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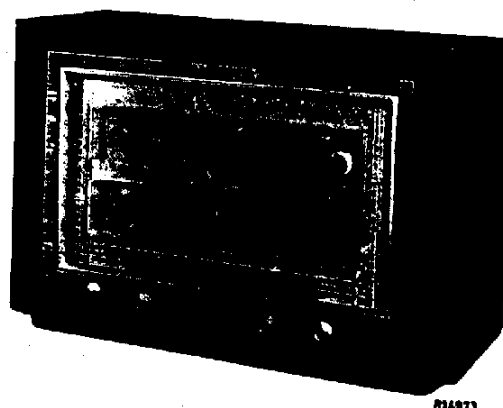
Eindhoven

PHILIPS

SERVICE NOTES

for the receiver

BX735A



1953

For A.C. mains supply.

GENERAL

WAVERANGES

1. M.W.	: 185	- 580	m	(1622	- 517	kc/s)
2. S.W.3	: 60	- 187	m	(5	- 1.604	Mc/s)
3. S.W.2d	: 32.25	- 60	m	(9.3	- 5	Mc/s)
4. S.W.2c	: 23.07	- 32.96	m	(13.0	- 9.1	Mc/s)
5. S.W.2b	: 17.00	- 25.87	m	(17.6	- 11.6	Mc/s)
6. S.W.2a	: 10.98	- 17.00	m	(27.3	- 17.6	Mc/s)

I.F.: 452 kc/s

CONTROLS

From left to right:

1. Knob : volume control + mains switch
Lever: radio - P.U. switch
2. Knob : tone control
Lever: bass switch
3. Knob : vernier tuning
4. Knob : waverange switch
5. Knob : main tuning
6. Knob (above right) for frame-aerial (ferroceptor)

MAINS VOLTAGE

90, 110, 125, 180,
200, 220V (50 c/s).

CONSUMPTION

80 W approx.

LOUDSPEAKER

type 9758-05 Z=5Ω

BANDWIDTH

The I.F. bandwidth (1:10) measured from g1 of B2 is approx. 11 kc/s. The "overall" bandwidth (1:10) measured from the aerial socket is about 9.5 kc/s at 1622 kc/s and 9 kc/s at 1000 kc/s.

VALVES

B1:EF41	B7:EL84
B2:ECH81	B8:EZ80
B3:EBF80	B9:EZ80
B4:EBC41	B10:EM34
B5:ECC40	
B6:EL84	

DIMENSIONS

Length : 60 cm	knobs included
Depth : 25 cm	
Height : 49 cm	

WEIGHT

16.0 kg.

DIAL LAMPS

L1 : 8045D-00; L2 : 8045D-00; L3 : 8073D-00

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List of illustrations:

- fig.1: R.F. and oscillator circuit for each position of the waverange switch.
- fig.2: Trimming points on the dial.
- fig.3: Cable drive for pointers, variable capacitor and frame derial.
- fig.4: Simplified diagram for tonecontrol and bass-switch SK6.
- fig.5: Push-pull output stage.
- fig.6: Switch wafers.
- fig.7: Circuit diagram.
- fig.8: Wiring diagram (under)
- fig.9: Wiring diagram (above)
- fig.10: Mains-transformer.

CIRCUIT DESCRIPTION

A. R.F. Part

Fig.1 shows for every position of the waverange switch a simplified diagram of the R.F. part.

Bandsread in the ranges S.W.2a, S.W.2b and S.W.2c is obtained by connecting condensers in series and in parallel with the variable condenser.

The vernier control is obtained by self-induction changes of the coil S28 for the ranges S.W.2a, S.W.2b and S.W.2c and of the coil S35 for the range S.W.2d.

B. The A.F. Part

The A.F. amplifier comprises 3 stages:

1. The pre-amplifier, B4, with tone control circuit.
2. The phase inverter valve, B5.
3. The push-pull output stage.

The A.F. signal obtained after detection is applied via R31-R32, C53, R39 and C54 to gB4. The volume controls R31-R32 and R54-R55 are mounted on one spindle in connection with the physiological tone correction.

1. TONE CONTROL

a. Bass-switch (SK6, fig.4)

Connected between the anode and the grid of B4 is an inverse feedback circuit some elements of which can be switched in and out of circuit. The working is as follows:

The impedance of the parallel connection R45-C59 is greater for low frequencies than for high ones, as a result of which the inverse feedback for the bass notes is reduced. The resistor R46 which can be connected in parallel to R45 reduces the influence of the filter R45-C59. In the grid circuit of B4 there is also C54, a small capacitor which attenuates the bass notes reaching gB4. This capacitor can be short circuited with the bass-switch.

Summary of the 3 positions of SK6:

1. Minimum bass notes: C54 in series with C53-R39
R46 parallel to R45-C59

- 2. Normal : C54 shortcircuited
R46 parallel to R45-C59
- 3. Maximum bass notes: C54 shortcircuited
R46 switched out of circuit

b. Whistle filter (9000 c/s) (fig.4)

The 9000 c/s whistle filter consists of the series circuit: C55-S48. Moreover a signal coming from S51 is applied to C55. At the resonance frequency a maximum voltage is produced across S48 which is applied to gB5 via R58 as inverse feedback voltage. The purpose of C64 is to prevent another rise of the frequency characteristic above 9000 c/s. The whistle filter is only switched on in the "radio" position of SK7.

c. Treble control (fig.4)

The treble response is adjusted with R49-R50. In the position "maximum treble" (slider of R49-R50 at the top of R49) the treble response is boosted because of the fact that C61 is connected in parallel to R47-R51. In the position "minimum treble" (slider of R49-R50 to the earth side of R50) R47-R49-C60-R48 and R51-C61 form two low-pass filters as a result of which the treble response is attenuated.

d. Pick-up correction

In the position "gramophone" of SK7, R38 in the inverse feedback circuit of B4 is replaced by the network R29-R30-C50. The impedance of this network is lower for the treble notes than for the bass so that the inverse feedback for the treble notes is reduced.

2. PHASE INVERTOR CIRCUIT (fig.5)

The A.F. signal which appears across R54-R55 is fed via R56 to gB5. B5 operates as normal A.F. amplifier. B5¹ which receives part of this amplified signal, is fed back via R67 in such a way that the signal voltage across R71 is equal but opposite in phase to the signal voltage across R69.

3. PUSH PULL OUTPUT STAGE

B6 derives its excitation voltage from B5, and B7 from B5¹. These voltages are opposite in phase (see C2).

TRIMMING THE RECEIVER

A. The I.F. Part

1. Set the waverange switch to M.W.
2. Turn the variable condenser to minimum.
3. Set the volume control to maximum.
4. Set the P.U. radio switch to radio.
5. Unscrew the iron cores of the I.F. coils.
6. Connect a voltmeter via a trimming transformer to the extension loudspeaker socket.

7. Apply to g¹ of B2 a modulated signal of 452 kc/s via a capacitor of 33000 pF.
8. Trim the I.F. circuits in the following order:

4th I.F. circuit S46-S47-C41 (coil U).
3rd I.F. circuit S44-S45-C40 (coil U).
1st I.F. circuit S40-S41-C38 (coil T).
2nd I.F. circuit S42-S43-C39 (coil T).
3rd I.F. circuit S44-S45-C40 (coil U).

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. bandfilters have been sealed with "Vaseline Compound" (see list of parts and tools). This compound can easily be removed in the cold state with the aid of a screw-driver. Heating of the core damages the core holder and makes trimming impossible.

B. R.F. and oscillator circuits

Trimming is done with the aid of trimming points on the dial (see fig.2).

There is no need to take the chassis out of the cabinet. Before starting to trim, be sure that the pointers are in the right positions at minimum capacitance of the variable capacitor.

The positions of the pointers are (at minimum position of the variable capacitor).

For range M.W. on trimming point (1)
For range S.W.3 on trimming point (4)
For range S.W.2b on trimming point (5)
For range S.W.2a on trimming point (5)
For range S.W.2c on trimming point (3)
For range S.W.2d on trimming point (3).

For all waveranges the following applies:

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

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

1	Waverange switch in position	M.W.	S.W.3	S.W.2b	S.W.2a	S.W.2c	S.W.2d
2	Unsolder connection to SK8	-	-	-	-	-	-
3	Pointer on trimming point... by means of tuning knob	2	2	6 [*]	2 [*]	2 [*]	2 [*]
4	Apply modulated signal of... to aerial socket via a capacitor of 33000 pF	553 kc/s	-	-	-	-	-
5	Apply modulated signal of.... to aerial socket via a normal dummy aerial	-	1.72 Mc/s	11.6 Mc/s	17.8 Mc/s	9.1 Mc/s	5.18 Mc/s
6	Trim for maximum output voltage	S39 S27 S17a S18a	S37 S24 S16	S30 S21 S10	S29 S20 S8	S31 S22 S12	S34 S23 S14
7	Pointer on trimming point... by means of tuning knob	1	4	5 [*]	-	-	-
8	Apply modulated signal of... to aerial socket via a capacitor of 33000 pF	1630 kc/s	-	-	-	-	-
9	Apply modulated signal of.... via a normal dummy aerial	-	5.1 Mc/s	18 Mc/s	-	-	-
10	Trim for maximum output voltage	C37 C21 C7	C35 C20 C6	C32 C18 C8	-	-	-
11	Repeat the points	2-10	2-10	2-10	-	-	-
12	Seal the trimmers and cores	S39 S27 S17a S18a C37 C21 C7	S37 S24 S16 C35 C20 C6	S30 S21 S10 C32 C18 C8	S29 S20 S8	S31 S22 S12	S34 S23 S14
13	Solder the connection to SK8	-	-	-	-	-	-

* Place vernier-tuning in the middle position on the dial.

REPAIRS AND REPLACEMENTS

Uncasing

1. Remove rear panel and bottom plate.
2. Remove knobs (they pull off except the knob of the vernier-tuning which has to be unscrewed).
3. Unscrew loudspeaker baffle (6 screws) and 1 screw above frame aerial.
4. Unscrew the four bottom screws.
5. Carefully draw the chassis out of the cabinet.

Variable capacitor and pointer drive

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

A. Variable capacitor drive

1. Remove the chassis from the cabinet.
2. Remove the broken cables.
3. Assemble the new cables "A" and "B".
4. Push the nipple a of the cable A into the slit A1 of the small drum and pass the cable ± 2 x in a clockwise direction around the drum.
5. Place the cable guide into position.
6. Pass the cable $\pm \frac{1}{2}$ x in an anti-clockwise direction around the drum of the variable capacitor.
7. Fix the cable temporarily with a crocodile clip.
8. Push the nipple b of the cable B into the slit B1.
9. Pass the cable B $\pm \frac{1}{2}$ x in an anti-clockwise direction around the small drum.
10. Place the cable guide into position.
11. Pass the cable around the pulley and $\pm 1\frac{1}{2}$ x in a clockwise direction around the variable capacitor drum.
12. Hook the spring into the cable loops, pass the ends through the drum opening and lay one end in the right direction around the pin of the drum.
13. Fix the spring on its bracket and remove the crocodile clip.

Pointerdrive.

1. Remove the chassis from the cabinet.
2. Remove the dialscale and if desired also the baffle.
3. Put cable D with nipple d in slit D1 on the cable drum and turn $\pm 1\frac{1}{2}$ turns to the left and clip temporarily with a crocodile clip on the friction wheel.
4. Put cable C with nipple c in slit C1 on the cabledrum and turn $\pm 2\frac{1}{2}$ turns to the right and clip temporarily with a crocodile clip on the friction wheel.
5. Put the baffle back in place.
6. Remove the crocodile clip from cable D and put the cable on its pulleys (see fig.3).
7. Remove the crocodile clip from cable C and put the cable on its pulleys (see fig.3).
8. Hook the two cable ends together with hook H as indicated in figure 3.
9. Fix the pointer carriers and pointers to the cable.
10. Check the tension in the cables, it must be taken up entirely by the spring on the side of the chassis.

Frame aerial drive.

1. Remove rear panel.
2. Remove dial lampholder.
3. Remove broken cord.
4. Take the aerial unit out of the cabinet (3 wood-screws and 1 cylindrical screw)...
5. Make up the cord according to fig.3.
6. Turn the knob entirely to the left.
7. Insert nipple p of cable E-F in the slit P1 of drum under frame aerial, the drum should be turned so that the slit is above the bracket.
8. Put the cord E $1\frac{1}{4}$ turns to the left around the drum under frame aerial and cord F $1\frac{1}{4}$ turn to the right around this drum.
9. Fix both cords on the drum with some vaseline compound.
10. Mount the frame aerial unit on its place.
11. Place the outer cables in their supports.
12. Put the cord F + 1 turn to the right around the drum on the baffle and cord E + $1\frac{1}{4}$ turn to the left around this drum.
13. Hook the cable loops in the spring and hook the other end of the spring to screw in the drum.

Repair of the vernier control

For the repair of this part unscrew the bracket from the chassis after which it will be easy to remove both the driving spindle and the cores.

Keep always free of grease the rubber driving rolls and core rods.

After repair the cores must be moved to and fro once or twice against their stop points, after which they come automatically in the right position.

Mainstransformer

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

If a mains tension of 180 Volts must be applied to the set, equipped with the standard transformer, it must be applied to the points 1A and 5 of this transformer. In case, the standard transformer has been replaced, the voltage adaptor, mentioned in the list of parts and tools, should also be replaced.

For connections see fig. 10.