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PHILIPS

SERVICE NOTES

for the radiograms

FX631A-00-01

1954 For A.C. mains.

GENERAL

WAVERANGES

S.W.2: 16.5 - 50.4 m (18.2 - 5.95 Mc/s)
M.W. :186 - 580 m (1613 - 517 kc/s)
L.W. :870 - 2000 m (345 - 150 kc/s)
F.M. : 3 - 3.43 m (100 - 87.5 Mc/s)

I.F.: A.M. : 452 kc/s
F.M. : 10.7Mc/s

PUSH BUTTONS

From left to right:

1. Mains switch (for switching-off the set).
2. Bass switch (pressed in: -bass; out: +bass).
3. Pick-up switch.
4. L.W.
5. M.W.
6. S.W.2.
7. F.M.

MAINS VOLTAGES

110-125-145-200-220-245 V~

POWER CONSUMPTION

80 W (220 V~)

LOUDSPEAKER

9750 M
Z=5Ω.

RECORD CHANGER

AG 1000
(see Service Notes AG1000).

CONTROL KNOBS

From left to right:

1. Large knob : Tone control + bandwidth switch.
   Small knob : Volume control.
2. Small knob (underneath the push buttons): aerial switch.
3. Large knob : F.M. tuning.
   Small knob : A.M. tuning.

VALVES

B1 : EC92
B2 : EC92
B3 : EF85
B4 : ECH81
B5 : EF41
B6 : EABC80
B7 : EL84
B8 : EZ80
B9 : DM71
B10: EBC41

DIAL LAMPS

L1-L4 : 8045D-00
L5 : 8037D-00
L6 : 8024N-00

DIMENSIONS

Width : 92 cm.
Height: 78 cm.
Depth : 39 cm.

Weight: 67 kg.

Printed in Holland

BANDWIDTH (AM)

A. I.F. BANDWIDTH (1:10)

Measured with the signal on g1B4:
12 kc/s in the position "small"
18.5 kc/s in the position "broad"

B. Overall bandwidth (1:10)

Measured with the signal on the aerial socket :

Frequency	Position "small"	Position "broad"
1613 kc/s	11 kc/s	18.5 kc/s
553 kc/s	10 kc/s	14 kc/s

TRIMMING THE RECEIVER

A.M. Section

I.F. band-pass filters

1. Turn tuning capacitor to maximum.
2. Push-button switch on M.W.
3. Turn volume control to maximum.
4. Set tone control to "quality".
5. Set bandwidth switch to "narrow".
6. Connect an output voltmeter via a trimming transformer to the extension loudspeaker sockets.
7. Screw the cores of the I.F. band-pass filters almost fully out.
8. Apply a modulated signal of 452 kc/s to g1B4 via a 33,000-pF capacitor.
9. Trim the I.F. circuits in the following order for maximum output voltage:

4th I.F. circuit	S34 - C47
3rd I.F. circuit	S32 - C46
1st I.F. circuit	S30 - C35/C73
2nd I.F. circuit	S31 - C36
3rd I.F. circuit	S32 - C46

After the last I.F. circuit has been trimmed, no further adjustments should be made to the I.F. circuits.
10. Seal the cores.

B.I.F. Wavetrap

1. Tuning capacitor on minimum.
2. Volume control on maximum.
3. Push-button switch on M.W.
4. Tone control to "quality" position.
5. Bandwidth switch to "narrow" position.
6. Connect an outputmeter via a trimming transformer to the extension loudspeaker sockets.
7. Apply a modulated signal of 452 kc/s via a 33,000-pF capacitor to g1B3.
8. Trim S40 for minimum output voltage.

C.R.F. and oscillator circuits

These circuits are trimmed at certain frequencies corresponding to the trimming points marked on the dial (see fig.8). Before commencing trimming operations, turn the tuning capacitor to minimum and check whether the pointer coincides with trimming point 1.Reset the

pointer if necessary.

The following applies on all waveranges:

1. Volume control to maximum.
2. Connect an outputmeter via a trimming transformer to the extension loudspeaker sockets.
3. Aerial switch on Y (2).

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

1	Push-button switch on	S.W.	M.W.	L.W.
2	Screw..... fully in	C40	-	-
3	Turn pointer to trimming point.....	2	2	2
4	Feed a modulated signal of..... to g1B4, via a 33,000-pF capacitor	-	553 kc/s	157 kc/s
5	Trim for maximum output voltage.....	-	S25	S27
6	Turn pointer to trimming point.....	-	1	1
7	Feed a modulated signal of..... to g1B4 via a 33,000-pF capacitor	-	1620 kc/s	350 kc/s
8	Trim for maximum output voltage.....	-	C41	C45
9	Repeat steps.....	-	3-8	3-8
10	Feed a modulated signal of..... to the aerial socket via a standard dummy aerial	6.25 Mc/s	1620 kc/s	350 kc/s
11	Trim for maximum output voltage.....	S23 S17	C22	C19
12	Feed a modulated signal of..... to g1B4, via a 33,000-pF capacitor, and tune the receiver to this signal	-	553 kc/s	157 kc/s
13	Now feed a modulated signal of..... to the aerial socket via a standard dummy aerial	-	553 kc/s	157 kc/s
14	Trim for maximum output voltage.....	-	S18a	S19a
15	Turn the pointer to trimming point.....	1	1	1
16	Feed a modulated signal of..... to the aerial socket, via a standard dummy aerial	18.2 Mc/s	1620 kc/s	350 kc/s
17	Trim for maximum output voltage.....	C40 C18	C22	C19
18	Repeat steps.....	3-17	10-17	10-17
19	Seal the trimmers.....	C40, C18	C41, C22	C45, C19
20	Seal the coils..... to the Ferroxcube rod with trimming wax.	-	S18a	S19a

F.M. Section

A. Trimming with the aid of an A.M. Service oscillator

A1.I.F. circuits

1. Volume control to maximum.
2. Push-button switch on F.M.
3. Tuning capacitor to maximum.
4. Tone control to "quality" position.
5. Connect diode voltmeter across C54 and set to 10 V range; do not earth the diode voltmeter.
6. Feed an unmodulated signal of 10.7 Mc/s, via a 1500-pF ceramic capacitor to g1B4.

IMPORTANT

When trimming, the voltage across C54 must never be allowed to rise above about 5V. The strength of the input signal should therefore be reduced whenever necessary.

7. Damp S28 with a 4700-Ω resistor.
8. Trim S29 for maximum deflection of the diode voltmeter.
9. Remove the damping resistor from S28 and damp S29.
10. Trim S28 for maximum deflection of the diode voltmeter.
11. Remove the damping resistor from S29.
12. Trim S36 for maximum deflection of diode voltmeter.
13. Connect a series combination of two 270-kΩ resistors (1% tolerance) across C55-C56.
14. Connect the diode voltmeter between the mid-point of these two resistors and the mid-point of C55-C56.
15. Trim S38 for minimum deflection of the diode voltmeter.
16. Connect the diode voltmeter across C54.
17. Slide a screening can over B2 and apply the signal to this can.
18. Damp S15 with a 4700-Ω resistor.
19. Trim S13 and S14 for maximum deflection of the diode voltmeter.
20. Remove the damping resistor from S15.
21. Trim S15 for maximum deflection of the diode voltmeter.
22. Adjust the strength of the input signal so that the diode voltmeter reads 8 V.
23. Vary the tuning of the Service oscillator for maximum deflection of the diode voltmeter. This should not be higher than 8½ V and the frequency found should lie between 10.68 and 10.72 Mc/s. If this is not the case, the I.F. circuits must be trimmed again.
24. Connect the diode voltmeter between the mid-point of the two 270-kΩ resistors and the mid-point of C55-C56.
25. Vary the frequency of the signal found in step 23 by + and - 75 kc/s; the deflection of the diode voltmeter must be the same in both cases. If not, re-trim S36 and S38.
26. Remove the two 270-kΩ resistors.

A2.I.F. wavetrap

1. Set the controls of the receiver and connect a diode voltmeter as given in A1, steps 1-5.
2. Apply an unmodulated signal with the frequency found in A1, step 23, to one of the F.M. aerial sockets and earth, and connect the junction of C75-S11 to chassis.
3. Trim S8 for minimum deflection of the diode voltmeter.

A3. R.F. and oscillator circuits

1. Set the controls of the receiver and connect a diode voltmeter as given in A1, steps 1-5.
2. Turn C12 to the middle of its range.
3. Feed an unmodulated signal of 86.5 Mc/s, to one of the F.M. aerial sockets.
4. Trim S9 for maximum deflection of the diode voltmeter.
5. Turn tuning capacitor to minimum.
6. Feed an unmodulated signal of 109 Mc/s to one of the F.M. aerial sockets.
7. Trim C12 for maximum deflection of the diode voltmeter.
8. Repeat steps 3-7.
9. Feed an unmodulated signal of 94 Mc/s to one of the F.M. aerial sockets.
10. Tune the receiver to this signal.
11. Trim S10 and S7 for maximum deflection of the diode voltmeter.
12. Adjust the pointer to the 94-Mc/s mark on the dial scale.
13. Seal C12.

B. Trimming with the aid of a F.M. Service oscillator

B1. I.F. circuits

1. Volume control to maximum.
2. Push-button switch to F.M.
3. Tuning capacitor to maximum.
4. Tone control to "quality" position.
5. Connect diode voltmeter, switched to 10 V range, across C54. Do not earth the diode voltmeter.
6. Connect output voltmeter via a trimming transformer to the extension loudspeaker sockets.
7. Feed a 10.7 Mc/s signal (frequency swing 22.5 kc/s and modulation frequency 400-500 c/s) via a 1500-pF ceramic capacitor to g1B4.

IMPORTANT

When trimming, the voltage across C54 must never be allowed to rise above about 5 V. The strength of the input signal should therefore be reduced whenever necessary.

8. Damp S28 with a 4700-Ω resistor.
9. Trim S29 for maximum deflection of the diode voltmeter.
10. Remove damping resistor from S28 and damp S29.
11. Trim S28 for maximum deflection of diode voltmeter.
12. Remove damping resistor from S29.
13. Trim S36 for maximum deflection of diode voltmeter.
14. Trim S38 for maximum output voltage.
15. Slide a screening can over B2 and apply the signal to this can.
16. Damp S15 with a 4700-Ω resistor.
17. Trim S13 and S14 for maximum deflection of the diode voltmeter.
18. Remove damping resistor from S15.
19. Trim S15 for maximum deflection of the diode voltmeter.
20. Adjust the strength of the input signal so that the diode voltmeter reads 8V.
21. Vary the frequency of the input signal until maximum deflection of the diode voltmeter is obtained. This reading should not be higher than 8½ V and the frequency found should lie between 10.68 and 10.72 Mc/s.

If this is not the case, the I.F. circuits have to be trimmed again.
22. Connect an oscilloscope across C58.
23. Feed a 10.75-Mc/s signal (frequency swing 150 kc/s, modulation frequency 50 c/s) to g1B4 via a 1500-pF ceramic capacitor. The curve displayed on the screen of the oscilloscope should be flat over + and - 75 kc/s.
24. Apply a 500-c/s A.M. signal, modulated 30%. The flat region of the curve should remain unaltered. If the curve does not meet the requirements given in steps 23 and 24, S36 and S38 must be re-trimmed.
25. Seal S13, S14, S28, S29, S36 and S38.

B2. I.F. wavetrap

1. Set the controls of the receiver as indicated in B1, steps 1-4.
2. Connect a voltmeter via a trimming transformer to the extension loudspeaker sockets.
3. Earth the junction of C75-S11.
4. Feed a balanced signal with a frequency as found in B1, step 21 (frequency swing 22.5 kc/s, modulation frequency 400-500 c/s), to the F.M. aerial sockets.
5. Trim S8 for minimum output voltage.

B3. R.F. and oscillator circuits

1. Set the controls of the receiver as indicated in B1, steps 1-4.
2. Connect a voltmeter via a trimming transformer to the extension loudspeaker sockets.
3. Turn C12 to the middle of its range.
4. Feed a balanced signal of 86.5 Mc/s, frequency swing 22.5 kc/s, modulation frequency 400-500 c/s, to the F.M. aerial sockets.
5. Trim S3 for maximum output voltage.
6. Turn tuning capacitor to minimum.
7. Feed a balanced signal of 101 Mc/s, frequency swing 22.5 kc/s,modulation frequency 400-500 c/s, to the F.M. aerial sockets.
8. Trim C12 for maximum output voltage.
9. Repeat steps 4-8.
10. Feed a balanced signal of 94 Mc/s, frequency swing 22.5 kc/s, modulation frequency 400-500 c/s to the F.M. aerial sockets.
11. Tune the receiver to this frequency.
12. Trim S10 and S7 for maximum output voltage.
13. Adjust the pointer to the 94-Mc/s mark on the dial.
14. Seal C12.

REPAIRS AND REPLACEMENT OF PARTS

Waverange switch sections

1. Remove chassis from cabinet.
2. Remove the dial tray.
3. Unsolder the leads from the switch section.
4. Remove the screening plate.
5. Remove the lamp for illuminating the push buttons.
6. Remove the plate at the back of the switch sections.
7. Remove the plate at the front of the switch sections.
8. Slide the contact strip from the stud on the push button lever and withdraw the strip.

Tuning capacitor and pointer drives

The length and path of the cables are indicated in fig.7, the tuning capacitors being in the maximum position.

A. Cables for A.M. tuning (A and B)

1. Remove chassis from cabinet.
2. Remove dial tray.
3. Remove the broken cables.
4. Make up a new cable.
5. Hook cable A in the slit in the large drum, pass it 2½ turns clockwise around the drum, 2½ turns counter-clockwise around the driving spindle, over the pulley and fasten it for the time being with a crocodile clip.
6. Hook cable B in the slit in the large drum, pass it 1½ turns counter-clockwise around the drum and over the pulley.
7. Hook the tension spring into the cable loops and remove the crocodile clip.

B. Cables for F.M. tuning (C and D)

1. Take the chassis out of the cabinet.
2. Remove the dial tray.
3. Remove the broken cables.
4. Make up a new cable.
5. Hook cable C in the slit in the small drum, wind it 2½ turns clockwise around the drum, 1½ turns counter-clockwise around the driving spindle, over the pulley, and fasten it for the time being with a crocodile clip.
6. Hook cable D in the slit in the small drum, wind it 1½ turns counter-clockwise around the drum and over the pulley.
7. Hook the tension spring into the cable loops and remove the crocodile clip.

Tone control cable E

Details of the tone control cable are given in fig.7. In this diagram the tone control is in the "minimum high notes" position and the bandwidth switch in the "narrow" position.

1. Remove the chassis.
2. Remove the dial tray.
3. Remove the broken cable.
4. Make up a new cable.
5. Turn the drums to the position shown in fig.7 (bandwidth switch in "narrow" position.
6. Push the cable through hole a1 in drum 1 and then through hole a3.
7. Pass the cable 3/4 of a turn counter-clockwise around the drum and then 1 1/4 turns counter-clockwise around drum 2.
8. Push the cable through hole b3 and then through hole b2.
9. Slide a cable grip over the cable. Pull the cable taut and pinch the cable securely.
10. Push the cable through hole b1 and then through hole b3.
11. Pass the cable 1 1/4 turns counter-clockwise around drum 2 and then 1 turn counter-clockwise around drum 1.
12. Push the cable through hole a3 and then through hole a2 (if necessary loosen the drum, but keep it in its original position).
13. Slide a cable grip over the cable. Pull the cable taut and pinch the cable grip securely. Cut off the superfluous end of the cable.

Cable for P.U. switch (F)

The length of the cable is shown in fig.7.

1. Remove the chassis.
2. Remove the dial tray.
3. Remove the broken cable.
4. Make up a new cable.
5. Hook the cable in the slit in the switch.
6. Push the cable through the appropriate hole in the chassis.
7. Lay the cable loop over the stud on the push button and pass the cable over the pulley.

Cable for F.M. switch (G)

The length of the cable is given in fig.7.

1. Remove the bottom plate.
2. Remove the broken cable.
3. Make up a new cable.
4. Hook the cable in the slits in the switches and lead the cable around the pulley.
5. Solder the free end of the cable to the chassis.

Cable for aerial switch (H)

The length and path of the cable is shown in fig.7.

1. Remove the chassis.
2. Remove the broken cable.
3. Make up a new cable.
4. Hook the cable in the slit in the switch and lay the cable loop over the stud on the lever.
5. Lead the cable around the pulley.

Chokes S4, S4a and S50

These chokes are not available as Service parts. They can be easily made from P.V.C. covered wire.

Inside diameter of coils	: 8 mm.
S4 and S4a	: 8 turns.
S50	:10 turns.

Power transformer

If the original power transformer breaks down, it should be replaced with the Service standard transformer, the code number of which is given in the Electrical Parts List. Care should be taken that the lamps L1-L6 are connected to points 16 and 18 on the standard transformer.

For connections see fig.9. Corresponding connecting points have the same numbers.

Valves		F.M.				A.M.			
		Va	Vg2 (+4)	Ia	Ig2 (+4)	Va	Vg2 (+4)	Ia	Ig2 (+4)
B1	EC92	200	-	9	-	-	-	-	-
B2	EC92	170	-	7.3	-	-	-	-	-
B3	EF85	206	65	7.7	2	232	80	8	2.3
B4	ECH81	218	71	6.1	4	238	62	2	4.6
		-	-	-	-	82	-	4.65	-
B5	EF41	218	67	5	1.5	237	75	6.25	1.7
B6	EABC80	75	-	0.7	-	75	-	0.8	-
B7	EL84	242	220	37	4.2	249	240	41	4.8
B9	DM71	64	-	0.15	-	76	-	0.16	-
B10	EBC41	60	-	0.5	-	70	-	0.53	-
		V	V	mA	mA	V	V	mA	mA
VC2 = 271 V VC1 = 264 V VC1a = 220 V Iprim = 325 mA (220 V~)						VC2 = 280 V VC1 = 270 V VC1a= 240 V Iprim = 300 mA (220 V~)			

These readings were obtained with a measuring instrument GM7635, with the receiver connected to 220 V~ under no-signal conditions.

FX631A-00,-01

LIST OF REPLACEMENT PARTS OF TOOLS

(see also General Spare Parts List)

When ordering always state:

1. Description and colour.
2. Codenumber.
3. Typenumber of the receiver.

		Description	Code number
		Knob (colour MC) for aerial switch	P4 076 51/19
		Knob (A.M. tuning)	A3 737 51.0
		Knob (tone control + bandwidth switch)	A3 737 53.0
		Knob (volume control, F.M.tuning) 2x	A3 737 52.0
		Spring in knobs (2x)	A3 522 08.2
		Dial (N)	A3 742 09.0
		Dial (S)	A3 742 10.0
		Grommet for chassis suspension (5x)	A3 642 18.0
		Variable capacitor	see cap.
		Spring for pointer drive (A.M.,F.M.) 2x	A3 646 14.0
		Nut G 1/8" (tone- and volume control) 2x	49 758 21.0
		Spindle (volume control)	A3 432 95.0
		Valveholder(B1, B2) 2x	B1 506 55.0
		Valveholder (B3,B4,B6-B8) 5x	B1 506 59.0
		Valveholder (B5, B10) 2x	49 231 84.1
		Valveholder (B9)	B1 506 70.0
		Dial-lampholders(5x)	A3 359 16.1
		Socketplate (magnetic-tape recorder,loudspeaker) 2x	A3 382 13.0
		Coil can clip (small) 5x	A3 652 75.1
		Coil can clip (large) 2x	A3 652 58.3
		Voltage adaptor	A3 228 85.0
		Mains switch	A3 182 24.0
		Plug plate (frame aerials)	A3 393 69.0
		Spring for push-button switches (9x)	A3 644 34.0
		Switch strip (SKK, SKM, SKL) 3x	A3 538 84.0
		Switch strip (SKF)	A3 551 99.0
		Switch strip (SKBas)	A9 867 57.0
		Switch strip (SKFa,SK ant.) 2x	A3 192 32.0
		Switch strip (SK P.U.) FX631A-00	A3 663 99.0
		Switch strip (SK P.U.) FX631A-01	A3 192 32.0
		Push button (7x)	A3 417 54.0
		Bandwidth switch (SKB b)	A3 401 79.0
		Socket plate (frame aerials)	A3 406 21.0
		Plug plate (dipole aerial)	A3 392 73.0
		Dipole feeder	R210KN/03AA
		Suspension spring (record-changer) 4x	49 933 87.0
		Suspension plate (record-changer) 4x	49 935 66.0
		TOOLS	
		Service oscillator	GM 2883
		Measuring instrument	GM 7635
		Vaseline compound	X 009 47.0

JAS/TV

FX631A-00,-01

S1			)
S2			) A3 141 37.5
S3			)
S4	< 1	Ω	) zie tekst
S4a	< 1	Ω	) voir texte
S5	< 1	Ω	)
S6	< 1	Ω	)
S7	< 1	Ω	) A3 126 79.0
S7a	< 1	Ω	)
S8	< 1	Ω	A3 126 17.0
S9	< 1	Ω	)
S11	< 1	Ω	) A3 126 81.0
S12	< 1	Ω	)
S10	< 1	Ω	)
S10a	< 1	Ω	) A3 126 80.0
S13	< 1	Ω	)
S14	< 1	Ω	) A3 126 75.0
C20	33	pF	)
S15	< 1	Ω	)
C26	27	pF	) A3 126 78.0
S16	1	Ω	)
S17	< 1	Ω	) A3 125 28.0
S18	< 1	Ω	)
S18a	1	Ω	) A3 117 04.0
S19	< 1	Ω	)
S19a	6,5	Ω	) A3 117 69.0
S21	< 1	Ω	)
S22	< 1	Ω	) A3 125 60.0
S23	< 1	Ω	)
S24	3	Ω	)
S25	7	Ω	) A3 125 93.0
S26	5	Ω	)
S27	24	Ω	) A3 125 76.0
S28	< 1	Ω	)
S29	< 1	Ω	)
C33	33	pF	) A3 126 76.0
C34	33	pF	)
S30	6	Ω	)
S30a	< 1	Ω	)
S31	4	Ω	) A3 122 80.0
C35	115	pF	)
C36	2x115	pF	)
S32	14	Ω	)
S34	14	Ω	)
C46	110	pF	) A3 124 25.4
C47	110	pF	)

S36	3	Ω	)
S37	< 1	Ω	)
S38	< 1	Ω	) A3 126 77.1
S39	< 1	Ω	)
C49	39	pF	)
S40	6	Ω	A3 125 84.0
S41	[illegible]	Ω	)
S42	90	Ω	)
S43	< 1	Ω	) A3 152 78.0
S44	3,5	Ω	)
S50	< 1	Ω	(zie tekst
			(voir texte
C1	50	µF	)
C1a	50	µF	) AC5408/50+50+
C2	50	µF	) 50
C3	10-499	pF	)
C4	12,5-520	pF	) 49 001 85.0
C5	1500	pF	A9 999 04/1K5
C6	8,2	pF	A9 999 04/8E2
C7	470	pF	A9 999 04/470E
C8	12	pF	A9 999 04/12E
C9	10	pF	A9 999 04/10E
C10	4,5-14,5	pF	)
C11	4,5-22,5	pF	) 49 001 84.0
C12	8	pF	49 005 47.0
C14	22	pF	A9 999 04/22E
C15	22	pF	A9 999 04/22E
C16	1500	pF	A9 999 04/1K5
C17	3000	pF	A9 999 05/3K
C18	25	pF	A9 999 07/6E-25E
C19	20	pF	49 005 59.3
C20	33	pF	(zie spoelen
			(voir bobines
C21	100	pF	A9 999 04/100E
C22	20	pF	49 005 59.3
C23	33	pF	A9 999 04/33E
C24	3900	pF	A9 999 04/3K9
C25	220	pF	A9 999 04/220E
C26	27	pF	(zie spoelen
			(voir bobines
C27	1500	pF	A9 999 04/1K5
C28	100	pF	A9 999 04/100E
C29	1500	pF	A9 999 04/1K5
C30	47000	pF	A9 999 06/47K
C31	470	pF	A9 999 04/470E
C32	68	pF	A9 999 04/68E
C33	33	pF	)
C34	33	pF	) zie spoelen
C35	115	pF	) voir bobines
C36	2x115	pF	)

C38	100	pF	A9 999 04/100E
C39	82	pF	A9 999 04/82E
C40	30	pF	28 212 36.4
C41	20	pF	49 005 59.3
C42	430	pF+	A9 999 05/430E
	24	pFpar	A9 999 05/24E
C43	160	pF	A9 999 05/160E
C44	82	pF	A9 999 04/82E
C45	20	pF	49 005 59.3
C46	110	pF)	zie spoelen
C47	110	pF)	voir bobines
C48	56	pF	A9 999 04/56E
C49	39	pF(	zie spoelen
		(	voir bobines
C50	10000	pF	A9 999 04/10K
C51	6800	pF	A9 999 04/6K8
C52	470	pF	A9 999 04/470E
C53	22000	pF	A9 999 06/22K
C54	5	µF	AC 5509/4
C55	330	pF	A9 999 04/330E
C56	330	pF	A9 999 04/330E
C57	10000	pF	A9 999 04/10K
C58	2200	pF	A9 999 04/2K2
C59	10000	pF	A9 999 04/10K
C60	22000	pF	A9 999 06/22K
C61	0,1	µF	A9 999 06/100K
C62	33000	pF	A9 999 06/33K
C63	33000	pF	A9 999 06/33K
C64	1500	pF	A9 999 04/1K5
C65	2200	pF	A9 999 06/V2K2
C66	39	pF	A9 999 04/39E
C67	0,1	µF	A9 999 06/100K
C68	180	pF	A9 999 04/180E
C69	100	µF	AC 5540/100
C70	0,1	µF	A9 999 06/V100K
C71	220	pF	A9 999 04/220E
C72	3,3	pF+	A9 999 04/3E3
	1	pFpar	A9 999 04/1E
C73	8,2	pF	A9 999 04/8E2
C74	270	pF	A9 999 04/270E
C75	68	pF	A9 999 04/68E
C76	10	pF	A9 999 04/10E
C77	10000	pF	A9 999 04/10K
C78	10000	pF	A9 999 04/10K
C79	6800	pF	A9 999 04/6K8
C80	10000	pF	A9 999 04/10K
C81	180	pF	A9 999 04/180E
C82	56	pF	A9 999 04/56E
C83	56	pF	A9 999 04/56E
C84	3,3	pF+	A9 999 04/3E3
	1	pFpar	A9 999 04/1E
C90	4700	pF	A9 999 06/4K7
C91	2200	pF	A9 999 06/2K2
C101	50	µF	AC 5540/50

C102	330	pF	A9 999 04/330E
C103	0,22	µF	A9 999 06/220K
C104	10000	pF	A9 999 06/10K
C105	1000	pF	A9 999 06/1K
R1	1000	Ω	48 494 05/1K
R1a	100	Ω	48 494 05/100E
R2	100	Ω	A9 999 00/100E
R3	82000	Ω	A9 999 00/82K
R4	10000	Ω	A9 999 00/10K
R6	6800	Ω	A9 999 00/6K8
R7	0,1	MΩ	A9 999 00/100K
R8	68000	Ω	A9 999 00/68K
R9	2200	Ω	A9 999 00/2K2
R10	1800	Ω	A9 999 00/1K8
R11	2200	Ω	A9 999 00/2K2
R12	39000	Ω	A9 999 00/39K
R13	0,82	MΩ	A9 999 00/820K
R14	47000	Ω	A9 999 00/47K
R15	68000	Ω+	A9 999 00/68K
	68000	Ωpar	A9 999 00/68K
R16	330	Ω	A9 999 00/330E
R17	1	MΩ	A9 999 00/1M
R18	1	MΩ	A9 999 00/1M
R19	0,82	MΩ	A9 999 00/820K
R20	220	Ω	A9 999 00/220E
R21	0,1	MΩ	A9 999 00/100K
R22	3900	Ω	A9 999 00/3K9
R23	47000	Ω	A9 999 00/47K
R24	2,2	MΩ	A9 999 00/2M2
R25	4,7	MΩ	A9 999 00/4M7
R26	10	Ω	A9 999 00/10E
R27	47000	Ω	A9 999 00/47K
R28	8200	Ω	A9 999 00/8K2
R30	10	MΩ	A9 999 00/10M
R31	56000	Ω	A9 999 00/56K
R32	56000	Ω	A9 999 00/56K
R33	0,45	MΩ)	48 900 00/GL
R34	0,05	MΩ)	50K+450K
R35	33000	Ω	A9 999 00/33K
R36	0,1	MΩ	A9 999 00/100K
R37	0,05	MΩ)	48 900 00/GL
R38	0,45	MΩ)	50K+450K
R39	150	Ω	A9 999 00/150E
R40	0,1	MΩ	A9 999 00/100K
R41	1	MΩ	A9 999 00/1M
R42	1,5	MΩ	A9 999 00/1M5
R43	0,47	MΩ	A9 999 00/470K
R44	47	Ω	A9 999 00/47E
R45	47	Ω	A9 999 00/47E
R47	0,1	MΩ	A9 999 00/100K
R48	6,8	MΩ	A9 999 00/6M8
R49	33000	Ω	A9 999 00/33K
R50	330	Ω	A9 999 00/330E
R51	47000	Ω	A9 999 00/47K
R60	1,5	MΩ	A9 999 00/1M5
R62	0,1	MΩ	A9 999 00/100K

R63	0,15 MΩ	A9 999 00/150K
R80	1 MΩ	A9 999 00/1M
R81	1 MΩ	A9 999 00/1M
R82	6,8 MΩ	A9 999 00/6M8
R83	1800 Ω	A9 999 00/1K8
R84	0,22 MΩ	A9 999 00/220K
R85	1 MΩ	A9 999 00/1M
R86	0,1 MΩ	A9 999 00/100K
R87	0,47 MΩ	A9 999 00/470K
R88	33000 Ω	A9 999 00/33K
R89	0,47 MΩ	A9 999 00/470K
	FX631A-00	
R61	1,5 MΩ	A9 999 00/1M5
	FX631A-01	
R90	0,22 MΩ	A9 999 00/220K

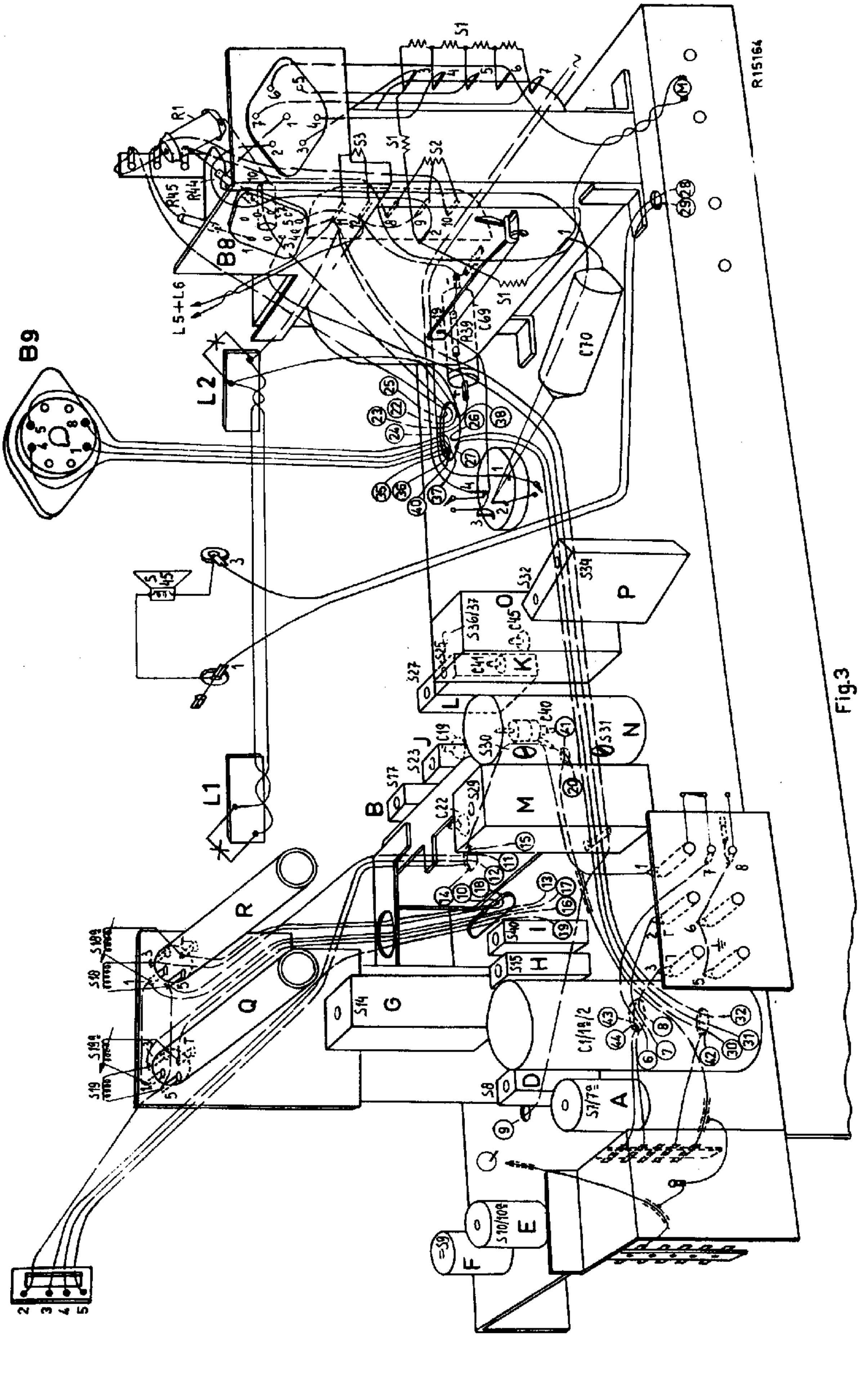


Fig.3

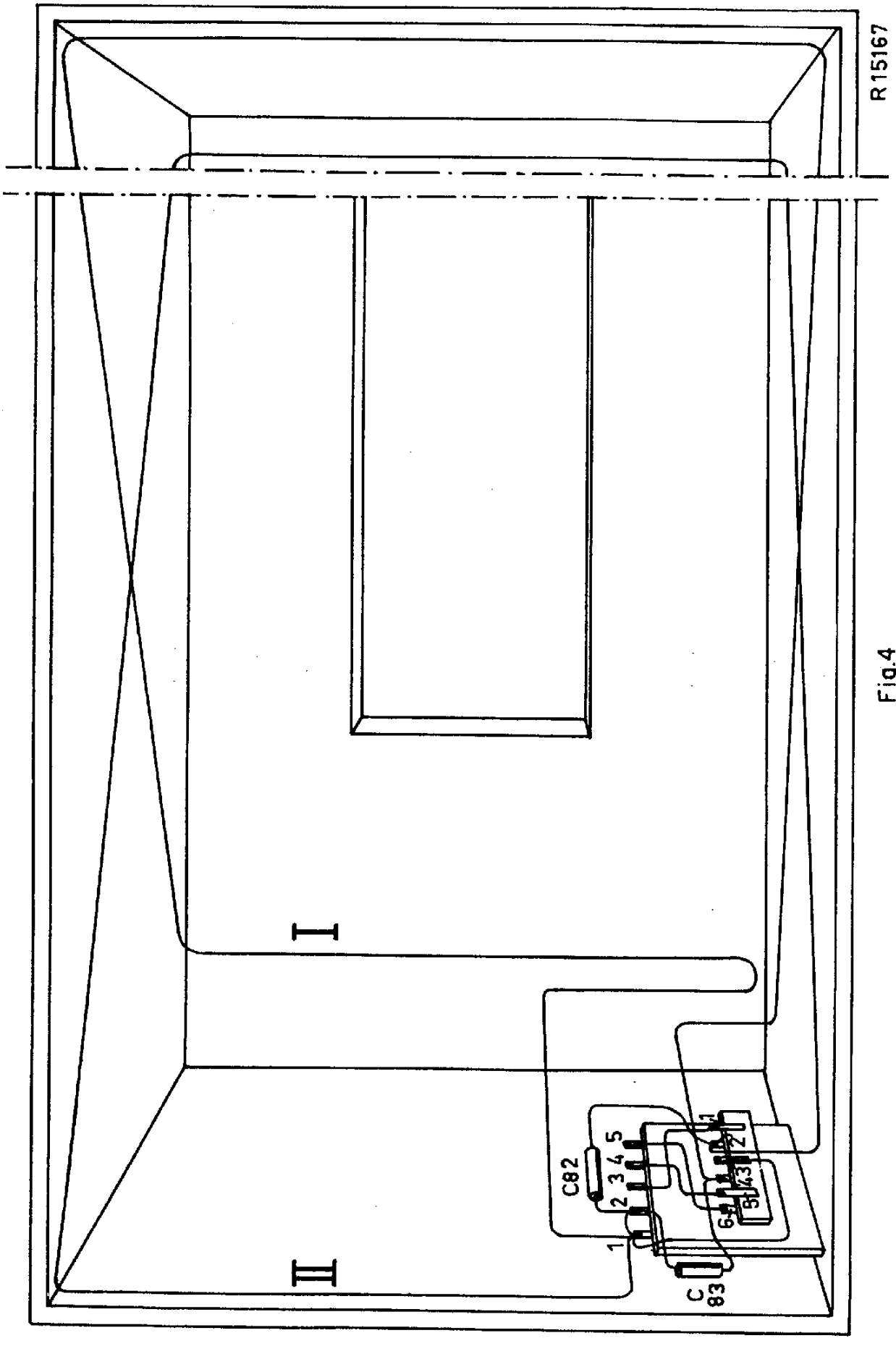


Fig.4

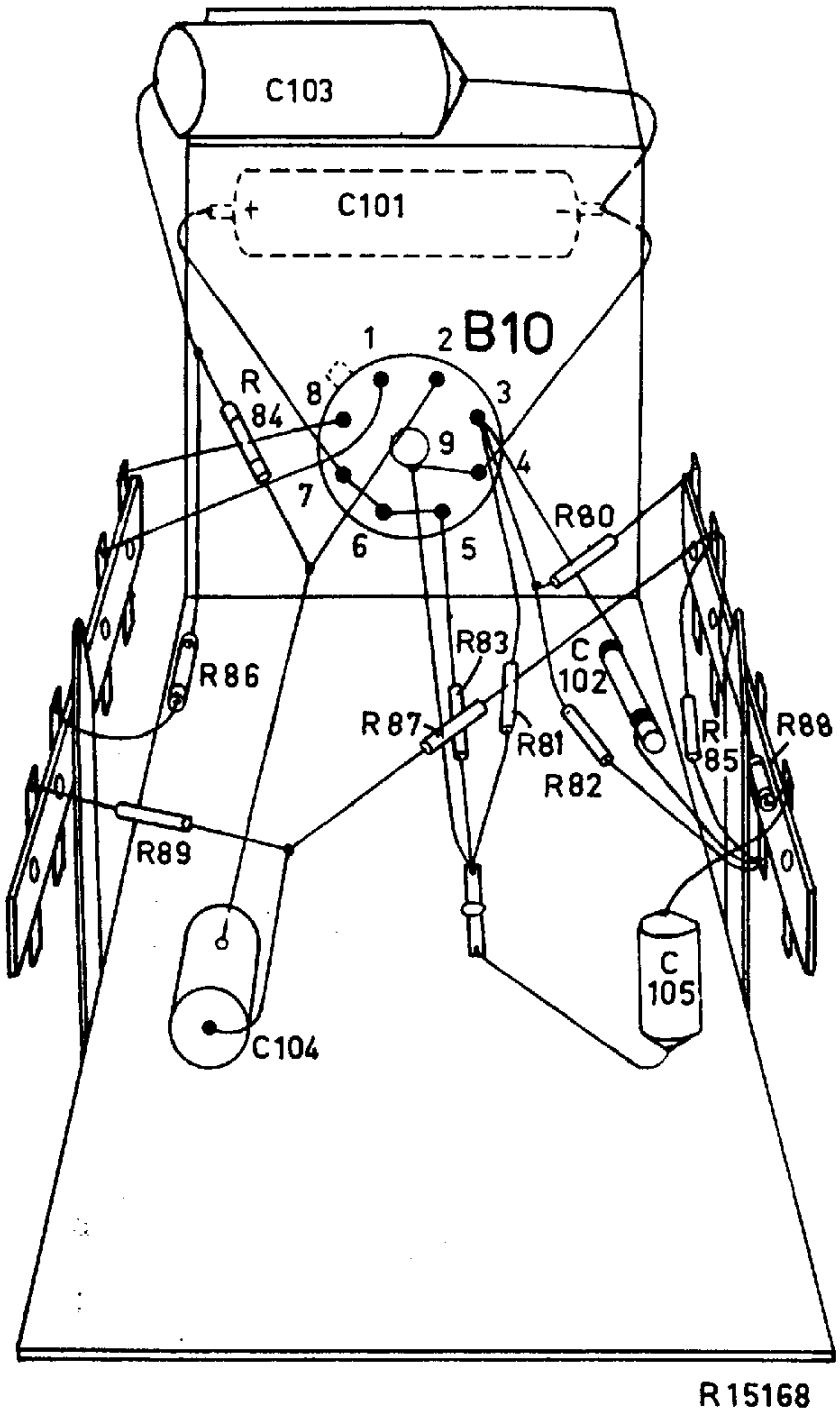
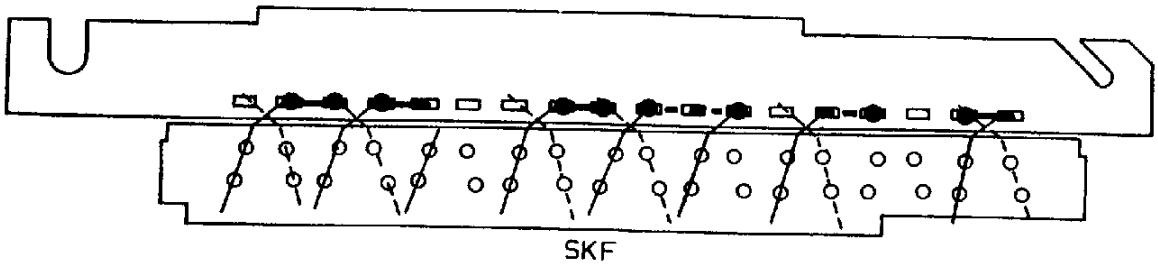
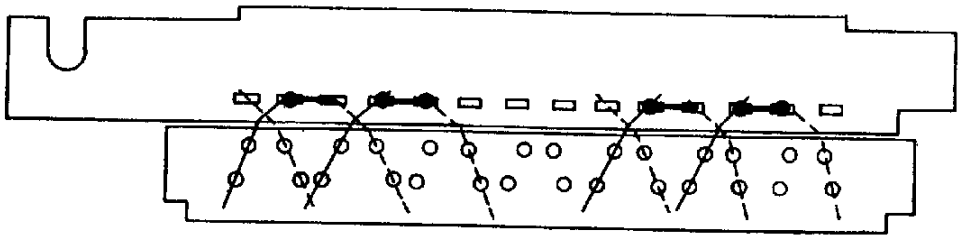

C103
C101
+
-
B10
1
2
3
4
5
6
7
8
9
R 84
R80
R83
C 102
R86
R87
R81
R82
R 85
R88
R89
C 105
C104
R 15168

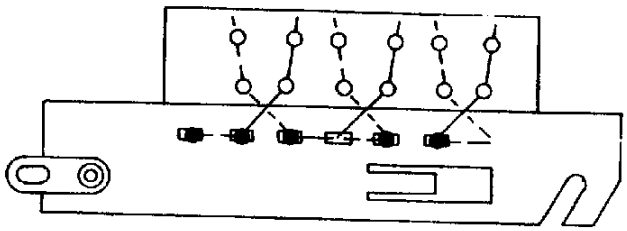
Fig.5



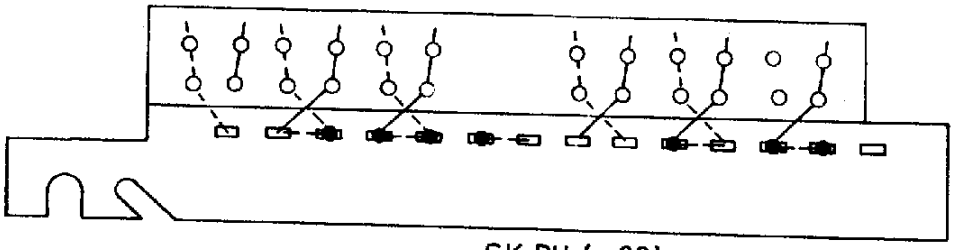
SKF



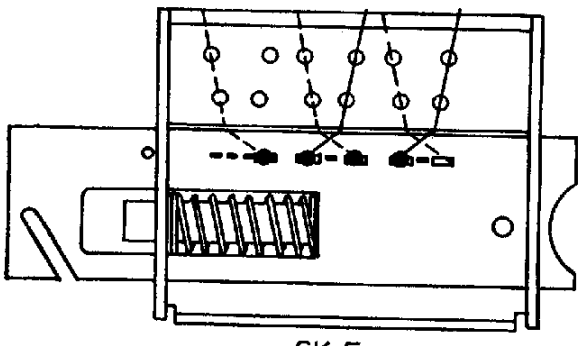
SKK SKM SKL



SK Ant.

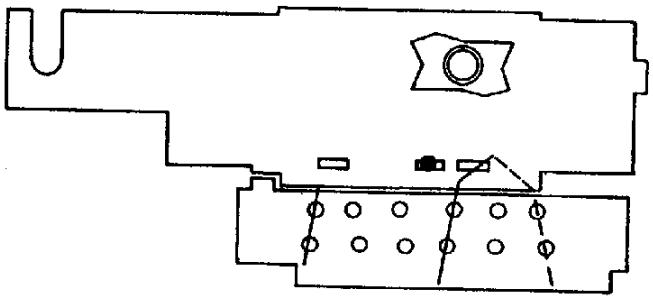


SK P.U. (-00)



SK Fa.

SK P.U. (-01)



SK Bas.

Fig.6

R 15165

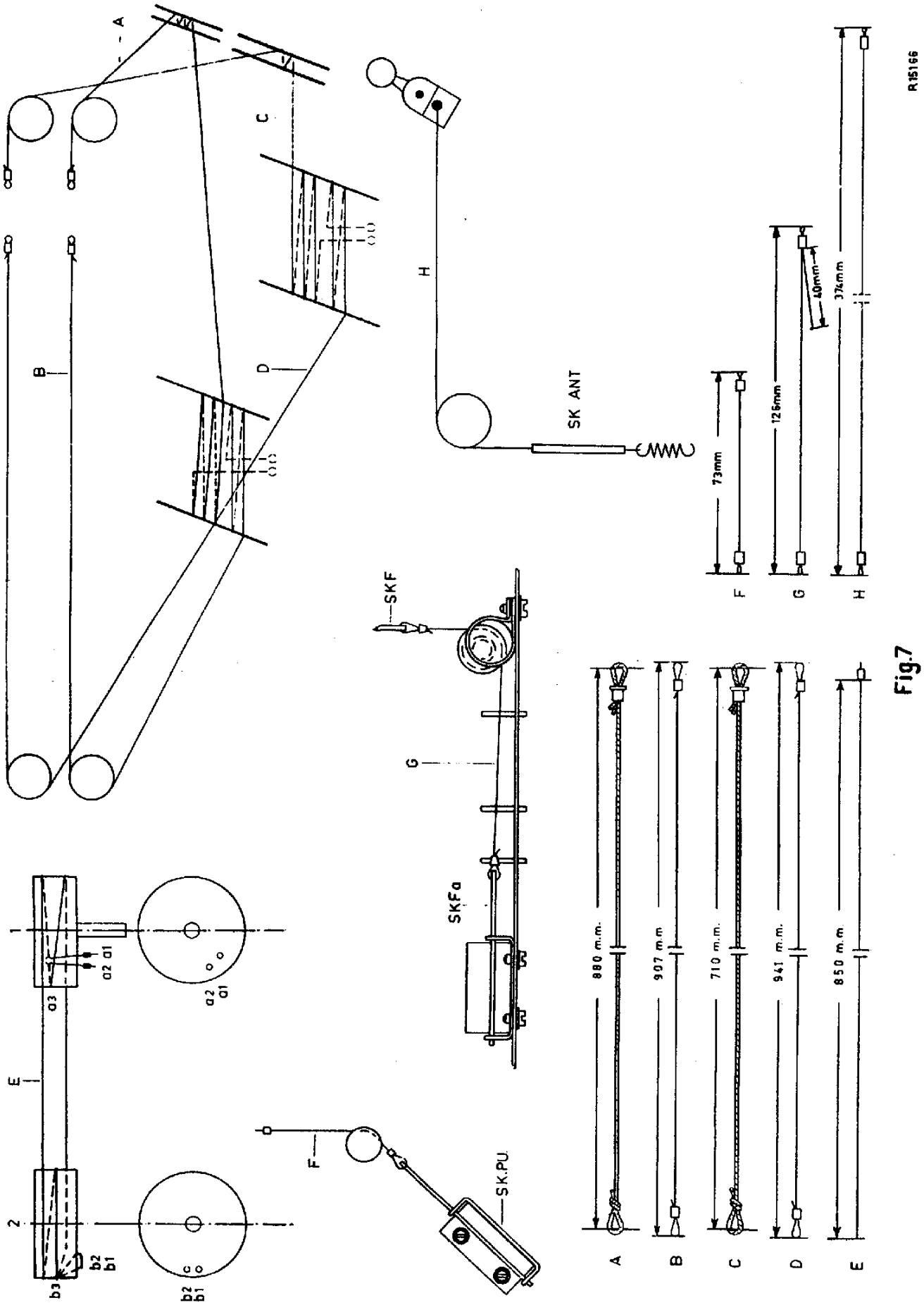

A
B
C
D
H
SK ANT
F
G
73mm
126mm
40mm
374mm
R15166
SKF
G
SKFa
a3
a2 a1
a2 a1
E
2
b2 b1
b3
b2 b1
F
SK.PU
880 m.m.
907 m.m
710 m.m.
941 m.m.
850 m.m
A
B
C
D
E

Fig.7

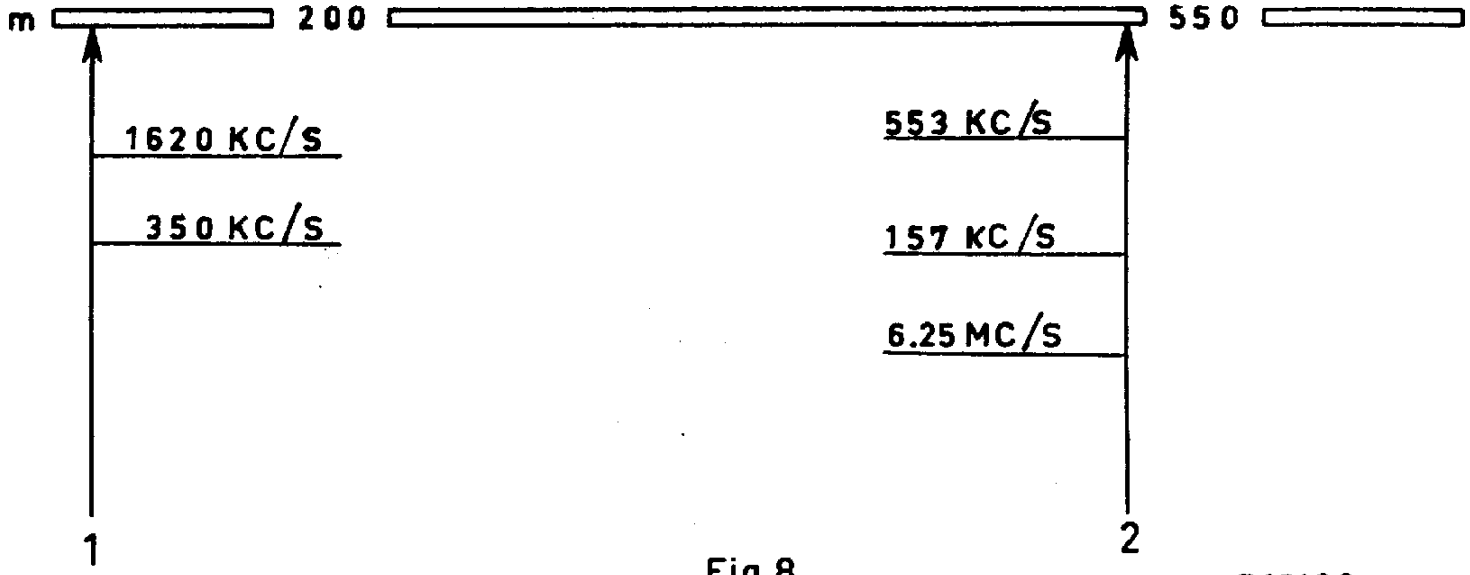


Fig.8

R15122

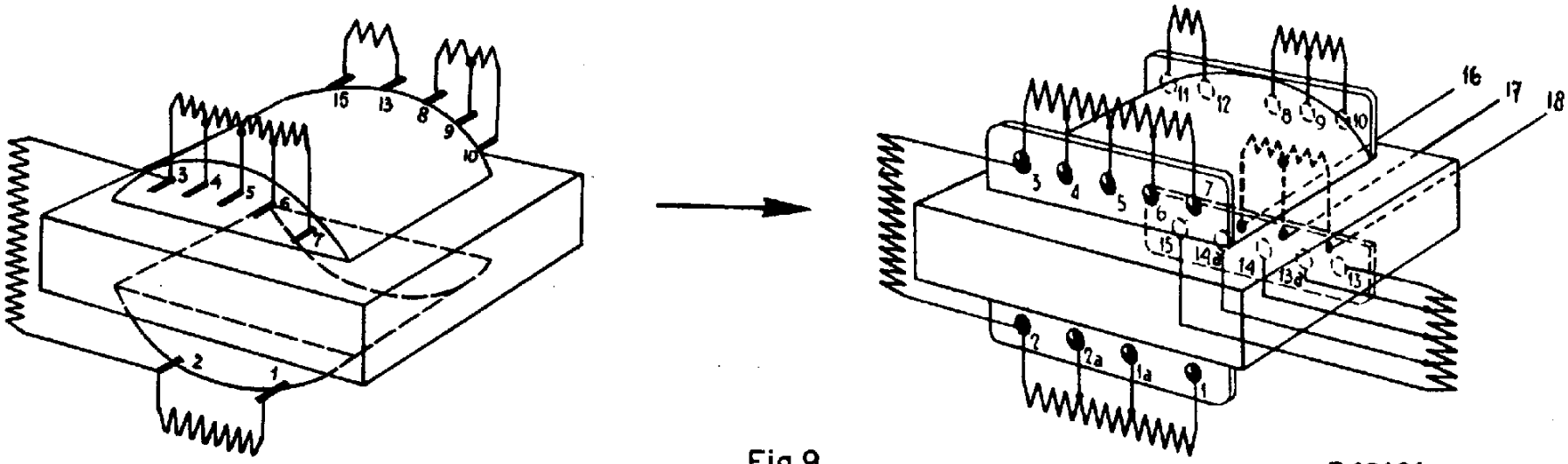


Fig.9

R15121

S:	44. 42. 43.41. P. O,K,L. J,B.
C:	63. 53. 65. 81. 52. 60.62.64. 90,58. 57. 61. 91. 59. 54. 77.56.55.76. 44. 45.41. .17.48.19.23.42. 51. 39.22.50.
R:	33.34. 35. 19. 60. 48. 31.38.37.47.61. 36.62.40.32. 63. 24.20. 30.25.27. 28. 23. 50. 42. 22. 7.

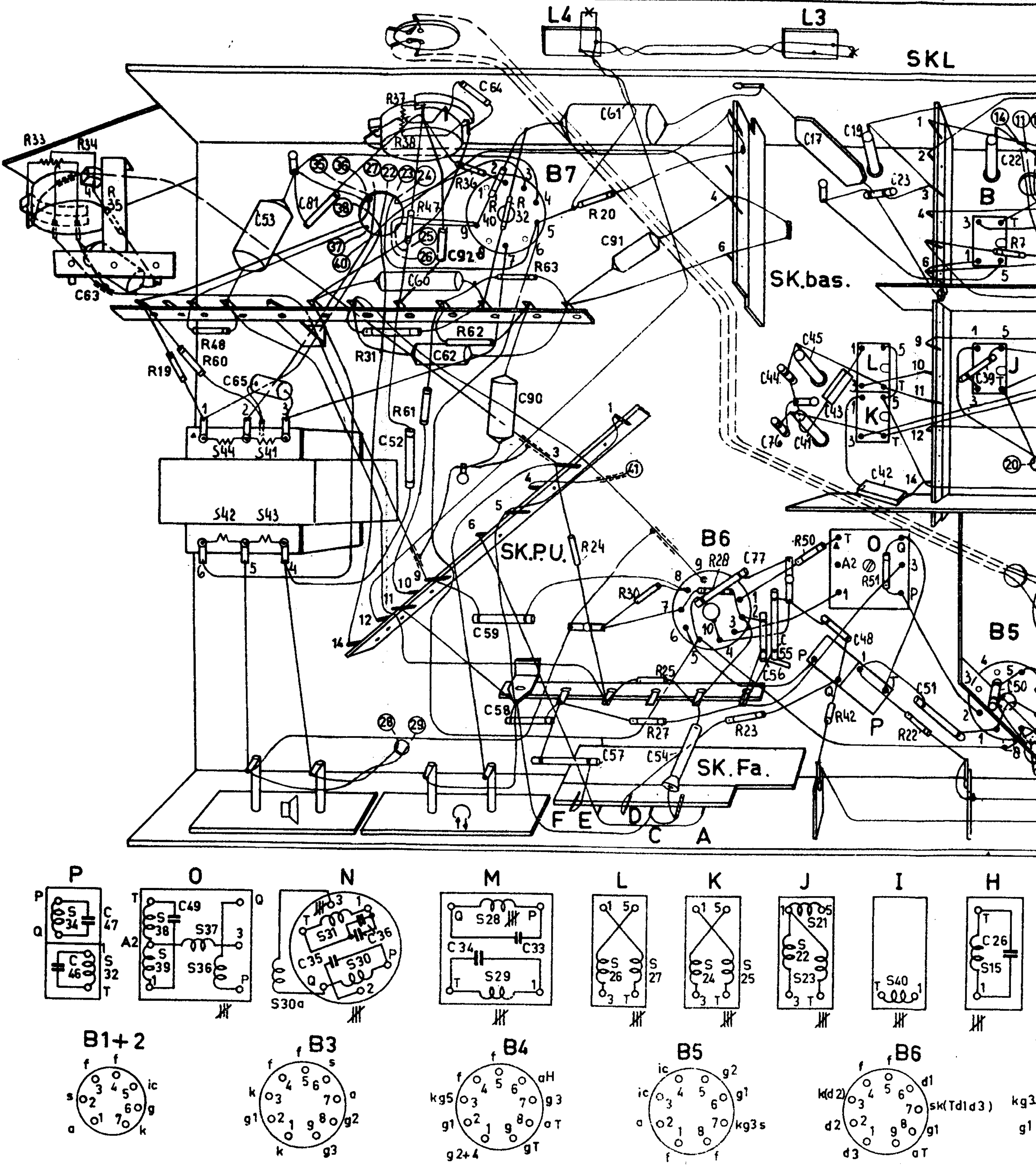


Fig.2

31A-00-01

P. O,K,L. J,B. N,30,30a,31. M. I G, H, 50. D. 4. A. E. 4a F
45.41. .17.48.19.23.42. 51. 39.22.50. 78. 73. 16. 27. 38. 18.32. 21.31.24. .80.71.67.25.28.29.15.72 84.7,30,10. 14.12.11.66.68.1a.9.6. 2,74.79.5.75. 8.
42. 22. 7. 16.21. 4. 17. 18. 11.43.14.13. 6. 41. 8. 10.15.15a.9.26.12. 1a. 2. 3.

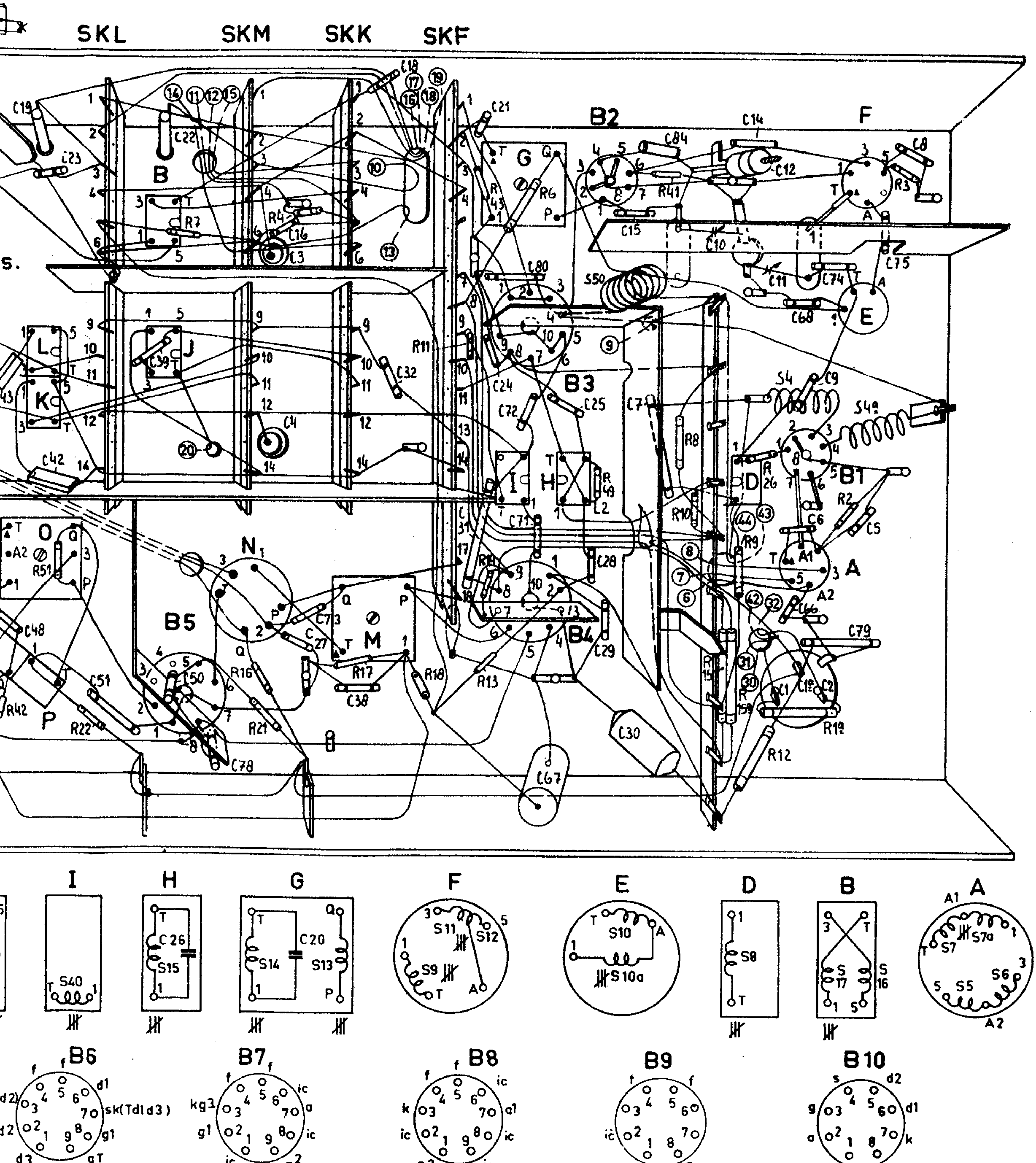
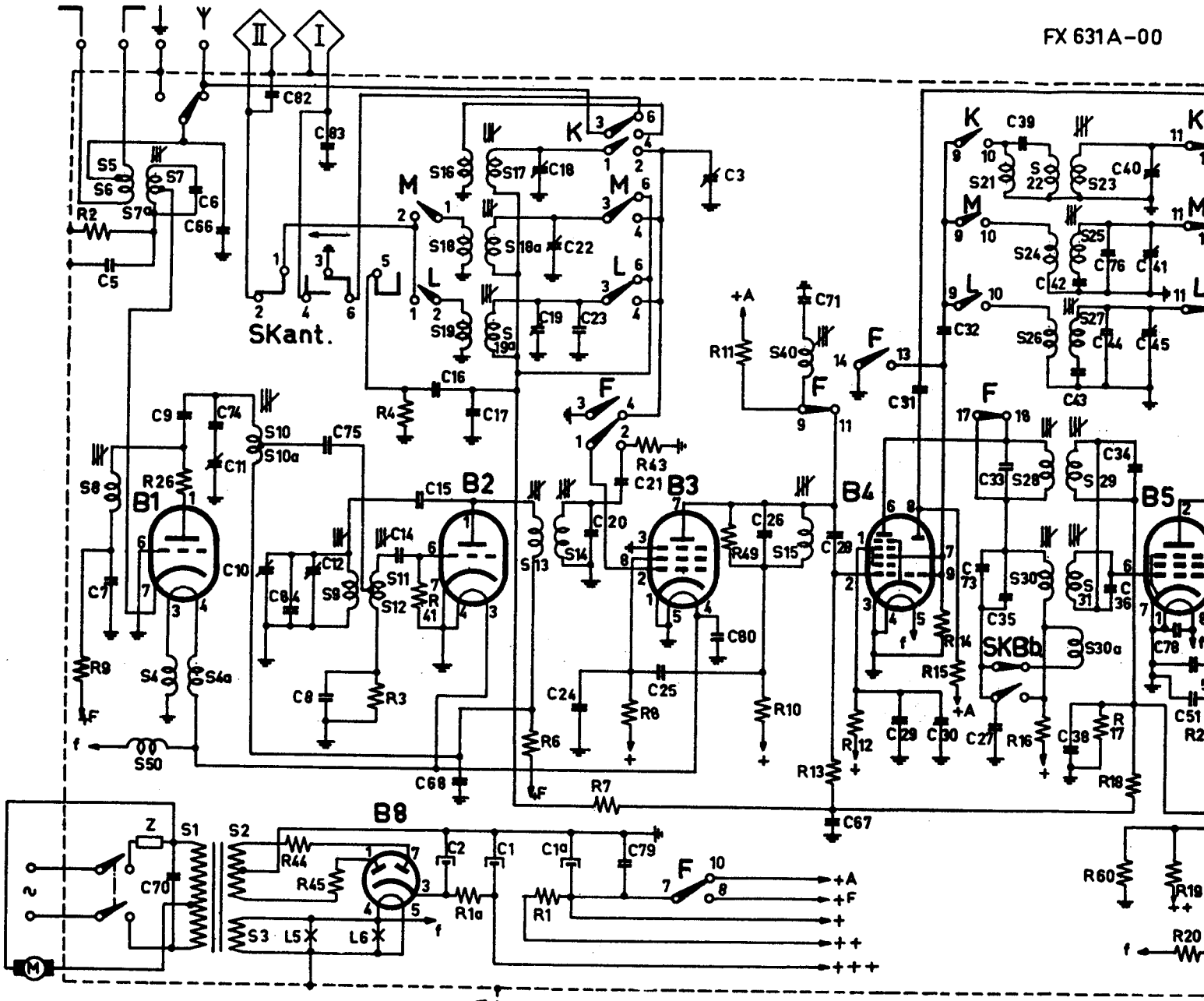


Fig.2

R15163A

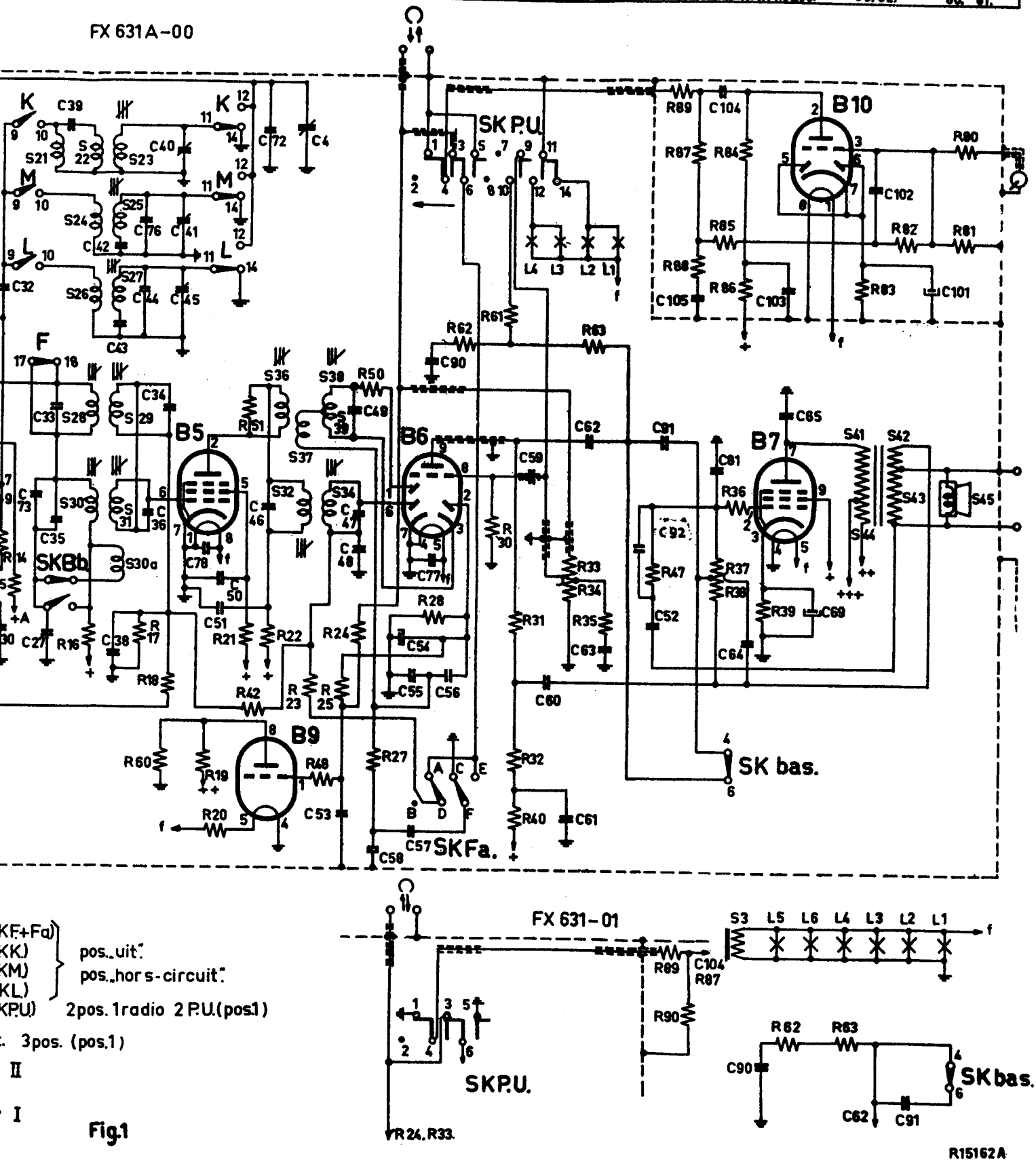
S:	5,6,8,7,7a,50,4,49,1,2,3,10,10a, 9, 11,12, 16,18,19,17,18a,19a,13,14, 40,15, 21,22,24,26,28,30,23,25,27,29,31,30a
C:	57, 70, 9, 6,66,11,74,10,82,84,75,83,12,8,16,14,15, 68, 2, 17, 1, 18, 22,19,1a,24,23,20,21,79,25,80, 3, 26, 71,67,28, 29,31,30,32,73,27,33,35,38,39,42,43,76,44,36,34,45
R:	2, 9, 26, 44, 45, 3, 4, 41, 1a, 6, 1, 7, 43, 8, 49,11,10, 13, 12, 14,15, 16, 60,17, 20,38,19, 2



FM.(SKF+Fa)
O.C-KG.(SKK.)
P.O-MG.(SKM.)
G.O-L.G.(SKL.)
P.U.(SKP.U.)
} pos. „uit".
} pos. „hors-circuit".
2pos. 1radio 2 P.U.(p

SKant. 3pos. (pos.1)
1- ⌒ II
2- Y
3- ⌒ I

Fig.1



KF+Fa) pos. „uit"
KK) pos. „hors-circuit"
KM)
KL)
KP.U) 2pos. 1radio 2 P.U.(pos.1)
3pos. (pos.1)
II
I

Fig.1

N.V. PHILIPS GLOEILAMPEN-FABRIEKEN EINDHOVEN	Service Information	No. Ba 63
		DATE 11-3-55
CENTRAL SERVICE DIVISION	GROUP: Apparatus ARTICLE: Radio TYPE: FX 631 A - FX 637 A	WV/HL

RE:

As the possibility exists that, when putting 30 cm records on the changer, they are damaged by the foremost of the protuding bolts in the grammophone section, we recommend to place a lath before this bolt.
This lath is already applied in the sets which are being produced now.

-.-.-.-.-.-

Comme il est très bien possible qu'en mettant des disques de 30 cm sur le changeur de disques, ceux-ci sont endommagés par le premier des boulons saillants dans le compartiment de gramophone, il est à conseiller d'apposer une petite latte devant ce boulon.
Dans les appareils en cours de production, cette latte a été déjà prévue.

-.-.-.-.-.-

Ya que existe la posibilidad que pondiendo discos de 30 cm sobre el cambiadiscos, éstos se deterioran por el primero de los pernos protuberantes en el compartimento de gramófono, aconsejamos disponer un listón delante de este perno.
En los aparatos que están produciéndose ahora se ha usado ya este listón.

-.-.-.-.-.-

CENTRAL SERVICE DEPARTMENT

A. van Heulen.