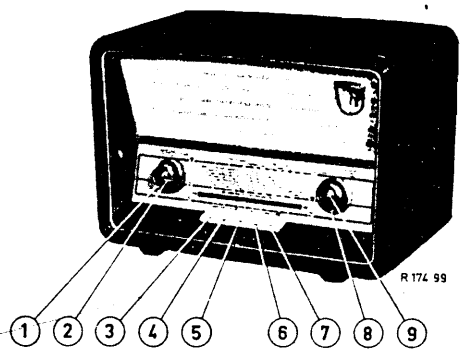
Published by
THE CENTRAL SERVICE DIVISION
N.V. Philips' Gloeilampenfabrieken
Eindhoven

PHILIPS

SERVICE NOTES

for the
radio-gramophone

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

dH/HT

Printed in Holland

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. bandfilters	M.W.	1	452 kc/s via 33000 pF to g1B1	S19,S18 S14,S15	Maximum output
I.F. wavetrap	M.W.	3	452 kc/s	S8,S9,S8	Minimum 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 22½ kc/s mod. freq. 500 c/s	g1B2 via 1500 pF	S20 S22-S23	Max.D.V.(±3V) Max. output
Maximum ⌘	10,7 Mc/s freq. swing 22½ kc/s Mod. frequ. 500c/s.	g1B1 via 1500 pF	S12 S13	Max. D.V. (± 8 V)
Maximum ⌘	10,7 Mc/s freq. swing 22½ 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 Oscillatorcircuits.

All supplied signals are modulated with 500 c/s and have a frequency swing of 22½ 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 (⌐|⌐).
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 (⌐|⌐).
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.

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 elctrical parts' list.
For connections see figs. 3 and 4.

B4X77A

Mechanical part's list

When ordering, always quote:

1. Description.
2. Codenumber and colourcode.
3. Typenumber of the set.

		Cabinet	A3 005 07
		Ornamental frame	A3 68634
		Knob (tone control)	A3 769 87
		Knob (tuning F.M.)	A3 769 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

dH/HT

S1)		
S2)		A3 141 37,5
S3)		
S5)		
S6)		9 22/01
S8)		
S9)		A3 119 70
C9)	5,6 pF	
C10)	240 pF	
S10)		A3 125 99
S11)		
S12)		
S13)		
C19)	18 pF	9 26/10.7
C20)	18 pF	
S14)		
S15)		
C22)	195 pF	9 25/452
C23)	195 pF	
S18)		
S19)		
C28)	195 pF	9 25/452
C29)	195 pF	
S20)		
S21)		
S22)		
S23)		9 26/10,7RD
C35)	10 pF	
C36)	47 pF	
S24)		
S25)		
S26)		9 18/09
S27)		
S28)		
C51)	15 pF	A3 127 83
S32)		
S32a)		
S33)		A3 803 22
S33a)		
C76	27 pF	
S35)		
S36)		A3 802 44
S37)		
S38)		A3 127 82
S39		A3 803 23
S45)		
S46)		9 21/24-52M
S47)		
S48)		9 23/24-52M

C1)	50 µF	
C2)	50 µF	9 12/L50+50
C3)		
C4)		49 001 98
C5	30 pF	9 08/30E
C6	30 pF	9 08/30E
C7	18 pF	9 04/18E
C8	3000 pF	9 05/3K
C9)	voir bobines	
C10)	Siehe Spulen	
C11	100 pF	9 04/100E
C12	15 pF	9 04/15E
C13	30 pF	9 08/30E
C14	30 pF	9 08/30E
C15	380 pF	9 07/330+47E (par.)
C16	6800 pF	9 04/6K8
C17	47 pF	9 04/47E
C18	330 pF	9 04/330E
C19)		
C20)	voir bobines	
C22)	Siehe Spulen	
C23)		
C24	4700 pF	9 04/4K7
C25	3000 pF	9 05/3K
C26	4,7 pF	9 04/4E7
C27	4,7 pF	9 04/4E7
C28)	voir bobines	
C29)	Siehe Spulen	
C30	10000 pF	9 04/10K
C31	4700 pF	9 04/4K7
C32	100 pF	9 04/100E
C33	100 pF	9 04/100E
C34	4700 pF	9 06/4K7
C35)	voir bobines	
C36)	Siehe Spulen	
C37	3,3 pF	9 04/3E3
C38	4700 pF	9 04/4K7
C39	1000 pF	9 06/1K
C40	3,2 µF	9 09/E3.2
C41	4700 pF	9 04/4K7
C42	8200 pF	9 06/8K2
C43	4700 pF	9 04/4K7
C44	22000 pF	9 06/22K
C45	0,22 µF	9 06/220K
C46	0,47 µF	9 06/470K
C47	6800 pF	9 04/6K8
C48	4700 pF	9 06/V4K7
C51	voir bobines	
	Siehe Spulen	
C54	10000 pF	9 04/10K
C55	27 pF	9 04/27E
C56	12 pF	9 04/12E

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

dH/PvE

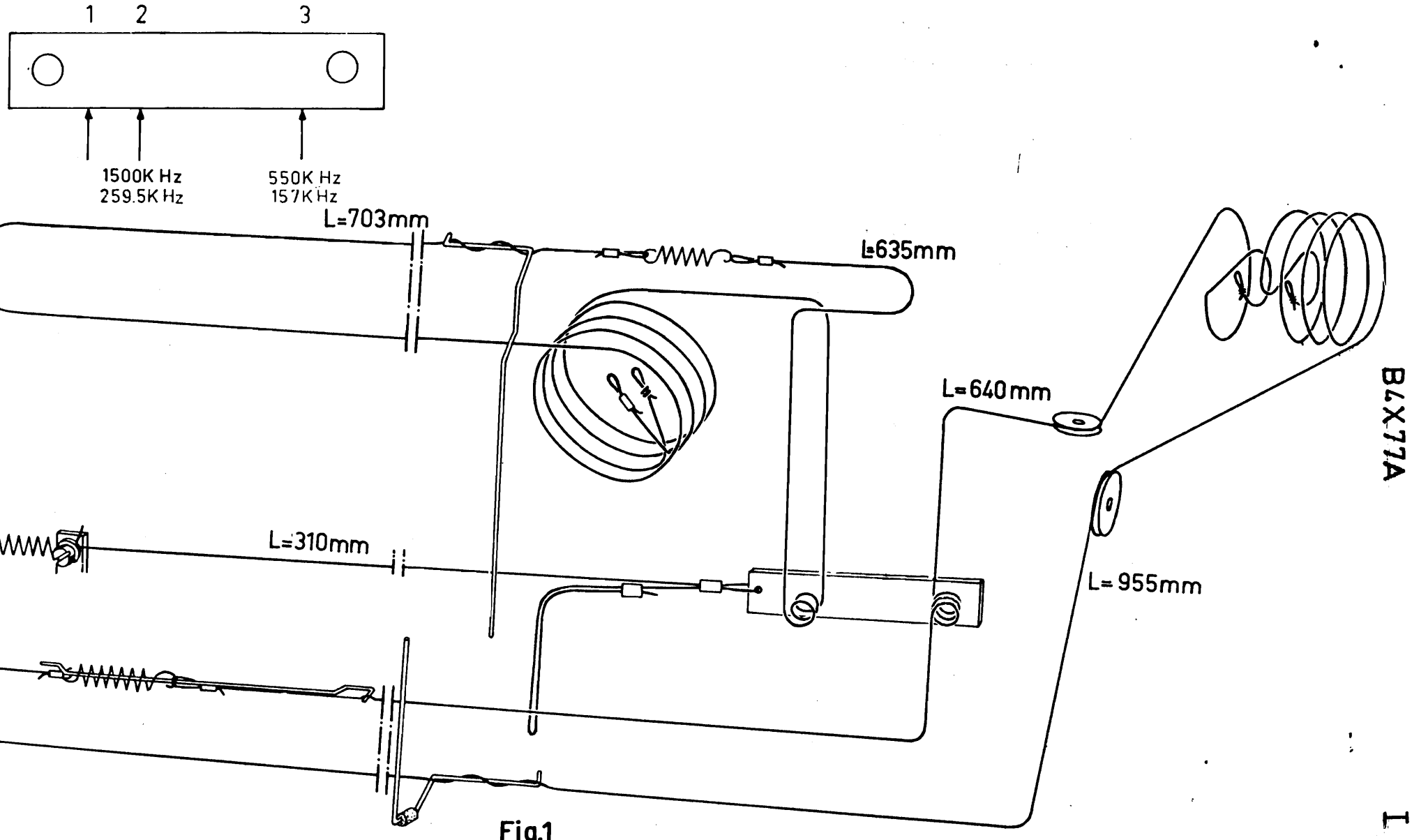
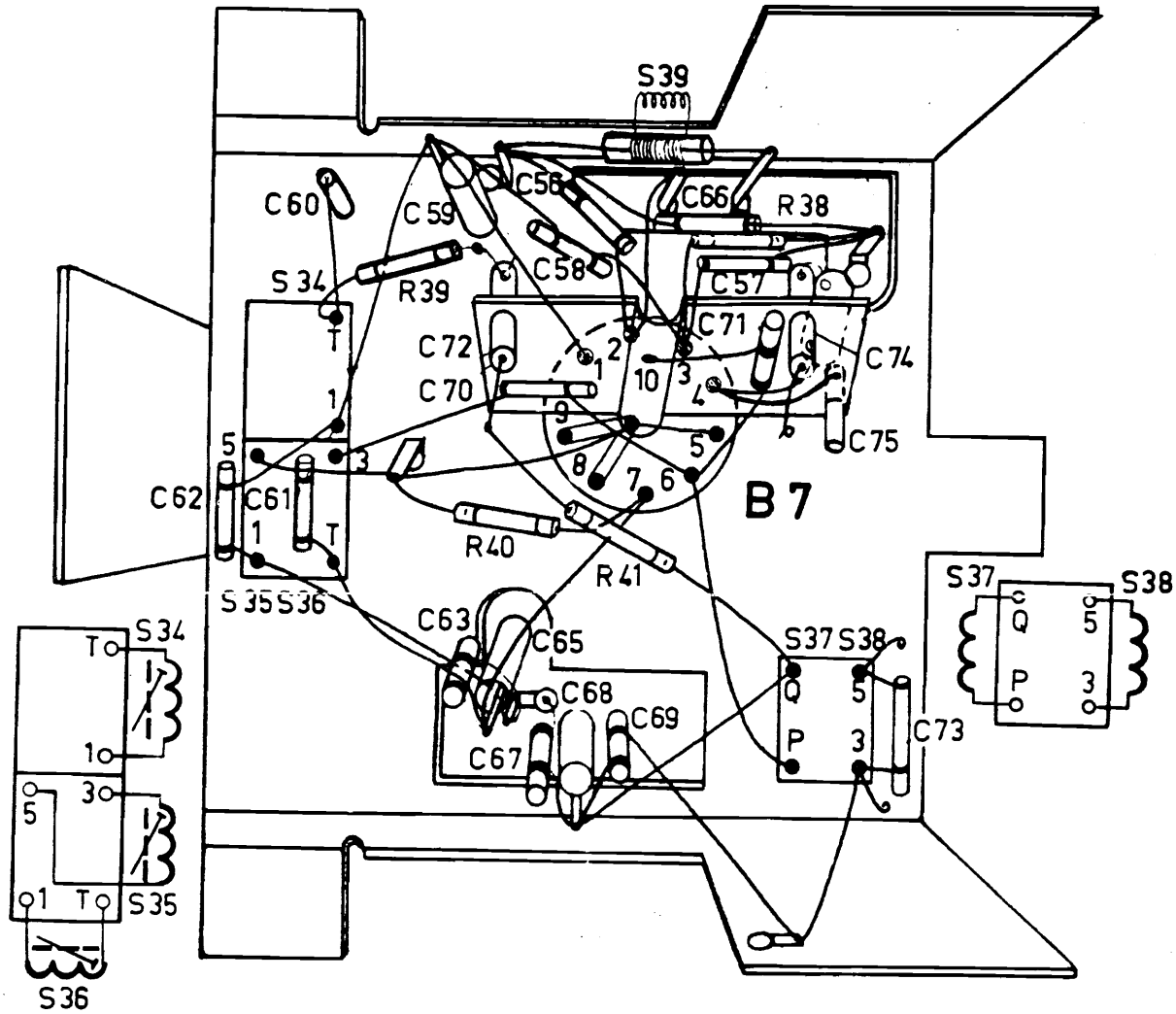


Fig.1

B4X77A



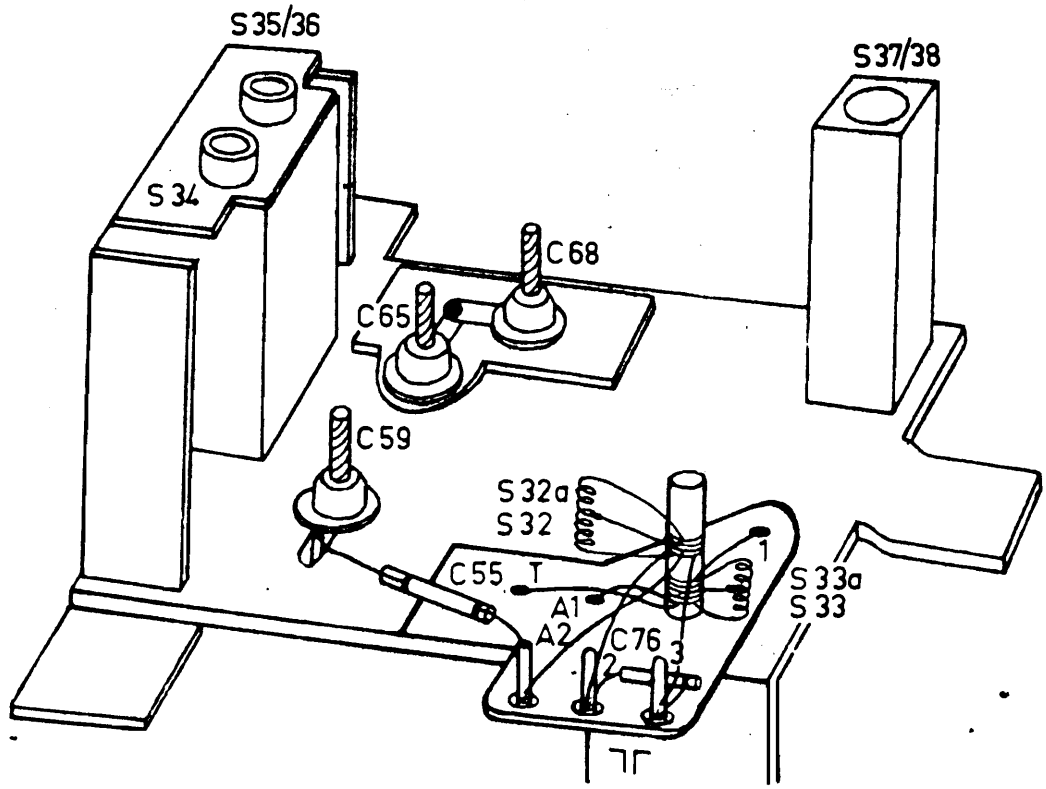


Fig.2

R 172 52

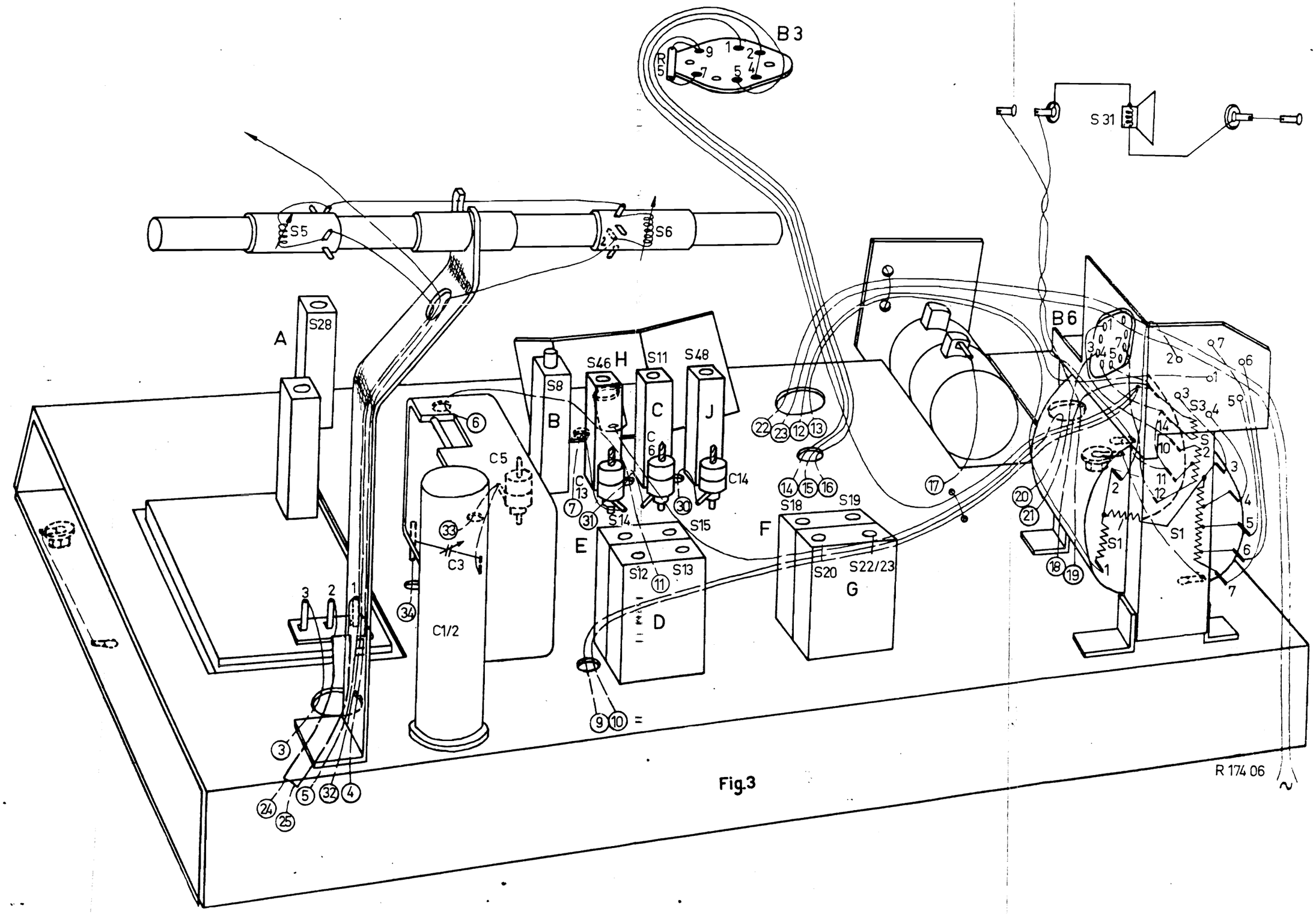


Fig.3

IV

B4X77A

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 2.1.8. 20. 18.
R	26. 29.17. 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.

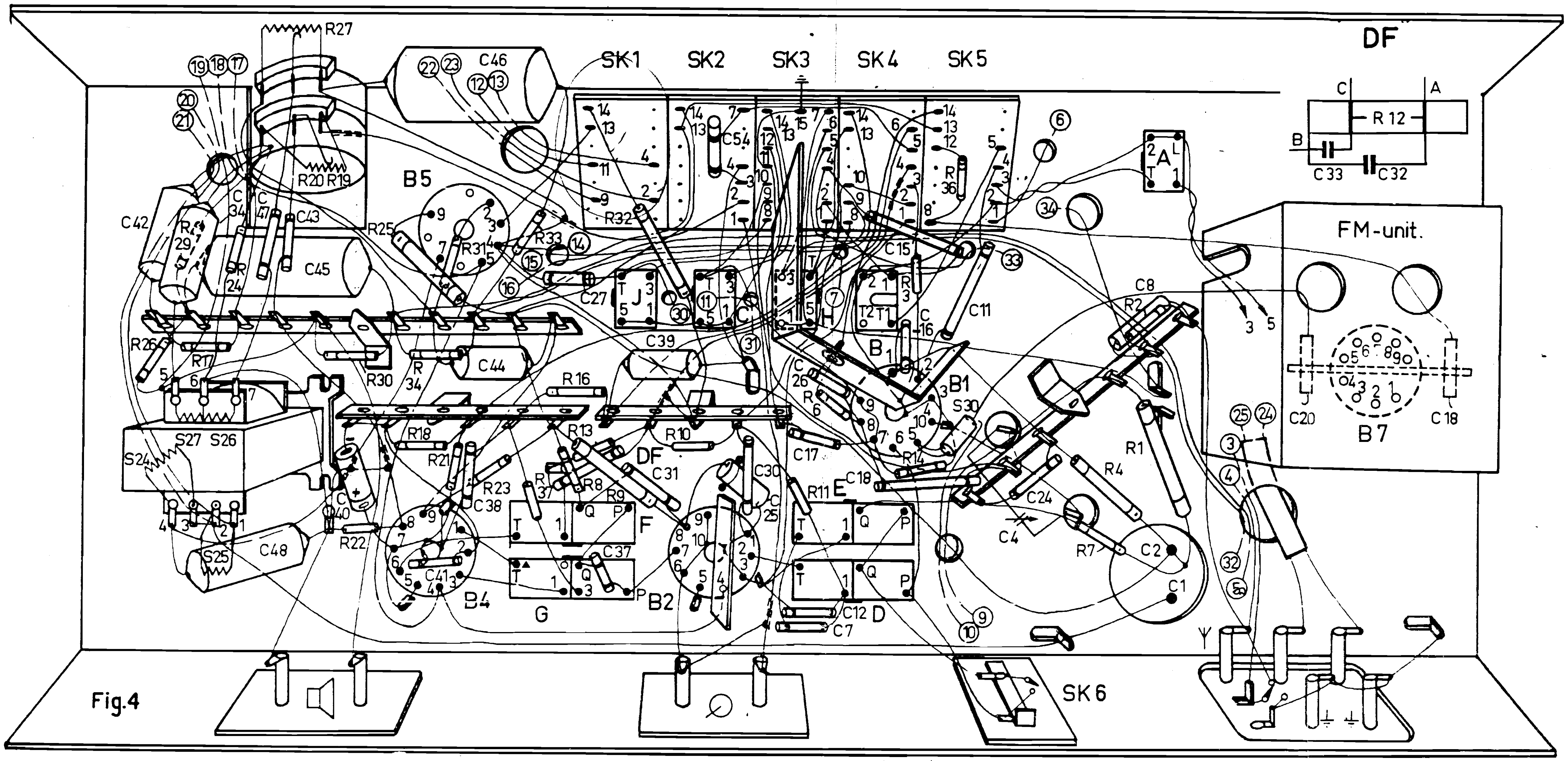
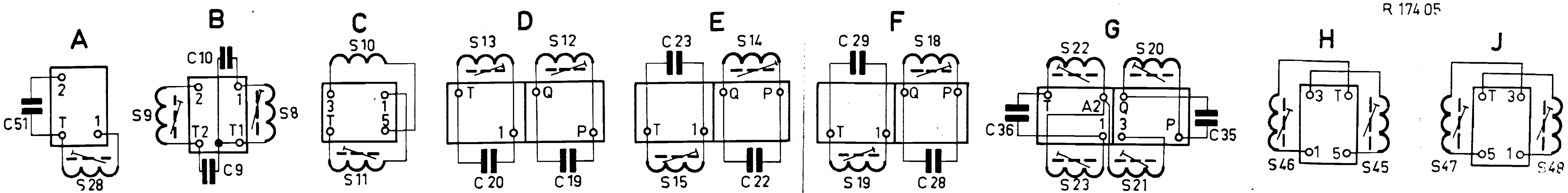


Fig.4

R 174 05



R 172 53

B4X77A

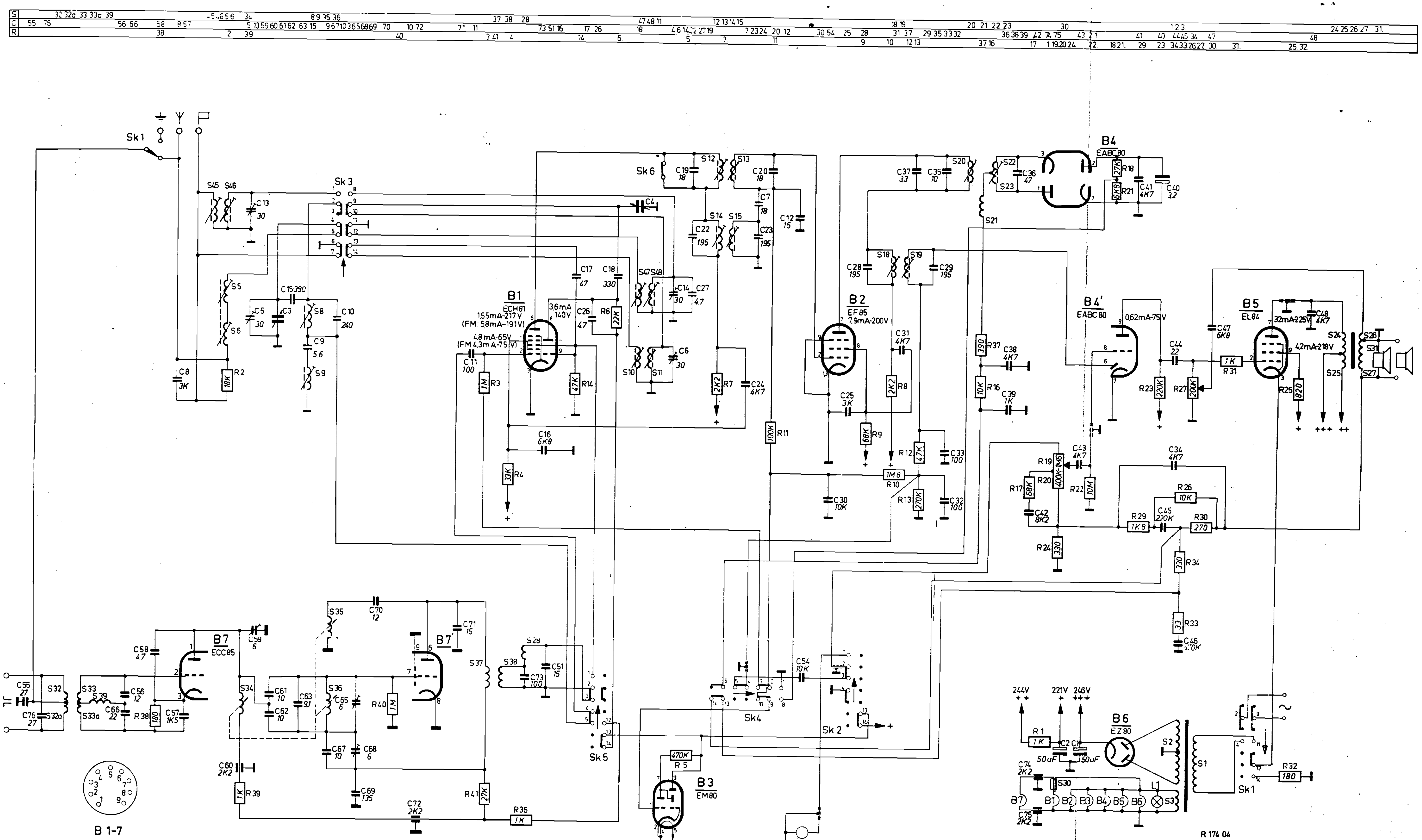


Fig.5