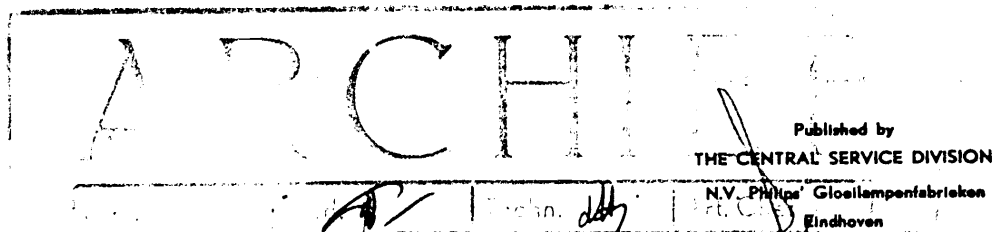


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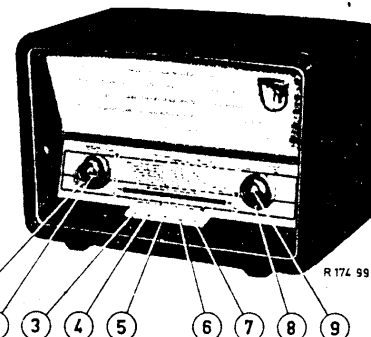


PHILIPS

SERVICE NOTES

for the
radio-granophone

B4X77A



1957. For A.C. mains supply 50 c/s.

General.

Waveranges.

F.M.: 87,5-100 Mc/s.
M.W.: 185-580 m (1620-517 kc/s).
S.W.: 24,3-51,7 m (12,3-5,80 kc/s)

Controls.

1. Tone control
2. Volume control
3. Push buttons: mains switch
4. P.U.
5. S.W.
6. M.W.
7. F.M.
8. Tuning F.M.
9. Tuning A.M.

Tubes.

B1 : ECH81
B2 : EF85
B3 : EM80
B4 : EABC80
B5 : EL84
B6 : EZ80
B7 : ECC85

I.F.

F.M.: 10,7 Mc/s.
A.M.: 452 kc/s.

Mains voltages.

90-110-127-145-190-220 V.

Consumption.

55 Watts (220 V).

Dimensions.

Width : 400 mm
Height: 267 mm
Depth : 206 mm

Dial lamp.

8024 N-778

Loudspeakers

AD3460M
(z = 5Ω)

93 992 29.1.05

The alignment of the receiver.

I. A.M. part

General:

Volume control at maximum.

Tone control at maximum high.

Connect a voltmeter to the extension loudspeaker sockets. The alignment is done with the aid of three trimming points on the dial:

trimming point 1 is situated at the extreme left,

trimming point 2 is situated just at the right side of trimming point 1,

trimming point 3 is situated at the extreme right of the dial.

Before trimming adjust the pointer at trimming point 1, with the variable capacitor in the position "minimum capacity".

Unless otherwise stated, all signals are supplied to the aerial socket via a normal dummy aerial.

Unscrew the cores of S18, S15, S9 and S8 as far as possible.

	Wave-range	pointer at trimming point	Signal	Adjust	Indication
I.F. band-filters	M.W.	1	452 kc/s via 33000 pF to g1B1	S19,S18 S14,S15	Maximum output
I.F. wave-trap	M.W.	3	452 kc/s	S8,S9,S8	<u>Minimum</u> output
R.F. and oscillator circuits	M.W.	3	550 kc/s	S11,S5, S6	Maximum output
	L.W.	3	6,02 Mc/s	S48,S46	
		2	11,73 Mc/s	C14,C13	
	M.W.	2	1500 kc/s	C6,C5	

II. F.M. part

General:

Push in the F.M. button,

Volume control at maximum.

Tone control at maximum high.

Connect a diodevoltmeter (D.V.) in series with 0,1 M ohm across C40, and a voltmeter to the extension loudspeaker sockets.

Alignment with the aid of a F.M. Service-Oscillator.

I.F. bandfilters Unscrew the cores of S28, S23, and S13 as far as possible

Tuning F.M. unit at	Signal	Connect oscillator to	Adjust	Indication
Maximum *	10,7 Mc/s freq. swing $22\frac{1}{2}$ kc/s mod. freq. 500 c/s	g1B2 via 1500 pF	S20 S22-S23	Max.D.V. (+3V) <u>Max. output</u>
Maximum *	10,7 Mc/s freq. swing $22\frac{1}{2}$ kc/s Mod. frequ. 500c/s.	g1B1 via 1500 pF	S12 S13	Max. D.V. (+ 8 V)
Maximum *	10,7 Mc/s freq. swing $22\frac{1}{2}$ kc/s mod. freq. 500 c/s	F.M. aerial sockets	S37 S28	Max. D.V. (+ 8 V)

* The cores are entirely screwed in.

R.F. and Oscillator circuits.

All supplied signals are modulated with 500 c/s and have a frequency swing of $22\frac{1}{2}$ kc/s.

Alignment when the core of S34 is out of order but the core of S35-S36 is still intact.

1. Unscrew the tuning-unit entirely, and adjust the pointer at 100,5 Mc/s.
2. Unsolder the broken core.
3. Pull out the bracket, to which the cores are soldered, and turn it a little.
4. Remove the broken core, and install a new one.
5. Install again the bracket in the original position.
6. The new core of S34 should be fixed in such a way, that the upper sides of the cores in unscrewed position, are about at the same height.
7. Connect the diodevoltmeter in series with 0,1 M ohm across C40.
8. Screw the tuning-unit in as far as the stud (cores entirely in the coils).
9. Supply a signal of 87,5 Mc/s to the F.M. aerial sockets (77).
10. Adjust S34 at maximum deflection of the diodevoltmeter. (+ 8 V) by shoving the core in the coil. Then solder it.
11. Unscrew the tuning-unit as far as the stud.
12. Supply a signal of 100,5 Mc/s to the F.M. aerialsockets (77).
13. Adjust C59 at maximum deflection of the diodevoltmeter (+ 8 V).
14. Repeat the items 8-13.

Alignment when the core of S35-S36 is out of order, but the core of S35 is still intact.

1. Items 1-5 as above.
6. The new core of S35-S36 should be fixed in such a way, that the upper sides of the cores in unscrewed position, are about at the same height.
7. Connect the diodevoltmeter in series with 0,1 M ohm across C40.
8. Screw the tuning-unit in as far as the stud.
9. Supply a signal of 87,5 Mc/s to the F.M Aerial sockets.
10. Adjust S35-S36 at maximum deflection of the diodevoltmeter (± 8 V). by shoving the core in the coil. Then solder it.
11. Unscrew the tuning-unit as far as the stud.
12. Supply a signal of 100,5 Mc/s to the F.M. aerial sockets.
13. Adjust C65 at maximum deflection of the diodevoltmeter (± 8 V).
14. Repeat the items 8-13.

Alignment when both the cores are out of order.

1. Unsolder the broken cores.
2. Pull out entirely the brackets, to which the cores are soldered, and turn it round 90°. Remove the broken cores.
3. Install new cores in the coils.
4. Turn the bracket in the original position, pull the connecting wires through the holes in the bracket, and solder the cores arbitrarily.
5. Unscrew the tuning-unit as far as the stud.
6. Adjust the pointer at 100,5 Mc/s.
7. Screw the tuning-unit in entirely, and after unsoldering the cores, push them in the coils as far as possible.
8. Supply a signal of 87,5 Mc/s to the F.M. aerial sockets.
9. Connect the diodevoltmeter in series with 0,1 M ohm across C40.
10. Adjust S35-S36 at maximum deflection of the diodevoltmeter (1st peak, ± 8 V), by shoving the core in the coil. Then solder it.
11. Adjust S35 at maximum deflection of the diodevoltmeter (± 8 V) by shoving the core in the coil. Then solder it.
After adjusting the cores should be at about the same height.
12. Unscrew the tuning-unit as far as the stud.
13. Supply a signal of 100,5 Mc/s to the F.M. aerial sockets.
14. Adjust C59 and C65 at maximum deflection of the diodevoltmeter.
15. Repeat the items 7-14.

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-5-

Alignment with the aid of an A.M. Service Oscillator.

I.F. Bandfilters. Unscrew the cores of S28, S22 and S13 as far as possible.

Tuning F.M. unit at	Unmodulated signal	Connect the Oscillator to	Adjust	Indication
Maximum***	10,7 Mc/s	g1B2 via 1500 pF	S20 *S22-S23	Max.D.V. (+3V) Min.D.V.
Maximum***	10,7 Mc/s	g1B1 via 1500 pF	**S12 S13	Max.D.V.
Maximum***	10,7 Mc/s	F.M. aerial socket and earth	S37 S28	Max.D.V.

* Connect two resistors of 0,22 M ohm (1%) in series across C40.
Connect the diodevoltmeter between the junction of the two resistors and the junction R16 - C39.

** Remove the two resistors of 0,22 M ohm, and connect the diodevoltmeter across C40.

*** The cores are entirely screwed in.

R.F. and Oscillator circuits.

The alignment of the R.F. and oscillator circuits is done as described above.

To obtain signals of 87,5 Mc/s use the 4th harmonics of respectively 21,88 Mc/s and 25,12 Mc/s.

The signals are supplied between one of the F.M. aerial sockets and earth ( and ), and are unmodulated.

Driving cords.

The length and path of the driving cords is drawn in fig. 1, with the variable capacitor in position "maximum capacity".

Transformers.

If one of the original transformers becomes out of order, it can be replaced by the standard transformer, mentioned in the electrical parts' list.

For connections see figs. 3 and 4.

		Cabinet	A3 005 07
		Ornamental frame	A3 68634
		Knob (tone control)	A3 769 87
		Knob (tuning F.M.)	A3 767 87
		Knob (tuning A.M.)	A3 752 19
		Knob (volume control)	A3 752 19
		Spring (in knobs)	A3 522 08
		Voltage adaptor	A3 229 76
		Spring (fixing coil, double)	A3 652 58
		Spring (fixing coil, simple)	A3 652 75
		Leaf spring (fixing coil)	A3 651 89
		Tension spring (in driving cord)	9 64/6x17
		Spring (fixing valve)	A3 652 94
		Variable capacitor	49 001 98
		Grommet (fixing var. cap.)	9 75/5x12,5
		Dial (oversea)	A3 924 73
		Dial (south)	A3 924 82
			<i>[Signature]</i>
			dH/HT

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S1)			C1)	50	μF	9 12/L50+50
S2)			C2)	50	μF	
S3)			C3)			49 001 98
S5)			C4)			
S6)		9 22/01	C5	30	pF	9 08/30E
S8)			C6	30	pF	9 08/30E
S9)		A3 119 70	C7	18	pF	9 04/18E
C9)	5,6 pF		C8	3000	pF	9 05/3K
C10)	240 pF		C9)	voir bobines		
S10)		A3 125 99	C10)	Siehe Spulen		
S11)			C11	100	pF	9 04/100E
S12)			C12	15	pF	9 04/15E
S13)			C13	30	pF	9 08/30E
C19)	18 pF	9 26/10.7	C14	30	pF	9 08/30E
C20)	18 pF		C15	380	pF	9 07/330+47E (par.)
S14)			C16	6800	pF	9 04/6K8
S15)			C17	47	pF	9 04/47E
C22)	195 pF	9 25/452	C18	330	pF	9 04/330E
C23)	195 pF		C19)	voir bobines		
S18)			C20)	Siehe Spulen		
S19)			C22)			
C28)	195 pF	9 25/452	C23)			
C29)	195 pF		C24	4700	pF	9 04/4K7
S20)			C25	3000	pF	9 05/3K
S21)			C26	4,7	pF	9 04/4E7
S22)			C27	4,7	pF	9 04/4E7
S23)		9 26/10,7RD	C28)	voir bobines		
C35)	10 pF		C29)	Siehe Spulen		
C36)	47 pF		C30	10000	pF	9 04/10K
S24)			C31	4700	pF	9 04/4K7
S25)			C32	100	pF	9 04/100E
S26)		9 18/09	C33	100	pF	9 04/100E
S27)			C34	4700	pF	9 06/4K7
S28)			C35)	voir bobines		
C51)	15 pF	A3 127 83	C36)	Siehe Spulen		
S32)			C37	3,3	pF	9 04/3E3
S32a)			C38	4700	pF	9 04/4K7
S33)		A3 803 22	C39	1000	pF	9 06/1K
S33a)			C40	3,2	μF	9 09/E3.2
C76	27 pF		C41	4700	pF	9 04/4K7
S35)			C42	8200	pF	9 06/8K2
S36)		A3 802 44	C43	4700	pF	9 04/4K7
S37)			C44	22000	pF	9 06/22K
S38)		A3 127 82	C45	0,22	μF	9 06/220K
S39		A3 803 23	C46	0,47	μF	9 06/470K
S45)			C47	6800	pF	9 04/6K8
S46)		9 21/24-52M	C48	4700	pF	9 06/V4K7
S47)			C51	voir bobines		
S48)		9 23/24-52M		Siehe Spulen		
			C54	10000	pF	9 04/10K
			C55	27	pF	9 04/27E
			C56	12	pF	9 04/12E

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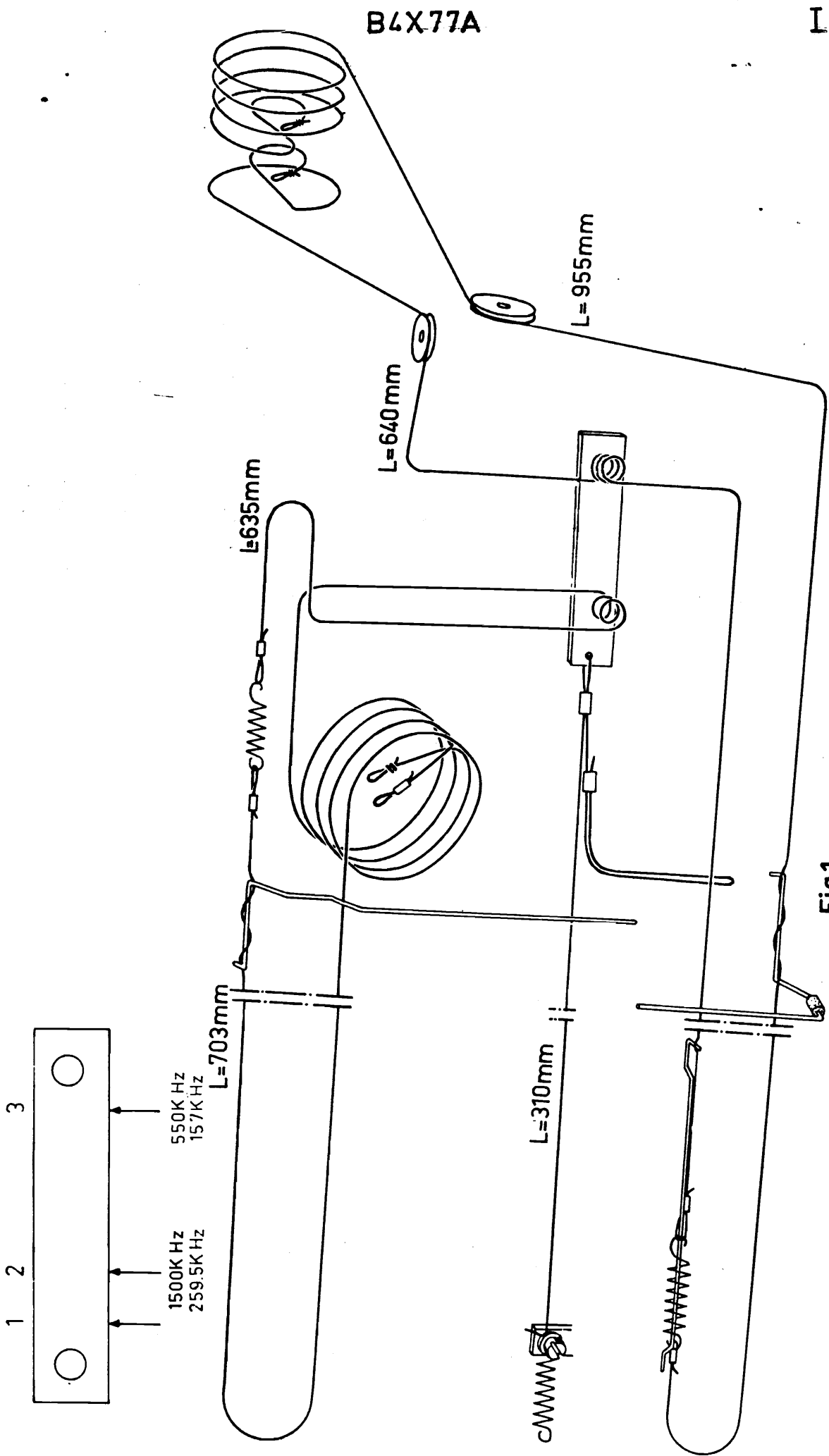
C57	1500	pF	9 04/1K5	R11	0,1 MΩ	9 00/100K
C58	4,7	pF	9 04/4E7	R12	47000 Ω	9 00/47K
C59	6	pF	9 08/5E5	R13	0,27 MΩ	9 00/270K
C60	2200	pF	B1 664 25	R14	47000 Ω	9 00/47K
C61	10	pF	9 04/10E	R16	10000 Ω	9 00/10K
C62	10	pF	9 04/10E	R17	68000 Ω	9 00/68K
C63	9.1	pF	9 04/3E3+5E6	R18	27000 Ω	9 00/27K
C65	6	pF	9 08/5E5	R19)	1,6 MΩ	
C66	22	pF	9 04/22E	R20)	0,4 MΩ	E 099 BG/AE11+
C67	10	pF	9 04/10E	R27)	0,2 MΩ	20
C68	6	pF	9 08/5E5	R21	6800 Ω	9 00/6K8
C69	135	pF	9 04/120E+5E par.	R22	10 MΩ	9 00/10M
C70	12	pF	9 04/12E	R23	0,22 MΩ	9 00/220K
C71	15	pF	9 04/15E	R24	330 Ω	9 00/330E
C72	2200	pF	B1 664 25	R25	820 Ω	9 00/820E
C73	100	pF	9 04/100E	R26	10000 Ω	9 00/10K
C74	2200	pF	B1 664 25	R29	1800 Ω	9 00/1K8
C75	2200	pF	B1 664 25	R30	270 Ω	9 00/270E
C76	Voir Bobines Siehe Spulen			R31	1000 Ω	9 00/1K
R1	1000	Ω	E 001 AK/A1K	R32	180 Ω	9 00/180E
R2	18000	Ω	9 00/18K	R33	33 Ω	9 00/33E
R3	1	MΩ	9 00/1M	R34	330 Ω	9 00/330E
R4	33000	Ω	9 00/33K	R36	1000 Ω	E 001 AD/A1K
R5	0,47	MΩ	9 00/470K	R37	390 Ω	9 00/390E
R6	22000	Ω	9 00/22K	R38	180 Ω	9 00/180E
R7	2200	Ω	E 001 AD/A2K2	R39	1000 Ω	9 00/1K
R8	2200	Ω	E 001 AD/A2K2	R40	1 MΩ	9 00/1M
R9	68000	Ω	9 00/68K	R41	27000 Ω	9 00/27K
R10	1,8	MΩ	9 00/1M8			

dH/PvE

1K

AE11+
20

K
K



II

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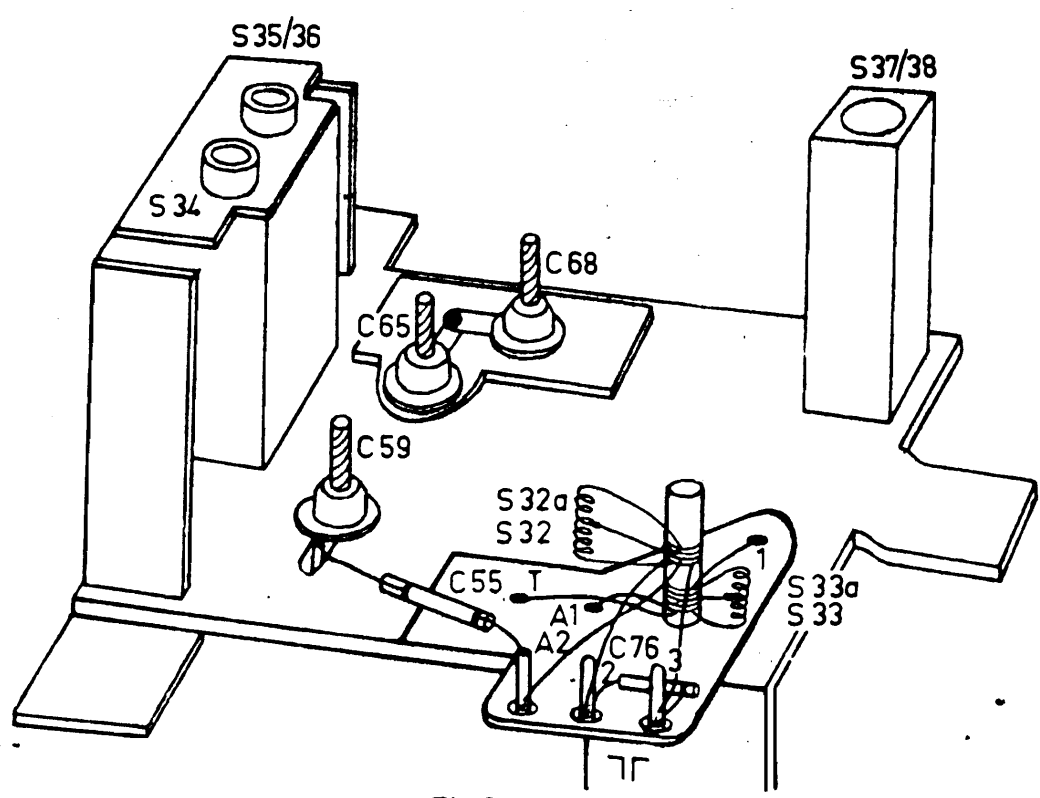
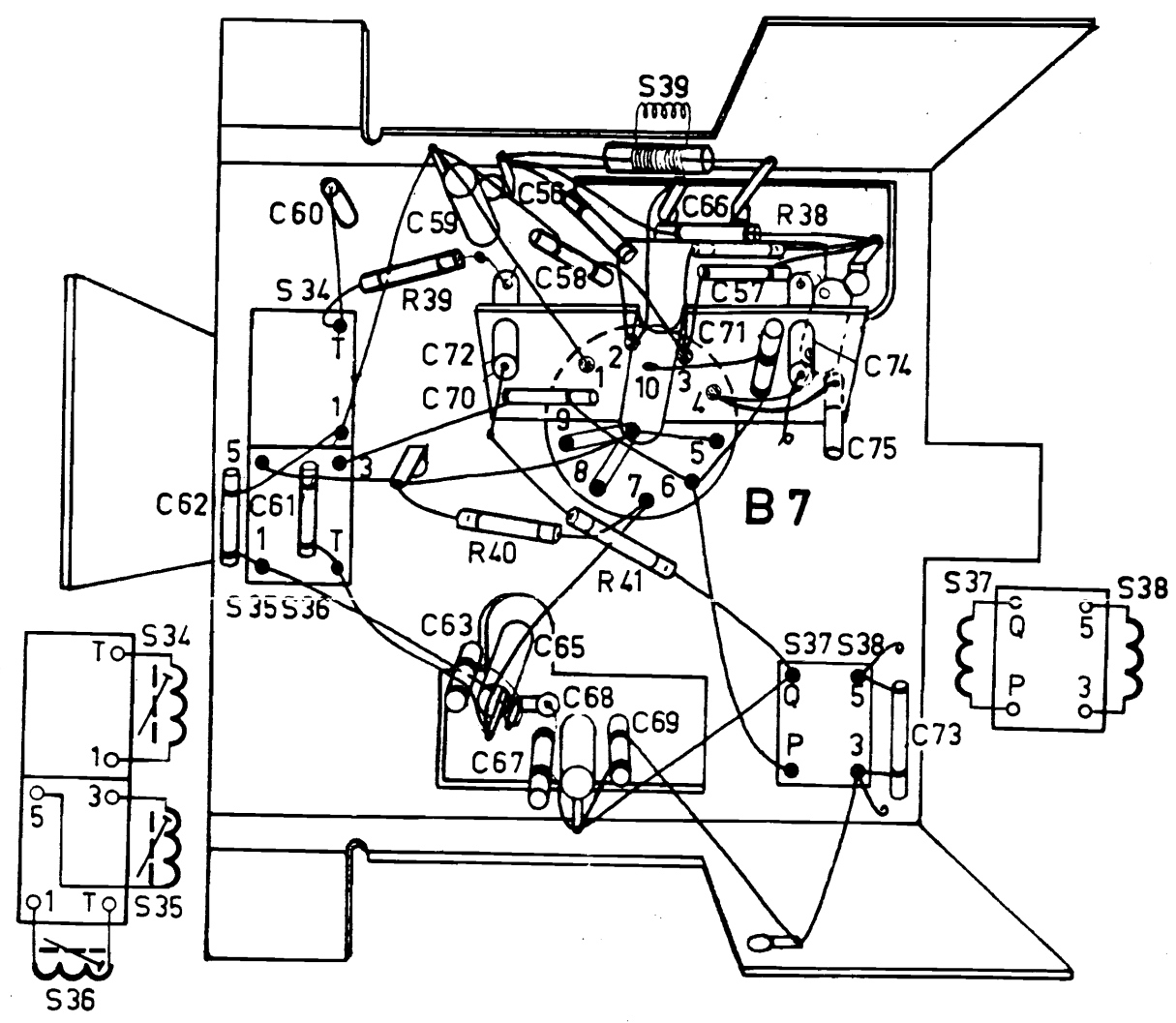


Fig. 2

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III

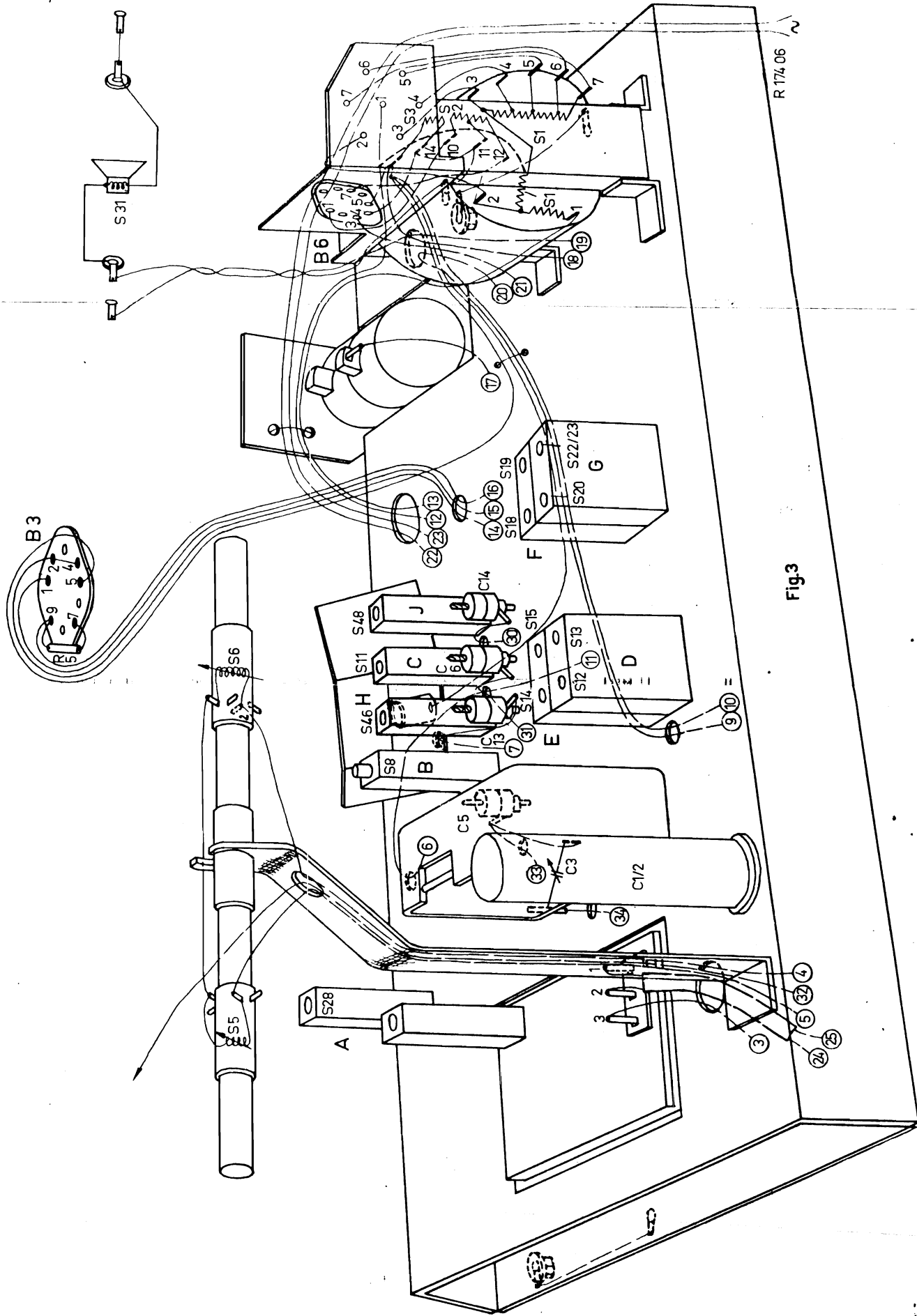


Fig. 3

R 174 06

IV

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S	24.	27.	26.25			G.F.	J	C	H	D.E.B.	30.	A.				
C	42.	34.	47.48.43.45.40.	41.46.38	44.	27.	37.	31.39.	54.30.25.14.187.52.26.12.15.16.17	11.	4.	24.3	2.18.	20.	18.	
R	26.	29.7.	24.	20.27.	19.30.	22.	25.	18.34.31.21.	23.	33.37.8.16.13.9.	32.10.	11.	6.	14. 3.	36.	7. 4. 1 2

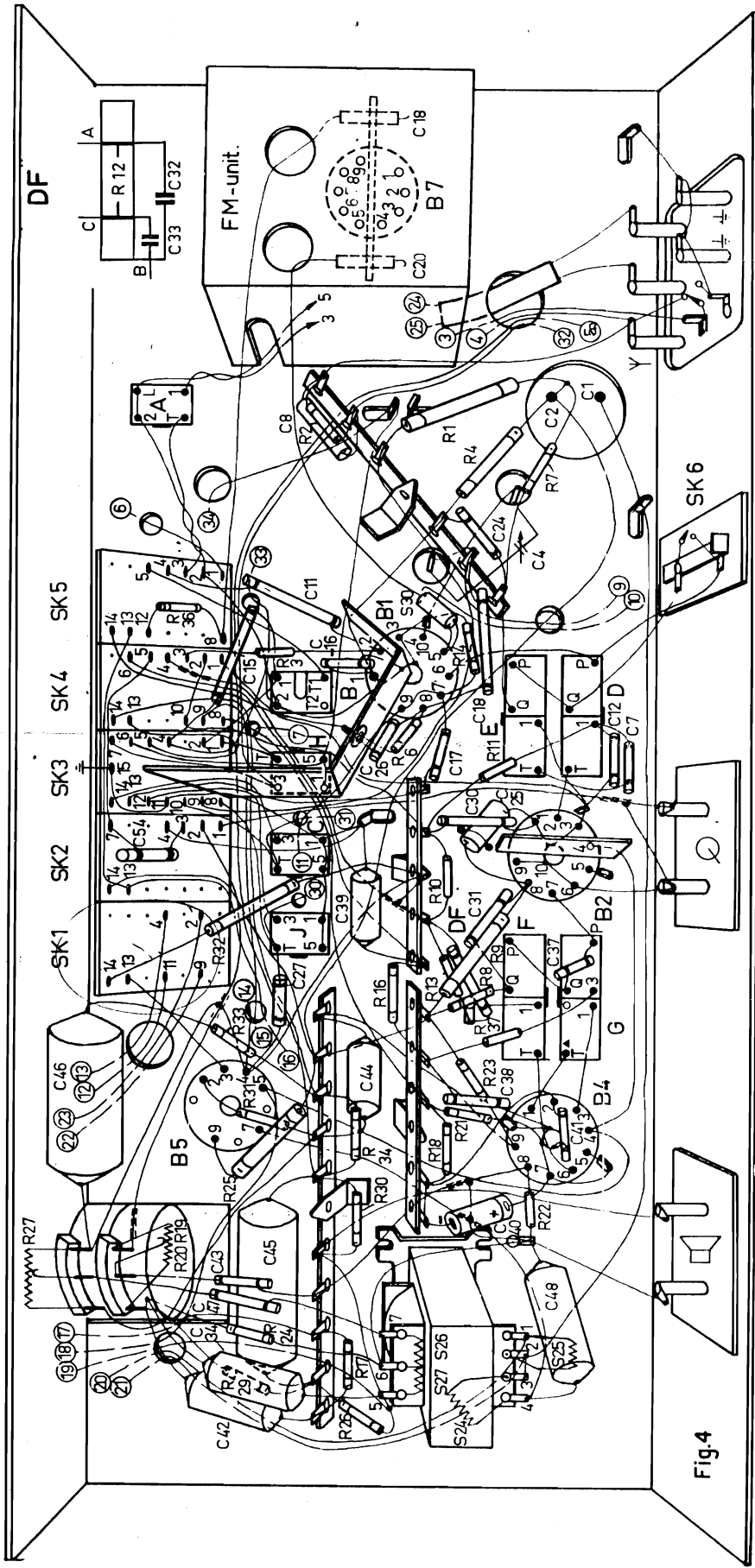
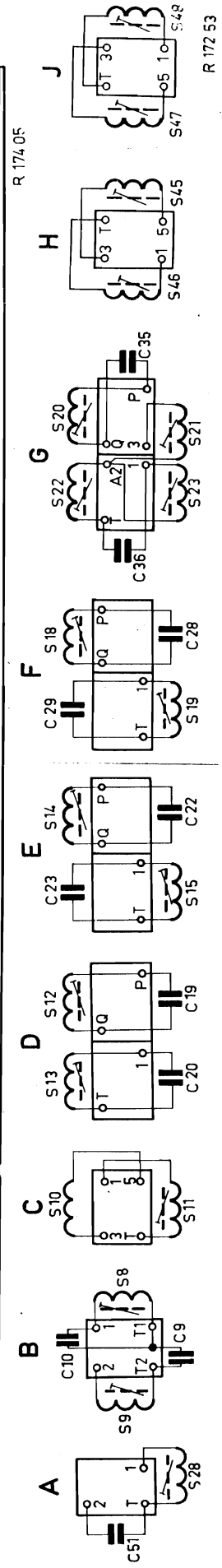


Fig.4



R 172.53

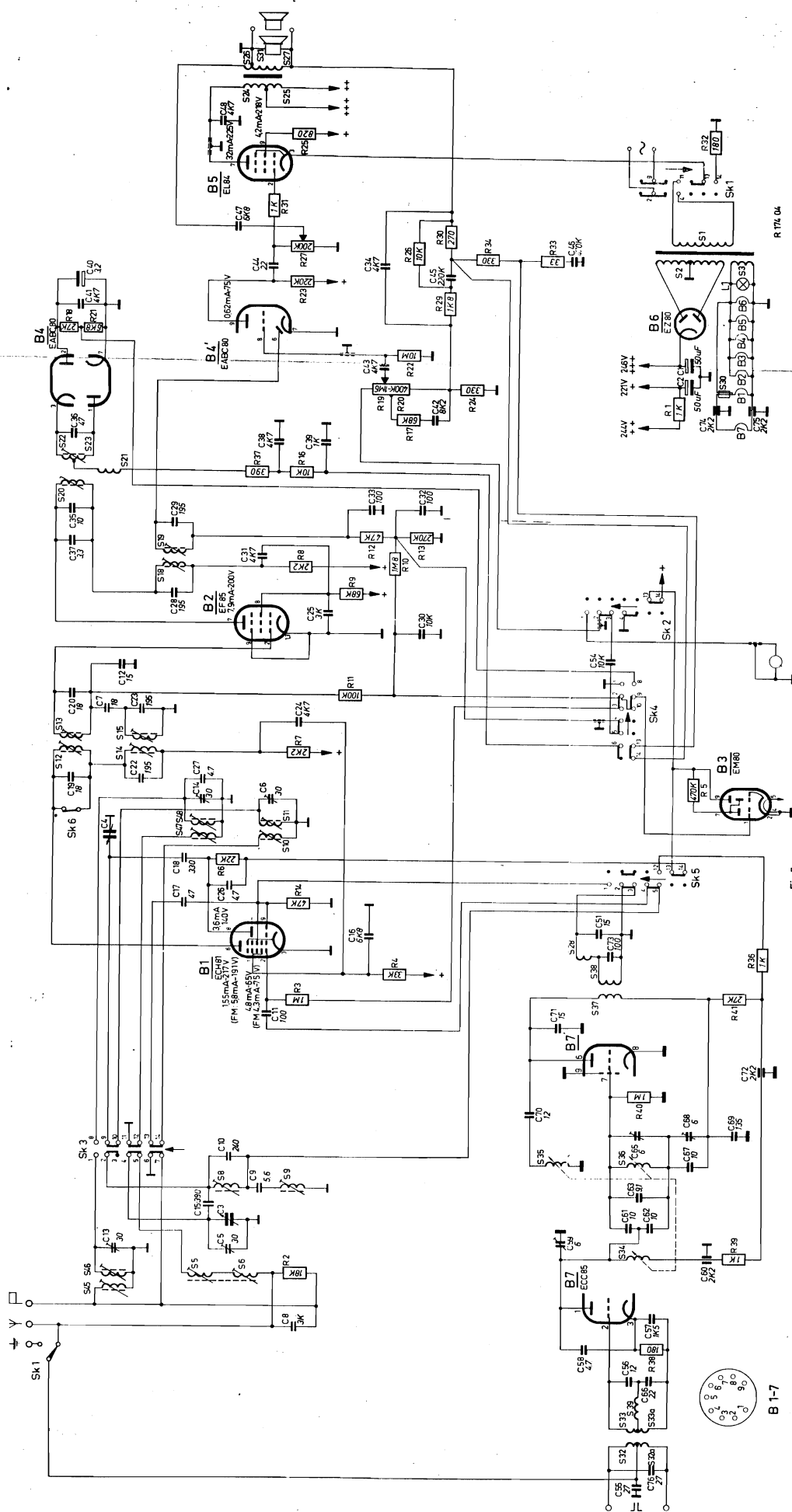
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Fig. 5

81-7