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PHILIPS

SERVICE NOTES

for the receiver

BX 435 A-11



1954 For A.C. mains supply

GENERAL

WAVERANGES

S.W. 2a :	11.4 - 19.9 m	(26.2 - 15.05 Mc/s)
S.W. 2b :	24.9 - 32.1 m	(12.05 - 9.32 Mc/s)
S.W. 3 :	30 - 93.1 m	(10 - 3.22 Mc/s)
M.W. :	185 - 580 m	(1622 - 517 kc/s)

CONTROLS

From left to right:

1. Large knob : Volume Control + mains switch.
1a Small knob : Tone control.
2. Large knob : Waverange switch.
2a Small knob : Tuning.

VALVES

B1 : ECH81
B2 : EBF80
B3 : EBC41
B4 : EL 42
B5 : EZ 80
B6 : DM 71

DIMENSIONS

Length : 37.5 cm } knobs
Depth : 17.5 cm } included
Height : 27 cm }

MAINS VOLTAGE

90-110-125-180-200-
220 V.a.c.

DIALLAMP

L1 : 8045 D-00

I.F.: 452 kc/s

CONSUMPTION

Approx. 35 W.

LOUDSPEAKER

Type : 9768 X

BANDWIDTH

The I.F. bandwidth (1:10) measured from g1 of B1 is approx. 10.75 kc/s. The "overall" bandwidth (1:10) measured from the aerial socket is about 9.5 kc/s at 1000 kc/s and about 9 kc/s at 550 kc/s

LIST OF ILLUSTRATIONS.

- Fig. 1. Trimming points on the dial.
- Fig. 2. Cable drive.
- Fig. 3. Switch wafers.
- Fig. 4. Mains transformer.
- Fig. 5. Circuit diagram.
- Fig. 6. Wiring diagram (under).
- Fig. 7. Wiring diagram (above).

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 pick-up radio switch to radio.
- 5. Unscrew the iron cores of the I.F. coils almost entirely.
- 6. Connect a voltmeter via a trimming transformer to the extension loudspeaker socket.
- 7. Apply to g1 of B1 a modulated signal of 452 kc/s via a capacitor of 33.000 pF.
- 8. Trim the I.F. circuits in the following order:
 - 4th I.F. circuit S48-C54 (coil W)
 - 3rd I.F. circuit S46-C53 (coil J)
 - 1st I.F. circuit S40-C51 (coil H)
 - 2nd I.F. circuit S42-C52 (coil H)

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

- 9. Seal the cores.

B. The series tuned 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. Set the P.U. radio switch in the radio position.
- 5. Connect a voltmeter via a trimming transformer to the extension loudspeaker socket.
- 6. Apply a modulated signal of 452 kc/s via a normal dummy aerial to the aerial socket.
- 7. Trim S60 for minimum output voltage.
- 8. Seal the core of S60.

C. R.F. and oscillator circuits.

Trimming is done with the aid of trimming points on the dial (see fig. 1). Before starting to trim, be sure that the pointer is in the right position at minimum capacitance of the variable capacitor. The pointer has then to be adjusted opposite the extreme left trimming mark on the dial.

For all waveranges the following applies:

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

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.3	M.W.
2	Pointer on trimming point by means of tuning knob	2	-	2	2
3	Apply a modulated signal of to aerial socket via dummy aerial	15.2 Mc/s	11.8 Mc/s	3.3 Mc/s	550 kc/s
4	Tune the receiver to the signal ..	-	11.8 Mc/s	-	-
5	Trim for maximum output voltage ..	S28, S17	C23	S31, S22	S37, S25
6	Pointer on trimming point by means of tuning knob	1	1	1	1
7	Apply modulated signal of to aerial socket via dummy aerial	26.4 Mc/s	12.2 Mc/s	10.1 Mc/s	1630 kc/s
8	Trim for maximum output voltage	C39, C19	C38	C32, C20	C34, C21
9	Repeat the points	2-7	-	2-7	2-7
10	Seal the trimmers and cores	S28, S17, C39, C19	C23, C38	S31, S22, C32, C20	S37, S25, C34, C21.

REPAIRS AND REPLACEMENTS

Removing the chassis from the cabinet.

1. Remove rear panel and bottom plate.
2. Remove the knobs.
3. Remove the pointer from its driving cable.
4. Remove the DM71 from its place by lifting the leaf spring.
5. Unsolder loudspeaker connections.
6. Unscrew the plate aerial connection.
7. Remove the dial lamp.
8. Unscrew the two screws fixing the chassis to the cabinet.
9. Carefully draw the chassis out of the cabinet.

Cable drive.

The paths and lengths of the cables are indicated in fig. 2, the variable capacitor being set to maximum.

A. Capacitor drive (cord "A - B").

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" $2\frac{1}{2}$ turns in an anti-clockwise direction around the drum and $2\frac{1}{2}$ turns 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" 1 turn in a clockwise direction around the drum and $2\frac{1}{2}$ turns 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 cord loops, 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 drum.

B. Pointer drive (cable C and D)

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 cable "D" in the slit "a" of the cable drums, pass the cable $1\frac{1}{2}$ turns in a clockwise direction around the drum and fix it temporarily with a crocodile clip to any convenient point.
5. Push the nipple "b" of cable "C" in the slit "b", pass the cable $2\frac{1}{2}$ turns in an anti-clockwise direction around the drum and the pulleys.
6. Connect the both cable-ends by means of the spring and remove the crocodile clip.

C. Volume control drive (cable G).

1. Remove the chassis from the cabinet.
2. Remove the broken cable.
3. Make up a new cable.
4. Turn the drums to the position shown in fig. 2, (mains switch in the "off" position).
5. Push the cable G through the hole a1 in drum 1 and then through hole a3.
6. Pass the cable $1\frac{1}{2}$ turns in a clockwise direction around the drum and then $1/4$ of a turn in a clockwise direction around drum 2.
7. Push the cable through hole b3 and then through hole b1.
8. Slide a cable grip over the cable, pull the cable taut and pinch the cable grip securely.
9. Push the cable through hole b2 and then through hole b3 again.
10. Pass the cable 1 turn in a clockwise direction around drum 2.
11. Push the cable through hole a4 and then through hole a2.
(If necessary loosen the drum, but keep it in its original position).
12. Slide a cable grip over the cable, pull the cable taut and pinch cable grip securely. Cut off the superfluous end of the cable.

CURRENTS AND VOLTAGES.

Valves			Va	Vg2(4+)	Vk	Ia	Ig2(+4)
B1	ECH81	Heptode	212	67	-	1.6	4.4
		Triode	93	-	-	3.6	-
B2	EBF80	Pentode	212	67	-	5.1	1.7
B3	EBC41	Triode	75	-	-	0.64	-
B4	EL 42	Pentode	220	212	9	23.5	3.9
			Volts	Volts	Volts	mA	mA

VC1 = 248 Volts

VC2 = 212 Volts

Iprim 155 mA (220 V.a.c.)

These measurements have been taken with the Universal Measuring Instrument GM 4257 with the receiver connected to 220 V a.c. and no signal on the aerial socket.

Mains transformer (see fig. 4)

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

For connections see fig. 4.

Corresponding connecting points have the same number.

LIST OF PARTS AND TOOLS

When ordering always quote:

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

	Description	Code number
	Cabinet	A3 738 67.0
	Knob (volume control + waverange switch)	A3 735 12.0
	Knob (tone control + tuning)	A3 735 15.0
	Leafspring in knobs	A3 522 08.2
	<u>Chassis</u>	
	Nut for fixing potentiometers	49 758 21.0
	P.U. radio switch	A3 402 44.0
	Large cable drum on variable capacitor	P4 095 01.0
	Spring in drum variable capacitor	A3 646 57.0
	Variable capacitor	see capacitors
	Spring in pointer driving cable	A3 646 14.0
	Valve holder (ECH81 + EBF80 + EZ80)	B1 505 22.0
	Connecting plate (aerial-earth + P.U. + loud-speaker)	A3 382 13.0
	Spring for fixing coilcans (double)	A3 652 58.3
	Spring for fixing coilcans (single)	A3 652 92.0
	Deal lamp holder	A3 360 52.0
	Valve holder DM 71	B1 506 70.0
	Voltage adaptor (original)	A3 228 81.1
	Spindle for volume control	A3 432 93.0
	Dial (overseas)	A3 742 18.0
	Dial (Mediterranean)	A3 742 19.0
	<u>Tools</u>	
	Service Oscillator	GM 2883 or GM 2884
	Universal Measuring Instrument	GM 4257
	Vaseline compound	X 009 47.0
		JvE/EdJ

S1			A3 141 35.3	C33	250-400	PF	A9 999 07/250E-400E
S2				C34	30	PF	28 212 36.4
S3				C35	560	PF	A9 999 05/560E
S16			A3 125 25.0	C36	150	PF	A9 999 05/150E
S17				C37	68	PF	A9 999 04/68E
S21			A3 125 30.0	C38	250-400	PF	A9 999 07/250E-400E
S22				C39	30	PF	28 212 36.4
S24			A3 116 92.0	C50	4700	PF	A9 999 06/4K7
S25				C51			See coils
S26			A3 125 50.0	C52			Voir bobines
S27				C53			Véase bobinas
S28				C54			
S29			A3 125 62.0	C55	22000	PF	A9 999 06/22K
S30				C56	0.1	MF	A9 999 06/100K
S31				C57	0.1	MF	A9 999 06/100K
S36			A3 125 72.0	C58	18000	PF	A9 999 06/18K
S37				C59	82	PF	A9 999 04/82E
S60			A3 125 84.0	C60	10000	PF	A9 999 06/10K
S40				C61	10000	PF	A9 999 06/10K
S42			A3 126 84.0	C62	15000	PF	A9 999 06/15K
C51	110	PF		C63	2200	PF	A9 999 06/V2K2
C52	195	PF		C64	3300	PF	A9 999 06/3K3
S46			A3 126 84.0	C65	270	PF	A9 999 04/270E
S48				C66	10000	PF	A9 999 06/10K
C53	110	PF		C68	100	MF	AC 5540Z/100
C54	195	PF		R1	1800	Ω	49 380 26.0
S50			A3 169 65.0	R2	1800	Ω	A9 999 00/18K
S51				R7	1	MΩ	A9 999 00/1M
S52				R8	47000	Ω	A9 999 00/47K
S53				R9	33000	Ω	A9 999 00/33K
C1	25	MF		R10	2x 7000	Ωpart	A9 999 00/47K
C2	25	MF	AC 5309/25A 25	R11	2.2	MΩ	A9 999 00/2M2
C6	11-498	PF	49 001 56.1	R12	56000	Ω	A9 999 00/56K
C7	11-498	PF	A9 999 04/680E	R13	47000	Ω	A9 999 00/47K
C18	680	PF	49 005 59.3	R14	1.6	MΩ	48 900 00/DL
C19	20	PF	A9 999 07/10E-50E	R15	0.4	MΩ	1M6+M4
C20	10-50	PF	A9 999 04/680E	R16	10	MΩ	A9 999 00/10M
C21	20	PF	A9 999 05/3K	R17	0.1	MΩ	A9 999 00/100K
C22	3000	PF	A9 999 07/45E-275E	R18	56000	Ω	A9 999 00/56K
C23	45-275	PF	A9 999 04/150E	R19	56000	Ω	A9 999 00/56K
C24	150	PF	A9 999 04/12E	R20	0.33	MΩ	A9 999 00/330K
C25	560	PF	A9 999 04/220E	R21	18000	Ω	A9 999 00/18K
C26	12	PF	A9 999 04/68E	R22	330	Ω	A9 999 00/330E
C27	220	PF	A9 999 04/470E	R23	1	MΩ	B1 639 19.0
C28	68	PF	A9 999 04/56E	R24	1	MΩ	A9 999 00/22K
C29	470	PF	A9 999 05/360E	R26	22000	Ω	A9 999 00/1K
C30	56	PF	49 005 59.3	R27	1000	Ω	A9 999 00/5M8
C31	360	PF		R28	6.8	MΩ	A9 999 00/220E
C32	20	PF		R29	220	Ω	A9 999 00/820K
				R30	0.82	MΩ	A9 999 00/3K3
				R31	3300	Ω	

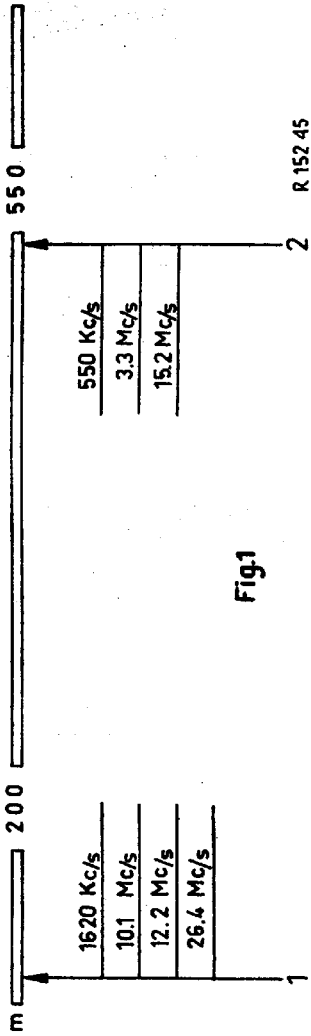


Fig.1

BX 435 A-11

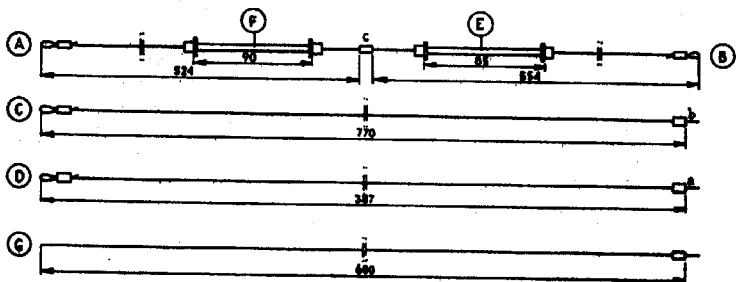
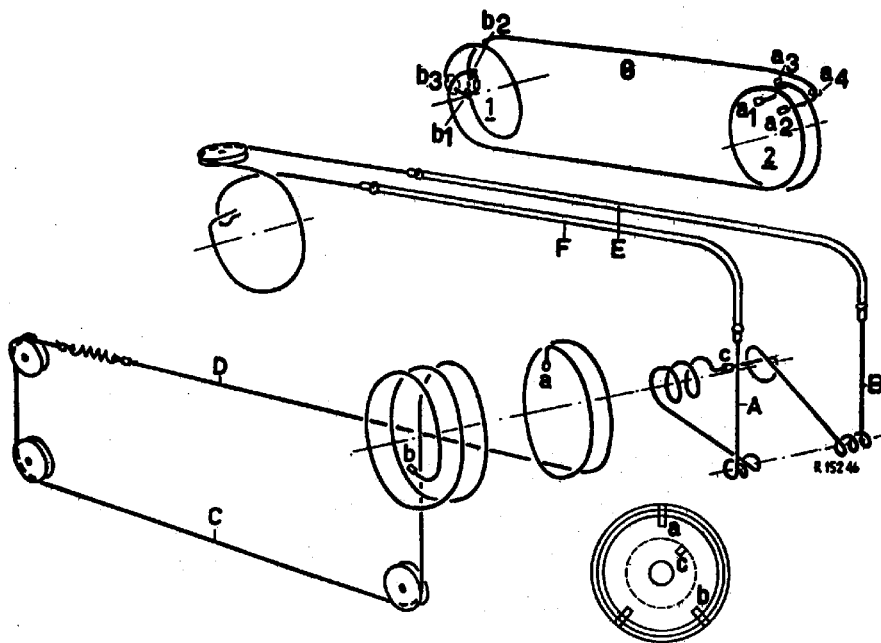


Fig2

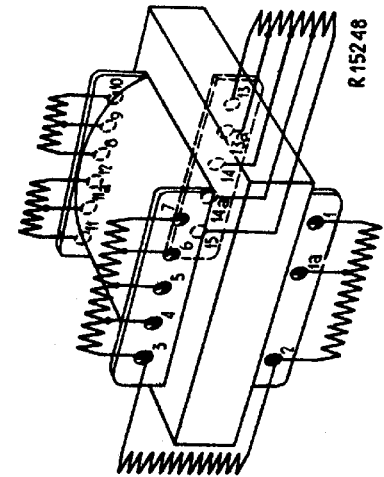


Fig.4

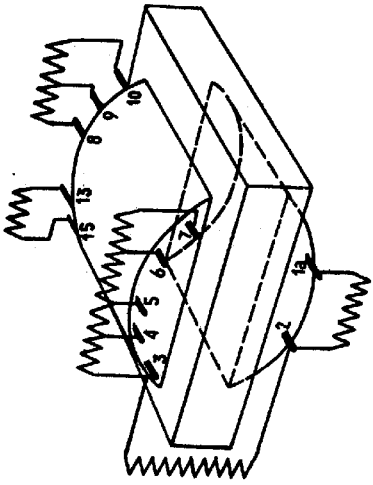
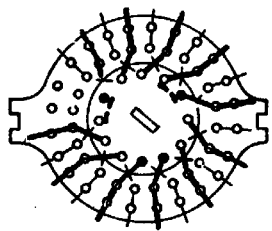
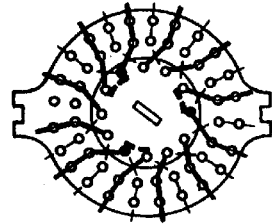


Fig.3



sk 2 R15247



sk 1

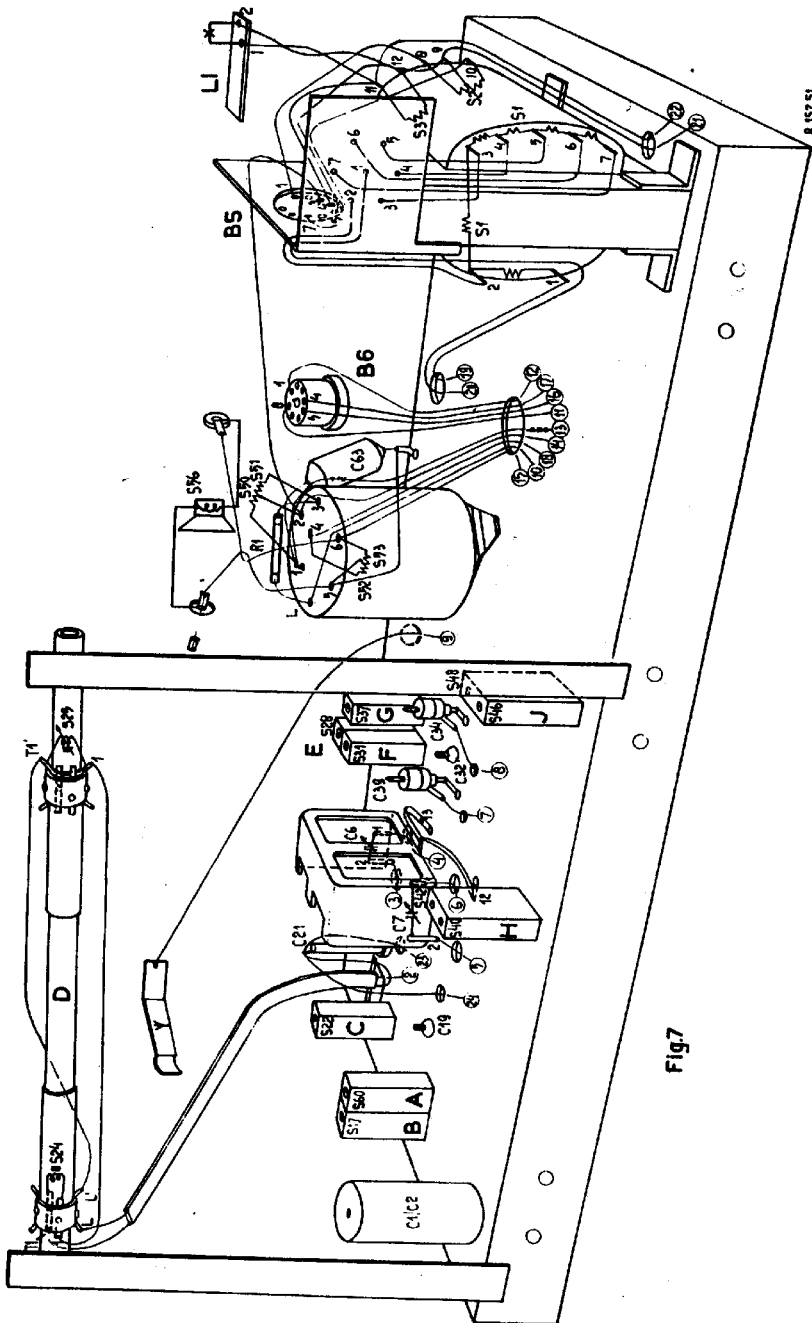


Fig 7