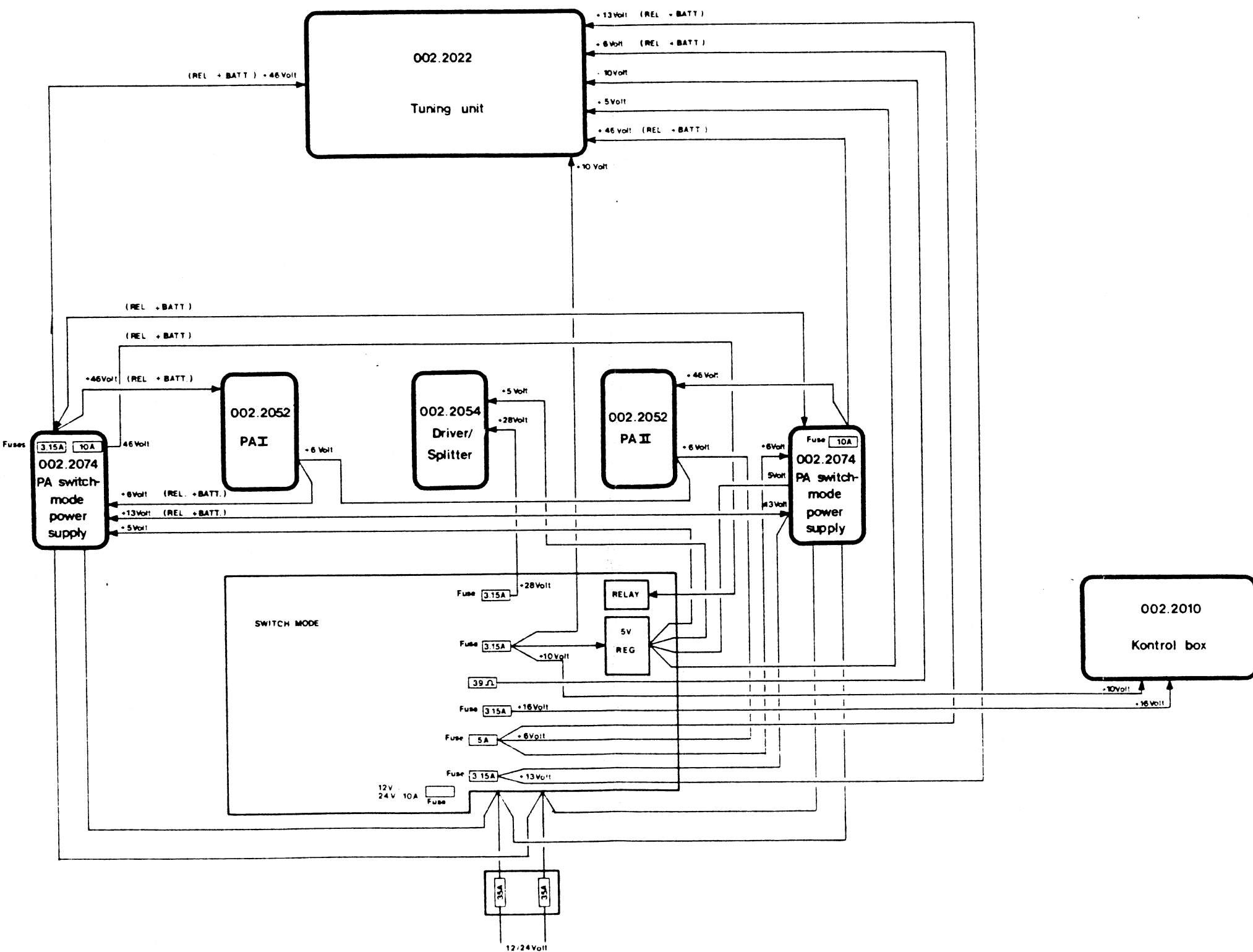
ERROR 20	=	COMMUNICATION ERROR
ERROR 21	=	COMMUNICATION BREAK
ERROR 22	=	INVALID COMMAND REC
ERROR 23	=	BUFFER OVERFLOW
ERROR 27	=	STI ERROR
ERROR 30	=	RAM CHANNEL/LOCATION ERROR
ERROR 31	=	TUNER PREDATA ERROR
ERROR 32	=	POWER UP/DAWN ERROR
ERROR 33	=	MPU WATCHDOG ERROR
ERROR 34	=	MPU INTERRUPT WATCHDOG 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 EMPTY
HELP	5	=	RECALLED TX CHANNEL/LOCATION EMPTY
HELP	6	=	TX KEY BLOCK
HELP	7	=	MODE/FREQUENCY CONFLICT

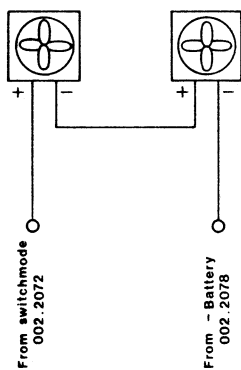


Block diagram for TX unit  
Drawing no. 001.0436

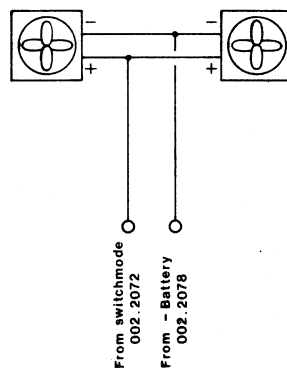


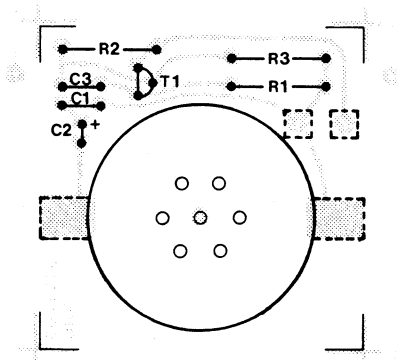
Fuse and voltage diagram  
Drawing no. 001.0438

### 24 Volt Blowers



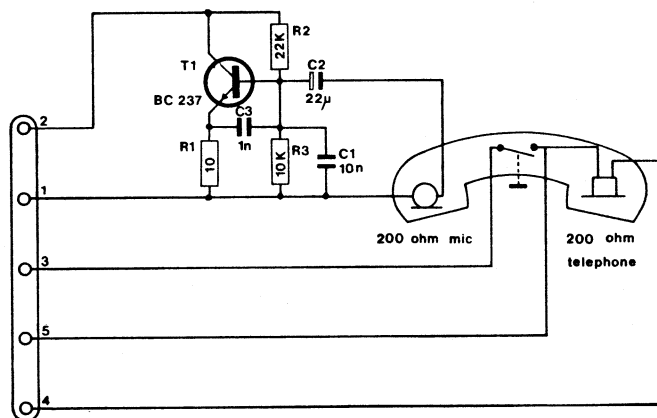
### 48 Volt Blowers





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





**Handset**

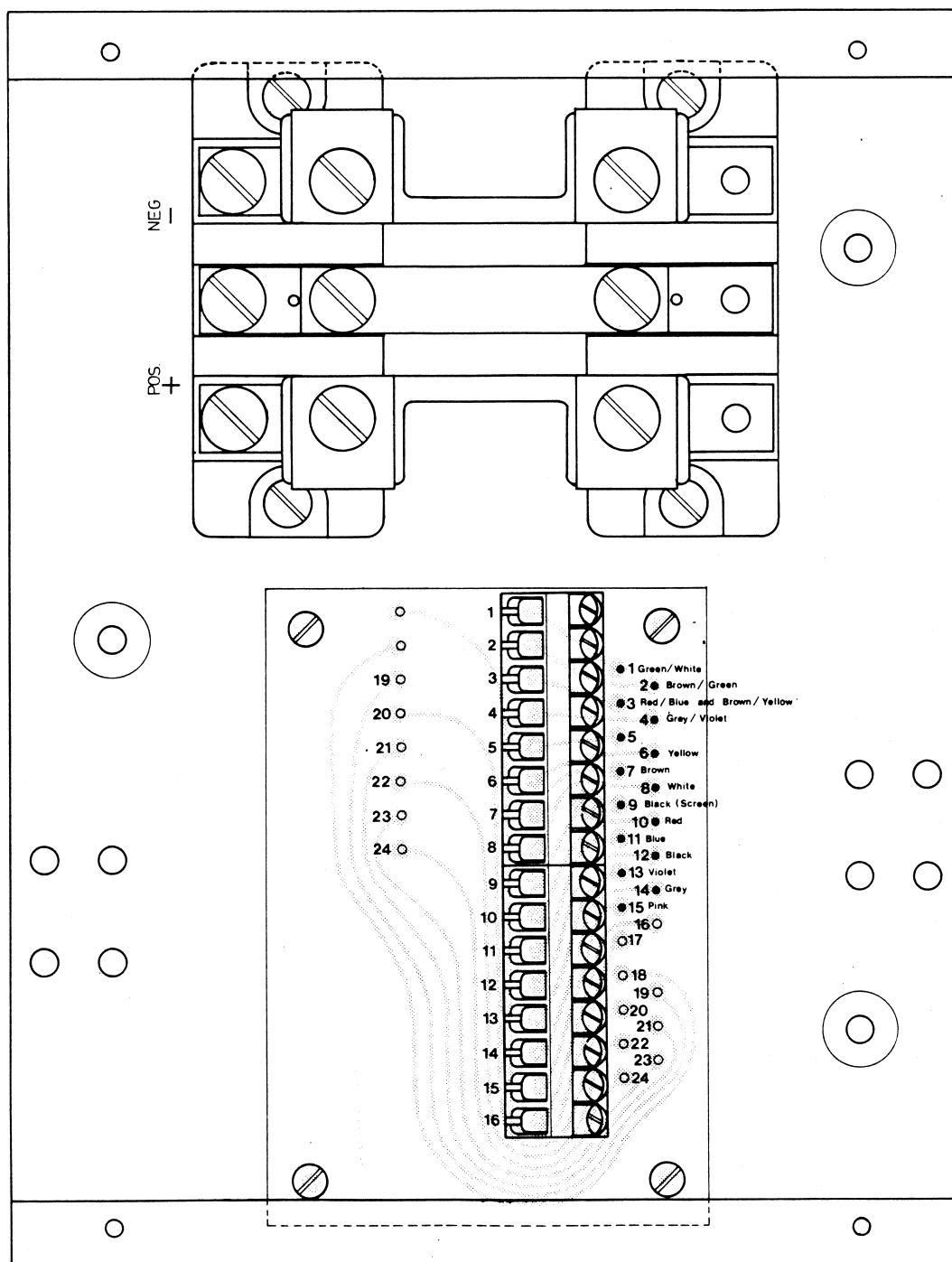
**Drawing no. 001.0401A**

**Unit no. 002.2005**

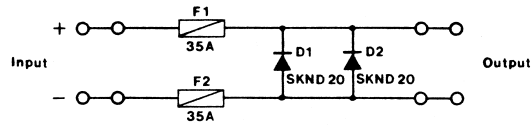
**PC.Board no. 003.0820**

**Layout no 33.0820**





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



SUB 'D' conn.	80 cm 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

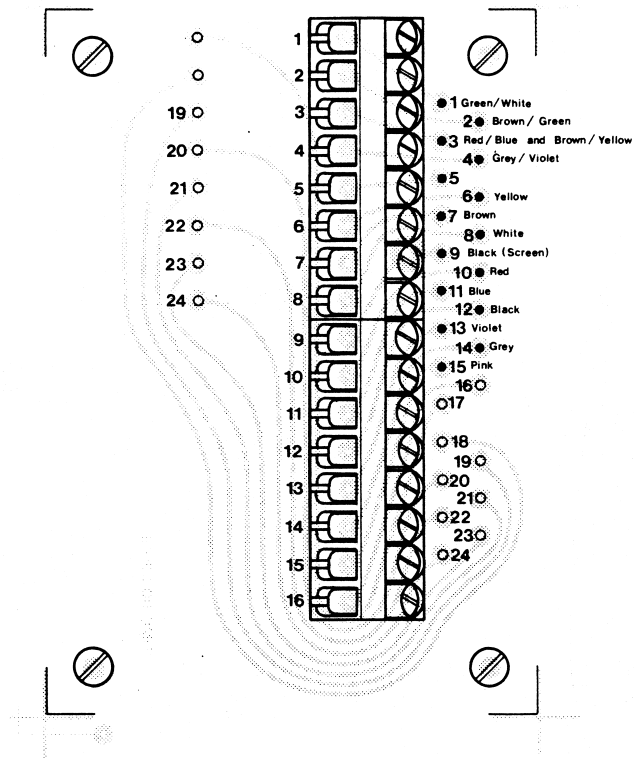
Junctionbox

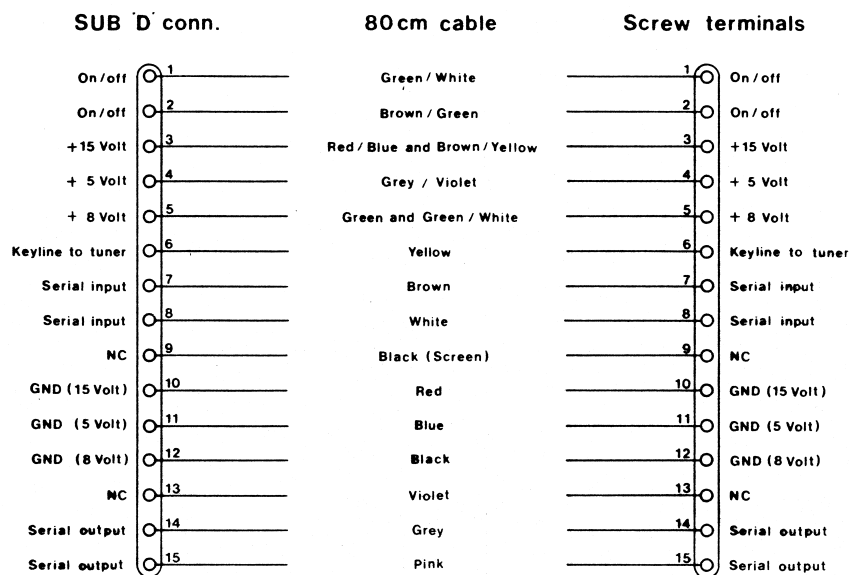
Drawing no. 001.0429

Unit no. 002.2014

PC. Board no. 003.2016

Layout no. 33.2016-2





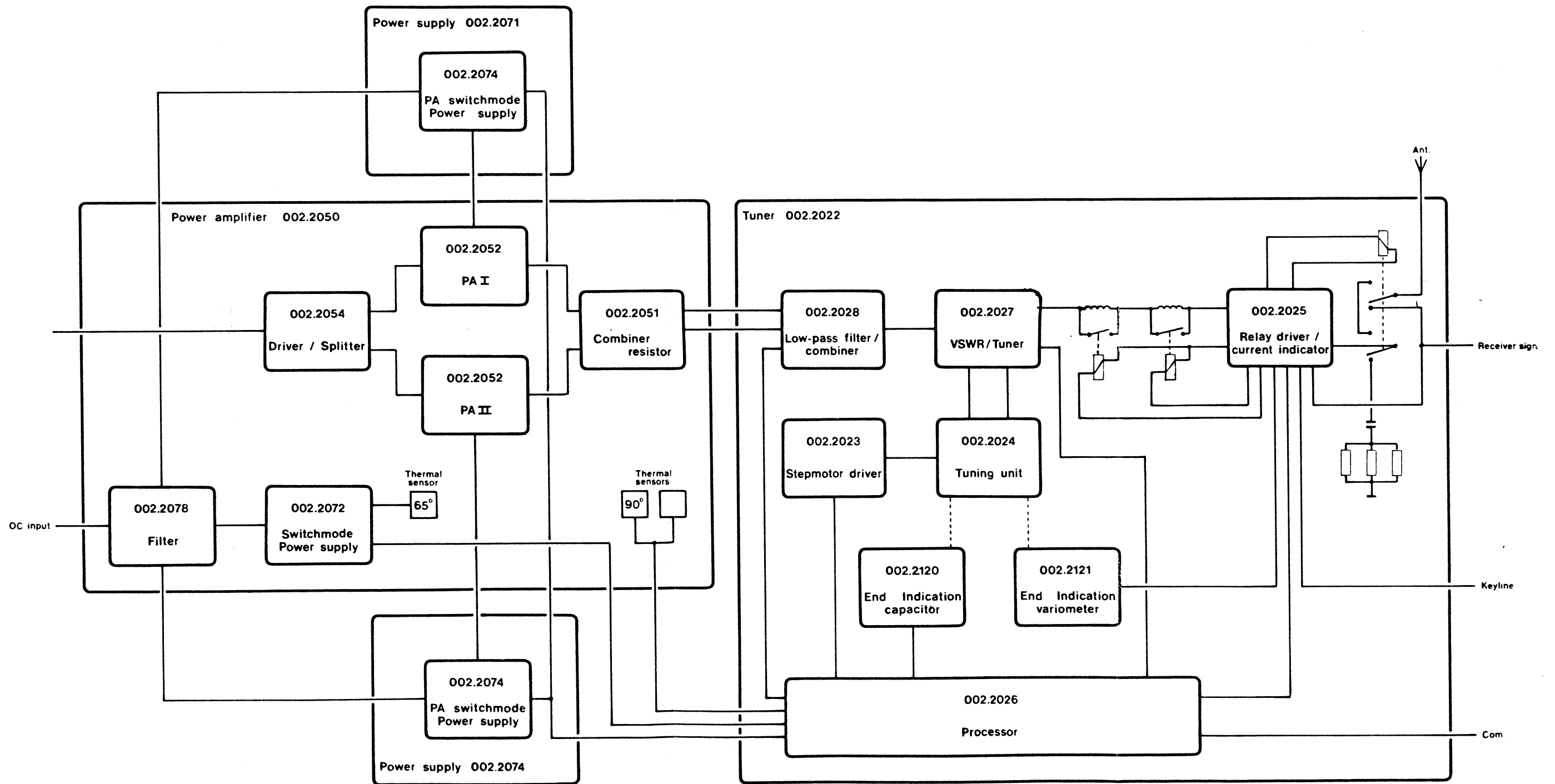
Junctionbox

Drawing no. 001.0402

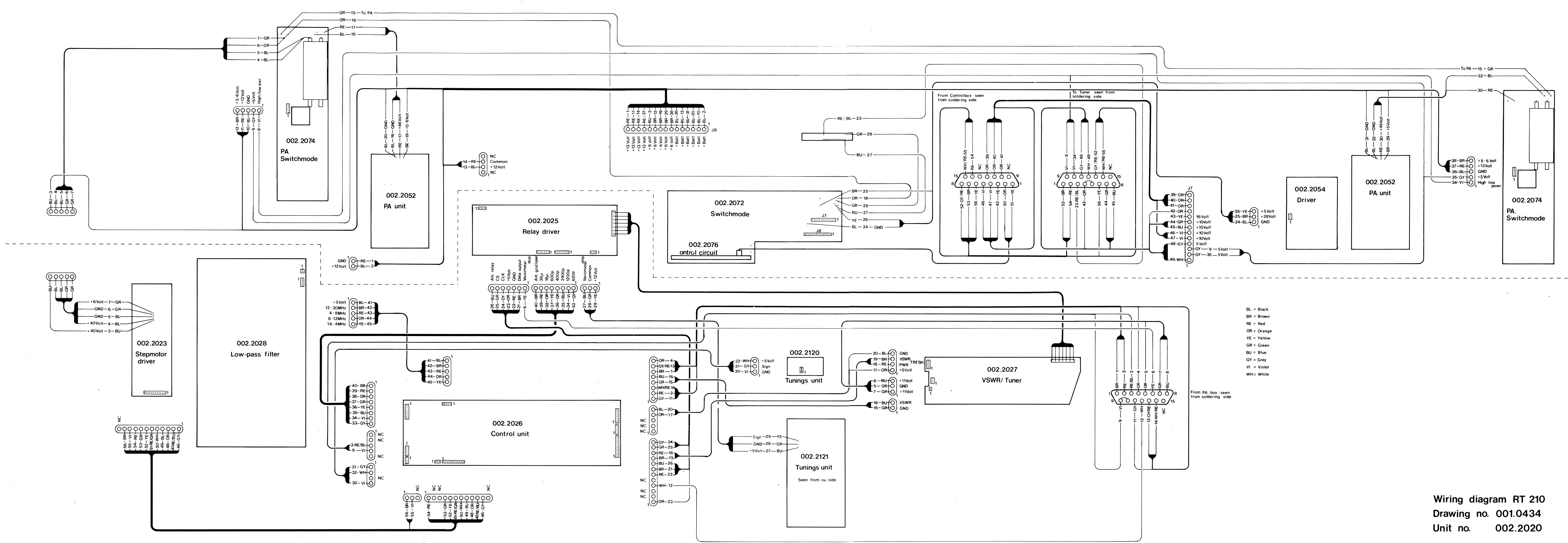
Unit no. 002.2016

PC. Board no. 003.2016

Layout no. 33.2016-1

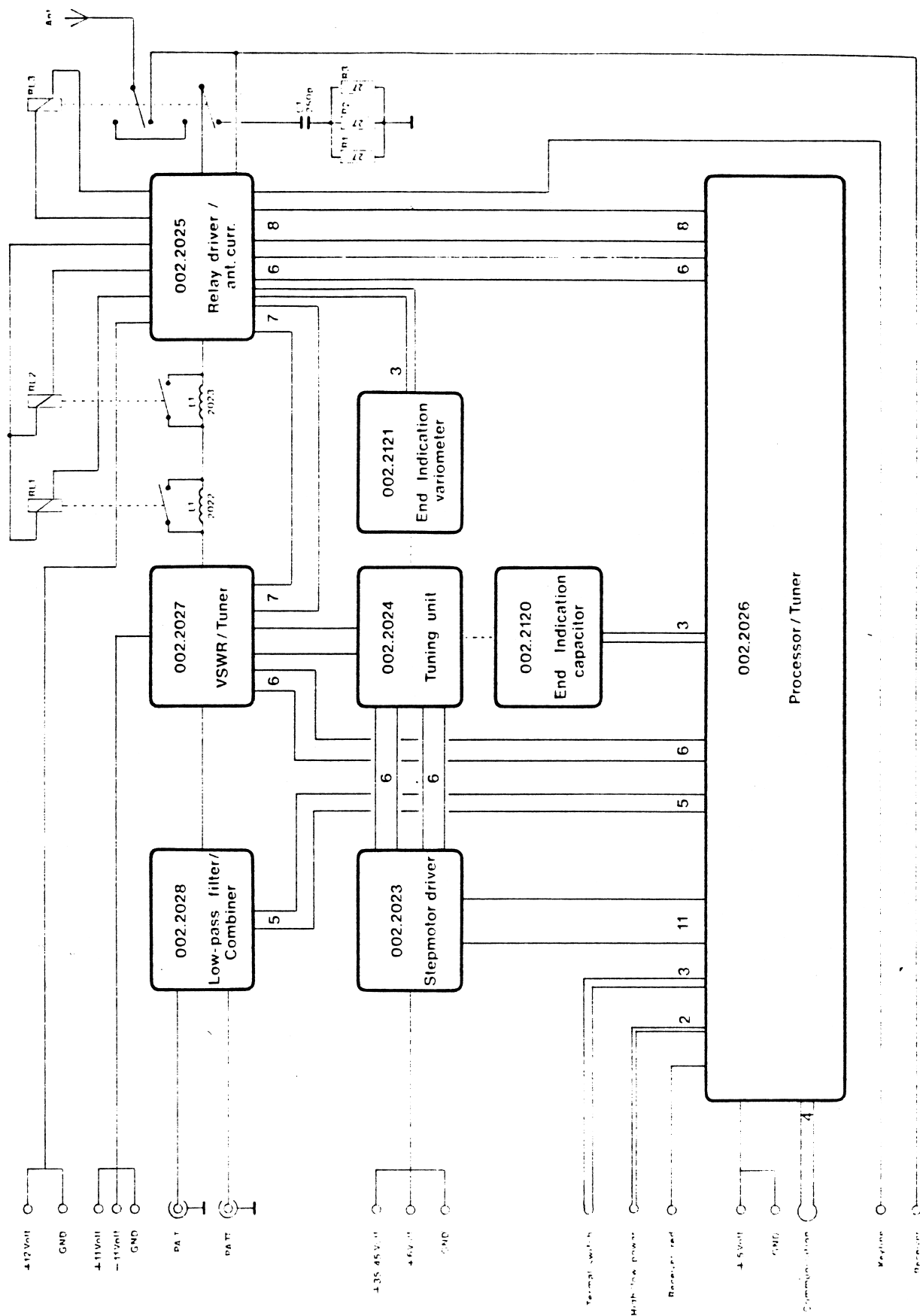


Block diagram for PA box  
Drawing no. 001.0431  
Unit no. 002.2020

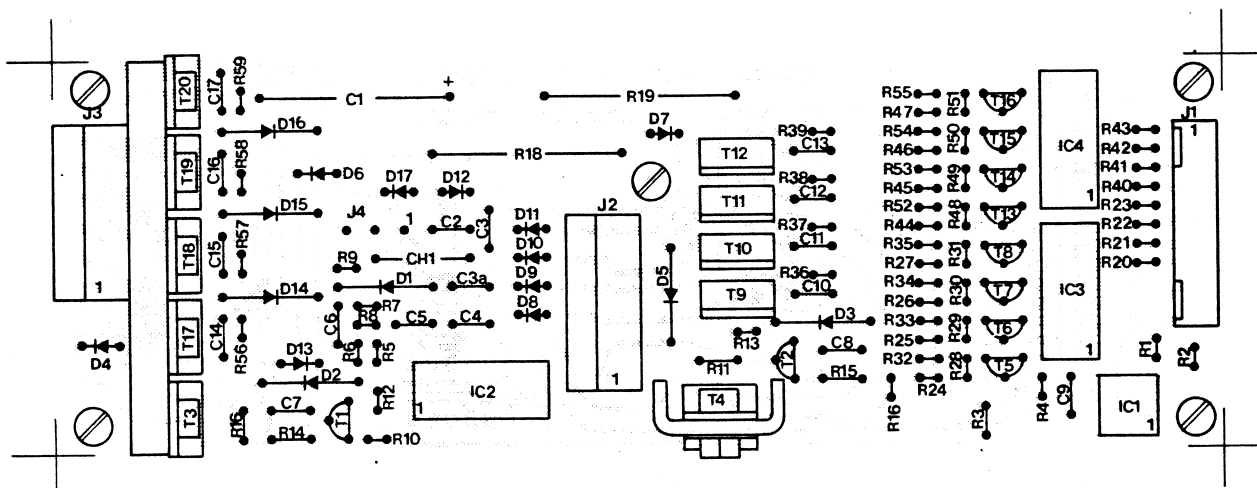


Wiring diagram RT 210  
Drawing no. 001.0434  
Unit no. 002.2020

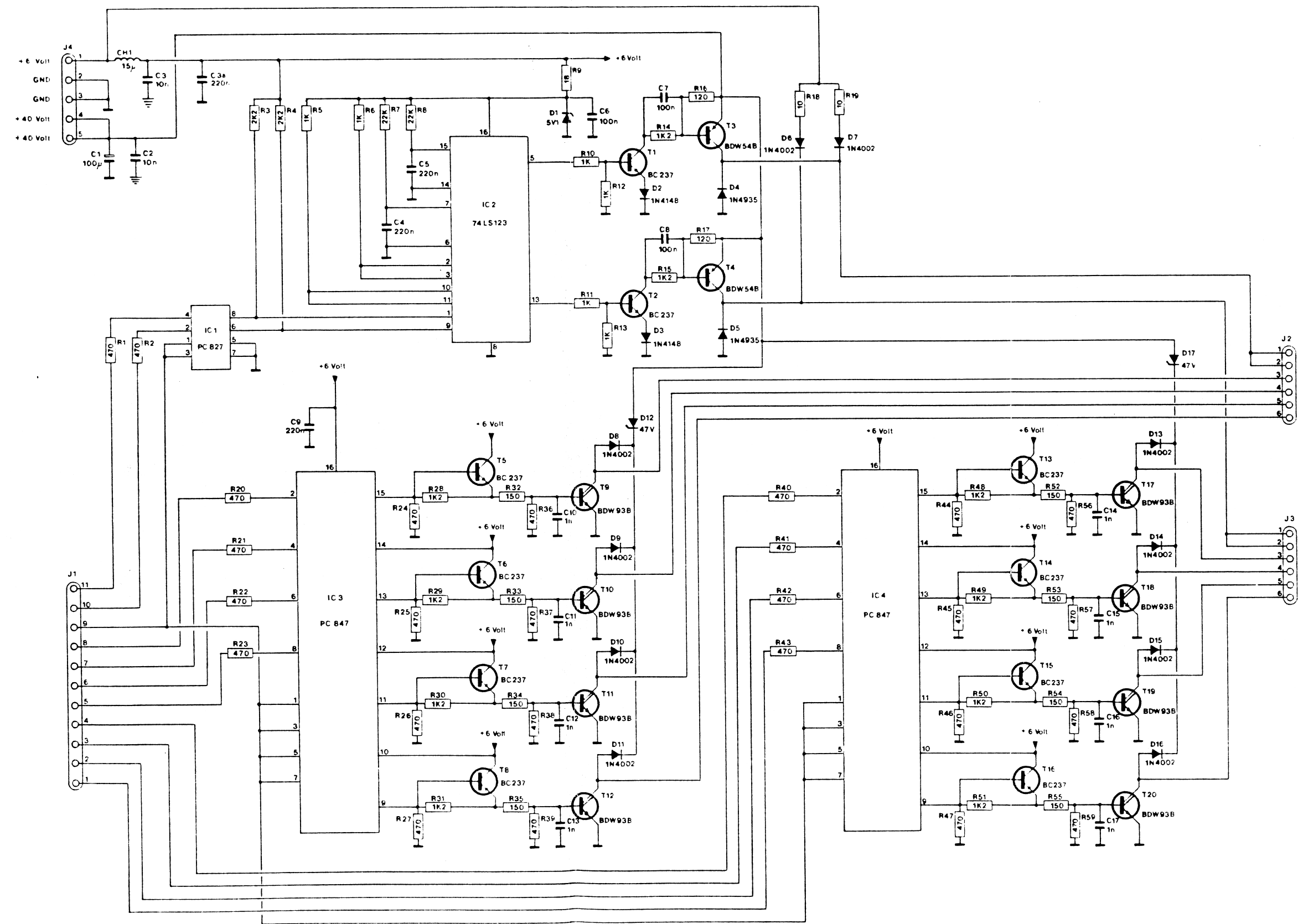




Block diagram for Tuner  
Drawing no. 001.0403  
Unit no. 002.2022



**Stepmotor driver**  
**Layout no. 33.2023A**



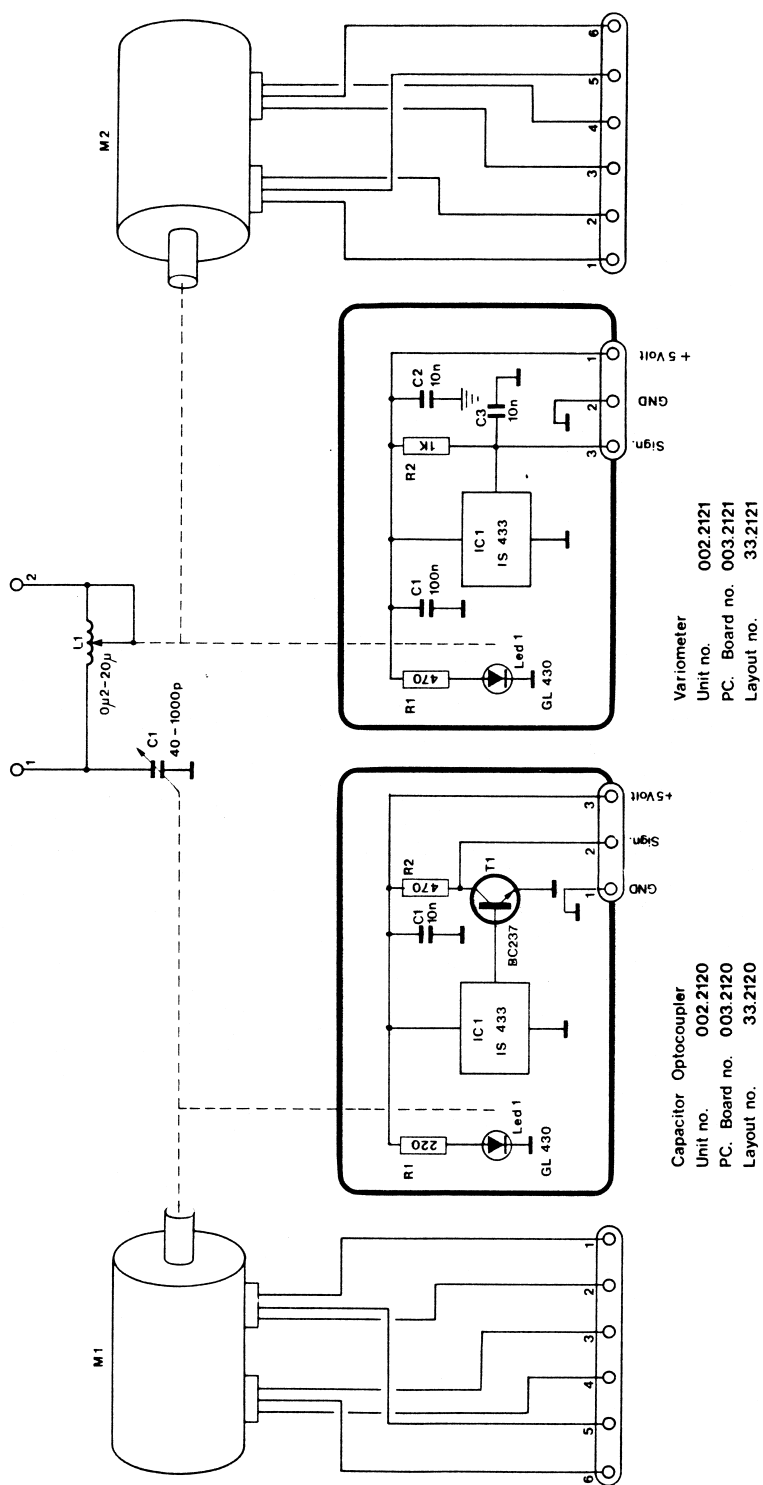
Stepmotor driver

Drawing no. 001.0404 A

Unit no. 002.2023

PC Board no. 003.2023 A

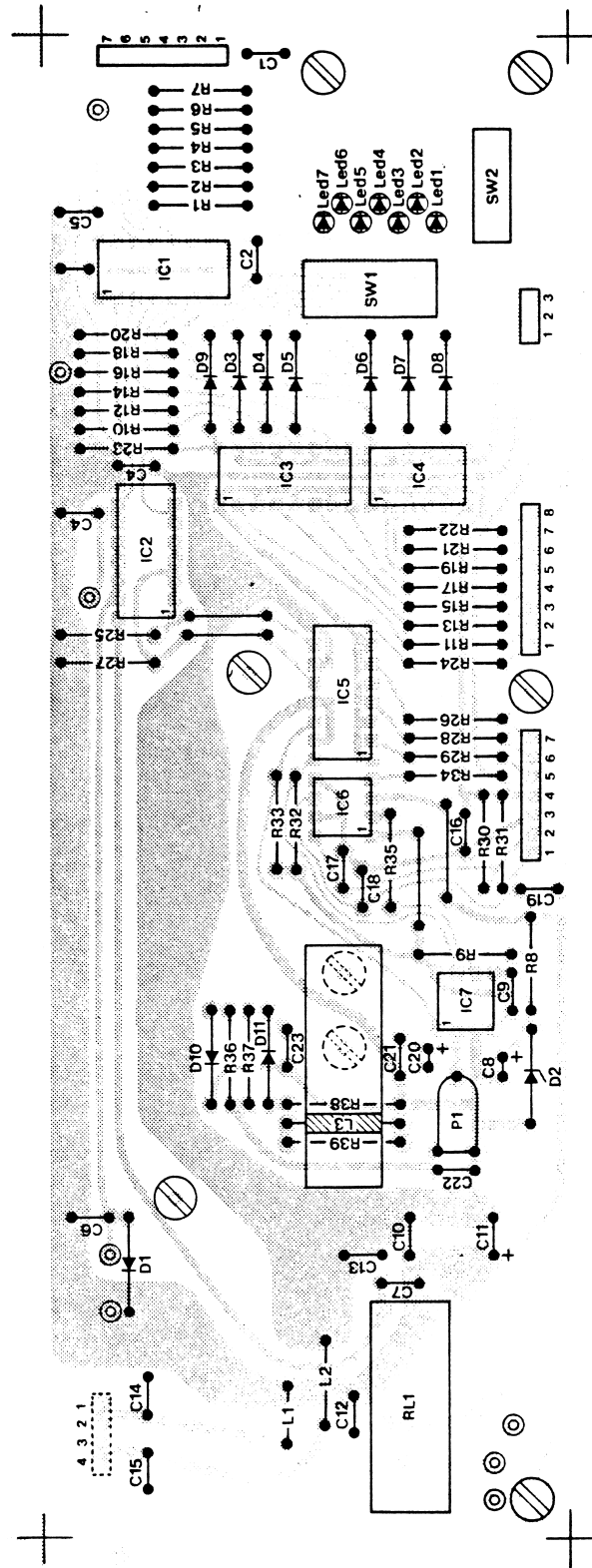
Layout no. 33.2023



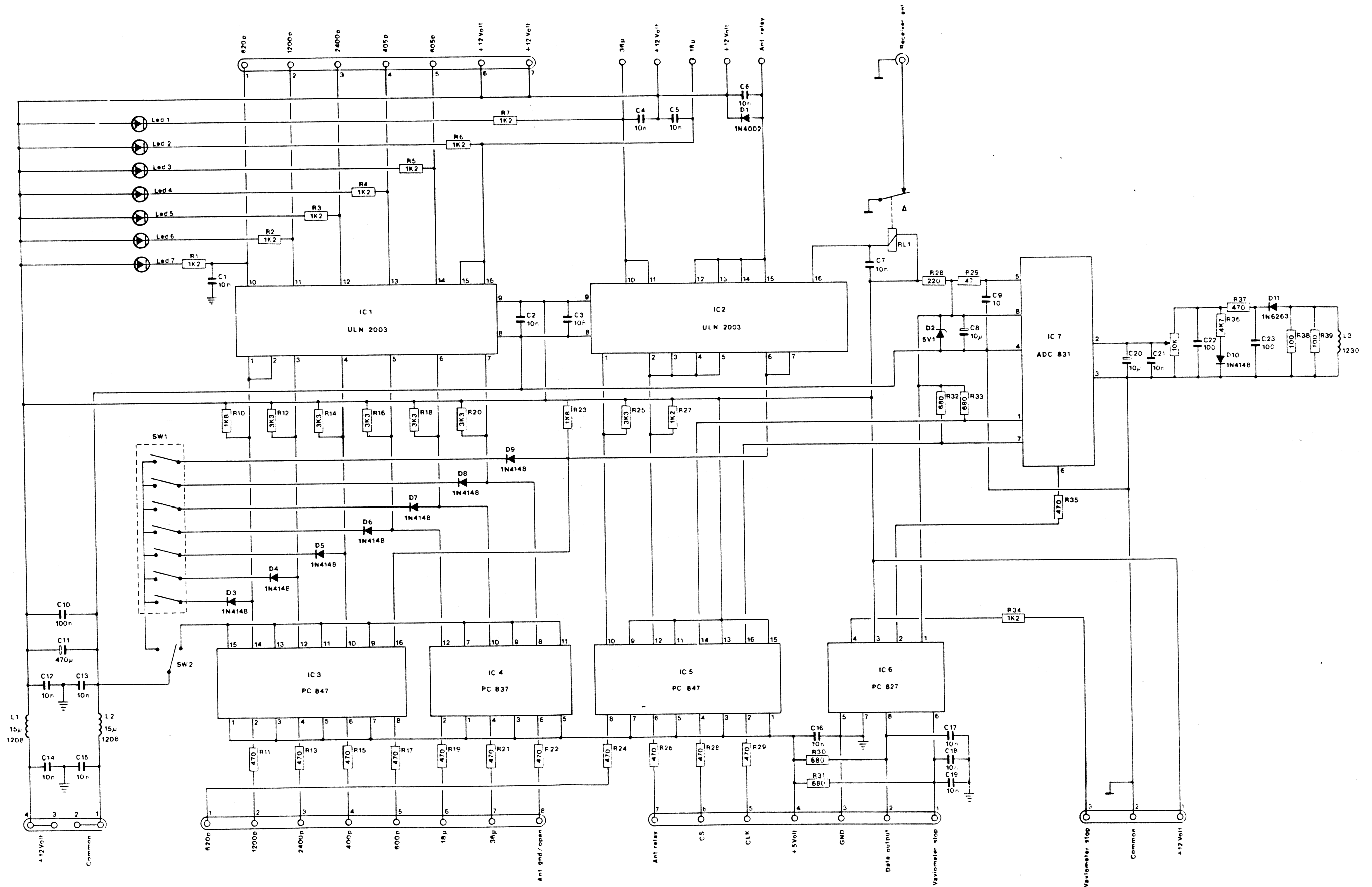
Tunings unit

Drawing no. 001.0410A

Unit no. 002.2024



Relay driver  
Layout no. 33.2025



Relay driver

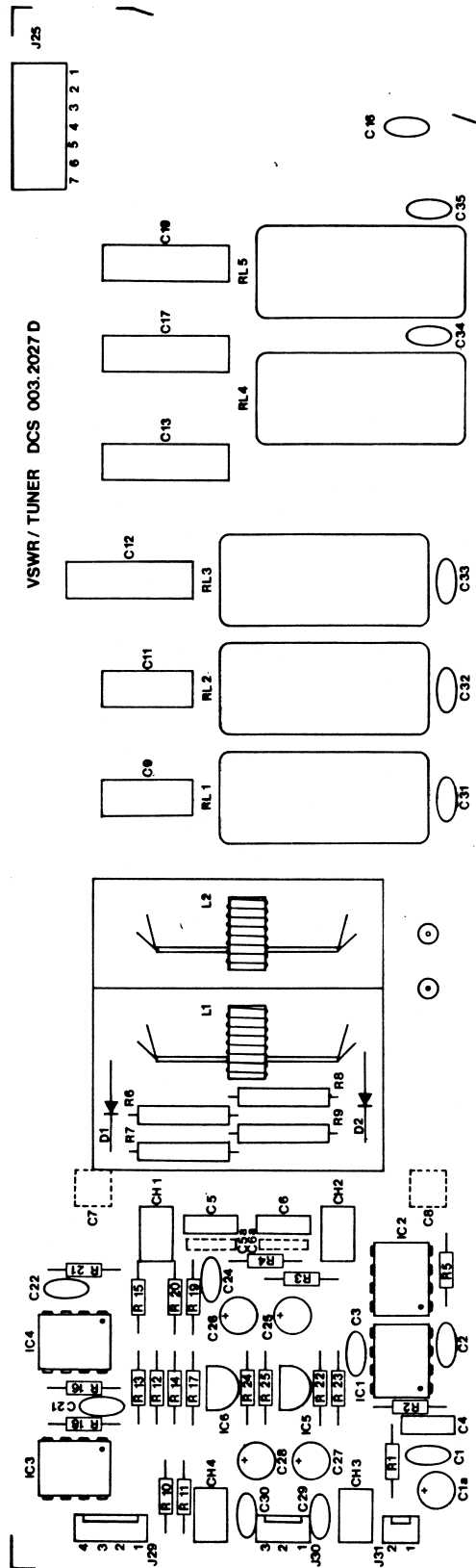
Drawing no. 001.0405

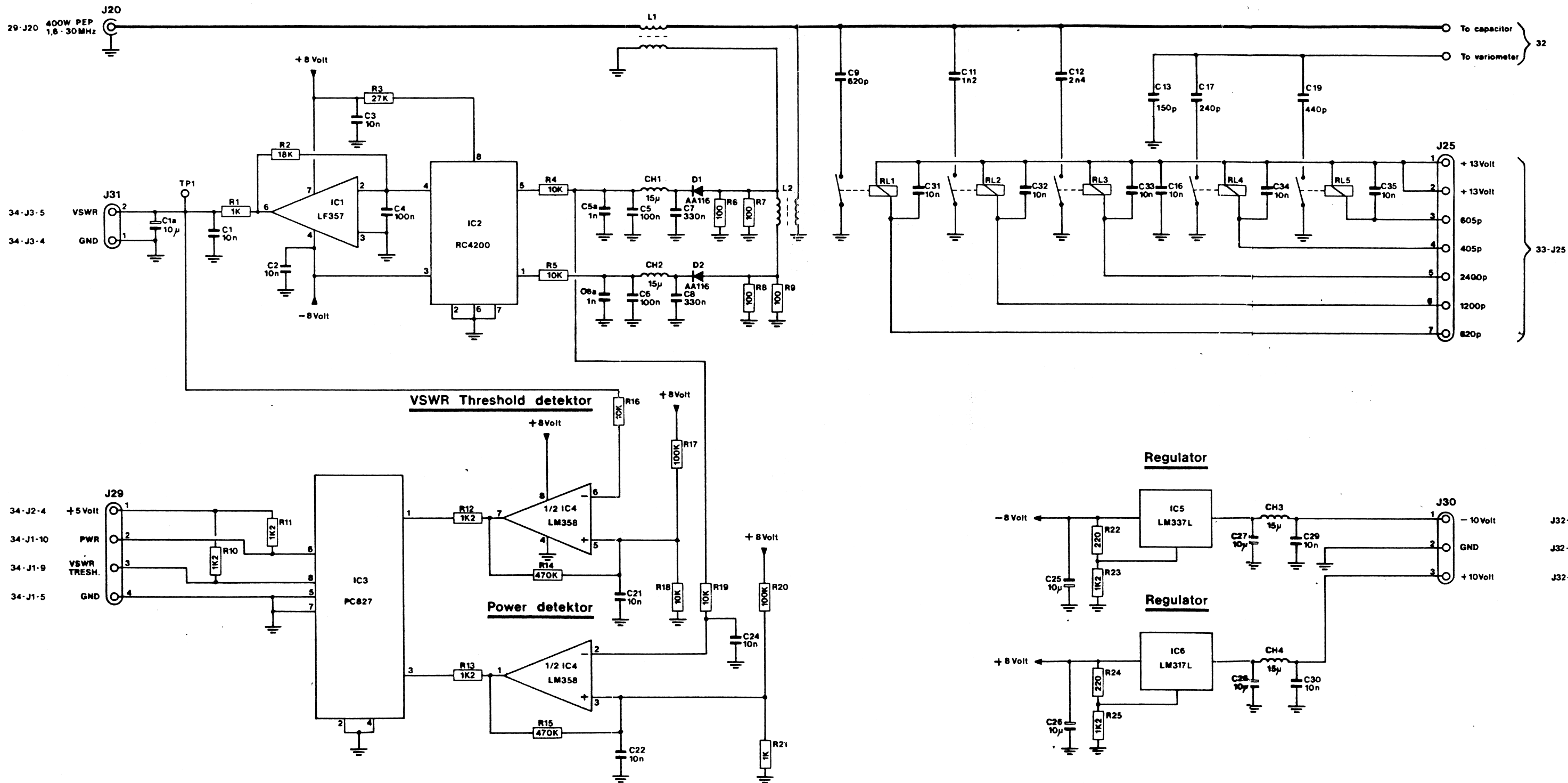
Unit no. 002.2025

PC Board no. 003.2025B

Layout no. 33.2025

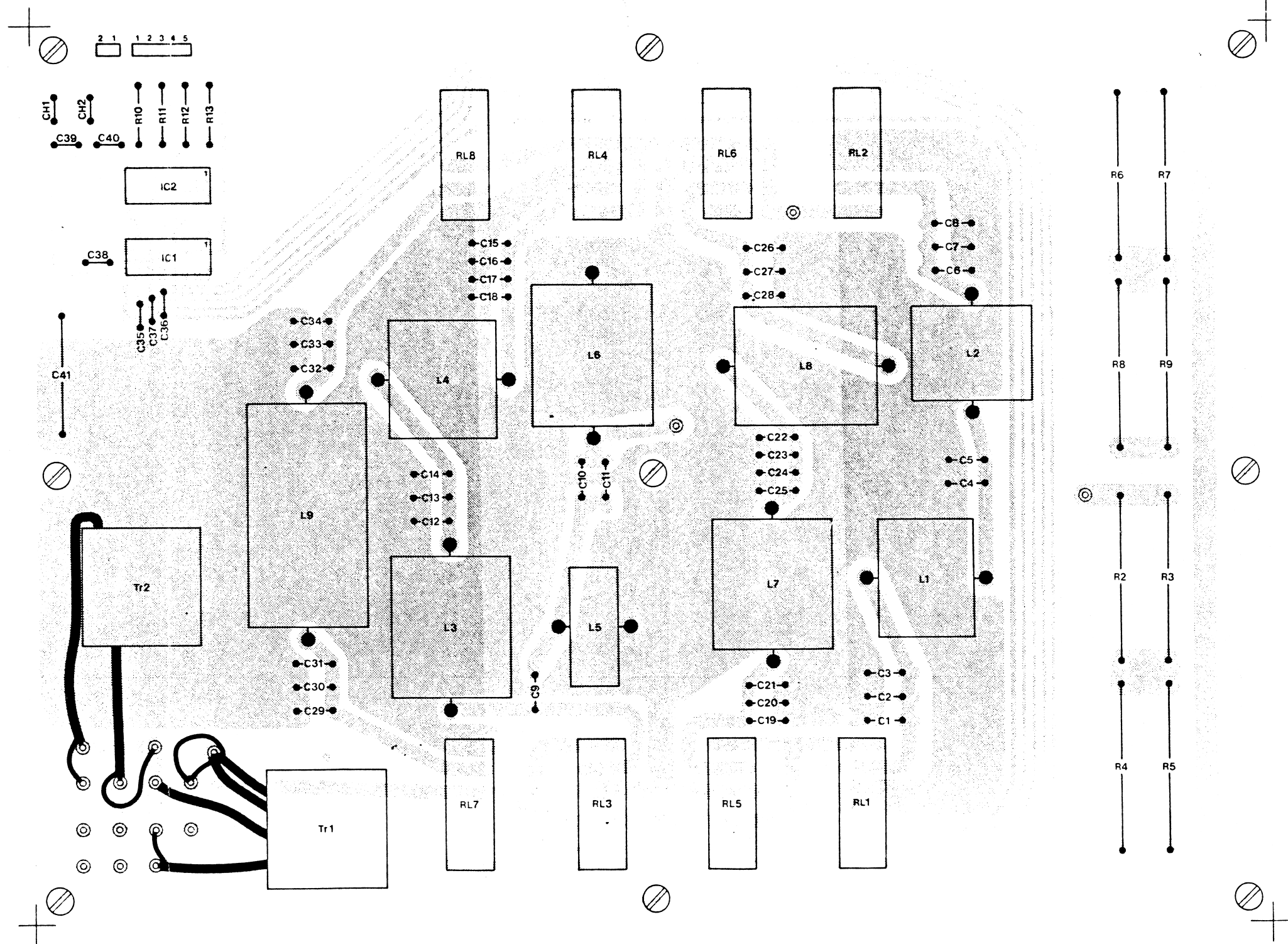
# VSWR / Tuner Layout no. 33.2027D



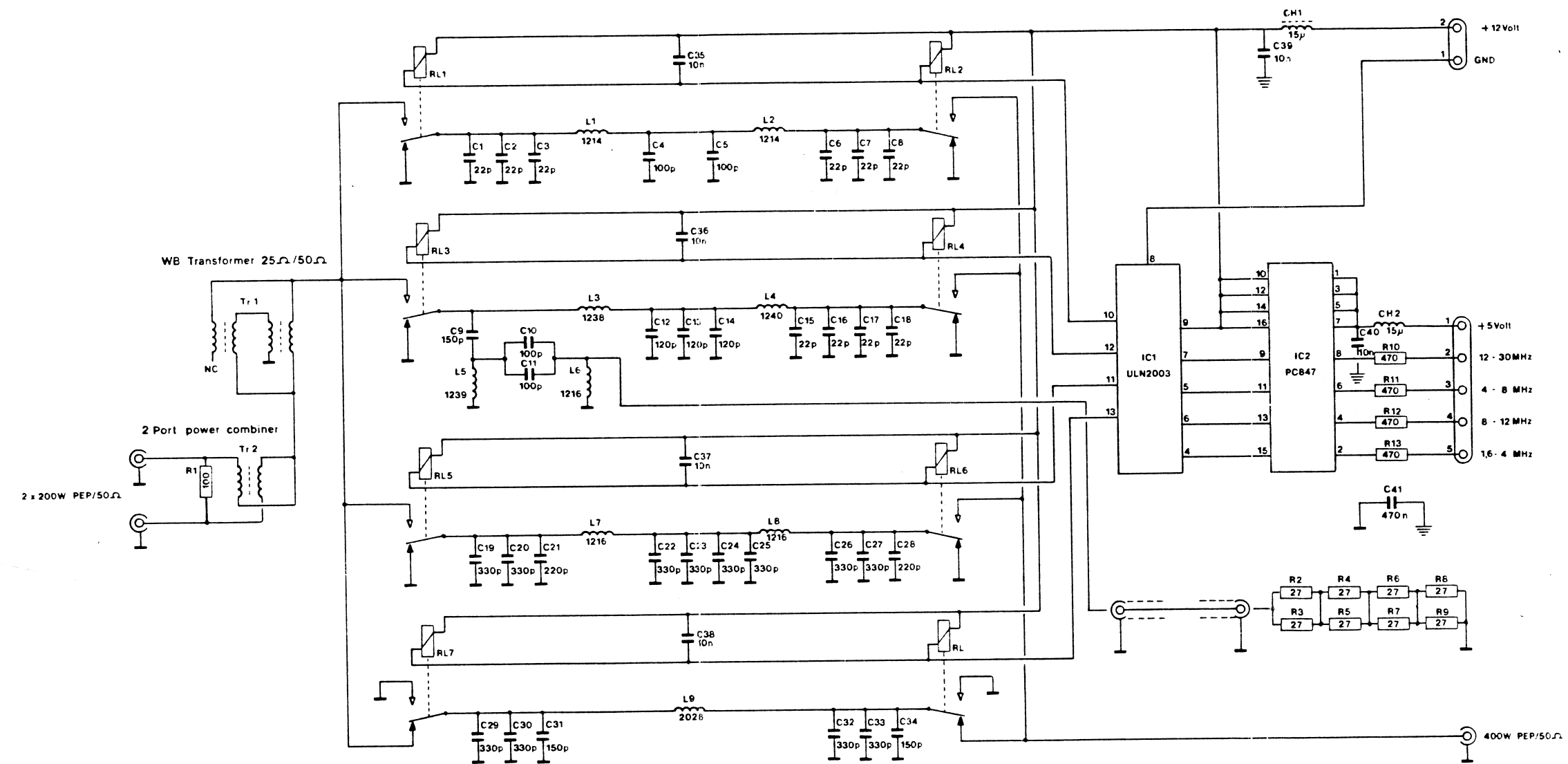


**VSWR/Tuner**  
Drawing no. 001.0407 E  
Unit no. 002.2027 E  
PC. Board no. 003.2027 E  
Layout no. 33.2027 E





Low-pass filter  
Layout no. 33.2028



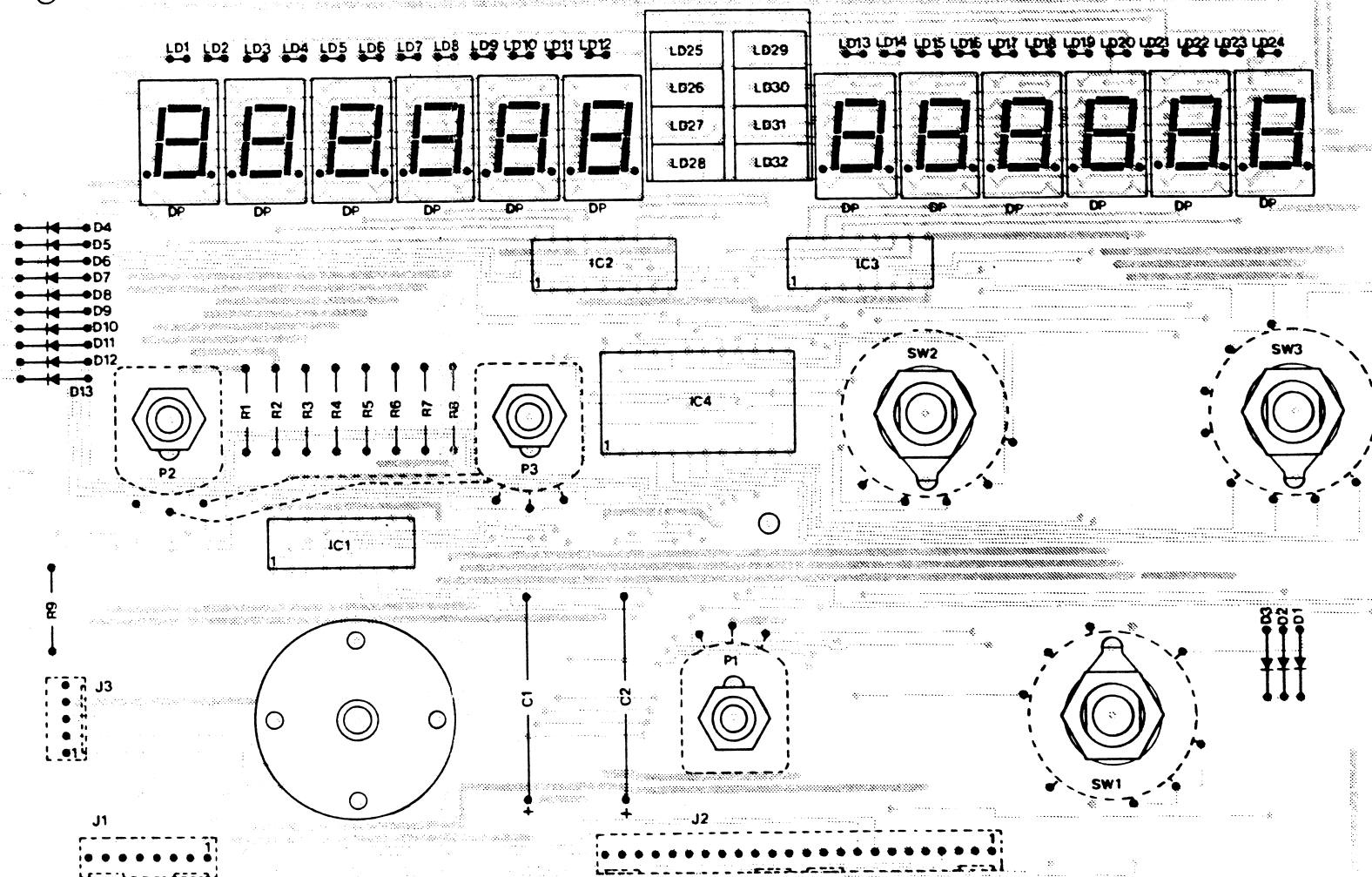
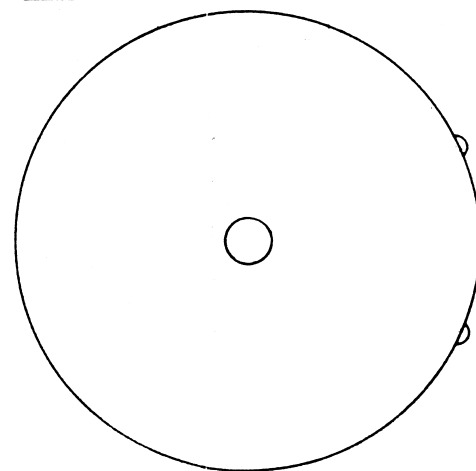
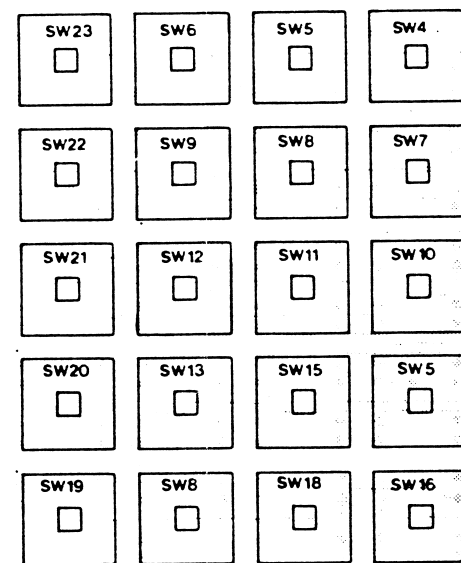
Low-pass filter

Drawing no. 001.0408

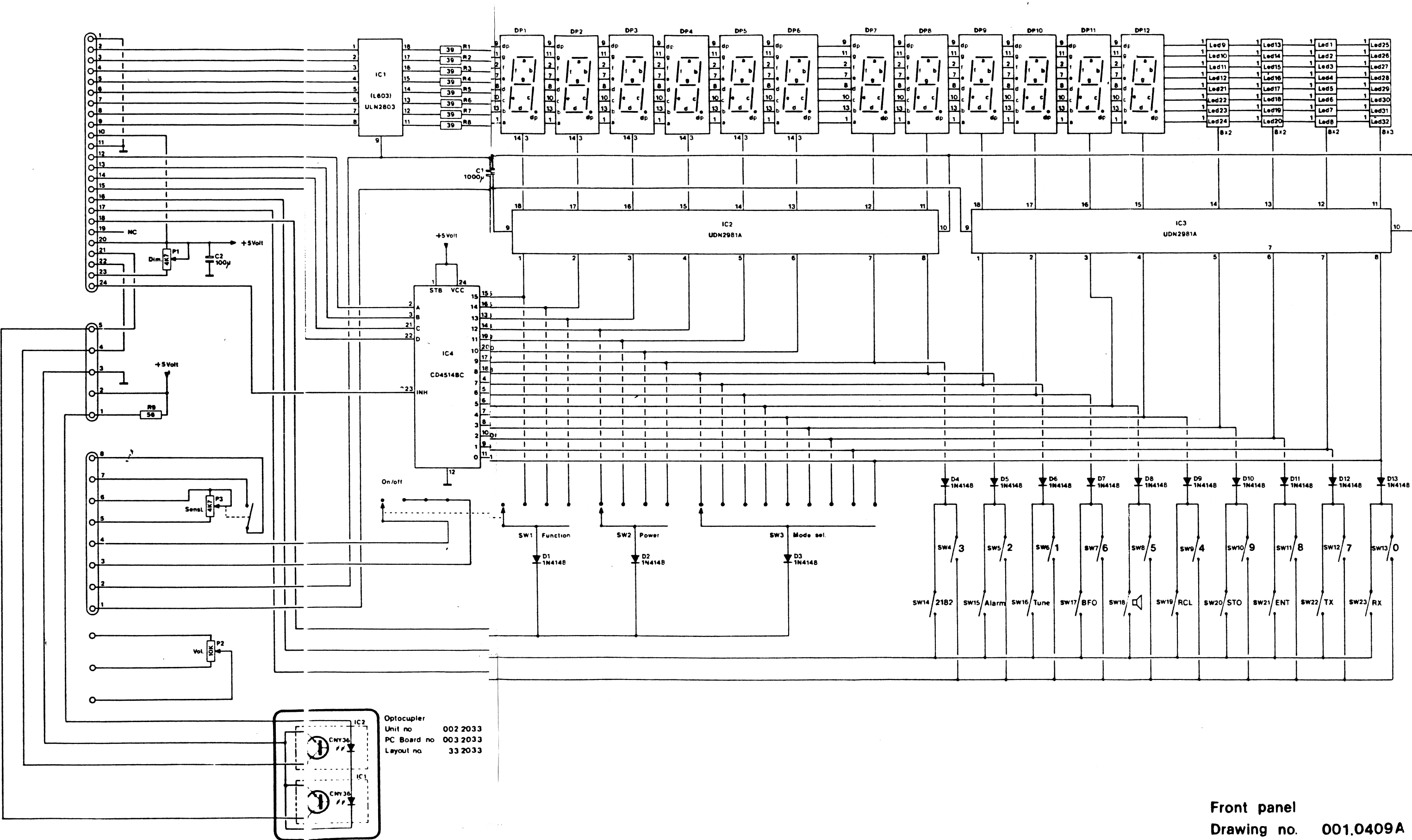
Unit no. 002.2028

PC. Board no. 003.2028B

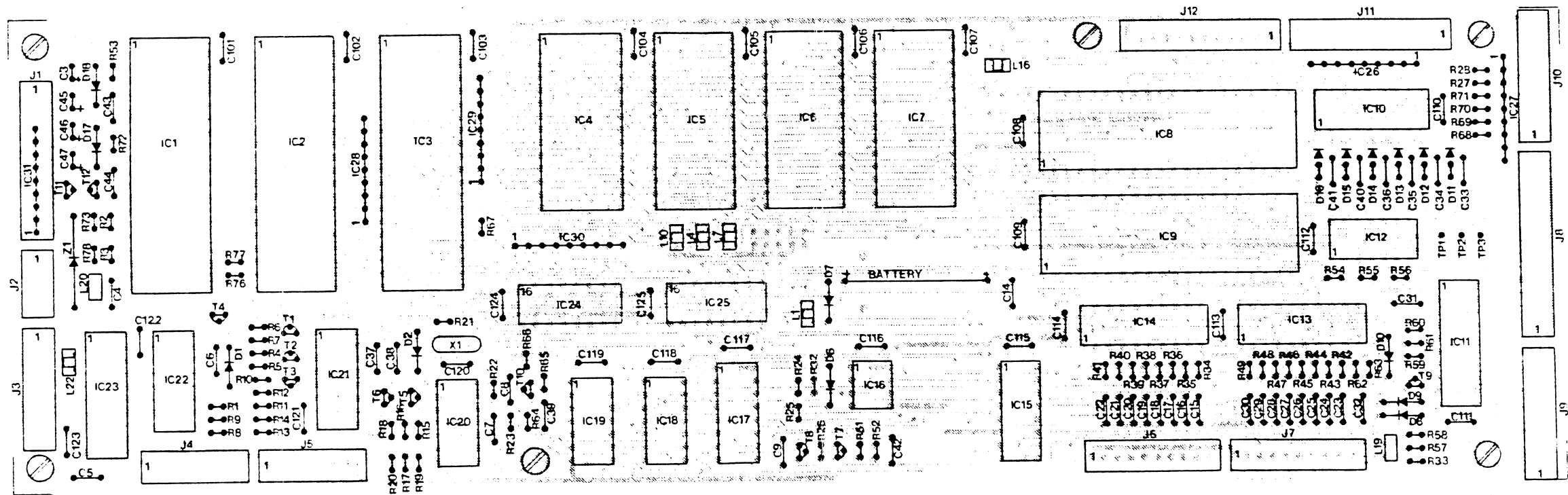
Layout no. 33.2028



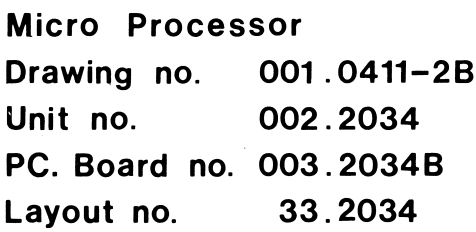
Front panel  
Layout no. 33.2032



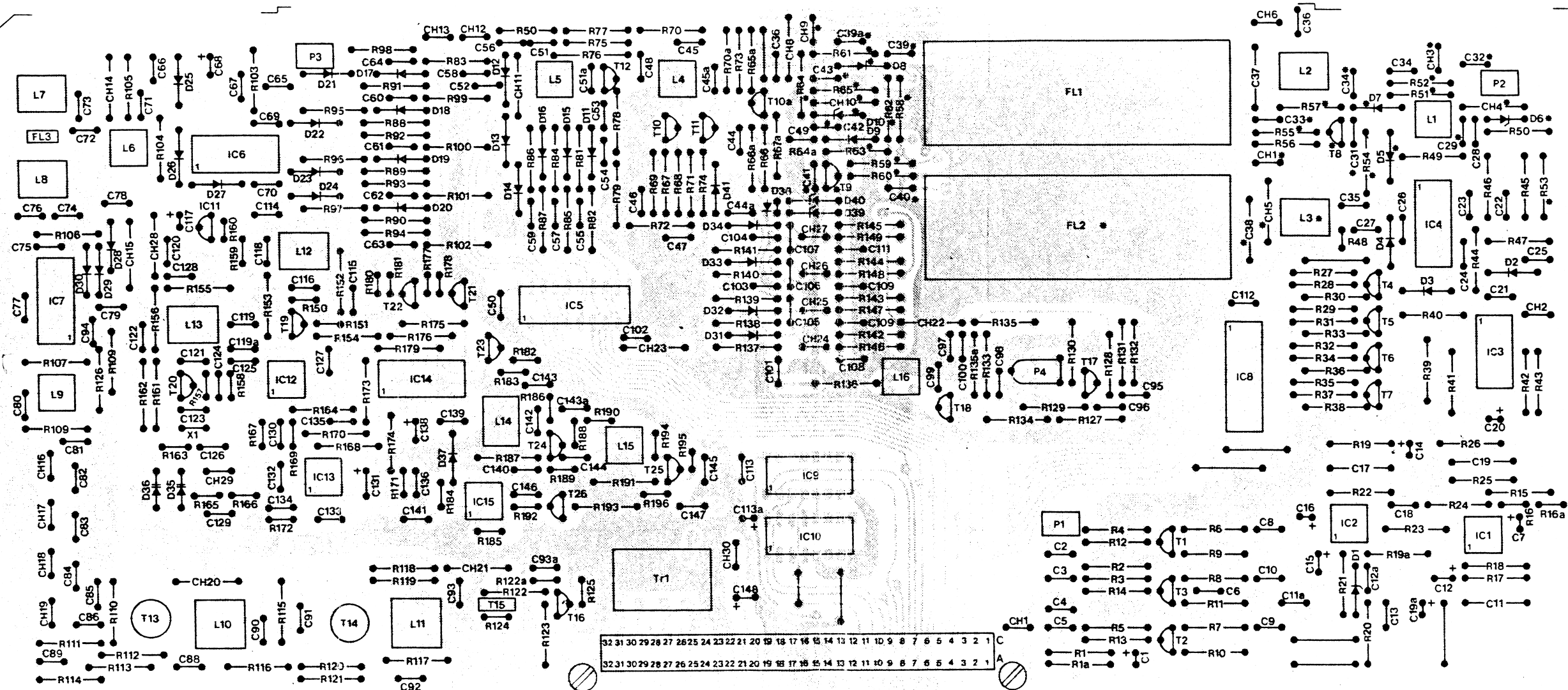
Front panel  
Drawing no. 001.0409A  
Unit no. 002.2032  
PC. Board no. 003.2032A  
Layout no. 33.2032



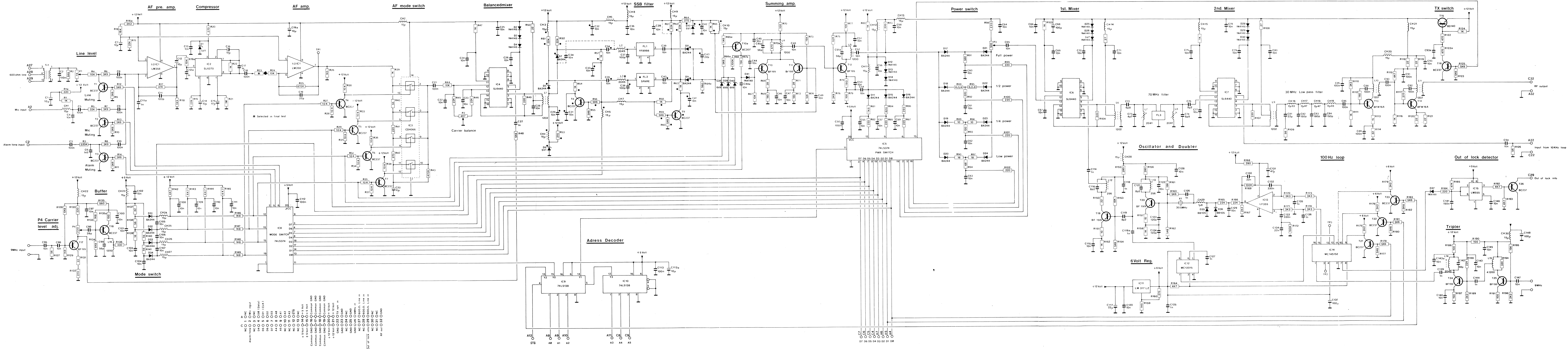
Micro-processor  
Layout no. 33.2034



Exciter  
Layout no. 33.2040

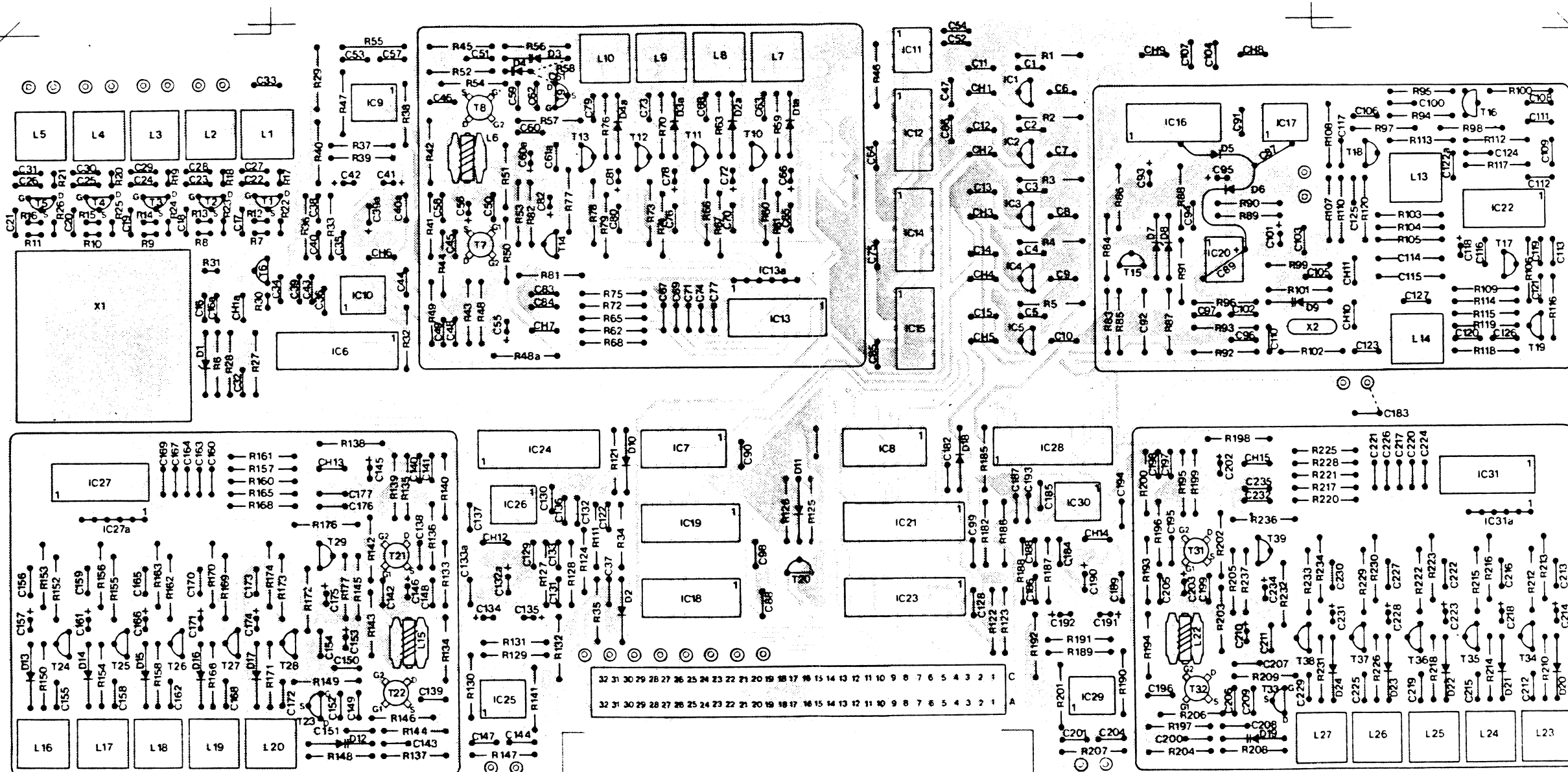


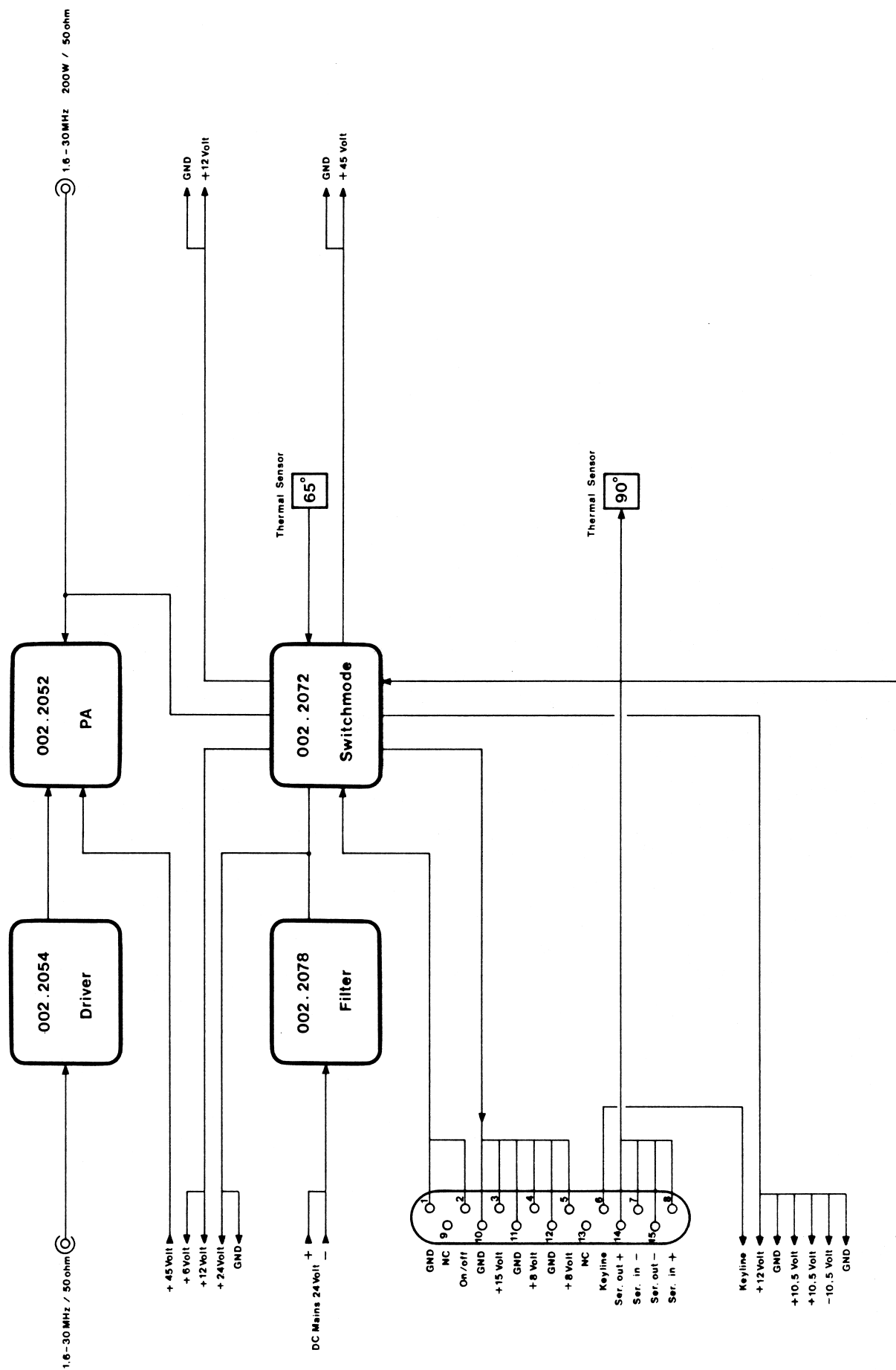




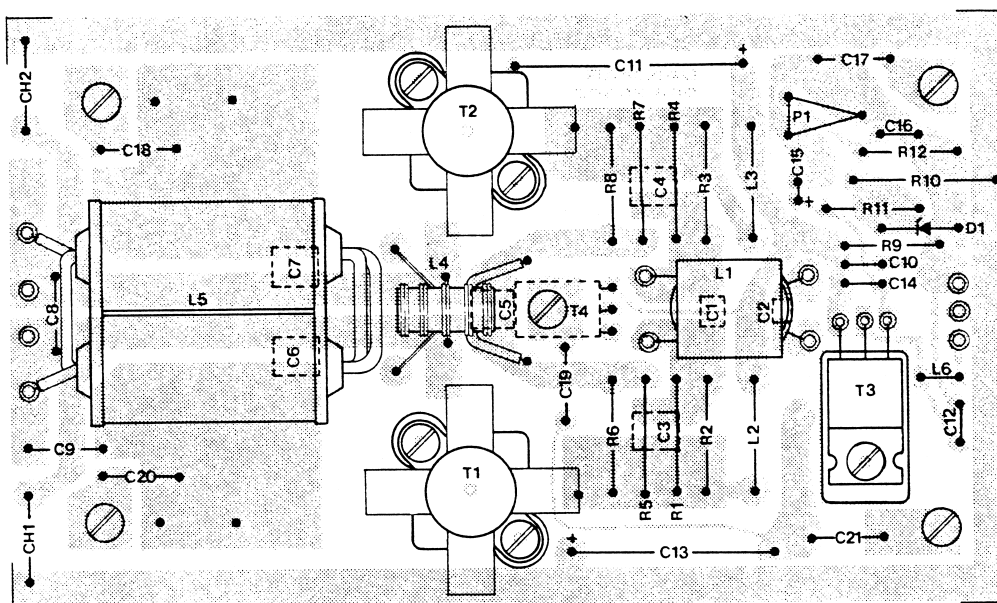
Exciter  
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 Unit no. 002.2040  
 PC. Board no. 003.2040  
 Layout no. 33.2040



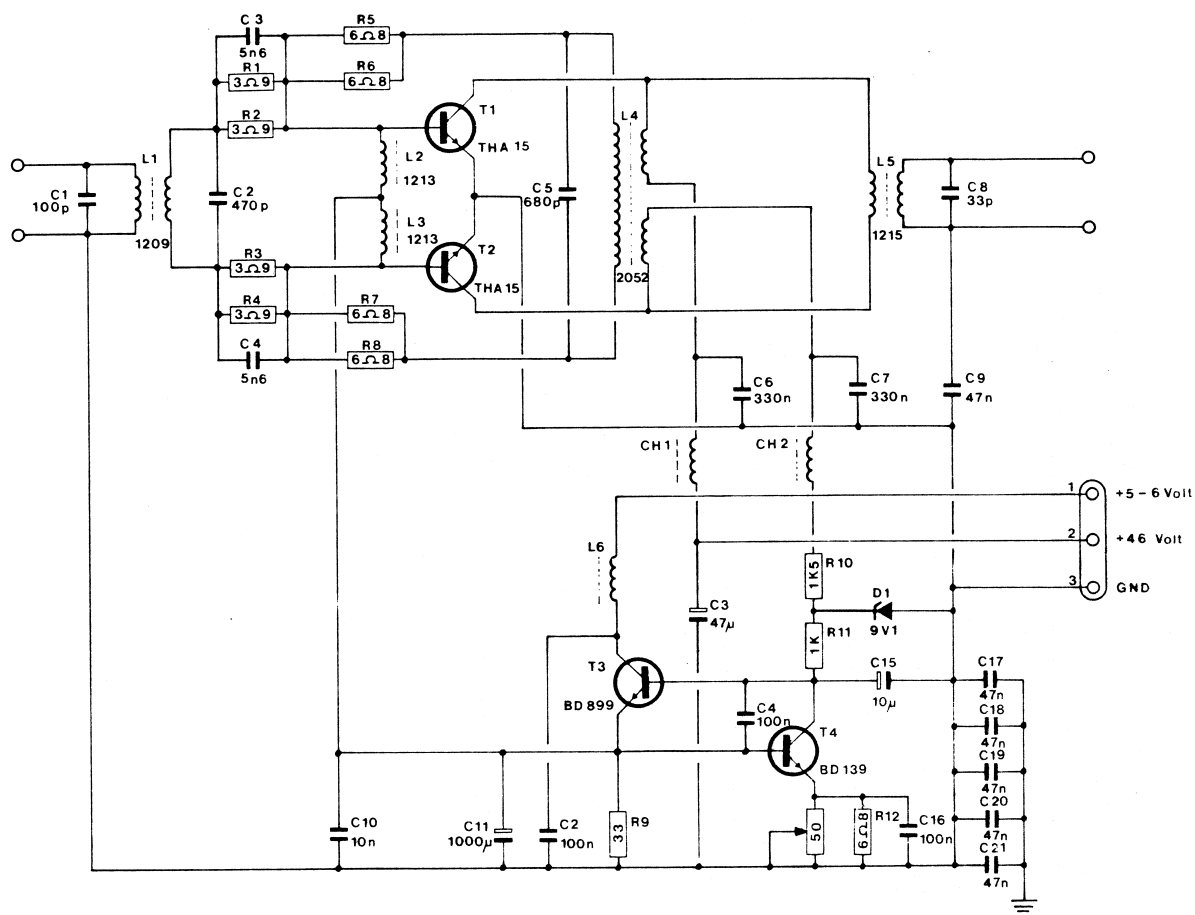




Block diagram for PA unit 200 W  
 Drawing no. 001.0430  
 Unit no. 002.2049



PA. Unit  
Layout no. 33.2050



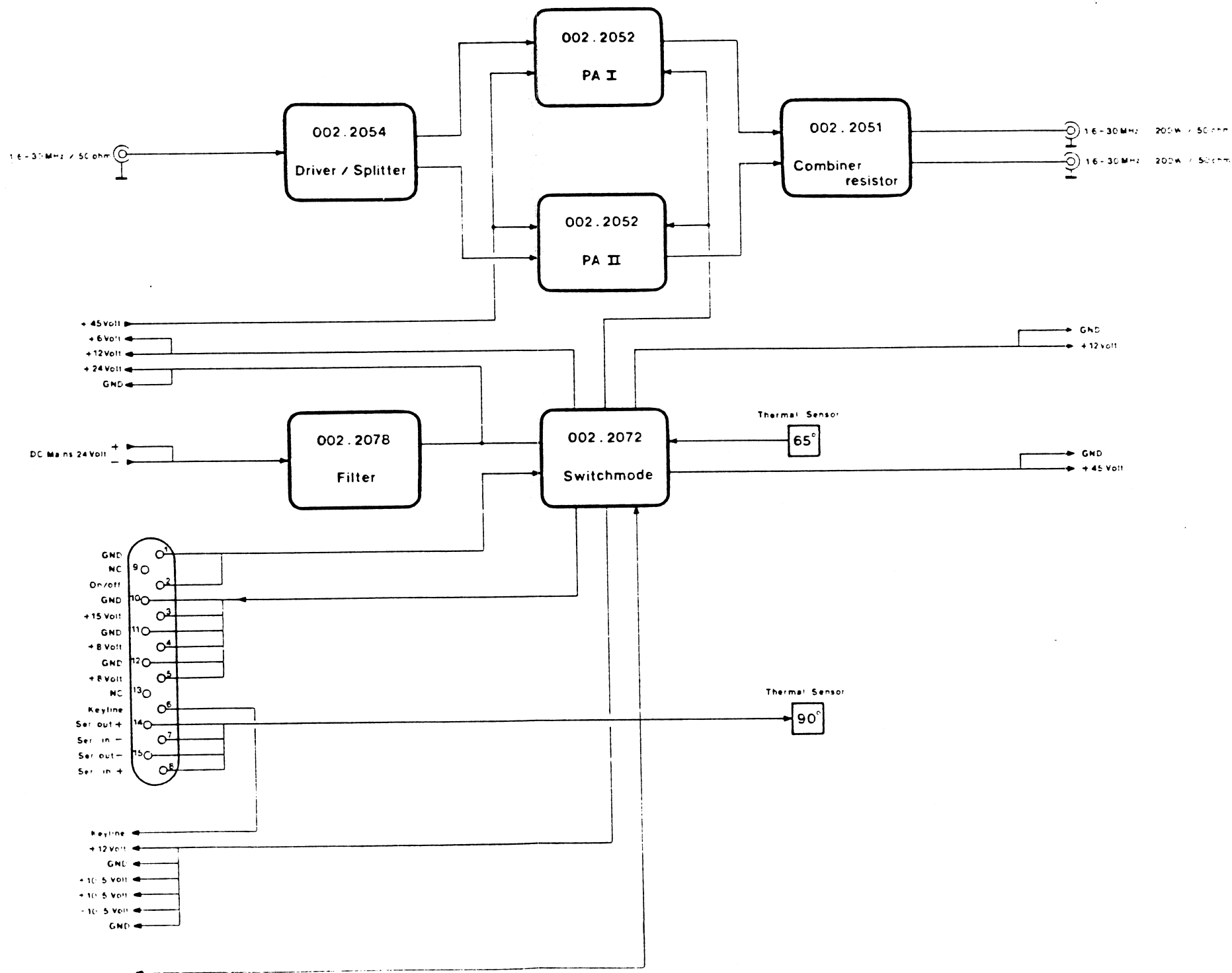
PA unit

Drawing no. 001.0415

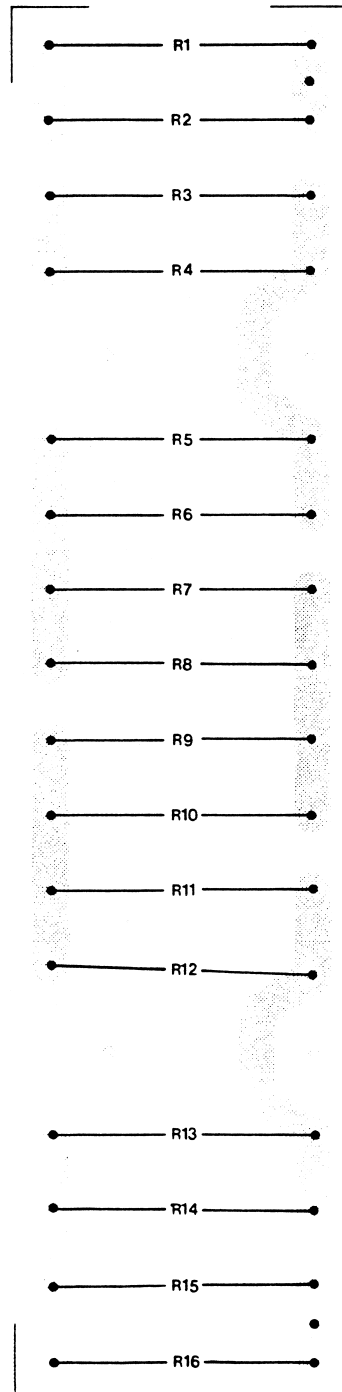
Unit no. 002.2052

PC. Board no. 003.2050

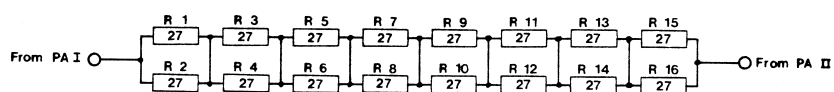
Layout no. 33.2050



Block diagram for PA unit  
Drawing no 001.0433  
Unit no 002.2050



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



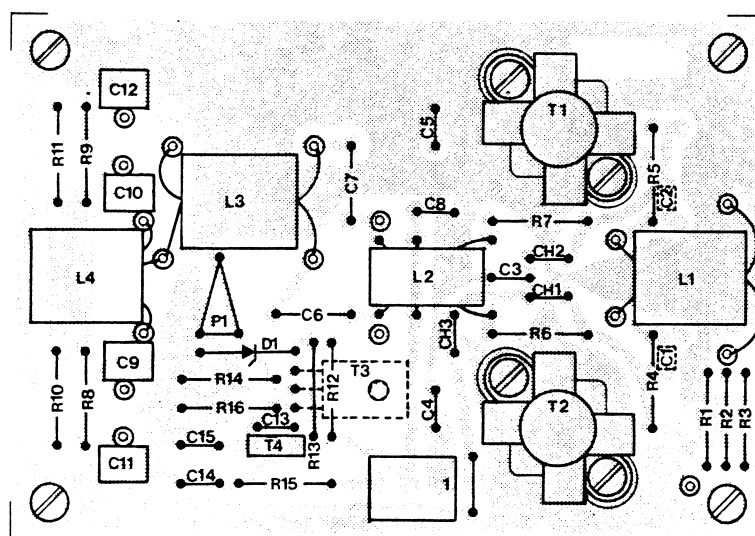
**Combiner resistor**

**Drawing no. 001.0414**

**Unit no. 002.2051**

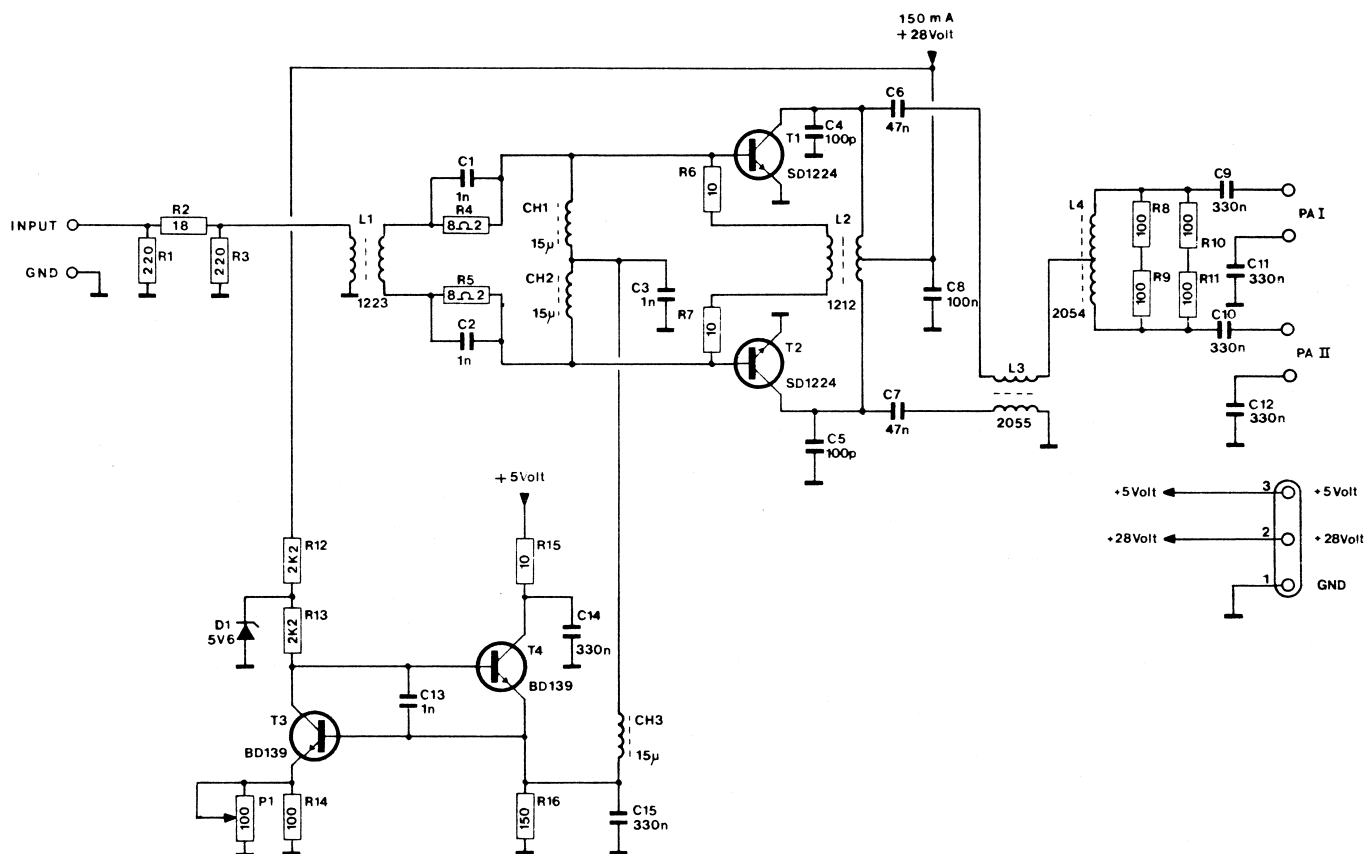
**PC. Board no. 003.2051**

**Layout no. 33.2051**



Driver  
Layout no. 33.2054





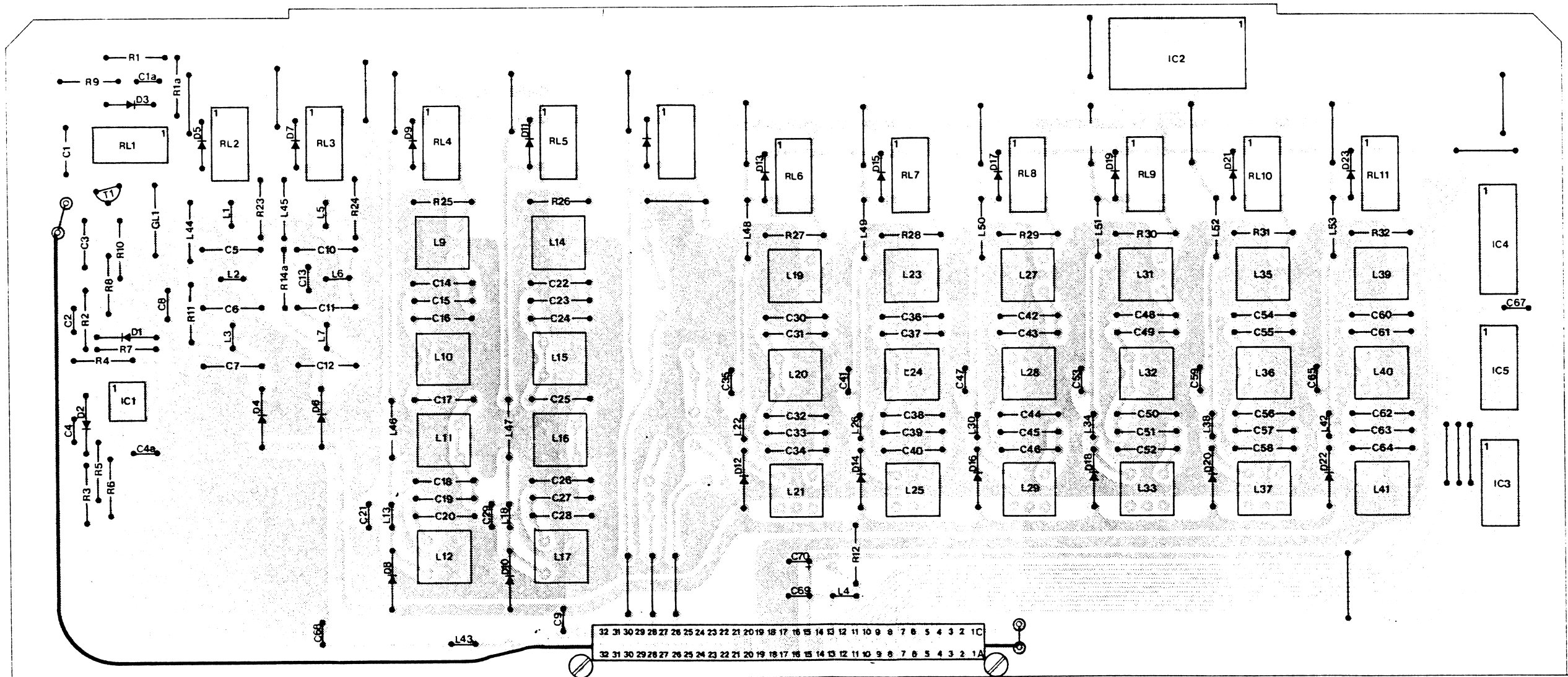
## Driver

Drawing no. 001.0416A

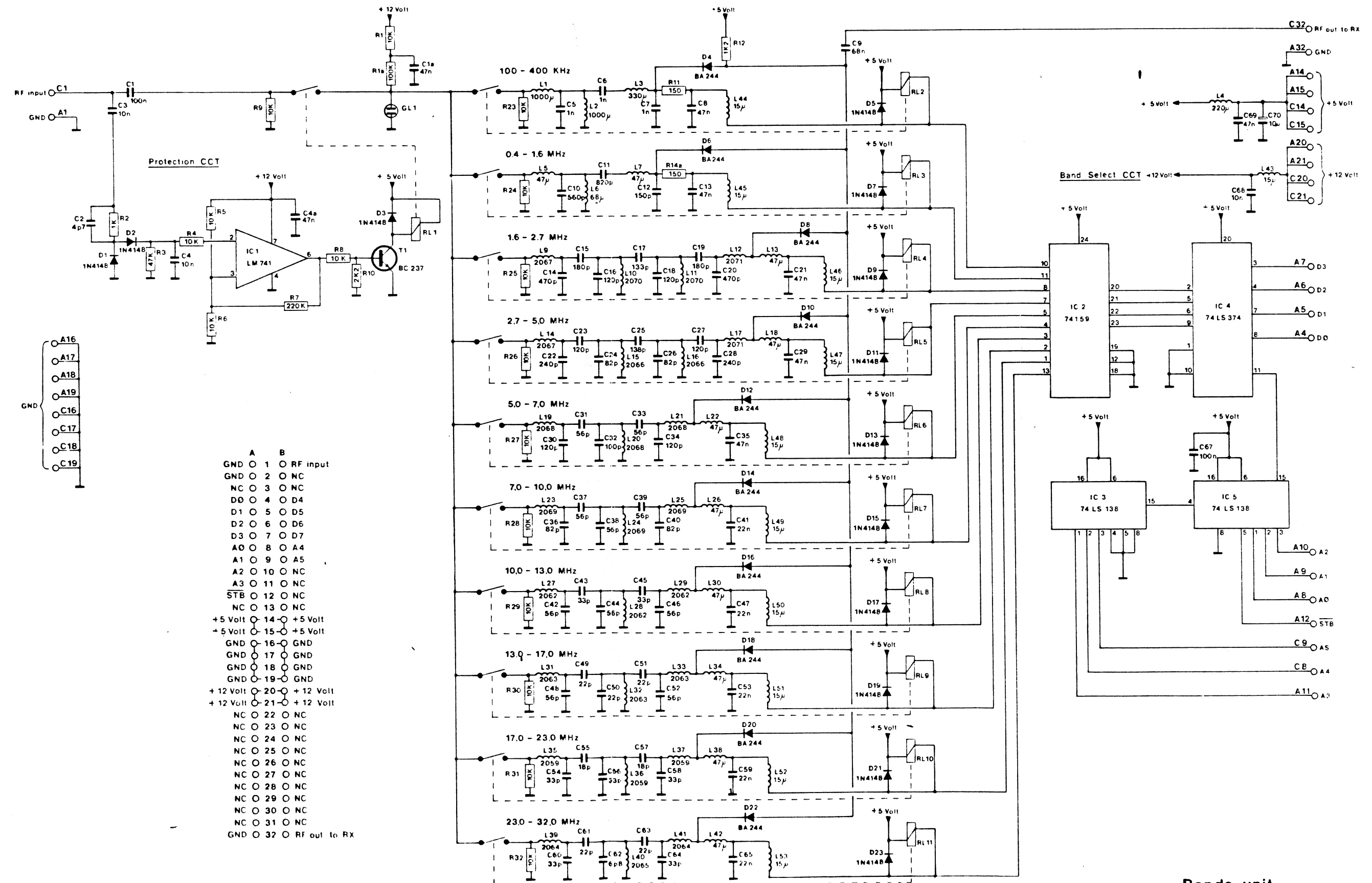
Unit no. 002.2054

PC. Board no. 003.2054D

Layout no. 33.2054



Bands unit  
 Layout no. 33.2062



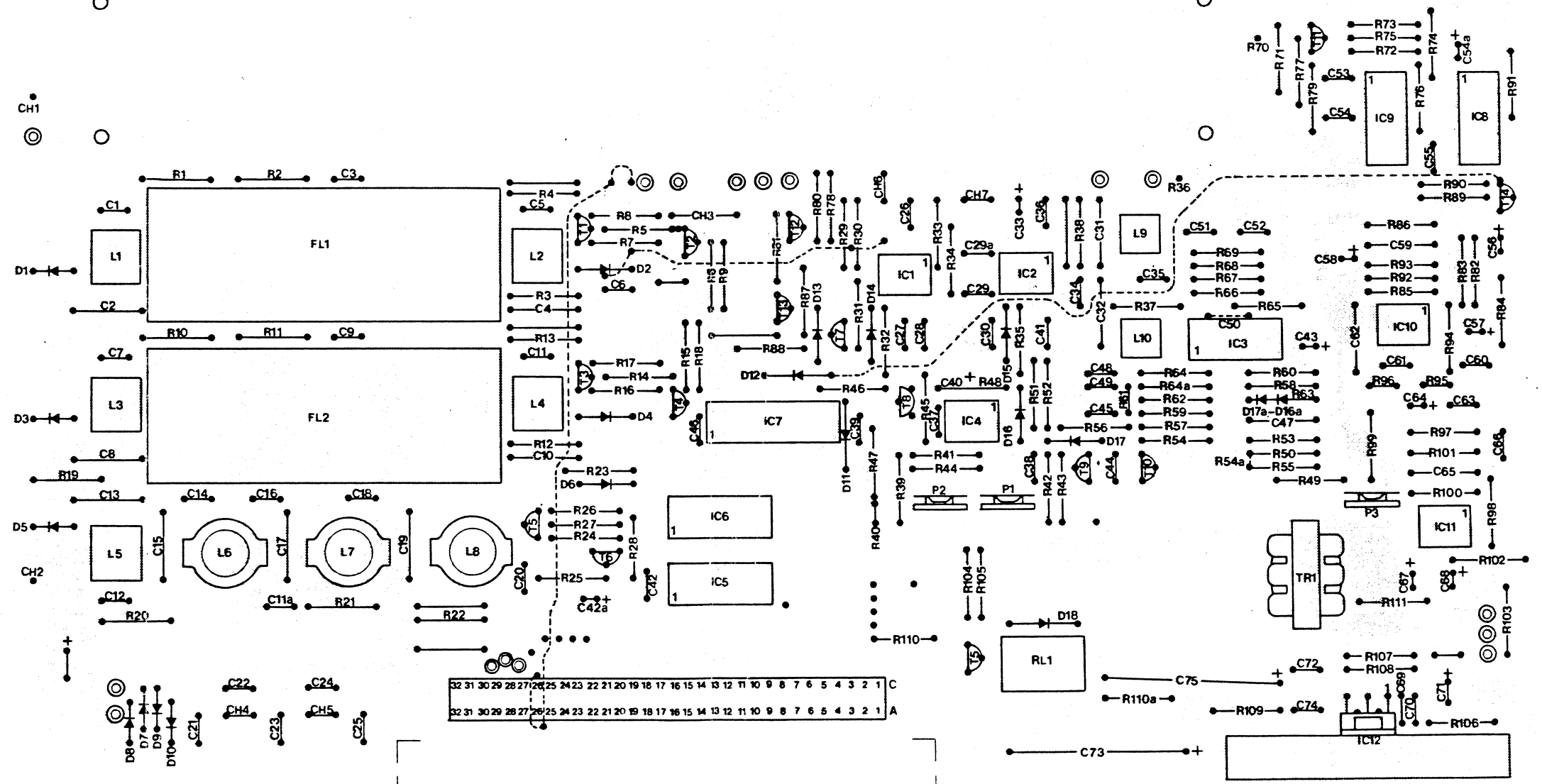
Bands unit

Drawing no. 001.0417A

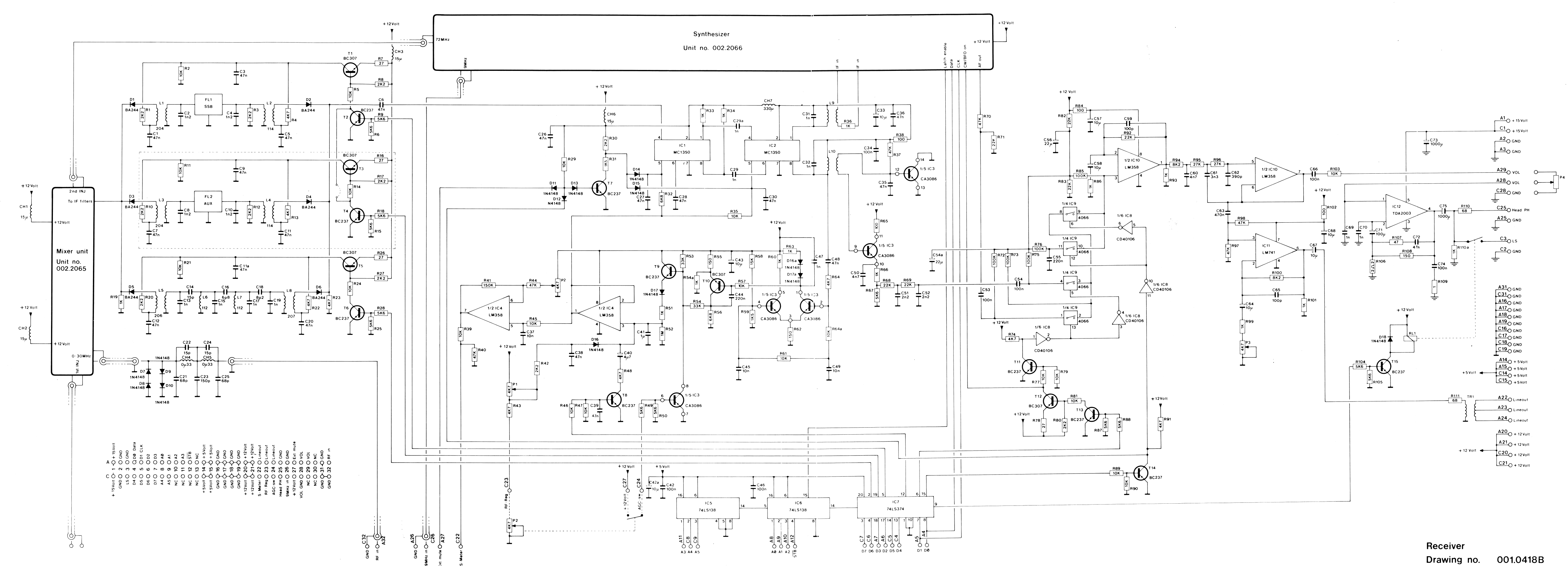
Unit no. 002.2062

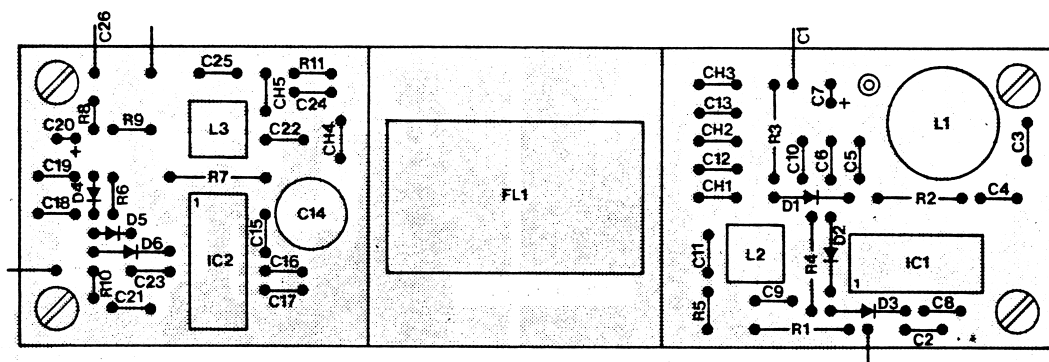
PC. Board no. 003.2062A

Layout no. 33.2062

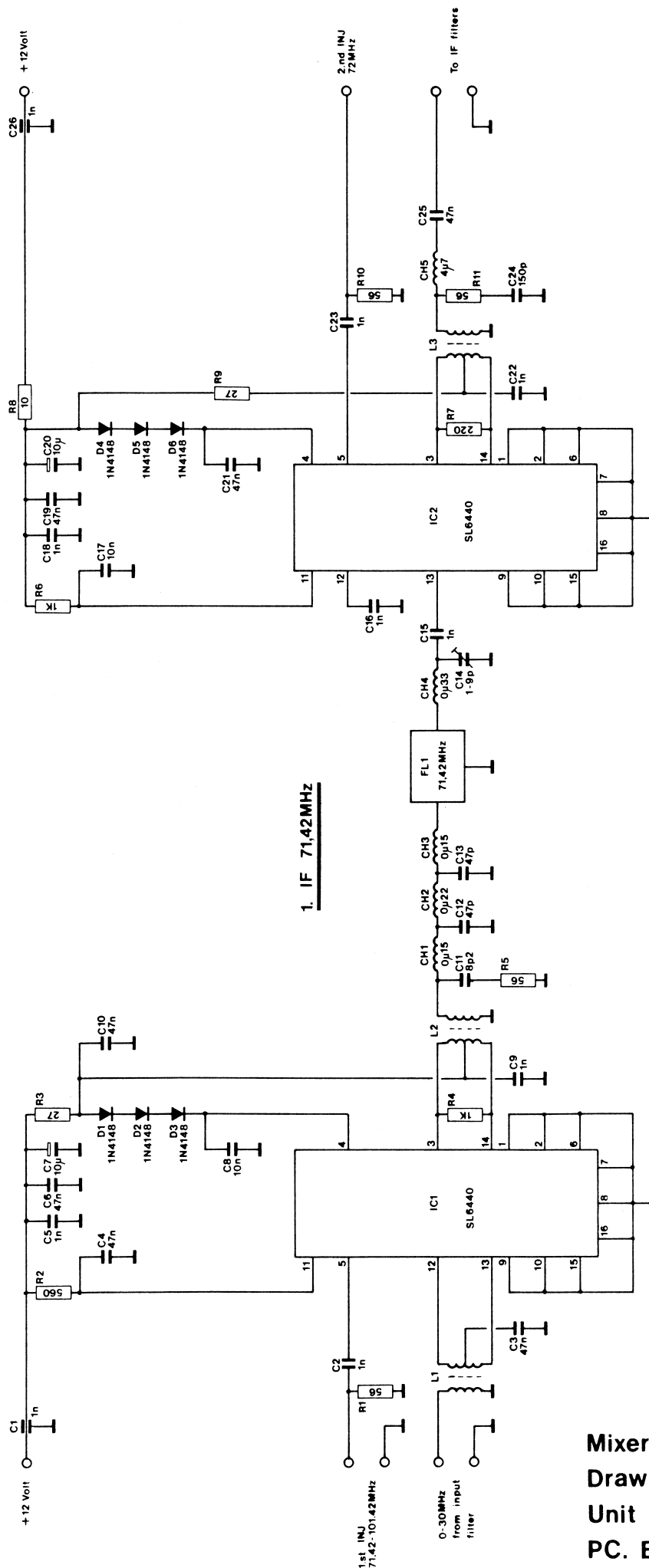


Receiver  
Layout no. 33.2064





Mixer unit  
Layout no. 33.2065



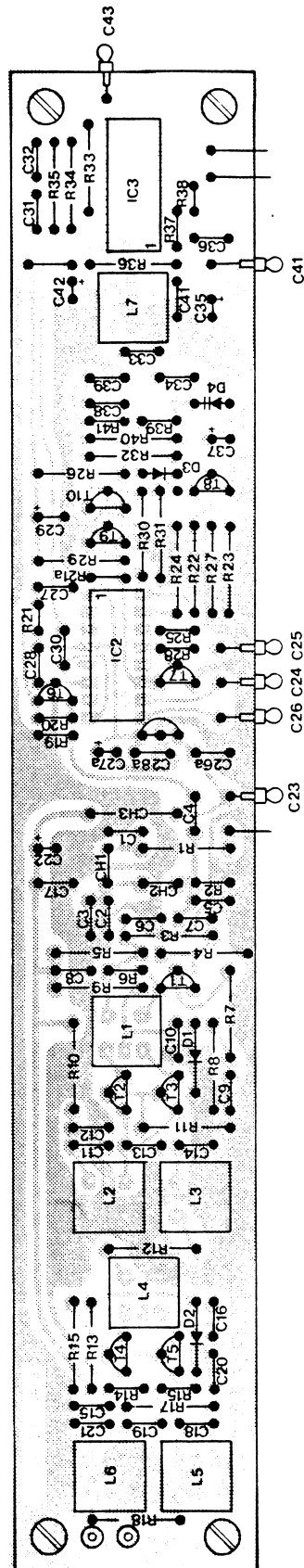
Mixer unit

Drawing no. 001.0419A

Unit no. 002.2065

PC. Board no. 003.2065A

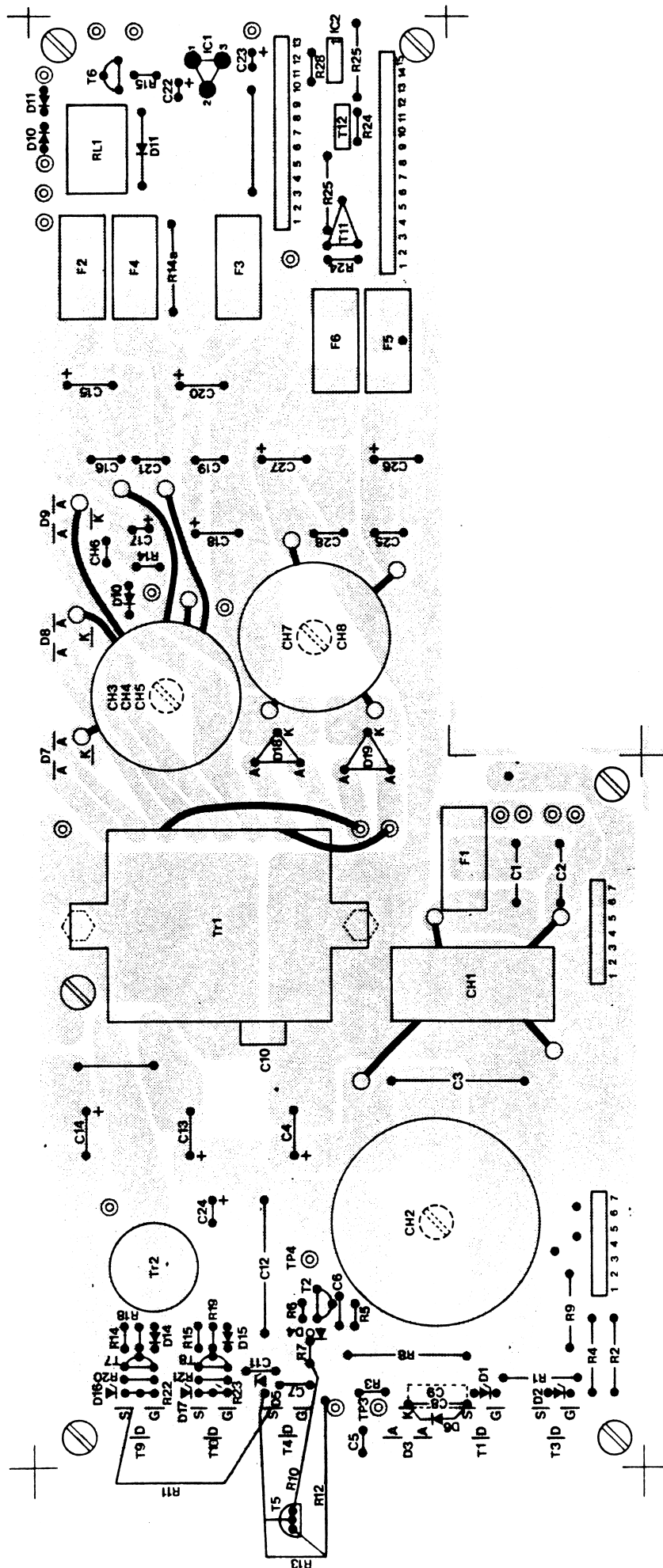
Layout no. 33.2065



Synthesizer receiver  
Layout no. 33.2066

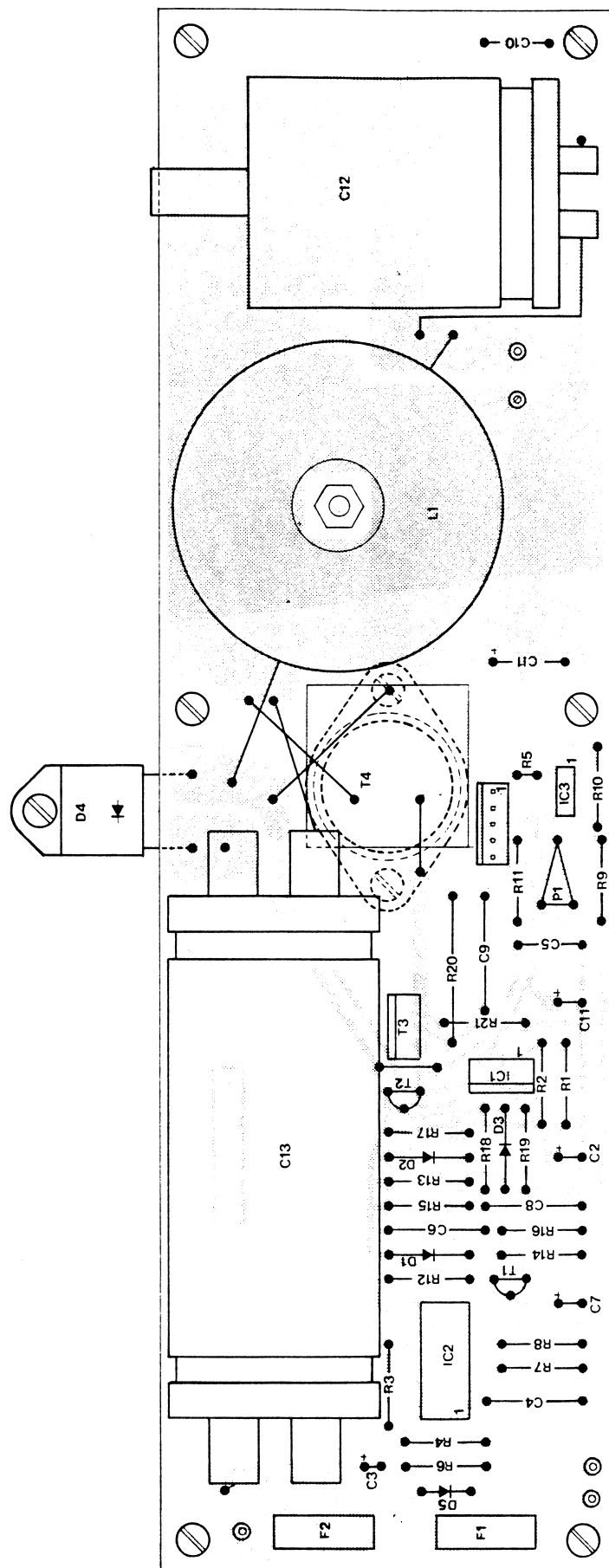




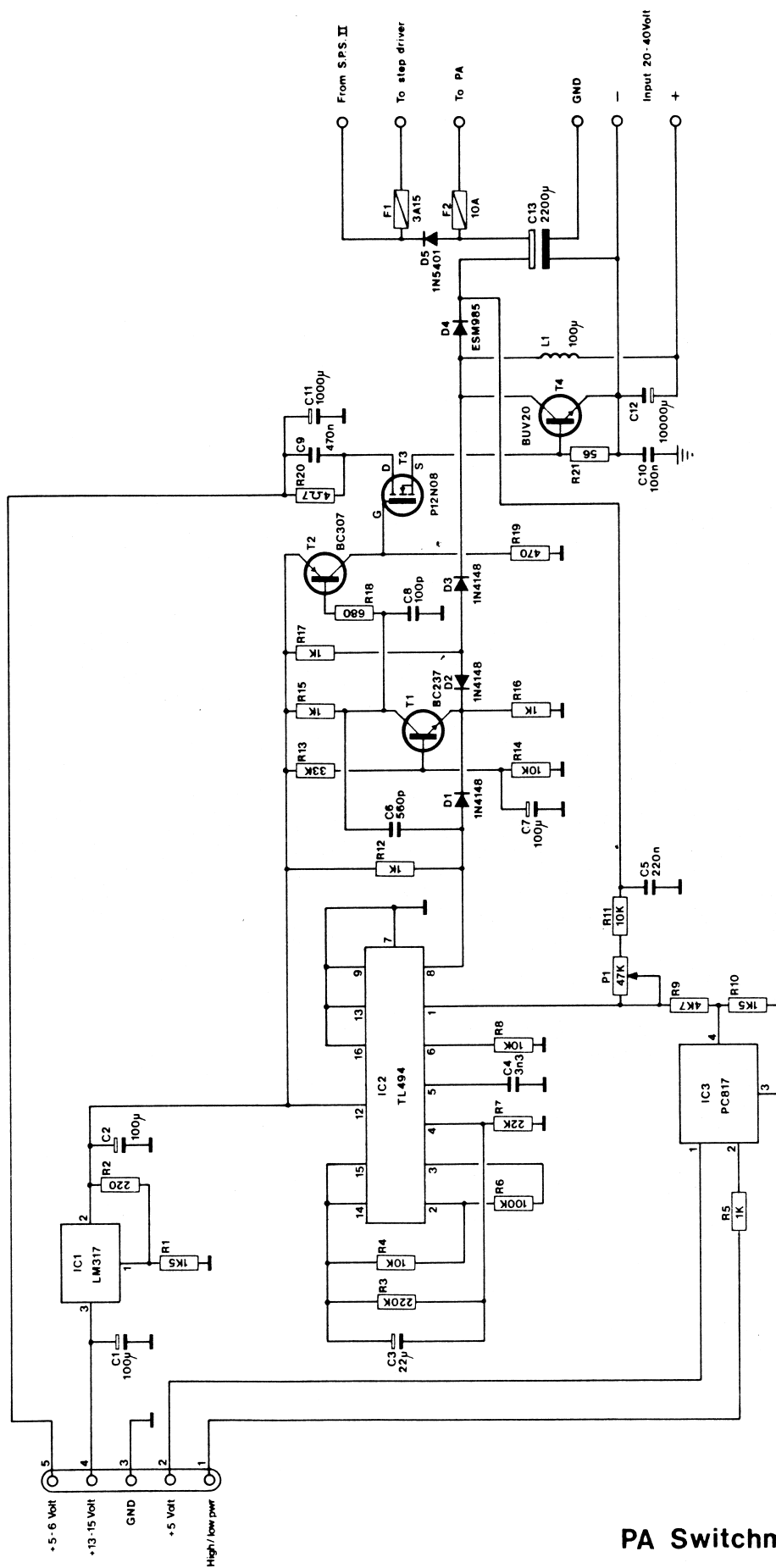


Switchmode  
Layout no. 33.2072A





PA Switchmode  
Layout no. 33.2074



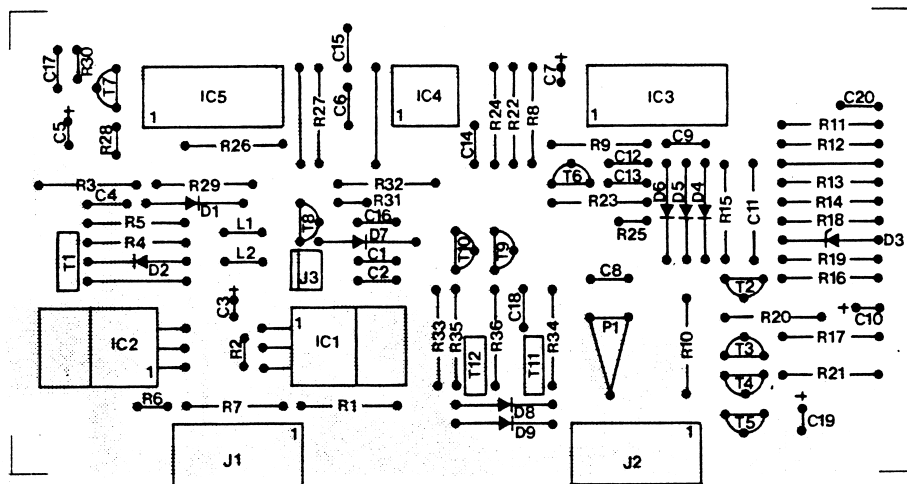
## PA Switchmode

Drawing no. 001.0422A

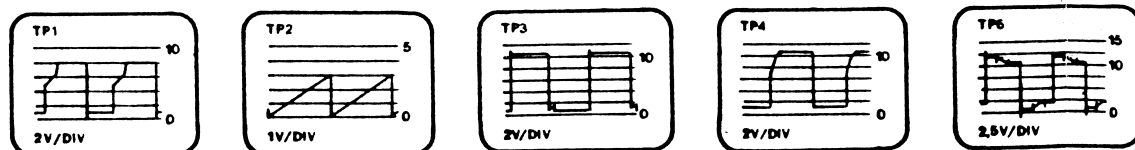
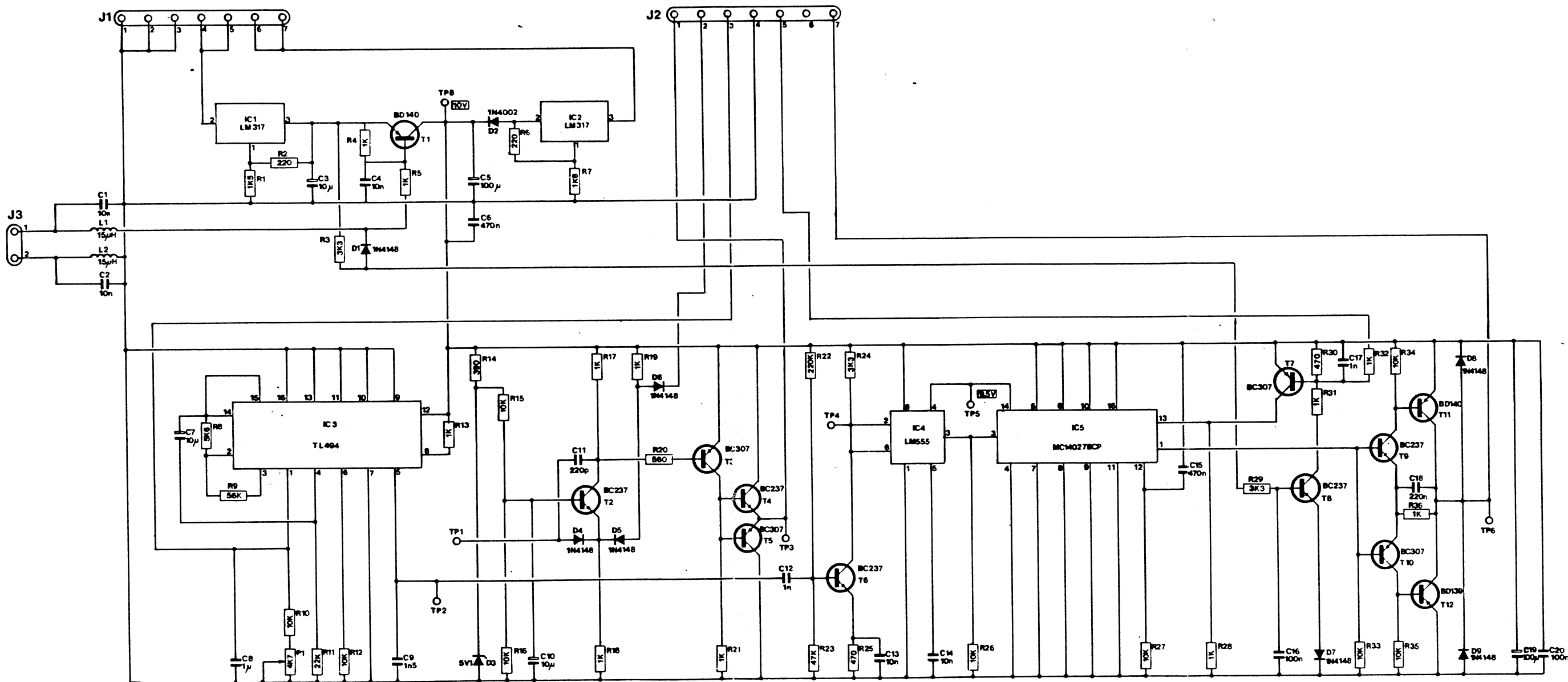
Unit no. 002.2074

PC. Board no. 003.2074

Layout no. 33.2074

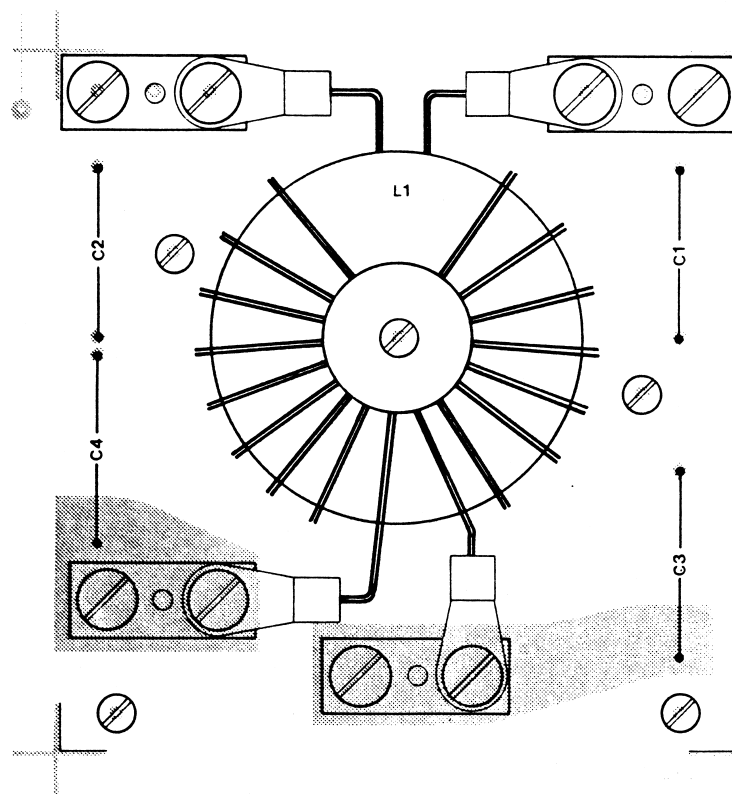


Control circuit  
Layout no. 33.2077



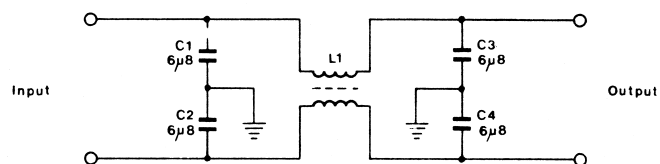
DC VOLTAGE SHOWN IN  

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



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





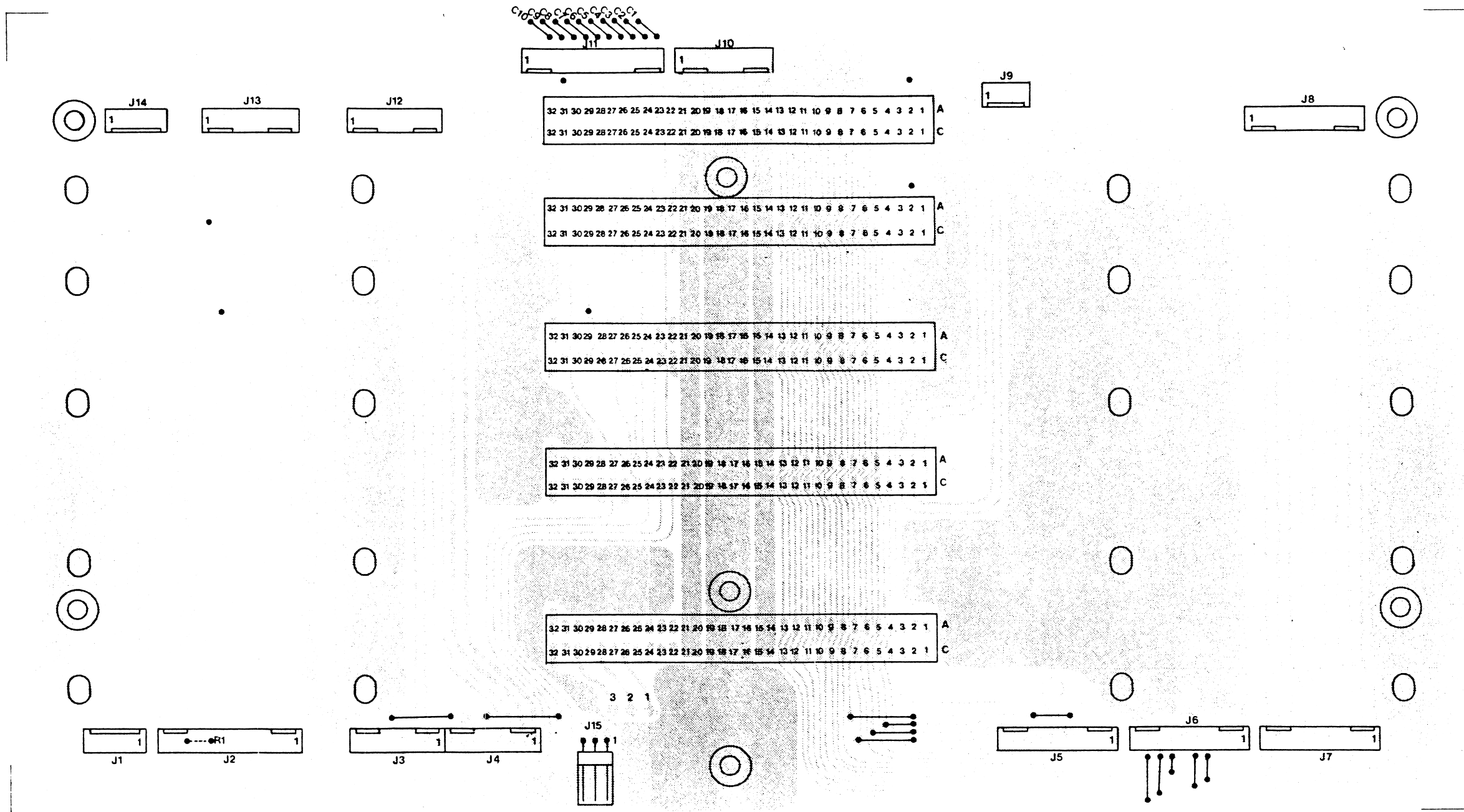
**Battery filter**

**Drawing no. 001.0424**

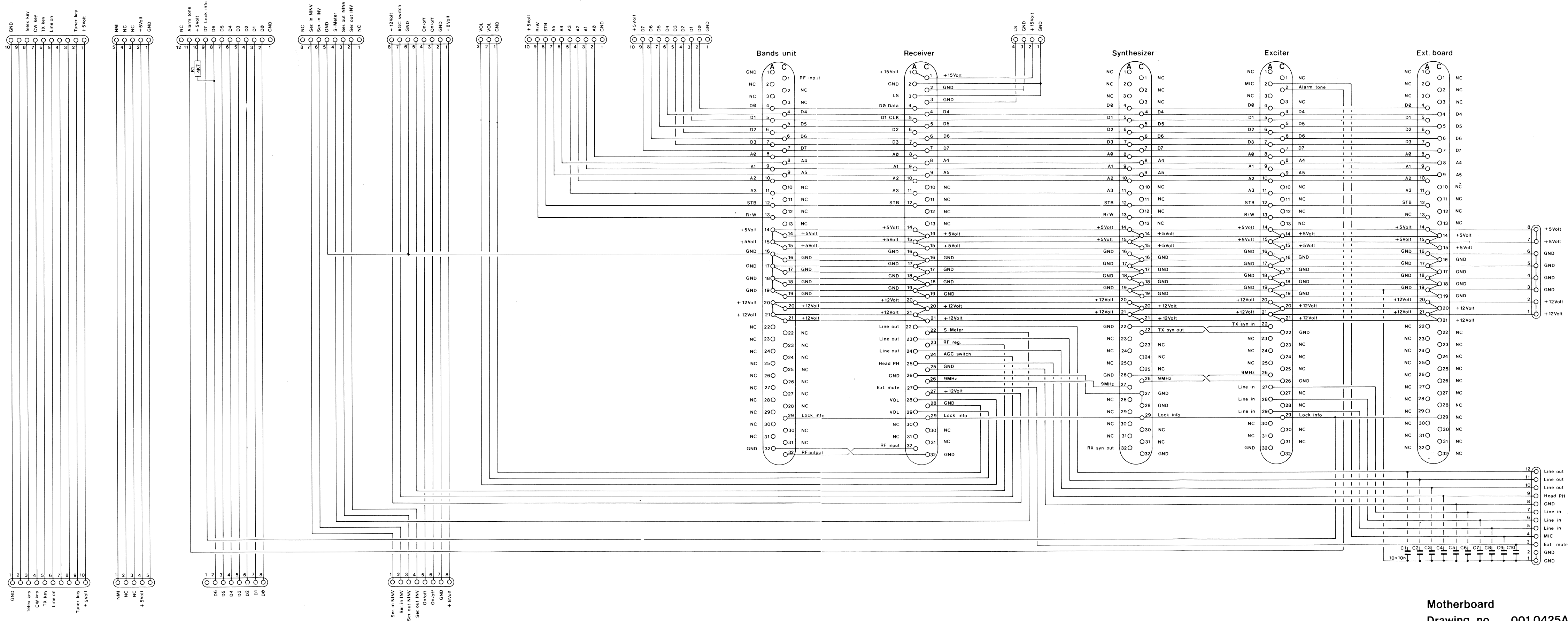
**Unit no. 002.2078**

**PC. Board no. 003.2078**

**Layout no. 33.2078**



Mother board  
Layout no. 33.2080



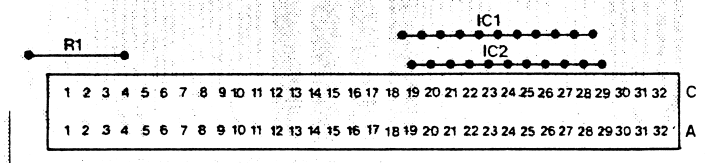
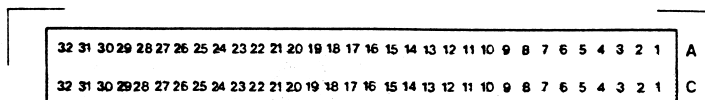
Motherboard

Drawing no. 001.0425A

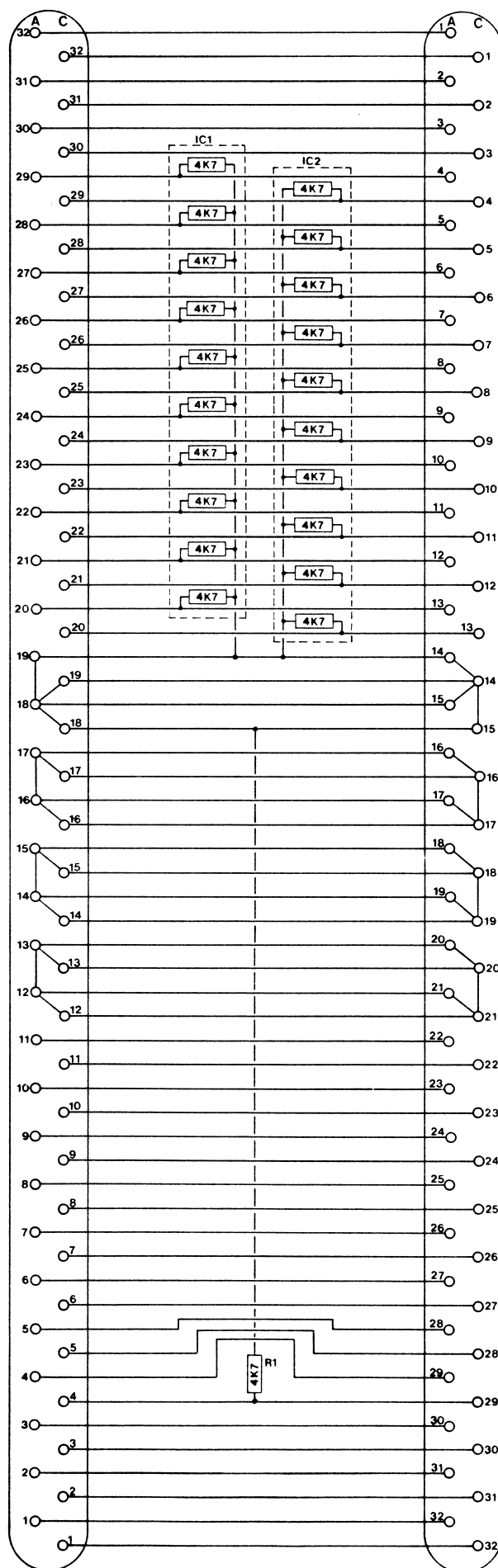
Unit no. 002.2080

PC. Board no. 003.2080

Layout no. 33.2080



Extension board  
Layout no. 33.2081



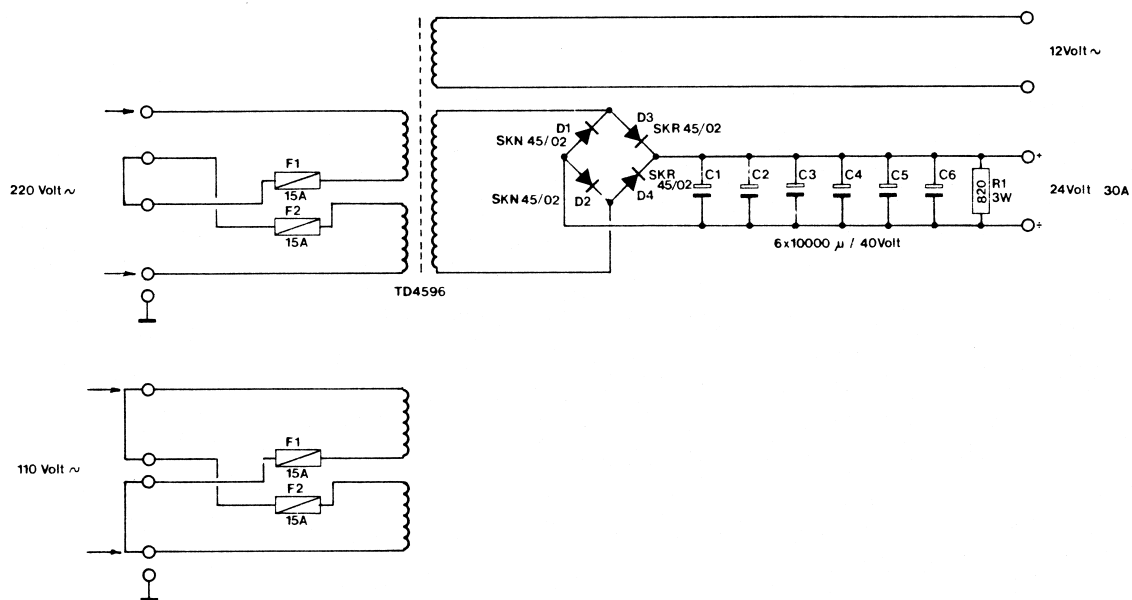
# **Extensionboard**

**Drawing no.** 001.0426

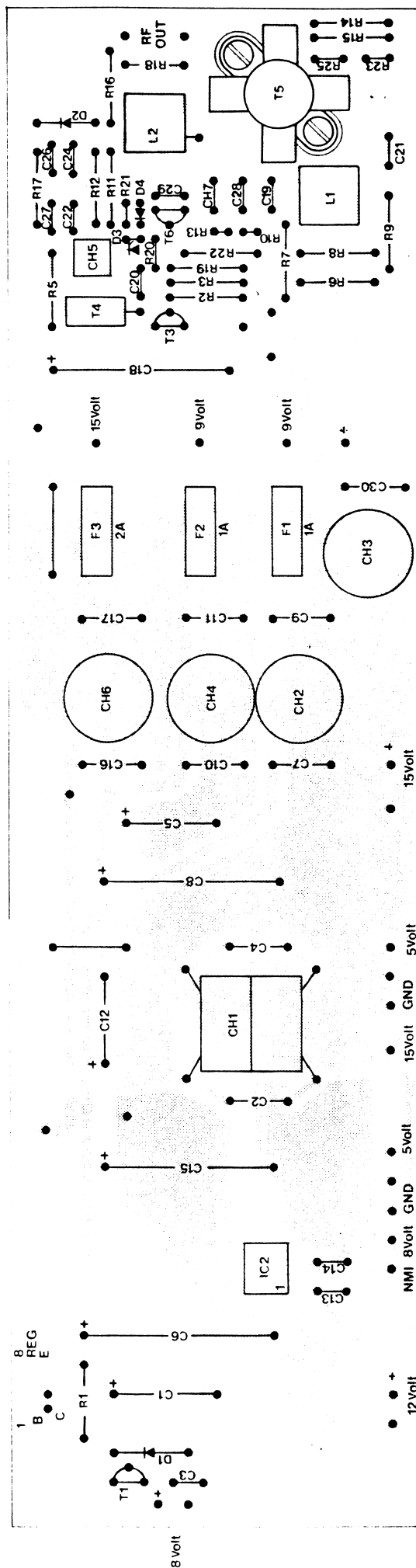
**Unit no.** 002.2081

**PC. Board no.** 003.2081

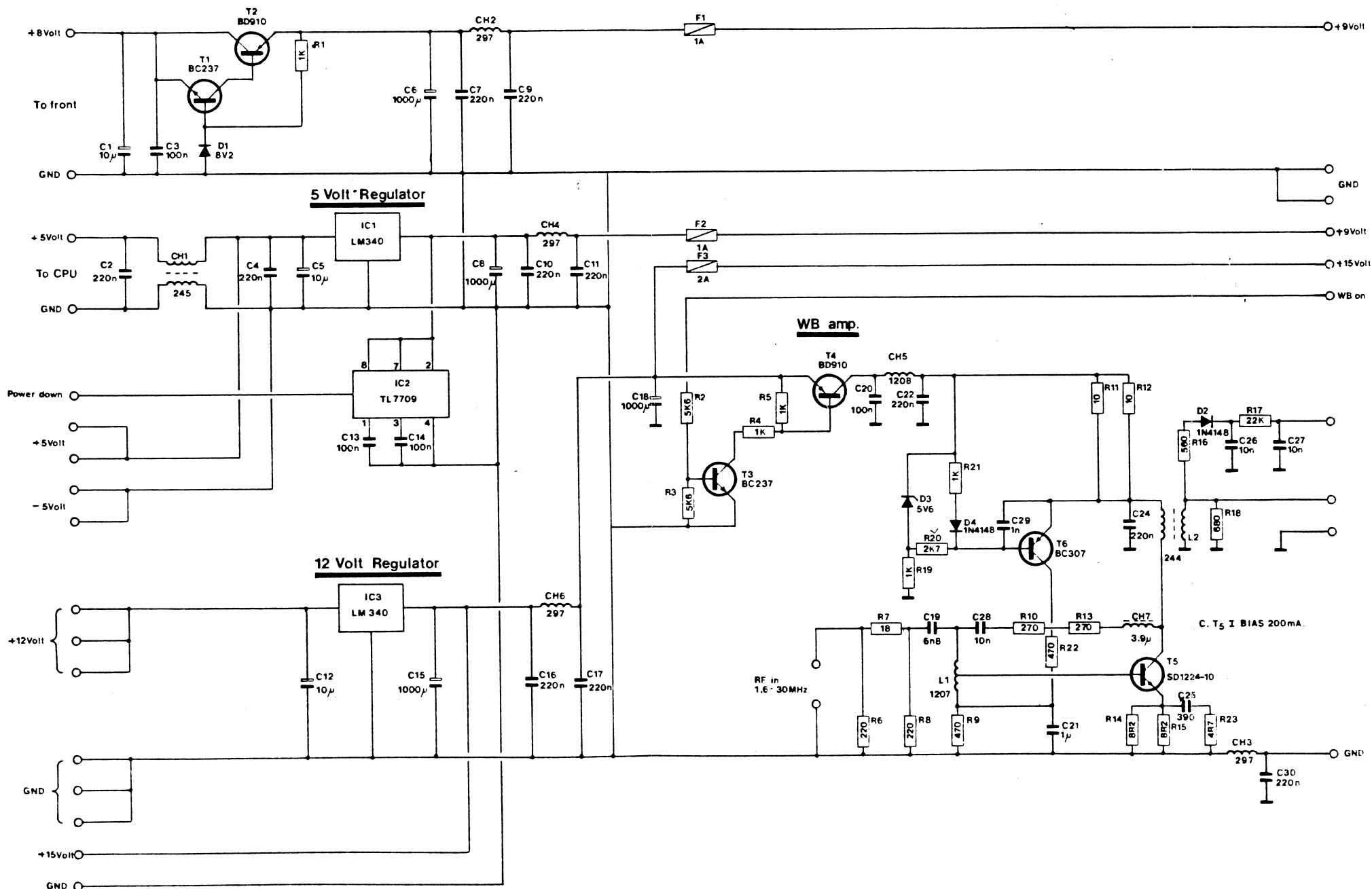
**Layout no.** 33.2081



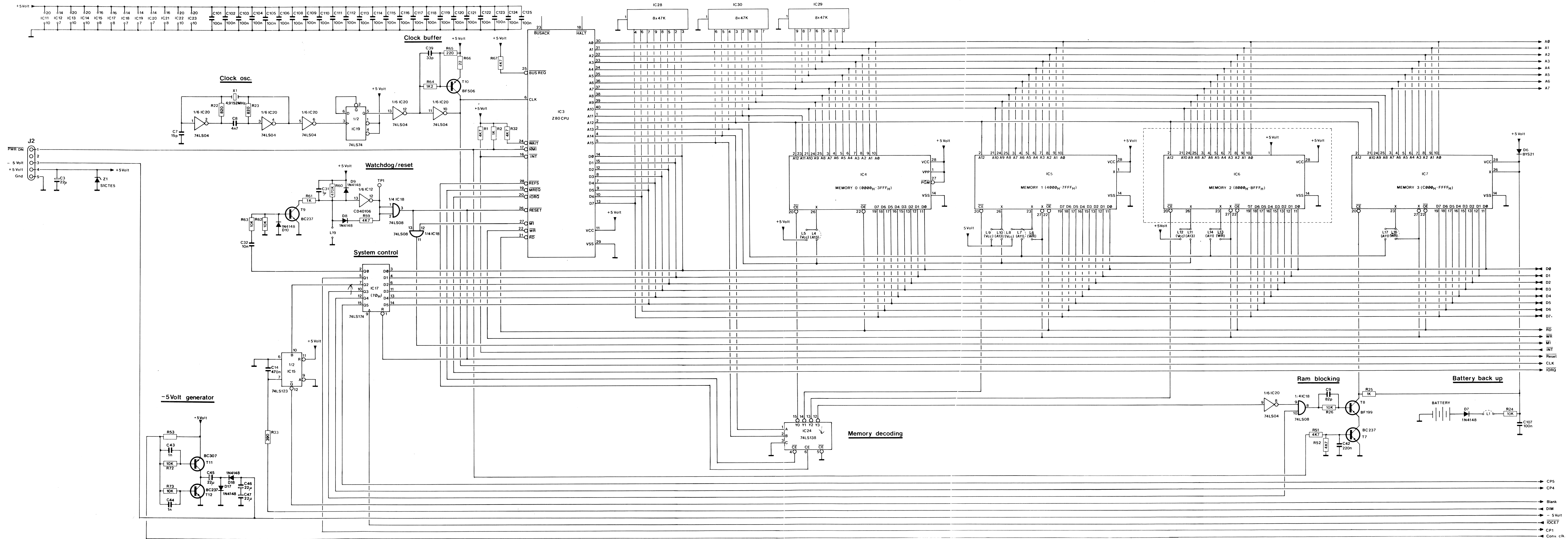
Power supply P 210  
 Drawing no. 001.0432  
 Unit no. 002.2085

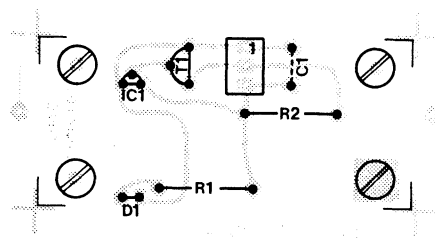


Regulator CCT  
Layout no. 33.2090

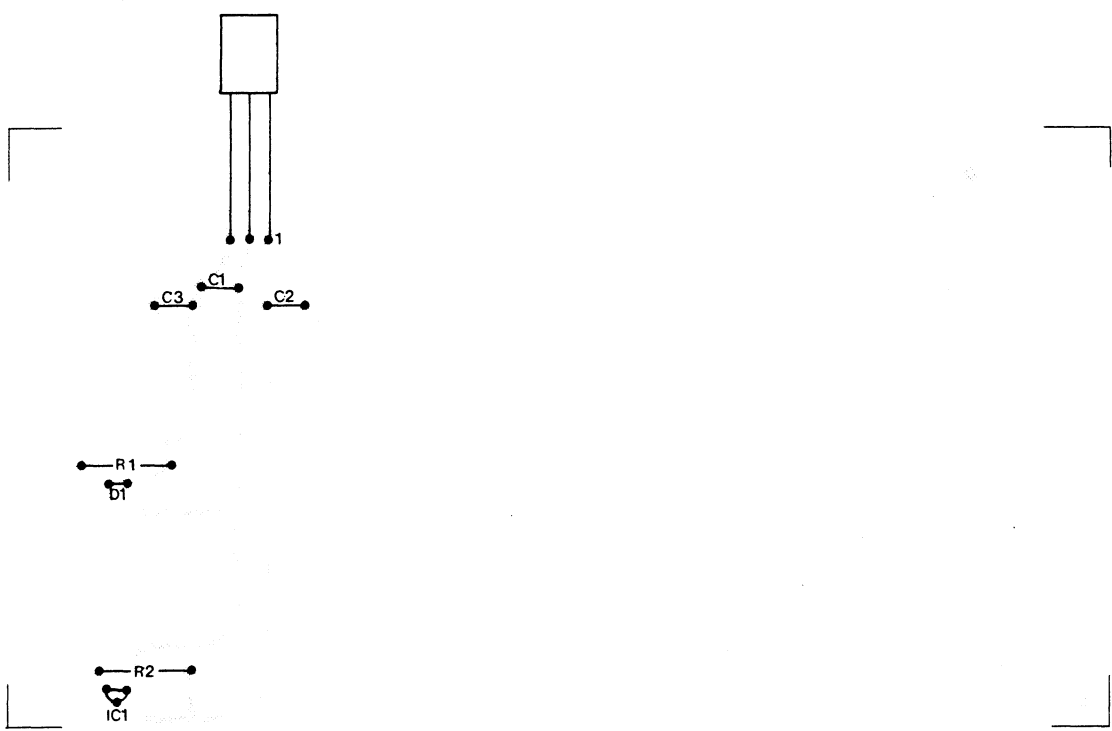








**Capacitor optocoupler**  
**Layout no. 33.2120**



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

**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

**Junction box Unit no. 002.2014**

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

**Stepmotor driver Unit no. 002.2023**

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%	01.149
R7	Resistor	22 Kohm	1/3W	5%	01.265
R8	Resistor	22 Kohm	1/3W	5%	01.165
R9	Resistor	18 Ohm	1/3W	5%	01.128
R10-11	Resistor	1 Kohm	1/3W	5%	01.249
R12-13	Resistor	1 Kohm	1/3W	5%	01.149
R14-15	Resistor	1.2 Kohm	1/2W	5%	01.350
R16	Resistor	120 Ohm	1/3W	5%	01.138
R17	Resistor	120 Ohm	1/3W	5%	01.238
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
R36-39	Resistor	470 Ohm	1/3W	5%	01.145
R40-47	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	BDW 54B			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

D1	Diode, zener	5.1 V	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	47 V			39.712
D13-16	Diode	1N4002			39.103
D17	Diode, zener	47 V			39.712

**Relay driver Unit no. 002.2025**

R1-7	Resistor	1.2 Kohm	1/3W	5%	01.150
R8	Resistor	220 Ohm	1/3W	5%	01.141
R9	Resistor	47 Ohm	1/3W	5%	01.133
R10	Resistor	1.8 Kohm	1/3W	5%	01.152
R11	Resistor	470 Ohm	1/3W	5%	01.145
R12	Resistor	3.3 Kohm	1/3W	5%	01.155
R13	Resistor	470 Ohm	1/3W	5%	01.145
R14	Resistor	3.3 Kohm	1/3W	5%	01.155
R15	Resistor	470 Ohm	1/3W	5%	01.145
R16	Resistor	3.3 Kohm	1/3W	5%	01.155
R17	Resistor	470 Ohm	1/3W	5%	01.145
R18	Resistor	3.3 Kohm	1/3W	5%	01.155
R19	Resistor	470 Ohm	1/3W	5%	01.145
R20	Resistor	3.3 Kohm	1/3W	5%	01.155
R21-22	Resistor	470 Ohm	1/3W	5%	01.145
R23	Resistor	1.8 Kohm	1/3W	5%	01.152
R24	Resistor	470 Ohm	1/3W	5%	01.145
R25	Resistor	3.3 Kohm	1/3W	5%	01.155
R26	Resistor	330 Ohm	1/3W	5%	01.143
R27	Resistor	1.2 Kohm	1/3W	5%	01.150
R28-29	Resistor	470 Ohm	1/3W	5%	01.145
R30-33	Resistor	680 Ohm	1/3W	5%	01.147
R34	Resistor	1.2 Kohm	1/3W	5%	01.150
R35	Resistor	470 Ohm	1/3W	5%	01.145
R36	Resistor	4.7 Kohm	1/3W	5%	01.157
R37	Resistor	470 Ohm	1/3W	5%	01.145
R38-39	Resistor	100 Ohm	carbon		06.106

P1	Resistor, pre.set	10 Kohm			04.161
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C1-7	Capacitor, cer	10 nF	30V		14.907
C8	Capacitor, ellyt	10 uF	40V		12.645
C9	Capacitor, cer	10 nF	30V		14.907
C10	Capacitor, pol	100 nF	63V		11.836
C11	Capacitor, ellyt	470 uF	25V		12.834
C12-19	Capacitor, cer	10 nF	30V		14.907
C20	Capacitor, ellyt	10 uF	40V		12.645
C21	Capacitor, cer	10 nF	30V		14.907
C22-23	Capacitor, pol	100 nF	63V		11.836

RL1	Relay	12 V	15A		27.124
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IC1-2	Integrated Circuit	ULN2003A			35.122
IC3	Integrated Circuit	OPTO PC847			39.809
IC4	Integrated Circuit	OPTO PC837			39.808
IC5	Integrated Circuit	OPTO PC847			39.809
IC6	Integrated Circuit	OPTO PC827			39.807
IC7	Integrated Circuit	ADC 831			36.512

D1	Diode	1N4002			38.103
D2	Diode, zener	5.1 V	0.4W		39.707
D3-10	Diode	1N4148			39.103
D11	Diode	1N6263			38.109

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 Unit no 002.2027D

R1	Resistor	1 Kohm	1/3W	5%	01.249
R2	Resistor	5.6 Kohm	1/3W	5%	01.258
R3	Resistor	8.2 Kohm	1/3W	5%	01.260
R4-5	Resistor	10 Kohm	1/3W	5%	01.161
R6-9	Resistor	100 Ohm	1/3W	5%	06.106
R10-13	Resistor	1.2 Kohm	1/3W	5%	01.250
R14	Resistor	470 Kohm	1/3W	5%	01.181
R15	Resistor	470 Kohm	1/3W	5%	01.281
R16	Resistor	10 Kohm	1/3W	5%	01.161
R17	Resistor	100 Kohm	1/3W	5%	01.173
R18	Resistor	10 Kohm	1/3W	5%	01.161
R19	Resistor	10 Kohm	1/3W	5%	01.261
R20	Resistor	100 Kohm	1/3W	5%	01.273
R21	Resistor	1 Kohm	1/3W	5%	01.249
R22	Resistor	220 Ohm	1/3W	5%	01.241
R23	Resistor	1.2 Kohm	1/3W	5%	01.250
R24	Resistor	220 Ohm	1/3W	5%	01.241
R25	Resistor	1.2 Kohm	1/3W	5%	01.250
P1	Resistor, pre.set	2.5 Kohm			04.154
C1	Capacitor, cer	10 nF	30V		14.907
C1a	Capacitor, ellyt	10 uF	63V		12.865
C2-3	Capacitor, cer	10 nF	30V		14.907
C4	Capacitor, cer	100 nF	63V		14.913
C5	Capacitor, pol	100 nF	63V		11.836
C5a	Capacitor, chip	1 nF			15.401
C6	Capacitor, pol	100 nF	63V		11.836
C6a	Capacitor, chip	1 nF			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
C16	Capacitor, cer	10 nF	30V		14.907
C17	Capacitor, cer	240 pF	3KV		15.424
C19	Capacitor, cer	440 pF	3KV		15.425
C21-22	Capacitor, cer	10 nF	30V		14.907
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
RL1-5	Relay SPST-NB	16 A	12V	coil	127.128
IC1	Integrated Circuit	LF357 N			35.114
IC2	Integrated Circuit	RC4200			36.513
IC3	Integrated Circuit	OPTO PC827			39.807
IC4	Integrated Circuit	LM358 N			35.112
IC5	Integrated Circuit	LM337 LZ			35.136
IC6	Integrated Circuit	LM317 LZ			35.135
D1-2	Diode	AA116			39.107
L1-2	Coil				04.2025

## 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 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 Unit no. 002.2034

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

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
F4	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
*R51-52	Resistor	22 Kohm	1/3W	5%	01.165
*R53	Resistor	270 Ohm	1/3W	5%	01.142
*R54	Resistor	1 Kohm	1/3W	5%	01.149
*R55-56	Resistor	5.6 Kohm	1/3W	5%	01.158
*R57-58	Resistor	1 Kohm	1/3W	5%	01.149
*R59-60	Resistor	5.6 Kohm	1/3W	5%	01.158
*R61-62	Resistor	22 Kohm	1/3W	5%	01.165
*R63	Resistor	1 Kohm	1/3W	5%	01.149
*R64	Resistor	270 Ohm	1/3W	5%	01.142
R64a	Resistor	560 Ohm	1/3W	5%	01.146
*R65	Resistor	1 Kohm	1/3W	5%	01.149
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
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	C1	Capacitor, ellyt	10 uF	63V	12.865
R95	Resistor	6.8 Ohm	1/3W	5%	01.123	C2-3	Capacitor, pol	100 nF	63V	11.836
R96	Resistor	10 Ohm	1/3W	5%	01.125	C4	Capacitor, cer	10 nF	30V	14.907
R97	Resistor	18 Ohm	1/3W	5%	01.128	C5	Capacitor, pol	100 nF	63V	11.836
R98-102	Resistor	220 Ohm	1/3W	5%	01.141	C6	Capacitor, pol	1.5 nF	63V	11.815
R103	Resistor	1 Kohm	1/3W	5%	01.149	C7	Capacitor, ellyt	10 uF	63V	12.865
R104	Resistor	220 Ohm	1/3W	5%	01.141	C8-10	Capacitor, pol	100 nF	63V	11.836
R105	Resistor	27 Ohm	1/3W	5%	01.130	C11	Capacitor, sty	100 pF	5%	10.125
R106	Resistor	1 Kohm	1/3W	5%	01.149	C11a	Capacitor, cer	1 nF	40V	14.902
R107	Resistor	220 Ohm	1/3W	5%	01.141	C12	Capacitor, ellyt	10 uF	63V	12.865
R108	Resistor	27 Ohm	1/3W	5%	01.130	C12a	Capacitor, cer	1 nF	40V	14.902
R109	Resistor	56 Ohm	1/3W	5%	01.134	C13	Capacitor, cer	10 nF	30V	14.907
R110	Resistor	3.3 Kohm	1/3W	5%	01.155	C14	Capacitor, ellyt	10 uF	63V	12.865
R111	Resistor	1 Kohm	1/3W	5%	01.149	C15	Capacitor, ellyt	47 uF	16V	12.809
R112	Resistor	180 Ohm	1/3W	5%	01.140	C16	Capacitor, ellyt	10 uF	63V	12.865
R113	Resistor	15 Ohm	1/3W	5%	01.127	C17	Capacitor, sty	1 nF	5%	10.149
R114	Resistor	82 Ohm	1/3W	5%	01.136	C18	Capacitor, pol	100 nF	63V	11.836
R115	Resistor	4.7 Kohm	1/3W	5%	01.157	C19	Capacitor, sty	22 pF	5%	10.109
R116	Resistor	1 Kohm	1/3W	5%	01.149	C19a-20	Capacitor, ellyt	10 uF	63V	12.865
R117	Resistor	270 Ohm	1/3W	5%	01.142	C21	Capacitor, pol	100 nF	63V	11.836
R118-121	Resistor	22 Ohm	1/3W	5%	01.129	C22-23	Capacitor, pol	10 nF	63V	11.824
R122	Resistor	470 Ohm	1/3W	5%	01.145	C24-26	Capacitor, cer	10 nF	30V	14.907
R122a	Resistor	470 Ohm	1/3W	5%	01.245	C27	Capacitor, cer	1 nF	40V	14.902
R123	Resistor	5.6 Kohm	1/3W	5%	01.158	C28	Capacitor, cer	10 nF	30V	14.907
R124	Resistor	1 Kohm	1/3W	5%	01.249	*C29	Capacitor, cer	10 nF	30V	14.907
R125	Resistor	5.6 Kohm	1/3W	5%	01.258	C30	not used			
R126-127	Resistor	56 Ohm	1/3W	5%	01.134	*C31-33	Capacitor, cer	10 nF	30V	14.907
R128	Resistor	6.8 Kohm	1/3W	5%	01.159	*C34	Capacitor, cer	10 nF	30V	14.907
R129	Resistor	1.8 Kohm	1/3W	5%	01.152	*C35	Capacitor, cer	10 nF	30V	14.907
R130	Resistor	220 Ohm	1/3W	5%	01.141	C36	Capacitor, cer	10 nF	30V	14.907
R131	Resistor	22 Ohm	1/3W	5%	01.129	C37	Capacitor, sty	150 pF	5%	10.129
R132	Resistor	270 Ohm	1/3W	5%	01.142	*C38	Capacitor, sty	100 pF	5%	10.125
R133	Resistor	1.8 Kohm	1/3W	5%	01.152	C39-39a	Capacitor, cer	10 nF	30V	14.907
R134	Resistor	6.8 Kohm	1/3W	5%	01.159	*C40-42	Capacitor, cer	10 nF	30V	14.907
R135	Resistor	560 Ohm	1/3W	5%	01.146	*C43	Capacitor, cer	22 pF		14.129
R135a	Resistor	100 Ohm	1/3W	5%	01.137	C44-44a	Capacitor, cer	10 nF	30V	14.907
R136	Resistor	220 Ohm	1/3W	5%	01.141	C45	Capacitor, cer	10 nF	30V	14.907
R137	Resistor	82 Ohm	1/3W	5%	01.136	C45a	Capacitor, cer	56 pF		16.367
R138	Resistor	56 Ohm	1/3W	5%	01.134	C46-49	Capacitor, cer	10 nF	30V	14.907
R139	Resistor	18 Ohm	1/3W	5%	01.128	C50	Capacitor, cer	100 nF	63V	14.913
R140	Resistor	39 Ohm	1/3W	5%	01.132	C51-67	Capacitor, cer	10 nF	30V	14.907
R141	Resistor	68 Ohm	1/3W	5%	01.135	C68	Capacitor, ellyt	100 uF	25V	12.831
R142-145	Resistor	4.7 Kohm	1/3W	5%	01.157	C69-71	Capacitor, cer	10 nF	30V	14.907
R146-149	Resistor	1.8 Kohm	1/3W	5%	01.152	C72	Capacitor, cer	6.8 pF		14.123
R150	Resistor	22 Ohm	1/3W	5%	01.229	C73	Capacitor, cer	4.7 pF		14.121
R151	Resistor	10 Ohm	1/3W	5%	01.225	C74	Capacitor, cer	6.8 pF		14.123
R152	Resistor	1 Kohm	1/3W	5%	01.149	C75	Capacitor, cer	10 nF	30V	14.907
R153	Resistor	18 Kohm	1/3W	5%	01.164	C76	Capacitor, cer	8.2 pF		14.124
R154	Resistor	5.6 Kohm	1/3W	5%	01.158	C77-80	Capacitor, cer	10 nF	30V	14.907
R155-156	Resistor	390 Ohm	1/3W	5%	01.144	C81	Capacitor, cer	22 pF		14.129
R157	Resistor	10 Ohm	1/3W	5%	01.225	C82	Capacitor, cer	150 pF	63V	14.339
R158	Resistor	1 Kohm	1/3W	5%	01.249	C83	Capacitor, cer	180 pF	63V	14.340
R159	Resistor	1.5 Kohm	1/3W	5%	01.251	C84	Capacitor, cer	150 pF	63V	14.339
R160	Resistor	270 Ohm	1/3W	5%	01.242	C85-86	Capacitor, pol	100 nF	63V	11.836
R161	Resistor	18 Kohm	1/3W	5%	01.164	C87	Not used			
R162	Resistor	5.6 Kohm	1/3W	5%	01.158	C88-92	Capacitor, pol	100 nF	63V	11.836
R163	Resistor	5.6 Kohm	1/3W	5%	01.258	C93-97	Capacitor, cer	10 nF	30V	14.907
R164	Resistor	4.7 Kohm	1/3W	5%	01.157	C98	Capacitor, cer	39 pF		14.232
R165-166	Resistor	22 Kohm	1/3W	5%	01.265	C99	Capacitor, cer	56 pF		16.367
R167	Resistor	2.2 Kohm	1/3W	5%	01.253	C100-111	Capacitor, cer	10 nF	30V	14.907
R168	Resistor	390 Ohm	1/3W	5%	01.144	C112-113	Capacitor, cer	100 nF	63V	14.913
R169	Resistor	100 Kohm	1/3W	5%	01.273	C113a	Capacitor, ellyt	10 uF	63V	12.865
R170	Resistor	3.3 Kohm	1/3W	5%	01.155	C114	Capacitor, cer	1 nF	40V	14.902
R171	Resistor	3.3 Kohm	1/3W	5%	01.255	C115	Capacitor, cer	10 nF	30V	14.907
R172	Resistor	100 Kohm	1/3W	5%	01.273	C116	Capacitor, cer	8.2 pF		14.124
R173-174	Resistor	3.3 Kohm	1/3W	5%	01.155	C117	Capacitor, ellyt	22 uF	40V	12.847
R175-176	Resistor	2.2 Kohm	1/3W	5%	01.153	C118	Capacitor, cer	1 nF	40V	14.902
R177-178	Resistor	5.6 Kohm	1/3W	5%	01.158	C119	Capacitor, cer	8.2 pF		14.124
R179	Resistor	2.2 Kohm	1/3W	5%	01.153	C119a	Capacitor, cer	1 nF	40V	14.902
R180-183	Resistor	5.6 Kohm	1/3W	5%	01.258	C120	Capacitor, cer	10 nF	30V	14.907
R184	Resistor	220 Ohm	1/3W	5%	01.241	C121	Capacitor, cer	8.2 pF		14.124
R185	Resistor	47 Kohm	1/3W	5%	01.269	C122	Capacitor, cer	1 nF	40V	14.902
R186	Resistor	100 Ohm	1/3W	5%	01.237	C123-124	Capacitor, cer	120 pF	N750	14.339
R187	Resistor	150 Ohm	1/3W	5%	01.239	C125-127	Capacitor, cer	1 nF	40V	14.902
R188	Resistor	22 Kohm	1/3W	5%	01.265	C128	Capacitor, cer	10 nF	30V	14.907
R189	Resistor	2.2 Kohm	1/3W	5%	01.253	C129	Capacitor, pol	10 nF	63V	11.824
R190	Resistor	100 Ohm	1/3W	5%	01.237	C130	Capacitor, pol	22 nF	63V	11.828
R191	Resistor	100 Ohm	1/3W	5%	01.137	C131	Capacitor, ellyt	47 uF	16V	12.809
R192	Resistor	4.7 Kohm	1/3W	5%	01.257	C132-133	Capacitor, pol	330 nF	63V	11.842
R193	Resistor	4.7 Kohm	1/3W	5%	01.157	C134	Capacitor, pol	22 nF	63V	11.828
R194	Resistor	33 Ohm	1/3W	5%	01.243	C135-136	Capacitor, cer	1 nF	40V	14.902
R195	Resistor	15 Kohm	1/3W	5%	01.263	C137	Not used			
R196	Resistor	2.2 Kohm	1/3W	5%	01.253	C138	Capacitor, ellyt	100 uF	25V	12.831
						C139	Capacitor, cer	1 nF	40V	14.902
						C140	Capacitor, cer	10 nF	30V	14.907
P1	Resistor, pre set	1 Kohm			04.355	C141	Capacitor, pol	150 nF	63V	11.838
P2	Resistor, pre set	5 Kohm			04.208	C142	Capacitor, cer	68 pF		16.369
P3	Resistor, pre set	500 Ohm			04.207	C143-143a	Capacitor, cer	10 nF	30V	14.907
P4	Resistor, pre set	250 Ohm			04.144	C144	Capacitor, cer	1 nF	40V	14.902

C145-147	Capacitor, cer	10 nF	30V	14.907	L10-11	Coil			004.1207
C148	Capacitor, electrolytic	100 uF	25V	12.831	L12-13	Coil			004.0256
					L14	Coil			004.2045
					L15-16	Coil			004.1200
CH1-2	Choke	15 uH		22.226					
*CH3	Choke	15 uH		22.226					
*CH4-5	Choke	15 uH		22.102					
CH6	Choke	15 uH		22.226					
*CH7	Choke	15 uH		22.226					
CH8	Choke	15 uH		22.102					
CH9	Choke	15 uH		22.226					
*CH10	Choke	15 uH		22.102					
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					
CH24-27	Choke	15 uH		22.226					
CH28	Choke	15 uH		22.102					
CH29	Choke	1.6 uH		22.215					
CH30	Choke	15 uH		22.102					
TR1	Trafo			26.124					
T1-7	Transistor	BC237		32.101	R1-5	Resistor	10 Ohm	1/3W	5% 01.125
*T6-9	Transistor	BC237		32.101	R6	Resistor	150 Ohm	1/3W	5% 01.139
T10	Transistor	BF199		33.102	R7-11	Resistor	150 Ohm	1/3W	5% 01.239
T10a	Transistor	BC307		32.102	R12-16	Resistor	270 Ohm	1/3W	5% 01.242
T11-12	Transistor	BF199		33.102	R17-21	Resistor	22 Ohm	1/3W	5% 01.229
T13-14	Transistor	BF W 16A		33.107	R22-26	Resistor	100 Ohm	1/3W	5% 01.237
T15	Transistor	BD140		30.102	R27	Resistor	100 Ohm	1/3W	5% 01.137
T16	Transistor	BC237		32.101	R28	Resistor	15 Kohm	1/3W	5% 01.163
T17	Transistor	BF199		33.102	R29	Resistor	2.2 Kohm	1/3W	5% 01.153
T18	Transistor	BC237		32.101	R30	Resistor	1 Kohm	1/3W	5% 01.249
T19-20	Transistor	BF199		33.102	R31	Resistor	100 Ohm	1/3W	5% 01.237
T21-23	Transistor	BC237		32.102	R32-33	Resistor	2.7 Kohm	1/3W	5% 01.154
T24-25	Transistor	BF199		33.102	R34	Resistor	220 Ohm	1/3W	5% 01.141
T26	Transistor	BC237		32.101	R35	Resistor	82 Kohm	1/3W	5% 01.172
					R36	Resistor	15 Kohm	1/3W	5% 01.163
IC1	Integrated Circuit	LM258		35.112	R37-38	Resistor	22 Kohm	1/3W	5% 01.165
IC2	Integrated Circuit	SL6270		35.111	R39-40	Resistor	10 Kohm	1/3W	5% 01.161
IC3	Integrated Circuit	CD4066		36.157	R41-42	Resistor	47 Ohm	1/3W	5% 01.133
IC4	Integrated Circuit	SL6440		35.125	R43	Resistor	470 Ohm	1/3W	5% 01.145
IC5	Integrated Circuit	74LS374		36.189	R44-45	Resistor	100 Ohm	1/3W	5% 01.137
IC6-7	Integrated Circuit	SL6440		35.125	R46	Resistor	820 Ohm	1/3W	5% 01.148
IC8	Integrated Circuit	74LS374		36.189	R47	Resistor	22 Kohm	1/3W	5% 01.165
IC9-10	Integrated Circuit	74LS138		36.172	R48	Resistor	12 Kohm	1/3W	5% 01.162
IC11	Integrated Circuit	LM317		35.135	R48a	Resistor	100 Ohm	1/3W	5% 01.137
IC12	Integrated Circuit	MC12015		36.505	R49	Resistor	47 Kohm	1/3W	5% 01.169
IC13	Integrated Circuit	LF355		35.115	R50	Resistor	100 Ohm	1/3W	5% 01.137
IC14	Integrated Circuit	MC145158		36.515	R51	Resistor	27 Kohm	1/3W	5% 01.166
IC15	Integrated Circuit	LM555		35.105	R52	Resistor	47 Kohm	1/3W	5% 01.169
					R53-54	Resistor	15 Kohm	1/3W	5% 01.163
D1	Diode, zener	5.1V	0.4W	39.707	R55	Resistor	10 Kohm	1/3W	5% 01.161
D2-4	Diode	1N4148		39.103	R56	Resistor	22 Kohm	1/3W	5% 01.165
*D5	Diode	BA244		39.101	R57	Resistor	820 Ohm	1/3W	5% 01.148
*D6	Diode, zener	5.1V	0.4W	39.707	R58	Resistor	22 Kohm	1/3W	5% 01.165
*D7-9	Diode	BA244		39.101	R59	Resistor	47 Kohm	1/3W	5% 01.169
*D10	Diode, zener	5.1V	0.4W	39.707	R60	Resistor	3.9 Kohm	1/3W	5% 01.156
D11	Diode	BA244		39.101	R61	Resistor	27 Kohm	1/3W	5% 01.166
D12-14	Diode	1N4148		39.103	R62	Resistor	100 Ohm	1/3W	5% 01.137
D15-24	Diode	BA244		39.101	R63	Resistor	47 Kohm	1/3W	5% 01.169
D25-30	Diode	1N4148		39.103	R64	Not used			
D31-34	Diode	BA244		39.101	R65	Resistor	100 Ohm	1/3W	5% 01.137
D35-36	Diode, cap.	BB105		39.403	R66	Resistor	3.9 Kohm	1/3W	5% 01.156
D37	Diode	1N4148		39.103	R67	Resistor	27 Kohm	1/3W	5% 01.166
D38-40	Diode, zener	6.8V		39.709	R68	Resistor	100 Ohm	1/3W	5% 01.137
D41	Diode	1N4148		39.103	R69	Not used			
X1	Crystal	30.5 MHz		50.152	R70	Resistor	47 Kohm	1/3W	5% 01.169
FL1	Filter	9 MHz		50.215	R71	Not used			
*FL2	Filter	9.0155 MHz		50.217	R72	Resistor	100 Ohm	1/3W	5% 01.137
FL3	Filter	70 MHz		50.217	R73	Resistor	3.9 Kohm	1/3W	5% 01.156
L1	Coil			004.1202	R74	Resistor	27 Kohm	1/3W	5% 01.166
L2	Coil			004.2043	R75	Resistor	100 Ohm	1/3W	5% 01.137
*L3	Coil			004.2043	R76	Resistor	47 Kohm	1/3W	5% 01.169
L4-5	Coil			004.1200	R77	Resistor	100 Ohm	1/3W	5% 01.157
L6	Coil			004.1202	R78	Resistor	3.9 Kohm	1/3W	5% 01.156
L7-8	Coil			004.2041	R79	Resistor	27 Kohm	1/3W	5% 01.166
L9	Coil			004.1202	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% 01.163
					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

## Synthesizer Unit no. 002.2045



R108	Resistor	1.5 Kohm	1/3W	5%	01.151	R214	Resistor	47 Kohm	1/3W	5%	01.169
R109	Resistor	820 Ohm	1/3W	5%	01.148	R215	Resistor	3.9 Kohm	1/3W	5%	01.156
R110	Resistor	560 Ohm	1/3W	5%	01.146	R216	Resistor	27 Kohm	1/3W	5%	01.166
R111	Resistor	82 Kohm	1/3W	5%	01.172	R217	Resistor	100 Ohm	1/3W	5%	01.137
R112	Resistor	220 Ohm	1/3W	5%	01.141	R218	Resistor	47 Kohm	1/3W	5%	01.169
R113	Resistor	470 Ohm	1/3W	5%	01.145	R219	Not used				
R114	Resistor	100 Ohm	1/3W	5%	01.137	R220-221	Resistor	100 Ohm	1/3W	5%	01.137
R115	Resistor	15 Kohm	1/3W	5%	01.163	R222	Resistor	3.9 Kohm	1/3W	5%	01.156
R116	Resistor	2.2 Kohm	1/3W	5%	01.153	R223	Resistor	27 Kohm	1/3W	5%	01.166
R117	Resistor	15 Kohm	1/3W	5%	01.163	R224	Not used				
R118	Resistor	470 Ohm	1/3W	5%	01.145	R225	Resistor	100 Ohm	1/3W	5%	01.137
R119	Resistor	100 Ohm	1/3W	5%	01.137	R226	Resistor	47 Kohm	1/3W	5%	01.169
R120	Resistor	2.2 Kohm	1/3W	5%	01.153	R227	Not used				
R121	Resistor	220 Ohm	1/3W	5%	01.141	R228	Resistor	100 Ohm	1/3W	5%	01.137
R122-123	Resistor	4.7 Kohm	1/3W	5%	01.157	R229	Resistor	3.9 Kohm	1/3W	5%	01.156
R124	Resistor	2.7 Kohm	1/3W	5%	01.154	R230	Resistor	27 Kohm	1/3W	5%	01.166
R125-126	Resistor	5.6 Kohm	1/3W	5%	01.158	R231	Resistor	47 Kohm	1/3W	5%	01.169
R127	Resistor	2.7 Kohm	1/3W	5%	01.154	R232	Resistor	100 Ohm	1/3W	5%	01.137
R128	Resistor	15 Kohm	1/3W	5%	01.163	R233	Resistor	3.9 Kohm	1/3W	5%	01.156
R129-130	Resistor	22 Kohm	1/3W	5%	01.165	R234	Resistor	27 Kohm	1/3W	5%	01.166
R131-132	Resistor	10 Kohm	1/3W	5%	01.161	R235	Not used				
R133-134	Resistor	47 Ohm	1/3W	5%	01.133	R236	Resistor	10 Kohm	1/3W	5%	01.161
R135	Resistor	470 Ohm	1/3W	5%	01.145	R237	Resistor	100 Kohm	1/3W	5%	01.173
R136-138	Resistor	100 Ohm	1/3W	5%	01.137						
R139	Resistor	12 Kohm	1/3W	5%	01.162	C1-10	Capacitor, poly	100 nF	63V		11.836
R140	Resistor	47 Kohm	1/3W	5%	01.169	C11-15	Capacitor, poly	10 nF	63V		11.824
R141	Resistor	22 Kohm	1/3W	5%	01.165	C16-26	Capacitor, cer	10 nF	30V		14.907
R142	Resistor	100 Ohm	1/3W	5%	01.137	C27-31	Capacitor, cer	82 pF	25V		14.336
R143	Resistor	12 Kohm	1/3W	5%	01.162	C32-36	Capacitor, cer	10 nF	30V		14.907
R144	Resistor	47 Kohm	1/3W	5%	01.169	C37	Capacitor, poly	150 nF	63V		11.838
R145-146	Resistor	15 Kohm	1/3W	5%	01.163	C38	Capacitor, poly	100 nF	63V		11.836
R147	Resistor	10 Kohm	1/3W	5%	01.161	C39	Capacitor, cer	1 nF	40V		14.902
R148	Resistor	22 Kohm	1/3W	5%	01.165	C39a	Capacitor, el	100 uF	25V		12.831
R149	Resistor	820 Ohm	1/3W	5%	01.148	C40	Capacitor, poly	15 nF	63V		11.826
R150	Resistor	47 Kohm	1/3W	5%	01.169	C40a	Capacitor, cer	10 nF	30V		14.907
R151	Not used					C41-42	Capacitor, el	10 uF	40V		12.845
R152	Resistor	3.9 Kohm	1/3W	5%	01.156	C43	Capacitor, cer	10 nF	30V		14.907
R153	Resistor	27 Kohm	1/3W	5%	01.166	C44-52	Capacitor, cer	1 nF	40V		14.902
R154	Resistor	47 Kohm	1/3W	5%	01.169	C53	Capacitor, poly	1.5 nF	63V		11.815
R155	Resistor	3.9 Kohm	1/3W	5%	01.156	C54	Capacitor, cer	1 nF	40V		14.902
R156	Resistor	27 Kohm	1/3W	5%	01.166	C55-56	Capacitor, el	4.7 uF	50V		12.843
R157	Resistor	100 Ohm	1/3W	5%	01.137	C57	Capacitor, poly	2.2 nF	63V		11.817
R158	Resistor	47 Kohm	1/3W	5%	01.169	C58-59	Capacitor, cer	4.7 pF			14.121
R159	Not used					C60	Capacitor, cer	2.2 pF			14.117
R160-161	Resistor	100 Ohm	1/3W	5%	01.137	C60a	Capacitor, el	4.7 uF	50V		12.843
R162	Resistor	3.9 Kohm	1/3W	5%	01.156	C61	Capacitor, cer	68 pF			16.369
R163	Resistor	27 Kohm	1/3W	5%	01.166	C61a	Capacitor, cer	1 nF	40V		14.902
R164	Not used					C62	Capacitor, cer	6.8 pF			14.123
R165	Resistor	100 Ohm	1/3W	5%	01.137	C63	Capacitor, cer	1 nF	40V		14.902
R166	Resistor	47 Kohm	1/3W	5%	01.169	C64-65	Capacitor, cer	10 nF	30V		14.907
R167	Not used					C66	Capacitor, el	4.7 uF	50V		12.843
R168	Resistor	100 Ohm	1/3W	5%	01.137	C67-69	Capacitor, cer	1 nF	40V		14.902
R169	Resistor	3.9 Kohm	1/3W	5%	01.156	C70	Capacitor, cer	10 nF	30V		14.907
R170	Resistor	27 Kohm	1/3W	5%	01.166	C71	Capacitor, cer	1 nF	40V		14.902
R171	Resistor	47 Kohm	1/3W	5%	01.169	C72	Capacitor, el	4.7 uF	50V		12.843
R172	Resistor	100 Ohm	1/3W	5%	01.137	C73-74	Capacitor, cer	1 nF	40V		14.902
R173	Resistor	3.9 Kohm	1/3W	5%	01.156	C75-76	Capacitor, cer	10 nF	30V		14.907
R174	Resistor	27 Kohm	1/3W	5%	01.166	C77	Capacitor, cer	1 nF	40V		14.902
R175	Not used					C78	Capacitor, el	4.7 uF	50V		12.843
R176	Resistor	10 Kohm	1/3W	5%	01.161	C79	Capacitor, cer	1 nF	40V		14.902
R177	Resistor	100 Kohm	1/3W	5%	01.173	C80	Capacitor, cer	10 nF	30V		14.907
R178	Not used					C81-82	Capacitor, el	4.7 uF	50V		12.843
R179	Not used					C83	Capacitor, cer	10 nF	30V		14.907
R180	Not used					C84	Capacitor, poly	100 nF	63V		11.836
R181	Not used					C85	Capacitor, cer	10 nF	30V		14.907
R182	Resistor	82 Kohm	1/3W	5%	01.172	C86	Capacitor, poly	100 nF	63V		11.836
R183	Not used					C87	Capacitor, poly	220 nF	63V		11.840
R184	Not used					C88	Capacitor, cer	100 nF	63V		14.913
R185	Resistor	220 Ohm	1/3W	5%	01.141	C89	Capacitor, el	10 uF	40V		12.845
R186-187	Resistor	2.7 Kohm	1/3W	5%	01.154	C90	Capacitor, cer	100 nF	63V		14.913
R188	Resistor	15 Kohm	1/3W	5%	01.163	C91	Capacitor, poly	1 uF	63V		11.848
R189-190	Resistor	22 Kohm	1/3W	5%	01.165	C92	Capacitor, poly	150 nF	63V		11.838
R191-192	Resistor	10 Kohm	1/3W	5%	01.161	C93	Capacitor, el	47 uF	35V		12.849
R193-194	Resistor	47 Ohm	1/3W	5%	01.133	C94	Capacitor, cer	1 nF	40V		14.902
R195	Resistor	470 Ohm	1/3W	5%	01.145	C95	Capacitor, el	4.7 uF	50V		12.843
R196-198	Resistor	100 Ohm	1/3W	5%	01.137	C96-97	Capacitor, poly	100 nF	63V		11.836
R199	Resistor	12 Kohm	1/3W	5%	01.162	C98-99	Capacitor, cer	10 nF	30V		14.907
R200	Resistor	47 Kohm	1/3W	5%	01.169	C100	Capacitor, poly	47 nF	63V		11.832
R201	Resistor	22 Kohm	1/3W	5%	01.165	C101	Capacitor, el	4.7 uF	50V		12.843
R202	Resistor	100 Ohm	1/3W	5%	01.137	C102	Capacitor, poly	22 nF	63V		11.828
R203	Resistor	12 Kohm	1/3W	5%	01.162	C103	Capacitor, cer	10 nF	30V		14.907
R204	Resistor	47 Kohm	1/3W	5%	01.169	C104	Capacitor, poly	100 nF	63V		11.836
R205-206	Resistor	15 Kohm	1/3W	5%	01.163	C105	Capacitor, cer	1 nF	40V		14.902
R207	Resistor	10 Kohm	1/3W	5%	01.161	C106-107	Capacitor, cer	10 nF	30V		14.907
R208	Resistor	22 Kohm	1/3W	5%	01.165	C108	Capacitor, poly	47 nF	63V		11.842
R209	Resistor	820 Ohm	1/3W	5%	01.148	C109	Capacitor, poly	100 nF	63V		11.836
R210	Resistor	47 Kohm	1/3W	5%	01.169	C110	Capacitor, cer	1 nF	40V		14.902
R211	Not used					C111	Capacitor, poly	3.3 nF	63V		11.819
R212	Resistor	3.9 Kohm	1/3W	5%	01.156	C112-113	Capacitor, poly	22 nF	63V		11.828
R213	Resistor	27 Kohm	1/3W	5%	01.166	C114-115	Capacitor, sty	150 pF		5%	10.129

C116-117	Capacitor, cer	10 nF	30V	14.907	CH1-15	Choke	15 uH	22.226
C118	Capacitor, el	10 uF	40V	12.845				
C119	Capacitor, cer	4.7 pF		14.121	T1-5	Transistor	J 310	34.107
C120	Capacitor, cer	10 nF	30V	14.907	T6	Transistor	BF 199	33.102
C121	Capacitor, cer	4.7 pF		14.121	T7-8	Transistor	MFE 131	34.108
C122	Capacitor, poly	150 nF	63V	11.838	T9	Transistor	J 310	34.107
C122a	Capacitor, cer	82 p	25V	14.336	T10-13	Transistor	BC 307	32.102
C123	Capacitor, cer	82 p	25V	14.336	T14-16	Transistor	BC 237B	32.101
C124-125	Capacitor, cer	10 nF	30V	14.907	T17-19	Transistor	BF 199	33.102
C126-127	Capacitor, cer	1 nF	40V	14.902	T20	Transistor	BC 237B	32.101
C128	Capacitor, cer	100 nF	63V	14.913	T21-22	Transistor	MFE 131	34.108
C129-130	Capacitor, cer	10 uF	30V	14.907	T23	Transistor	J 310	34.107
C131	Capacitor, poly	100 nF	63V	11.836	T24-28	Transistor	BC 307	32.102
C132	Capacitor, cer	1 nF	40V	14.902	T29	Transistor	BC 237B	32.101
C132a	Capacitor, el	100 uF	25V	12.831	T30	Not used		
C133	Capacitor, poly	15 nF	63V	11.826	T31-32	Transistor	MFE 131	34.108
C133a	Capacitor, cer	10 nF	30V	14.907	T33	Transistor	J 310	34.107
C134-135	Capacitor, el	10 uF	40V	12.845	T34-38	Transistor	BC 307	32.102
C136	Capacitor, cer	10 nF	30V	14.907	T39	Transistor	BC 237B	32.101
C137-143	Capacitor, cer	1 nF	40V	14.902				
C144	Capacitor, poly	1.5 nF	63V	11.815	IC1-5	Integrated Circuit	LM 78L05 5V	35.216
C145-146	Capacitor, el	4.7 uF	50V	12.843	IC6	Integrated Circuit	MC 145146	36.504
C147	Capacitor, cer	10 nF	30V	14.907	IC7	Integrated Circuit	74LS14	36.193
C148-149	Capacitor, cer	4.7 pF		14.121	IC8	Integrated Circuit	CD 40106	
C150	Capacitor, cer	2.2 pF		14.117	IC9	Integrated Circuit	LM358N	35.112
C151	Capacitor, cer	10 pF		14.125	IC10	Integrated Circuit	MC 12015	36.505
C152	Capacitor, cer	2.2 pF		14.117	IC11	Integrated Circuit	MC 3396	35.218
C153	Capacitor, el	4.7 uF	50V	12.843	IC12	Integrated Circuit	SN 74LS90	36.118
C154-155	Capacitor, cer	1 nF	40V	14.902	IC13	Integrated Circuit	74LS174	36.195
C156	Capacitor, cer	10 nF	30V	14.907	IC13a	SIL	4x4K7	
C157	Capacitor, el	4.7 uF	50V	12.843	IC14-15	Integrated Circuit	SN74LS90	36.118
C158	Capacitor, cer	1 nF	40V	14.902	IC16	Integrated Circuit	MC 14046 BCP	36.166
C159	Capacitor, cer	10 nF	30V	14.907	IC17	Integrated Circuit	UA 555	35.105
C160	Capacitor, cer	1 nF	40V	14.902	IC18-19	Integrated Circuit	74LS138	36.172
C161	Capacitor, el	4.7 uF	50V	12.843	IC20	Integrated Circuit	LF 355	35.115
C162-164	Capacitor, cer	1 nF	40V	14.902	IC21	Integrated Circuit	74LS244	36.192
C165	Capacitor, cer	10 nF	30V	14.907	IC22	Integrated Circuit	TBA 120S	35.104
C166	Capacitor, el	4.7 uF	50V	12.843	IC23	Integrated Circuit	74LS244	36.192
C167-169	Capacitor, cer	1 nF	40V	14.902	IC24	Integrated Circuit	MC 1451 46	36.504
C170	Capacitor, cer	10 nF	30V	14.907	IC25	Integrated Circuit	LM358N	35.112
C171	Capacitor, el	4.7 uF	50V	12.843	IC26	Integrated Circuit	MC 1205	36.505
C172	Capacitor, cer	1 nF	40V	14.902	IC27	Integrated Circuit	74LS174	36.195
C173	Capacitor, cer	10 nF	30V	14.907	IC27a	SIL	5x4K7	
C174-175	Capacitor, el	4.7 uF	50V	12.843	IC28	Integrated Circuit	MC145146	36.504
C176	Capacitor, cer	10 nF	30V	14.907	IC29	Integrated Circuit	LM358N	35.112
C177	Capacitor, poly	100 nF	63V	11.836	IC30	Integrated Circuit	MC12015	36.505
C178	Not used				IC31	Integrated Circuit	74LS174	36.195
C179	Not used				IC31a	SIL	5x4K7	
C180	Not used							
C181	Not used				D1	Diode	9V1	39.717
C182	Capacitor, poly	150 nF	63V	11.838	D1a	Diode	BA244	39.101
C183	Capacitor, cer	1 nF	40V	14.902	D2	Diode	1N4148	39.103
C184-185	Capacitor, cer	10 nF	30V	14.907	D2a	Diode	BA244	39.101
C186	Capacitor, poly	100 nF	63V	11.836	D3	Diode	BB 409	39.406
C187	Capacitor, cer	1 nF	40V	14.902	D3a	Diode	BA244	39.101
C188	Capacitor, poly	15 nF	63V	11.826	D4	Diode	BB 409	39.406
C189	Capacitor, cer	10 nF	30V	14.907	D4a	Diode	BA 244	39.101
C190	Capacitor, el	100 uF	25V	12.831	D5-6	Diode	1N4148	39.103
C191-192	Capacitor, el	10 uF	40V	12.845	D7	Diode	zener	5V1 39.707
C193	Capacitor, cer	10 nF	30V	14.907	D8	Diode	1N4148	39.103
C194-200	Capacitor, cer	1 nF	40V	14.902	D9	Diode	BB 609	
C201	Capacitor, poly	2.2 nF	63V	11.817	D10-11	Diode	1N4148	39.103
C202-203	Capacitor, el	4.7 uF	50V	12.843	D12	Diode	BB 409	39.406
C204	Capacitor, cer	10 nF	30V	14.907	D13-17	Diode	BA 244	39.101
C205-206	Capacitor, cer	4.7 pF		14.121	D18	Diode	1N4148	39.103
C207	Capacitor, cer	2.2 pF		14.117	D19	Diode	BB 409	39.406
C208	Capacitor, cer	12 pF		14.126	D20-24	Diode	BA 244	39.101
C209	Capacitor, cer	2.2 pF		14.117				
C210	Capacitor, el	4.7 uF	50V	12.843	X1		TCXO MHz	50.214
C211-212	Capacitor, cer	1 nF	40V	14.902	X2		9.015 MHz	50.151
C213	Capacitor, cer	10 nF	30V	14.907				
C214	Capacitor, poly	100 nF	63V	11.836	L1-5	Coil		4.2044
C215	Capacitor, cer	1 nF	40V	14.902	L6	Coil		4.1200
C216	Capacitor, cer	10 nF	30V	14.907	L7-9	Coil		4.2058
C217	Capacitor, cer	1 nF	40V	14.902	L10	Coil		4.2057
C218	Capacitor, poly	100 nF	63V	11.836	L11	Not used		
C219-221	Capacitor, cer	1 nF	40V	14.902	L12	Not used		
C222	Capacitor, cer	10 nF	30V	14.907	L13-14	Coil		4.2044
C223	Capacitor, poly	100 nF	63V	11.836	L15	Coil		4.1200
C224-226	Capacitor, cer	1 nF	40V	14.902	L16-19	Coil		4.2040
C227	Capacitor, cer	10 nF	30V	14.907	L20	Coil		4.2040
C228	Capacitor, poly	100 nF	63V	11.836	L21	Not used		
C229	Capacitor, cer	1 nF	40V	14.902	L22	Coil		4.1200
C230	Capacitor, cer	10 nF	30V	14.907	L23-26	Coil		4.2050
C231	Capacitor, el	4.7 uF	50V	12.843	L27	Coil		4.2040
C232	Capacitor, cer	10 nF	30V	14.907				
C233	Not used							
C234	Capacitor, el	4.7 uF	50V	12.843				
C235	Capacitor, poly	100 nF	63V	11.836				

## 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

C3	Capacitor, cer	1 nF	40V	14.902
C4-5	Capacitor, cer	100 pF		16.373
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	14.902
C14-15	Capacitor, pol	220 nF	63V	11.842
CH1-3	Choke	15 uH		22.226
T1-2	Transistor	SD1224		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

## 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
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
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

## Driver Unit no. 002.2054

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	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		15.401

## Bands unit Unit no. 002.2062

R1	Resistor	1 Kohm	1/3W 5%	01.161
R1a	Resistor	100 Kohm	1/3W 5%	01.173
R2	Resistor	1 Kohm	1/3W 5%	01.149
R3	Resistor	47 Kohm	1/3W 5%	01.169
R4-6	Resistor	10 Kohm	1/3W 5%	01.161
R7	Resistor	220 Kohm	1/3W 5%	01.177
R8-9	Resistor	10 Kohm	1/3W 5%	01.161
R10	Resistor	2.2 Kohm	1/3W 5%	01.153
R11	Resistor	150 Ohm	1/3W 5%	01.139
R12	Resistor	1.2 Kohm	1/3W 5%	01.150
R13	Not used			
R14	Not used			
R14a	Resistor	150 Ohm	1/3W 5%	01.139
R15-22	Not used			
R23-32	Resistor	10 Kohm	1/3W 5%	01.161
C1	Capacitor, pol	100 nF	63V	11.836
C1a	Capacitor, pol	47 nF	63V	11.832
C2	Capacitor, cer	4.7 pF		14.121
C3	Capacitor, pol	10 nF		11.313
C4	Capacitor, cer	10 nF	30V	14.907
C4a	Capacitor, pol	47 nF	63V	11.832
C5-7	Capacitor, sty	1 nF		5% 10.149
C8	Capacitor, pol	47 nF	63V	11.832
C9	Capacitor, pol	68 nF	63V	11.834
C10	Capacitor, sty	560 pF		5% 10.143
C11	Capacitor, sty	820 pF		5% 10.147
C12	Capacitor, sty	150 pF		5% 10.129
C13	Capacitor, pol	47 nF	63V	11.832
C14	Capacitor, sty	470 pF		5% 10.141
C15	Capacitor, sty	180 pF		5% 10.131
C16	Capacitor, sty	120 pF		5% 10.127
C17	Capacitor, sty	100 pF		5% 10.125
C17	Capacitor, sty	33 pF		5% 10.113
C18	Capacitor, sty	120 pF		5% 10.127
C19	Capacitor, sty	180 pF		5% 10.131
C20	Capacitor, sty	470 pF		5% 10.141
C21	Capacitor, pol	47 nF	63V	5% 11.832
C22	Capacitor, sty	240 pF		5% 10.134
C23	Capacitor, sty	120 pF		5% 10.127
C24	Capacitor, sty	82 pF		5% 10.123
C25	Capacitor, sty	82 pF		5% 10.123
C26	Capacitor, sty	33 pF		5% 10.119
C27	Capacitor, sty	82 pF		5% 10.123
C27	Capacitor, sty	120 pF		5% 10.127
C28	Capacitor, sty	240 pF		5% 10.134
C29	Capacitor, pol	47 nF	63V	11.832
C30	Capacitor, sty	120 pF		5% 10.127
C31	Capacitor, sty	56 pF		5% 10.119
C32	Capacitor, sty	100 pF		5% 10.125
C33	Capacitor, sty	56 pF		5% 10.119
C34	Capacitor, sty	120 pF		5% 10.127
C35	Capacitor, pol	47 nF	63V	11.832
C36	Capacitor, sty	82 pF		5% 10.123
C37-39	Capacitor, sty	56 pF		5% 10.119
C40	Capacitor, sty	82 pF		5% 10.123
C41	Capacitor, pol	22 nF	63V	11.828
C42	Capacitor, sty	56 pF		5% 10.119

C43	Capacitor, sty	33 pF	5%	10.113	L42	Choke	47 uH	22.232
C44	Capacitor, sty	56 pF	5%	10.119	L43-53	Choke	15 uH	22.102
C45	Capacitor, sty	33 pF	5%	10.113				
C46	Capacitor, sty	56 pF	5%	10.119	GL1	Glow Lamp		55.201
C47	Capacitor, pol	22 nF		11.828				
C48	Capacitor, sty	56 pF	5%	10.119				
C49-51	Capacitor, sty	22 pF	5%	10.109				
C52	Capacitor, sty	56 pF	5%	10.119				
C53	Capacitor, pol	22 nF		11.828				
C54	Capacitor, sty	33 pF	5%	10.113				
C55	Capacitor, cer	18 pF		14.128				
C56	Capacitor, sty	33 pF	5%	10.113				
C57	Capacitor, cer	18 pF		14.128				
C58	Capacitor, sty	33 pF	5%	10.113	R1	Resistor	2.2 Kohm 1/3W	5% 01.153
C59	Capacitor, pol	22 nF		11.828	R2	Resistor	10 Kohm 1/3W	5% 01.161
C60	Capacitor, sty	33 pF	5%	10.113	R3	Resistor	2.2 Kohm 1/3W	5% 01.153
C61	Capacitor, sty	22 pF	5%	10.109	R4	Resistor	4.7 Kohm 1/3W	5% 01.157
C62	Capacitor, cer	6.8 pF		14.123	R5	Resistor	10 Kohm 1/3W	5% 01.161
C63	Capacitor, sty	22 pF	5%	10.109	R6	Resistor	5.6 Kohm 1/3W	5% 01.158
C64	Capacitor, sty	33 pF	5%	10.113	R7	Resistor	27 Ohm 1/3W	5% 01.130
C65	Capacitor, pol	22 nF		11.828	R8	Resistor	2.2 Kohm 1/3W	5% 01.153
C66	Not used				R9	Resistor	5.6 Kohm 1/3W	5% 01.158
C67	Capacitor, pol	100 nF	63V	11.836	R10	Resistor	2.2 Kohm 1/3W	5% 01.153
C68	Capacitor, pol	10 nF		11.313	R11	Resistor	10 Kohm 1/3W	5% 01.161
C69	Capacitor, pol	47 nF	63V	11.832	R12	Resistor	2.2 Kohm 1/3W	5% 01.153
C70	Capacitor, ellyt	10 uF	40V	12.648	R13	Resistor	4.7 Kohm 1/3W	5% 01.157
					R14	Resistor	10 Kohm 1/3W	5% 01.161
RL1-11	Relay	Reed relay	5V	27.125	R15	Resistor	5.6 Kohm 1/3W	5% 01.158
T1	Transistor	BC237B		32.101	R16	Resistor	27 Ohm 1/3W	5% 01.130
IC1	Integrated Circuit	LM741		35.106	R17	Resistor	2.2 Kohm 1/3W	5% 01.153
IC2	Integrated Circuit	SN74159N		36.196	R18	Resistor	5.6 Kohm 1/3W	5% 01.158
IC3	Integrated Circuit	74LS138		36.172	R19	Resistor	1 Kohm 1/3W	5% 01.149
IC4	Integrated Circuit	74LS374		36.189	R20	Resistor	2.2 Kohm 1/3W	5% 01.153
IC5	Integrated Circuit	74LS138		36.172	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
D1-3	Diode	1N4148		39.103	R28	Resistor	5.6 Kohm 1/3W	5% 01.158
D4	Diode	BA244		39.101	R29	Resistor	10 Kohm 1/3W	5% 01.161
D5	Diode	1N4148		39.103	R30	Resistor	2.2 Kohm 1/3W	5% 01.153
D6	Diode	BA244		39.101	R31	Resistor	1.5 Kohm 1/3W	5% 01.151
D7	Diode	1N4148		39.103	R32	Resistor	6.8 Kohm 1/3W	5% 01.159
D8	Diode	BA244		39.101	R33-34	Resistor	1 Kohm 1/3W	5% 01.149
D9	Diode	1N4148		39.103	R35	Resistor	10 Kohm 1/3W	5% 01.161
D10	Diode	BA244		39.101	R36	Resistor	1 Kohm 1/3W	5% 01.149
D11	Diode	1N4148		39.103	R37	Resistor	47 Kohm 1/3W	5% 01.169
D12	Diode	BA244		39.101	R38	Resistor	100 Ohm 1/3W	5% 01.137
D13	Diode	1N4148		39.103	R39	Resistor	10 Kohm 1/3W	5% 01.161
D14	Diode	BA244		39.101	R40	Resistor	47 Kohm 1/3W	5% 01.269
D15	Diode	1N4148		39.103	R41	Resistor	150 Kohm 1/3W	5% 01.175
D16	Diode	BA244		39.101	R42	Resistor	2.2 Kohm 1/3W	5% 01.153
D17	Diode	1N4148		39.103	R43	Resistor	4.7 Kohm 1/3W	5% 01.157
D18	Diode	BA244		39.101	R44	Resistor	47 Kohm 1/3W	5% 01.169
D19	Diode	1N4148		39.103	R45-47	Resistor	10 Kohm 1/3W	5% 01.161
D20	Diode	BA244		39.101	R48	Resistor	4.7 Kohm 1/3W	5% 01.157
D21	Diode	1N4148		39.103	R49-50	Resistor	5.6 Kohm 1/3W	5% 01.158
D22	Diode	BA244		39.101	R51	Resistor	1 Kohm 1/3W	5% 01.149
D23	Diode	1N4148		39.103	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
L1-2	Choke	1 MH		22.248	R55	Resistor	150 Ohm 1/3W	5% 01.139
L3	Choke	330 uH		22.242	R56	Resistor	6.8 Kohm 1/3W	5% 01.159
L4	Choke	220 uH		22.240	R57	Resistor	10 Kohm 1/3W	5% 01.161
L5	Choke	47 uH		22.232	R58	Resistor	15 Kohm 1/3W	5% 01.163
L6	Choke	68 uH		22.234	R59	Resistor	1.5 Kohm 1/3W	5% 01.151
L7	Choke	47 uH		22.232	R60	Resistor	1 Kohm 1/3W	5% 01.149
L8	Not used				R61	Resistor	10 Kohm 1/3W	5% 01.261
L9	Coil			004.2067	R62	Resistor	150 Ohm 1/3W	5% 01.139
L10-11	Coil			004.2070	R63	Resistor	1 Kohm 1/3W	5% 01.149
L12	Coil			004.2071	R64	Resistor	4.7 Kohm 1/3W	5% 01.157
L13	Choke	47 uH		22.232	R64a	Resistor	10 Kohm 1/3W	5% 01.161
L14	Coil			004.2067	R65	Resistor	100 Ohm 1/3W	5% 01.137
L15-16	Coil			004.2066	R66	Resistor	1 Kohm 1/3W	5% 01.149
L17	Coil			004.2071	R67	Resistor	5.6 Kohm 1/3W	5% 01.158
L18	Choke	47 uH		22.232	R68-69	Resistor	22 Kohm 1/3W	5% 01.165
L19-21	Coil			004.2068	R70	Resistor	47 Kohm 1/3W	5% 01.169
L22	Choke	47 uH		22.232	R71	Resistor	22 Kohm 1/3W	5% 01.165
L23-25	Coil			004.2069	R72-73	Resistor	100 Kohm 1/3W	5% 01.173
L26	Choke	47 uH		22.232	R74	Resistor	4.7 Kohm 1/3W	5% 01.157
L27-29	Coil			004.2062	R75-76	Resistor	100 Kohm 1/3W	5% 01.173
L30	Choke	47 uH		22.232	R77	Resistor	10 Kohm 1/3W	5% 01.161
L31-33	Coil			004.2063	R78	Resistor	27 Ohm 1/3W	5% 01.130
L34	Choke	47 uH		22.232	R79	Resistor	10 Kohm 1/3W	5% 01.161
L35-37	Coil			004.2059	R80	Resistor	2.2 Kohm 1/3W	5% 01.153
L38	Choke	47 uH		22.232	R81	Resistor	10 Kohm 1/3W	5% 01.161
L39	Coil			004.2064	R82-83	Resistor	22 Kohm 1/3W	5% 01.165
L40	Coil			004.2065	R84	Resistor	100 Ohm 1/3W	5% 01.137
L41	Coil			004.2064	R85	Resistor	100 Kohm 1/3W	5% 01.173

## Receiver Unit no. 002.2064

R86	Resistor	1 Kohm	1/3W	5%	01.149	C74	Capacitor, poly	100 nF	63V	11.836	
R87-88	Resistor	5.6 Kohm	1/3W	5%	01.158	C75	Capacitor, lyt	1000 uF	16V	12.249	
R89-90	Resistor	10 Kohm	1/3W	5%	01.161						
R91	Resistor	4.7 Kohm	1/3W	5%	01.157	CH1-3	Choke	15 uH	0.6A	22.102	
R92	Resistor	22 Kohm	1/3W	5%	01.165	CH4-5	Choke	0.33 uH		22.206	
R93	Resistor	1 Kohm	1/3W	5%	01.149	CH6	Choke	15 uH		22.226	
R94	Resistor	8.2 Kohm	1/3W	5%	01.160	CH7	Choke	330 uH		22.242	
R95-96	Resistor	27 Kohm	1/3W	5%	01.266						
R97-98	Resistor	47 Kohm	1/3W	5%	01.169	TR1	Transformer	600 Ohm		26.124	
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	RL1	Relay		12V	27.112	
R102	Resistor	100 Ohm	1/3W	5%	01.137						
R103	Resistor	10 Kohm	1/3W	5%	01.161	T1	Transistor	BC 307		32.102	
R104-105	Resistor	5.6 Kohm	1/3W	5%	01.158	T2	Transistor	BC 237B		32.101	
R106	Resistor	2.2 Ohm	1/3W	5%	01.117	T3	Transistor	BC 307		32.102	
R107	Resistor	47 Ohm	1/3W	5%	01.133	T4	Transistor	BC 237B		32.102	
R108	Resistor	150 Ohm	1/3W	5%	01.139	T6-9	Transistor	BC 237B		32.101	
R109	Resistor	1 Ohm	1/3W	5%	01.113	T10	Transistor	BC 307		32.102	
R110	Resistor	68 Ohm	1/3W	5%	01.135	T11	Transistor	BC 237B		32.101	
R110a	Resistor	1 Kohm	1/3W	5%	01.149	T12	Transistor	BC 307		32.102	
R111	Resistor	68 Ohm	1/3W	5%	01.135	T13-15	Transistor	BC 237B		32.101	
P1-3	Resistor	5 Kohm	Preset		04.357	IC1-2	Integrated Circuit	MC 1350		35.137	
C1	Capacitor, poly	47 nF	63V		11.832	IC3	Integrated Circuit	T.Array CA3086		35.134	
C2	Capacitor, sty	220 pF		5%	10.133	IC4	Integrated Circuit	LM 358N		35.112	
	Capacitor, sty	1 nF		5%	10.149	IC5-6	Integrated Circuit	74LS138		36.172	
C3	Capacitor, poly	47 nF	63V		11.832	IC7	Integrated Circuit	74LS374		36.189	
C4	Capacitor, sty	220 pF		5%	10.133	IC8	Integrated Circuit	74C14		36.191	
	Capacitor, sty	1 nF		5%	10.149	IC9	Integrated Circuit	CD4066CN		36.157	
C5-7	Capacitor, poly	47 nF	63V		11.832	IC10	Integrated Circuit	LM358N		35.112	
C8	Capacitor, sty	220 pF		5%	10.133	IC11	Integrated Circuit	UA 741		35.106	
	Capacitor, sty	1 nF		5%	10.149	IC12	Integrated Circuit	TDA 2002A		35.108	
C9	Capacitor, poly	47 nF	63V		11.832	D1-6	Diode	BA 244		39.101	
C10	Capacitor, sty	220 pF		5%	10.133	D7-18	Diode	1N4148		39.103	
	Capacitor, sty	1 nF		5%	10.149						
C11-12	Capacitor, poly	47 nF	63V		11.832	FL1-2	X Fil	F580 1U		50.201	
C13	Capacitor, sty	1 nF		5%	10.149						
C14	Capacitor, cer	15 pF			14.127	L1-8	Coil			4.0112	
C15	Capacitor, sty	1 nF		5%	10.149	L9	Coil	5961		23.109	
C16	Capacitor, cer	6.8 pF			14.123	L10	Coil	5876		23.104	
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	R1	Resistor	56 Ohm	1/3W	5%	01.134
C25	Capacitor, cer	68 pF			16.369	R2	Resistor	560 Ohm	1/3W	5%	01.146
C26-28	Capacitor, poly	47 nF	63V		11.832	R3	Resistor	27 Ohm	1/3W	5%	01.130
C29-29a	Capacitor, cer	1 nF	40V		14.902	R4	Resistor	1 Kohm	1/3W	5%	01.149
C30	Capacitor, poly	47 nF	63V		11.832	R5	Resistor	56 Ohm	1/3W	5%	01.234
C31-32	Capacitor, cer	1 nF	40V		14.902	R6	Resistor	1 Kohm	1/3W	5%	01.249
C33	Capacitor, lyt	10 uF	40V		12.845	R7	Resistor	220 Ohm	1/3W	5%	01.141
C34	Capacitor, poly	100 nF	63V		11.836	R8	Resistor	10 Ohm	1/3W	5%	01.225
C35-36	Capacitor, poly	47 nF	63V		11.832	R9	Resistor	27 Ohm	1/3W	5%	01.230
C37	Capacitor, cer	10 nF	30V		14.907	R10-11	Resistor	56 Ohm	1/3W	5%	01.234
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	C1	Capacitor, gen	1 nF			15.502
C42	Capacitor, cer	100 nF	63V		14.913	C2	Capacitor, cer	1 nF			14.902
C42a-43	Capacitor, lyt	10 uF	40V		12.845	C3-4	Capacitor, pol	47 nF	63V		11.822
C44	Capacitor, poly	220 nF	63V		11.840	C5	Capacitor, cer	1 nF	40V		14.902
C45	Capacitor, cer	10 nF	30V		14.907	C6	Capacitor, pol	47 nF	63V		11.832
C46	Capacitor, cer	100 nF	63V		14.913	C7	Capacitor, ellyt	10 uF	40V		12.845
C47	Capacitor, sty	1 nF		5%	10.149	C8	Capacitor, cer	10 nF	30V		14.907
C48	Capacitor, poly	47 nF	63V		11.832	C9	Capacitor, cer	1 nF	40V		14.902
C49	Capacitor, cer	10 nF	30V		14.907	C10	Capacitor, pol	47 nF	63V		11.832
C50	Capacitor, cer	4.7 nF		10%	14.357	C11	Capacitor, cer	8.2 pF			14.224
C51-52	Capacitor, poly	2.2 nF	63V		11.817	C12-13	Capacitor, cer	47 pF	63V		14.333
C53-54	Capacitor, poly	100 nF	63V		11.836	C14	Capacitor, var	1.5-9 pF			17.204
C54a	Capacitor, lyt	22 uF	40V		12.847	C15-16	Capacitor, cer	1 nF	40V		14.902
C55	Capacitor, poly	220 nF	63V		11.840	C17	Capacitor, cer	10 nF	30V		14.907
C56	Capacitor, lyt	22 uF	40V		12.847	C18	Capacitor, cer	1 nF	40V		14.902
C57-58	Capacitor, lyt	10 uF	40V		12.845	C19	Capacitor, pol	47 nF	63V		11.832
C59	Capacitor, sty	100 pF		5%	10.125	C20	Capacitor, ellyt	10 uF	40V		12.845
C60	Capacitor, poly	4.7 nF	63V		11.820	C21	Capacitor, pol	47 nF	63V		11.832
C61	Capacitor, poly	3.3 nF	63V		11.819	C22-23	Capacitor, cer	1 nF	40V		14.902
C62	Capacitor, sty	390 pF		5%	10.139	C24	Capacitor, cer	150 pF	63V		14.339
C63	Capacitor, poly	470 nF	63V		11.844	C25	Capacitor, pol	47 nF	63V		11.832
C64	Capacitor, lyt	10 uF	40V		12.845	C26	Capacitor, gen	1 nF			15.502
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	CH1	Choke	0.15 uH			22.202
C69-70	Capacitor, cer	1 nF	40V		14.902	CH2	Choke	0.22 uH			22.204
C71	Capacitor, lyt	100 uF	25V		12.831	CH3	Choke	0.15 uH			22.202
C72	Capacitor, poly	47 nF	63V		11.832	CH4	Choke	0.33 uH			22.206
C73	Capacitor, lyt	1000 uF	16V		12.249	CH5	Choke	0.47 uH			22.208

## Mixer unit Unit no. 002.2065

IC1-2	Integrated Circuit	SL 6440	35.125	T1-6	Transistor	BF199	33.102
D1-6	Diode	1N4148	39.103	T7-10	Transistor	BC237B	32.101
FL1	Filter	71.42 MHz	50.216	IC1	Integrated Circuit	LM78L05	35.216
				IC2	Integrated Circuit	MC145158	36.515
				IC3	Integrated Circuit	TDA 10625	36.517
L1	Coil		004.1102				
L2-3	Coil		004.1202	D1-3	Diode	1N4148	39.103
				D4	Diode, cap	BB209	39.404

## 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

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

## 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		11.846
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	39.706
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 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
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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	OPTO 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

## 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	1 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
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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	11.846
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
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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

## Filter Unit no. 002.2078

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

## Mother board Unit no. 002.2080

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

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
15	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

## Ext. board Unit no. 002.2081

R1	Resistor	4.7 Kohm	1/3W	5%	01.157
1C1-2	Resistors	10 x 4.7 Kohm			06.126

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

## 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			38.103
F1-2	Fuse	15A	6.3x32		55.412

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

## 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

## 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 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



