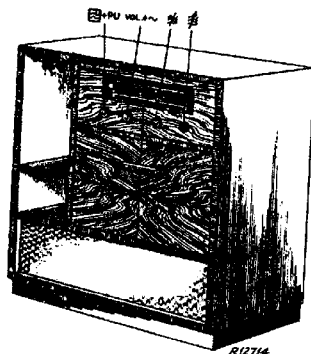


PHILIPS

SERVICE NOTES

for the
radiogrammophone

FX618A



1951

For a.c. mains supply

GENERAL

WAVERANGES

S.W.2a :	11 - 20 m	{	26.2 - 15.05 Mc/s)	I.F. :	452 kc/s
S.W.2b :	25 - 32 m	{	12.05 - 9.32 Mc/s)		
S.W.3 :	30 - 95 m	{	10 - 3.17 Mc/s)		
M.W. :	185 - 580 m	{	1622 - 517 kc/s)		

CONTROLS

From left to right:

1. Radio - P.U. switch
2. Volume- and tone control (push-pull)
3. Waverange switch
4. Tuning

VALVES

B1 : ECH21
B2 : EAF42
B3 : EBC41
B4 : EL41
B5 : AZ41
B6 : EM34

DIMENSIONS

Length : 685 cm) knobs
Depth : 285 cm) in-
Height : 800 cm) cluded

WEIGHT : 26 kg.

DIALLAMP

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

UITLEENBIBLIOTHEEK
N.V. Philips' Verkoop-Maatschappij
Voor Nederland.
Technische dienst

MAINS VOLTAGE

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

CONSUMPTION

55 W

LOUDSPEAKER

Type number 9750-05
Z = 5 Ω

BANDWIDTH

The I.F. bandwidth (1;10) measured from g1 of B1 is about 10 kc/s. The overall-bandwidth (1;10) measured from the aerial socket is about 10 kc/s at 1000 kc/s and about 9 kc/s at 548 kc/s.

RECORD-CHANGER

This apparatus is provided with the record-changer 2508 D. In case of repairs to the record-changer which necessitates its removal from the cabinet, be carefull to connect it to the correct mains voltage (220 V). For further information see the service notes of the record-changer.

CIRCUIT DESCRIPTION

R.F. PART

The circuiting of the R.F. part is shown in fig. 1 separately for each position of the waverange switch. The switch turns 90° for every position.

A.F. PART

The detected A.F. signal is applied to the grid of B3 via the volume control R12-R13 and C37. The cathode resistors R14 and R21 of B3 and B4 respectively are not decoupled, so that negative feedback of current takes place for these valves. The resulting loss of gain is compensated by a positive feedback circuit obtained by connecting R22 between the cathodes 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 C36 in parallel across the part R12 of the volume control.

QUALITY CONTROL

A negative feedback voltage, taken from the moving arm of the potentiometer R16 shunted across the secondary S28-S29 of the output transformer, is applied via C38 to the cathode of B3. Together with R14, C38 forms a high-pass filter. When the moving arm 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 "dull" position. As the moving arm is moved upward the negative feedback voltage is reduced to zero, when the phase of the voltage is inverted and thus a positive feedback is applied to the cathode of B3. This positive feedback voltage accentuates the reproduction of the treble notes - the "quality" position.

TRIMMING THE RECEIVER

A. THE I.F. PART

1. Set the waverange switch to M.W.
2. Turn the variable capacitor to minimum.
3. Set the volume control to maximum.
4. Set the tone control to "dull".
5. Connect an outputmeter via atrimming transformer to the additional loudspeaker sockets.
6. Unscrew the iron cores of the I.F. coils.
7. Apply to g1 of B1 a modulated signal of 452 kc/s via a capacitor of 32000 pF.
8. Trim the I.F. circuits in the following order;

4th I.F. circuit S25 - S26 - C30
3rd I.F. circuit S23 - S24 - C29
1st I.F. circuit S19 - S20 - C27
2nd I.F. circuit S21 - S22 - C28

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. 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. Set the waverange switch to M.W.
2. Turn the variable capacitor to minimum.
3. Set the volume control to maximum.
4. Connect an outputmeter via a trimming transformer to the additional loudspeaker sockets.
5. Apply to the aerial sockets a modulated signal of 452 kc/s via a normal dummy aerial.
6. Trim C7 to minimum output.
7. Seal C7.

C. R.F. and OSCILLATOR CIRCUITS

Except on the S.W.2b and 2a ranges at respectively 11.85 Mc/s and 15.2 Mc/s the oscillator frequency is higher than the signal frequency. Trimming is done with the aid of trimming points on the dial. Before starting to trim, with the variable capacitor in the minimum position set the pointer to the extreme left trimming point on the dial.

For all waveranges the following applies;

1. Set the volume control to maximum.
2. Turn the quality control to the "dull" position.
3. Connect an outputmeter via a trimming transformer to the additional loudspeaker sockets.

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

1	Waverange switch in position	S.W.2a	S.W.2b	S.W.3	M.W.
2	Pointer on trimming point for by means of tuning knob	11.36m	31.09m	29.7m	184m
3	Apply modulated signal of to aerial socket via dummy aerial	26.4 Mc/s	9.65 Mc/s	10.1 Mc/s	1630 kc/s
4	Trim for maximum output	C24, C17	S13	C20, C12	C23-C13
5	Pointer on trimming point for by means of tuning knob	19.74m	25.32m	-	547m
6	Apply a modulated signal of to aerial socket via dummy aerial	15.2 Mc/s	11.85 Mc/s	-	548 kc/s
7	Trim for maximum output	S36	C19	-	C22
8	Repeat the points	2-4	2-7	-	2-4
9	Seal the trimmers	C24, S36	S13 C19	C20	C23

The wire trimmers C12, C13, C17, C22 must not be sealed with compound because changes in capacity may result.

REPAIRS AND REPLACEMENTS

REMOVING THE CHASSIS FROM THE CABINET

1. Remove the back panel of the receiver.
2. Remove the connections from motor, pick-up, shielding and loudspeaker (Note these connections).
3. Pull the knobs off the spindles.
4. Remove the four fixing screws from the record-changer compartment.
5. Take the chassis out of the cabinet.

REMOVING THE RECORD CHANGER

1. Remove the back panel of the record-changer.
 2. Remove the connections from motor and pick-up.
 3. Remove the four fixing screws in the corners of the record-changer.
 4. Take the record-changer out of the cabinet.
- Never rest the record-changer on its mechanism.

POINTER DRIVE

The paths and lengths of the cables are indicated in fig. 3, for the position where the variable capacitor is set to maximum. To replace the driving cord for the variable capacitor the large "Philite" intermediate wheel has to be unscrewed (3 screws). The smaller wheel is to be fixed with a nail, after which the cord can be lain on, beginning with the small intermediate wheel. When the driving spindle is turned the two loops of cord should move in the same direction.

WAVERANGE INDICATOR

The effective length of the cord is 6.5 cm.

When replacing the cord adjustment of the indicator is done by varying the length of the cord before fixing the loop on the little hook on the spindle of the waverange switch. The length of the loop itself should be about 3.5 cm long. This is necessary to avoid the cable loop grip from turning around the spindle which would be the case if the length of the loop were made too short.

CURRENTS AND TENSIONS

Valve			V _a	V _{g2(+4)}	V _k	I _a	I _{g2(+4)}
B1	ECH21	Hexode	230	65	-	1.7	5.8
		Triode	120	-	-	4.4	-
B2	BAF42	Penthode	230	65	-	4	1.4
B3	EBC41	Triode	100	-	1.15	0.6	-
B4	EL41	Penthode	235	230	5.3	31	4.5
B6	EM34		230	V _{a1} = 40 V	-	I _L = 1 mA	-
				V _{a2} = 24 V			
			Volt	Volt	Volt	mA	mA

VC1 = 260 Volt

VC2 = 230 Volt

I prim. (220 V) = 180 mA

These measurements have been taken with the Universal Measuring Instrument GM 4257. No signal on the aerial socket and the waverange switch set to M.W.

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
Rear panel	A3 252 17.0
Pointer for dial	A3 692 31.0
Pointer for waverange indicator	A3 697 08.0
Dial (oversea) (glass)	A3 223 41.0
Dial (glass)	A3 223 69.0
Variable condenser	49 001 56.0
Drum for same	A9 864 25.1
Fixing material for same	A9 865 03.0
Knob for tuning (colour MD)	A3 368 94.0
Knob for waverange switch, volume- and tone control, AM-FM-PU switch (colour MD)	A3 368 93.0
Rubber grommet for fixing chassis	A3 642 15.0
Tension spring for support frame of record-changer	89 312 53.3
Spring for fixing record-changer	49 928 07.0
Socket plate (PU and loudspeaker)	A1 340 92.0
Socket plate (aerial-earth)	A3 381 29.0
Cable drum (colour AA)	23 644 47.2
Cable drum (small) (colour AA)	23 644 75.0
Spindle (tuning)	A3 334 22.0
Spindle (waverange switch)	A3 432 13.2
Spindle (volume- and tonecontrol)	A3 334 24.0
Spindle (AM-FM-PU switch)	A3 662 66.0
Spring for condenser drive	A3 646 26.0
Spring for pointer drive	A3 646 14.0
Leaf spring for arret of waverange switch	A3 648 42.0
Fixing plate for same	A3 661 82.0
Valve holder for tuning indicator	B1 505 26.1
Clutch for tone control	A3 693 64.0
Clutch for volume control	A3 693 65.0
Plate for voltage adaptor	A1 354 86.2
Knob for same	A3 228 03.0
Regulating pin for S.W. coils	A3 599 56.0
<u>LOUDSPEAKER 9750-05</u>	
Clamping ring	25 871 81.0
Paper ring	28 451 54.0
Diffusor	23 666 56.0
<u>TOOLS</u>	
Service oscillator	GEM 2882 or GEM 2883 or GEM 2884
Universal Measuring Instrument	GEM 4256 or GEM 4257
Vaseline compound	X 009 47.0

COILS_BOBINES_BOBINAS

S1	24 ohm		S19	2.8 ohm	
S2	270 ohm		S20	4.6 ohm	
S3	1 ohm	A3 141 68.1	S21	3.1 ohm	
S4	1 ohm		S22	4.8 ohm	A3 121 94.2
S5	32 ohm	A3 110 60.1	C27	115 pF	
S33	1.2 ohm		C28	115 pF	
S34	1 ohm	A3 123 64.0	S23	2.8 ohm	
S8	6.5 ohm		S24	4.6 ohm	
S9	1.1 ohm		S25	3.1 ohm	A3 121 94.2
S10	100 ohm	A3 123 14.0	S26	4.8 ohm	
S11	5.5 ohm		C29	115 pF	
S35	1 ohm		C30	115 pF	
S36	1 ohm	A3 114 76.0	S27	75 ohm	
S12	1 ohm		S28	1 ohm	A3 169 32.0
S13	1 ohm	A3 114 77.0	S29	1 ohm	
S15	1 ohm		S30	3.5-4.3 ohm	49 981 27.0
S16	1 ohm				
S17	3.6 ohm	A3 123 13.0			
S18	7 ohm				

CONDENSERS_CONDENSADEURS_CONDENSAORES

C1	50 uF)	48 317 09/50+50	C22	400-575 pF	49 005 55.2
C2	50 uF)		C23	30 pF	28 212 36.4
C4	12-492 pF)	49 001 56.0	C24	30 pF	28 212 36.4
C5	12-492 pF)		C25	4700 pF	48 751 20/4K7
C7	30 pF	28 212 36.4	C26	285 pF	48 429 01/285E
C8	111 pF	48 203 01/111E	C31	1000 pF	48 751 20/1K
C9	182 pF	48 203 01/182E	C32	47000 pF	48 750 20/47K
C10	260 pF	48 429 01/260E	C33	0.22 uF	48 751 20/220K
C11	395 pF	48 203 01/395E	C34	82 pF	48 203 10/82E
C12	25 pF	49 005 49.2	C35	47000 pF	48 750 20/47K
C13	25 pF	49 005 49.2	C36	15000 pF	48 750 20/15K
C14	220 pF	48 203 20/220E	C37	8200 pF	48 750 20/8K2
C15	56 pF	48 203 10/56E	C38	12000 pF	48 751 20/12K
C16	470 pF	48 203 20/470E	C39	0.1 uF	48 751 20/100K
C17	25 pF	49 005 49.2	C40	3300 pF	48 751 20/3K3
C18	134 pF	48 429 01/134E	C41	6800 pF	48 758 20/6K8
C19	30 pF	28 212 36.4	C42	2700 pF	48 751 20/2K7
C20	30 pF	28 212 36.4	C44	150 pF	48 203 20/150E
C21	2600 pF	48 429 02/2K6			

RESISTORS_RESISTANCES_RESISTENCIAS

R1	1200 ohm	49 379 78.0	R15	0.12 Mohm	48 556 05/120K
R4	0.82 Mohm	48 555 10/820K	R16	50000 ohm	49 472 49.0
R5	47000 ohm	48 555 10/47K	R18	0.1 Mohm	48 555 10/100K
R6	22000 ohm	48 555 10/22K	R19	0.68 Mohm	48 555 10/680K
R7	47000/2 ohm	48 555 10/47K	R20	1000 ohm	48 555 10/1K
R8	1.5 Mohm	48 555 10/1M5	R21	150 ohm	48 556 10/150E
R9	47000 ohm	48 555 10/47K	R22	39000 ohm	48 555 05/39K
R10	1 Mohm	48 555 10/1M	R24		
R11	27000 ohm	48 555 10/27K	R25	2.2 Mohm	48 555 10/2M2
R12	0.05 Mohm		R26	1 Mohm	48 555 10/1M
R13	0.45 Mohm	49 500 34.0	R27	1 Mohm	48 555 10/1M
R14	1800 ohm	48 555 10/1K8	R48	0.12 Mohm	48 555 10/120K

FX618A

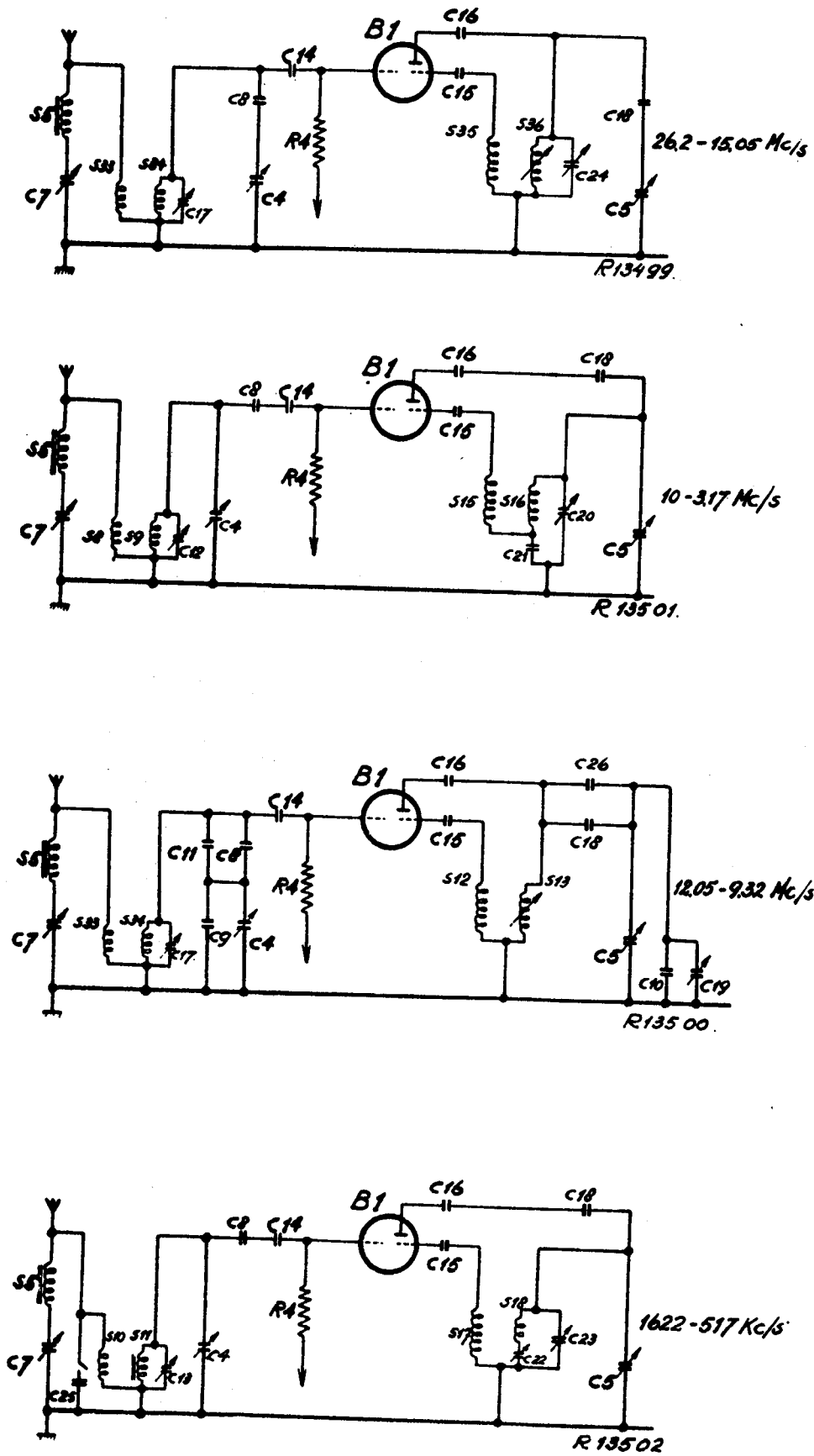


Fig.1

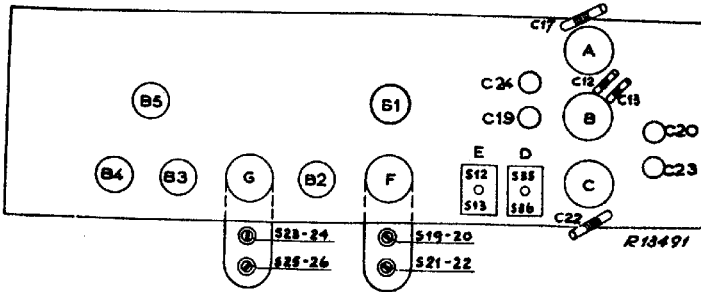


Fig 2

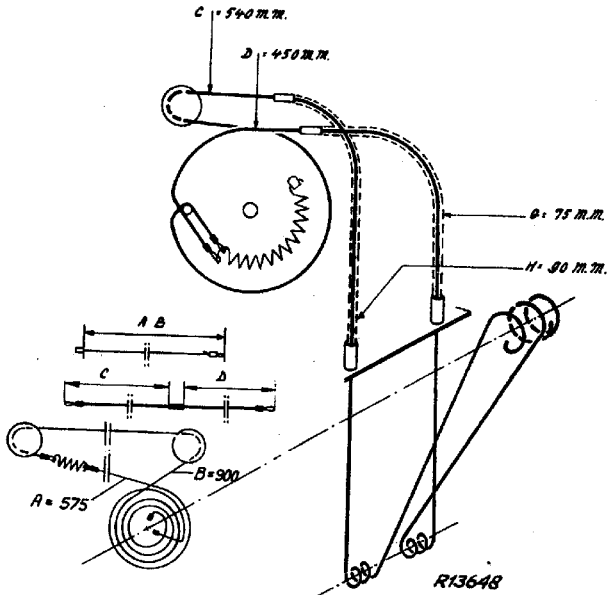


Fig 3

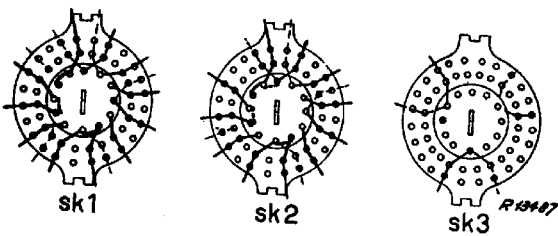
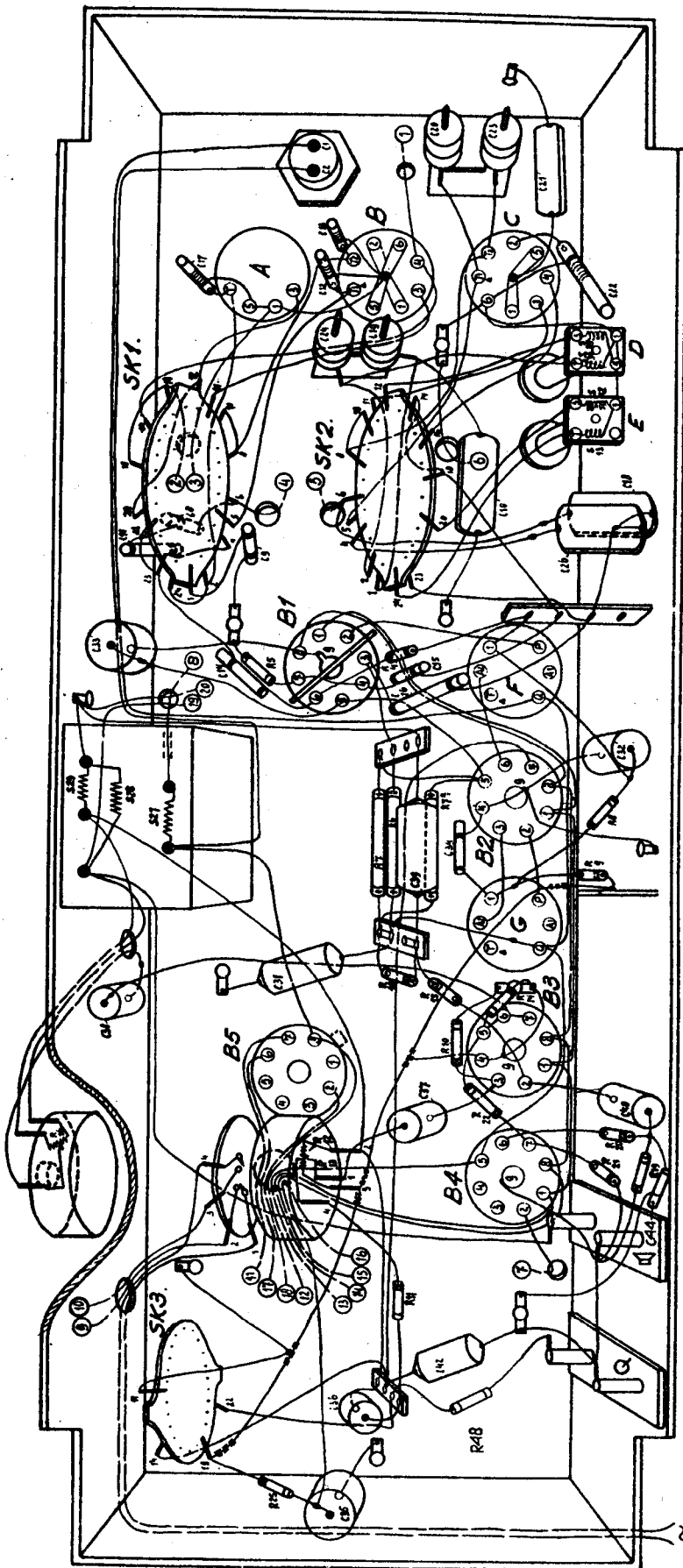


Fig 4

FX618A

5:	36	42	44	47	49	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100		
C:	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	
R:	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75	77	79	81	83	85	87	89	91	93	95	97	99



R1364A

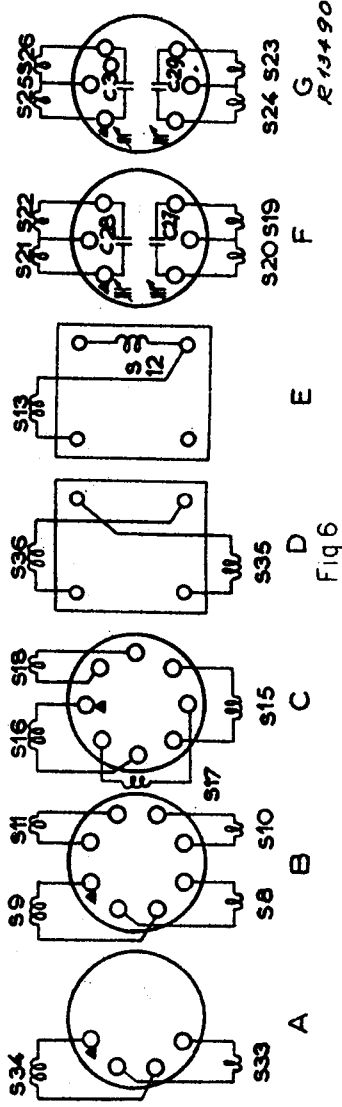


Fig 6

FX618A

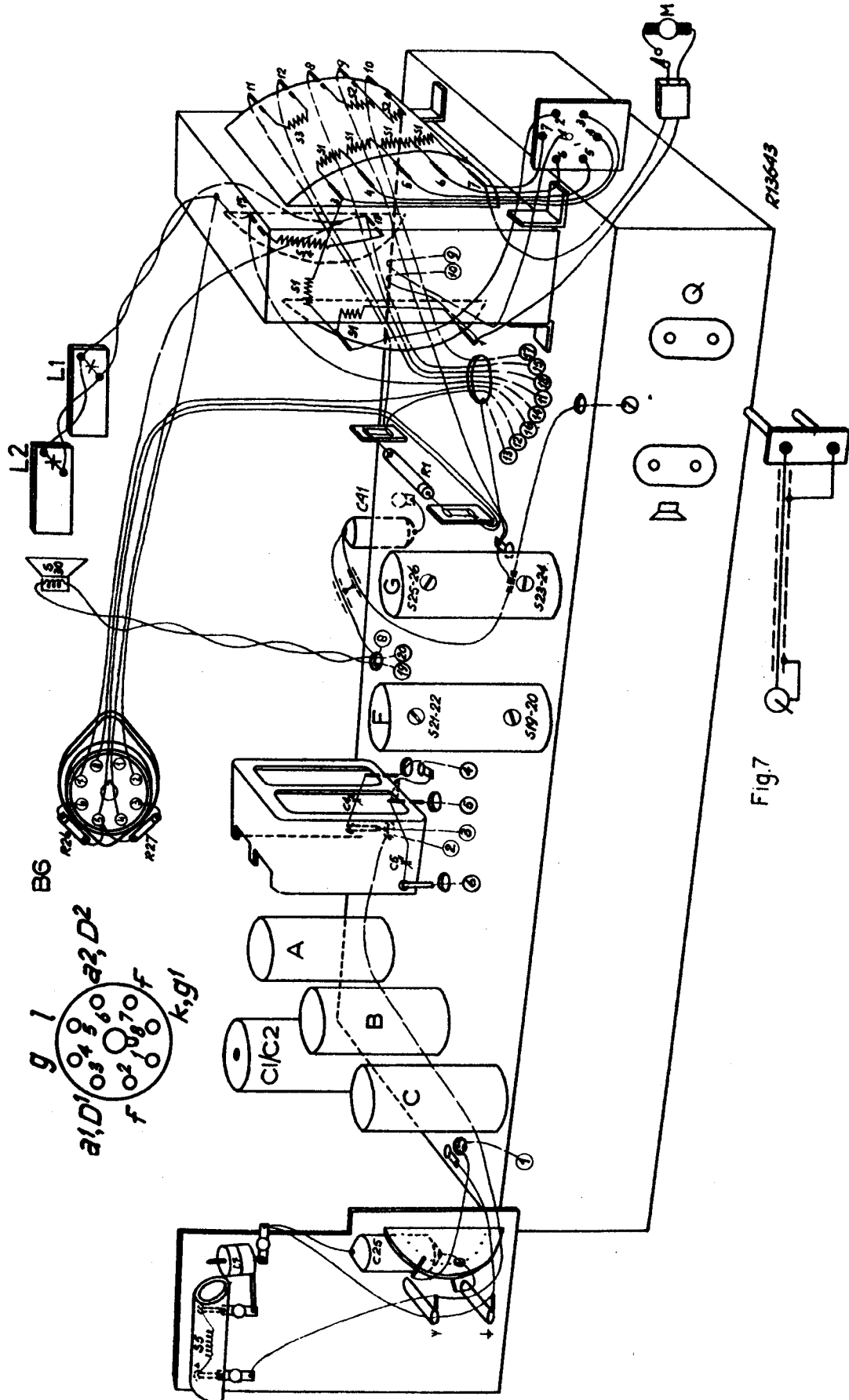


Fig.7

PHILIPS

SERVICE NOTES

for the
Radiogrammophone

FX618A-03-08

1951

For A.C. mains supply

The radio-grammophones FX618A-03 and FX618A-08 are equal to type FX618A, with the following exceptions:

FX618A-03 is provided with the recordchanger type AG 1001. This recordchanger is furnished with a voltage-adaptor and is connected to the 110 V tap of the powertransformer of the receiver. For repairs to and trimming of the recordchanger see the Service Notes of type AG 1001.

The codenumber of the suspension spring is A3 697 62.0

FX618A-08 is provided with the recordchanger type 2508D-61 (220V-60 c.s. with P.U.-unit AG 3005). This recordchanger is connected to the 220 V tap of the powertransformer of the receiver and is suitable for a mains frequency of 60 c.s. For repairs to and trimming of this recordchanger see Service Notes of type 2508.

Further details about these radio-grammophones are given in the Service Notes of type FX618A.