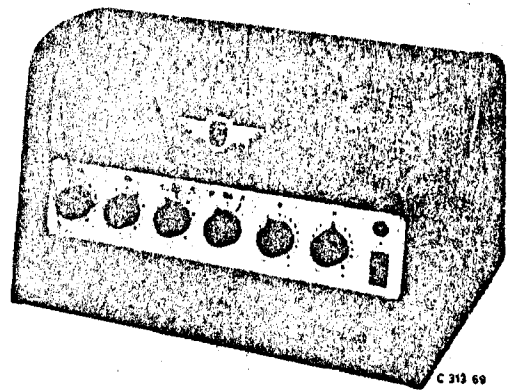


# PHILIPS

# Service



## EL6431/00



### GENERAL

The EL 6431-00 amplifier has been developed for public address purposes. There are 5 inputs:  
2 for microphone - 1 for pick-up - 1 for tape recorder and 1 for radio connection.

The possibility of mixing is given between:

- a.  $d_1$  and  $d_2$
- b.  $d_1$  and  $d_2$  or R.
- c.  $d_2$  and  $d_1$  or R.
- d.  $d_1$  and  $d_2$  and  $d_1$  or R.

Mixing is not possible between  $d_1$  and R.

### DIMENSIONS

Length : 395 mm  
Breadth : 285 mm  
Height : 250 mm

### GERMANIUM DIODE

GR9 : OA55

### PILOT LAMP

LA1 : 8008N

### WEIGHT

Complete with tubes : 16,5 kg.

### VALVES

B1, B2 : EF 40 - EF86  
B3, B4 : ECC83  
B5 to B8 : EL 34

### FUSES

VL1 : 4A (110-145 V) : 974/4000  
          2A (200-245 V) : 974/2000  
VL2 : 20A : 08 143 02.0  
VL3 : : 974/T125

SERVICE INFORMATION										
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FIGURES

- Fig. 1 Circuit diagram  
 Fig. 2 Plan view  
 Fig. 3 View from below  
 Fig. 4 Mounting of selenium cells  
 Fig. 5 Supply transformer  
 Fig. 6 Output transformer  
 Fig. 7 Measuring diagram  
 Fig. 8 Frequency response curves  
 A-B-C  
 Fig. 9 Distortion curve

ELECTRICAL DATA

Mains voltage	110-125-145-200-220-245 V	
Mains frequency	50-100 c/s	
Max. output	120 W	
Power consumption	Zero load : 165 W $\cos \varphi = 0,87$ Full load : 345 W $\cos \varphi = 0,89$	
Output voltage	10-25-35-50-70-100 V Separate output 4.5 V	
Load impedance at 100 V	84 $\Omega$	
Input impedance (40-15,000 c/s)	C <sub>1</sub> and C <sub>2</sub>	$\infty$ $\infty$ $\infty$
	0,22 - 0,15 M	150.000 - 68.000
Sensitivity	2,2 mV	200 mV
Interference level	-54 db	-66 db

CONNECTIONS

From left to right the following connections are located at the rear of the apparatus.

a. Mains connection

In the form of a recessed plug with 6 pins.

b. Loudspeaker connection

Recessed socket for 13-mm plug with flat pins. Both pins are insulated from earth.

c. 4.5 volt output

In the form of a screw connection. Both pins are insulated from earth.

d. Radio input.e. Tape recorder input.f. Pick-up input.g. Microphone input, no. 2.

h. Microphone input, no. 1

k. Next to the loudspeaker connection is a screw for earthing the apparatus.

The inputs  $\phi$ ,  $\phi\phi$  and R have been made with socket contracts for a 19 mm plug provided with a flat centre pin. The right-hand socket (seen from the rear of the apparatus) is earthed.

The microphone inputs are made with 3-pole pin contacts.

Pin 1 : sensitive side

Pin 2 : earth side

Pin 3 : screening of the microphone cable.

CONTROL KNOBS.

The following control knobs are arranged from left to right on the front of the apparatus:

- a. Volume control for  $\phi_1$ .
- b. Volume control for  $\phi_2$ .
- c. Volume control for  $\phi$ ,  $\phi\phi$  or R.
- d. Switch with which one of the inputs  $\phi$ ,  $\phi\phi$  or R can be selected.
- e. Low-tone control.  
In the anti-clockwise direction the low-notes are attenuated by approx. 12 db at 40 c/s. In the clockwise direction the low-notes are boosted by approx. 11 db at 40 c/s.
- f. High-note control.  
In the anti-clockwise direction the high-notes are attenuated by approx. 16 db at 10,000 c/s.  
In the clockwise direction the high-notes are boosted by approx. 7 db at 10,000 c/s.
- g. Mains switch.  
A pilot lamp mounted above the mains switch burns when the amplifier is switched on.

VOLTAGE ADAPTORS

Inside the apparatus are two adaptors for adjusting the mains and output voltages. To set these adaptors the caps have first to be removed.

LOW-OHMIC MICROPHONE INPUT

If a low-ohmic microphone input is required, then it is simple to build in an input transformer (see fig. 1 and 2 pos. (A) and pos. (B)). Type EL 6803/00 can be used as an input transformer.

DESCRIPTION OF CIRCUIT (see fig. 1)

The microphone inputs  $\phi_1$  and  $\phi_2$  are connected via the separating capacitors C1 and C2 and the blocking resistors R13 and R14 to the control grids of valves  $B_1$  and  $B_2$ . The negative grid voltage is obtained by giving the leak resistors  $R_{11}$  and  $R_{12}$  a high rating (10 M $\Omega$ ). As a consequence of the grid current, which is generated when there is an input signal, the capacitors C1 and C2 will be charged. In this way the valves will automatically receive a negative grid voltage.

The amplified signals are fed via the capacitors C5 and C6 to the potentiometers R1 and R2.

A signal that may originate from the sockets Q, O or R arrives at the potentiometer R3.

To prevent the potentiometers R1, R2 and R3 influencing each other, the resistors R22, R23 and R24 (220 K) are incorporated in series with the sliding contacts of these potentiometers.

The full signal is fed to the grid of B3.

After being amplified by B3 the signal reaches the tone control network via C9.

### Tone control.

#### Control of high notes.

The total impedance for high frequencies is determined for the great part by R4 in the branch in which the potentiometer R4 is incorporated.

Practically the whole of these high frequencies are across R4.

According to the position of the sliding contact of R4 less or more "high notes" are fed to the grid of B3'.

Potentiometer R5 is shorted by the capacitors C12 and C13 for high frequencies.

Variation of R5 has, therefore, no influence on the "high-notes".

#### Control of low notes

The total impedance for low frequencies is determined for the great part by R5 in the branch in which the potentiometer R5 is incorporated.

Thus the "low notes" are across R5. According to the position of the sliding contact of R5 less or more "low notes" are fed to the grid of B3'.

The impedance of the branch in which R4 is incorporated is determined mainly by C10 and C11 for low frequencies. Variation of R4 will, therefore, have little influence on the "low notes".

After being amplified by B3' (B3' receives a negative feedback voltage at the cathode, originating from S4 of the transformer) the signal reaches the grid of the top half of B4 via C16. B4 is incorporated in the circuit as a phase inverter. A part of the input signal arrives across R35. This part is amplified by the lower half of the tube. At the top half of the tube the full input signal is reduced with that part which has been fed across R35.

By giving R35, R36 and R37 suitable ratings, two similar, phase-opposed voltages arrive at the anodes of B4. These control the balance final stage.

Besides grid stopping resistors small self-inductances have been introduced into the anode leads in order to prevent oscillation.

### Supply

Selenium rectifiers in Graetz connection supply the various anode and screen grid voltages. The selenium cells are mounted in the base plate of the amplifier. (see fig. 4).

The baseplate can be opened on hinges together with the selenium cells. A special winding on the supply transformer T2 supplies the negative grid voltage for the output valves after rectification by Gr9 and smoothing by C24.

CHECKS AND MEASUREMENTSImportant:

Owing to the fact that some of the components carry very high tensions it is dangerous to switch on the amplifier when it is open!

Currents and voltages at valves

The measurements are carried out with the volume controls in the position 0 (except when measuring the output valves under full load). The tone controls are placed in the centre position. Use of the Philips universal meter P 811 00 is recommended. The values quoted in the table are extreme values. The values to be measured should fall between these quoted values.

	B1, B2 EF40	B3 ECC83	B4 ECC83	B5 to B8 EL34 zero load	B5 to B8 EL34 full load 1)	
Va	66-90	150-205	250-300	805-860	660-720	V
Ia	0,95-1,15	0,87-1,05	1,75-2,2	14-30	54-81	mA
Vg2	45-59			397-422	305-335	V
Ig2	0,17-0,23			1,8-3,8	10-18	mA
Va'		124-144	200-250			V
Ia'		1,1-1,35	0,75-1,0			mA
Vg				-40--42	-38--40,5	V
Vk		1,3-1,6				V
Vk'		0,62-0,75	2-2,6			V
Vf	6,10-6,45	6,10-6,45	6,10-6,45	6,10-6,45	6,10-6,4	V

1) When measuring a full load the amplifier is connected as for "stage-by-stage measuring" (see fig. 7).

Stage-by-stage measuring

- Set the output adaptor to 100 V,
- Connect a resistance of 83  $\Omega$  (120 W) to the output.
- Connect an audio-frequency generator to  $\Omega_1$  or  $\Omega_2$ . (Do not forget the series resistor).
- Set the audio-frequency generator to 1000 c/s.
- Set the tone controls to the centre position and the volume controls to maximum.
- Switch on the amplifier.
- Feed in a signal of such power that the output voltage across the load resistance is 100 V.
- The values given below should be found at the following points (see also fig. 1).

A <sub>1-2</sub>	2,2 mV	G	1,3 V
B <sub>1-2</sub>	1,9 mV	H	1,3 V
C <sub>1-2</sub>	175 mV	I	0,5 V
D <sub>1-2</sub>	53 mV	K <sub>1-K<sub>2</sub></sub>	25 V
E	2,3 V	L <sub>1-2-3-4</sub>	25 V
F	155 mV	M <sub>1-2-3-4</sub>	440 V 2)

2) The Philip's universal meter P 811 00 was used for carrying out the measurements at points M1, M2, M3 and M4.

A valve voltmeter GM 6005 or GM 6017 can be used for the other measurements.

Differences of greater than 20% indicate a discrepancy in the relevant stage.

#### Measuring frequency response curves.

- Set the output adaptor to 100 V
- Connect an 83-Ω resistance (120 W) to the output.
- Set the volume control of the channel to be measured to maximum; set the other volume controls to minimum.
- Connect the audio-frequency generator to the channel to be measured. In this case it is recommended to feed the following voltages to the inputs.

for Q 1,15 mV  
 for Ø 39 mV  
 for Q OR 97 mV

For Q Q and R the measurements are made with the tone controls in the centre position.

For Ø the measurements are made with the tone controls in the centre position and at +B, +H and -B, -H.

#### LOUDSPEAKER MATCHING

The amplifier has been made in accordance with the 100 V system. 100, 70, 50, 35, 25 and 10 V output can be selected with the output adaptor. This series has been so selected that the total nominal power of the loudspeakers can be doubled when the output voltage is lowered by one stage.

This system gives numerous possibilities of adaptation. If one has loudspeakers which give their nominal power at 100 V, then so many can be connected in parallel to the 100 V output until the total nominal power is approx. 120 W.

If it is required to connect several loudspeakers of this type, then the output voltage should be lowered by 1 stage.

The total nominal power of the loudspeakers can then be doubled. Each loudspeaker takes half its nominal power.

The above also applies to 70 V and 50 V loudspeakers. Care should be taken, however, to ensure that the output voltage is not higher than the voltage for which the loudspeakers are suitable.

The 10 V connection can be used for low impedance loudspeakers or for a large number of headsets.

In addition the output transformer has a completely separate 4. V output which is not connected to earth, and which can be used for controlling other amplifiers or for headsets. The various connection possibilities are given in the table on the other side.

Output voltage of the amplifier	maximum nominal power		
	100 V loudspeaker	70 V loudspeaker	50 V loudspeaker
100 V	120		
70 V	240	120	
50 V	480	240	120
35 V	960	480	240
25 V	1920	960	480
10 V	low-impedance loudspeakers and headsets		

LIST OF MECHANICAL PARTS.

Pos.	Description	Code number
	<u>Fig. 2</u>	
1	Valve holder EF 40	976/8x12
2	Pin socket 3-pole	977/M05
3	Female plug 3-pole	977/F05
4	Valve holder ECC 83	976/9x12
5	Plug 2-pole	49 302 27
6	Spark cap	V3 693 24.0
7	Valve holder EL 34	976/V8x17
8	Plug 2-pole	978/2x12
9	Female plug 2-pole	978/34x19
10	Fuse holder	974/2x20
11	Mans voltage adaptor	A3 228 85.1
12	Knob for adaptor	23 723 16.1
13	Pilot lamp holder	976/1x9
14	Sliding switch 2-pole	970/01AA
15	Arrow head	973/PO1
16	Knob	973/O3
17	Knob with arrow	973/17
	Valve holder EF86	976/9x12

Fig. 3

1	Mounting support	967/8
2	Valve (Kerisima)	56 162 46/50
3	Rubber grommet 11x1	975/11x5
4	Pin socket 2-pole	978/M2x19
5	Socket 2-pole	978/12
6	Large union nut	992/M4
7	Socket plate	979/2x19
8	Pin socket 3-pole	977/M05
9	Rubber grommet (7x1)	975/7x4
	Connection strip for coil L5	910/18x110



T2	V3 617 63				
C18	906/470K	0.47	μF		
C19	906/470K	0.47	μF		
C24	910/D50	50	μF		
C25	906/L15K	15,000	pF		
C26	911/D100	100	μF	50	V
C27	912/R25+25	50	μF	500	V
R44	900/1K8 ) 900/1K5 ) parallel				
R45	900/1K8 ) 900/1K5 ) parallel				
R48	900/22K ) 900/1K8 ) parallel				
R50	48 768 05/100K				
R51	48 768 05/100K				
R52	48 768 05/100K				
R58	900/100K	100	kΩ		
R59	901/1M2	1.2	MΩ		W
R60	900/220K	0.22	MΩ		W
R61	900/220K	0.22	MΩ		W
R62	900/220K	0.22	MΩ		W
L5	E3 140 59				

T1	V3 621 66			R24	900/220K	220	kΩ
C1	906/L10K	10.000	pF	R25	900/1M	1	MΩ
C2	906/L10K	10.000	pF	R26	900/1K5	1500	Ω
C3	906/270K		0.27 μF	R27	900/82K	82	kΩ
C4	906/270K		0.27 μF	R28	900/150K	150	kΩ
C5	906/33K	33.000	pF	R29	900/10K	10	kΩ
C6	906/33K	33.000	pF	R30	900/100K	100	kΩ
C7	906/L22K	22.000	pF	R31	900/56K	56	kΩ
C8	910/D50	50	μF	R32	900/560E	560	Ω
C9	906/56K	56.000	pF	R33	900/100K	100	kΩ
C10	905/1K	1.000	pF	R34	900/120K	120	kΩ
C11	906/L10K	10.000	pF	R35	900/820E	820	Ω
C12	905/2K2	2.200	pF	R36	900/33K	33	kΩ
C13	906/L33K	33.000	pF	R37	900/150K	150	kΩ
C14	906/L100K		0.1 μF	R38	900/270K	270	kΩ
C15	904/68E	68	pF	R39	900/270K	270	kΩ
C16	906/22K	22.000	pF	R40	900/1K	1	kΩ
C17	904/56E	56	pF	R41	900/1K	1	kΩ
C18	906/100K		0.1 μF	R42	900/1K	1	kΩ
C19	906/100K		0.1 μF	R43	900/1K	1	kΩ
C20	912/R25+25	25+25	μF	R44	900/820E	820	Ω
C21	912/R25+25	25+25	μF	R45	900/820E	820	Ω
C22	912/R25+25	25+25	μF	R46	900/33K	33	kΩ
C23	912/R25+25	25+25	μF	R47	900/22K	22	kΩ
C24	910/D25	25	μF	R48	900/10K	10	kΩ
R1	915/L75K+275K	350	kΩ log.	R49	900/22K	22	kΩ
R2	915/L75K+275K	350	kΩ log.	R50	900/100K	100	kΩ
R3	915/L75K+275K	350	kΩ log.	R51	900/100K	100	kΩ
R4	915/L50K+450K	500	kΩ log.	R52	900/100K	100	kΩ
R5	915/L50K+450K	500	kΩ log.	R53	900/1K2	1200	Ω
R6	900/270K	270	kΩ	R54	900/10E	10	Ω
R7	900/270K	270	kΩ	R55	900/10E	10	Ω
FB	900/1M	1	MΩ	R56	900/10E	10	Ω
R9	900/1M	1	MΩ	R57	900/10E	10	Ω
R10	900/1M	1	MΩ				
R11	900/10M	10	MΩ				
R12	900/10M	10	MΩ				
R13	900/47K	47	kΩ				
R14	900/47K	47	kΩ				
R15	900/4K7	4700	Ω				
R16	900/4K7	4700	Ω	GR1	V3 696 91		
R17	900/4K7	4700	Ω	GR2	V3 696 91		
R18	900/680K	680	kΩ	GR3	V3 696 91		
R19	900/680K	680	kΩ	GR4	V3 696 91		
R20	900/100K	100	kΩ	GR5	V3 696 91		
R21	900/100K	100	kΩ	GR6	V3 696 91		
R22	900/220K	220	kΩ	GR7	V3 696 91		
R23	900/220K	220	kΩ	GR8	V3 696 91		
				GR9	V3 696 91		

4821 130 5021

EL 6431/00

The changes marked in red are modifications which have been introduced in the later production for the following reasons.

1. Power transformer T2 (code no. V3 616 93) is replaced by V3 617 63, which is better able to stand up against overcharge. For connections see fig. 5.
2. The resistors marked in red R44, R45, R48, R50, R51 and R52 are of greater power than these resistors, which are indicated in black.
3. In order to avoid the output valves EL34 becoming defective, a special coil, (code no. V3 628 67) must be connected in parallel to the resistors R38 and R39.  
The middle tap of the coil is connected to the point of junction of R38-R39.  
The value of the coupling capacitors C18 and C19 must be increased from 0.1  $\mu$ F to 0.47  $\mu$ F.
4. It may occur that the amplifier shows a tendency to parasitic oscillations.  
In order to prevent this:  
The position of C7, C16, R22, R23 and R24 has been changed.  
The value of C24 is changed from 25  $\mu$ F to 50  $\mu$ F.  
For B3 a grid resistor R58 of 100 k $\Omega$  has been added.
5. Although the hum level falls within the requirements, it is still desirable for some applications to reduce this level. This can be done as follows:  
Connect capacitor of 100  $\mu$ F, 50 V in parallel to C24, for instance 911/D100.  
Connect capacitor of 50  $\mu$ F, 500 V in parallel to R10 for instance 912/R25+R25.  
The reduction of the hum level by this is approx. 9 dB on an average.
6. In order to increase the stability an RC filter has been provided between coupling capacitor C16 and the grid (point 7) of B4. In some amplifiers this filter has been placed at the upper side of C16. Under special circumstances (for instance an inductive charge, volume control fully open, high notes strongly boosted) the amplifier may start parasitic oscillation. In order to prevent this it is advisable to place the filter at the left from the valve holder for B4.
7. For the amplifiers in which valves EF86 instead of EF40 have been applied, the valve holders for EF86 can be supplied under code no. 976/9x12.

Note:

The letter A, C or F may be added to the serial number of this amplifier.

if a follows behind the serial number, then the modification 3 has been made in the amplifier.

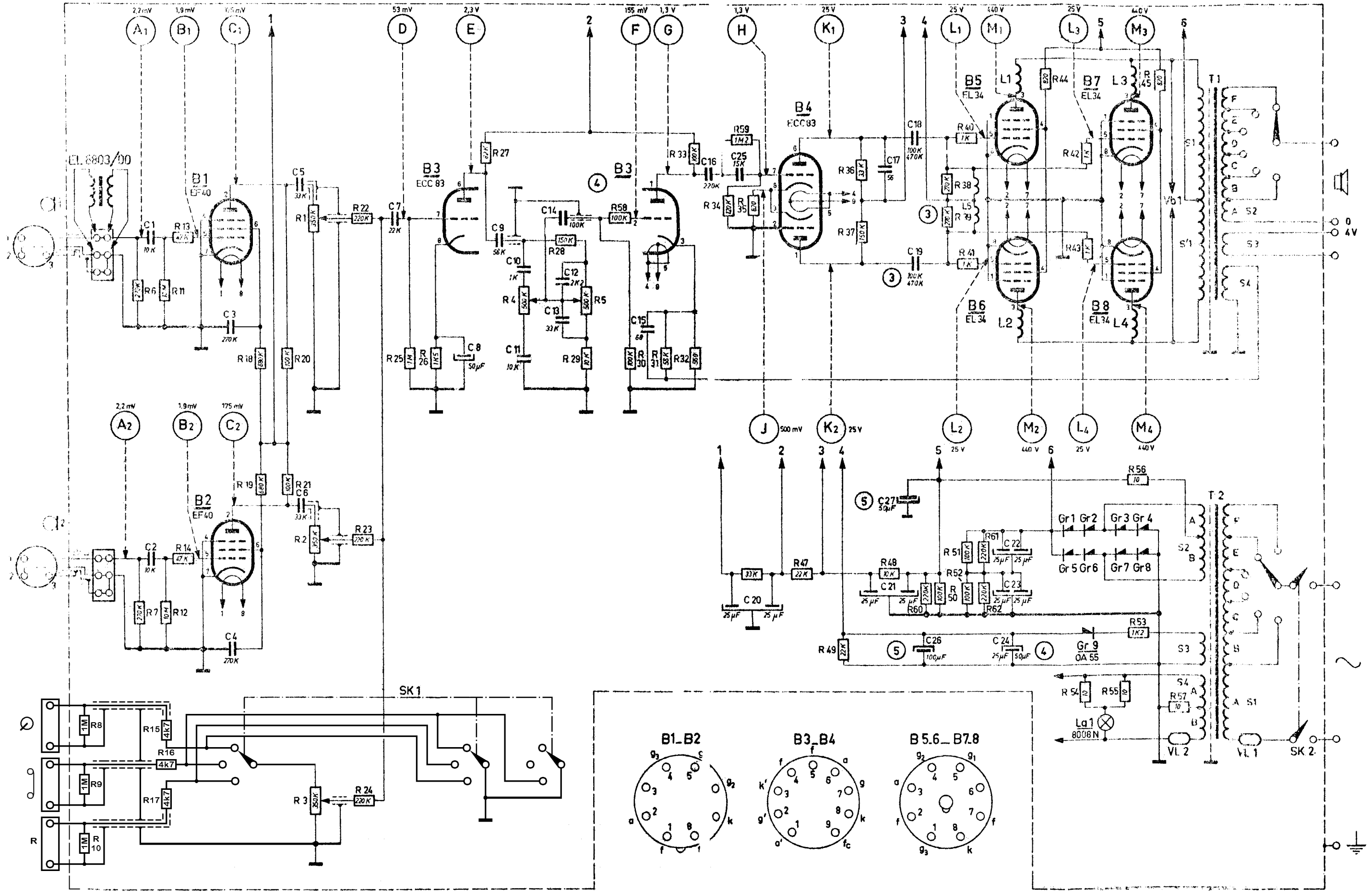
EL 6431/00

If C follows behind the serial number, then the modifications  
1, 3 and 6 have been made in the amplifier.

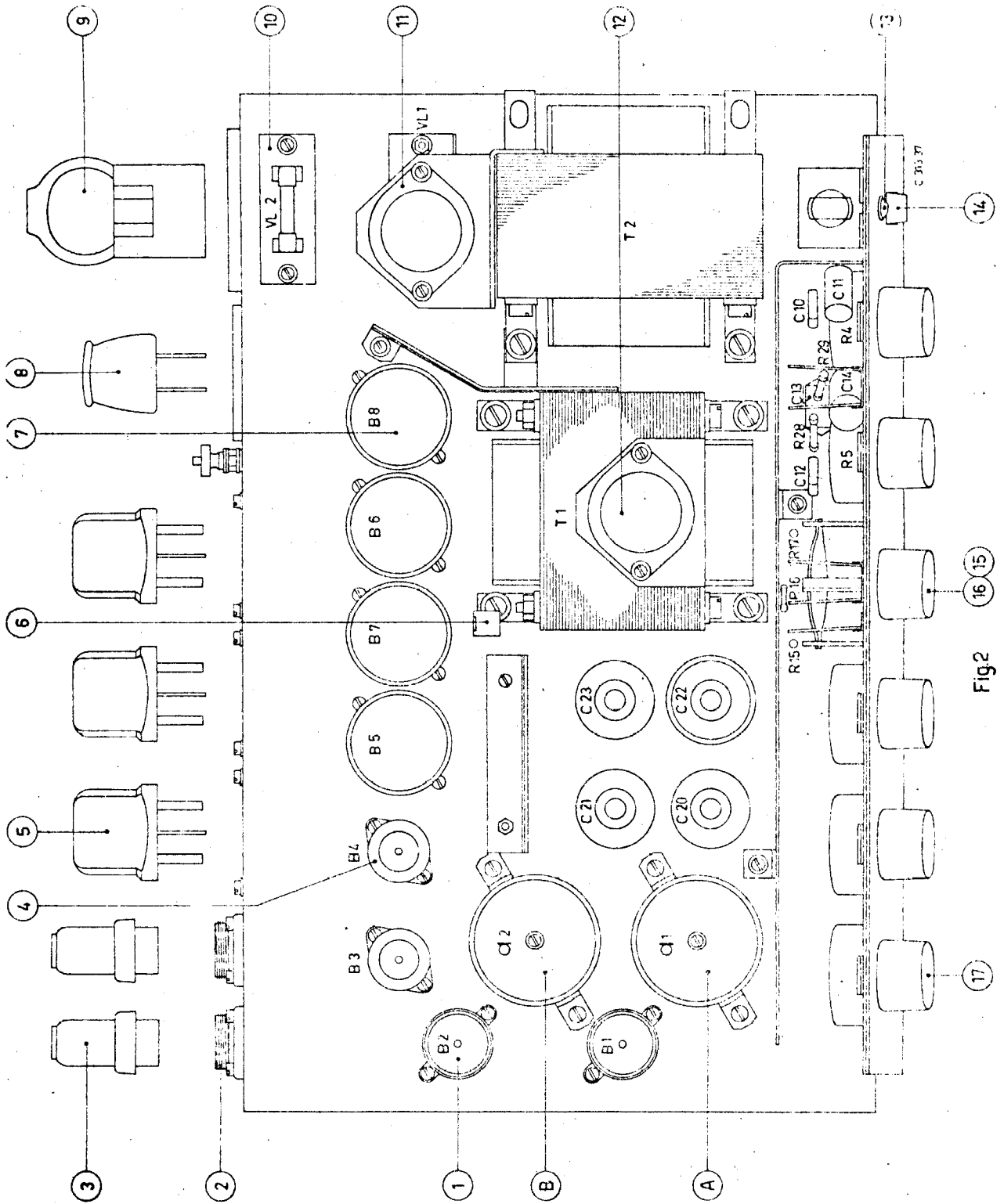
If F follows behind the serial number, then the modifications  
3 and 6 have been made.

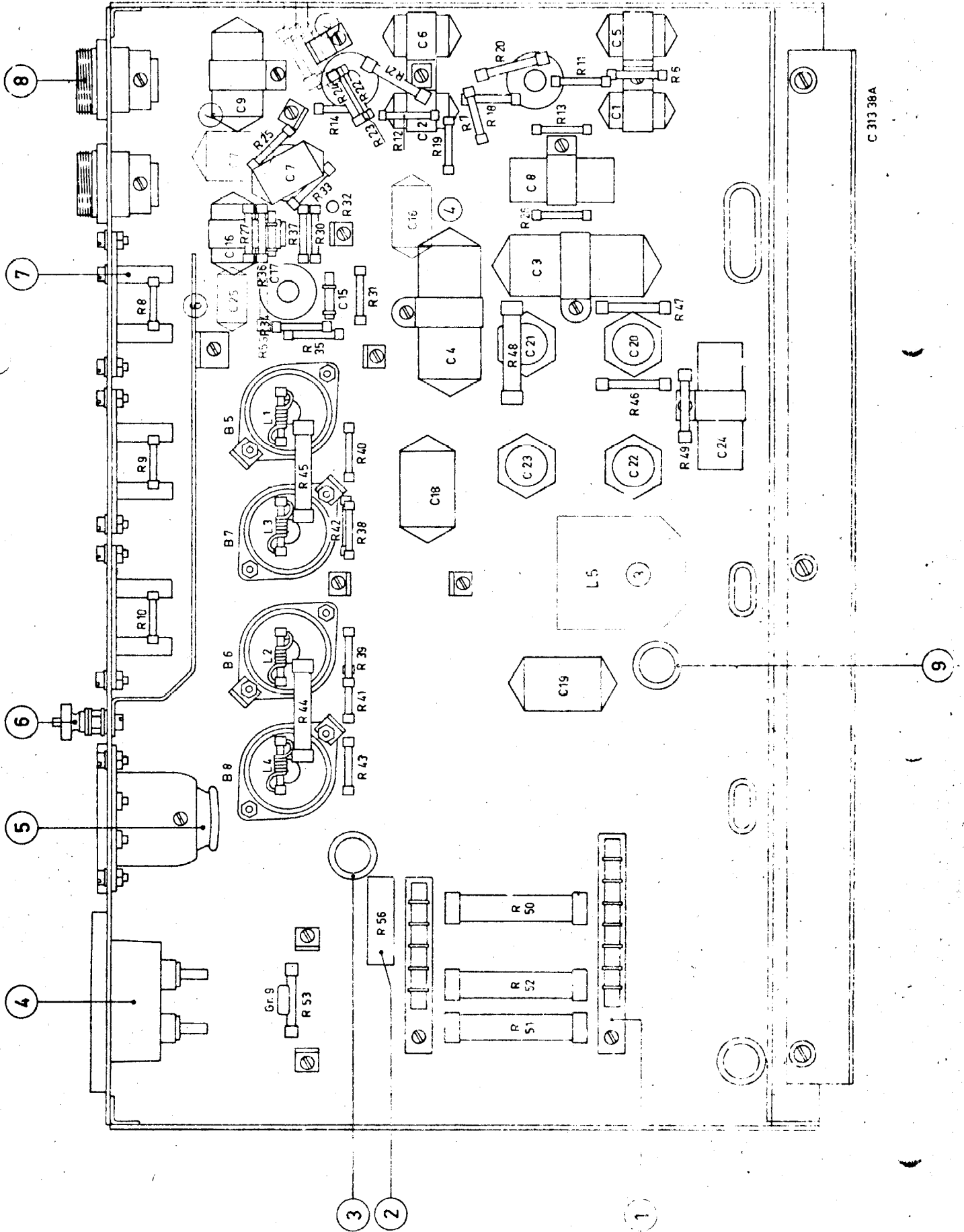
EL0431

1, 2, 3, 10,	6, 7, 11, 12, 15, 16, 17, 13, 14,	18, 19,	20, 21, 1, 2, 3,	22, 23, 24,	25,	26,	27,	4,	28,	5, 29,	58, 30,	31,	32, 33,	59, 35, 46,	47,	49,	26, 37,	48,	60, 50, 38, 49, 51, 52, 40, 41, 162,	44,	54, 42, 43,	55,	53, 56, 45, 57,
1, 2,	3, 4,	5, 6,	7,	8,	9,	10, 11,	12, 13,	14,	15,	16,	20,	21, 22,	23, 24,	25,	26,	27, 21,	28, 29, 26,	22, 23, 24,					



# EL 6431





C 313 38A

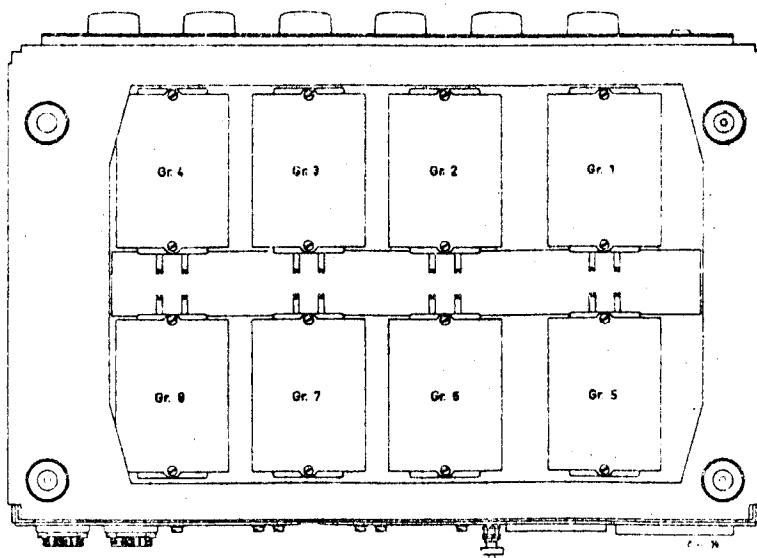


Fig 4

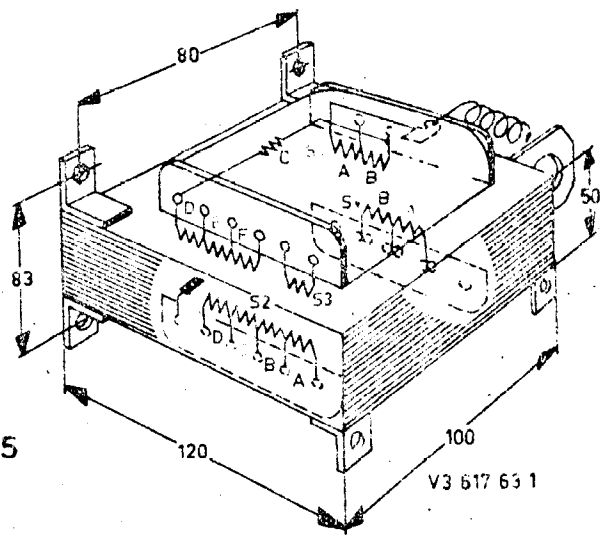
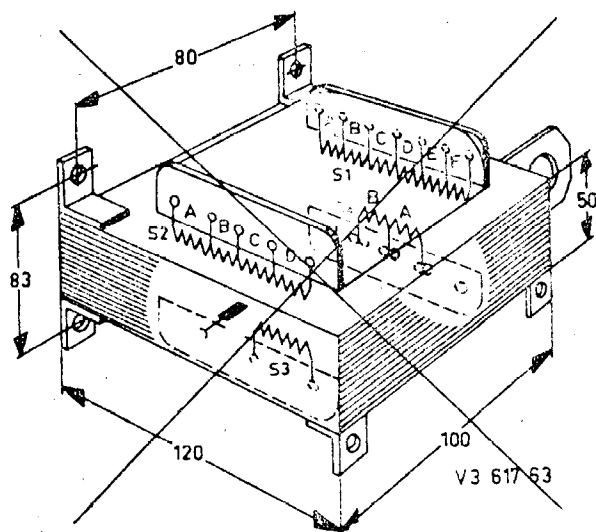


Fig 5

	S1A	B	C	D	E	F	S2 A-D	B=C	S3	S4A=B
n	230	32	41	115	42	52	35	730	86	7
∅	2 x 0.6	0.6			0.5			0.3	0.3	2 x 1.4
Ω	1.5	1.06			4.5			100	6.05	< 1

S <sub>1</sub> -S <sub>1</sub> '	S <sub>2</sub> -S <sub>2</sub> '=S <sub>2</sub> <sup>*</sup>						S <sub>3</sub> -S <sub>3</sub> '=S <sub>3</sub> <sup>*</sup>	S <sub>4</sub> -S <sub>4</sub> '	
	A	B	C	D	E	F			
	735 W	18 W	26 W	18 W	2 W	6 W	13 W	8 W	20 W

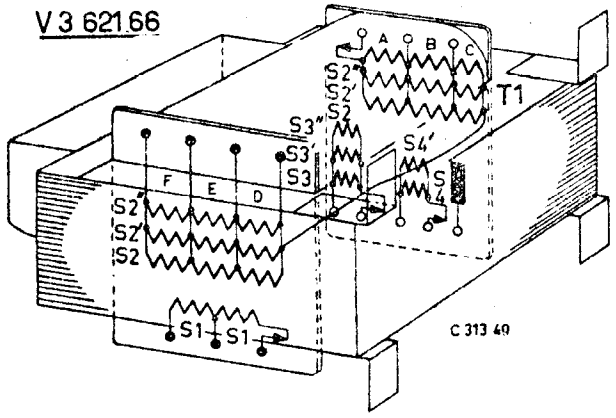
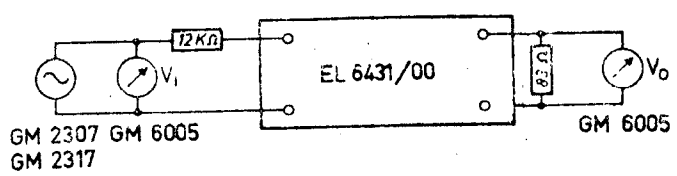


Fig 6



GM 2307 GM 6005  
GM 2317

C 313 42

Fig 7



# EL 6431

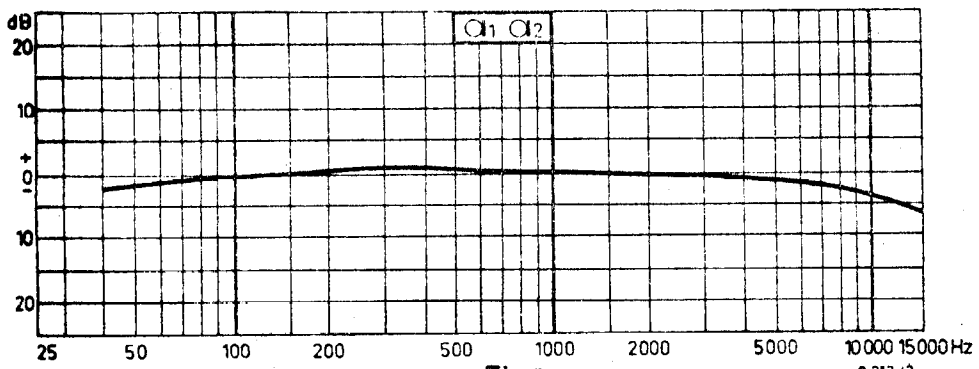


Fig. 8a

C 313 43

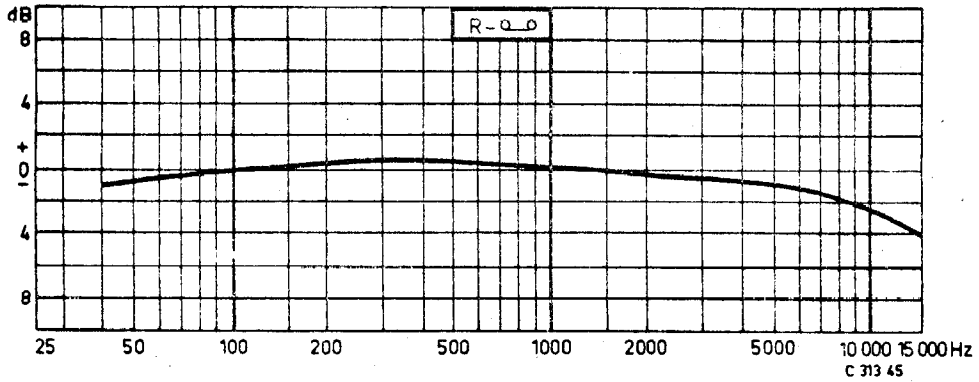


Fig. 8b

C 313 45

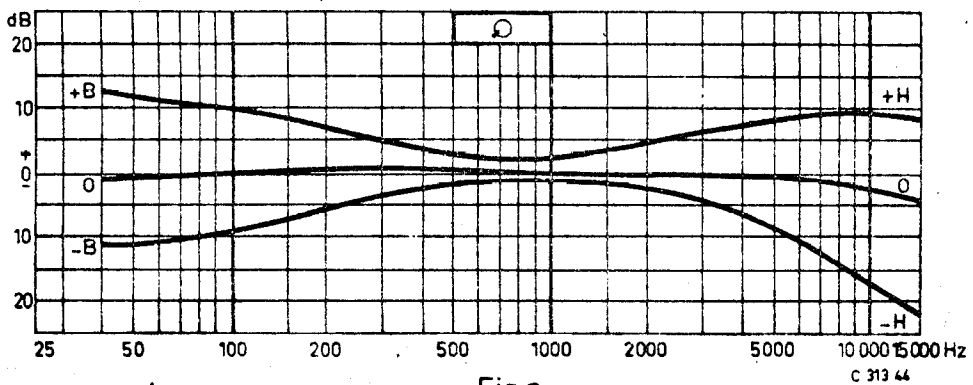


Fig. 8c

C 313 44

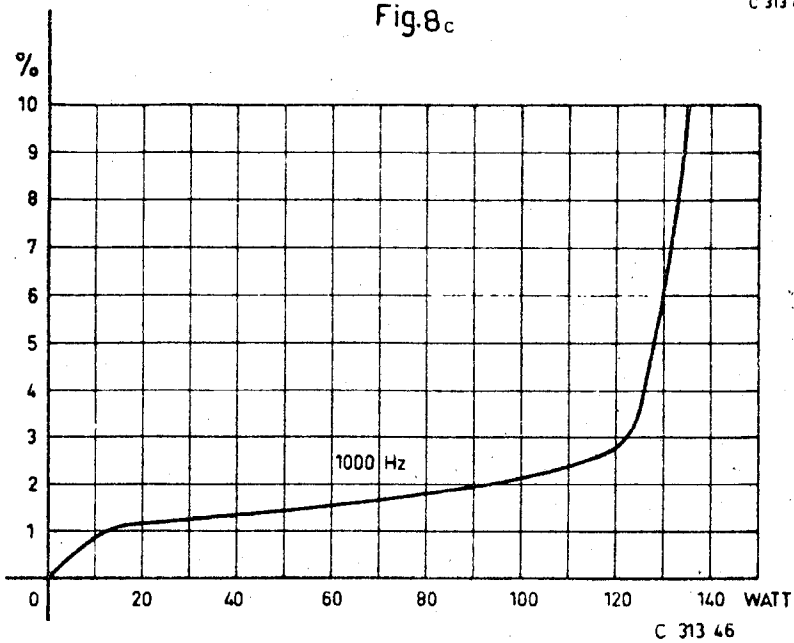


Fig. 9

C 313 46

**PHILIPS**

*Service*

**INFORMATION**

22-10-1960

EL 6431, EL 6432

Eb 133



Re : Flashing-over between pins 2 and 3 of the valve EL 34

In order to prevent flashing-over between pins 2 and 3 of the output valve EL 34 in the amplifiers EL 6431 and EL 6432, we recommend you to bore a hole 1/8" (3 mm) diameter between pins 2 and 3 in the artificial resin of the valve base.

- - - - -

Betr. : Overslag tussen de pennen 2 en 3 van de buis EL 34

Teneinde overslag tussen de pennen 2 en 3 van de eindbuis EL 34 in de versterkers EL 6431 en EL 6432 te voorkomen, raden wij U aan in het kunstharz van de buisvoet tussen de pennen 2 en 3 een gat van 3 mm (1/8") te boren.

- - - - -

Concerne : Contournement entre les borches 2 et 3 du tube EL 34

Pour éviter le contournement entre les broches 2 et 3 du tube de sortie EL 34 dans les amplificateurs EL 6431 et EL 6432 nous vous conseillons de percer un trou de 3 mm (1/8") dans la résine artificielle du culot de tube entre les broches 2 et 3.

- - - - -

Betr. : Ueberschlag zwischen den Stiften 2 und 3 der Röhre EL 34

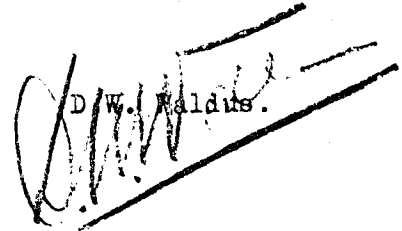
Um Ueberschlag zwischen den Stiften 2 und 3 der Endröhre EL 34 in den Verstärkern EL 6431 und EL 6432 zu verhindern, raten wir Ihnen im Kunstharz des Röhrenfusses zwischen den Stiften 2 und 3 ein Loch von 3 mm (1/8") zu bohren.

- - - - -

Asunto : Descarga disruptiva entre las patillas 2 y 3 de la válvula EL 34

Para evitar la descarga disruptiva entre las patillas 2 y 3 de la válvula de salida EL 34 en los amplificadores EL 6431 y EL 6432, les aconsejamos a Uds. que taladren un orificio de 3 mm (1/8") en el material de resina artificial de la base de válvula entre las patillas 2 y 3.

CENTRAL SERVICE DEPARTMENT

  
D.W. Maldus.

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 vulling van de bestelling is niet gegarandeerd. Het is niet toegestaan de  
 afgeleverde goederen te kopiëren of te verspreiden. Het is niet toegestaan  
 de afgeleverde goederen te gebruiken voor andere doeleinden dan die  
 bedoeld zijn in de bestelling. Het is niet toegestaan de afgeleverde  
 goederen te gebruiken voor andere doeleinden dan die bedoeld zijn in  
 de bestelling. Het is niet toegestaan de afgeleverde goederen te  
 gebruiken voor andere doeleinden dan die bedoeld zijn in de bestelling.

→ gev. of toegev. de

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						S1=S1'=735 W															
						S2A=S2C= 13 W															
						S2B=S2D= 26 W															
1					Uitgangstransf	S2E= 36 W	V3 621 66							afz st						T1	
						S2F= 53 W															
						S3=S3'-S3''=3 W															
						S4=S4'= 20 W															
						S1A=230 W															
						S1B= 32 W															
						S1C= 41 W															
						S1D=115 W															
						S1E= 42 W															
1					Krachttransf	S1F= 52 W	V3 617 63							afz st						T2	
						S2A=S2B= 765 W															
						S3= 36 W															
						S4A=S4B= 7 W															
1					Spoel		V3 590 56							Z st o t						L1	
1					Spoel		V3 590 56							Z st o t							L2
1					Spoel		V3 590 56							Z st o t							L3
1					Spoel		V3 590 56							Z st o t							L4
1					Smoorspoel		V3 628 67							A st o t							L5
1					→ Polyester 125V 10000 pF 20%		C 296 AA/A10K														C1
1					→ Polyester 125V 10000 pF 20%		C 296 AA/A10K														C2
1					Giepac 400 V 0,27 uF 20%		48 231 20/270K														C3
1					Giepac 400 V 0,27 uF 20%		48 231 20/270K														C4
1					Giepac V 400V 33000 pF 20%		48 236 20/33K														C5
1					Giepac V 400V 33000 pF 20%		48 236 20/33K														C6
1					→ Polyester 125V 22000 pF 20%		C 296 AA/A22K														C7
1					PW elco 25 V 64 uF geïsl		AC 8121/64														C8
1					Giepac V 400V 56000 pF 20%		48 236 20/56K														C9
1					Perlimico A 1000 pF 10%		48 335 10/1K														C10
1					→ Polyester 125V 10000 pF 10%		C 296 AA/A10K														C11
1					Perlimico A 2200 pF 10%		48 336 10/2K2														C12
1					→ Polyester 125V 33000 pF 10%		C 296 AA/A33K														C13
1					→ Polyester 125V 0,1 uF 20%		C 296 AA/A100K														C14
1					Kerco I B 68 pF 20%		C 304 AH/P68E														C15
1					Giepac V 400V 0,22 uF 20%		48 236 20/220K														C16
1					Kerco I B 56 pF 10%		C 304 AH/A56E														C17
1					Giepac V 400V 0,47 uF 20%		48 236 20/470K														C18
1					Giepac V 400V 0,47 uF 20%		48 236 20/470K														C19
1					HS elco 500 V 25+25 uF		AC 6011/25+25														C20
1					HS elco 500 V 25+25 uF		AC 6011/25+25														C21
1					HS elco 500 V 25+25 uF geïsl		AC 6031/25+25														C22
1					HS elco 500 V 25+25 uF		AC 6011/25+25														C23
1					PW elco 50 V 64 uF geïsl		AC 8122/64														C24
1					→ Polyester 125V 15000 pF 10%		C 296 AA/A15K														C25

QUANT. TOT.	QUANTUM PER EENHEID					OMSCHRIJVING DES.OMS.	MATERIAAL MAT.	AFMETING DIM. ABM.	NORM. STAND. NORME	NR. CODE/TEK./TYPE DRAW.-DESSIN.-ZEICH.	FOUK.	OPMERKING REM.-SEM.	POST
	1	2	3	4	5								
	1					17.5.54	1		2				
						12.9.57							
						24.10.57							
						4.11.58							

120 WATT VERSTERKER

EL 6431

MECH/ELECTR. STUKLIJST — PARTLIST — NOMENCL. — STUCL. (3 SH.P.) 11

de Visser DAT. 17.5.54

N.V. PHILIPS' GLOEILAMPENFABRIEKEN EINDHOVEN — NEDERLAND

COMM. NR. 547

QUANT.

BESTELLER



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1				Isokowee 2 W 0,1 M Ohm 5%	B8 305 08B/180K		R52
1				Prakowee 0,5 W 1200 Ohm 2%	E 003 AD/D1K2		R53
1				Isokowee 0,5 W 10 Ohm 10%	B8 305 06A/10E		R54
1				Isokowee 0,5 W 10 Ohm 10%	B8 305 06A/10E		R55
1				Isokowee 1 W 10 Ohm 10%	B8 305 07A/10E		R56
1				Isokowee 1 W 10 Ohm 10%	B8 305 07A/10E		R57
1				Isokowee 0,5 W 0,1 M Ohm 10%	B8 305 06A/100K		R58
1				Isokowee 0,5 W 1,2 M Ohm 5%	B8 305 06B/1M2		R59
3				Isokowee 2 W 0,22 M Ohm 5%	B8 305 08B/220K	R60-R61	R62
1				Buis	EF 86		B1
1				Buis	EF 86		B2
1				Buis	ECC 83		B3
1				Buis	ECC 83		B4
1				Buis	EL 34		B5
1				Buis	EL 34		B6
1				Buis	EL 34		B7
1				Buis	EL 34		B8
1				Gelijkrichtcel	V3 696 91	Z	Gr1
1				Gelijkrichtcel	V3 696 91	Z	Gr2
1				Gelijkrichtcel	V3 696 91	Z	Gr3
1				Gelijkrichtcel	V3 696 91	Z	Gr4
1				Gelijkrichtcel	V3 696 91	Z	Gr5
1				Gelijkrichtcel	V3 696 91	Z	Gr6
1				Gelijkrichtcel	V3 696 91	Z	Gr7
1				Gelijkrichtcel	V3 696 91	Z	Gr8
1				Gelijkrichtcel	0A 55		Gr9
1				Verlichtingslampje	8008 N		La1
				Schakelaar 1 p 3 st	zie mech st		Sk1
				Netschakelaar	zie mech st		Sk2
1				Smeltpatroon 4 A	08 142 34	v 110-120	V11
1				Smeltpatroon 2 A	08 142 31	v 200-245V	V12
1				Smeltpatroon 20A	08 143 02		V13
				Temperatuurveiligheid	zie T2		V13
				Vonkenbrug 800 V	zie mech st		Vb1

QUANT. TOT.	QUANTUM PER EENHEID					OMSCHRIJVING DES. OMS.	MATERIAAL MAT.	AFMETING DIM. ABM.	NORM. STAND. NORME	NR. CODE/TEK./TYPE DRAW.-DESSIN-ZEICH.	POST	OPMERKING REM.-BEM.
	1	2	3	4	5							
	EL 6431/00					17.5.54	1		2	3	4	5
						19.2.59						
						25.6.59						

120 WATT VERSTERKER		EL 6431		COMM. Nr.
MECH./ELECTR. STUKLIJST - PARTLIST - NOMENCL. - STUCL.				
de Visser		DAT. 17.5.54		VERV.-OUPERS. REEMPL.-OES.
N.V. PHILIPS' GLOEILAMPEN FABRIEK				



A MECHANISCHE CONTROLE

Zie hiervoor het algemeen geldend voorschrift.

B ELECTRISCHE CONTROLE

De onderdelen moeten voor de montage volgens de betreffende gegevens getroleerd zijn.

C GEMONTEERD APPARAAT

Kap nog niet aangebracht.

Wisselstroomleidingen naar de hoogspanningsgelijkrichtcellen nog niet aangesloten. (Moeten voorlopig los blijven daar anders reeds plaatsspanning op de uitgangstransformator enz. staat, voordat de caroussels gecontroleerd zijn. Leidingen nog niet op nokken S2 van T2 solderen).

1. Contrôle aarding, enz.

Contrôleren of de volgende punten met aarde verbonden zijn:

- a. De pennen 2 en 3 van de microfoon contacten.
- b. De rechtse bussen (app. van achteren gezien) van gramfoon, magnetfoon, en radio aansluitingen.
- c. Uitbellen of de gloeidraad zekering op de juiste wijze is aangesloten.
- d. Nagaan of de verbindingen op de aansluitplaatjes voor de eventueel aan te brengen ingangstransformatoren op de juiste wijze zijn aangebracht.

2. Contrôle netspanningscaroussel.

Netschakelaar in.

Netzekering 2 A en gloeidraadzekering 20 A aanbrengen.

Nog geen buizen en signaallampje in' apparaat.

Op de gloeidraadwikkeling de secundaire van een transformator E3 263 22 aansluiten, welke tijdens het meten primair gevoed moet worden met 220 V 50 Hz.

Op de netklemmen een GM 4132 aansluiten.

Nu de caroussel draaien en meten:

In de stand	110	69 - 77	Volt
	125	79 - 87	Volt
	145	91 - 101	Volt
	200	131 - 141	Volt
	220	145 - 155	Volt
	245	161 - 173	Volt

Na de meting caroussel plaatsen in stand 220 V.

3. Contrôle outputveiligheid.

Nagaan of het juiste type op de juiste plaats is aangesloten (Spleet 0,5 mm).

Spleet met mal contrôleren.

4. Contrôle outputcaroussel.

Sluit op de luidspreekbussen de secundaire van een transformator E3 263 22 aan en voedt deze tijdens de meting primair met 220 V 50 Hz. Sluit tussen de aardklem van het apparaat en een van de anodeaansluitingen van de EL 34's een GM 4132 aan.

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Contrôlevoorschrift		7 (M) SLB 31	
2.5.55	de Jager	DATE 20.12.54	VERV-SUPERS REMPLE-ERS
AVB	N.V. PHILIPS' GLOEILAMPENFABRIEKEN EINDHOVEN — NEDERLAND		FORM. A
37 120 90.4			



Te meten spanning in de stand:

10 V	182 - 202 Volt
25	77 - 85 "
35	55 - 61 "
50	30 - 43 "
70	26 - 31 "
100	18 - 22 "

Na de meting de carroussel op stand 100 Volt plaatsen.

Na het verrichten van bovengenoemde metingen:

Buizen aanbrengen

Signaallampje aanbrengen

Wisselstroomleidingen cellen vast solderen (op nokken S2 van T2).

5. Stromen en spanningen aan de buizen.

Tijdens deze metingen volumeregelaars op "0". (Behalve bij meten eindbuizen in vollast).

Filters in de middenstand.

Meting	Buis	B1, B2 EF 40	B3 ECC 83	B4 ECC 83	B5, B6, B7, B8 EL 34 Nullast	B5, B6, B7, B8 EL 34 Vollast (Vo 100 V - 1000 Hz)	La 1 008 N
	Va		66- 90	150-205	250-300	305-850	660 <sup>690V</sup> - 716
Ia		0,95-1,15	0,87-1,05	1,75-2,2	14- 30	54 - 81	-
Vg2		45- 59	-	-	397-422	305 - 335	-
Ig2		0,17-0,23	-	-	1,8-3,8	10 - 18	--
Va'		-	124-144	200-245	-	-	-
Ia'		-	1,1-1,35	0,75-1,0	-	-	-
-Vg		-	-1,3--1,6	-	-40--42	-38--40,5	-
-Vg'		-	-0,62--0,75	-2 --2,6	-	-	-
Vf		6,10-6,45	6,10-6,45	6,10-6,45	6,10-6,45	6,05-6,4	5,4-6,0

Kap aanbrengen. <sup>2,4</sup> 2 4 8+12 260  
100 8

6. Opgenomen vermogen.

Zonder signaal : 148 - 182 W; 0,74 - 0,98 A.

Met signaal (Vo 100 V - 1000 Hz): 310 - 380 W; 1,54 - 2,00 A.

7. Vervorming en inputgevoeligheid (Filters op rechte kar.) Freq. 1000 Hz.

Apparaat op de 100 V uitgang belasten met 83 Ohm inductievrij.  
Vervorming meten op alle inputs. Deze mag maximaal 5% bedragen.

Gevoeligheid mag bedragen op kanaal:

□ 1	1,75 - 2,55 mV.
□ 2	1,75 - 2,65 mV.
○	160 - 240 mV.
○	160 - 240 mV.
R	160 - 240 mV.

Wanneer het apparaat belast 100 V levert moet op de 4 V uitgang een spanning gemeten worden van 4,5 - 4,7 V.

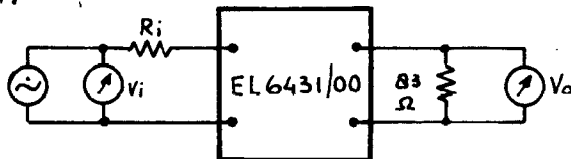
120 WATT VERSTERKER		EL 6431/00	
Contrôlevoorschrift		7 32	
2.5.55	de Jager	DAT. 2.12.54	VERV-SUPERS REPL-ERS
EL	AvB	N.V. PHILIPS' GLOEILAMPENFABRIEKEN	EINDHOVEN - NEDERLAND
37 120 90.4			FORM. A

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## 8. Karakteristieken.

Meetschema:



Ri voor  $\alpha 1$ :  $\alpha 2$  en  $\alpha$  12.000 Ohm. Voor R en  $\omega$  0 Ohm.

Alleen de volumeregelaar van het kanaal dat gemeten wordt op max. De anderen op "0".

Te meten waarden: \* D.w.z. filterknoppen op stand "0".

Ingang Freq. Hz. ↓	$\alpha$	$\alpha$	$\alpha$	$\alpha 1: \alpha 2$	$R_i, \omega$	V
	recht*	+B+H	-B-H	recht*	recht	
40	19,6	70	5,0	41	50	Volt
60	20	67	5,7	47	51	"
120	21	54	8,0	52	54	"
250	22	35	12,3	53	54	"
500	21	25,5	16,7	53	52	"
1000	20	25,5	17,7	50	50	"
2000	19	33	14,3	48	49	"
4000	18	42	8,5	44	46	"
6000	17	44,5	5,6	40	43	"
8000	15,5	45	4,0	36	40	"
10000	14,5	45	3,0	32	37	"
12000	13	44	2,2	28	34	"
15000	11	42	1,6	23	30	"
Vi ca	39	39	39	1,15	97	mV

Tol.  $\pm$  2 dB aan de uiteinden t.o.v. de standaardkarakteristieken op de bladen 35, 36 en 37.

## 9. Branden.

Apparaat gedurende 3 uur op de 10% netoverspanning in bedrijf zetten. Belasten met 83 Ohm op 100 V's uitgang.

Zo'nig muzieksignaal op  $\alpha$  ingang, dat het apparaat in de pieken juist 100 V levert.

## 10. Hoogspanningstest.

Direct na het branden uitvoeren.

Netschakelaar apparaat op "in".

Tussen de doorverbonden netklemmen enerzijds en alle andere doorverbonden klemmen anderzijds een spanning aanleggen van 2000 V 50 Hz.

## 11. Doorspelen.

Apparaat op alle aansluitingen doorspelen.

Potentiometer en filters op kraken en goede regeling beluisteren.

Overspreken diverse kanalen beluisteren.

Werking netschakelaar controleren.

## 12. Stoorniveau. (Meten vlg. R.M.A. standaard, op 100 V uitgang belast met 83 $\Omega$ )

Microfoonkanalen kortsluiten.

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Contrôlevoorschrift		7 33	
de Jager	DAT. 20.12.54	REPL-ESS	
EL	AvB	N.V. PHILIPS' GLOEILAMPENFABRIEKEN EINDHOVEN — NEDERLAND	

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Q, Q en R open.

Filters op rechte karakteristiek.

Meten met vol.regelaars dicht, daarna kanaal voor kanaal met de betreffende volumeregelaar op max.

Te meten waarden:

	Meting →	dB	Max. mV
Ingang ↓			
Vol.reg. dicht		-60	100
Q 1		-50	320
Q 2		-50	320
Q		-60	100
Q		-60	100
R		-60	100

Opmerking.

Voor dit apparaat bestaat geen controlevoorschrift voor het meten aan de band.

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120 WATT VERSTERKER		EL 6431/00	
Contrôlevoorschrift		( 7 34 )	
2. 5. 55	de Jager	DAT. 20.12.54	FORM. A
AvB	N.V. PHILIPS' GLOEILAMPENFABRIEKEN EINDHOVEN — NEDERLAND		FORM. A