

PHILIPS *Service*



PHILICORDA

AG 7500/12/15/16 / 17/18 / 19/20/22/26
/29/ 30/32/35 / 38/40/43/53/80



	<u>Page</u>
Specification	2
Block diagram	3
Description of circuit diagram	5
Mechanical parts list	10
Electrical parts list	11
Voltage diagrams	12
Tuning	15
Power unit	16
Vibrato oscillator	17
Master oscillators	18
Divider sections	20
Circuit diagram	24
Wiring diagram	25
Circuit diagram key panels	26
Printed panels key's	27
Cabinet	28
Key-bord	29

SERVICE INFORMATION										
------------------------	--	--	--	--	--	--	--	--	--	--

SK	function
1	8'
2	4'
3	2'
4	VOX I
5	VOX II
6	VOX III
7	VOX IV
8	VOX V
9	vibrato

Pos.	SK10		SK11
1	Philicorda	bass	continuous
		descant	
2	Philicorda + pick-up	bass	VOX I 4' + 2'
		descant	separate registering
3	pick-up	bass	chords
		descant	separate registering

The function of the balance regulator is dependent on the position of SK10.

- a. SK10 in pos. 1 : loudness ratio of bass and descant (SK11 in pos. 2 or 3)
- b. SK10 in pos. 2 : loudness ratio of organ and pick-up
- c. SK10 in pos. 3 : balance regulator switched off.

Function of SK11 when SK10 is at position 1.

- Pos. 1 Balance regulator in the middle. Is not in action when SK11 is in this position.
- Pos. 2 Balance regulator regulates bass-descant ratio.
- Pos. 3 Balance regulator regulates bass-descant ratio.

4. Table showing arrangement of master oscillators and neon dividers

C sharp	→	c ⁴ #	c ³ #	c ² #	c ¹ #	c#	C#
D	→	d ⁴	d ³	d ²	d ¹	d	D
D sharp	→	d ⁴ #	d ³ #	d ² #	d ¹ #	d#	D#
E	→	e ⁴	e ³	e ²	e ¹	e	E
F	→	f ⁴	f ³	f ²	f ¹	f	F
F sharp	→	f ⁴ #	f ³ #	f ² #	f ¹ #	f#	F#
G	→	g ⁴	g ³	g ²	g ¹	g	G
G sharp	→	g ⁴ #	g ³ #	g ² #	g ¹ #	g#	G#
A	→	a ⁴	a ³	a ²	a ¹	a	A
A sharp	→	a ⁴ #	a ³ #	a ² #	a ¹ #	a#	A#
B	→	b ⁴	b ³	b ²	b ¹	b	B
C	→	c ⁵	c ⁴	c ³	c ²	c ¹	c

TRA1508

Above we see the arrangement of the sawtooth oscillator panels in their relationship to the mains oscillators. This table allows us to distinguish between three sorts of divider sections as follows :

- 1. for c sharp to a sharp inclusive : 5 panels with 2x6 sawtooth oscillators
- 2. for b : 1 panel with 6 sawtooth oscillators
- 3. for c : 1 panel with 7 sawtooth oscillators

Description of circuit-diagram

1. Master oscillators

The master oscillators are Hartley oscillators. The ECC83 is used as oscillator valve. There are 12 master oscillators in all on the two oscillator printed circuits.

The vibrato signal (6 c/s) is fed to the master oscillator via a resistor of 100 kΩ.

By this means the vibration generated by the master oscillator is frequency modulated.

The oscillator signal is fed to the divider section across a resistor of 100 kΩ.

2. Divider sections

Figure 1 shows a normal sawtooth oscillator. When the d.c. voltage V_b is connected C will be charged as shown in the curve in figure 6a until the ignition voltage V_o of the neon tube B is attained. B will ignite at that moment and C will quickly discharge. When the extinguishing voltage is again reached B suddenly ceases to be conducting and C will again charge up.

The whole process takes place between the extinguishing and ignition voltage of B and the result is a sawtooth voltage as in fig. 2.

The frequency of this sawtooth voltage is dependent on :

- 1. The RC-time
- 2. The ignition voltage of the tube
- 3. The extinguishing voltage of the tube
- 4. The supply voltage.

It is clear that the frequency of the sawtooth voltage must be very constant. The voltage must therefore be synchronized.

Fig. 3 shows part of one of the divider circuits. B1, R1, C1 and C2 together form a sawtooth oscillator. R2 is very small in comparison with R1. The synchronizing signal is supplied across R2. This synchronizing signal is a sinusoidal voltage obtained from the master oscillator.

The RC-time (R1, C1-2) has been so selected that the frequency of the sawtooth voltage is the same as that of the synchronizing signal. Now how does the synchronisation of this oscillator work?

The voltage across B1 is equal to the sum of the voltages across the condensers C1 and C2 and across the resistor R2. Hence B1 will not ignite when the voltage across C1 and C2 has risen to V_0 but earlier, and in fact somewhere during the negative phase of sinusoidal synchronizing voltage. The moment of ignition of B1 is thus determined by this sinusoidal voltage. Both are shown in Fig. 4. This figure also shows that correct synchronization is still possible at various values of RC-time (I : RC-large, II : RC-small). The synchronization of the following sawtooth oscillators is carried out with the help of sawtooth voltages. For this purpose, for instance, the sawtooth voltage is led across the anode of B1, across a capacitive divider C3 and C4 to the cathode of B2.

The silicon diode GR1 has two functions :

1. A low resistance for rapid discharge of condensers C5 and C6 across B2, so that the sawtooth voltage will have a steep flank, which is important for high harmonic content.
 2. A high resistance while B2 is extinguished, so that a large synchronizing voltage with low capacitances is fed to the cathode of B2. The coupling between the stages must be slight, so that the discharging pulses across the silicon diodes do not penetrate to the preceding stages and there cause interference in the form of sub-harmonics.
- The voltage across the silicon diode if B2 is not present is roughly sawtooth in form, but thanks to the diode is below the 0-volt line.

Here, too, the voltage across B2 is equal to the sum of the voltages across the condensers C5 and C6 and across the diode GR1. Likewise B2 will be ignited before the voltage across the condensers C5 and C6 has increased to V_0 , that is, the voltage across B2 at the flank of the synchronizing sawtooth becomes suddenly greater than the ignition voltage V_0 , so that the latter becomes conducting. Therefore the voltage across diode GR1 suddenly increases to roughly 0 volt, after which it too becomes conducting and the condensers C5 and C6 discharge. The voltage across the diode GR1 then remains fairly constant until the next sawtooth voltage.

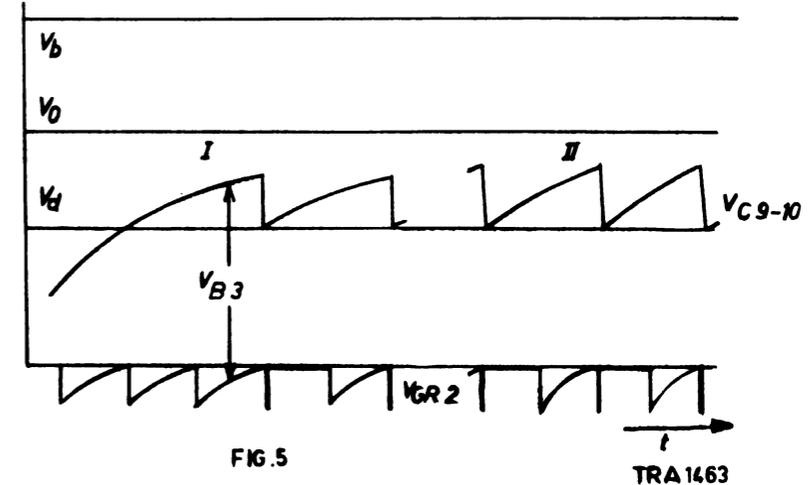
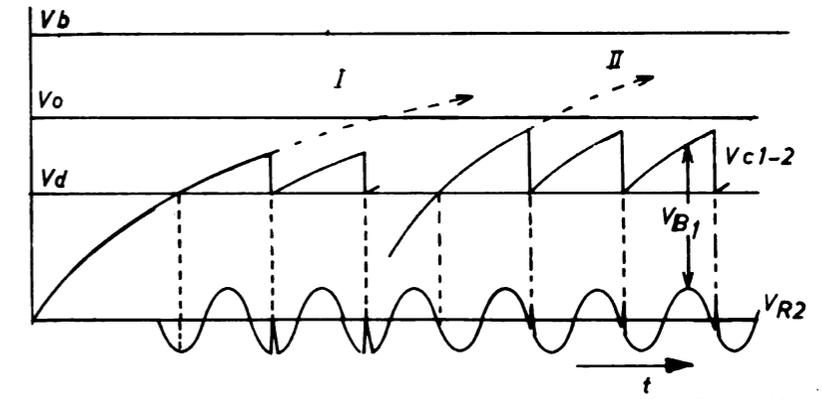
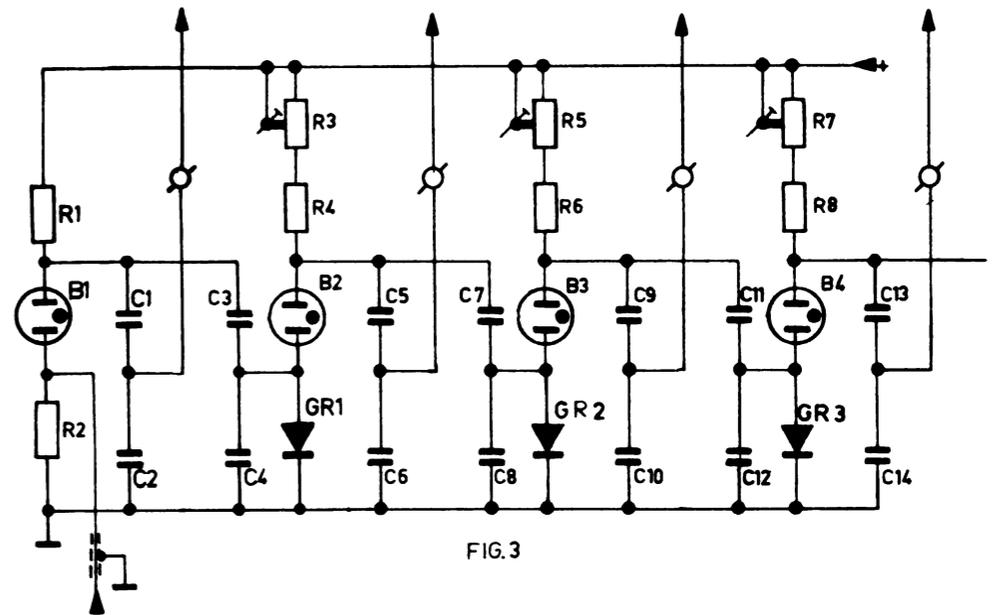
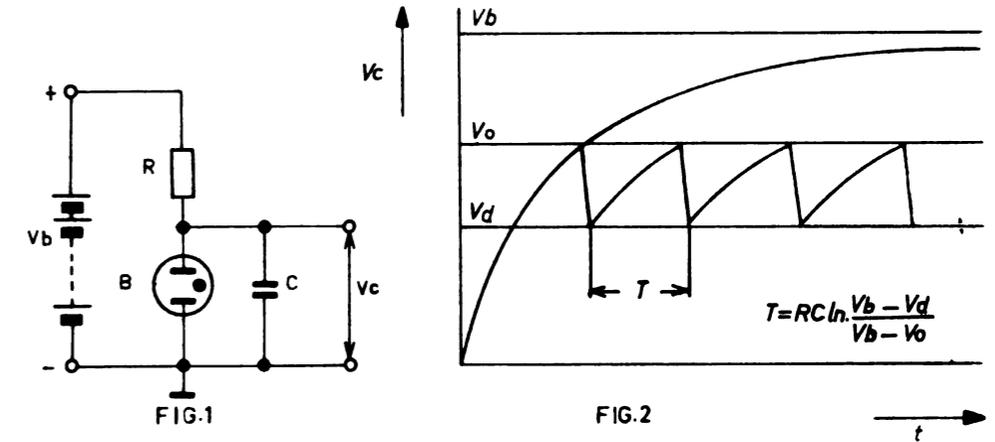
Both are shown in fig. 5.

A new neon tube, the Z70U, has been applied in the oscillators for the lowest frequencies (C-65,4 cps, C sharp-69,2 cps, D-73,4 cps, D-sharp-77,4 cps, E-82,4 cps).

3. Amplifiers and filters

The amplifier circuits and the vibrato oscillator are mounted together on one panel. Three triodes are used as amplifier tubes. One triode section of B83 (ECC83) is used for the vibrato oscillator. The second triode is used as follows, independently of the position of SK11 :

- amplifier for descant and bass (SK11 in pos. 1)
- amplifier for descant (SK11 in pos. 2 or 3)



TRA 1462

TRA 1463

When SK11 is in position 1 both the bass and the descant signals are fed to the filters.

The filters are selected by means of SK4, 5, 6, 7 and 8.

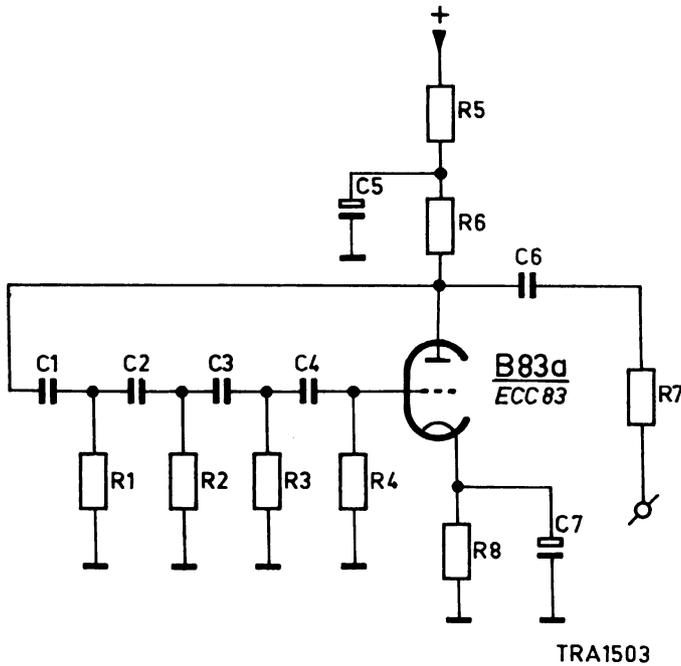
In this way a note can be given any desired timbre.

When SK11 is in pos. 2, the bass notes have a fixed timbre (that is, they cannot be adjusted by means of the filter switches) and the 8' register for the bass is switched off. The descant notes are again normally fed to the filters across B83.

TRA564 shows the main diagram of the filter circuits. By means of SK4 to SK8 inclusive the filter can be switched on both separately and in groups.

The voltages of the sawtooth generators are fed to B83 across SK1, 2 or 3 or across combinations of these circuits. From B83 these signals are fed to the filters. SK6 is an exception. It gets a 2' signal independently of B83.

4. The vibrato oscillator



The vibrato oscillator is an RC oscillator. In order to get the circuit to oscillate, the output signal and the input signal must be equal in phase and in amplitude. The a.c. voltage across the anode is in opposite phase to the a.c. grid voltage. 180° of phase shift is obtained by means of the 4 RC combinations (total 360° : the output signal in phase with the input signal).

Thus, per combination we have,

$$\frac{180^\circ}{4} = 45^\circ$$

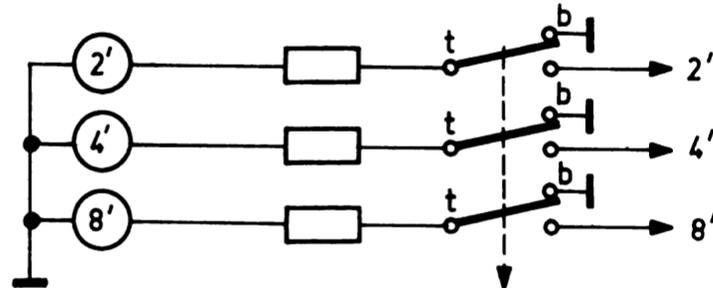
The frequency of the signal is,

$$\frac{1}{2\pi RC}$$

The amplification of the valve must be so that the attenuation resulting from the RC network is roughly equal to the amplification of the valve.

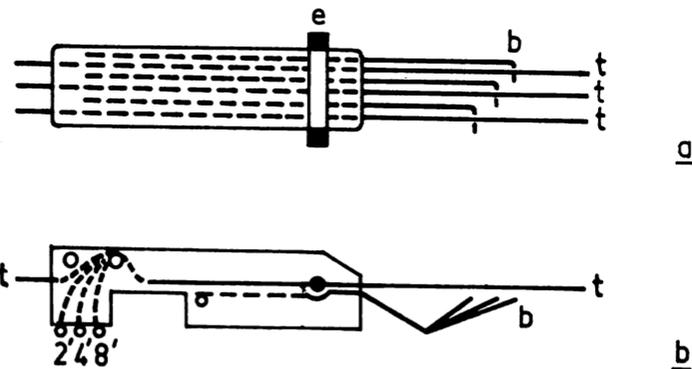
The generated voltage has a frequency of roughly 6 c/s.

5. The keyboard



When a key is pressed down the three note contacts are pressed against the three rail contacts, that is for the 2', 4' and 8' ranges. When the key is in the rest position the tone contacts are earthed. This prevents crosstalk between tone and rail contacts.

Figs. a and b shows the mechanical construction of a contact block with three contacts.



Contact blocks with 5 contacts are used for all keys in the bass because of the chords available when SK11 is in position 3. The straight wires are the tone contacts (t) which, when the key is in the rest position, are close up against the earth rail (e). The bent wires are the rail contacts (b). The contact points are self-cleaning for, when the key is pressed down, they brush against and along one another.

6. The stabilised supply unit

The supply unit must be stabilised to ensure that there is no voltage change due to mains voltage variations. The correct oscillation frequency of the divider sections depends on the supply voltage. The circuit works in the following way. A slight increase in d.c. voltage (V) across point 1 is led back across the triode to the pentode grid in such a phase that the voltage between anode and cathode will increase.

The result is that the voltage variation of V will decrease. A newly developed miniature neon tube (ZZ1000) is used to obtain a constant cathode voltage of the triode to earth. The d.c. voltage can be regulated with a potentiometer.

Mechanical parts

4822 106 00464	Ornamental plate frontside
P5 342 34/KE	Foot
A3 493 47	Music support
4822 107 00669	Music support (plastic)
A3 493 21	Spring for A3 493 47
4822 162 01053	Plastic foot for A3 493 47
A3 546 83	Key cover, black
A3 546 84	Key cover, white
A3 546 82	Contact block, 3 poles
A3 546 81	Contact block, 5 poles
A3 187 45	Voltage adapter
A3 486 99	Switch strip (spring)
P5 261 92/HA	Frame (mounting, switch buttons)
A3 492 81	Rotary switch
A3 493 32	Ornamental strip (for plugs)
A3 493 04	Knobs (phono and chord)
A3 493 05	Knobs (volume and balance)
994/04	Spring fixing knobs
979/F5X1	5 poles socket
979/20	Spring for 5 poles socket
4822 211 00965	Socket earphone
A3 715 60	Nut for socket earphone
A3 493 39	6 poles switch unit
P5 261 86/GY	Knob dark grey
P5 261 86/GH	Knob light grey
P5 261 86/JT	Knob red
4822 134 00225	Mains switch
A3 493 46	3 poles switch unit
4822 108 00492	Spring for key
4822 108 00493	Screw for key
4822 108 00507	Felt ring for key's
978/M5X1	5 poles male plug
A9 881 05/T30	Glue for key covering

Electrical parts

A3 511 22	Mains transformer	S101-112
4822 117 00379	Output transformer	S152-153
A3 510 91	Filter coil	S150
A3 510 91	Filter coil	S151
A3 510 90	Oscillator coil, C#	S1-2
A3 510 90	Oscillator coil, D	S3-4
A3 510 90	Oscillator coil, D#	S5-6
A3 510 90	Oscillator coil, E	S7-8
A3 510 90	Oscillator coil, F	S9-S10
A3 510 90	Oscillator coil, F#	S11-12
A3 510 90	Oscillator coil, G	S51-52
A3 510 90	Oscillator coil, G#	S53-54
A3 510 90	Oscillator coil, A	S55-56
A3 510 90	Oscillator coil, A#	S57-58
A3 510 90	Oscillator coil, B	S59-60
A3 510 90	Oscillator coil, C	S61-62
A3 508 93	Pilot lamp	L1

Capacitors

C1	4822 069 00852
C4	4822 069 00852
C701-703	AC 5331/25+25
C761-772	AC 8208/8+8
C763	909/A100
C774	909/A100

Resistors

R1C3 - R116 - R153 - R166 - R203 - R216 - R253 - R266 - R303 - R317 - R353 - R403 :	E 097 AC/1M
R105 - R107 - R109 - R111 - R118 - R120 - R122 - R124 - R155 - R157 - R159 - R161 - R168 - R170 - R172 - R174 - R205 - R207 - R209 - R211 - R218 - R220 - R222 - R224 - R255 - R257 - R259 - R261 - R268 - R270 - R272 - R274 - R305 - R307 - R309 - R312 - R319 - R321 - R323 - R 326 - R355 - R357 - R359 - R361 - R405 - R407 - R409 - R411 - R415 :	E 097 AC/2M
R701	48 766 10/33K
R 702	E 001 BD/A10K
R704	E 097 AC/2K
R707	E 001 AK/A2K7
R708	E 001 AK/A2K7
R709	E 001 AC/A100E
R710	E 001 AC/A100E
R772-773	E 091 CG/OOB84
R778	916/GL40K+160K

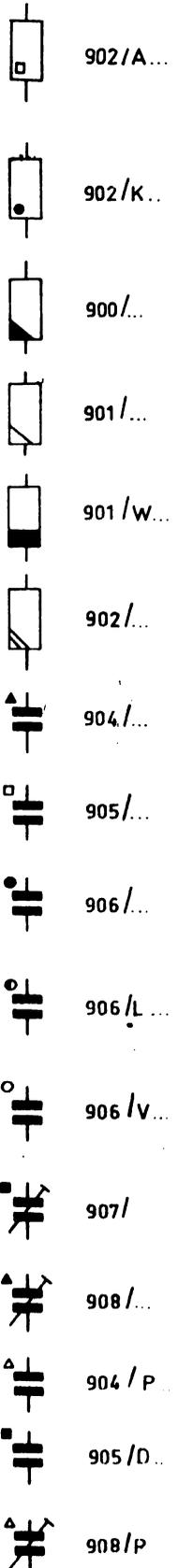
Voltages shapes in the apparatus

The voltage shapes at different points in the circuit are shown in Figs. 1-33. They are measured with respect to earth by means of a GM 5602.

The amplitude and the position of the control elements is shown in every figure.

Button a (440 c/s) is depressed in Figs. 5 ... 24.

The measuring spot is indicated in circuit diagram TRA1476 by means of the encircled numbers. These numbers correspond to the figure number.



"Each square of the measuring graticule is 1 x 1 cm "

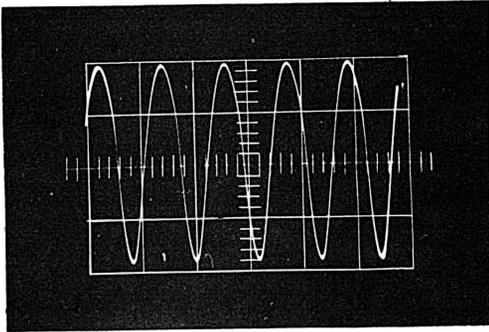


Fig. 1
Vertical : 20 V/cm

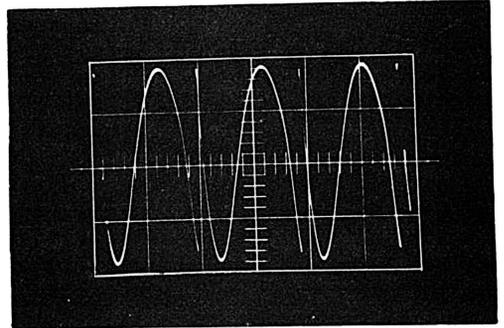


Fig. 2
Vertical : 5 V/cm

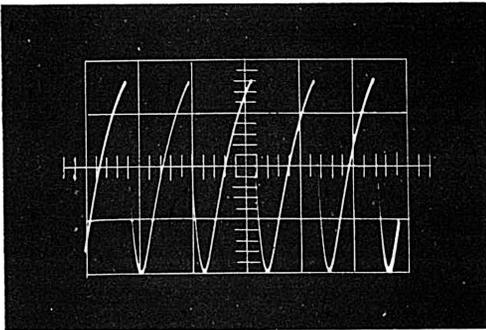


Fig. 3
Vertical : 0,75 V/cm

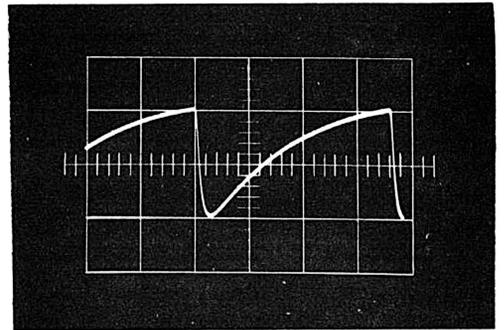


Fig. 4
Vertical : 2 V/cm

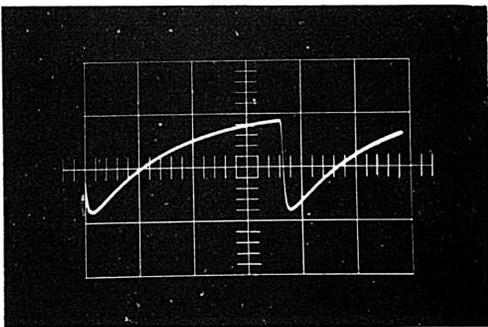


Fig. 5
Vertical : 0,2 V/cm

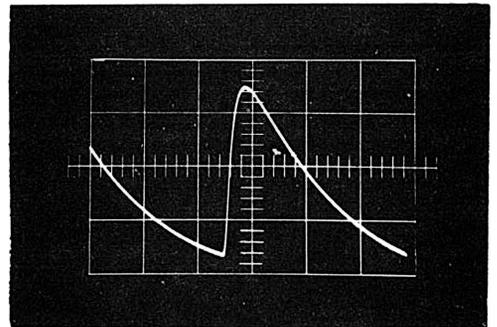


Fig. 6
Vertical : 2 V/cm
SK3 switched on

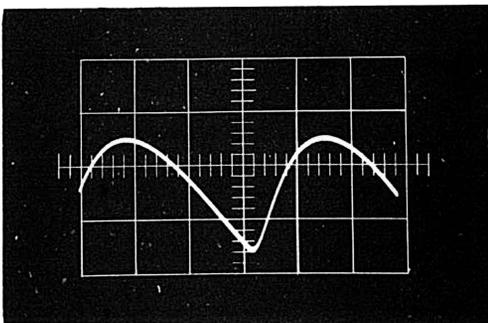


Fig. 7
Vertical : 1 V/cm
SK3, SK4 switched on

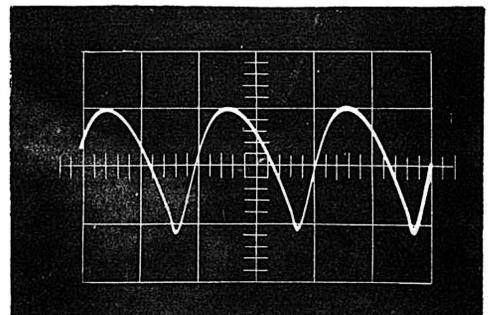


Fig. 8
Vertical : 0,5 V/cm
SK3, SK4 switched on

"Each square of the measuring graticule is 1 x 1 cm"

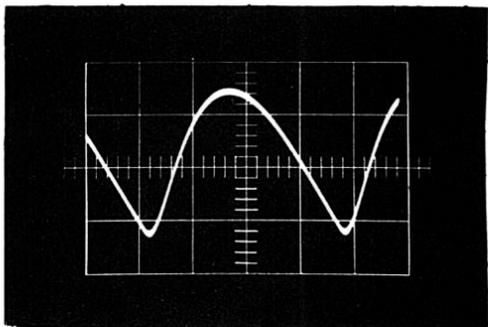


Fig. 9
Vertical : 1 V/cm
SK3, SK4 switched on

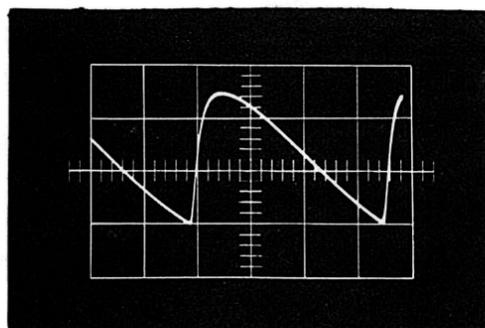


Fig. 10
Vertical : 1 V/cm
SK3, SK4, SK5 switched on

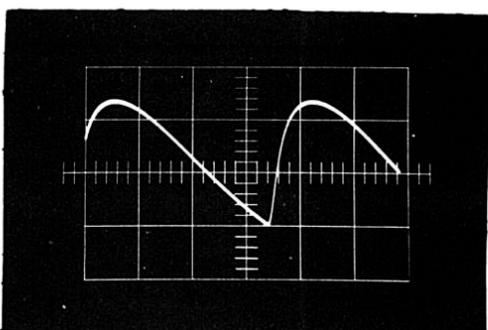


Fig. 11
Vertical : 0,2 V/cm
SK3, SK4, SK5 switched on

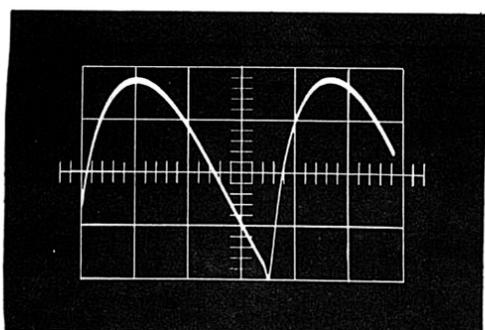


Fig. 12
Vertical : 0,075 V/cm
SK3, SK4, SK5, SK6 switched on

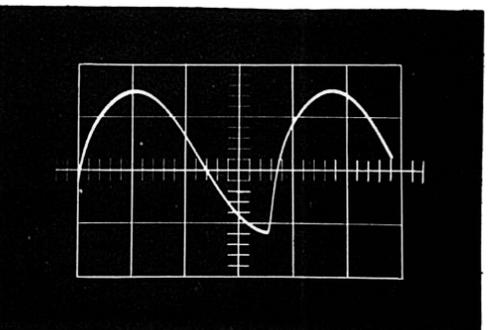


Fig. 13
Vertical : 0,5 V/cm
SK3, SK4, SK5, SK6, SK7 switched on

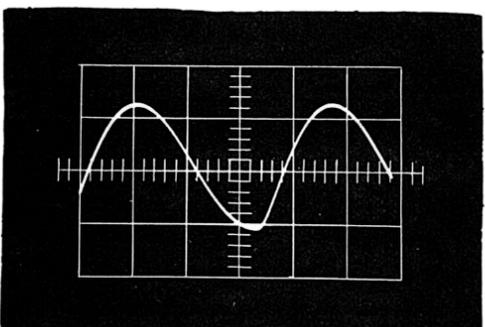


Fig. 14
Vertical : 0,5 V/cm.
SK3, SK4, SK5, SK6, SK7 switched on.

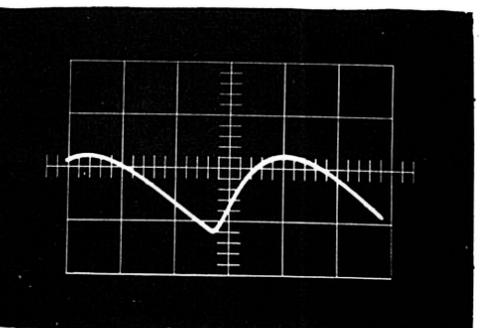


Fig. 15
Vertical : 1 V/cm.
SK3, SK4, SK5, SK6, SK7 switched on.

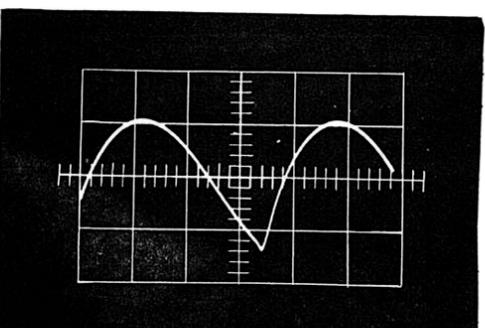


Fig. 16
Vertical : 0,2 V/cm.
SK3, SK4, SK5, SK6, SK7 switched on.

"Each square of the measuring graticule is 1 x 1 cm"

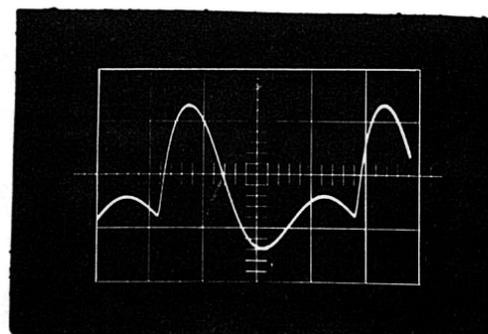


Fig. 17
Vertical : 0,5 V/cm.
SK3, SK4, SK5, SK6, SK7, SK8 switched on.

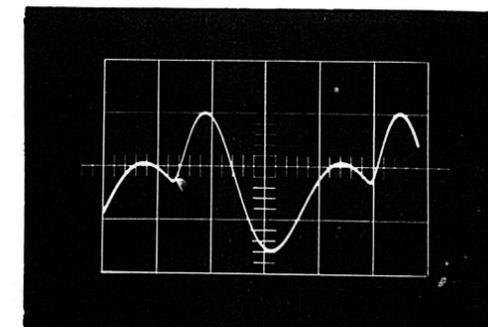


Fig. 18
Vertical : 0,5 V/cm
SK3,SK4,SK5,SK6,SK7,SK8 switched on

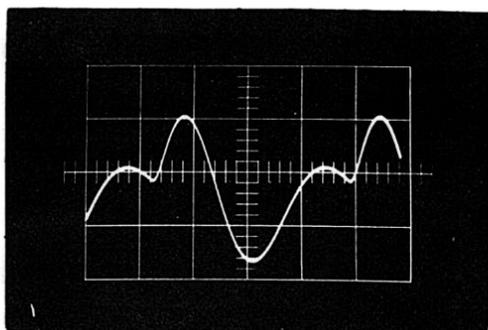


Fig. 19
Vertical : 0,5 V/cm
SK3,SK4,SK5,SK6,SK7,SK8 switched on

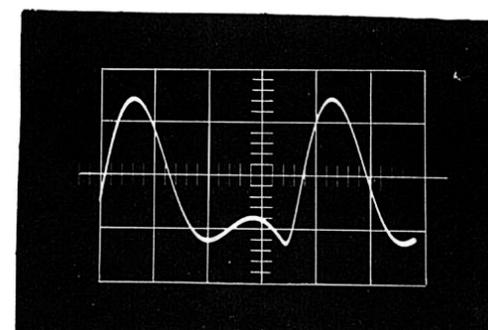


Fig. 20
Vertical : 0,2 V/cm
SK3,SK4,SK5,SK6,SK7,SK8 switched on

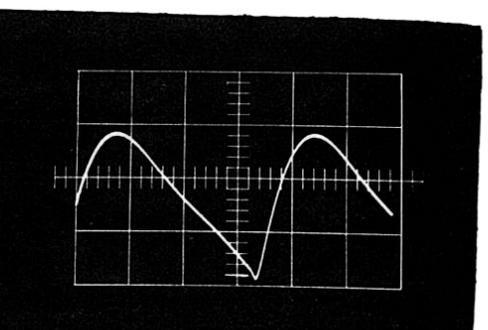


Fig. 21
Vertical : 0,2 V/cm
SK3,SK4,SK5,SK6,SK7,SK8 switched on

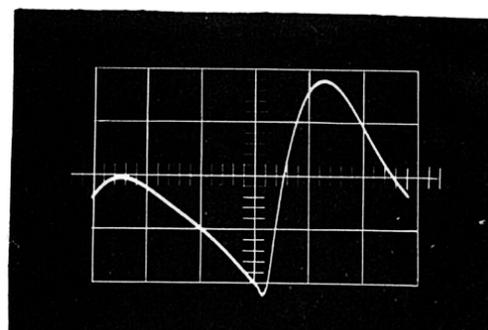


Fig. 22
Vertical : 0,2 V/cm
SK2,SK3,SK4,SK5,SK6,SK7,SK8 switched on

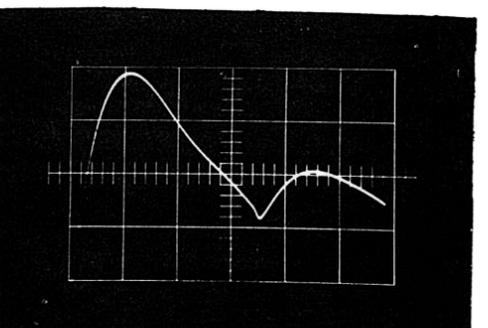


Fig. 23
Vertical : 0,2 V/cm
SK1,SK2,SK3,SK4,SK5,SK6,SK7,SK8 switched on

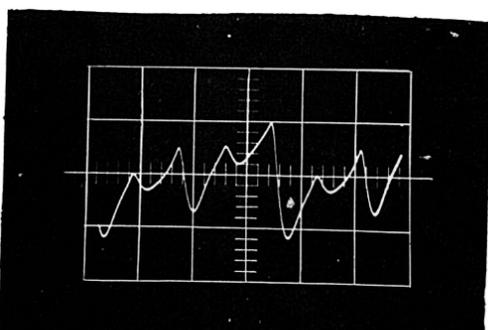


Fig. 24
Vertical : 5 V/cm
SK1,SK2,SK3,SK4,SK5,SK6,SK7,SK8 switched on

"Each square of the measuring graticule is 1 x 1 cm"

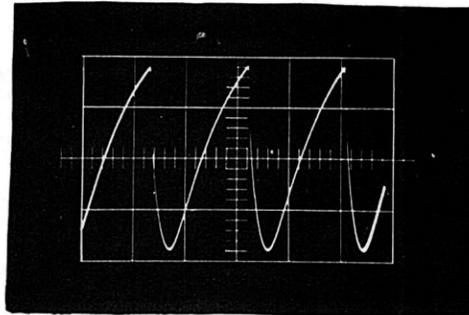


Fig. 25
Vertical : 0,5 V/cm
Key "A" pressed down
SK10 in pos. "1", SK11 in pos. "2"

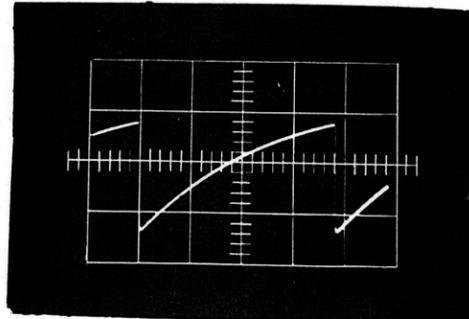


Fig. 26
Vertical : 0,2 V/cm
Key "A" pressed down
SK10 in pos. "1", SK11 in pos. "2"

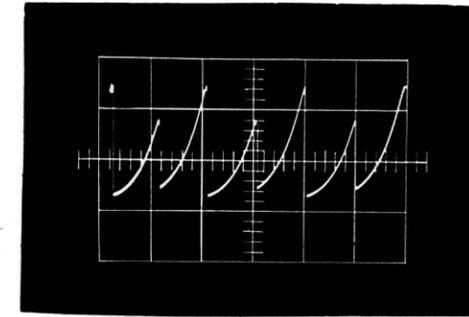


Fig. 33
Vertical : 1 V/cm
Supply voltage "+1" not right

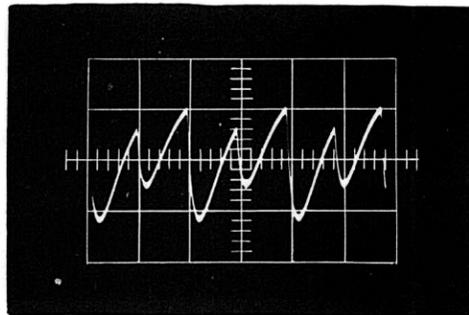


Fig. 27
Vertical : 0,075 V/cm
Key "A" pressed down
SK10 in pos. "1", SK11 in pos. "2"

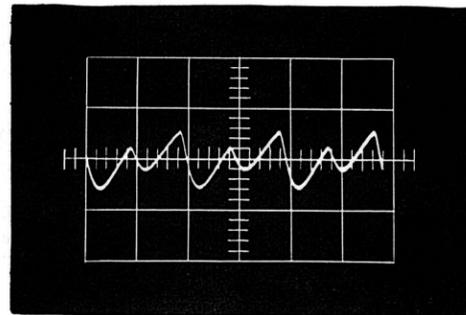


Fig. 28
Vertical : 0,075 V/cm
Key "A" pressed down
SK10 in pos. "1", SK11 in pos. "2"

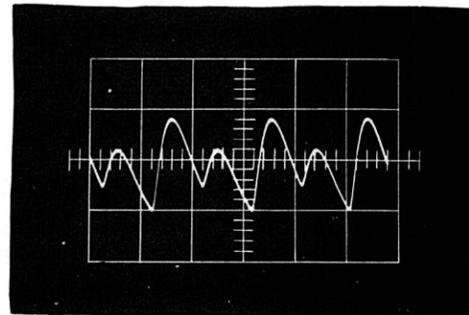


Fig. 29
Vertical : 0,2 V/cm
Key "A" pressed down
SK10 in pos. "1", SK11 in pos. "2"

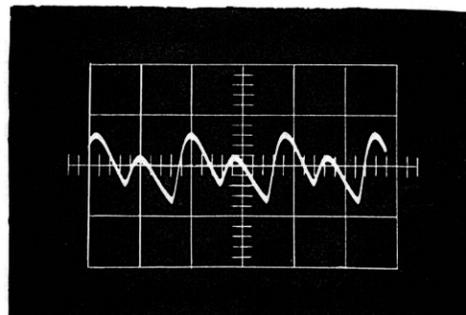


Fig. 30
Vertical : 0,075 V/cm
Key "A" pressed down
SK10 in pos. "1", SK11 in pos. "2"

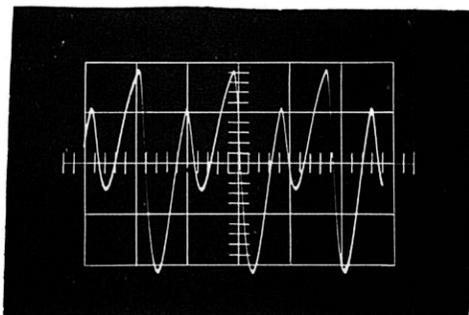


Fig. 31
Vertical : 1 V/cm
Key "A" pressed down
SK10 in pos. "1", SK11 in pos. "2"

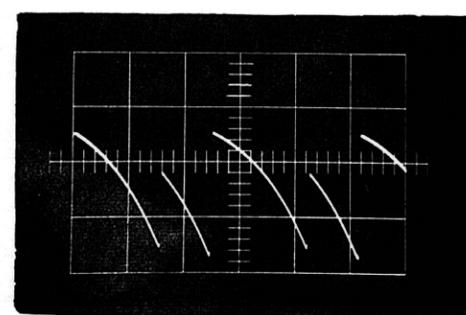


Fig. 32
Vertical : 0,5 V/cm
Not synchronized

Tuning instructions

a. Comparison method with the tuning fork generator

Brand : Wandel und Goltermann
Type : STG1
Philicorda : SK1 and SK5 switched on
SK10 and SK11 at pos. 1
Balance regulator in neutral position

Tuning fork generator : "Standard pitch" knob at position 440 c/s
"Detuning" knob in neutral position.

Tuning fork generator		Philicorda		ear	Oscillogr.
a ¹	If an oscilloscope is used, feed the output signal from the generator to the horizontal input	a ¹	If an oscilloscope is used, feed the output signal from the Philicorda to the vertical input	Adjust to zero deviation	Adjust to stationary circle
a sharp ¹		a sharp ¹			
b ¹		b ¹			
c ²		c ²			
c sharp ²		c sharp ²			
d ²		d ²			
d sharp ²		d sharp ²			
e ²		e ²			
f ²		f ²			
g ²		g ²			
g sharp ²	g sharp ²				
a ²	a ²				

b. Tuning by ear

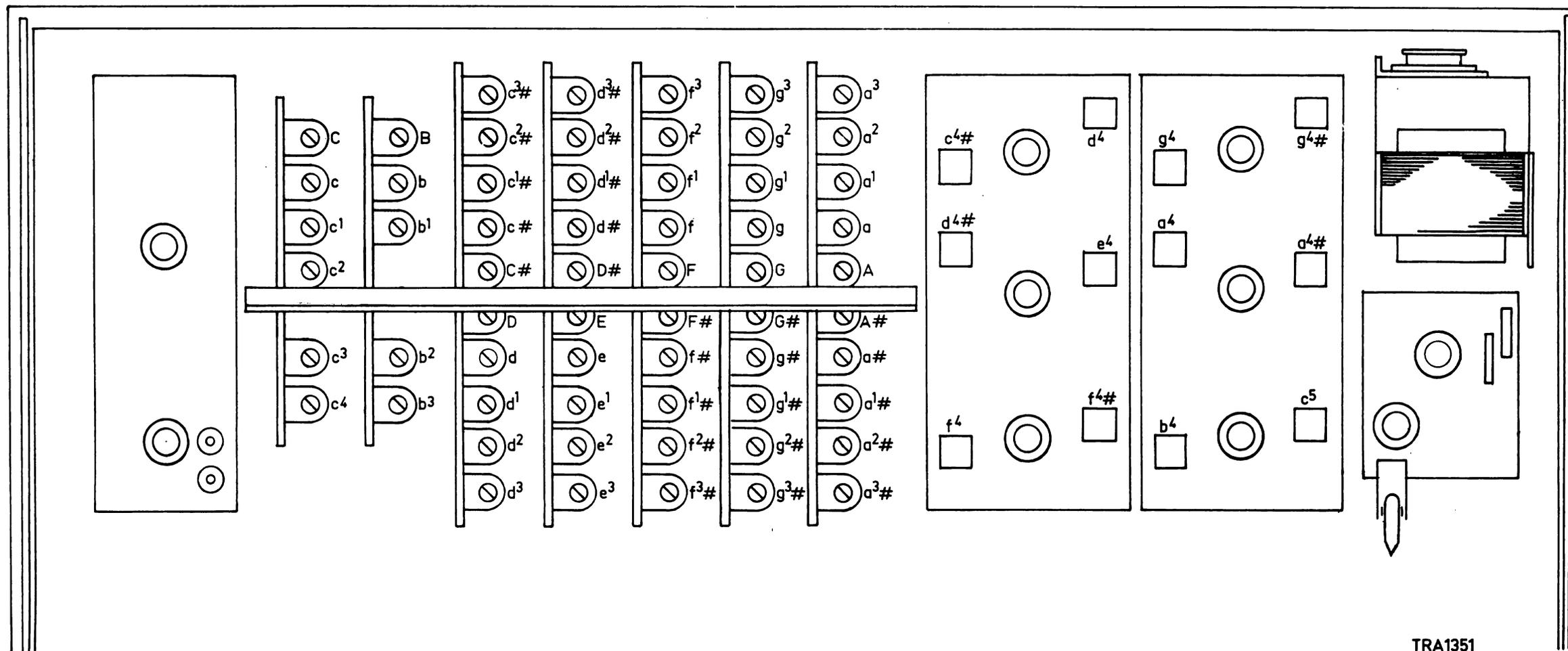
SK1 and SK5 switched on.
SK10 and SK11 at position 1.
Balance regulator in central position.

With a tuning fork tune a' to 440 c/s (unison). Then tune the second note given in the table below (that is e') correctly with reference to the first. That is to say, no deviations should be audible. Then the second note is tuned so much lower (turn the core inwards) that in ten seconds the number of such fluctuations in heard in accordance with the table given below.

a' = 440 c/s	
Notes	Number of fluctuations in 10 sec.
a' - e'	14
e' - b'	10
b' - f sharp'	14
f sharp' - c sharp'	14
c sharp' - g sharp'	10
g sharp' - d sharp'	14
d sharp' - a sharp'	10
a sharp' - f'	14
f' - c'	14
c' - g'	10
g' - d'	14
d' - a'	10

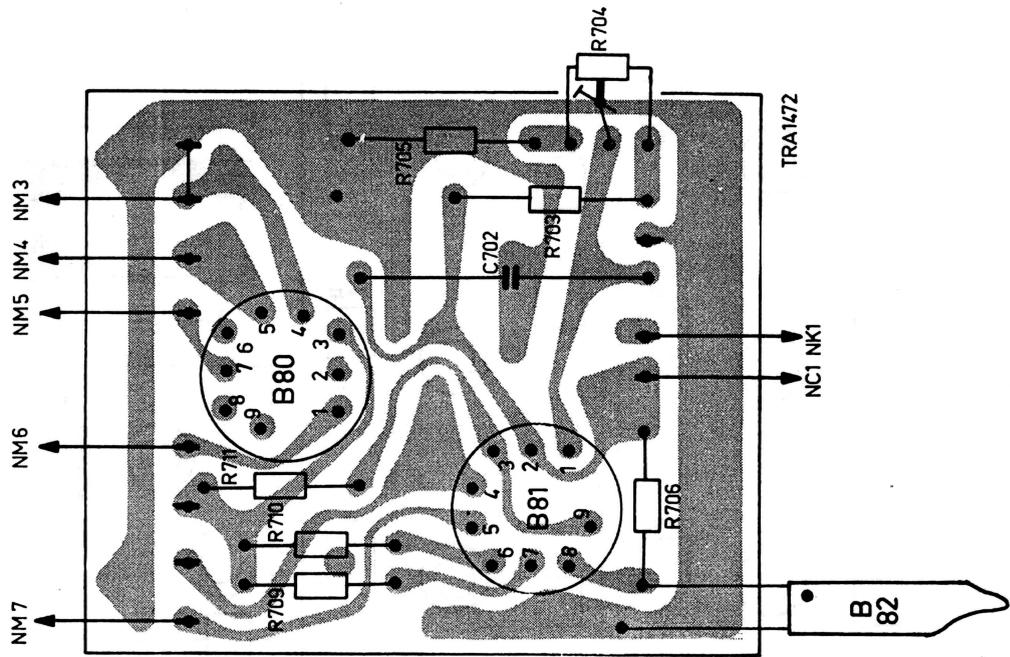
Chords table

Key	Chord	Composed of
C	C maj	C c' e g
Cis	A7	Cis cis' A g
D	D min	D d' f a
Dis	E ^b maj	Dis dis' g ais
E	E min	E e' g b
F	F maj	F f' a c'
Fis	D. maj	Fis fis' d a
G	G maj	G g' b d'
Gis	E7	Gis gis' d e
A	A min	A a' e c'
Ais	B ^b maj	Ais ais' f d'
B	G7	B b' f g
c	C min	c c" dis g
cis	B9	cis cis" Dis a
d	G min	d d" G ais
dis	F7	dis dis" F a
e	C7	e e" C ais

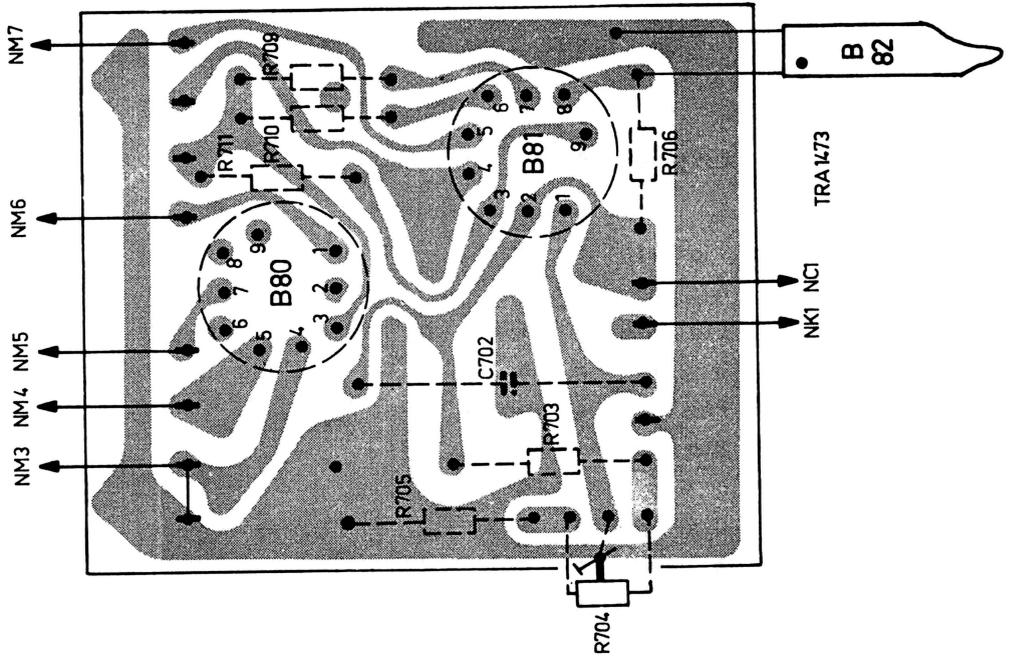


UNIT N

C	702.	703.	705.	704.
R	709.710.706.711.			

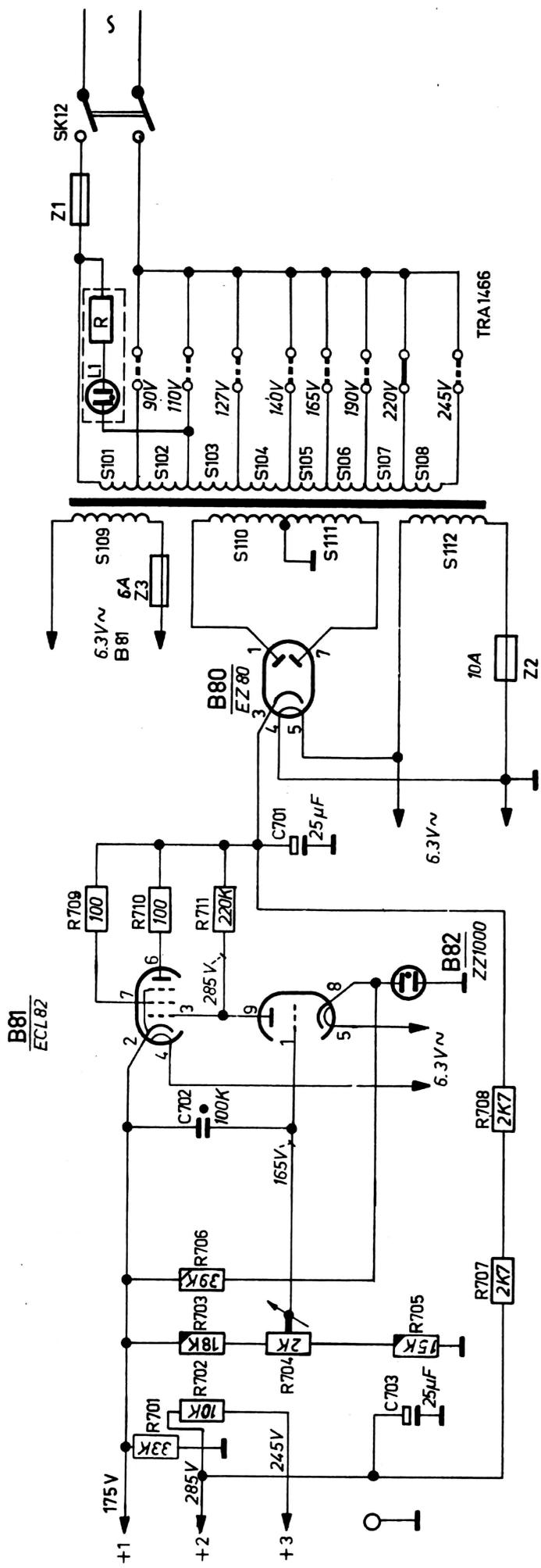


C	702.	711.706.710.709.
R	704. 705. 703.	



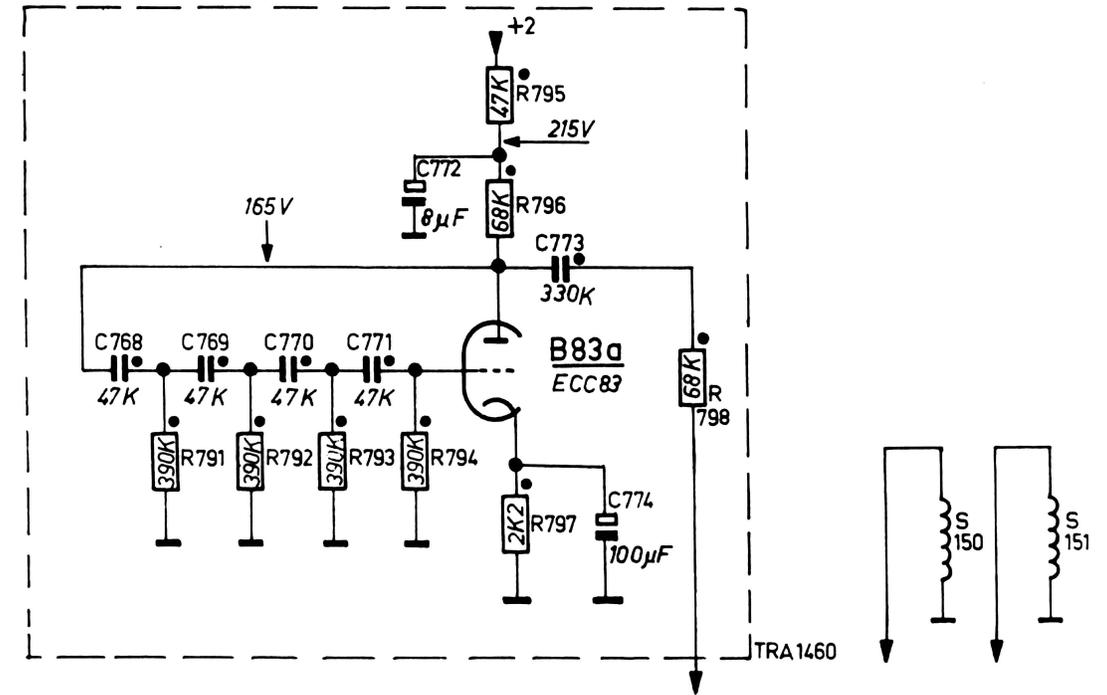
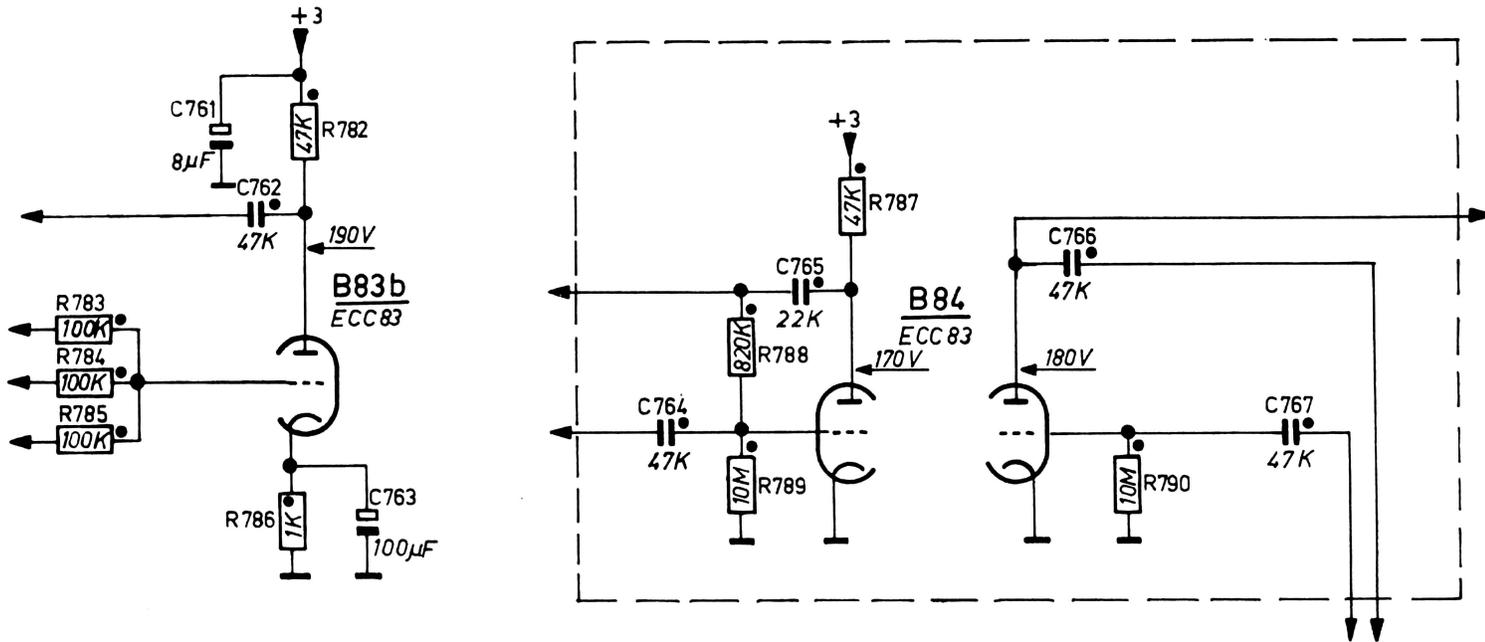
UNIT N

C	703.	702.	701.
R	701. 702. 703.704.705. 706.707.	708.	709.710.711.



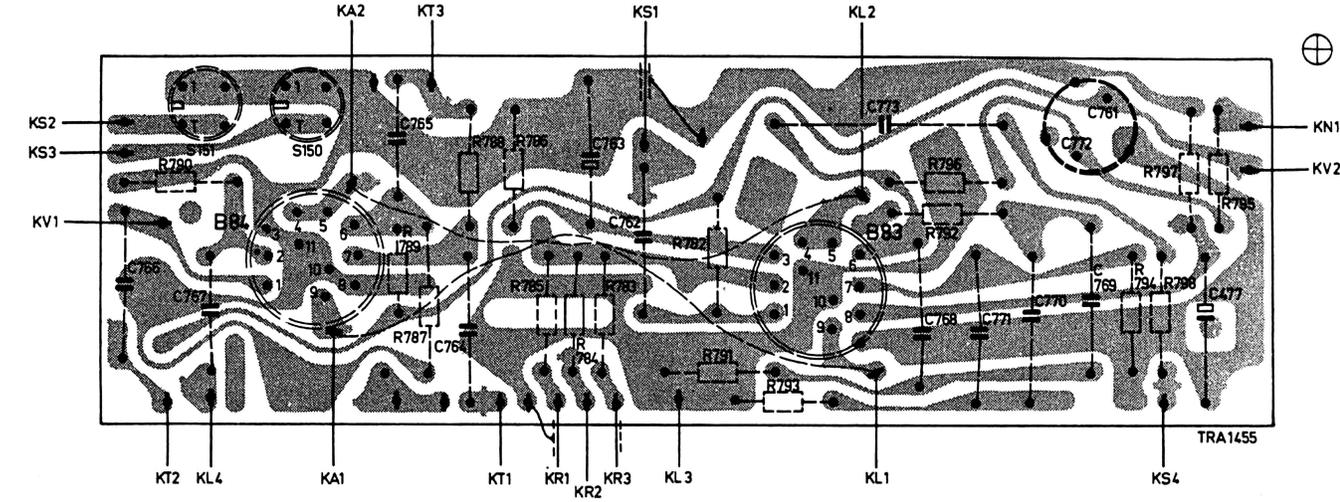
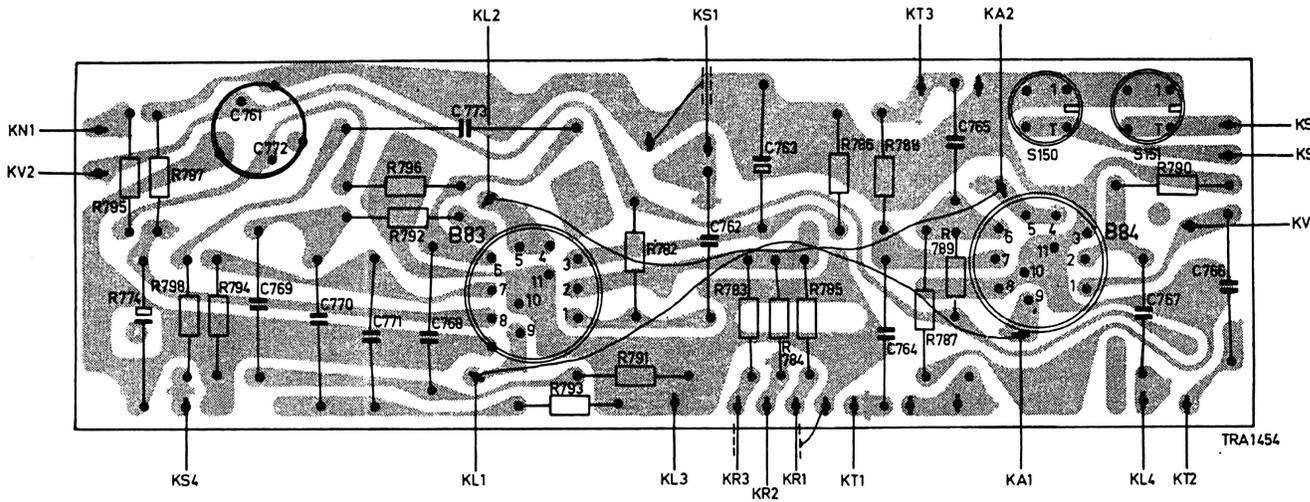
UNIT K

C	761. 762.	763.	764.	765.	766.	767.	768.	769.	770.	771.	772.	773.	774.
R	783.784.785.	786. 782.	788. 789. 787.		790.		791.	792.	793.	794.	795.796.797.	798.	



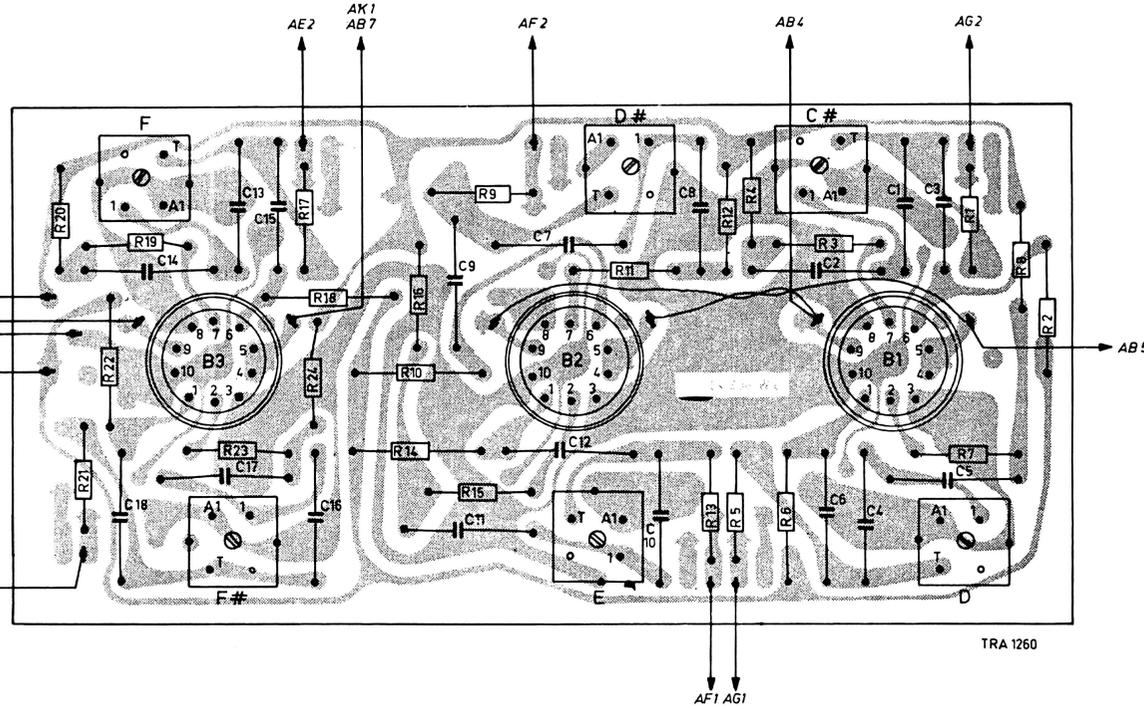
C	774.	761.769.772. 770.	771.	768. 773.	762.	763.	764.	765.	767.	766.
R	795. 797. 798.794.	796.792.	793.	782.791.	783.784.785.	786.	788. 787.789.	790.		

C	766.	767.	765.	764.	763.	762.	773.	768.	771.	770. 772.769.761.	477.
R	790.		789.787. 788.	786.	785.784.783.	791.782.	793.	792.796.		794.798. 797. 795.	

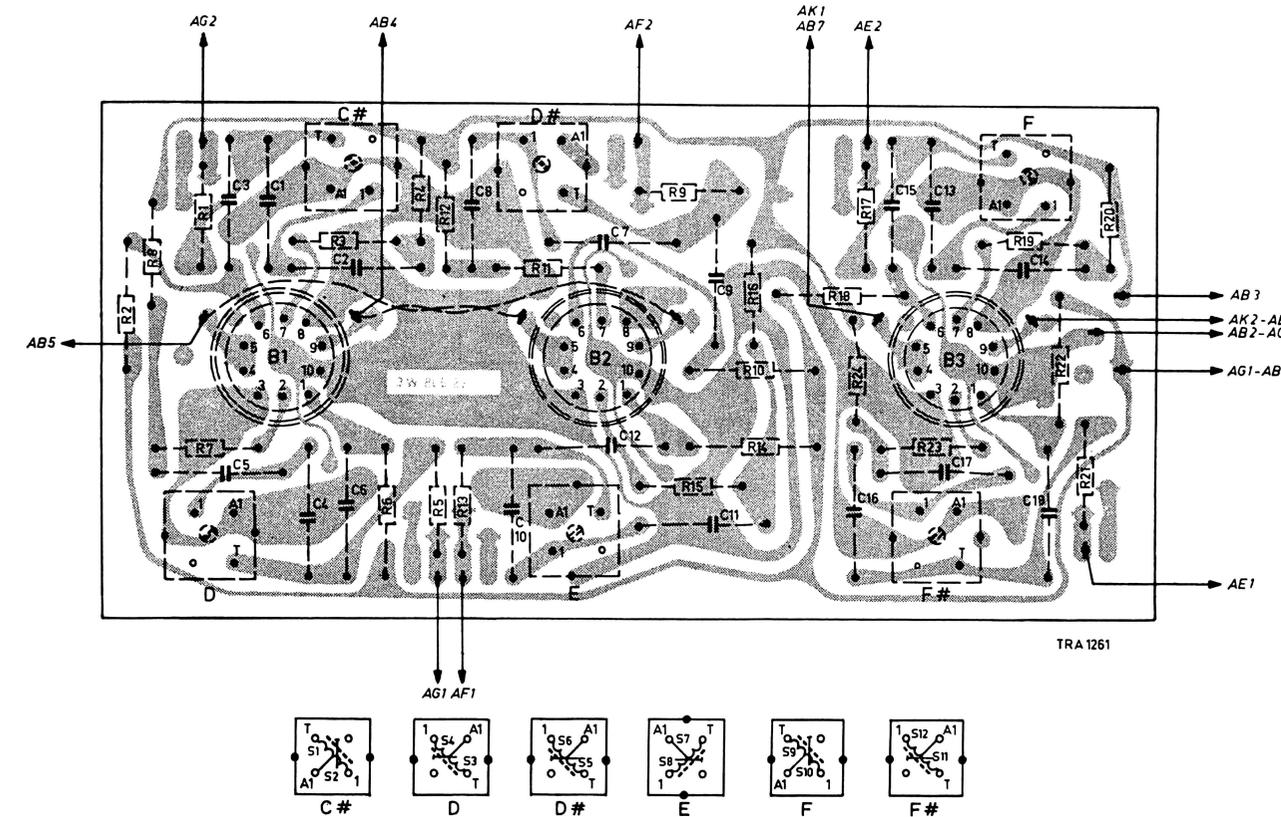


UNIT A

C	18	14	17	13	15	16	9	11	12	7	10	8	2	5	4	1	3	5			
R	20	21	22	19	23	17	24	18	15	9	11	13	12	5	4	6	3	1	7	8	2

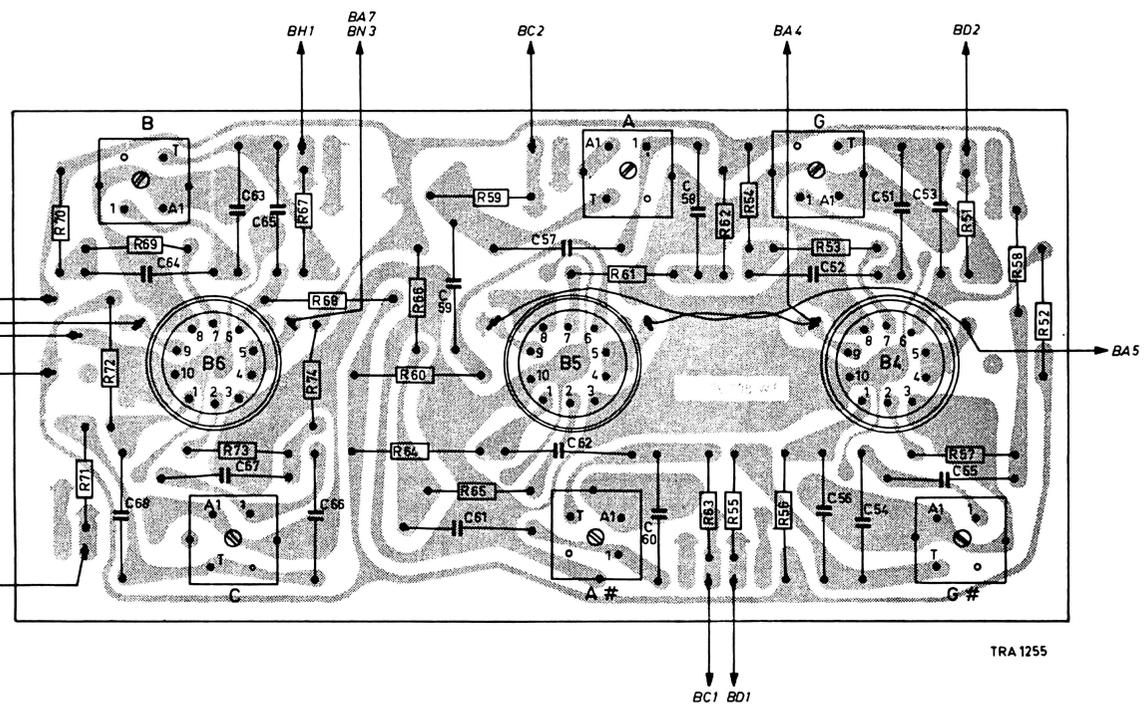


C	3	5	1	4	6	2	8	10	7	12	9	11	15	16	14	18	17	13	15	14	18			
R	2	8	1	7	3	6	4	5	12	13	11	9	15	16	10	14	18	24	17	23	19	22	21	20

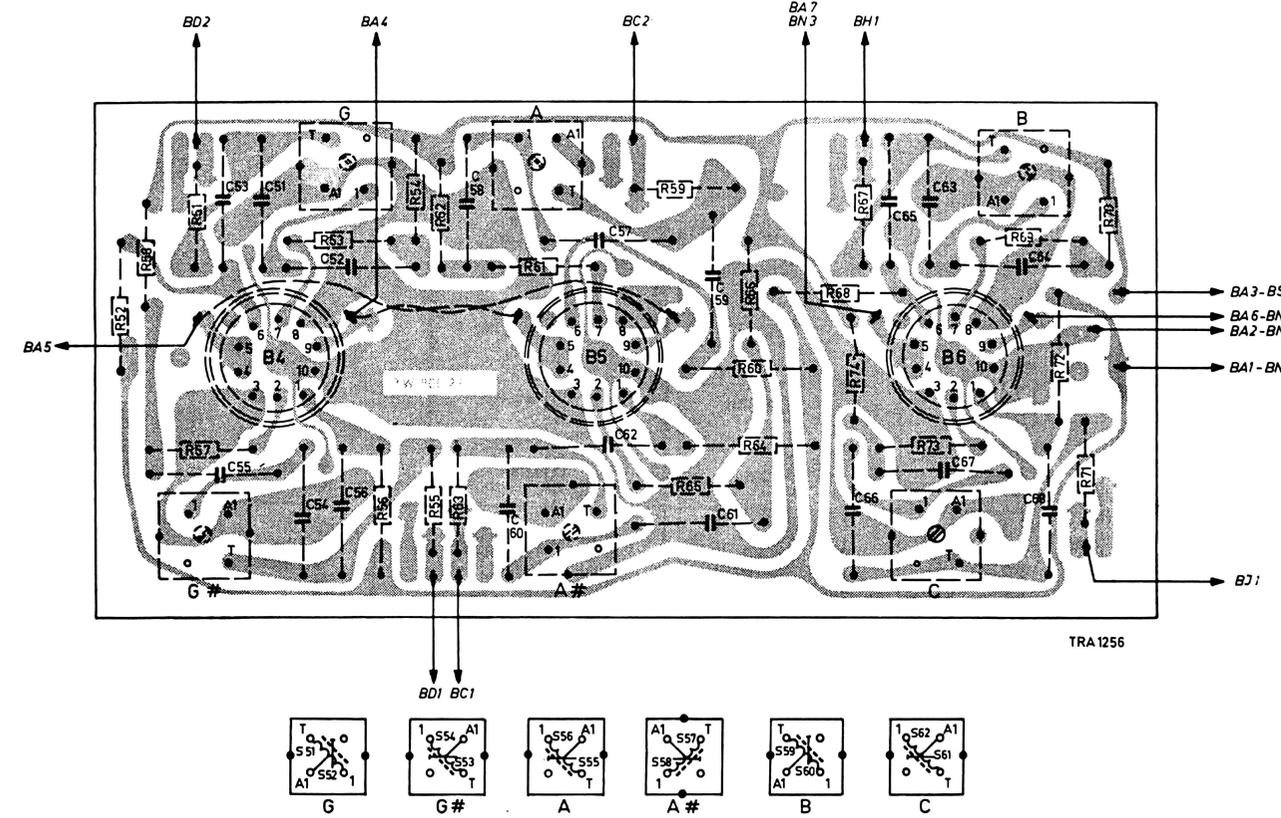


UNIT B

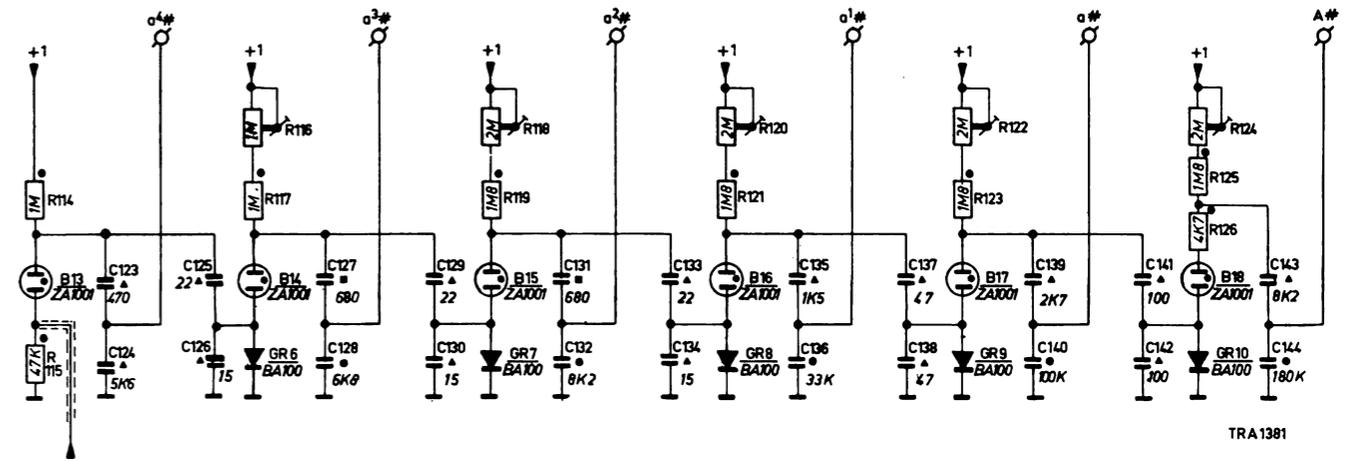
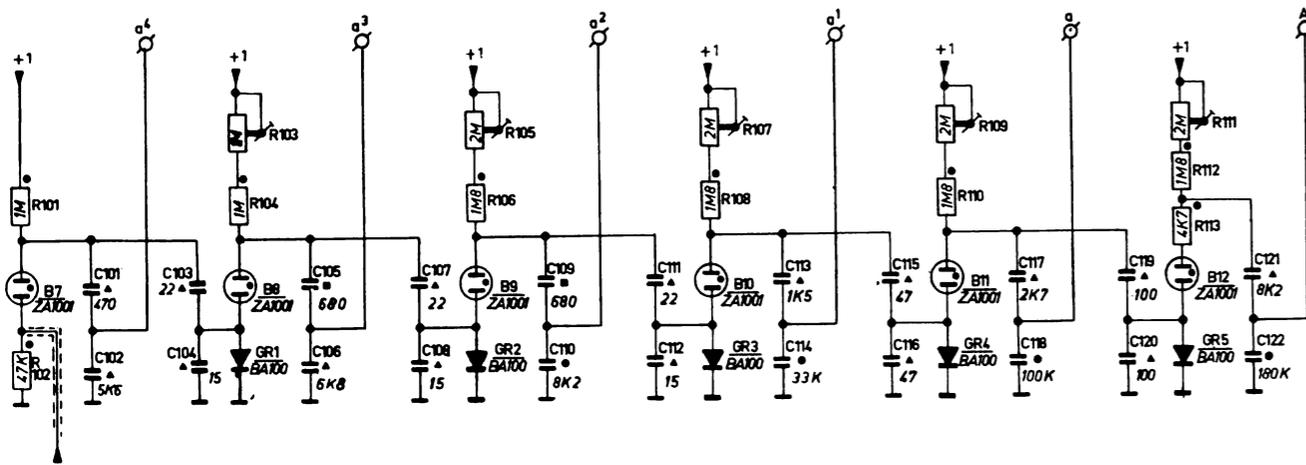
C	68	64	67	63	65	66	59	61	62	57	60	58	52	56	54	51	53	55				
R	70	71	72	69	73	67	74	68	64	66	60	59	61	63	62	55	54	53	51	57	85	52



C	55	53	51	54	56	52	58	60	57	62	61	56	66	65	63	67	64	68						
R	52	58	57	51	53	56	54	55	62	63	61	59	65	60	66	64	68	74	67	73	69	72	71	70

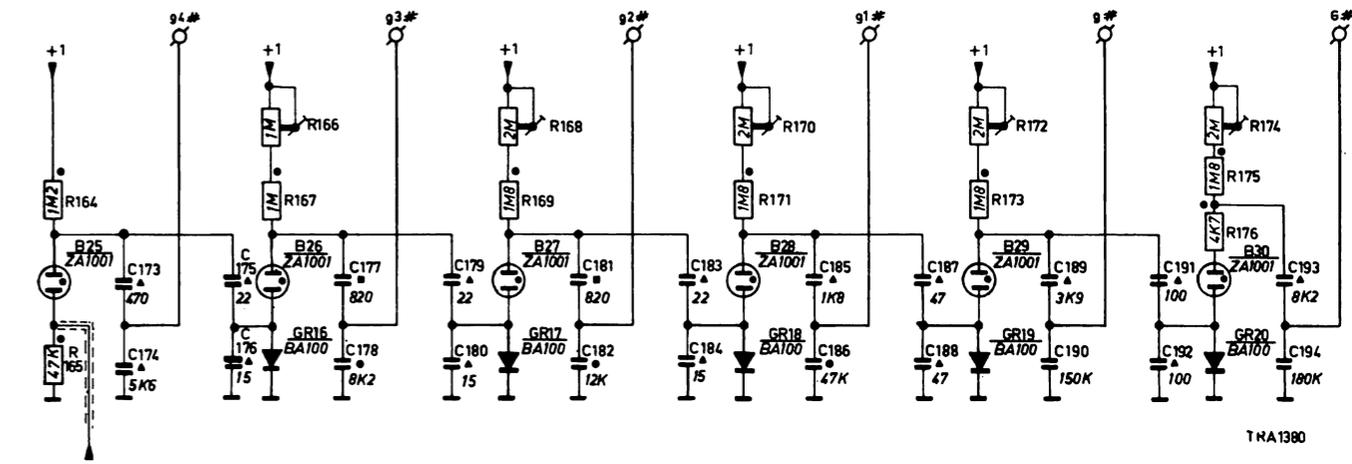
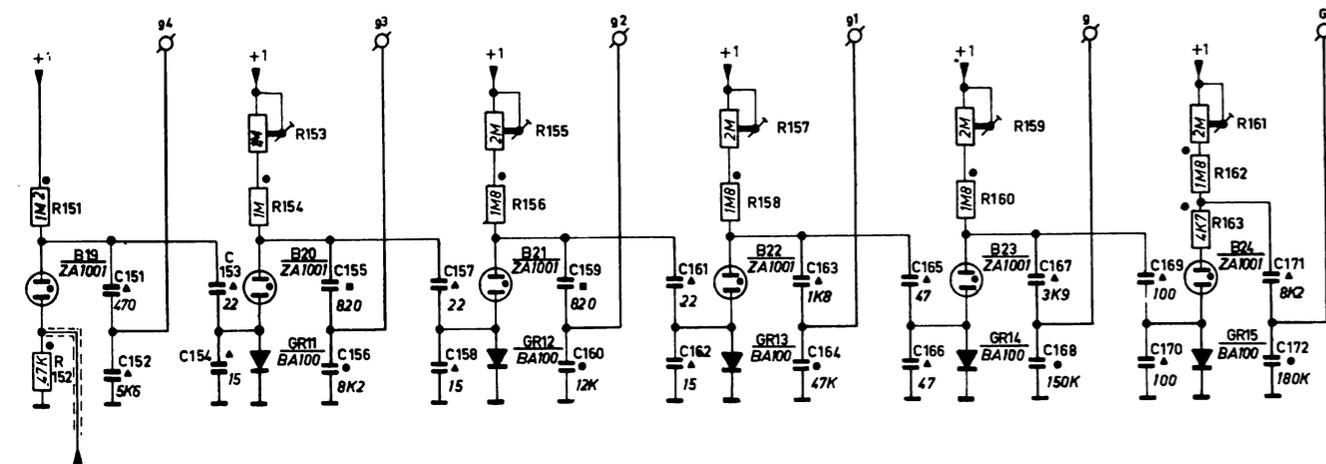


UNIT C



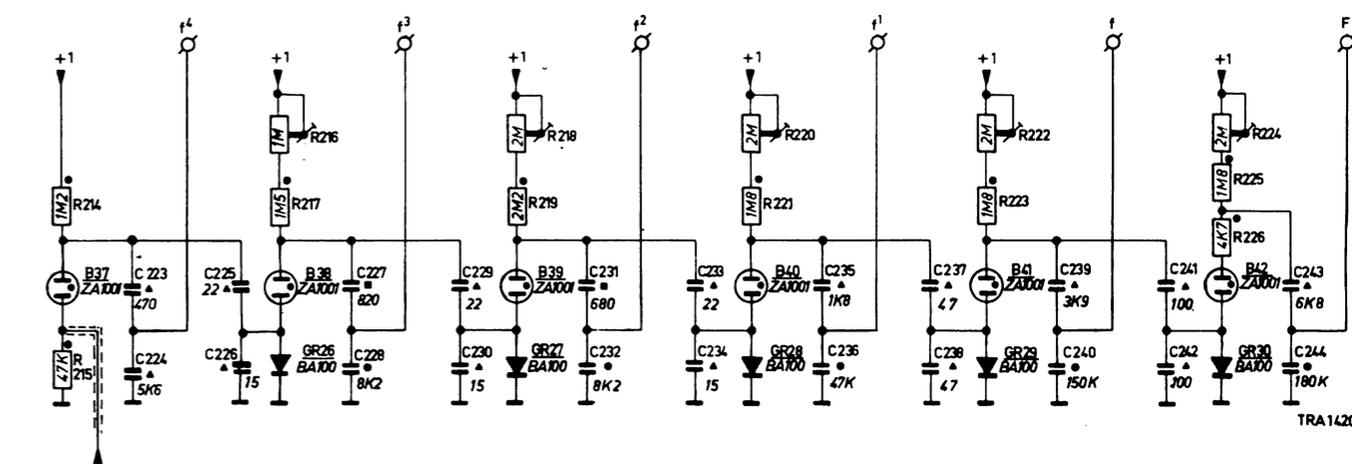
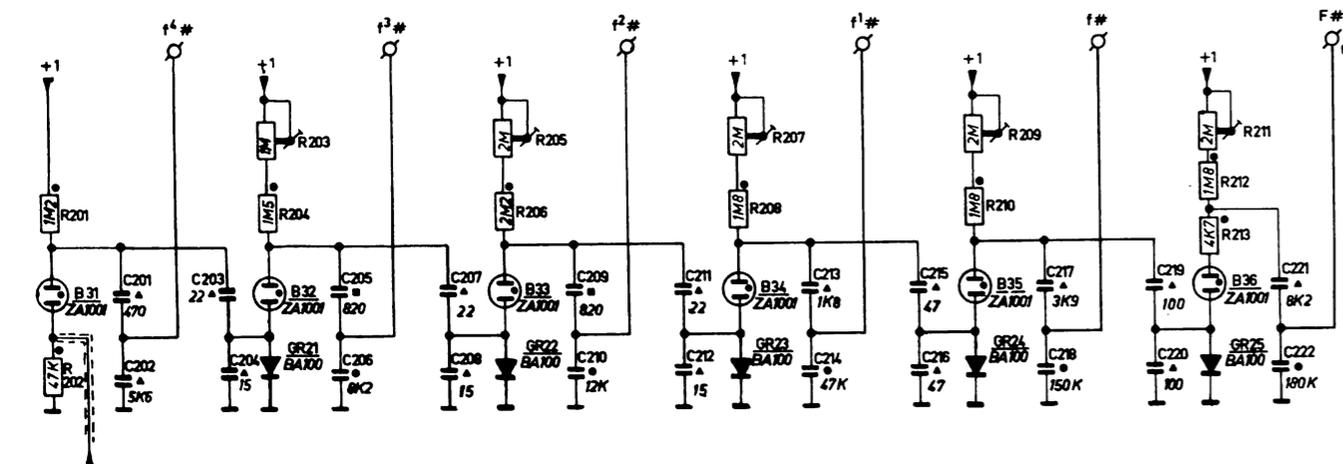
TRA1381

UNIT D



TRA1380

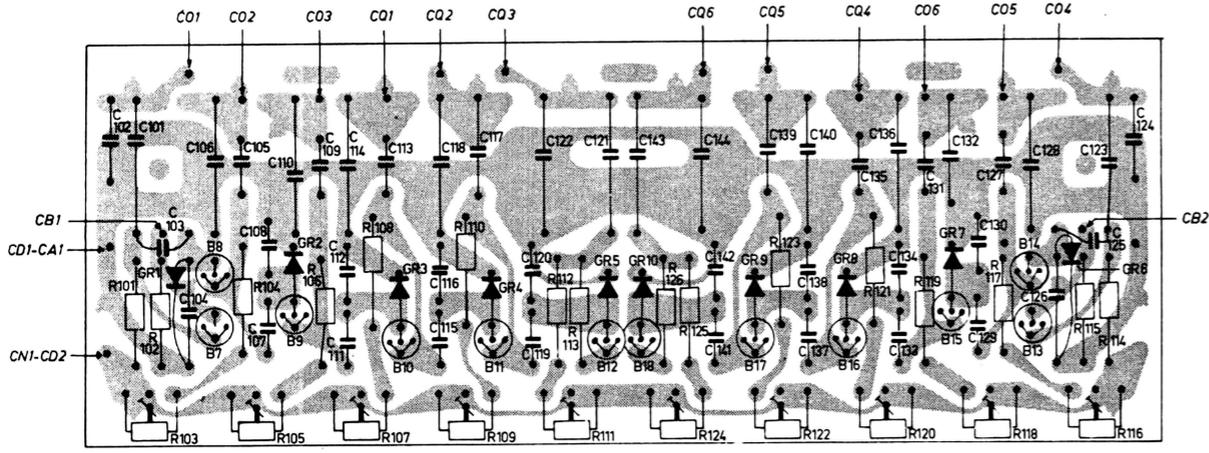
UNIT E



TRA1420

UNIT C

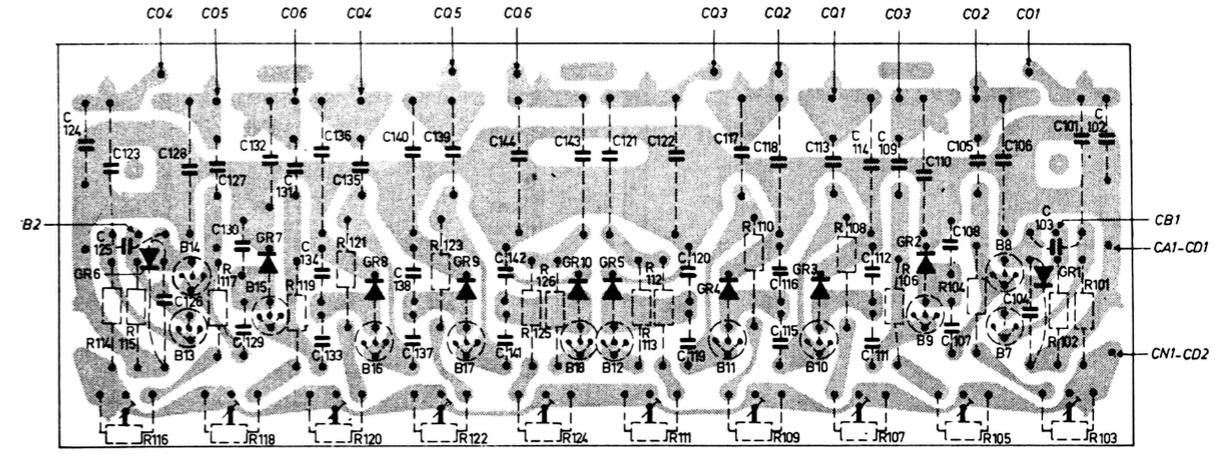
C	102, 101, 103, 104, 106, 105, 108, 107, 110, 109, 114, 111, 113, 118, 116, 115, 117, 120, 119, 122, 121, 143, 144, 142, 141, 139, 140, 138, 137, 135, 121, 136, 134, 133, 131, 132, 130, 129, 127, 128, 126, 125, 123, 124,
R	101, 102, 103, 104, 105, 106, 107, 108, 110, 109, 112, 113, 111, 126, 125, 124, 123, 122, 121, 120, 119, 118, 117, 115, 114, 116,



TRA1285

UNIT C

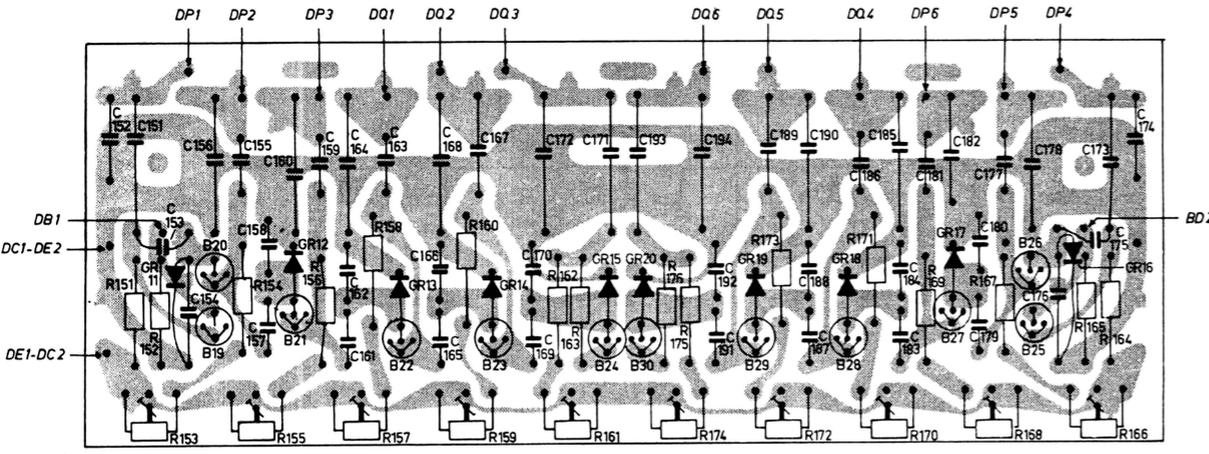
C	124, 123, 125, 126, 128, 127, 129, 130, 132, 131, 133, 134, 136, 121, 135, 137, 138, 140, 139, 141, 142, 144, 143, 121, 122, 119, 120, 117, 115, 116, 118, 113, 111, 112, 114, 109, 110, 107, 108, 105, 106, 104, 103, 101, 102,
R	116, 114, 115, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 111, 113, 112, 109, 110, 108, 107, 106, 105, 104, 103, 102, 101,



TRA1286

UNIT D

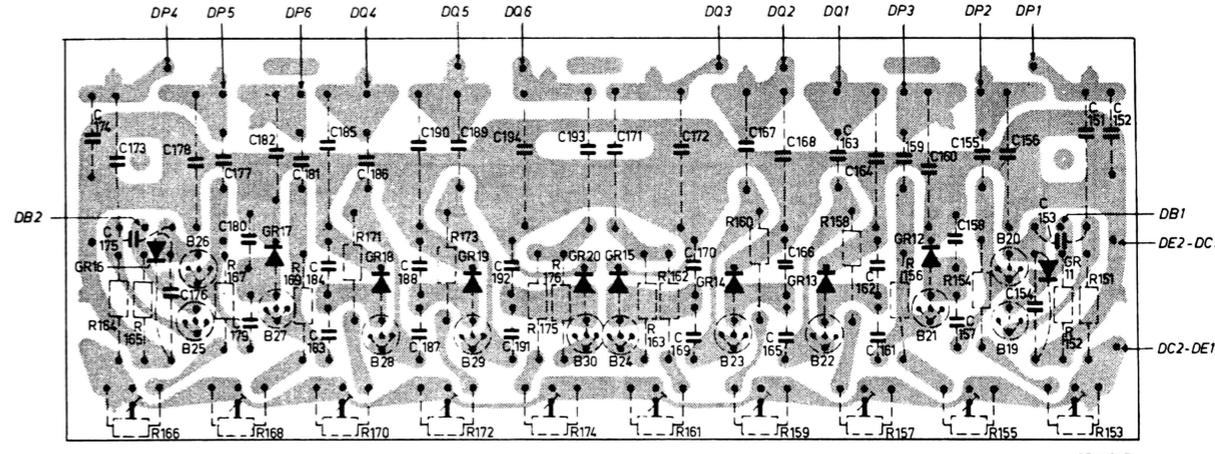
C	152, 151, 153, 154, 156, 155, 158, 157, 160, 159, 164, 162, 161, 163, 168, 166, 165, 167, 170, 169, 172, 171, 193, 194, 192, 191, 189, 190, 188, 187, 186, 185, 184, 183, 181, 182, 180, 179, 177, 178, 176, 175, 173, 172,
R	151, 152, 153, 154, 155, 156, 157, 158, 160, 159, 162, 161, 163, 176, 174, 175, 173, 172, 171, 170, 169, 168, 167, 165, 166, 164,



TRA1283

UNIT D

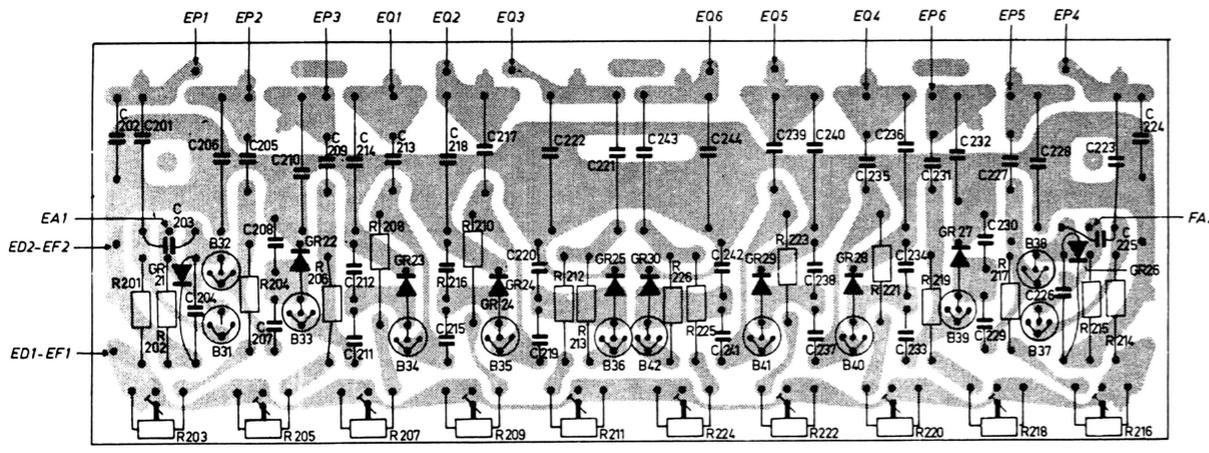
C	174, 173, 175, 176, 178, 177, 179, 180, 182, 181, 183, 184, 186, 185, 187, 188, 190, 189, 191, 192, 194, 193, 171, 172, 169, 170, 167, 165, 166, 168, 163, 161, 162, 164, 159, 160, 157, 158, 155, 156, 154, 153, 151, 152,
R	164, 166, 165, 167, 168, 169, 170, 171, 172, 173, 175, 174, 176, 163, 161, 162, 159, 160, 158, 157, 156, 155, 154, 153, 152, 151,



TRA1287

UNIT E

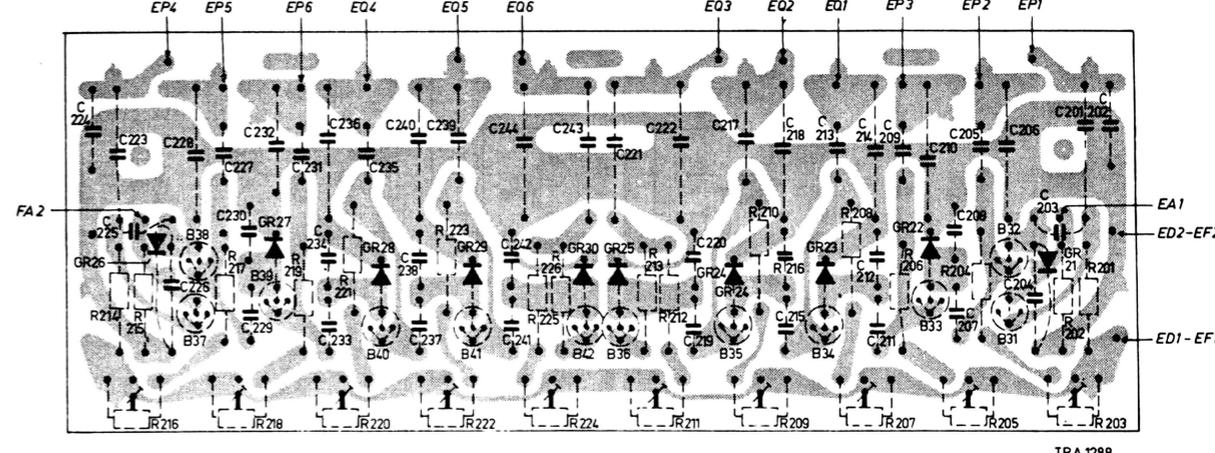
C	202, 201, 203, 204, 206, 205, 208, 207, 210, 209, 214, 212, 211, 213, 218, 216, 215, 217, 220, 219, 222, 221, 243, 244, 242, 241, 239, 240, 238, 237, 235, 221, 236, 234, 233, 231, 232, 230, 229, 227, 228, 226, 225, 223, 224,
R	201, 202, 203, 204, 205, 206, 207, 208, 210, 209, 212, 213, 211, 226, 225, 224, 223, 222, 221, 220, 219, 218, 217, 215, 214, 216,



TRA1284

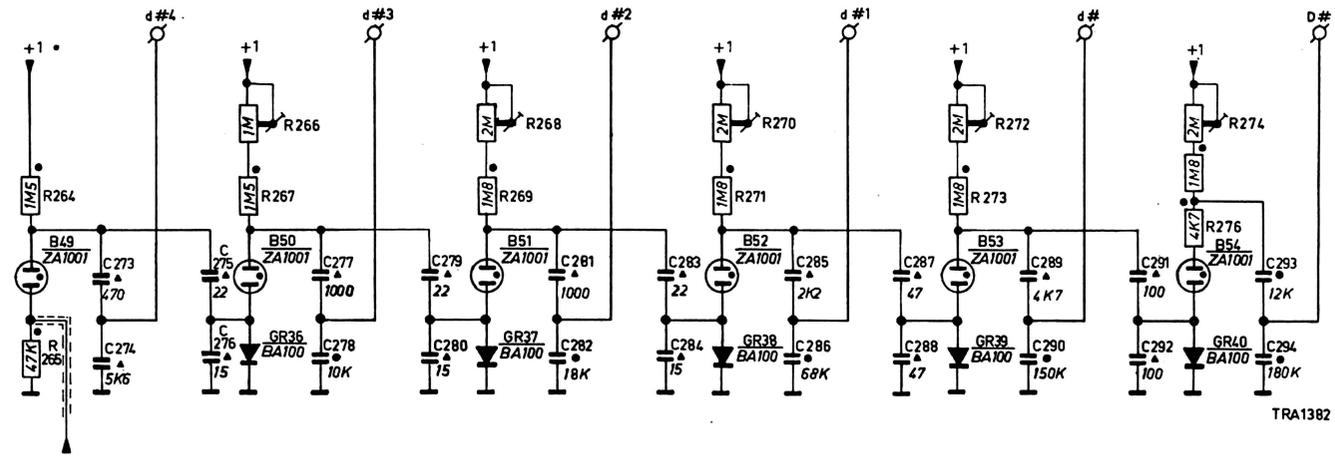
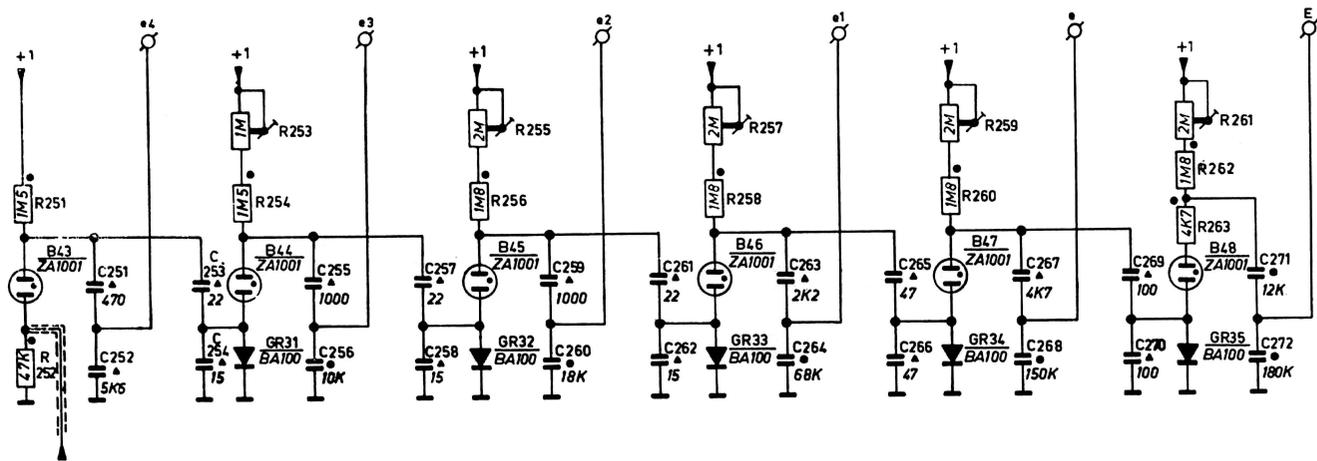
UNIT E

C	224, 223, 225, 226, 228, 227, 229, 230, 232, 231, 233, 234, 236, 221, 235, 237, 238, 240, 239, 241, 242, 244, 243, 221, 222, 219, 220, 217, 215, 216, 218, 213, 211, 212, 214, 209, 210, 207, 208, 205, 206, 204, 203, 201, 202,
R	216, 214, 215, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 211, 213, 212, 209, 210, 208, 207, 206, 205, 204, 203, 202, 201,



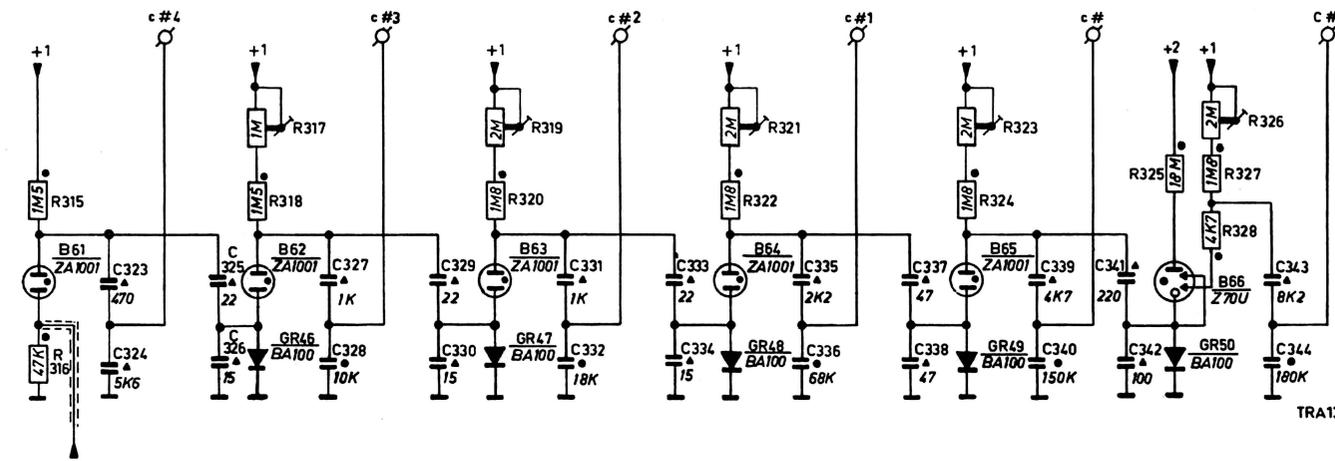
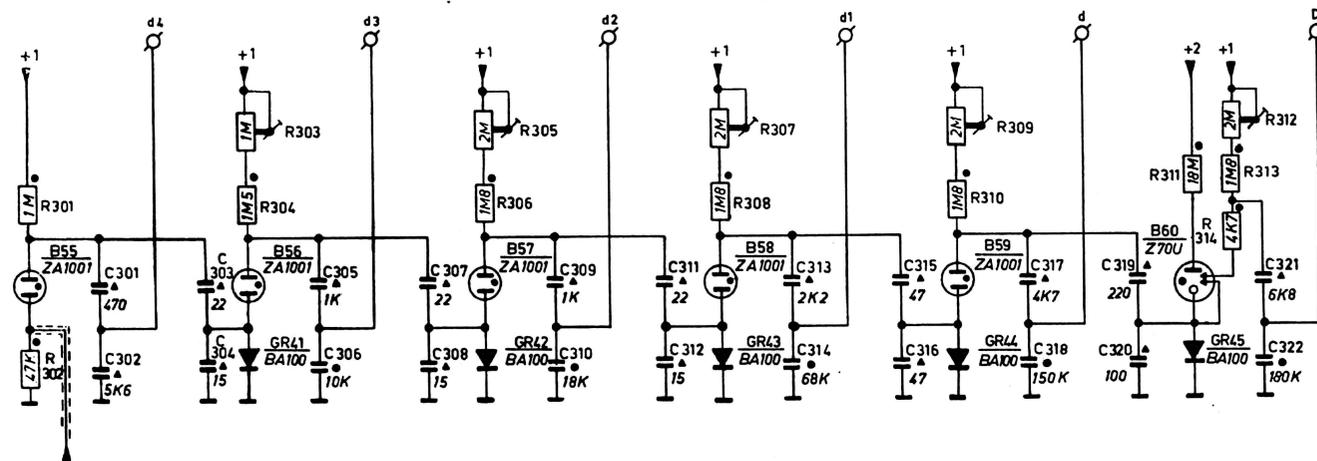
TRA1288

UNIT F



TRA1382

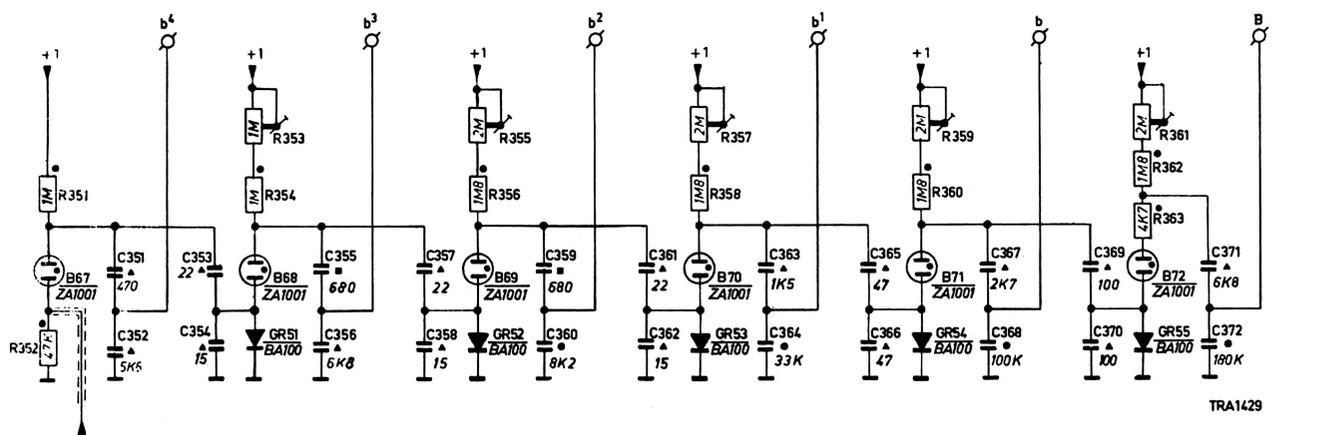
UNIT G



TRA1383

UNIT H

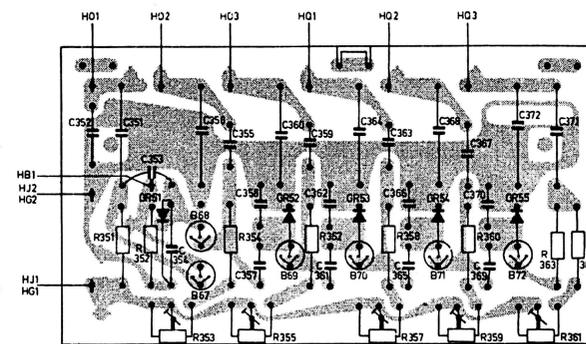
C	351.352	353.354	355.356	357.358	359.360	361.362	363.364	365.366	367.368	369.370	371.372
R	351.352	363.354	355.356	357.358	359.360	361.362	363.364	365.366	367.368	369.370	371.372



TRA1429

UNIT H

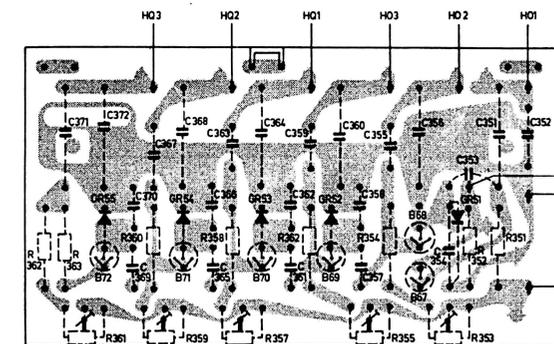
C	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	
R	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371



TRA1440

UNIT H

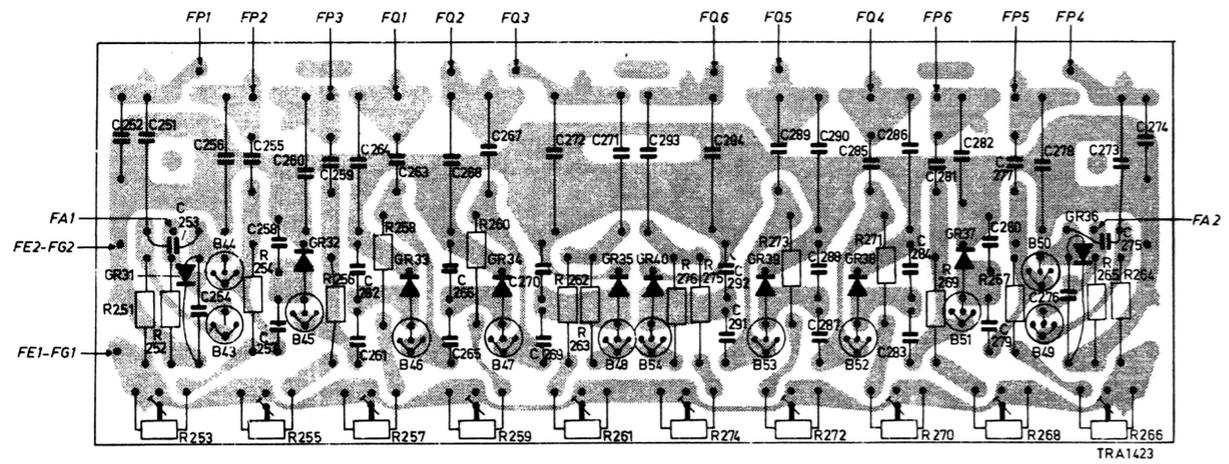
C	371	370	369	370	367	368	365	364	363	364	361	362	359	360	357	358	355	356	354	353	351	352	
R	362	363	361	360	358	358	357	362	355	354	353	352	351	350	349	348	347	346	345	344	343	342	341



TRA1443

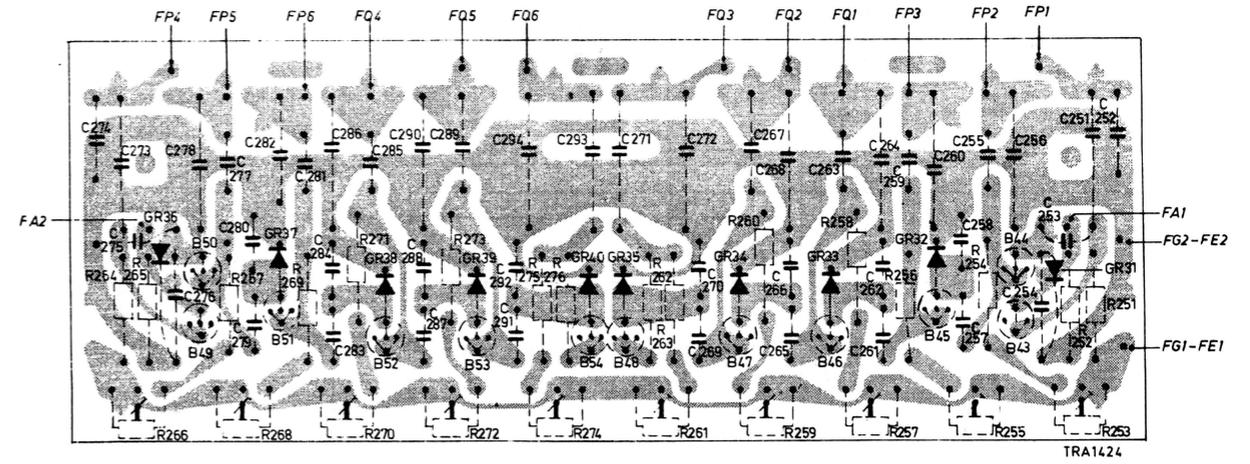
UNIT F

C	252	251	253	254	256	255	258	257	260	259	264	262	261	263	268	266	265	267	270	269	272	271	293	294	292	291	289	290	288	287	285	286	284	283	281	282	280	279	277	278	276	275	273	Z/L					
R	251	252	253		254	255		256	257	258		260	259	262	261	263		276	274	275		273	272		271	270	269		271	270	269		268	267		265	266	264											



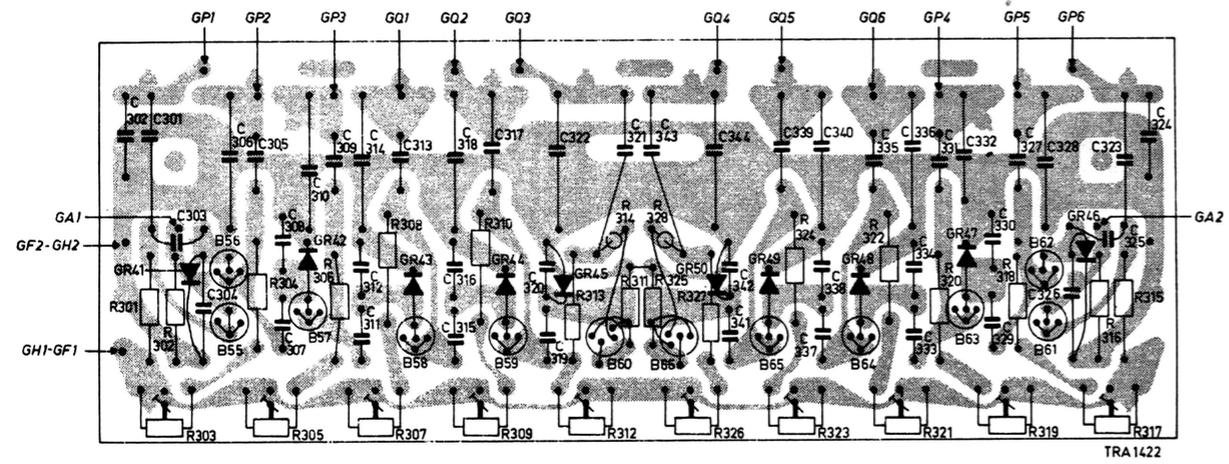
UNIT F

C	274	273	275	276	278	277	275	280	282	281	283	284	286	285	287	288	290	289	291	292	294	293	271	272	269	270	267	266	266	268	263	261	262	264	259	260	257	258	255	256	254	253	251	252			
R	264	265	265		267	268		269	270	271		272	273		275	274	276		263	261	262		259	260		258	257	258		255	254		253	252	255												



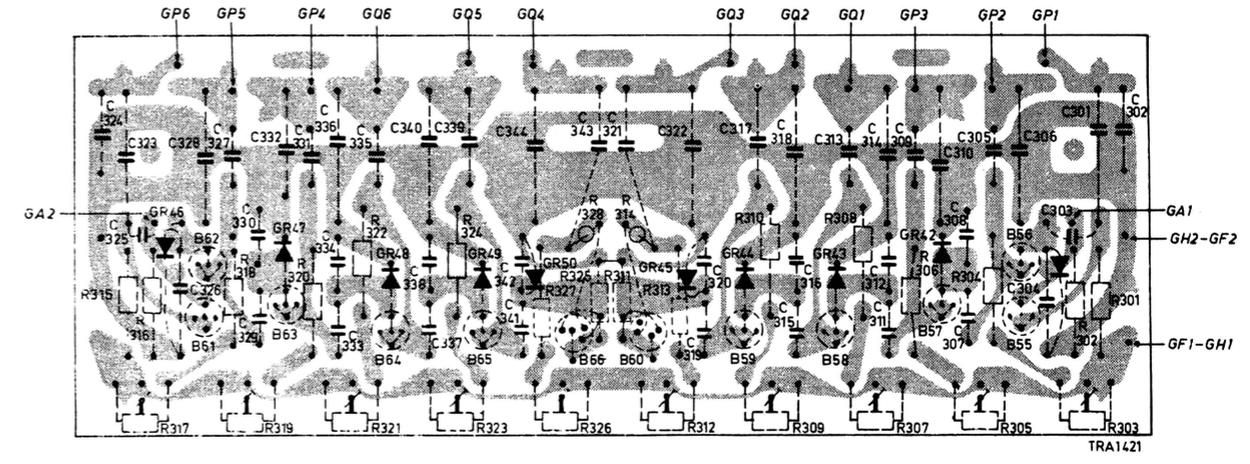
UNIT G

C	302	301	303	304	306	305	307	308	309	310	312	311	313	316	315	317	320	319	322		321	343		344	342	341	337	339	338	340		335	336	334	333	331	332	330	329	327	326	328	323	325	324				
R	301	302	303		304	305	306	307	308	309		310		313	312	314	311	328	325	327	326		324	323		322	321	320	319	318		316	315	317															



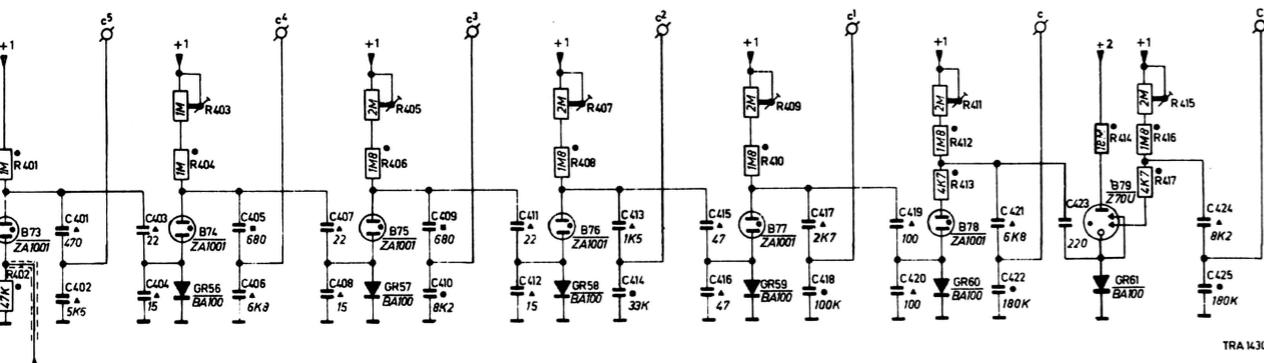
UNIT G

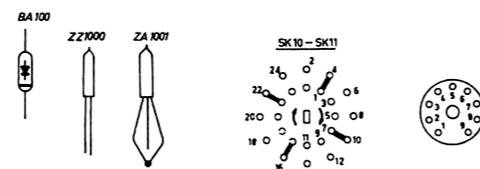
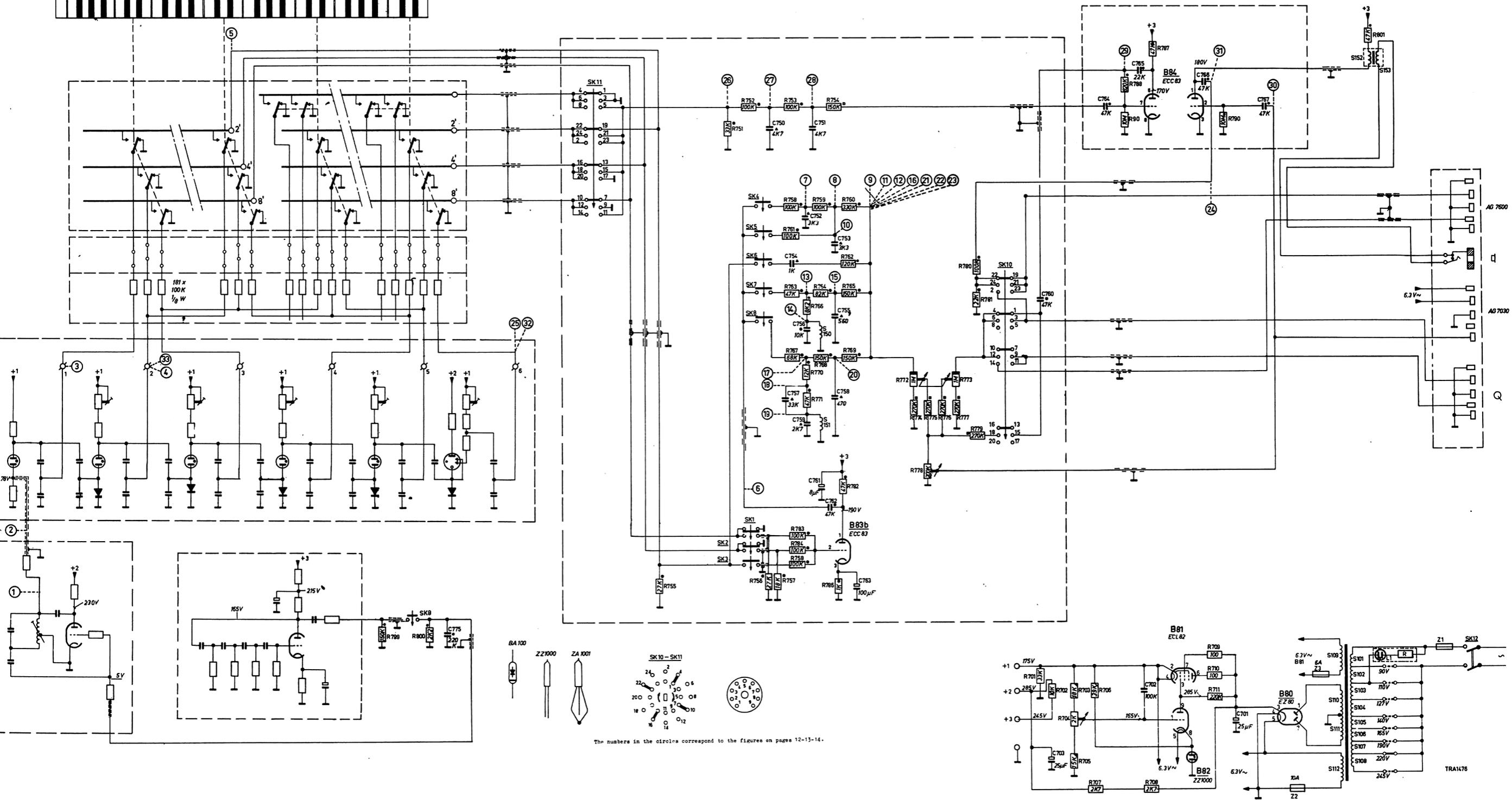
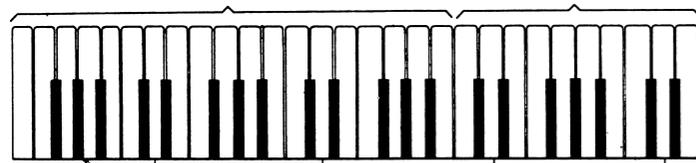
C	324	325	323	328	326	327	329	330	332	331	333	334	336	335	337	340	338	339		341	342	344		343	321	322	319	320	317	315	316	318	313	312	311	314	310	309	308	307	306	305	304	303	301	302			
R	317	315	316		318	319	320	321	322		323	324		326	327	325	328	311	314	312	313		310		309	308	307	306	305	304																			



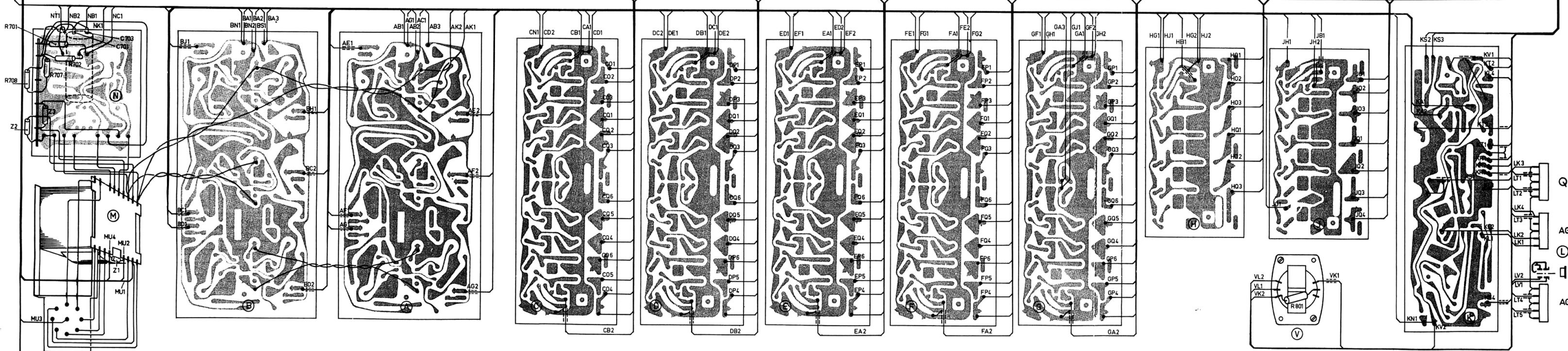
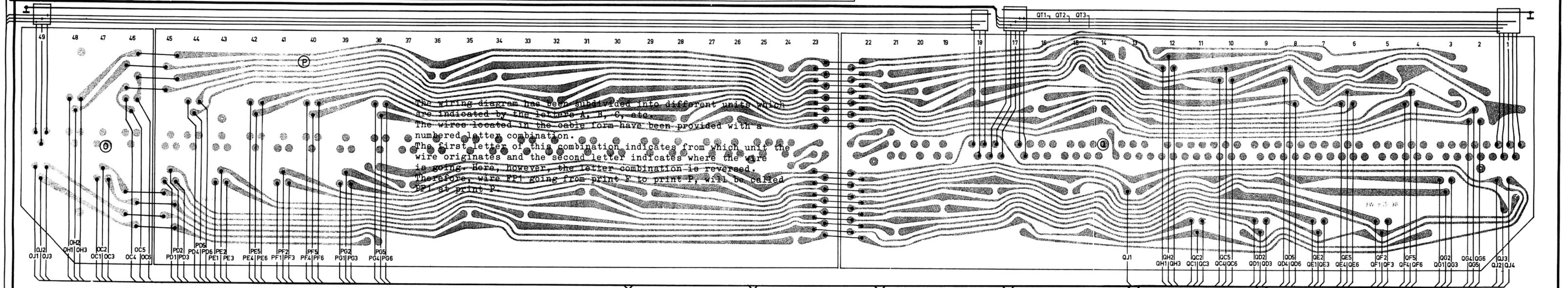
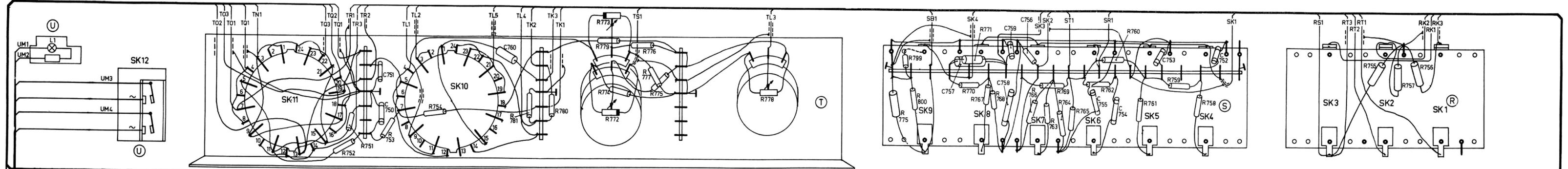
UNIT J

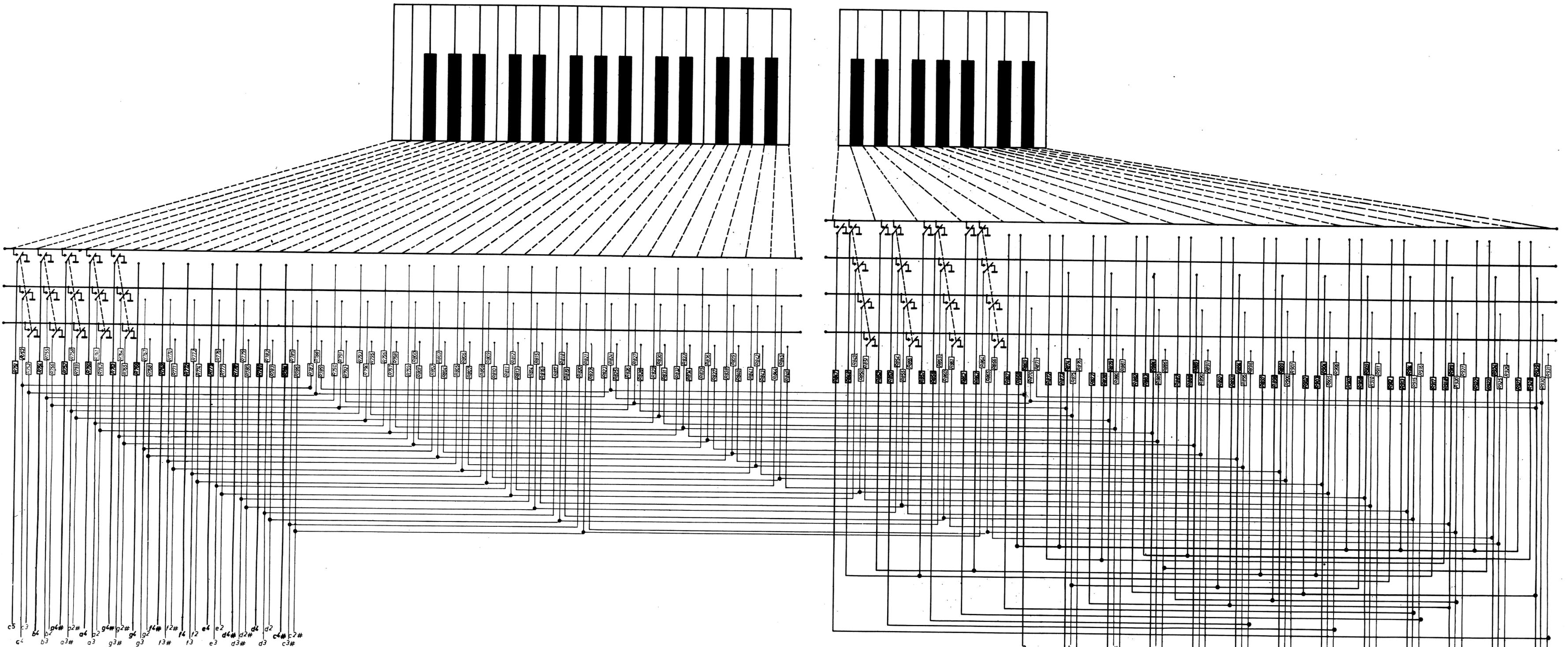
C	401	402		403	404		405	406		407	408		409	410		411	412		413	414		415	416		417	418		419	420		421	422		423		424	425
R	401	402		403	404		405	406		407	408		409	410		411	412		413	414		415	416		417	418		419	420		421	422		423		424	425





The numbers in the circles correspond to the figures on pages 12-13-14.



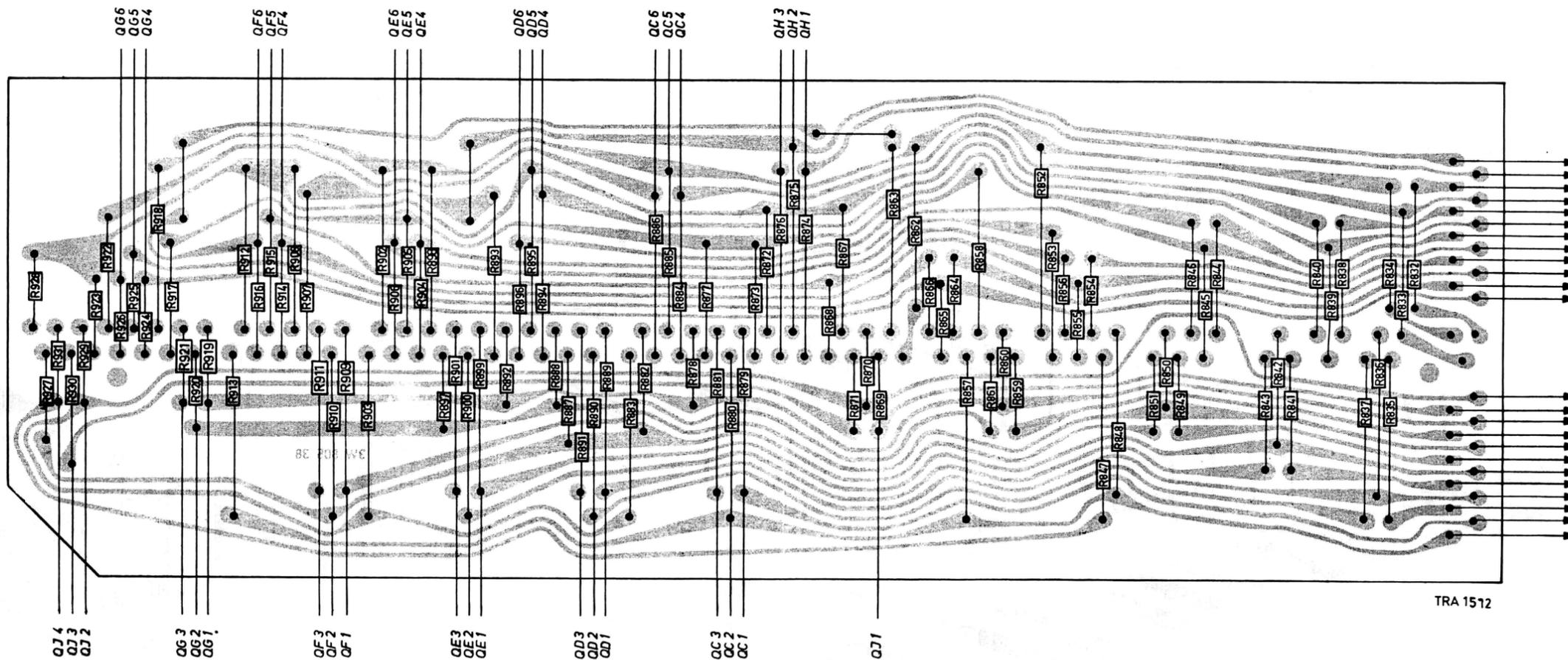


c5 c3 b4 b3 g4# b2# a4 a2 g4# g2# f4# f2# e4 e2 d4 d2 c4# c2#
 c4 c3 b3 a3# a3 g3# g3 f3# f3 e3 d3# d3 c3# c2#

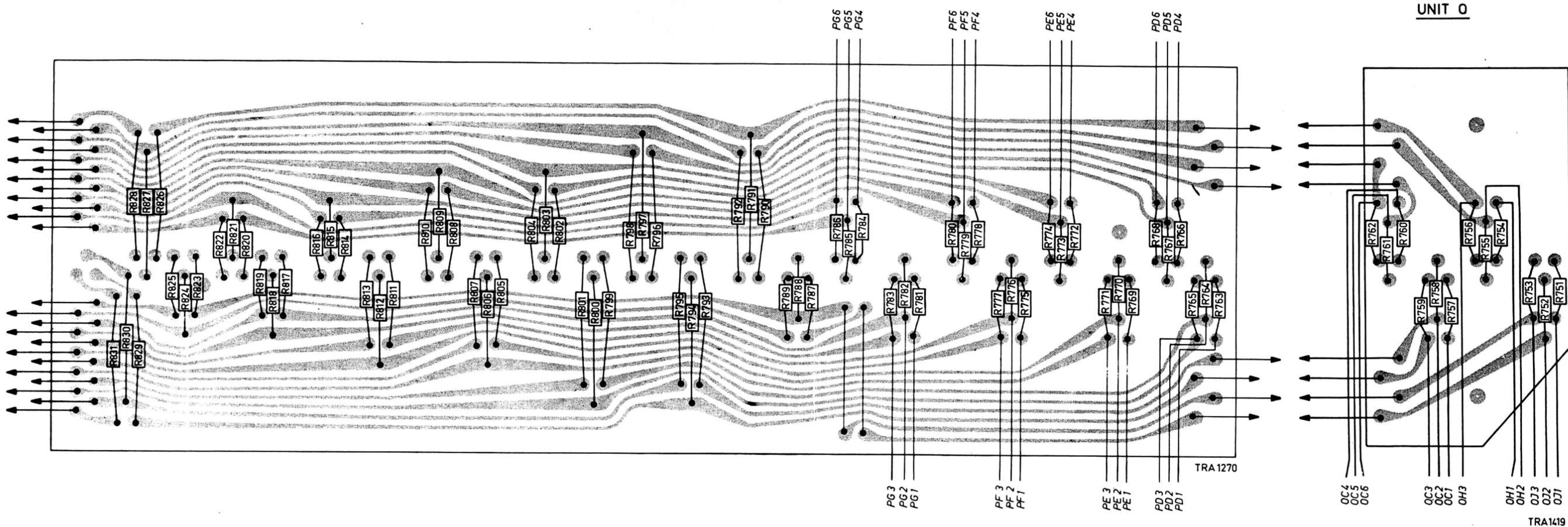
R751-931 : 100K 1/8 Watt.

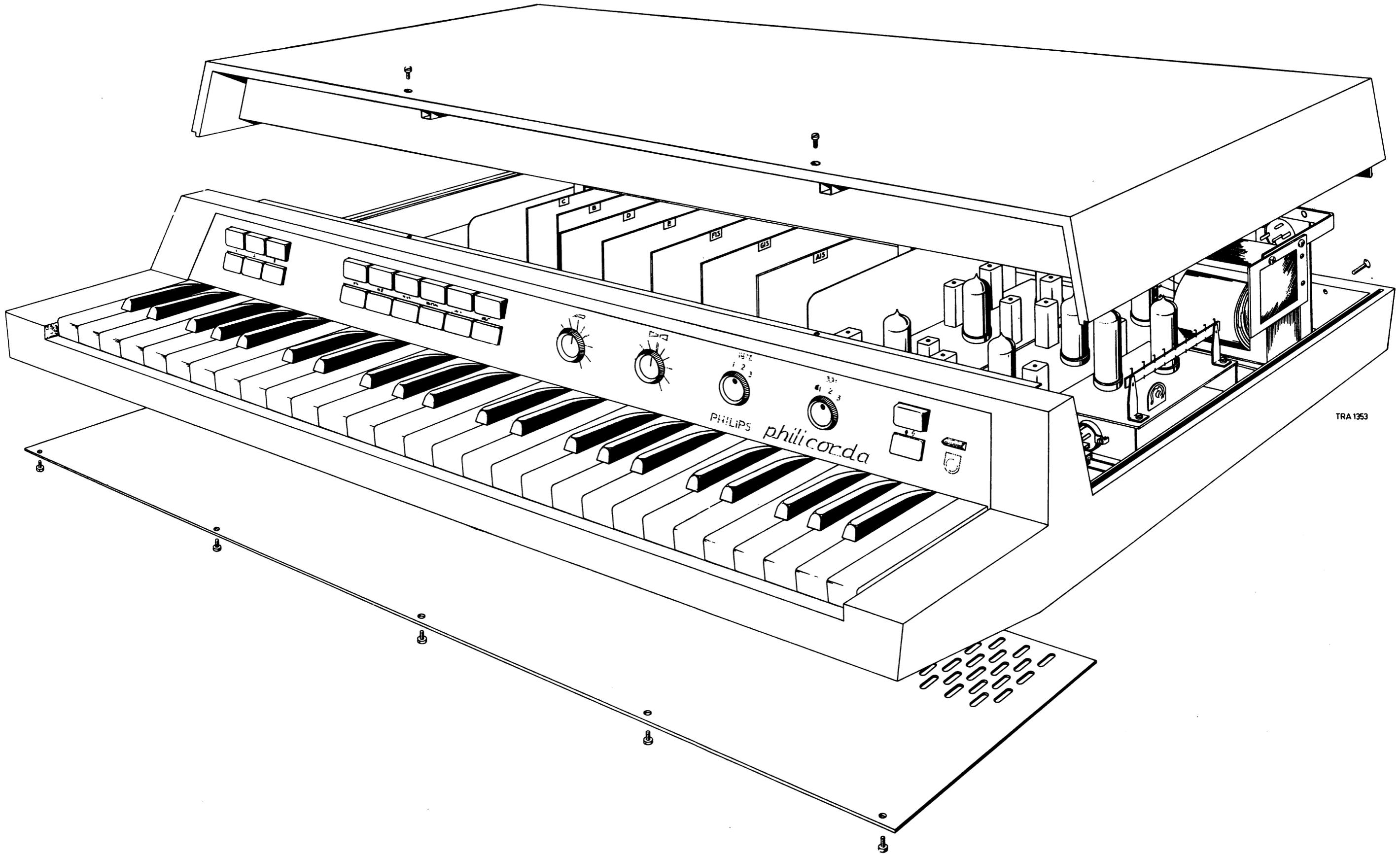
c2 b B a# A# a A g# G# g G f# F# f F e E d# D# d D c# C# c C

UNIT Q

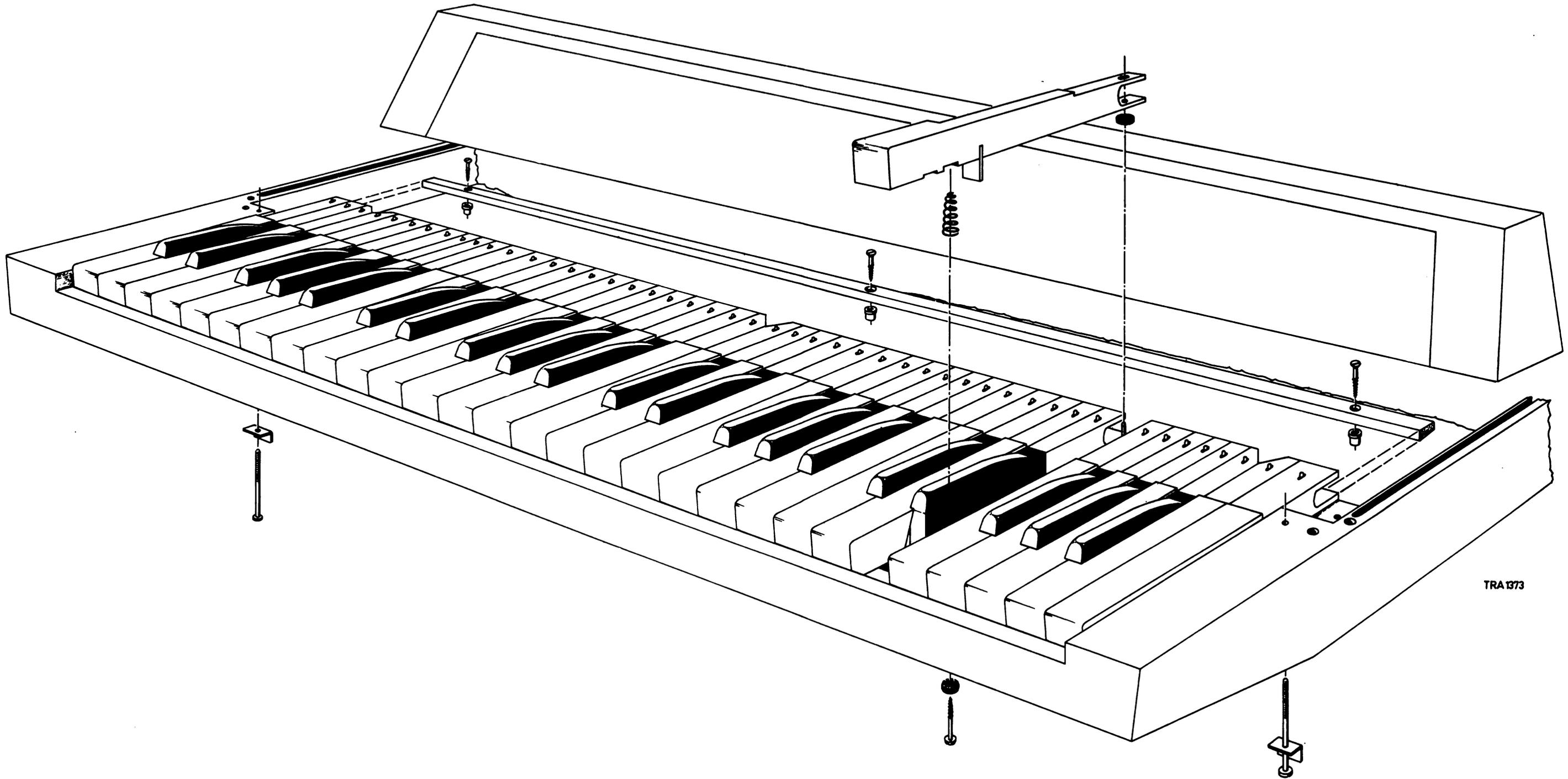


UNIT P





TRA 1353



TRA 1373

PHILICORDA

AG 7500/12/15/16/17/18/19/20/22/26
/29/30/32/35/38/40/43/53/80



SUPPLEMENT

A key-board with pastic keys is applied in several Philicordas. If this is the case, TRA 1526 should be used for the mounting diagram of the keyboard.

For code numbers of the service parts, see the following list :

Key A	4822 116 00721
Key B, E	4822 116 00722
Key D	4822 116 00723
Key C, F	4822 116 00724
Key G	4822 116 00725
Key C ⁵	4822 116 00726
Key, black	4822 116 00727
Key hinge	4822 116 00728
Adjusting pin	4822 116 00729

In verschillende Philicorda's wordt een klavier toegepast, met plastic toetsen.

Als dit het geval is moet men voor het montageschema van het klavier TRA 1526 gebruiken.

Voor codenummers van de service-onderdelen, zie onderstaande lijst :

Toets A	4822 116 00721
Toets B, E	4822 116 00722
Toets D	4822 116 00723
Toets C, F	4822 116 00724
Toets G	4822 116 00725
Toets C ⁵	4822 116 00726
Toets, zwart	4822 116 00727
Toetsscharnier	4822 116 00728
Instelstift	4822 116 00729

Différents Philicorda sont munis de touches en matière plastique. Si cela est le cas, il faut utiliser TRA 1526 pour le schéma de montage du clavier.

Pour les numéros de code des pièces de rechange, voir la liste ci-après:

Touche A	4822 116 00721
Touche B, E	4822 116 00722
Touche D	4822 116 00723
Touche C, F	4822 116 00724
Touche G	4822 116 00725
Touche C ⁵	4822 116 00726
Touche, noire	4822 116 00727
Charnière de touche	4822 116 00728
Broche de réglage	4822 116 00729

In verschiedenen Philicordas wird ein Manual mit Plastik-Tasten angewandt. Wenn dies der Fall ist, muss man für das Montageschema des Manuals TRA 1526 gebrauchen.

Für die Kodenummern der Service-Einzelteile siehe untenstehende Liste :

Taste A	4822 116 00721
Taste B, E	4822 116 00722
Taste D	4822 116 00723
Taste C, F	4822 116 00724
Taste G	4822 116 00725
Taste C ⁵	4822 116 00726
Taste, schwarz	4822 116 00727
Tastenscharnier	4822 116 00728
Einstellstift	4822 116 00729

En varias Philicordas se usa un teclado de teclas de plástico.

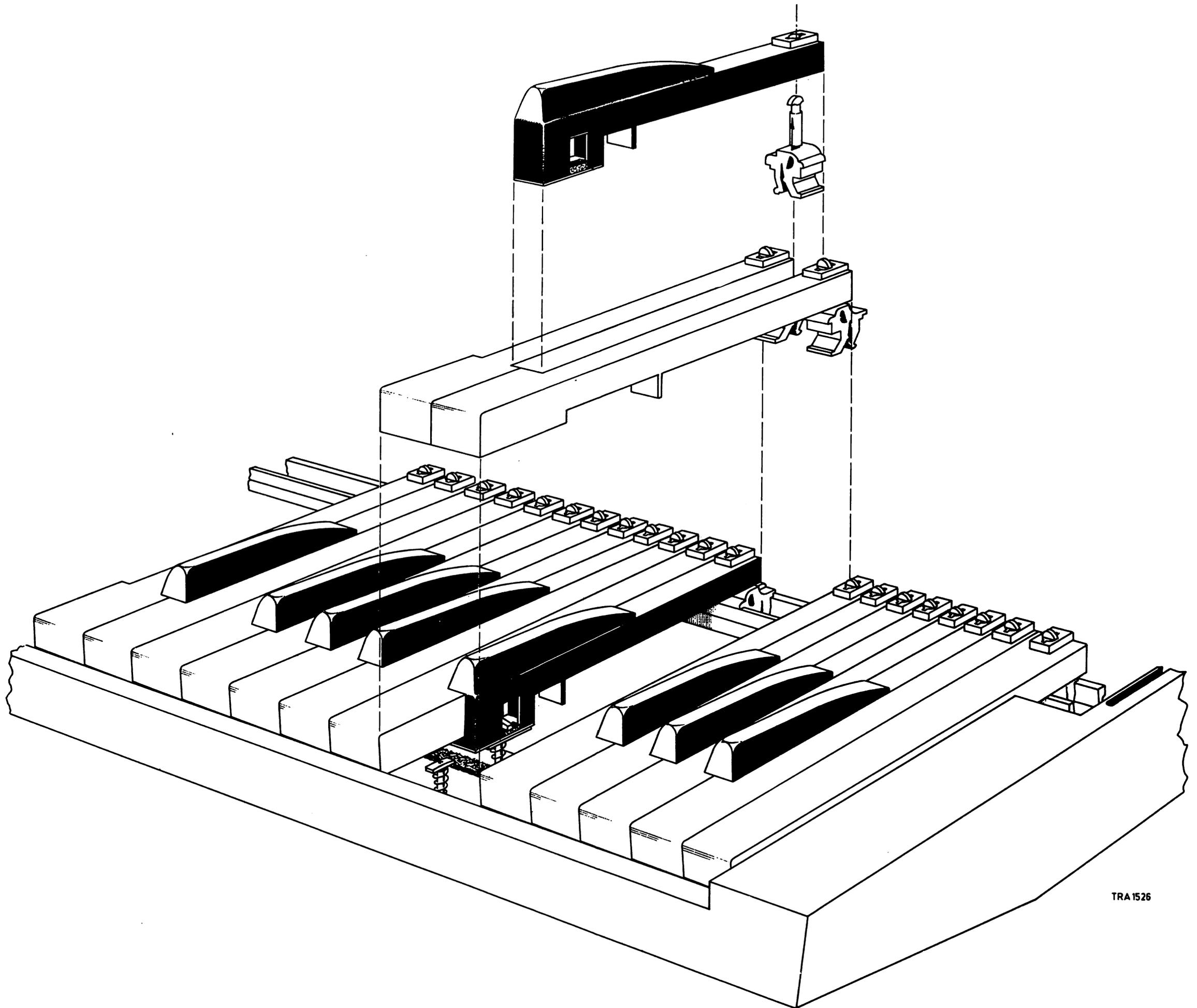
En tal caso tiene que emplearse como esquema de montaje el teclado TRA 1526.

Para los nos. de código de las piezas de servicio se remite a la lista a continuación :

Tecla A	4822 116 00721
Tecla B, E	4822 116 00722
Tecla D	4822 116 00723
Tecla C, F	4822 116 00724
Tecla G	4822 116 00725
Tecla C ⁵	4822 116 00726
Tecla, negro	4822 116 00727
Bisagra de tecla	4822 116 00728
Patilla de ajuste	4822 116 00729

Sum

SERVICE INFORMATION										
---------------------	--	--	--	--	--	--	--	--	--	--



PHILIPS *Service*

PHILICORDA

AG 7500/12/15/16/17/18/19/20/22/26
/29/30/32/35/38/40/43/53/80



2^e SUPPLEMENT

Some modifications and improvements have been made in the Philicorda. Consequently, the Service Notes on the Philicorda should be adapted as follows:

1. Apparatuses code-numbered AH 06 and up have been provided with a new music stand-(code number 4822 175 01491).
2. Capacitors C1 and C4 are now polyester capacitors (code number 906/12K).
Capacitors C105, C109, C131, C355, C359, C405 and C409 are now also polyester capacitors, code-numbered 4822 069 01141
3. R106, R108, R110, R112, R119, R121, R123, R125, R208, R210, R212, R221, R223, R225, R306, R308, R310, R313, R320, R322, R324 and R327 are now 2.2 M Ω instead of 1.8 M Ω (code number 902/K2M2).
R104 and R117 are now 1.5 M Ω instead of 1 M Ω (code number 902/K1M5).
4. As the lowest sawtooth oscillator of dividers D $\#$ and E are now provided with a Z70U instead of a ZA 1001, the circuit and wiring diagrams of these dividers are completely changed (see TRA 1382A, 1423A, 1424A).
5. The wiring (page 25), circuit diagram, keyboard (page 26) and the prints of the keyboard (page 27) have been adapted.
6. In the circuit diagram of C $\#$ and D on page 23 (TRA 1421 and TRA 1422), diodes GR45 and GR50 should be drawn reversed.
7. R701 of the parts list (page 11) should have code number 938/B33K, while R702 have code number E 001 AD/A10K.

- - - - -

In de Philicorda zijn enkele wijzigingen en verbeteringen aangebracht. Dientengevolge wordt de documentatie van de Philicorda aangepast.

1. De apparaten met code AH 06 en hoger zijn uitgerust met een nieuwe muziekstandaard (codenummer 4822 175 01491).
2. De condensatoren C1 en C4 zijn polyester condensatoren geworden (codenummer 906/12K). De condensatoren C105, C109, C127, C131, C355, C359, C405 en C409 worden eveneens polyester condensatoren met het codenummer 4822 069 01141.
3. R106, R108, R110, R112, R119, R121, R123, R125, R208, R210, R212, R221, R223, R225, R306, R308, R310, R313, R320, R322, R324, R327 worden 2,2 MΩ in plaats van 1,8 MΩ (codenummer 902/K2M2). R104 en R117 worden 1,5 MΩ in plaats van 1 MΩ (codenummer 902/K1M5).
4. Doordat de laagste zaagtandoscillator van de delers D# en E voortaan met een Z70U in plaats van een ZA 1001 zijn uigevoerd, veranderen de principe- en bedradingschema's van deze delers geheel (zie TRA 1382A, 1423A, 1424A).
5. De bedrading (blad 25), principeschema, toetsenpaneel (blad 26) en de printen van het toetsenpaneel (blad 27) zijn aangepast.
6. Op de printtekening van C# en D op bladzijde 23 (TRA 1421 en TRA 1422) moeten de diodes GR45 and GR50 andersom getekend worden.
7. In de stuklijst (blad 11) moet R701 het codenummer 938/B33K en R702 het codenummer E 001 AD/A10K hebben.

Le Philicorda a subi quelques modifications et améliorations, ce qui entraîne une adaptation de la documentation.

1. Les appareils avec numéro de code AH 06 et au-delà sont équipés d'un nouveau pupitre (numéro de code 4822 175 01491).
2. Les condensateurs C1 et C4 sont devenus des condensateurs au polyester (numéro de code 906/12K). Les condensateurs C105, C109, C127, C131, C355, C359, C405 et C409 deviennent également des condensateurs au polyester sous le numéro de code 4822 069 01141
3. R106, R108, R110, R112, R119, R121, R123, R125, R208, R210, R212, R221, R223, R225, R306, R308, R310, R313, R320, R322, R324 et R327 seront de 2,2 MΩ au lieu de 1,8 MΩ (numéro de code 902/K2M2). R104 et R117 deviennent de 1,5 MΩ au lieu de 1 MΩ (numéro de code 902/K1M5).
4. Comme l'oscillateur à dents de scie le plus bas des diviseurs D# et E est maintenant exécuté avec un Z70U au lieu d'un ZA 1001, les schémas de principe et de câblage de ces diviseurs changent entièrement (voir TRA 1382A, 1423A, 1424A).
5. Le câblage (page 25), le schéma de principe, le panneau des touches (page 26) et platines imprimées du panneau des touches (page 27) ont été adaptés.
6. Sur le dessin de la platine imprimée de C# et D à la page 23

Lon

(TRA 1421 et TRA 1422) les diodes GR45 et GR50 doivent être dessinées de manière inverse.

7. Dans la nomenclature des composants (page 11) R701 doit avoir le numéro de code 938/B33K et R702 le numéro de code E 001 AD/A10K.

In der Philicorda sind einige Änderungen und Verbesserungen vorgenommen worden. Demzufolge wurde die Kundendienstanleitung von der Philicorda angepasst.

1. Die Geräte mit Kodenummer von AH 06 an sind mit einem neuen Notenständer (Kodenummer 4822 175 01491) ausgestattet.
2. Die Kondensatoren C1 und C4 sind Polyester-Kondensatoren geworden (Kodenummer 906/12K). Die Kondensatoren C105, C109, C127, C131, C355, C359, C405 und C409 wurden ebenfalls Polyester-Kondensatoren mit der Kodenummer 4822 069 01141
3. R106, R108, R110, R112, R119, R121, R123, R125, R208, R210, R212, R221, R223, R225, R306, R308, R310, R313, R320, R322, R324 und R327 werden 2,2 MΩ anstelle von 1,8 MΩ (Kodenummer 902/K2M2). R104 und R117 werden 1,5 MΩ anstelle von 1 MΩ (Kodenummer 902/K1M5).
4. Da der niedrigste Sägezahnoszillator der Teiler D# und E von nun an mit einer Z70U anstelle einer ZA 1001 ausgeführt wird, werden die Prinzip- und Verdrahtungsschaltbilder dieser Teiler vollständig geändert (siehe TRA 1382A, 1423A, 1424A).
5. Die Verdrahtung (Seite 25), Prinzipschaltbild, Tastenpaneel (Seite 26) und die Printplatten des Tastenpaneels (Seite 27) sind angepasst.
6. Auf der Printplattenzeichnung von C# und D auf Seite 23 (TRA 1421 und TRA 1422) müssen die Dioden GR45 und GR50 entgegengesetzt gezeichnet werden.
7. In der Einzelteilliste (Seite 11) muss R701 die Kodenummer 938/B33K und R702 die Kodenummer E 001 AD/A10K haben.

En la Philicorda se han efectuado algunas modificaciones y mejoras. Debido a esto, la documentación de la Philicorda es adaptada.

1. Los aparatos con el código AH 06 y más altos están equipados con un nuevo soporte de partituras (número de código 4822 175 01491).
2. Los condensadores C1 y C4 son ahora condensadores de poliester (número de código 906/12K). Los condensadores C105, C109, C127, C131, C355, C359, C405 y C409 son ahora también condensadores de poliester, con el número de código 4822 069 01141
3. R106, R108, R110, R112, R119, R121, R123, R125, R208, R210, R212, R221, R223, R225, R306, R308, R310, R313, R320, R322, R324, R327 tienen ahora un valor de 2,2 MΩ en lugar de 1,8 MΩ (Número de código 902/K2M2).

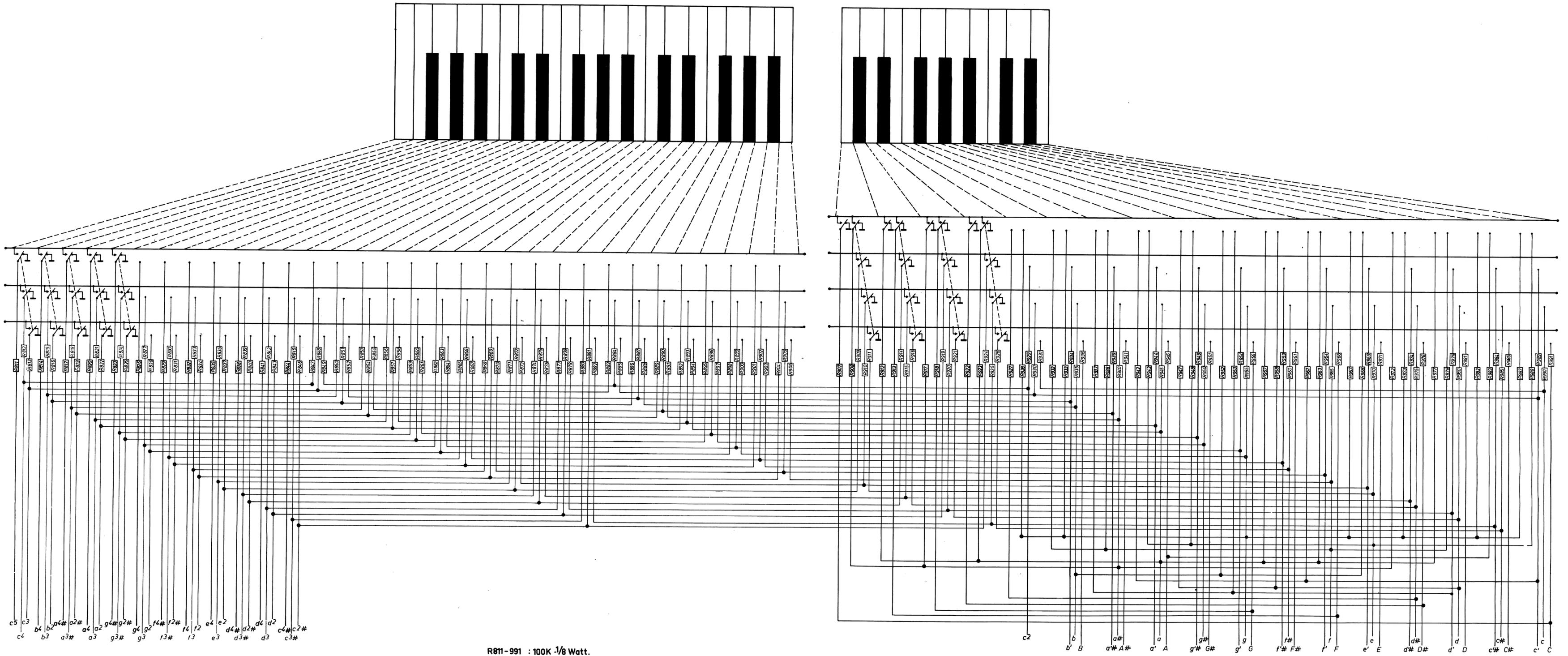
Lon

R104 y R117 tienen ahora un valor de 1,5 MΩ en lugar de 1 MΩ (número de código 902/K1M5).

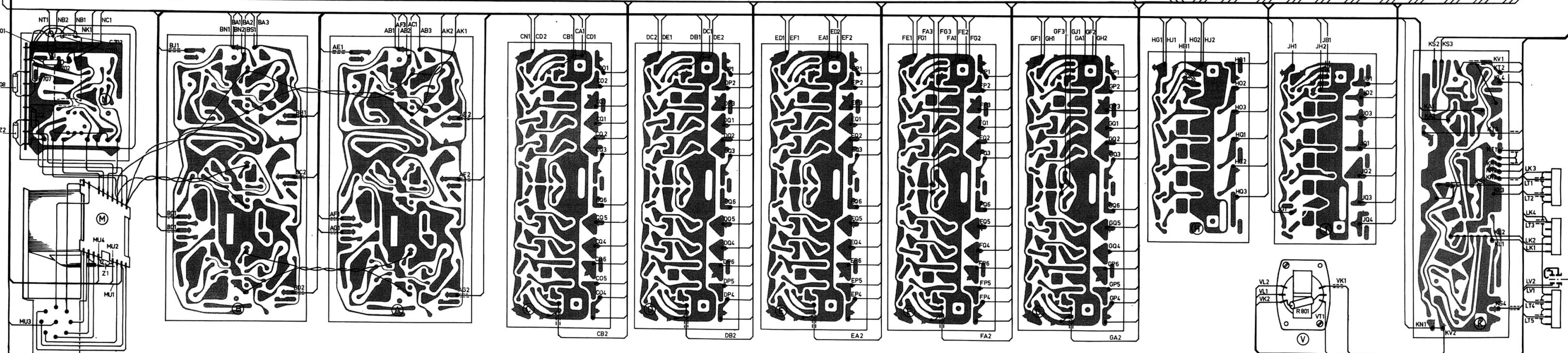
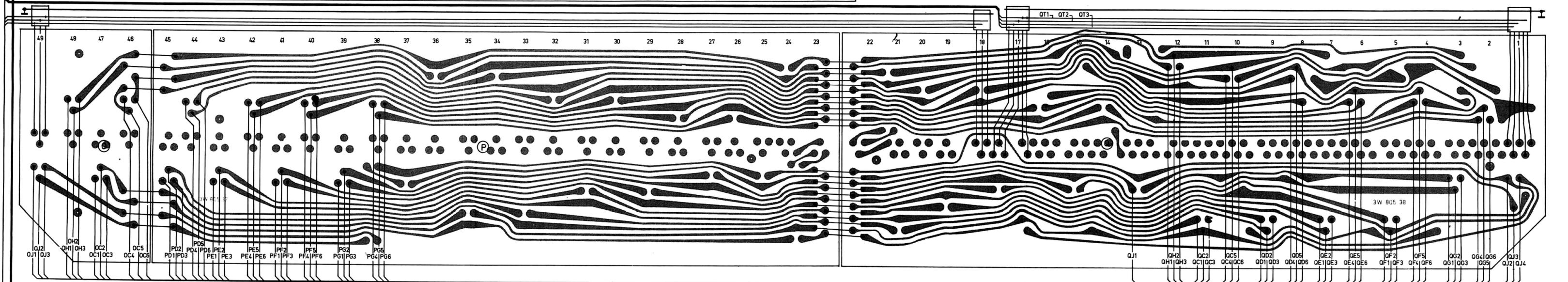
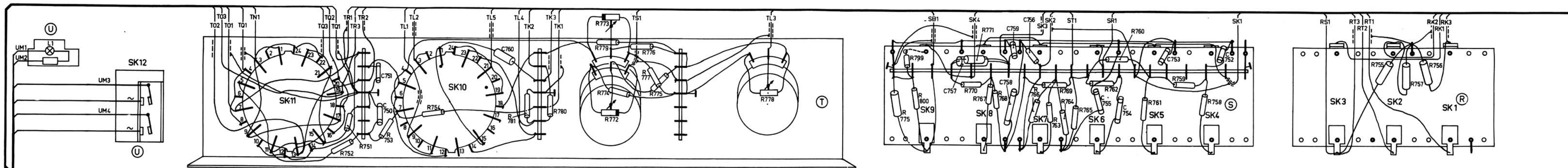
4. Debido a que el oscilador de diente de sierra más bajo de los divisores D# y E es quipado a partir de ahora con un Z70U en lugar de un ZA 1001, varían completamente los esquemas de principio y de cableado de estos divisores (véanse TRA 1382A, 1423A, 1424A).
5. El cableado (página 25), el esquema de principio, el panel de teclas (página 26) y los circuitos impresos del panel de teclas (página 27) han sido adaptados.
6. En el dibujo del circuito impreso de C# y D. En la página 23 (TRA 1421 y TRA 1422) deben dibujarse los diodos GR45 y GR50 al revés.
7. En la lista de componentes (página 11), R701 debe tener el número de código 938/B33K y R702 el número de código E 001 AD/A10K.

CENTRAL SERVICE


Th. Sijm



R811-991 : 100K 1/8 Watt.



PHILIPS *Service*

PHILICORDA

AG 7500/12/15/16/17/18/19/20/22/26
/29/30/32/35/38/40/43/53/80



3^e SUPPLEMENT

See also	AG 7500 : English	93 749 10.1.10
Zie ook	AG 7500 : Nederlands	93 749 51.1.27
Voir aussi	AG 7500 : Français	93 749 51.1.32
Sehen Sie auch	AG 7500 : Deutsch	93 749 51.1.18
Véanse también	AG 7500 : Español	93 749 51.1.37
	1 ^e supplement	93 749 81.1.90
	2 ^e supplement	93 752 30.1.90

Starting September 15, 1965, a completely new contact system has been applied in the Philicorda under modification code AH08. As a result, the wiring diagram has been changed for apparatuses with AH08 and up. Furthermore, the three print plates underneath the key board have been replaced by one large one. The service parts for the new contact system are :

49x Contact block	4822 175 01515
49x Spring for securing the contact block	4822 175 01516
8x Contact rail with conductive rubber	4822 175 01517
18x Spacer for the contact rails	4822 175 01518

Met ingang van 15 september 1965 is er in de Philicorda, onder wijzigingscode AH08, een geheel nieuw contactstelsel toegepast. Dientengevolge is het bedradingsschema, voor de apparaten met AH08 en hoger, veranderd. Verder zijn de drie printplaten onder het klavier vervangen door een grote. De service-onderdelen voor het nieuwe contactstelsel zijn :

49x Contactblokje	4822 175 01515
49x Veer voor bevestiging van het contact- blokje	4822 175 01516

SERVICE INFORMATION										
------------------------	--	--	--	--	--	--	--	--	--	--

8x Contactrail met geleidende rubber	4822 175 01517
18x Afstandsstuk voor de contactrails	4822 175 01518

Depuis le 15-9-1965 un système de contact entièrement nouveau est appliqué dans le Philicorda sous le code de modification AH08. Par conséquent le schéma de câblage pour les appareils avec AH08 et au-delà a été changé.

De plus les trois platines à câblage imprimé sous le clavier ont été remplacées par des exemplaires plus grands.

Pièces de rechange pour le nouveau système de contact :

49x Barrette à bornes	4822 175 01515
49x Ressort de fixation de la barrette à bornes	4822 175 01516
8x Rail de contact avec caoutchouc conducteur	4822 175 01517
18x Entretoise pour les rails de contact	4822 175 01518

Ab 15 September 1965 wird in der Philicorda, unter Aenderungskode AH08, ein völlig neues Kontaktsystem angewandt.

Demzufolge ist das Verdrahtungsschema für die Geräte von AH08 an geändert worden.

Weiter sind die drei Printplatten unter der Tastatur durch eine grosse ersetzt worden.

Die Service-Einzelteile für das neue Kontaktsystem sind :

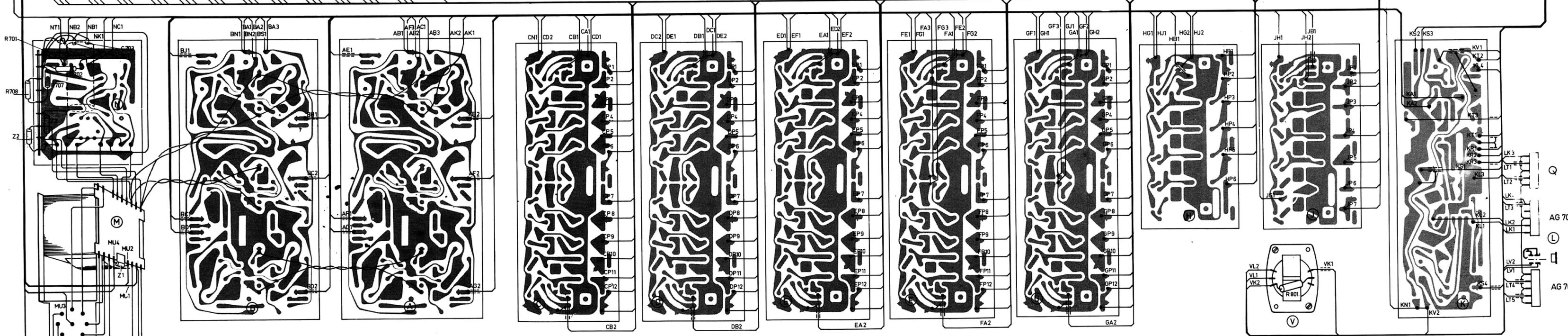
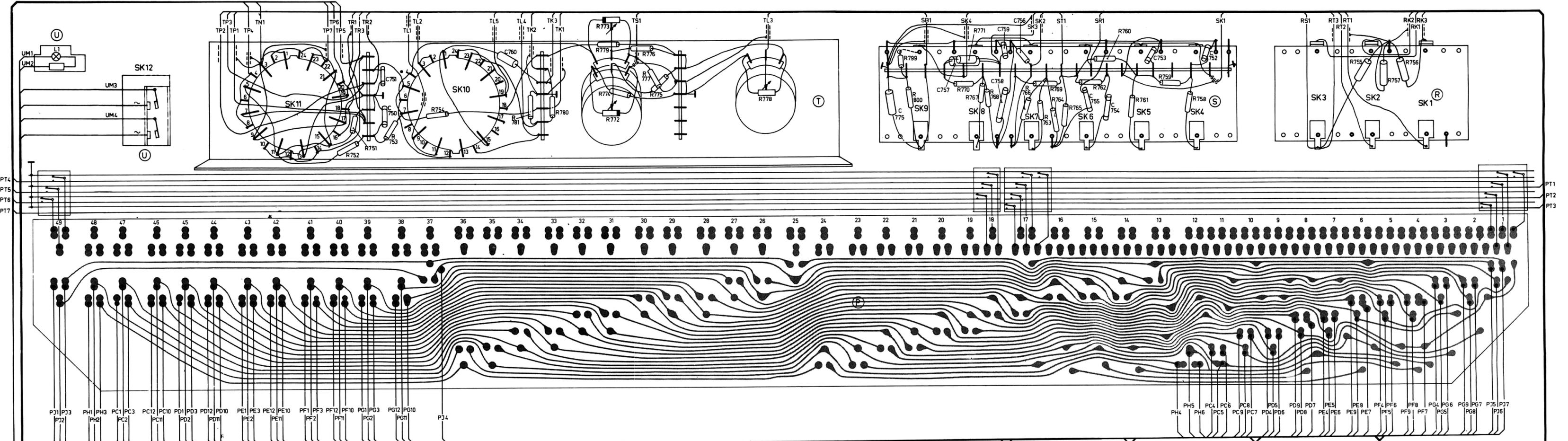
49x Kontaktblock	4822 175 01515
49x Feder zur Befestigung des Kontaktblocks	4822 175 01516
8x Kontaktschiene mit leitendem Gummi	4822 175 01517
18x Distanzstück für die Kontaktschiene	4822 175 01518

A partir del 15 de setiembre de 1965 se emplea en el Philicorda bajo el código de modificación un sistema de contacto completamente nuevo. Por consecuencia fué cambiado el esquema de cableado para los aparatos con estampillado a partir de AH08.

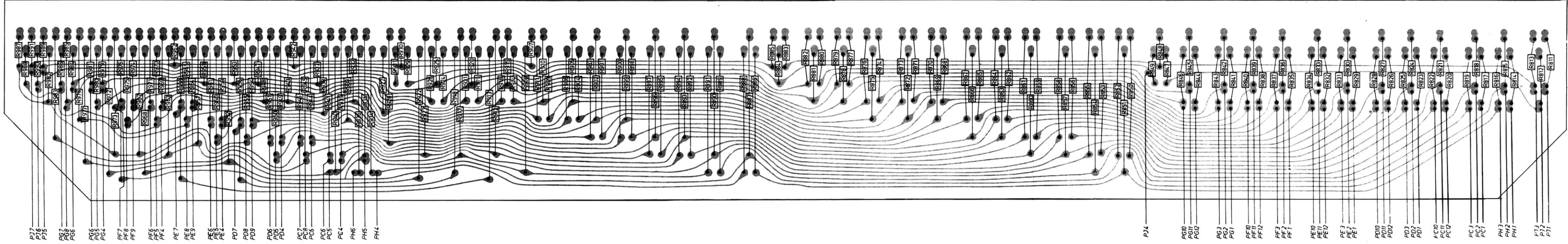
Luego, las tres placas impresas bajo el teclado fueron sustituidas por una sola placa impresa más grande.

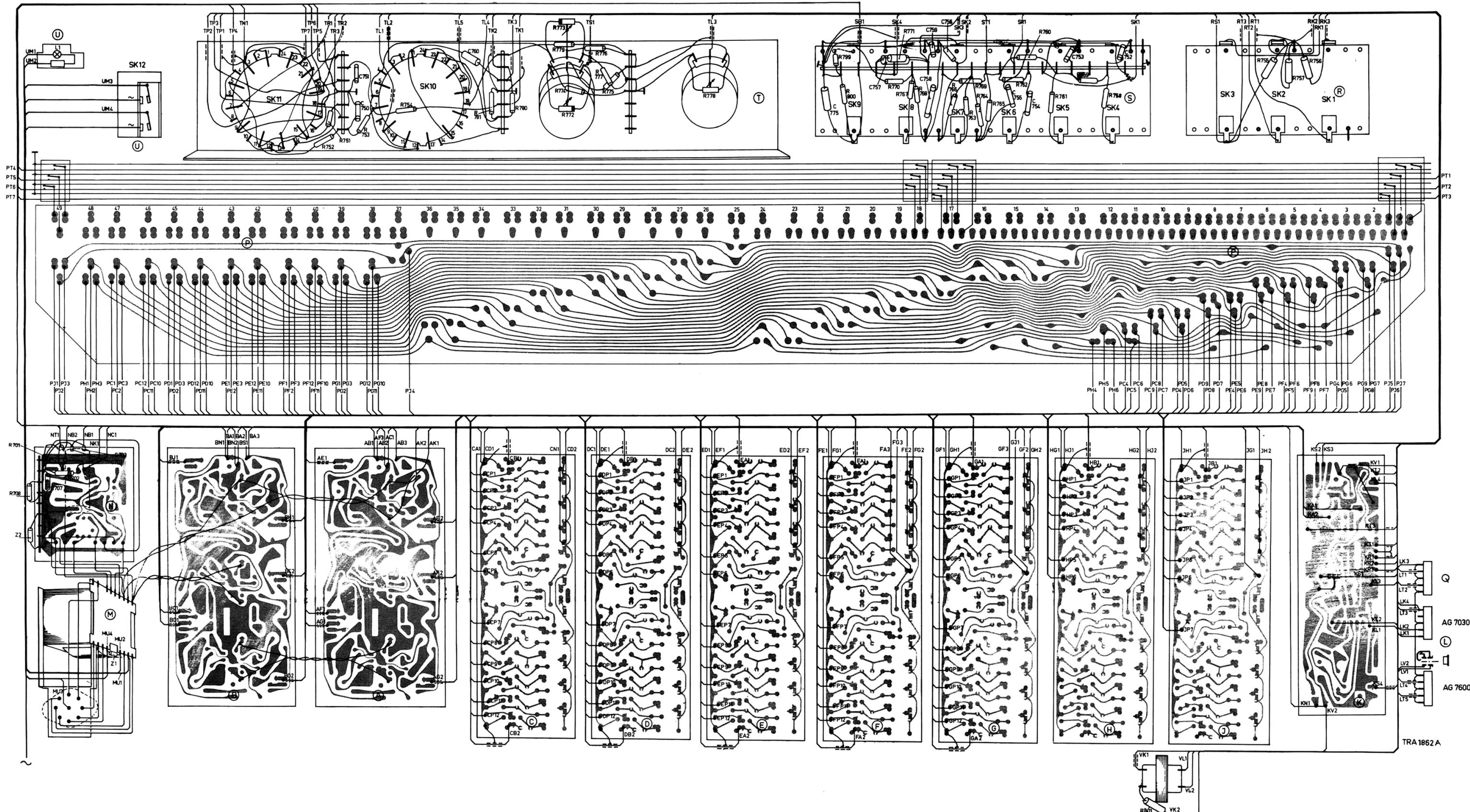
Los componentes de Servicio para el nuevo sistema de contacto son :

49x Bloque de contacto	4822 175 01515
49x Resorte para sujeción del bloque de contacto	4822 175 01516
8x Riel de contacto con goma conductiva	4822 175 01517
18x Separador para rieles de contacto	4822 175 01518



UNIT P





Q
 AG 7030
 L
 AG 7600
 TRA 1862 A

UNIT C

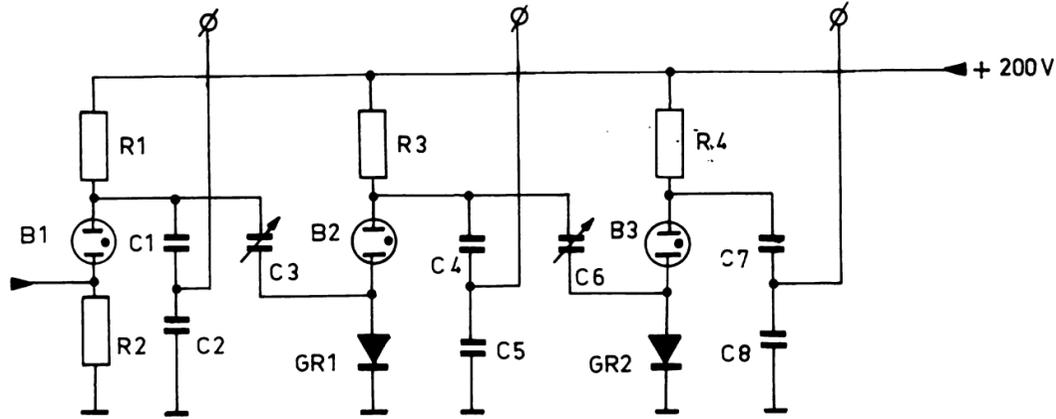


FIG. 1.

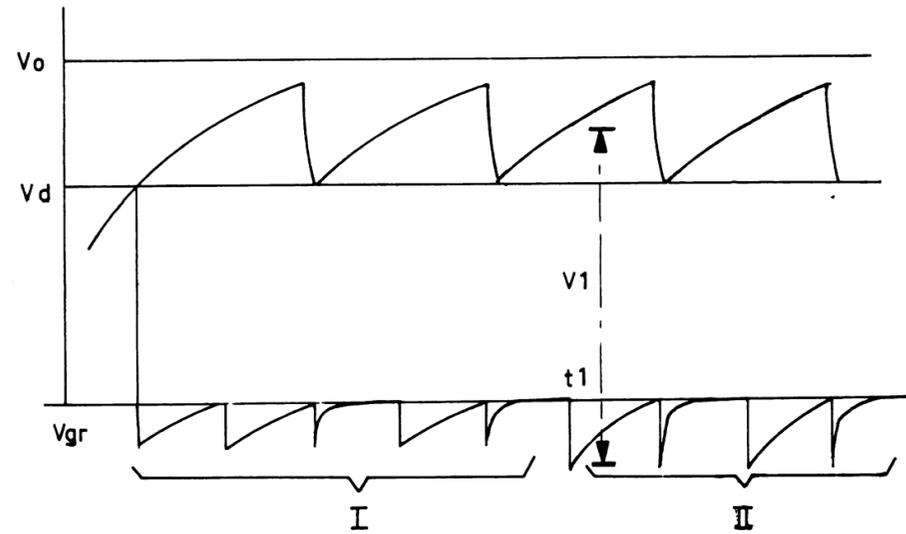


FIG 2

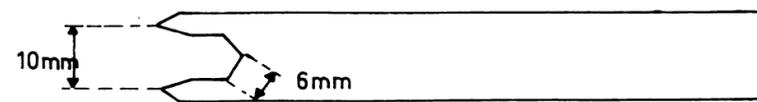
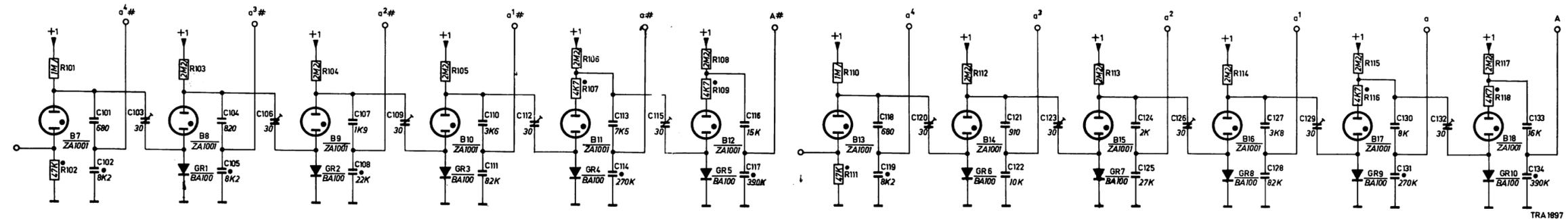


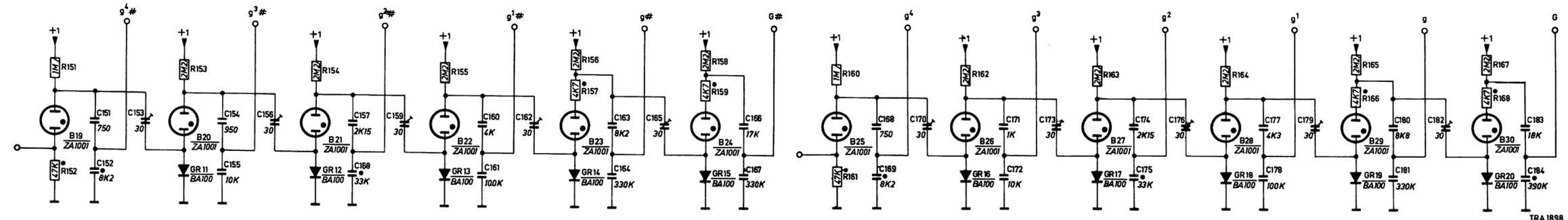
FIG 3

TRA 2002



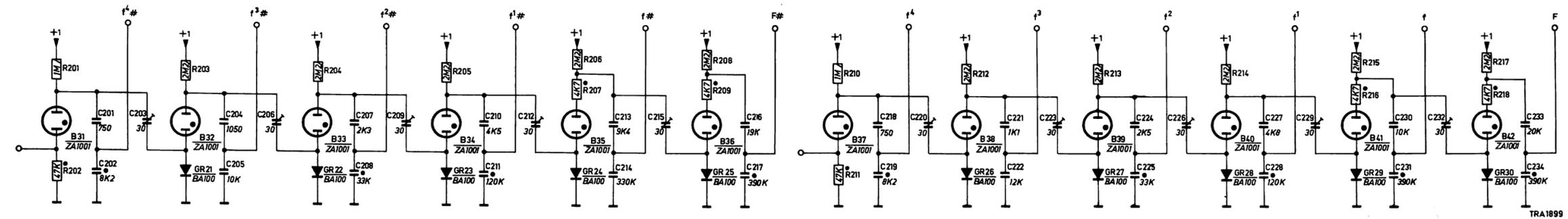
TRA 1897

UNIT D



TRA 1898

UNIT E



TRA 1899

PHILIPS *Service*

INFORMATION

PHILICORDA

9-4-1965	AG 7500	Ba 818
----------	---------	--------



Re: Keyboard Philicorda

All keys in the Philicorda were provided with a fixing hole up to now, see Fig. A.

The keys which will be supplied from now on, will have round holes.

A special hinge should be used for these keys (see Fig. 'B'). This hinge can also be used for the old keys instead of the old hinge.

The code numbers of hinges and keys remain the same.

Remark:

The keys are delivered in two parts, i.e.: the key body and the fitting piece. This fitting piece is first mounted on the frame with the hinge.

After that, the key body is glued onto the bottom piece. In this way, the new key can be mounted so that it is in line with other keys.

Code number of the glue: A9 881 05/T30.

Betreft: Toetsenbord Philicorda

Alle toetsen in de Philicorda waren tot nu toe uitgevoerd met een bevestigingsgat volgens fig. A.

De toetsen die vanaf nu geleverd zullen worden hebben echter een rond gat. U dient voor deze nieuwe toetsen een speciaal scharnier te gebruiken (zie fig. B).

Dit scharnier is ook bruikbaar in plaats van de oude scharnieren, voor de oude toetsen.

De codenummers van scharnier en toetsen blijven ongewijzigd.

Asunto: Teclado Philicorda

Todas las teclas de la Philicorda estaban provistas hasta ahora de un orificio de sujeción según la fig. A. Las teclas que van a suministrarse desde ahora tienen sin embargo un orificio redondo, para las cuales ha de usarse una bisagra nueva (ver la fig. B). Esta bisagra puede emplearse también en lugar de las bisagras antiguas para las teclas del modelo antiguo. Los nos. de código de la bisagra y de las teclas quedan sin cambiar.

Nota:

Las teclas se suministran en dos partes, es decir el cuerpo de la tecla y la pieza de sujeción. Esta se sujeta primero mediante la bisagra sobre el armazón. Después se encola el cuerpo de la tecla sobre la parte inferior. De esta manera puede montarse la tecla nueva de forma que la parte anterior esté en una línea con las demás teclas.

(No. de código de la cola A9 881 05/T30).

CENTRAL SERVICE



Th. Sijm.

GG/CB

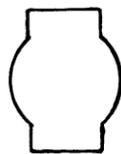


FIG. A

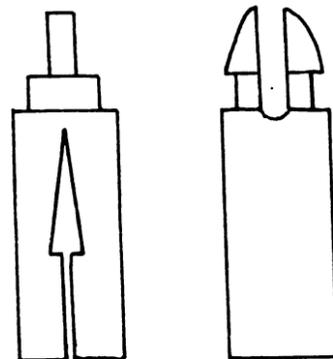


FIG. B

PHILIPS *Service*

INFORMATION

PHILICORDA

9-11-1965

AG 7500

Bc 595



The voltages indicated in the Service Notes of the Philicorda are wrong.

Please change these voltages. (See page 2)

R787 and R789 have been interchanged on the print drawing of unit K. Moreover, R789 should be connected to 7B84 instead of 6B84.

De aangegeven spanningen in de Servicedocumentatie van de Philicorda zijn fout.

Gelieve deze spanningen te veranderen. (Zie blad 2)

Op de printtekening van unit K zijn R787 en R789 verwisseld. Bovendien moet R789 aan 7B84 zitten, in plaats van 6B84.

Les tensions indiquées dans la documentation Service pour le Philicorda ne sont pas correctes.

Veillez changer ces tensions. (Voir page 2)

Sur le dessin de la platine imprimée du bloc K R787 et R789 ont été confondues.

De plus, R789 doit être reliée à 7B84 au lieu d'a 6B84.

Die in der Kundendienstanleitung der Philicorda angegebenen Spannungen sind nicht richtig.

Bitte ändern Sie diese Spannungen. (Siehe Seite 2)

Auf der Printplattenzeichnung von Einheit K sind R787 und R789 verwechselt. Ausserdem muss R789 an 7B84 statt 6B84 befestigt sein.

Las tensiones indicadas en la Documentación de Servicio del Philicorda son incorrectas. Sírvanse cambiar estas tensiones. En los dibujos de las placas impresas de la unidad K, R787 y R789 han sido intercambiados. Además, R789 tiene que estar conectado a 7B84 en lugar de 6B84.

+1	175 V	8B81	82 V	6B84	145 V
+2	300 V	9B81	150 V	1B1 ÷ 6	220 V
+3	250 V	1B83	175 V	6B1 ÷ 6	220 V
3B80	415 V	6B83	150 V	C772	205 V
1B81	80 V	1B84	145 V		

CENTRAL SERVICE



A. Remmers

TL/JD

PHILIPS *Service*

INFORMATION

PHILICORDA

31-11-1965	AG 7500	Bc 596
------------	---------	--------



Modification code AH09

To reduce the detuning of the master oscillators of the Philicorda, the type and value of various capacitors have been changed. The changes in units A and B are as follows :

C1,4	10 kpF	(code number C 295 AA/D10K)
C7,10	7.5 kpF	(code number 4822 121 50214)
C13,16	6.5 kpF	(code number 4822 121 50234)
C51,54	5.1 kpF	(code number 4822 069 00922)
C2,5,8,11,57,60	3.9 kpF	(code number 4822 069 00838)
C14,17,52,55	3.3 kpF	(code number 4822 121 50235)
C58,61,63,64,66,67	2.7 kpF	(code number 4822 069 00694)

When one of these capacitors is replaced, it is necessary to use a capacitor of the same type in view of the stability of the oscillator. In order to increase the output power of the headphone, the transformer for the headphone has been modified (code number 4822 117 00379).

Wijzigingscode AH09

Om het verloop van de hoofdoscellatoren van de philicorda te verminderen zijn verschillende condensatoren van waarde en uitvoering veranderd. De veranderingen in unit A en B zijn als volgt :

C1,4	10 kpF	(codenumber C 295 AA/D10K)
C7,10	7,5 kpF	(codenumber 4822 121 50214)
C13,16	6,8 kpF	(codenumber 4822 121 50234)
C51,54	5,1 kpF	(codenumber 4822 069 00922)
C2,5,8,11,57,60	3,9 kpF	(codenumber 4822 069 00838)
C14,17,52,55	3,3 kpF	(codenumber 4822 121 50235)
C58,61,63,64,66,67	2,7 kpF	(codenumber 4822 069 00694)

Indien een van deze condensatoren verwisseld moeten worden is het wel noodzakelijk, in verband met de stabiliteit van de oscillator, hetzelfde type condensator te gebruiken.

Teneinde het uitgangsvermogen in de hoofdoortelefoon te verhogen is de transformator voor de telefoon veranderd (codenummer 4822 117 00379).

Code de modification AH09

Afin de réduire la dérive des oscillateurs principaux du Philicorda les valeurs et les versions de plusieurs condensateurs ont été changées. Dans les blocs A et B il s'agit des modifications suivantes :

C1,4	10 kpF	(numéro de code C 295 AA/D10K)
C7,10	7,5 kpF	(numéro de code 4822 121 50214)
C13,16	6,8 kpF	(numéro de code 4822 121 50234)
C51,54	5,1 kpF	(numéro de code 4822 069 00922)
C2,5,8,11,57,60	3,9 kpF	(numéro de code 4822 069 00838)
C14,17,52,55	3,3 kpF	(numéro de code 4822 121 50235)
C58,61,63,64,66,67	2,7 kpF	(numéro de code 4822 069 00694)

Au cas où un de ces condensateurs doit être remplacé, il importe d'utiliser le même type pour ne pas affecter la stabilité de l'oscillateur.

Le transformateur pour le casque d'écoute (numéro de code 4822 117 00379) a été changé pour améliorer sa puissance de sortie.

Aenderungskode AH09

Um das Verlaufen der Hauptoszillatoren in der Philicorda zu vermindern, sind Wert und Ausführung verschiedener Kondensatoren geändert. Die Änderungen in Einheit A und B sind folgende :

C1,4	10 kpF	(Kodenummer C 295 AA/D10K)
C7,10	7,5 kpF	(Kodenummer 4822 121 50214)
C13,16	6,8 kpF	(Kodenummer 4822 121 50234)
C51,54	5,1 kpF	(Kodenummer 4822 069 00922)
C2,5,8,11,57,60	3,9 kpF	(Kodenummer 4822 069 00838)
C14,17,52,55	3,3 kpF	(Kodenummer 4822 121 50235)
C58,61,63,64,66,67	2,7 kpF	(Kodenummer 4822 069 00694)

Wenn einer dieser Kondensatoren ausgewechselt werden muss, ist es wegen der Stabilität des Oszillators erforderlich, denselben Kondensatortyp zu benutzen.

Um die Ausgangsleistung im Kopfhörer zu erhöhen, wurde der Transformator für den Hörer geändert (Kodenummer 4822 117 00379).

PHILIPS *Service*

INFORMATION

PHILICORDA

1-2-1966

AG 7500

Bc 616



Re : Replacing plastic keys of the Philicorda

With alteration code AH08, a new contact system has been introduced into the Philicorda.

Simultaneously, the keys of the plastic key-board have been slightly modified. The so-called stop cam - i.e. the cam that makes sure that the key-contacts are pressed against the contact rails - has been given a different shape for the new keys.

Figure A shows the former version, while Figure B shows the new one. The new keys cannot be used instead of the former ones, but the former keys can be used instead of the new ones.

For this, the length of the old stop cam, which is 14 mm, should be reduced to 9 mm. This can be done by carefully cutting slightly less than 5 mm from the cam with a pair of pliers and then filing the edge till the length of the cam is 9 mm. If this has been done, the new key can be simply replaced by the old one. Therefore, Central Service will, for the time being, continue to supply the old keys.

Betrifft : Ersetzen von Kunststofftasten der Philicorda

Mit Aenderungskode AH08 wurde in der Philicorda ein neues Kontaktsystem eingeführt.

Gleichzeitig sind die Tasten der Kunststofftastatur etwas geändert worden.

Der sogenannte Anschlagnocken, der dafür sorgt, dass die Tastenkontakte gegen die Kontaktschienen gedrückt werden, hat bei den neuen Tasten eine andere Form.

In Abb. A ist die alte und in Abb. B die neue Ausführung dargestellt. Die neuen Tasten können nicht für die alte Ausführung, die alten Tasten jedoch wohl für die neue Ausführung benutzt werden.

Der alte Anschlagnocken, der 14 mm lang ist, muss dazu 9 mm lang gemacht werden. Hierzu mit einer Zange vorsichtig etwas weniger als 5 mm vom Nocken schneiden und den abgeschnittenen Rand beifeilen, bis die Länge des Nockens 9 mm beträgt. Hiernach kann die neue Taste ohne weiteres durch die alte ersetzt werden. Vorläufig werden deshalb noch die alten Tasten geliefert.

de la leva por medio de unos alicates, y limando luego el borde cortado hasta que la longitud de la leva sea 9 mm.
Una vez hecho esto, se puede sustituir directamente la tecla nueva por la antigua.
Provisionalmente se suministrarán todavía las teclas antiguas.

CENTRAL SERVICE

A. Remmers
A. Remmers

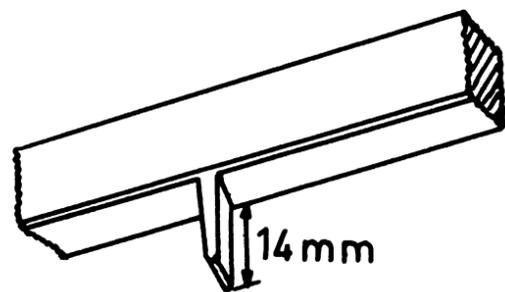


FIG. A

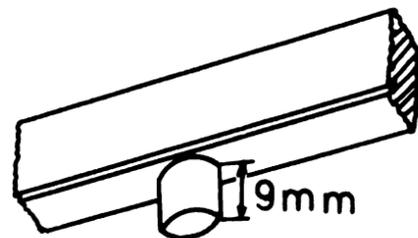


FIG. B

TGR 968

PHILIPS *Service*

INFORMATION

PHILICORDA

3-1-1966

AG 7500

Bc618



With alteration code AH10, which will be introduced in the beginning of January 1966, the saw-tooth oscillators of the Philicorda are altered.

Though the principle remains the same, the way of adjusting the dividers is modified.

Figure 1 shows some dividers, as they will be applied in future. As can be seen, the dividers can no longer be adjusted by varying the RC-product, because this RC-product will from now on have a constant value. (The value of the trimmer can be neglected with respect to the values of C1 and C2.)

For every divider the RC-product has, therefore, a definite constant value, which has been so selected, that the saw-tooth voltage that would be generated by the divider without synchronisation, has a somewhat lower frequency than the one that would be generated with synchronisation. The RC-product should, therefore, be very constant. This constancy can be obtained by applying resistors and capacitors that have a very small tolerance.

When replacing one of these parts, the prescribed version should always be used. The first stage (B1, R1, C1, C2) is synchronised by the sinusoidal master oscillator voltage, as in the former version. The saw-tooth voltage of this stage is supplied to the series circuit of C3 and GR1. If the diode is blocked, it has a so-called "blocking-zone capacitance" (C0), which is approx. 5 pF.

The voltage will then be divided across C3 and C0. The ratio of the voltages depends on the ratio of the values of C3 and C0. C0 has a definite value, while C3 is adjustable. With C3 the ratio between C3 and C0 can be varied, so that the voltage ratio is consequently varied. By varying C3, the amplitude of the voltage across C0 (i.e. across the diode in blocking direction) can be varied.

This means that the amplitude of the synchronisation voltage for the second stage is varied. The fact is that the voltage across C0 increases, if C3 increases and vice versa.

Figure 2 shows that the second stage still synchronises well with different values for C3 (i.e. with different amplitudes of the synchronisation voltage).

(I, C3 is low; II, C3 is high). Should the voltage V1 be higher than V0 at moment t1 in Fig. 2, then the tube would be

ignited prematurely. C3 has certain limit values in between which the stage has the correct adjustment. The divider has its best possible adjustment, if the value of C3 lies exactly between these two limit values. To adjust the trimmers a pertinax or plastic trimmer key should be used as drawn in Fig. 3.

In view of the alteration of the dividers, the stabilised supply voltage has been increased from 175 V to 200 V. The resistance value of R705, in the supply circuit, has consequently become 12 kΩ.

Additional Service parts are given in the following pages.

Besides the capacitors mentioned in Service Information Bulletin Bc596, the resistors R1, 5, 9, 13, 17, 21, 51, 55, 59, 63, 67, 71 have been altered from 100 kΩ into 180 kΩ, with alteration code AH09, concerning the alteration of the master oscillators.

As the voltage difference between the heater and the cathode of B81 (ECL82) is too large, the heater is connected to the cathode of the triode part (point 4 of B81 is connected to point 8 of B81 instead of point 2 of B81).

L/MdC

CENTRAL SERVICE

[Signature]
Remmers

Value			Quantity	Code number
1	MΩ	1 %	12	901/1M
2,2	MΩ	1 %	61	901/2M2
30	pF		61	C 005 CC/30E (trimmer)
680	pF	2 %	4	4822 121 50181
750	pF	2 %	5	4822 121 50182
780	pF	2 %	1	4822 121 50183
820	pF	2 %	5	4822 121 50184
910	pF	2 %	1	C 399 AA/D910E
950	pF	2 %	1	4822 121 50185
1000	pF	2 %	1	4822 121 50186
1050	pF	2 %	1	C 399 AA/D1K04
1100	pF	2 %	1	4822 121 50187
1200	pF	2 %	1	4822 121 50188
1300	pF	2 %	1	4822 121 50189
1350	pF	2 %	1	C 399 AA/D1K37
1450	pF	2 %	1	4822 121 50191
1700	pF	2 %	1	4822 121 50192
1800	pF	2 %	1	C 399 AA/D1K8
1900	pF	2 %	1	4822 121 50193
2000	pF	2 %	1	C 399 AA/D2K
2150	pF	2 %	2	4822 121 50194
2300	pF	2 %	1	4822 121 50195
2500	pF	2 %	2	4822 121 50196
2700	pF	2 %	1	4822 069 00694
2900	pF	2 %	1	4822 121 50197
3000	pF	2 %	1	4822 121 50198
3200	pF	2 %	1	4822 121 50199
3400	pF	2 %	1	4822 121 50201
3600	pF	2 %	1	4822 121 50202
3800	pF	2 %	1	4822 121 50203
4000	pF	2 %	1	4822 121 50204
4300	pF	2 %	1	4822 121 50205
4500	pF	2 %	1	4822 121 50206
4800	pF	2 %	1	4822 121 50207
5000	pF	2 %	1	4822 069 00922
5400	pF	2 %	1	4822 121 50208
5600	pF	2 %	1	4822 121 50209
6000	pF	2 %	1	4822 121 50211
6600	pF	2 %	1	4822 121 50212
7000	pF	2 %	1	4822 121 50213
7500	pF	2 %	1	4822 121 50214
8000	pF	2 %	1	4822 121 50215
8200	pF	2 %	1	4822 121 50216
8800	pF	2 %	1	4822 121 50217
9400	pF	2 %	1	4822 121 50218

[Signature]

Value			Quantity	Code number
10000	pF	2 %	1	C 295 AA/D10K
10500	pF	2 %	1	4822 121 50219
11000	pF	2 %	1	4822 121 50221
12000	pF	2 %	1	4822 057 00443
12500	pF	2 %	1	4822 121 50222
13000	pF	2 %	1	C 297 AA/C13K
13500	pF	2 %	1	4822 121 50223
14000	pF	2 %	2	4822 121 50224
14500	pF	2 %	1	4822 121 50225
15000	pF	2 %	1	C 297 AB/C15K
15500	pF	2 %	1	4822 121 50226
16000	pF	2 %	1	C 297 AC/C16K
17000	pF	2 %	1	4822 121 50227
17500	pF	2 %	1	4822 121 50228
18000	pF	2 %	1	4822 121 50229
19000	pF	2 %	1	4822 121 50231
20000	pF	2 %	1	4822 121 50232
10000	pF	10 %	8	4822 069 01027
12000	pF	10 %	3	4822 069 01068
27000	pF	10 %	1	4822 069 01067
47000	pF	10 %	3	4822 069 01071
82000	pF	10 %	2	4822 069 01069
0,1	μF	10 %	2	4822 069 01064
0,15	μF	10 %	2	4822 069 01063
0,22	μF	10 %	1	4822 069 01123
0,33	μF	10 %	5	4822 069 00601

hom

PHILIPS Service

INFORMATION

PHILICORDA

13-1-1966

AG 7500

Bc 612



Re : Tuning with the aid of a pitch pipe

As a continuation of the tuning methods mentioned in the Service Notes, the following is a complete description of a method which fully meets the demands made, provided a proper pitch pipe is used. Tuning with the aid of a pitch pipe should be done by ear and can be done only in a quiet room.

The main advantage of this method is that it requires no electronic equipment at all. The only requirements are a pitch pipe and a screwdriver which cannot influence the tuning of the master oscillator coils.

For this it is best to use a plastic or messing screwdriver. The pitch pipe should comprise the 12 tones of an octave as is the case with the Philicorda, (i.e. the intervals between the tones should be the same).

In principle, it does not matter which octave of the Philicorda is covered by the pitch pipe. For accuracy however, it is important that the tone range is as high as possible. On the other hand, it is also important that the tones are agreeable to the ear.

Most pitch pipes therefore have a tone range with an a^1 of 440 c/s. This method is based on the following :

A tone is auditory because of a periodic vibration of the air. This means that the nodes and antinodes reach the ear in a certain rhythm. Assumed that an auditory tone is purely sinusoidal, the nodes and antinodes will reach the ear in the rhythm of this sine. If, simultaneously with the first tone, a second tone is made audible, these two tones will reach the ear simultaneously.

There then are two possibilities :

1. The frequencies of the two tones are exactly the same. In that case the rhythm of the nodes and antinodes is the same. The ear then hears a tone having the same frequency as the individual tones. The volume of the auditory tone depends on the phase shift between the two individual tones.

2. The frequencies of both tones differ.

The nodes and antinodes will not reach the ear simultaneously. This means that the notes sometimes support and sometimes counteract each other so that the sum of the auditory sound is a tone which has been frequency as well as amplitude modulated.

In this case, maxima and minima in the volume are audible. The distance between two maxima (equal to the distance between two minima) is called a beat. Fig. TRA 1945 shows that the number of beats per second equals the frequency difference of the two tones. In our example, V_1 has a frequency of 6 c/s and V_2 a frequency of 4 c/s.

The number of beats of V_f is 2.

These beats are employed when tuning with the aid of a pitch pipe. For tuning a Philicorda, proceed as follows :

1. Switch on the instrument and allow it to warm up for about 15 minutes.
2. Switch on a register (e.g. Vox II).
3. Strike all keys of the keyboard in succession while SK1, SK2 and SK4 (8', 4' and 2' switches) are depressed successively.
4. If a divider is incorrectly adjusted, this will be heard at once. The tone then will sound entirely different from the tones on either side. For example, it will be one octave too high or much too low. In that case, properly adjust the dividers before adjusting the master oscillators. For this, proceed as follows: Turn the wiper of the trimming potentiometer pertaining to the relevant tone away from the stop so far that the correct tone just becomes audible. Then continue turning. The tone will then remain the same over a wide range. The divider is adjusted correctly by setting the wiper to exactly the centre of this range.

After this, check whether the master oscillators are tuned correctly. For this, proceed as follows :

Find out which octave of the Philicorda corresponds with the range of the pitch pipe.

Assume that the pitch pipe has a range with an a^1 of 440 c/s.

If then a certain tone is produced with the pitch pipe and the same tone is struck on the Philicorda, there will be no auditory beats if the tones are exactly the same.

If there are beats, it means that the master oscillator of the relevant tone is detuned. The coil core of the master oscillator will therefore have to be turned. This can be done by making a tone (e.g. a^1) on the pitch pipe and striking the same tone on the Philicorda (i.e. a^1). It may be handy to put a little metal block on the key so that one hand is kept free. Then switch on the register the timbre of which corresponds with that of the pitch pipe. Keep the volume of the pipe and the Philicorda as constant as possible. Blow the pipe at a constant force. If there are beats, carefully turn the coil core of the a with a screwdriver until the number of beats becomes zero. This means that then all a 's are properly tuned.

If this is done with all twelve tones of an octave, all tones will be tuned correctly. While adjusting the master oscillators, it may occur that the tone struck on the Philicorda changes suddenly. This means that then the divider of the relevant tone no longer is adjusted properly. This will then have to be readjusted first.

If the frequency difference between the two tones is too large, there are so many beats that they can no longer be heard. It then is necessary to adjust the tone of the Philicorda to about that of the pitch pipe by ear. If the master oscillators have been tuned, it then is necessary to go through the keyboard again to check whether all dividers still are adjusted correctly.

If this is done with active vibrato switch, it can be checked whether there are dividers which are adjusted just to the edge. As the dividers of a certain scale (e.g. $a^4 \dots A$) affect each other, it is necessary to readjust, for example when the divider of a^3 has been readjusted, the dividers below it at the same time (i.e. $a^2 \dots A$). It may also occur that two dividers are detuned (e.g. a^3 and a^2). In that case, first tune the highest divider (a^3) before tuning the dividers below it. It is very easy to hear whether the dividers have been adjusted properly.

For example, the a^3 should sound one octave lower than the a^4 .

The a^4 cannot be adjusted by means of a potentiometer so that it is automatically adjusted correctly if the master oscillator is properly adjusted. The a^2 should be one octave lower than the a^3 , etc.

Fig. TRA 1263A shows the keyboard of the Philicorda with the total tone range. The figures above the drawing (i.e. 8', 4' and 2') indicate which range is covered when SK1, SK2 or SK3 are depressed respectively. Fig. TRA 1351 shows the position of the master oscillator coils (the squares at the right) and the potentiometers of the sawtooth oscillators.

Starting with modification code AH10, the dividers have been modified. Since then, the adjustment is effected by means of air-gap trimmers. The trimmer for a certain tone is in the same position as the potentiometer in the older version of the Philicorda, so that Fig. TRA 1351 still applies.

Here also, the trimmer has a certain number of turns at which the divider is adjusted correctly. The trimmer should therefore be set to the centre of this range.

When doing this, a plastic or pertinax open-end spanner should be used as otherwise the problem of hand-effect may arise.

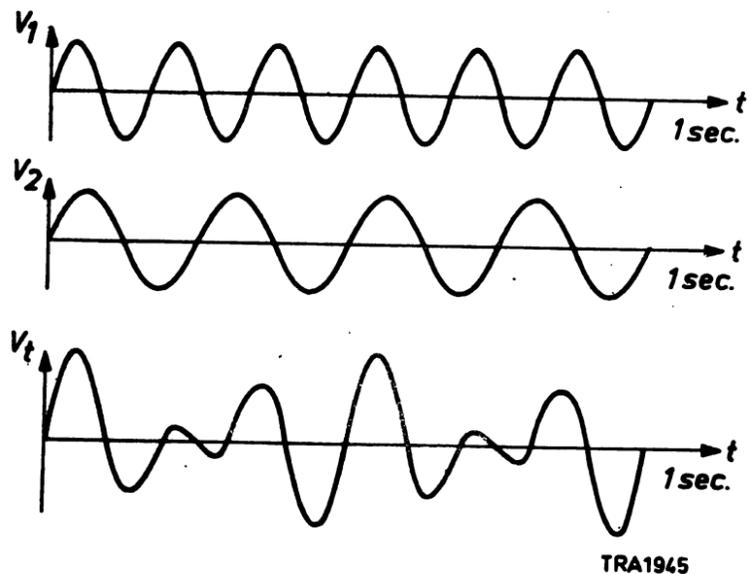
Example :

- a. Tones c^2 , c^1 , c and C sound much too low or one octave too high, while c^3 , c^4 and c^5 appear to be in order. This means that one or more dividers of the c are incorrectly adjusted.
 1. Adjust the highest detuned divider (c^2) so that the tone sounds one octave lower than the c^3 .
 2. Check the dividers of the c^1 , c and C. These tones should be one octave lower each time.
 3. Using the pitch pipe, check that all master oscillators are properly adjusted (zero beats between the tone of the pitch pipe and that of the Philicorda).

4. If necessary, readjust the master oscillators.
 5. Check all tones again, the vibrato being switched on.
 6. Readjust the dividers which still are detuned.
- b. At the initial check, everything appears to be in order, but after checking the master oscillators with the pitch pipe, beats are audible at certain tones.
1. If beats are audible at certain tones, the master oscillator belonging to the relevant tone should be readjusted to zero beats.
 2. Assume that the adjusted master oscillator is A, then all dividers from a³ ... A should be checked again.
 3. Check all tones with the vibrato switched on.
 4. Readjust the dividers which still are detuned.

Remark

Always watch the position of the 8', 4' and 2' switches. When tuning, only one of these switches may be switched on, depending on the tone being tuned.



CENTRAL SERVICE

A. Remmers
 A. Remmers

PHILIPS *Service*

INFORMATION

PHILICORDA

19-11-1965	AG 7500	Bc 597
------------	---------	--------



Supplement to Service Information Bulletin Ba 846

In order to prevent misunderstandings when ordering conductive rubber tubes, we inform you of the following :

The code number 4822 175 01487 is the code number for one bag of tubes, with a content sufficient to convert one philicorda. If 10 philicordas have to be converted 10 x 4822 175 01487 has to be ordered.

Aanvulling op Servicemededeling Ba 846

Om misverstanden te voorkomen met het bestellen van de buisjes geleidende rubber, delen wij het volgende mee :

Het codenummer 4822 175 01487 is het codenummer voor één zakje buisjes, met een inhoud, voldoende om één philicorda om te bouwen. Wil men dus 10 philicorda's ombouwen, dan moet men 10x 4822 175 01487 bestellen.

Supplément de l'Information Service Ba 846

Pour éviter des malentendus concernant les commandes des douilles en caoutchouc conducteur, nous vous signalons que le code 4822 175 01487 désigne 1 sachet de douilles dont le contence suffit à modifier 1 philicorda. Si l'on veut par exemple modifier 10 philicorda , il faut donc commander 10 x 4822 175 01487.