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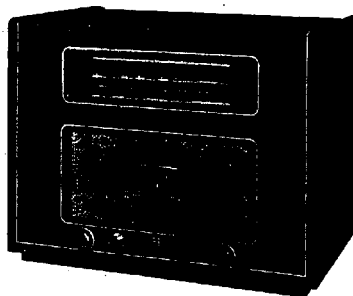
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SERVICE NOTES

for the radio gramophone

HX528A-01



R14737

1953

For a.c. mains supply.

GENERAL

WAVERANGES

S.W.2a :	11,5 - 19,9 m	{ 26.2 - 15.03 Mc/s	I.F. : 452 kc/s
S.W.2b :	24,9 - 32 m	{ 12.03 - 9.32 Mc/s	
S.W.3 :	30 - 93 m	{ 10 - 3.22 Mc/s	
M.W. :	185 - 580 m	{ 1622 - 517 kc/s	

CONTROLS

From left to right:

1st knob : Volume control + mains switch
Lever : Radio-p.u. switch
2nd knob : Tone control
Lever : Bass-switch
3rd knob : Waverange switch
4th knob : Tuning

MAINS VOLTAGE

90, 110, 125, 145, 200,
220 V.

CONSUMPTION

About 56 W.

LOUDSPEAKER

Type number
9768 (Z = 5 Ω)

DIMENSIONS

Length : 57 cm) knobs
Depth : 38 cm) in-
Height : 42 cm) cluded

WEIGHT: approx. 14 kg.

RECORD-CHANGER

AG 1000

VALVES

B1 : ECH42
B2 : BAF42
B3 : EBC41
B4 : BL41
B5 : AZ41
B6 : EM34

DIALLAMP

L1 : 8045D-00
L2 : 8045D-00

BANDWIDTH

The I.F. bandwidth (1:10) measured from g1 of B1 is about 11 kc/s.
The "overall" bandwidth (1:10) measured from the aerial socket is about 9,5 kc/s at 547 kc/s, 1000 kc/s.

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LIST OF ILLUSTRATIONS

- Fig.1.: Details of R.F. and oscillator circuits.
 Fig.2.: Switch segments.
 Fig.3.: Pointer and gang capacitor drive.
 Fig.4.: Circuit diagram.
 Fig.5.: Wiring diagram (under).
 Fig.6.: Wiring diagram (above).
 Fig.7.: Wiring in the cabinet.
 Fig.8.: Mains transformer.

CIRCUIT DESCRIPTIONR.F.PART

Fig.1 shows for every position of the waverange switch a simplified circuit diagram of the R.F. part. Bandsread in the ranges S.W. 2a and 2b is obtained by connecting fixed capacitors in series and in parallel with the variable capacitor.

A.F.PART

The detected A.F. signal is applied to the grid of B3 via the volume control R12-R13 and C30. The cathode resistors R14 and R21 of B3 and B4 respectively are not decoupled, so that negative current feedback takes place for these valves. The resulting loss of gain is compensated by a positive feedback circuit obtained by connecting R22 and R42 between the cathode of B3 and B4. Physiological audio correction, accentuating the bass notes compared with the treble, at low signal strength, is obtained by connecting R11 in series with C29 in parallel across the part R13 of the volume control.

QUALITY CONTROL

A negative feedback voltage, taken from the slider of the potentiometer R16 shunted across the secondary S24-S27 of the output transformer, is applied via C28 to the cathode of B3.

Together with R14, C28 forms a high-pass filter. When the slider of the quality control is in the lowest position the negative feedback voltage is strongest, with the result that the treble notes are suppressed. This is the "mellow position".

As the slider is moved upward the negative feedback voltage is reduced to zero, thereby inverting the phase of the voltage and thus a positive feedback is applied to the cathode of B3.

This positive feedback voltage accentuates the reproduction of the treble notes. This is the "quality" position.

RECORD-CHANGER

This apparatus is equipped with the record-changer AG1000. For readjustments or repair see Service Notes of the AG1000.

TRIMMING THE RECEIVERA. THE I.F. PART

1. Waverange switch to M.W.
2. Variable capacitor to minimum.
3. Volume control to maximum.
4. Connect a voltmeter via a trimming transformer to the extension loudspeaker sockets.

5. Unscrew the iron cores of the I.F. coils
 6. Apply to g1 of B1 a modulated signal of 452 kc/s via a capacitor of 33000 pF.
 7. Trim the I.F. circuit in the following order:
 - 4th I.F. circuit S21-S22-C26 (coil J)
 - 3rd I.F. circuit S19-S20-C25 (coil J)
 - 1st I.F. circuit S15-S16-C21 (coil H)
 - 2nd I.F. circuit S17-S18-C22 (coil H)
- After the last circuit has been trimmed, the cores of the I.F. coils must be left as they are.
8. Seal the cores.

NOTE

The iron cores of the I.F. band filters have been sealed with "Vaseline Compound" - see the 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 I.F. WAVE TRAP

1. Waverange switch to M.W.
2. Turn the variable capacitor to minimum.
3. Volume control to maximum
4. Connect a voltmeter via a trimming transformer to the extension loudspeaker sockets.
5. Apply to the aerial socket a modulated signal of 452 kc/s via a normal dummy aerial.
6. Trim S26 to the first minimum from the unscrewed position of the core.
7. Seal S26.

C R.F. and OSCILLATOR CIRCUITS

Trimming is done with the aid of trimming marks on the dial. There is no need to take the chassis out of the cabinet.

Before beginning the trimming procedure, the pointer has to be adjusted opposite the extreme left trimming mark on the dial, with the variable capacitor in its minimum capacitance position.

For all waveranges the following applies:

1. Volume control to maximum
2. Turn the quality control to the "clear" position.
3. Connect a voltmeter via a trimming transformer to the extension loudspeaker sockets.

Trim as indicated in the following table, strictly observing the order given.

1	Waverange switch in position	S.W.2a	S.W.2b	S.W.2a	S.W.3	M.W.
2	Pointer on trimming point for.. by means of tuning knob	19.8 m	31.7 m	11.4m	88.2m	548m
3	Apply modulated signal of..... to aerial socket via dummy	15.5 Mc/s	9.45 Mc/s	26.3 Mc/s	3.4 Mc/s	547 kc/s
4	Trim for maximum output voltage	S12, S6	C17	C38	S31, S29	S14 S8
5	Pointer on trimming point for.. by means of tuning knob	11.4 m	-	-	29.7m	184m
6	Apply a modulated signal of.... to aerial socket via dummy	26.3 Mc/s	-	-	10.1 Mc/s	1630 kc/s
7	Trim for maximum output voltage	C38, C9	-	-	C15, C46	C16 C39
8	Repeat the points.....	2 to 7	-	-	2 to 7	2 to 7
9	Seal the trimmers.....	S12,S6 C9	C17	C38	S31, S29, C15, C46	S14 S8 C16 C39

REPAIRS AND REPLACEMENTS

REMOVING THE CHASSIS FROM THE CABINET

1. Remove the rear panel
2. Remove the loudspeaker connections from the block I
3. Remove the tuning indicator from the front panel
4. Remove the mains lead for the motor from block III
5. Disconnect P.U. connectingplate from chassis.
6. Release the pointer from the driving cable.
7. Disconnect the supply lead for the diallamps from block II
8. Remove the 4 bottom screws from the chassis.
9. Lift up the record-changer a little
10. Carefully withdraw the chassis from the cabinet.

REMOVING THE RECORD-CHANGER FROM THE CABINET

1. Remove the wooden rearpanel
2. Disconnect the P.U. connecting plate from chassis.
3. Disconnect the supply lead for the motor from block III
4. Disconnect the supply lead for the diallamps from block II
5. Unscrew the mounting shelf from the cabinet
6. Withdraw the mounting shelf and record-changer from the cabinet.

MAINSTRANSFORMER

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

For connections see fig.8.

Capacitor and pointer drive

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

A. Capacitor drive

1. Remove the chassis from the cabinet.
2. Remove the large cable drum (3 screws).
3. Remove the broken cord.
4. Assemble the new cord "A-B".
5. Push the nipple "c" of the cord "A-B" in the slit "c" of the small drum.
6. Turn the drum till the slit "c" is underneath.
7. Fasten the drum with a nail.
8. Pass the end "A" in a clockwise direction around the drum and $2\frac{1}{2}$ x in an anti-clockwise direction around the tuning spindle
9. Place the cable guide in position.
10. Pass the cord in an anti-clockwise direction around the capacitor drum and fix it temporarily with a crocodile clip.
11. Pass the end "B" $\frac{3}{4}$ x in an anti-clockwise direction around the drum and $2\frac{1}{2}$ x in a clockwise direction around the tuning spindle.
12. Place the cable guide in position.
13. Pass the cord around the pulley and the capacitor drum.
14. Hook the spring in the cordloops, pass the ends through the drum opening and lay one end in the right direction around the pin of the drum.
15. Fix the spring on its bracket and remove the crocodile clip.
16. Remove the nail and replace the large cable drum.

B. Pointer Drive

1. Remove the chassis from the cabinet.
2. Remove the broken cable(s).
3. Assemble the new cable(s).
4. Push the nipple "a" of the cable "D" in the slit "a" of the cable drum, pass the cable $1\frac{1}{2}$ x in an anti-clockwise direction around the drum and fix it temporarily with a crocodile clip to any convenient point.
5. Push the nipple "b" of the cable "C" in the slit "b", pass the cable 3 x in a clockwise direction around the drum and the pulleys.
6. Connect the both cable ends by means of the spring and remove the crocodile clip.

VOLTAGES AND CURRENTS

Valves		Va	Vg2(+4)	Vk	Ia	Ig2(+4)
B1	Hexode	235	65	-	2,7	4
	Triode	78	-	-	4,6	-
B2	Pentode	235	65	-	4,8	1,6
B3	Triode	108	-	1,27	0,58	-
B4	Pentode	245	235	5,5	31	5
B6	EM 34	235	d1 = 35	-	1,3	d1 = 0,20
			d2 = 18			d2 = 0,22
		V	V	V	mA	mA

VC1 = 270 Volts VC2 = 235 Volts Iprim (220 V ~) = 210 mA

The measurements were taken with the universal testinstrument GM4257, with no signal at the aerial sockets. Radio-gram, switch in the "radio" position.

LIST OF PARTS AND TOOLS

When ordering always quote:

1. Code number and colour.
2. Description.
3. Type number of the set.

	DESCRIPTION	Code number
	Rubbergrommets for fixing chassis	A3 642 15.0
	Rear Panel	A3 254 86.0
	Connecting plate for P.U.	A3 380 96.0
	Knob (volume control)	A3 735 61.0
	Lever (bass switch + radio-pickup switch)	23 643 94.0
	Knob (tone control)	A3 366 33.0
	Knob (waverange switch)	A3 735 62.0
	Knob (tuning)	A3 735 64.0
	Diallampholder	A3 359 16.1
	Spring for fixing Record-changer	49 933 87.0
	Dial (overseas)	A3 740 13.0
	Dial (mediterranean)	A3 740 14.0
	<u>Ornamental star consists of:</u>	
	Star	A3 671 79.0
	Star	P5 410 01/01
	Star	A3 403 95.0
	Lens for EM 34	P5 310 00.0
	<u>Chassis</u>	
	Plug socket plate (aerial-earth)	A1 340 92.0
	Springclip (fixing coil cans) (3x)	A3 652 58.2
	Voltage adaptor	A3 228 81.0
	Switch for bass-switch and P.U.-radio switch	A3 402 44.0
	Cable drum (small)	23 644 75.0
	Spring in drum variable capacitor	A3 646 26.0
	Cable drum (large)	23 644 41.2
	Spring in cable pointer drive	A3 646 14.0
	Spring clip (fixing coil can) (1x)	A3 652 92.0
	Valve holder for EM34	B1 505 26.1
	<u>Tools:</u>	
	Service oscillator	GH2882 or GH2883 or GH2884
	Universal Measuring instrument	GH4256 or GH4257.
	Vaseline compound	X 009 47.0

S1)	37.0			C24	0.1	PF	48 751 20/100K
S2)	225			C25)	115	PF	Coils-Bobinas
S3)	<1		A3 141 37.3	(C26)	115	PF	Bobinas
S4)	<1			C27	82	PF	48 203 10/82E
S5	1.0	Ω		C28	12000	PF	48 750 20/12K
S6	1	Ω	A3 125 25.0	C29	33000	PF	43 750 10/33K
S8C	3.0	Ω		C30	8200	PF	48 750 20/82E
S39	1	Ω	A3 125 30.0	C32	6300	PF	48 751 20/63E
S7	41	Ω		C33	4700	PF	48 758 20/47K
S8	3.2	Ω	A3 125 35.0	C34	0.1	UF	48 751 20/100K
S26	33	Ω	A3 125 86.0	C35	330	PF	48 336 01/330E
S10	3	Ω		C36	150	PF	48 336 01/150E
S11	1	Ω	A3 125 50.0	C37	583	PF	48 336 01/583E
S12	1	Ω		C38	30	PF	28 212 36.4
S13	4.8	Ω		C39	30	PF	28 212 36.4
S14	13	Ω	A3 125 72.0	C40	200	PF	48 203 01/200E
S15)	2.8	Ω		C41	150	PF	48 203 01/150E
S16)	4.6	Ω		C42	640	PF	48 203 01/640E
S17)	2.8	Ω		C45	39	PF	48 203 10/39E
S18)	4.6	Ω	A3 121 94.2	C46	25	PF	49 005 49.2
C21)	115	PF		C48	68	PF	48 203 10/68E
C22)	115	PF		C60	1000	PF	48 751 20/1K
S19)	2.8	Ω		C61	47000	PF	48 750 20/47K
S20)	4.6	Ω		R1	1200	Ω	49 379 78.0
S21)	2.8	Ω		R2	0.33	Ω	49 999 00/330K
S22)	4.6	Ω	A3 121 94.2	R3	2.7	Ω	49 999 00/27K
C25)	115	PF		R4	0.82	Ω	49 999 00/820K
C26)	115	PF		R5	27000	Ω	49 999 00/27K
S23)	800	Ω		R6	33000	Ω	49 999 00/33K
S24)	1	Ω	A3 169 22.2	R7	1.5	Ω	49 999 00/15E
S27)	1	Ω		R8	2x 47000	Ω par	49 999 00/47K
S30)	1	Ω		R9	47000	Ω	49 999 00/47K
S30a)	1	Ω	A3 125 62.0	R10	1	Ω	49 999 00/1M
S31)	1	Ω		R11	15000	Ω	49 999 00/15K
C1)	50	PF)		R12)	0.45	Ω	49 500 34.0
C2)	50	PF)	48 317 09/50+	R13)	0.05	Ω	49 999 00/11E
C3	10000	PF	50	R14	1800	Ω	49 999 00/18K
C5)	11-500	PF	48 751 20/10K	R15	0.12	Ω	49 999 00/120K
C6)	11-500	PF	49 001 56.1	R16	50000	Ω	49 470 45.0
C7	22	PF	48 201 10/22E	R18	0.1	Ω	49 999 00/100K
C9	30	PF	28 212 36.4	R19	0.68	Ω	49 999 00/680K
C11	220	PF	48 203 20/220E	R20	1000	Ω	49 999 00/1K
C12	470	PF	48 203 20/470E	R21	150	Ω	49 999 00/150E
C13	56	PF	48 203 10/56E	R22	12000	Ω	49 999 00/12K
C14	290	PF	48 203 01/290E	R23	18000	Ω	49 999 00/18K
C15	30	PF	28 212 36.4	R24	27000	Ω	49 999 00/27K
C16	30	PF	28 212 36.4	R31	0.27	Ω	49 999 00/270E
C17	50	PF	49 005 50.2	R32	10000	Ω	49 999 00/10K
C19	460	PF	48 203 01/460E	R40	1.8	Ω	49 999 00/18E
C20	1800	PF	48 751 20/18E	R41	1.8	Ω	49 999 00/18E
C21)	115	PF	Coils-Bobinas-	R42	18000	Ω	49 999 00/18K
C22)	115	PF	Bobinas	R43	5.6	Ω	49 999 00/56E
C23	47000	PF	48 750 20/47K	R50	0.18	Ω	49 999 00/180K

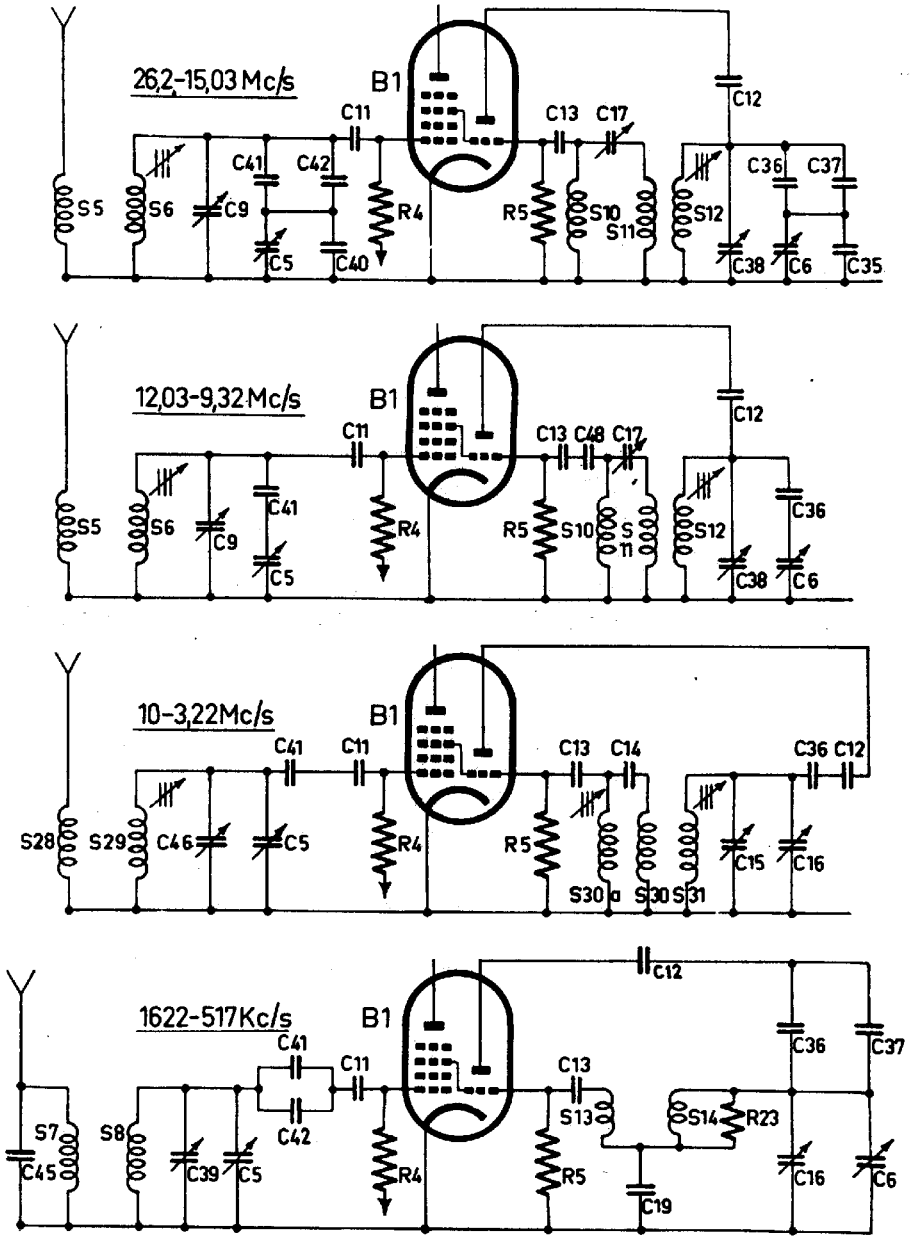


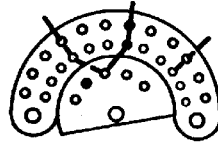
Fig.1

R14749



sk1-sk2

R14735



sk 5

R14734

Fig.2

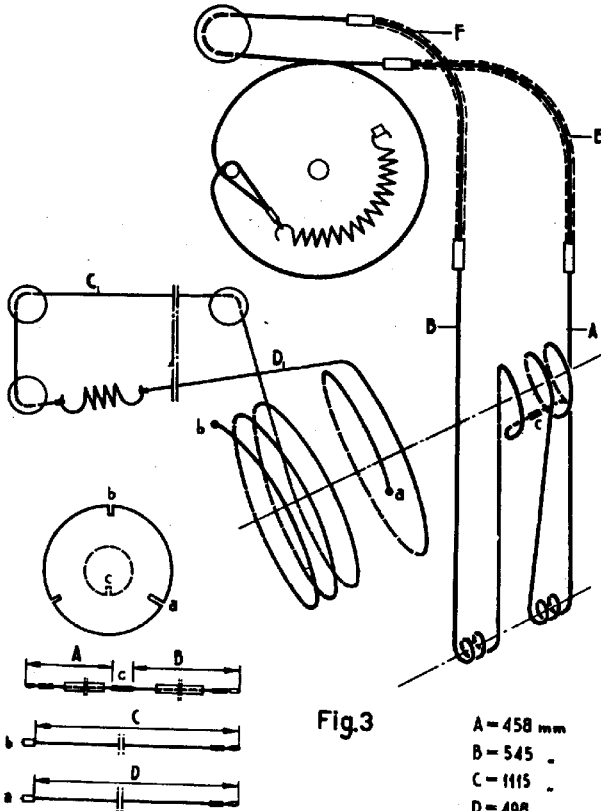


Fig.3

- A-458 mm
- B-545 .
- C-1115 .
- D-498 .
- E-70 .
- F-85 . R14661

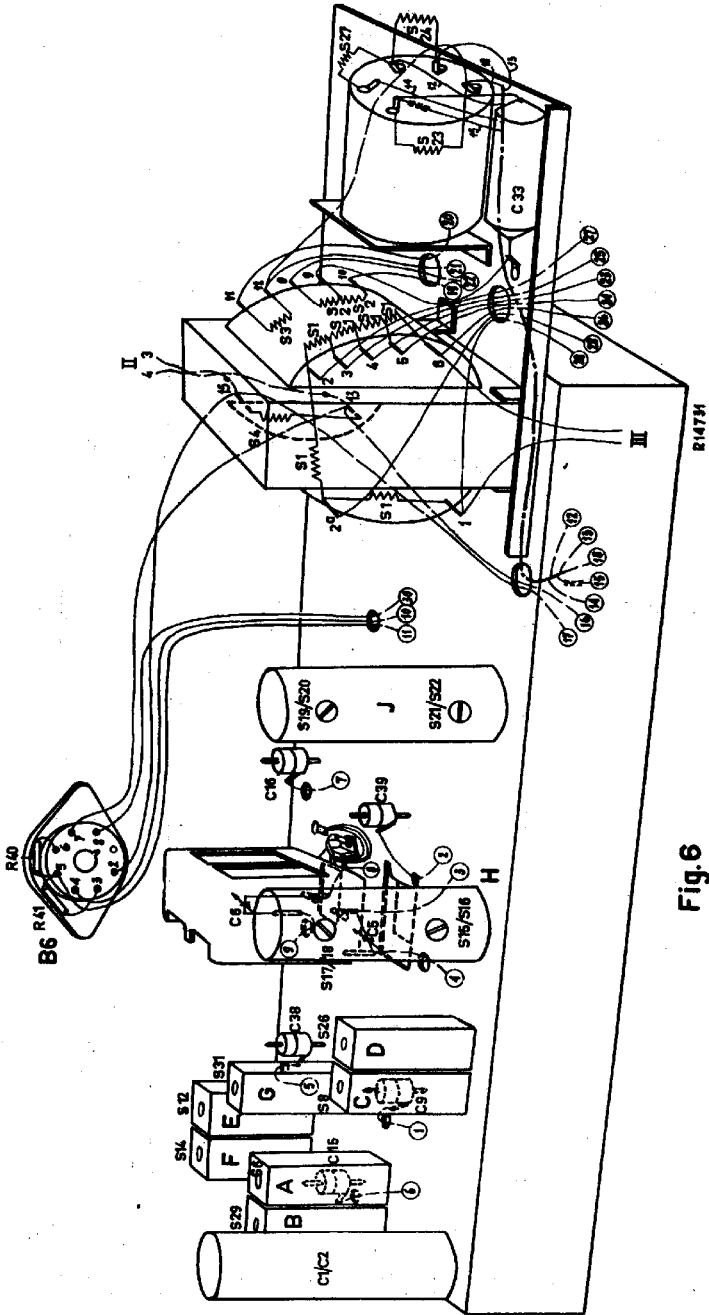


Fig. 6

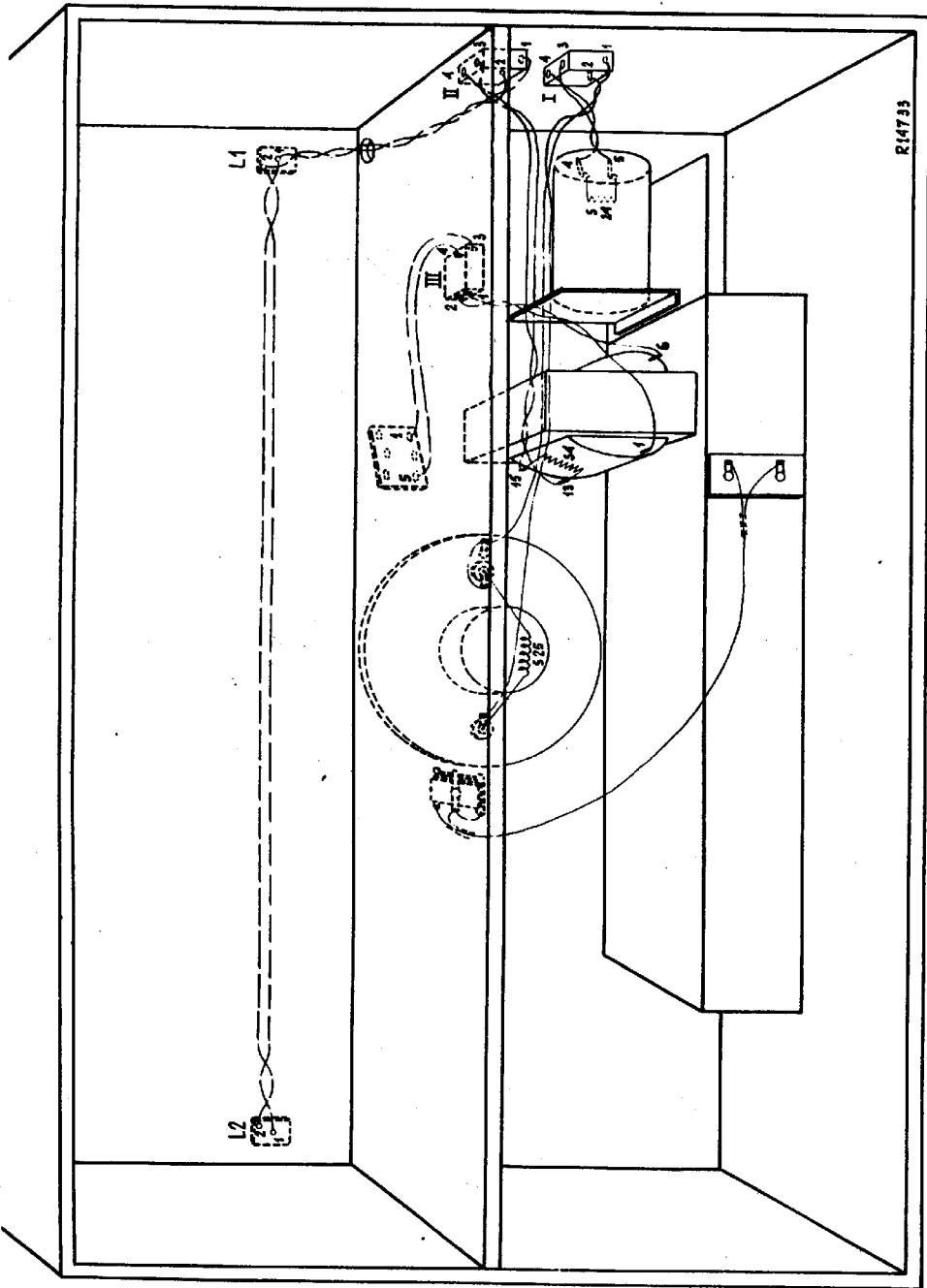


Fig.7

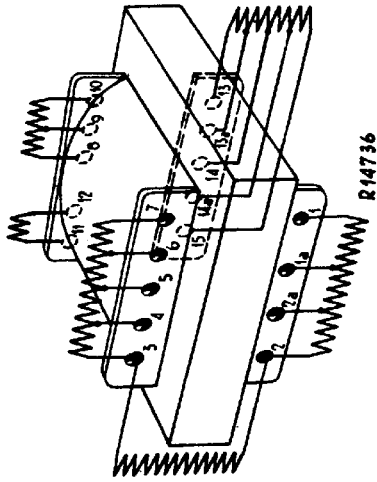
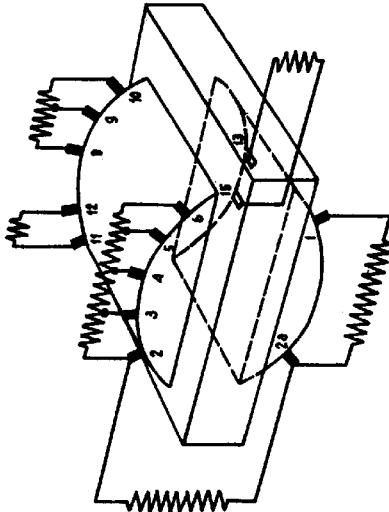
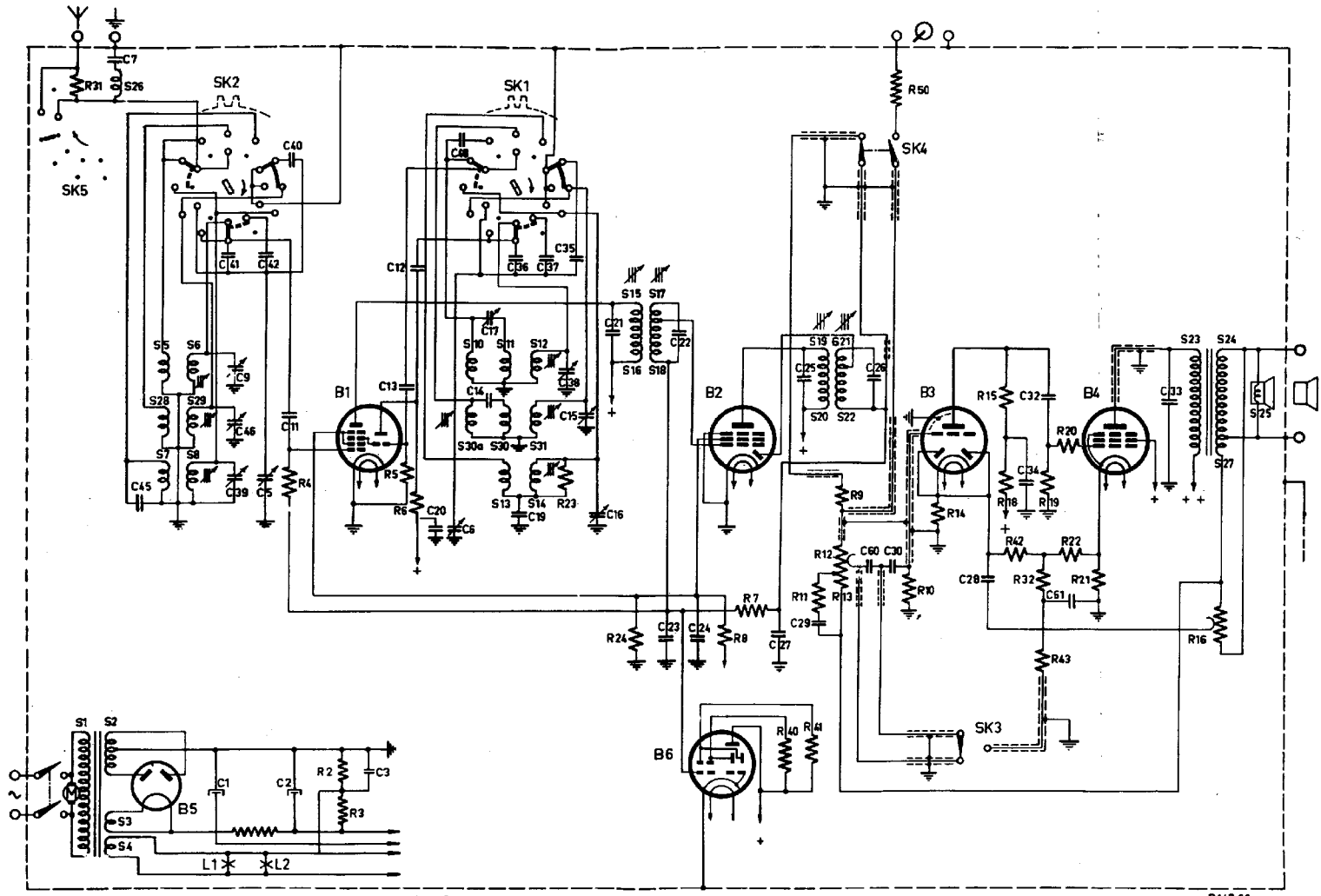


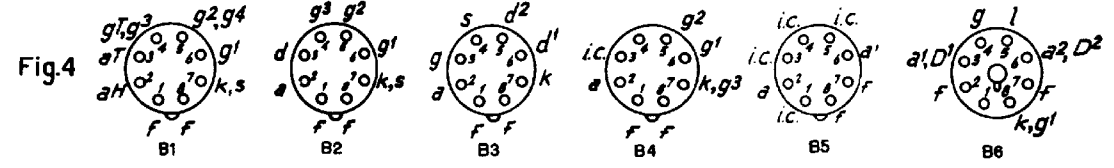
Fig. 8



S:	1, 2, 3, 4, 28, 5, 29, 7, 6, 29, 8.	10, 30, 31, 30, 32, 31, 34.	15, 16, 37, 38.	18, 20, 21, 22.	23, 24, 27, 25.
C:	7, 46, 61, 9, 48, 38, 42, 5, 1, 40, 1, 2, 3.	13, 12, 20, 48, 6, 12, 14, 18, 28, 27, 28.	35, 15, 16, 21, 22, 22.	24, 25, 29, 60, 26, 27, 30.	28, 34, 32, 61, 33.
R:	31, 1, 2, 3, 4.	5, 6.	22, 24.	8, 7, 4, 6, 11, 12, 13, 9, 50, 10, 14.	15, 18, 42, 19, 32, 43, 20, 22, 21, 16.



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S:											J						H						G			E, A			F, B
C:	29.	60,61.	30.				28.	32,34.	20.	24.			27.	13,12,11.	36,41.	48,42,37,23.	35,40,7.	45.	44,43.			17.	46						
R:	11.	9,13,12.	32,50.	43.	19,22,40,46,42.			21,20.	18,15,24.	8,14,8 ^o .	6.			5,7,4.											31,23,1.				

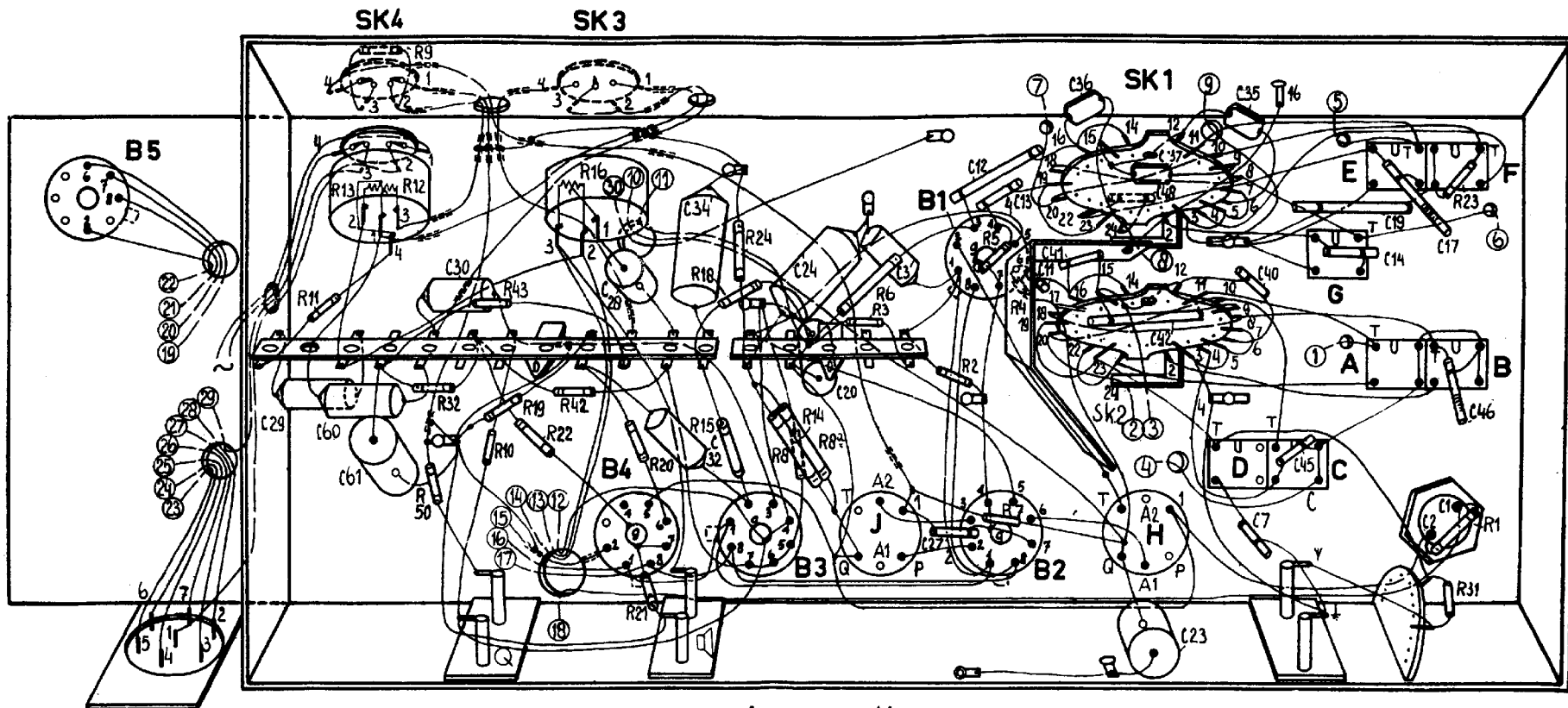


Fig.5

