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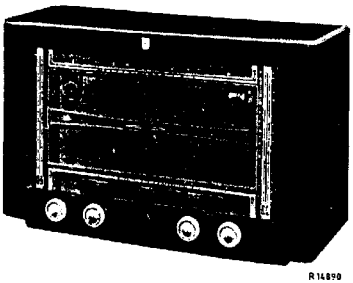
PHILIPS

SERVICE NOTES

for the receiver

BX638A



R14890

1953 For A.C. mains supply.

GENERAL

WAVERANGES

1. M.W.	: 185	- 580	m	(1622	- 517	kc/s)	I.F.: 452 kc/s
2. S.W.3	: 60	- 187	m	(5	- 1.604	Mc/s)	
3. S.W.2d	: 32.25-	60	m	(9.3	- 5	Mc/s)	
4. S.W.2c	: 23.07-	32.96	m	(13.0	- 9.1	Mc/s)	
5. S.W.2b	: 17.00-	25.87	m	(17.6	- 11.6	Mc/s)	
6. S.W.2a	: 10.98-	17.00	m	(27.3	- 17.6	Mc/s)	

CONTROLS

From left to right:

1. Knob : volume control + mains switch
   Lever: radio - P.U. switch
2. Knob : tone control
   Lever: bass switch
3. Knob : vernier tuning
4. Knob : waverange switch
5. Knob : main tuning
6. Knob (above right) for frame-aerial.

MAINS VOLTAGE

90,110,125,180,
200,220V~(50 c/s).

CONSUMPTION

50 W approx.

LOUDSPEAKER

type 9770 Z=5Ω

VALVES

B1 : EF41
B2 : ECH81
B3 : EBF80
B4 : EBC41
B5 : EL84
B6 : EZ80
B7 : EM34

DIMENSIONS

Length : 55 cm)
Depth : 26 cm) knobs included
Height : 34.5 cm)

WEIGHT

11.0 kg.

BANDWIDTH

The I.F. bandwidth (1:10) measured from g1 of B2 is approx. 11 kc/s. The "overall" bandwidth (1:10) measured from the aerial socket is about 9.5 kc/s at 1622 kc/s and 9 kc/s at 1000 kc/s.

DIAL LAMPS

L1 : 8045D-07; L2 : 8045D-07; L3 : 8073D-07

Printed in Holland

FIGURES

Fig.1. R.F. and oscillator circuit for each position of the waverange switch.
Fig.2. Trimming points on the dial.
Fig.3. Pointer and gang capacitor drive.
Fig.4. Switch wafers.
Fig.5. Circuit diagram.
Fig.6. Wiring diagram (under).
Fig.7. Wiring diagram (above).
Fig.8. Mainstransformer.

CIRCUIT DESCRIPTION

R.F. Part

Fig.1 shows for every position of the waverange switch a simplified diagram of the R.F. part.
Bandspread in the ranges S.W.2a, S.W.2b and S.W.2c is obtained by connecting condensers in series and in parallel with the variable condenser.

The vernier control is obtained by self-induction changes of the coil S29 for the ranges S.W.2a, S.W.2b and S.W.2c and of the coil S30 for the range S.W.2d.

A.F. Part

The detected A.F. signal is applied to the grid of B4 via the volume control R14-R15 and C52.The cathode resistor R25 of B5 is not decoupled so that negative current feedback takes place for this valve. The resulting loss of gain is compensated by a positive feedback circuit, obtained by inserting S50 in the cathode circuit of B5.

Tone control

A negative feedback voltage, taken from S49 and S50 of the output-transformer, is applied via C60 to the grid of B5.

Together with a part of R24, C60 forms a high pass-filter. When the moving arm of the tonecontrol is in the upper position the negative feedback voltage is strongest, with the result that the treble notes are suppressed.

This is the "mellow" position.

As the moving arm of the tone control is moved downwards the negative feedback voltage is reduced.This is the "quality" position.

Bass-switch SK7

a. "Maximum low notes" position.
(This position is drawn in fig.5).
For the treble notes, the load resistor of B4 is only R20.
For the low notes, the load resistor of B4 consists of R20 and R19.
So the gain of the low notes is stronger with respect to treble notes.

b. "Minimum low notes" position.
In this position C56 is connected in parallel with C54, so that the load resistor for both the treble and the low notes consists of R20 only.

TRIMMING THE RECEIVER

A. The I.F. Part

1. Set the waverange switch to M.W.
2. Turn the variable condenser to minimum.
3. Set the volume control to maximum.
4. Set the P.U. radio switch to radio.
5. Unscrew the iron cores of the I.F. coils.
6. Connect a voltmeter via a trimming transformer to the extension loudspeaker socket.
7. Apply to g1 of B2 a modulated signal of 452 kc/s via a capacitor of 33000 pF.
8. Trim the I.F. circuits in the following order:

   4th I.F. circuit S45-S46-C48 (coil U).
   3rd I.F. circuit S43-S44-C47 (coil U).
   1st I.F. circuit S39-S40-C44 (coil T).
   2nd I.F. circuit S41-S42-C45 (coil T).
   3rd I.F. circuit S43-S44-C47 (coil U).

   After the last circuit has been trimmed the cores of the I.F. coils must be left as they are.
9. Seal the cores.

Note

The iron cores of the I.F. bandfilters have been sealed with "Vaseline Compound" (see list of parts and tools). This compound can easily be removed in the cold state with the aid of a screwdriver. Heating of the core damages the core holder and makes trimming impossible.

B. R.F. and oscillator circuits

Trimming is done with the aid of trimming points on the dial (see fig.2).
There is no need to uncase the apparatus. Before starting to trim, be sure that the pointers are in the right positions at minimum capacitance of the variable condenser.

The positions of the pointers are (at minimum position of the variable capacitor).

For range M.W. on trimming point (1)
For range S.W.3 on trimming point (4)
For range S.W.2b on trimming point (5)
For range S.W.2a on trimming point (5)
For range S.W.2c on trimming point (3)
For range S.W.2d on trimming point (3).

For all waveranges the following applies:

1. Set the volume control to maximum.
2. Turn the tone control to the "quality" position.
3. Connect a voltmeter via a trimming transformer to the extension loudspeaker socket.

Trim as indicated in the following tabel strictly observing the order given:

1	Waverange switch in position	M.W.	S.W.3	S.W.2b	S.W.2a	S.W.2c	S.W.2d
2	Unsolder connection to SK8	-	-	-	-	-	-
3	Pointer on trimming point..... by means of tuning knob	2	2	6*	2*	2*	2*
4	Apply modulated signal of..... to aerial socket via a capacitor of 33000 pF	553 kc/s	-	-	-	-	-
5	Apply modulated signal of..... to aerial socket via a capacitor of 125 pF	-	1.72 Mc/s	11.6 Mc/s	17.8 Mc/s	9.1 Mc/s	5.18 Mc/s
6	Trim for maximum output voltage	S38 S24 S16a	S36 S21 S14	S27 S18 S8	S26 S17 S6	S28 S19 S10	S34 S20 S12
7	Pointer on trimming point..... by means of tuning knob	1	4	5*	-	-	-
8	Apply modulated signal of..... to aerial socket via a capacitor of 33000 pF	1630 kc/s	-	-	-	-	-
9	Apply modulated signal of..... via a capacitor of 125 pF	-	5.1 Mc/s	18 Mc/s	-	-	-
10	Trim for maximum output voltage	C43 C24 C13	C39 C23 C12	C33 C19 C8	-	-	-
11	Repeat the points	2-10	2-10	2-10	-	-	-
12	Seal the trimmers and cores	S38 S24 S16a C43 C24 C13	S36 S21 S14 C39 C23 C12	S27 S18 S8 C33 C19 C8	S26 S17 S6	S28 S19 S10	S34 S20 S12
13	Solder the connection to SK8	-	-	-	-	-	-

* Place vernier-tuning in the middle position on the dial.

REPAIRS AND REPLACEMENTS

Uncasing

1. Remove rear panel and bottom plate.
2. Remove knobs (they pull off except the knob of the vernier-tuning which has to be unscrewed).
3. Unscrew loudspeaker baffle (4 screws).
4. Unscrew the four bottom screws and 1 screw above frame aerial.
5. Carefully draw the chassis out of the cabinet.

Variable capacitor and pointer drive

The path and the lengths of the cables are indicated in fig.3, the variable capacitor being set to maximum.

A. Variable capacitor drive

1. Remove the chassis from the cabinet.
2. Remove the broken cables.
3. Assemble the new cables "A" and "B".
4. Push the nipple a of the cable A into the slit A1 of the small drum and pass the cable ± 2 x in a clockwise direction around the drum.
5. Place the cable guide into position.
6. Pass the cable ± ½ x in a anti-clockwise direction around the drum of the variable capacitor.
7. Fix the cable temporarily with a crocodile clip.
8. Push the nipple b of the cable B into the slit B1.
9. Pass the cable B ± ½ x in an anti-clockwise direction around the small drum.
10. Place the cable guide into position.
11. Pass the cable around the pulley and ± 1½ x in a clockwise direction around the variable capacitor drum.
12. Hook the spring into the cableloops, pass the ends through the drum opening and lay one end in the right direction around the pin of the drum.
13. Fix the spring on its bracket and remove the crocodile clip.

Pointerdrive.

1. Remove the chassis from the cabinet.
2. Remove the dialscale and if desired also the baffle.
3. Put cable D with nipple d in slit D1 on the cable drum and turn ± 1½ turns to the left and clip temporarily with a crocodile clip on the friction wheel.
4. Put cable C with nipple c in slit C1 on the cabledrum and turn ± 2½ turns to the right and clip temporarily with a crocodile clip on the friction wheel.
5. Put the baffle back in place.
6. Remove the crocodile clip from cable D and put the cable on its pullies (see fig.3).
7. Remove the crocodile clip from cable C and put the cable on its pullies (see fig.3).
8. Hook the two cable ends together with hook H as indicated in figure 3.
9. Fix the pointer carriers and pointers to the cable.
10. Check the tension in the cables, it must be taken up entirely by the spring on the side of the chassis.

Frame aerial drive.

1. Remove rear panel.
2. Remove dial lampholder.
3. Remove broken cord.
4. Take the aerial unit out of the cabinet (3 wood-screws and 1 cylindrical screw).
5. Make up the cord according to fig.3.
6. Turn the knob entirely to the left.
7. Insert nipple p of cable E-F in the slit P1 of drum under frame aerial, the drum should be turned so that the slit is above the bracket.
8. Put the cord E11/4 turns to the left around the drum under frame aerial and cord F1/4 turn to the right around this drum.
9. Fix both cords on the drum with some vaseline compound.
10. Mount the frame aerial unit on its place.
11. Place the outer cables in their supports.

12. Put the cord F + 1 turn to the right around the drum on the baffle and cord E + 1/4 turn to the left around this drum.
13. Hook the cable loops in the spring and hook the other end of the spring to screw in the drum.

Repair of the vernier control

For the repair of this part unscrew the bracket from the chassis after which it will be easy to remove both the driving spindle and the cores.
Keep always free of grease the rubber driving rolls and core rods.

After repair the cores must be moved to and fro once or twice against their stop points, after which they come automatically in the right position.

Mainstransformer

If the original mainstransformer of this apparatus becomes defective, it must be replaced by the standard transformer mentioned in the electrical parts list.

If a mains tension of 180 Volts must be applied to the set, equipped with the standard transformer,it must be applied to the points 1A and 5 of this transformer. In case, the standard transformer has been replaced, the voltage adaptor,mentioned in the list of parts and tools, should also be replaced.

For connections see fig.8.

CURRENTS AND VOLTAGES

			Va	Vg2(+4)	Vk	Ia	Ig2(+4)
B1	EF41	Pentode	210	75	1.2	2.8	0.7
B2	ECH81	Hexode	240	75	-	2.0	4.7
		Triode	90	-	-	4.3	-
B3	EBF80	Pentode	240	75	-	5.0	1.6
B4	EBC41	Triode	75	-	-	0.58	-
B5	EL84	Pentode	245	240	7.6	45	4.8
B7	EM34	Tuning Indicator	240	d1=40 d2=25	-	-	d1=0.1 d2=0.11
			Volts	Volts	Volts	mA	mA

VC1 = 265 V
VC2 = 240 V

Iprim 235 mA (220V 50 c/s)

These measurements have been taken with the Universal Measuring Instrument GM4257 with the receiver connected to 220 V a.c. and no signal on the aerial socket.

LIST OF PARTS AND TOOLS

When ordering always quote:
1. Codenumber
2. Description
3. Typenumber of the set.

		Description	Code number
		Cabinet	A3 737 24.0
		Rubbergrommet (fixing chassis) 4x	A3 327 14.0
		Rear panel	A3 255 36.0
		Knobs 4x	A3 736 57.0
		Leaf spring for knobs	28 753 01.2
		Levers (colour MC)bass-switch and Radio-P.U. switch	23 952 95.5
		Knob vernier control	23 610 54.1
		Spring in drum frame aerial drive	A3 644 80.0
		CHASSIS	
		Connecting plate (aerial-earth)	A1 340 92.0
		Valve holder	R1 662 11.0
		Voltage adaptor	A3 228 85.0
		Spring for fixing coil cans 7x	A3 652 58.2
		Spring for fixing coil can 1x	A3 652 92.0
		Bass switch and P.U.-radio switch	A3 402 44.0
		Rubber grommet for fixing baffle	A3 327 14.0
		Disque for waverange indication	A3 404 08.0
		Plate for vernier control indication	A3 404 09.2
		Plate for tone control indication	A3 390 04.0
		Tension spring for driving cable at side of chassis	A3 646 17.0
		Pointer carrier	A3 372 35.0
		Valve holder	B1 505 26.1
		Dial lampholder (2x)	A3 359 16.1
		Ornamental window for frame aerial	A3 360 63.0
		Indication disque for frame aerial	A3 724 54.0
		Knob for frame aerial	A3 737 22.0
		Leaf spring for knob frame aerial	A3 522 08.0
		Dial lampholder frame aerial (1x)	A3 359 16.1
		Cable drum under frame aerial	P4 095 06/01
		Spring in drum variable capacitor	A3 646 09.3
		Gear wheel	A3 330 43.0
		Large vertical pully for cable drive	P4 095 04/01
		Large horizontal pully for cable drive	P4 095 05/01
		Ornamental window for tuning indicator	A3 357 13.0
		Dial (overseas)	A3 740 23.0
		Dial (Mediterranean)	A3 740 24.0
		TOOLS	
		Service Oscillator	GM2882 or GM2883 or GM2884
		Universal Measuring Instrument	GM4256 or GM4257
		Vaseline Compound	X 009 47.0

S1	-	A3 141 37.4
S2	-	
S3	-	
S4	-	
S5	1.5 Ω	A3 125 79.0
S6	< 1 Ω	
S9	1.6 Ω	A3 125 28.0
S10	< 1 Ω	
S7	1.5 Ω	A3 125 26.0
S8	< 1 Ω	
S11	1.6 Ω	A3 125 28.0
S12	< 1 Ω	
S13	13 Ω	A3 125 33.0
S14	1.7 Ω	
S16	1 Ω	A3 117 33.0
S16a	< 1 Ω	
S17	< 1 Ω	A3 125 80.0
S19	< 1 Ω	A3 125 41.0
S18	< 1 Ω	A3 125 39.0
S20	< 1 Ω	A3 125 41.0
S21	1.7 Ω	A3 125 46.0
S22		
S23	45 Ω	A3 125 35.0
S24	3 Ω	
S25	26 Ω	A3 110 66.0
S26	< 1 Ω	A3 113 10.0
S28	< 1 Ω	A3 125 44.0
S27	< 1 Ω	A3 125 42.0
S32	< 1 Ω	A3 125 60.0
S33	< 1 Ω	
S34	< 1 Ω	
S29	< 1 Ω	A3 117 43.0
S30	< 1 Ω	A3 117 43.0
S35	1 Ω	A3 125 68.0
S36	3 Ω	
S37	4.7 Ω	A3 125 72.0
S38	10 Ω	
S39	7.5 Ω	
S40		
S41	2 Ω	A3 121 94.2
S42	3 Ω	
C44	115 pF	
C45	115 pF	
S43	7.5 Ω	A3 121 94.2
S44		
S45	2 Ω	

S46	3 Ω	A3 121 94.2
C47	115 pF	
C48	115 pF	
S47	400 Ω	A3 169 57.0
S48		
S49	< 1 Ω	
S50	< 1 Ω	
C1	50 µF	48 317 59/50+50
C2	50 µF	
C3	11-498 pF	49 001 66.2
C4	11-498 pF	
C5	11-498 pF	
C6	330 pF	48 203 10/330E
C7	3000 pF	48 429 05/3K
C8	60 pF	49 005 58.0
C9	0.1 µF	48 757 20/100K
C10	140 pF	48 203 01/140E
C12	30 pF	28 212 36.4
C13	5 pF	49 627 50.0
C14	150 pF	48 203 01/150E
C15	150 pF	48 203 10/150E
C16	150 pF	48 203 10/150E
C17	150 pF	48 203 10/150E
C18	10.000pF	48 207 50/10K
C19	60 pF	49 005 58.0
C21	140 pF	48 203 01/140E
C22	3300 pF	48 429 05/3K3
C23	30 pF	28 212 36.4
C24	30 pF	28 212 36.4
C25	150 pF	48 203 01/150E
C26	150 pF	48 203 10/150E
C27	0.22 µF	48 751 10/220K
C29	220 pF	48 203 20/220E
C30	500 pF	48 336 01/500E
C31	180 pF	48 336 01/180E
C33	60 pF	49 005 58.0
C34	100 pF	48 203 20/100E
C35	100 pF	48 203 20/100E
C36	100 pF	48 203 02/100E
C37	150 pF	48 336 01/150E
C39	30 pF	28 212 36.4
C40	1575 pF	48 429 01/1K 575
C42	390 pF	48 336 02/390E
C43	30 pF	28 212 36.4
C44	see coils	-
C45	voir bobines	-
C46	10 pF	48 201 10/10E
C47	see coils	-
C48	voir bobines	-
C49	82 pF	48 203 10/82E
C50	47000 pF	48 750 10/47K
C51	33000 pF	48 750 10/33K
C52	10000 pF	48 750 10/10K
C53	0.1µF	48 751 10/100K
C54	10000 pF	48 751 10/10K

C55	22000 pF	48 751 10/22K
C56	0.1 µF	48 751 10/100K
C57	2200 pF	48 758 20/2K2
C58	2200 pF	48 751 10/2K2
C59	1500 pF	48 206 50/1K5
C60	1500 pF	48 206 50/1K5
C61	47000 pF	48 750 10/47K
R1	1000 Ω	49 379 81.0
R2	10000 Ω	A9 999 00/10K
R3	0.1 MΩ	A9 999 00/100K
R4	10000 Ω	A9 999 00/10K
R5	1000 Ω	A9 999 00/1K
R6	0.82 MΩ	A9 999 00/820K
R7	2x 47000 Ω par.	A9 999 00/47K
R8	47000 Ω	A9 999 00/47K
R9	33000 Ω	A9 999 00/33K
R10	560 Ω	A9 999 00/560E
R11	1 MΩ	A9 999 00/1M
R12	1.2 MΩ	A9 999 00/1M2

R13	47000 Ω	A9 999 00/47K
R14	0.45 MΩ)	49 500 34.0
R15	0.05 MΩ)	
R16	15000 Ω	A9 999 00/15K
R17	2.2 MΩ	A9 999 00/2M2
R18	10 MΩ	A9 999 00/10M
R19	0.1 MΩ	A9 999 00/100K
R20	0.12 MΩ	A9 999 00/120K
R21	47000 Ω	A9 999 00/47K
R22	1000 Ω	A9 999 00/1K
R23	0.05 MΩ)	49 472 80.0
R24	0.45 MΩ)	
R25	150 Ω	A9 999 00/150E
R26	100 Ω	A9 999 00/100E
R27	1 MΩ	A9 999 00/1M
R28	1 MΩ	A9 999 00/1M
R29	12000 Ω	A9 999 00/12K
R30	330 Ω	A9 999 00/330E

JvE/TV

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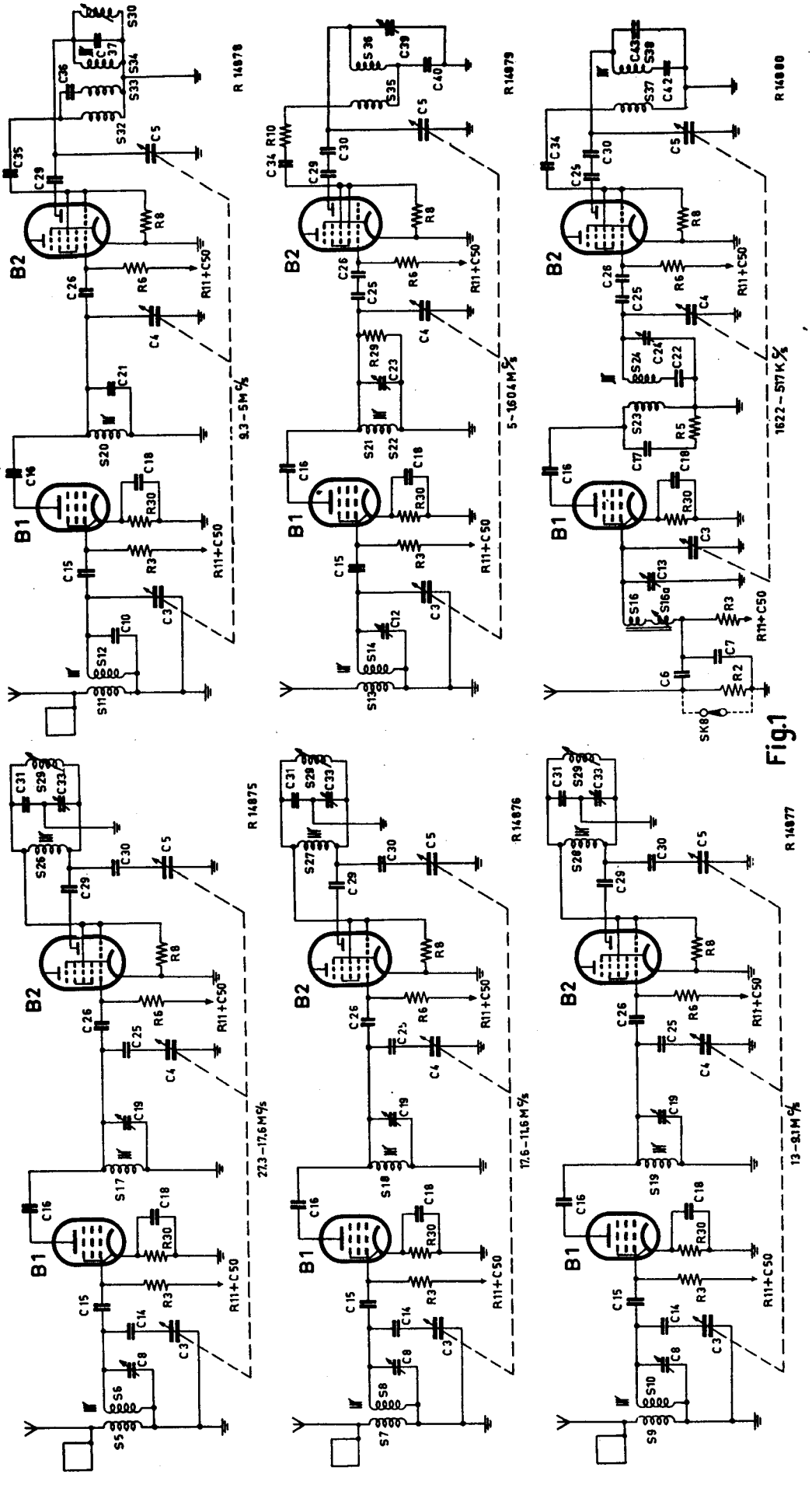

Fig.1

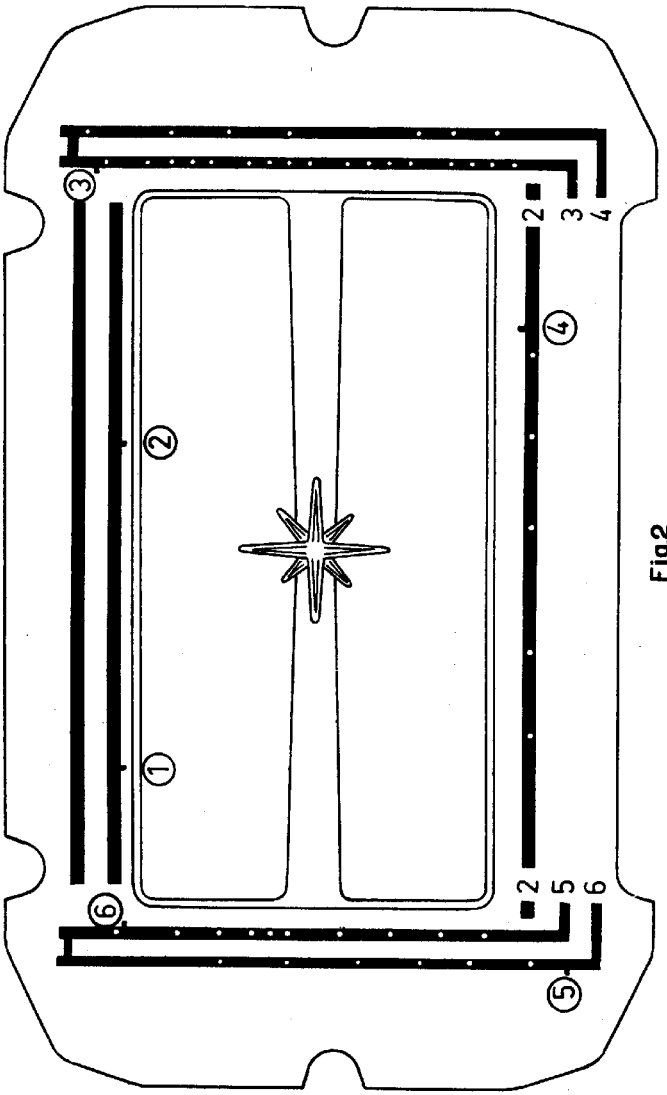

Fig.2

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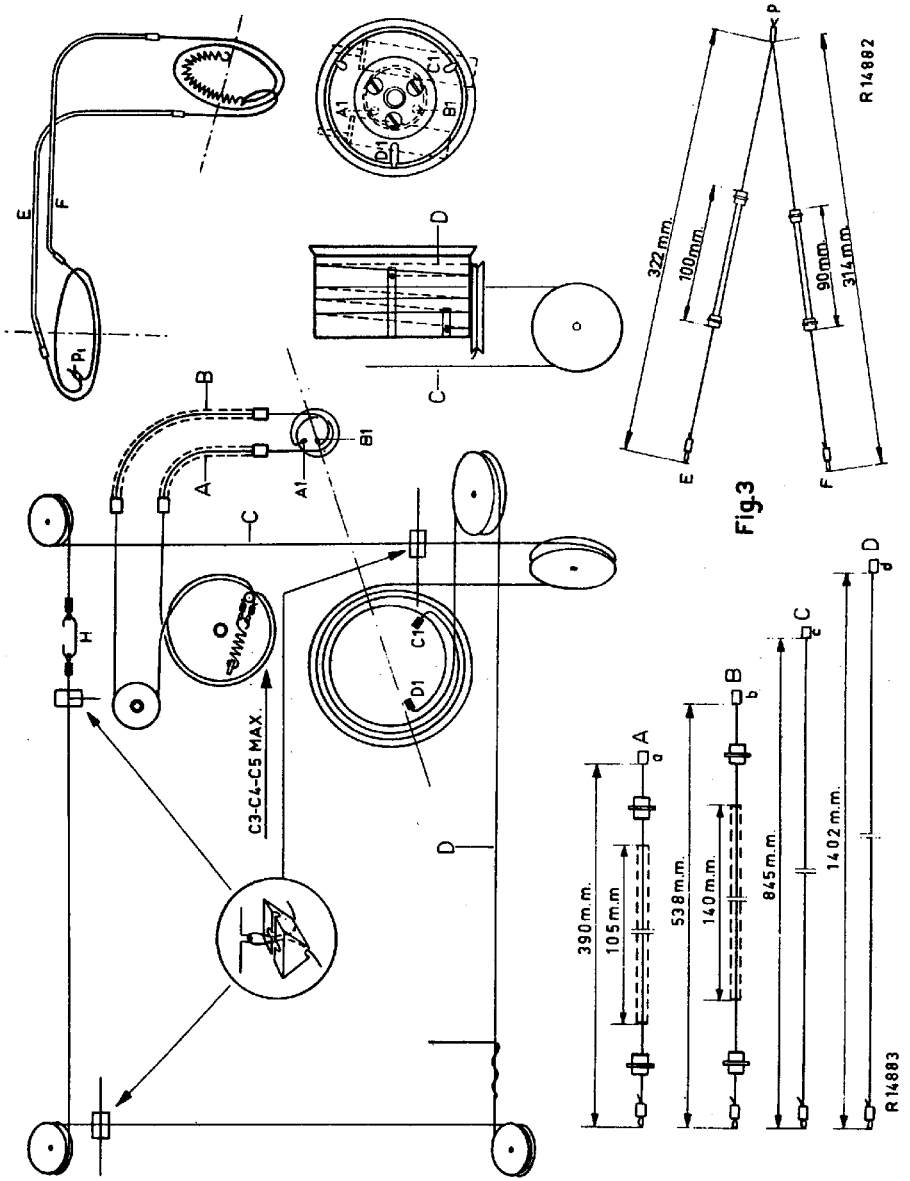
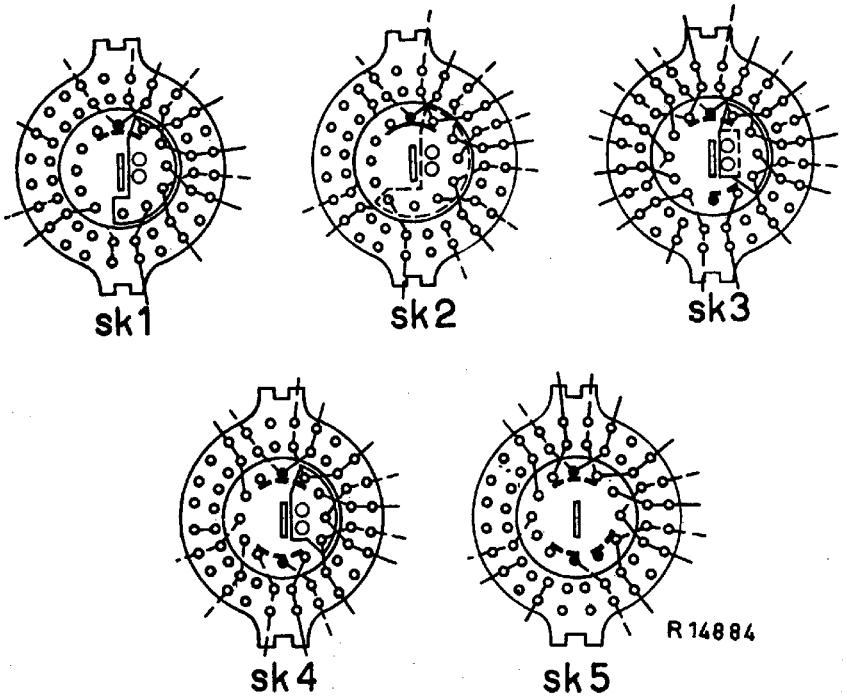
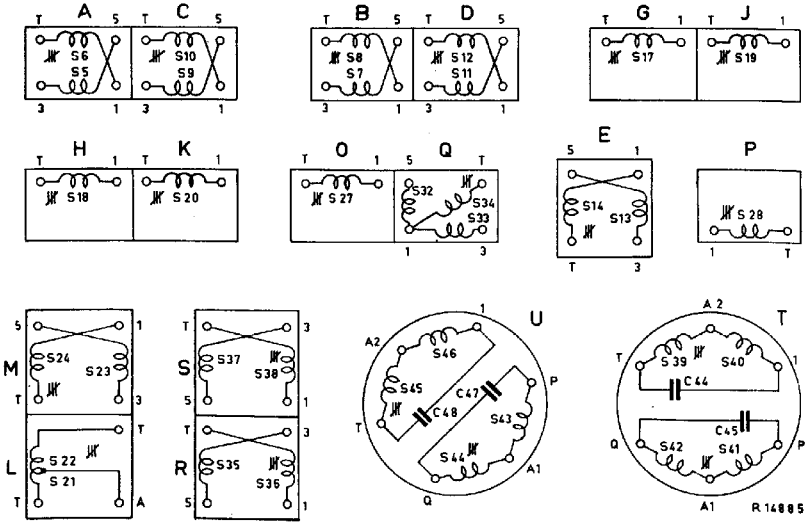

E
F
P1
A1
B1
D1
D
C
B
A
C1
H
C3-C4-C5 MAX.
P
322 mm.
100 mm.
90 mm.
314 mm.
R14882
390 m.m.
105 m.m.
538 m.m.
140 m.m.
845 m.m.
1402 m.m.
R14883

Fig.3


sk1
sk2
sk3
sk4
sk5
R 14884


A
C
B
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M
L
S
R
U
T
S24
S23
S22
S21
S37
S38
S35
S36
S46
S45
C47
C48
S43
S44
S39
S40
C44
C45
S42
S41
R 14885

Fig.4

S	1. 2. 3. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 16, 25. 23. 17. 18. 19. 20. 21. 24. 32. 33. 35. 37. 29. 26. 27. 28. 34. 30. 36. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51.
C	9. 6. 7. 8. 10. 12. 13. 3. 14. 15. 16. 59. 17. 1. 2. 18. 22. 21. 23. 19. 24. 27. 4. 25. 26. 58. 29. 30. 5. 31. 34. 35. 36. 40. 42. 33. 37. 39. 43. 44. 45. 50. 46. 61. 47. 51. 48. 49. 52. 53. 54. 55. 56. 60. 57.
R	2. 3. 30. 4. 5. 1. 29. 7. 6. 8. 9. 10. 11. 12. 17. 27. 16. 13. 14. 15. 18. 28. 29. 20. 19. 21. 22. 23. 24. 25. 26.

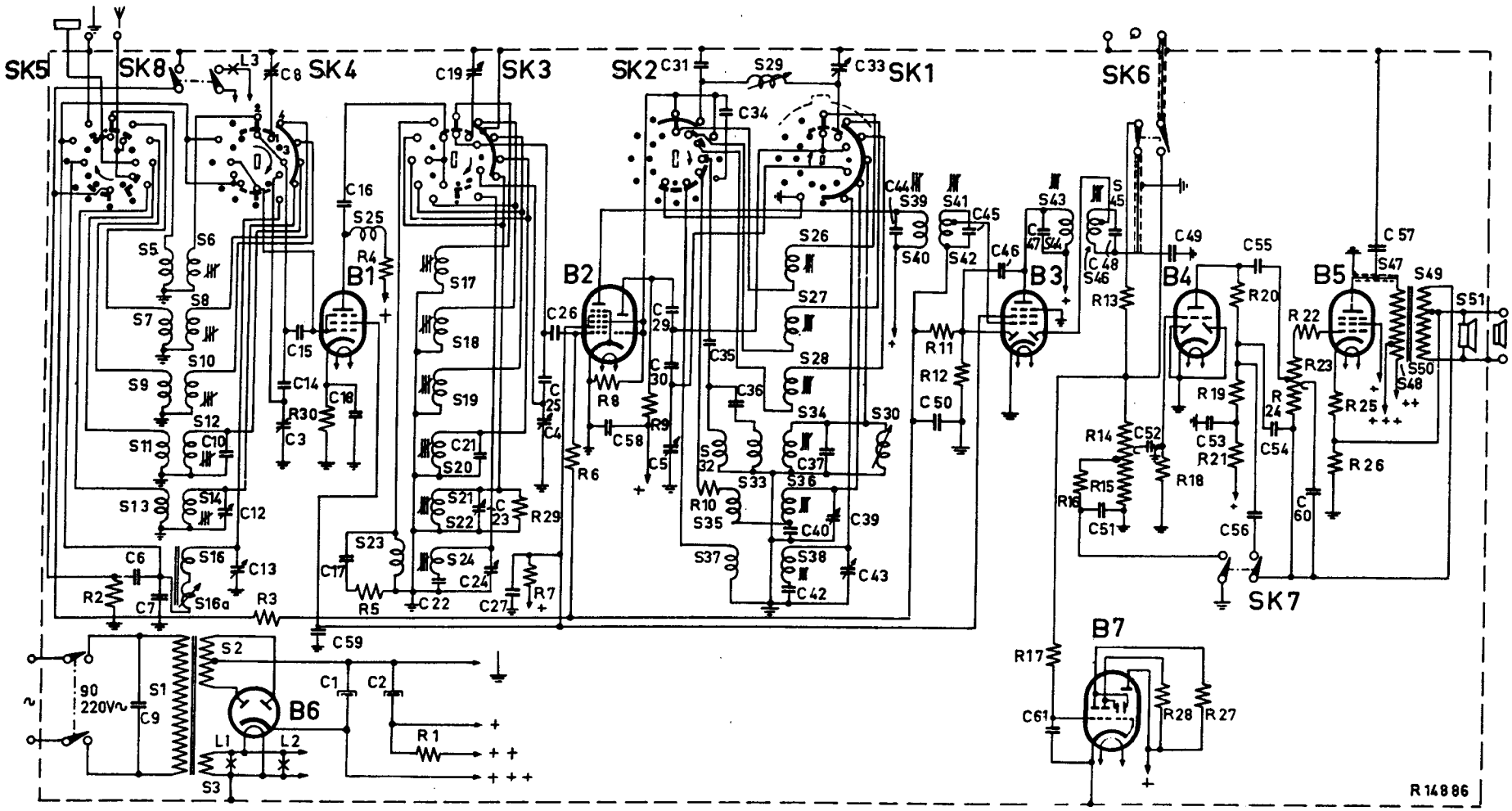
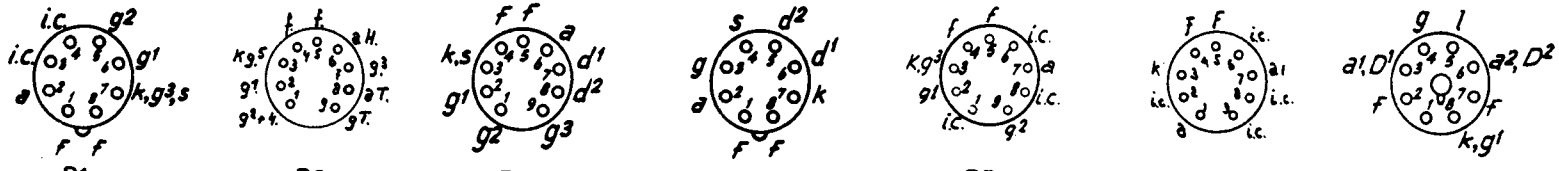


Fig.5



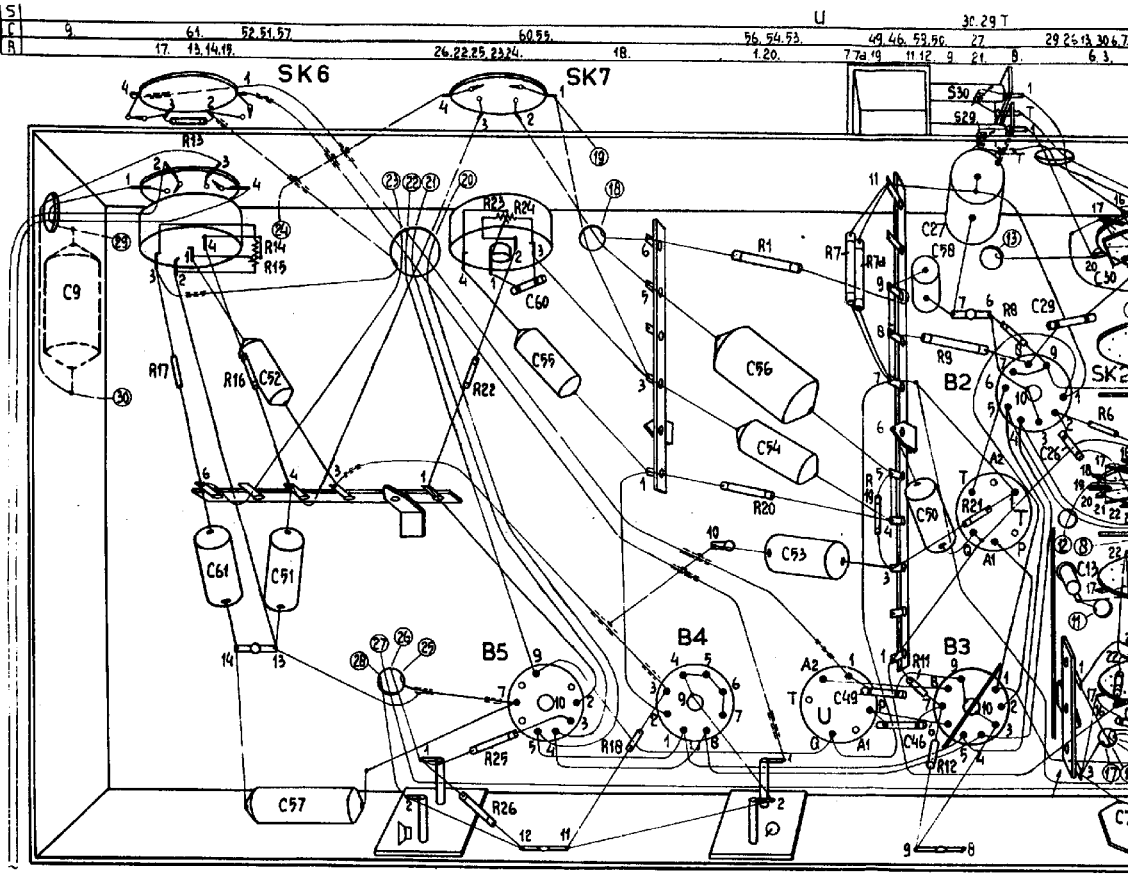

SK6
SK7
B2
B3
B4
B5
C9
C51
C52
C53
C54
C56
C57
C58
C59
C60
C61
R1
R6
R8
R9
R11
R12
R13
R14
R15
R16
R17
R18
R20
R21
R22
R25
R26
S29
S30

Fig.6

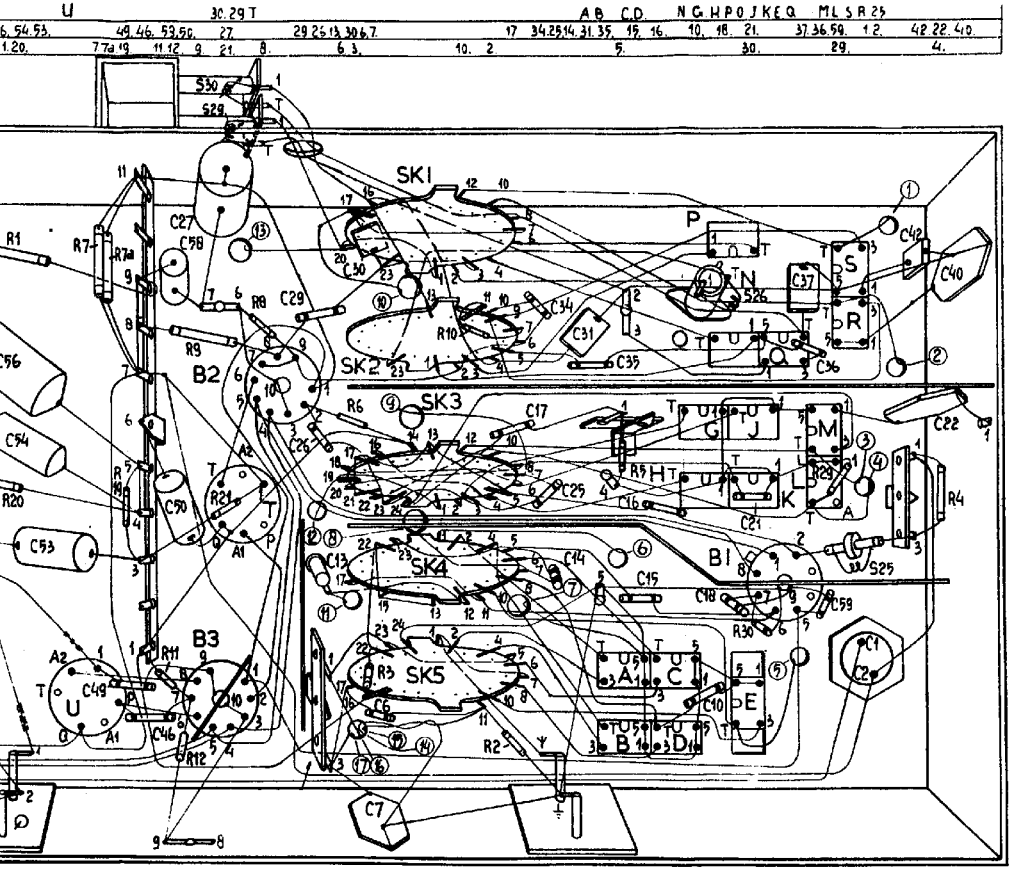
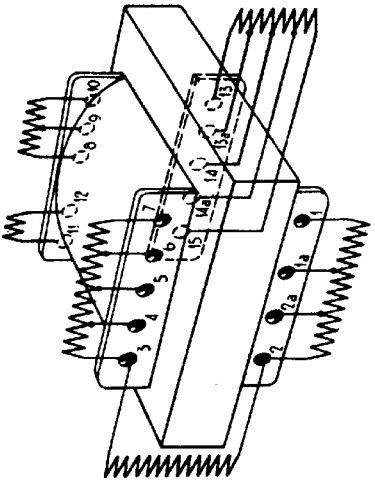


Fig.6



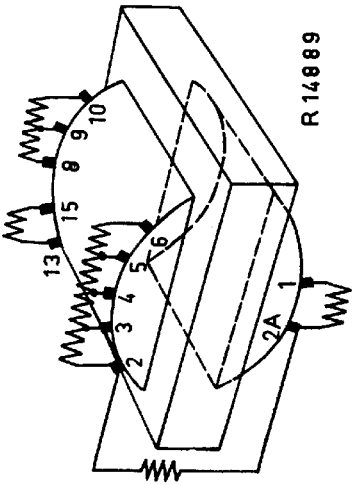


Fig.8

R 14889

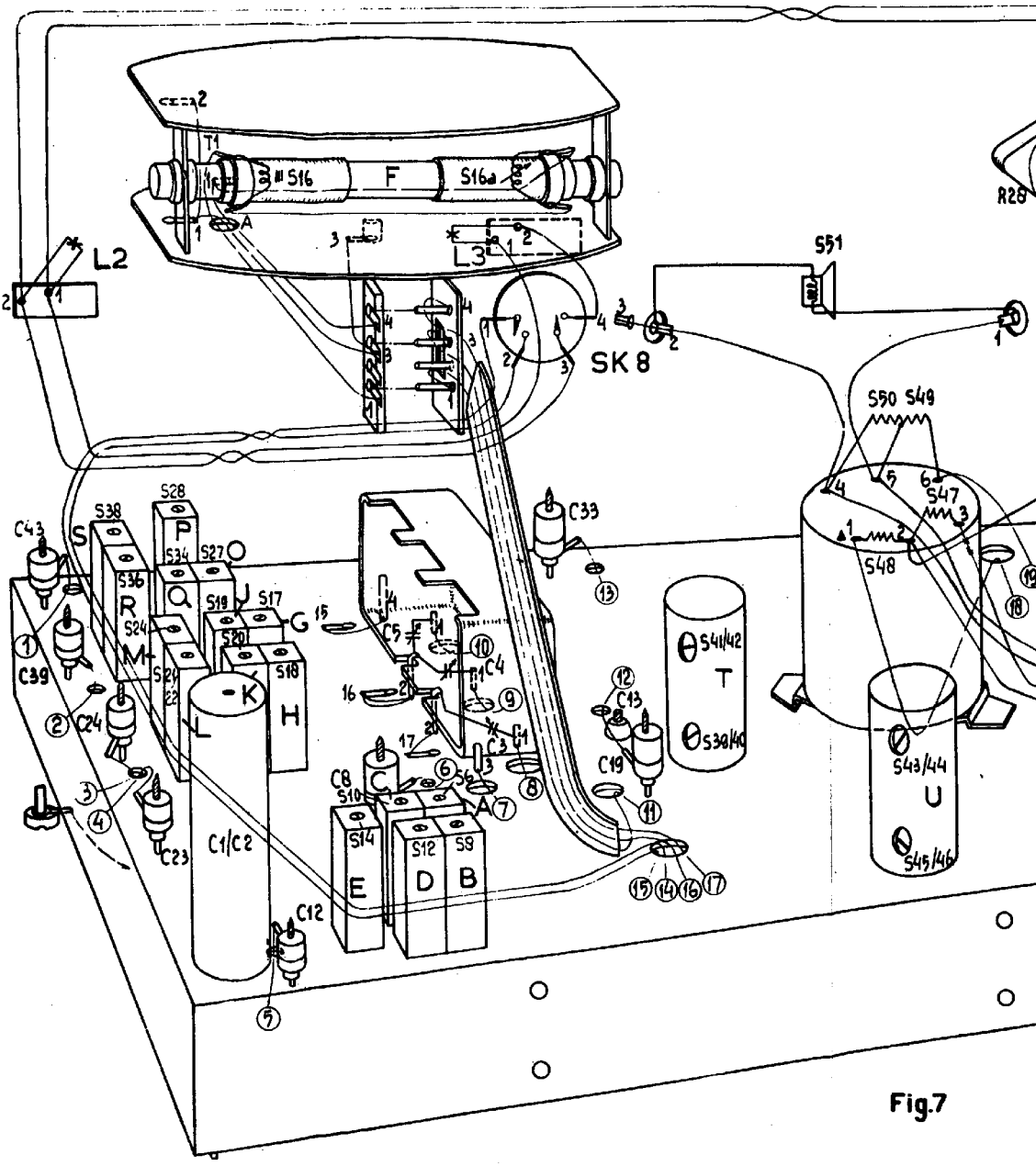

T1
S16
F
S16a
L2
L3
SK 8
S51
S50
S49
S47
S48
S28
S38
S34
S27
S36
S19
S17
S24
S20
S18
S29
C43
C39
C24
C23
C1/C2
C12
C33
C4
C5
C3
C8
S10
S14
S12
S9
C13
C19
S41/42
S39/40
S43/44
S45/46
R28
P
Q
R
M
S
G
H
K
L
C
A
E
D
B
T
U

Fig.7

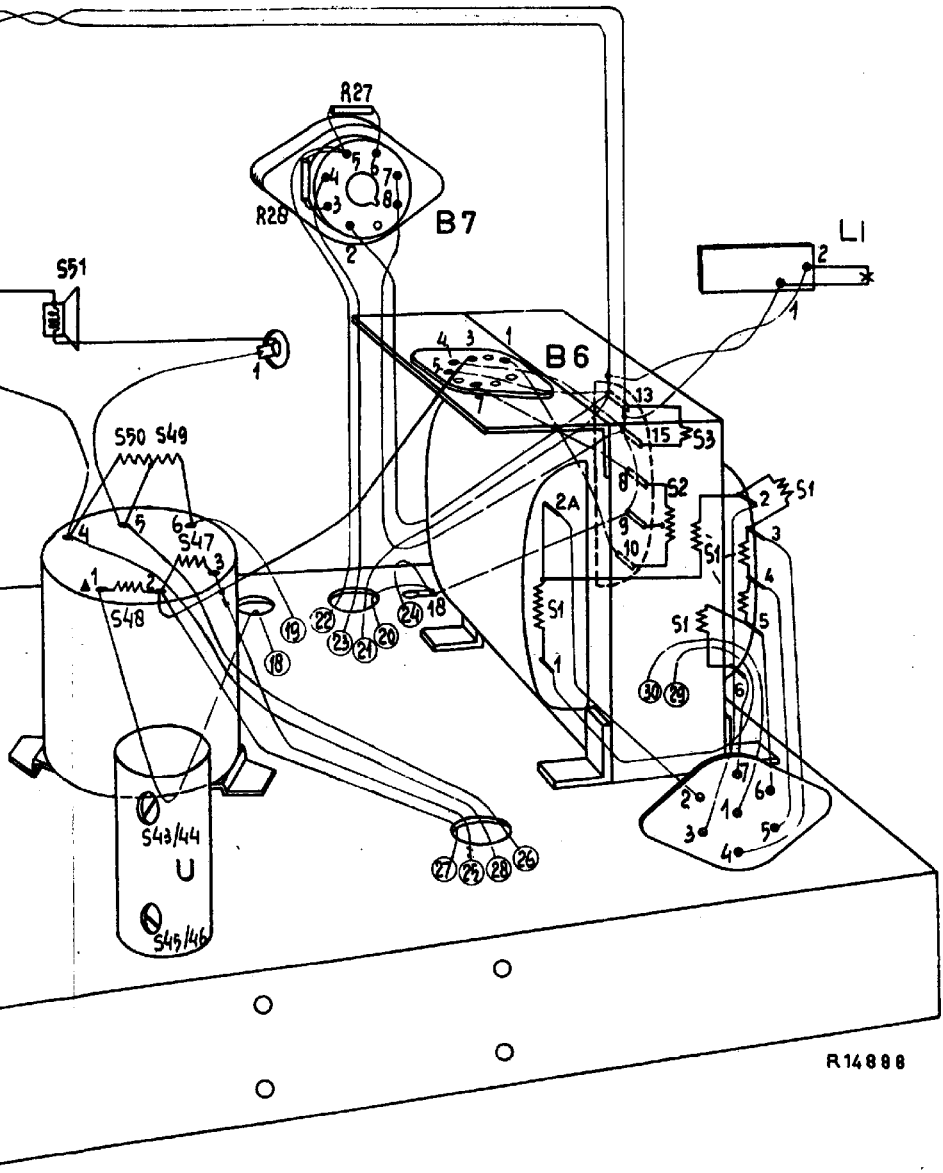

R27
R28
B7
L1
S51
B6
S50 S49
S47
S48
S43/44
U
S45/46
S53
S52
S1
2A
R14888

Fig.7