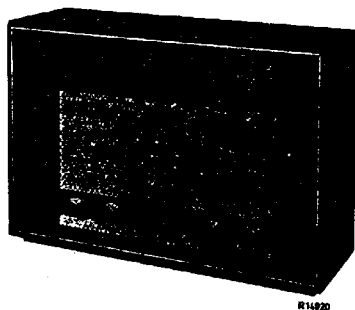


PHILIPS

SERVICE NOTES

for the receiver

BX514A



1953

For a.c. mains supply

GENERAL

WAVE RANGES

S.W. : 16.3 - 49.2 m (18.5 - 6.1 Mc/s)
 M.W. : 182 - 548 m (1650 - 547.5 kc/s)
 L.W. : 706 - 1948 m (425 - 154 kc/s)

I.F.: 470 kc/s

CONTROLS

From left to right:

1. Radio-P.U. and Quality switch
2. Mains switch + volume control
3. Waverange switch
4. Tuning

MAINS VOLTAGES

110, 125, 145, 200, 220,
245 V (50 ~)

POWER CONSUMPTION

45 W (220 V ~)

VALVE COMBINATION

B1 : ECH42
 B2 : EF 41
 B3 : EBC41
 B4 : EL 41
 B5 : EZ 40
 B6 : EM 34

DIALLAMPS

L1 : 8028D-00
 L2 : 8028D-00

LOUDSPEAKER

Type : 9636 (repairable)
 Z = 5 Ω

DIMENSIONS

Width : 52 cm) knobs
 Height : 37 cm) in-
 Depth : 21 cm) cluded

WEIGHT : 9 kg

BANDWIDTH

The I.F. bandwidth (1:10) measured from g1 of B1 is about 10.5 kc/s.
 The overall bandwidth (1:10) measured from the aerial socket is about 10 kc/s at 1000 kc/s and about 9.5 kc/s at 250 kc/s.

ILLUSTRATIONS

- Fig. 1 Circuit diagram.
- Fig. 2 Position of coils and trimmers.
- Fig. 3 Coil connections.
- Fig. 4 Switch wafers.
- Fig. 5 Trimming points on the dial.
- Fig. 6 Cable drive for pointer and variable capacitor.
- Fig. 7 Replacement of the power transformer.

TRIMMING THE RECEIVER

A. I. F. BANDFILTERS

- 1. Waverange switch to M.W.
- 2. Variable capacitor to minimum.
- 3. Volume control to maximum.
- 4. Radio-P.U. switch to Radio.
- 5. Set the Quality switch to "mellow".
- 6. Connect a voltmeter via a trimming transformer to the extension loud-speaker sockets.
- 7. Screw the cores of the I.F. coils nearly full out.
- 8. Apply to g1 of B1 a modulated signal of 470 kc/s via a capacitor of 33.000 pF.
- 9. Trim the I.F. circuits for maximum output voltage in the following order
 - 4th circuit S25-S26-C30
 - 3rd circuit S23-S24-C29
 - 1st circuit S19-S20-C27
 - 2nd circuit S21-S22-C28

After the last circuit has been trimmed no further I.F. adjustments should be made.

- 10. Seal the cores.

B. I.F. FILTER CIRCUIT

- 1. Waverange switch to M.W.
- 2. Variable capacitor to minimum.
- 3. Volume control to maximum.
- 4. Radio-P.U. switch to Radio.
- 5. Set the Quality switch to "mellow".
- 6. Connect a voltmeter via a trimming transformer to the extension loud-speaker sockets.
- 7. Apply a modulated signal of 470 kc/s to the aerial socket via a normal dummy aerial.
- 8. Trim C7 for minimum output voltage.
- 9. Seal C7.

C. R.F. AND OCILLATOR CIRCUITS

Trimming is done with the aid of the trimming points on the dial (fig.5). Before starting to trim, turn the variable capacitor to minimum and set the pointer on the extreme left trimming point of the dial (point A). For all waveranges the following applies:

- 1. Volume control to maximum.
- 2. Radio-P.U. switch to Radio.
- 3. Set the Quality switch to "quality".
- 4. Connect a voltmeter via a trimming transformer to the extension loud-speaker sockets.
- 5. Apply all signals via a normal dummy aerial to the aerial socket.

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

		S.W.	M.W.	L.W.
1	Turn range switch to			
2	The pointer on the trimming point . . . by means of the tuning knob	A	A	B
3	Apply a modulated signal of	18.5 Mc/s	1547.5 kc/s	154 kc/s
4	Trim for maximum output voltage	C19	C20 C12	unscrew C23 trim C22 to beyond maximum output voltage
5	The pointer on the trimming point . . . by means of the tuning knob	B	B	A
6	Apply a modulated signal of	6.1 Mc/s	547.5 kc/s	425 kc/s
7	Trim for maximum output voltage	C17	C21	C23
8	Repeat the points	2-8	2-5	-
9	The pointer on the trimming point . . . by means of the tuning knob	A	-	B
10	Apply a modulated signal of	18.5 Mc/s	-	154 kc/s
11	Trim for maximum output voltage	C11	-	C22
12	Repeat the points	-	-	5-11
13	The pointer on the trimming point . . . by means of the tuning knob	-	-	A
14	Apply a modulated signal of	-	-	425 kc/s
15	Trim for maximum output voltage	-	-	C13
16	Deal the trimmers	C19 C17 C11	C20 C21 C12	C23 C22 C13

REPAIRS AND REPLACEMENT OF PARTS

REMOVING THE CHASSIS FROM THE CABINET

1. Remove the rear panel.
2. Set the variable capacitor to maximum.
3. Remove the knobs.
4. Detach the diallamp holders.
5. Disconnect the earth lead at the back of the chassis.
6. Release the scale pointer from the cable.
7. Release the tuning indicator.
8. Remove the four chassis-fixing bolts and take the chassis carefully out of the cabinet.

POINTER AND CAPACITOR DRIVE

The paths and lengths of the cables are indicated in fig.6, the variable capacitor being set to maximum.

A. VARIABLE CAPACITOR DRIVE

1. Remove the chassis from the cabinet.
2. Remove the large "Philite" 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" twice in a clockwise direction around the drum and 3 times 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 with a crocodile clip.
11. Pass the end "B" $\frac{3}{4}$ turn in an anti-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, push the ends through the opening in the drum and lay the ends in the right direction around the pin in the drum.
15. Fix the spring on its bracket and remove the crocodile clip.
16. Remove the nail and replace the large "Philite" 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 large "Philite" drum.
5. Pass the cable "D" 3 times in a clockwise direction around the "Philite" drum and over the pulley. Hook the end on the spring and fix it with a crocodile clip to a convenient point.
6. Push the nipple "b" of the cable "C" in the slit "b" of the large "Philite" drum.
7. Pass the cable "C" $1\frac{1}{2}$ turns in an anti-clockwise direction around the "Philite" drum and the pulleys.
8. Connect the both cable ends by means of the spring and remove the crocodile clip.

CURRENTS AND VOLTAGES

Valves			Va	Vg2(+4)	Ia	Ig2(+4)
B1	6CH42	Hexode	230	85	5.3	3.2
		Triode	65		5	
B2	EF 41	Pentode	230	85	5.5	1.8
B3	EBC41	Double diode triode	100	-	0.65	-
B4	EL 41	Pentode	239	230	30	4.8
B6	EM 34	Tuning indicator	Va1=40 V1=230 Va2=22	-	-	I1=1.7
			Volts	Volts	mA	mA

VC1 = 255 V

VC2 = 230 V

These measurements are made with the Universal Measuring Apparatus GM 4257. Waverange switch to M.W., no signal on the serial socket.

BK 514 A
LIST OF PARTS AND TOOLS
 (see also General Spare Parts List)

When ordering always quote:

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

		Description	Code number
		Wooden cabinet	MK 952 97.0
		Rear panel	MK 398 28.0
		Dial	MK 703 21.0
		Knob (4x)	A3 366 33.0
		Strip for waverange switch	A3 617 66.0
		Strip for quality switch	A3 618 42.0
		Valve holder (EM 34)	B1 505 26.1
		Lens for EM 34	P5 310 00.0
		Pointer	A3 691 29.0
		Tension spring (pointer)	A3 646 14.0
		Philite drum (small)	23 644 75.0
		Philite drum (large)	23 644 40.1
		Variable capacitor	see capacitors
		Voltage adaptor compl.	A3 228 85.0
		Socket plate (aerial-earth)	A3 381 17.0
		Valve holder (5x)	49 232 02.0
		Rubber grommet (4x)	A3 642 15.0
		Tension spring (variable capacitor)	A3 646 26.0
		Locating spring (6x)	A3 648 42.0
		<u>Tools</u>	
		Service oscillator	GM 2882 or GM 2883 or GM 2884
		Universal Measuring Instrument	GM 4256 or GM 4257
		Vaseline compound	* X 009 47.0

S1	56 Ω		C12	30 pF	28 212 36.4
S2	370 Ω	A3 141 67.4	C13	30 pF	28 212 36.4
S3	<1 Ω		C14	220 pF	48 203 10/220E
S5	35 Ω	A3 112 76.0	C15	56 pF	48 203 10/56E
S6	2 Ω		C16	470 pF	48 203 10/470E
S7	<1 Ω		C17	100 pF	49 005 51.2
S8	105 Ω	A3 124 44.0	C19	30 pF	28 212 36.4
S9	5.5 Ω		C20	30 pF	28 212 36.4
S10	180 Ω		C21	575 pF	49 005 55.0
S11	40 Ω		C22	175 pF	49 005 52.2
S11a	6.5 Ω	A3 124 45.0	C23	30 pF	28 212 36.4
S12	<1 Ω		C24	33 pF	48 203 10/33E
S13	<1 Ω		C27	115 pF	see coils
S14	2.2 Ω		C28	115 pF	voir bobines
S15	2.5 Ω		C29	115 pF	see coils
S16	7 Ω	A3 124 46.0	C30	115 pF	voir bobines
S17	7 Ω		C31	2200 pF	48 751 10/2K2
S18	19 Ω		C32	47000 pF	48 750 10/47K
S19	2.6 Ω		C33	0.22 pF	48 751 10/220K
S20	4.3 Ω		C34	82 pF	48 203 10/82E
S21	2.6 Ω		C35	390 pF	48 203 10/390E
S22	4.2 Ω	A3 123 47.0	C36	3300 pF	48 751 10/3K3
S27	115 pF		C37	10000 pF	48 750 10/10K
S28	115 pF		C38	22000 pF	48 750 10/22K
S23	2.6 Ω		C39	56 pF	48 203 10/56E
S24	4.4 Ω		C40	10000 pF	48 751 10/10K
S25	2.6 Ω		C41	0.1 pF	48 751 10/100K
S26	4.2 Ω	A3 123 47.0	C42	4700 pF	48 758 20/4K7
S29	115 pF		C47	10 pF	48 201 10/10E
S30	115 pF		C48	150 pF	48 203 10/150E
S27	770 Ω		C55	47000 pF	48 750 10/47K
S29	<1 Ω	A3 152 46.0	C56	10000 pF	48 750 10/10K
S30	<1 Ω		C57	680 pF	48 203 10/680E
C1	50 pF	48 317 09/50+50	C61	15 pF	48 201 10/15E
C2	50 pF		R1	1200 Ω	49 379 78.0
C3	100 pF	48 313 22/100	R2	180 Ω	49 999 00/180E
C4	11-500 pF		R3	0.56MΩ	49 999 00/560K
C5	11-500 pF	49 001 56.1	R4	1.5 MΩ	49 999 00/1M5
C6	22.000 pF	48 758 20/22K	R5	33000 Ω	49 999 00/33K
C7	30 pF	28 212 36.4	R6	33000 Ω	49 999 00/33K
C10	18 pF	48 201 10/18E	R7	27000 Ω	49 999 00/27K
C11	30 pF	28 212 36.4	R8	1.5 MΩ	49 999 00/1M5
			R9	6.8 MΩ	49 999 00/6M8
			R10	47000 Ω	49 999 00/47K
			R11	0.1 MΩ	49 999 00/100K
			R11a	0.22MΩ	49 999 00/220K
			R12	68000 Ω	49 999 00/68K
			R13	2 MΩ	
			R14	0.65MΩ	49 477 04.2
			R15	68000 Ω	49 999 00/68K
			R16	47000 Ω	49 999 00/47K
			R17	2.2 MΩ	49 999 00/2M2
			R18	1 MΩ	49 999 00/1M
			R19	0.1 MΩ	49 999 00/100K

BX 514A

R20	0.1 MΩ	A9 999 00/100K			
R21	0.39MΩ	A9 999 00/390K			
R22	1000 Ω	A9 999 00/1K			
R23	0.22MΩ	A9 999 00/220K			
R33	0.56MΩ	A9 999 00/560K			
R34	47 Ω	A9 999 00/47Ω			
R40	2.2 MΩ	A9 999 00/2MΩ			
R41	1 MΩ	A9 999 00/1M			
R42	1 MΩ	A9 999 00/1M			
R43	0.1 MΩ	A9 999 00/100K			
R44	0.1 MΩ	A9 999 00/100K			

BX514A

S: 5.6.8.10.13.24.11A.1.97	14.12.15.17.13.16.18.19.20.21.22.	23.24.25.26.
C: 10.7.11.12.13.6.14.1.2.3.15.16	5.31. 17.33. 19.21.22.20.23.24.27.28.32.	29. 55. 30. 35.37. 34.36. 57.56.38. 41. 47.40.39.48.
R: 4.1.2.5.34.6.	7. 9.	8. 15.40.10.11.11A.12.13.14.1.42.3.44.43.16.17.18.33.23.19.20.21.22.

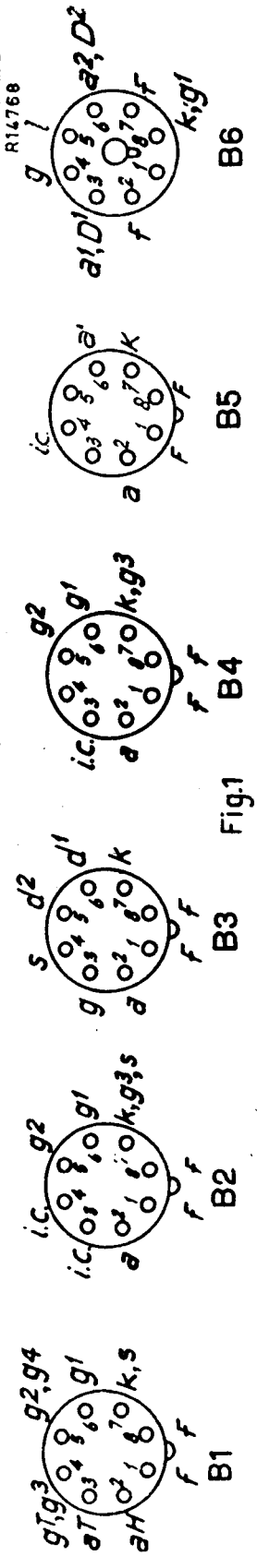
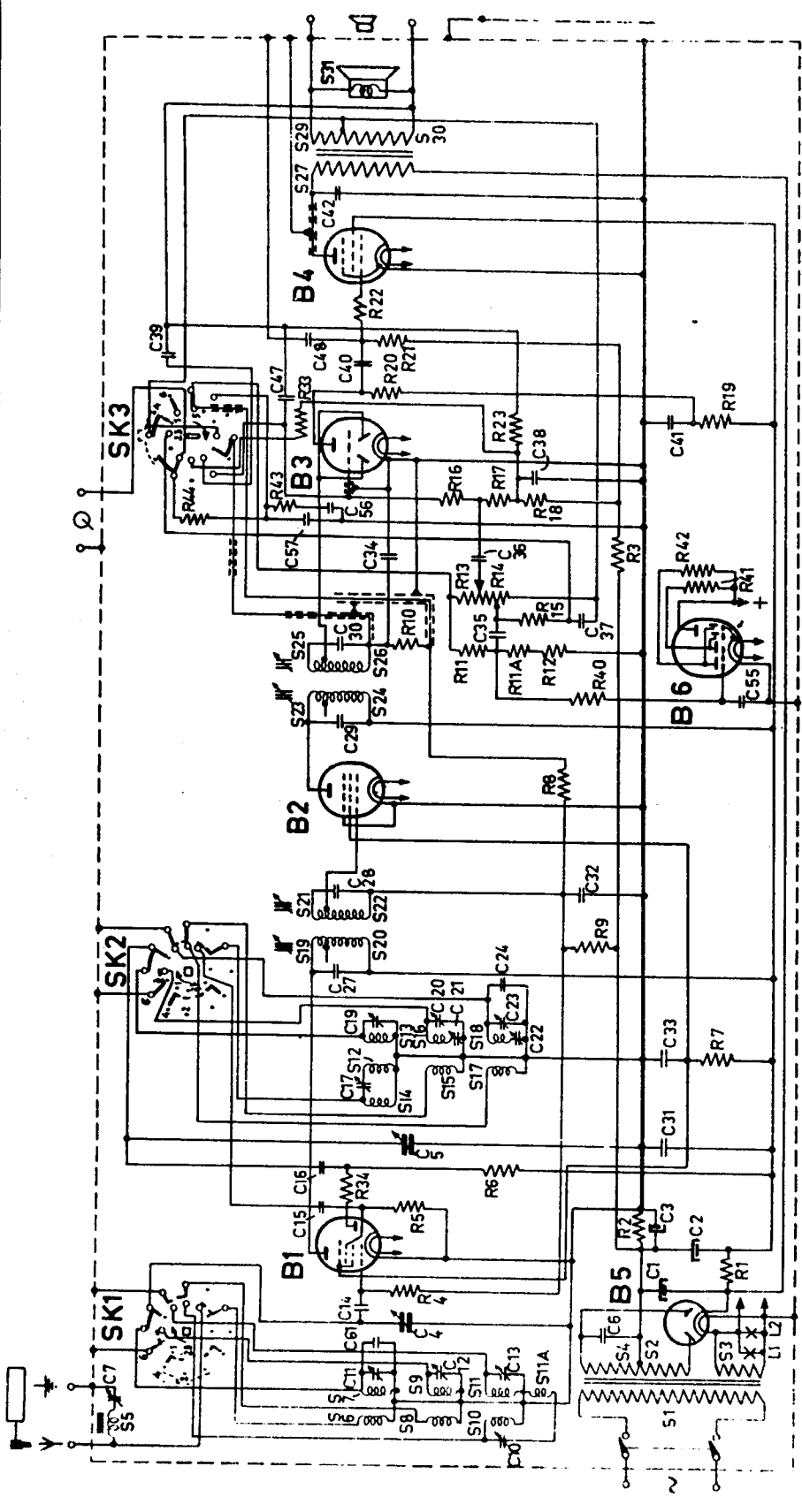


Fig.1

R14768

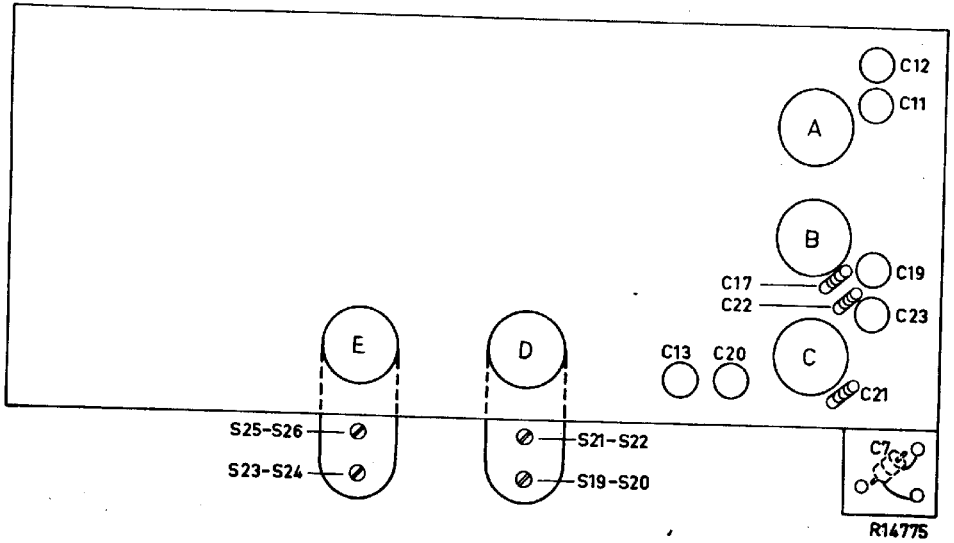


Fig.2

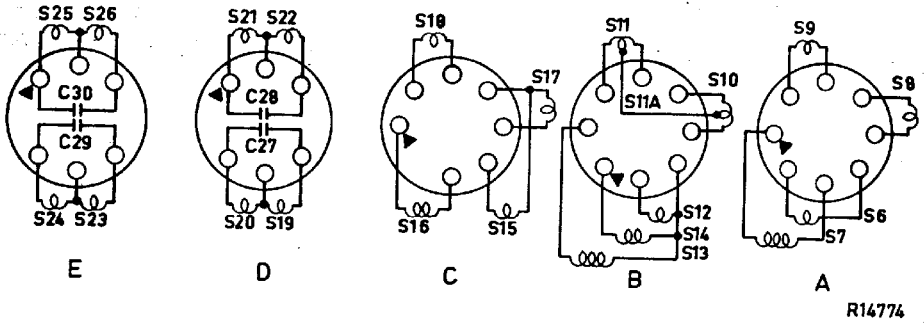
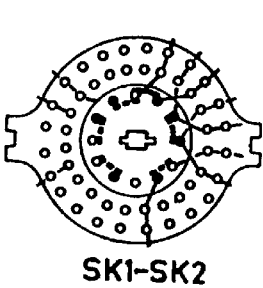


Fig.3



SK1-SK2

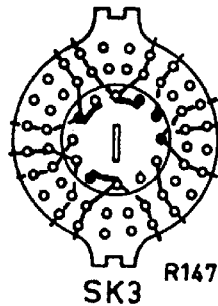


Fig.4

SK3 R14772

