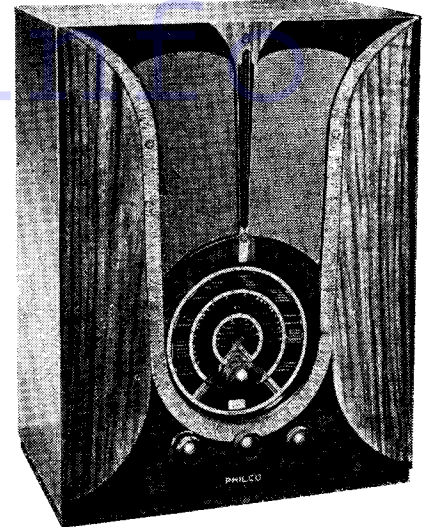


PHILCO MODEL A537 EMPIRE FIVE



The Baby Grand model of the Philco A537 series of "Empire Five" receivers.

CIRCUIT.—The aerial input circuit is designed to be fed by a doublet or an ordinary single wire aerial. The aerial is coupled to the grid of V1, a pentode frequency changer, via a set of tuned aerial coils. Converted to the I.F. frequency, the signal passes through an I.F. transformer to the amplifying valve V2, an H.F. pentode.

Coupled by a further I.F. transformer the signal passes to the demodulating diode of V3, a double diode triode. The other diode provides a D.C. potential that is fed back to the preceding stages through a resistance capacity network to give automatic volume control.

The coupling arrangements to the grid of the triode section include a manual volume control tapped at one megohm. A resistance and condenser in series connected between the tapping and the chassis provide tone-volume compensation.

V3 is resistance capacity coupled to the output valve V4, an output pentode, in the anode circuit of which is connected the speaker matching transformer. A variable tone control arrangement is found in the grid circuit of this valve, and a pentode compensator is connected between the anode and chassis.

Mains equipment consists of a transformer, a full-wave rectifying valve, electrolytic smoothing condensers and smoothing choke (speaker energising coil). A mains suppressor centre-tapped condenser is connected across the primary of the mains transformer.

Chassis Removal.—Remove the back of the cabinet (secured by eight wood screws), and also the four control knobs from the front of the cabinet. These are of the spring fixing type. Turn the cabinet or its side and remove the four fixing bolts and washers from the base.

The speaker can be removed if desired, or alternatively the leads to the speaker panel unsoldered. For the reverse process the white lead goes to the left-hand tag.

the green to the centre tag, and the green and white to the right-hand tag.

Special Notes.—A pair of sockets on the speaker panel enable an external speaker to be operated if desired. This should be of the permanent magnet type, having an impedance of some 2 to 3 ohms. The speech coil of the external speaker should be connected to the sockets on the speaker panel.

A pair of sockets at the rear of the chassis provide for a pick-up. This should be of the high impedance type with the pick-up winding well insulated from the case and tone-arm. The makers recommend a Philco type 350-200, and state that a resistance of 5,000 ohms should be connected in shunt with the leads.

The single dial light is mounted in a spring holder clamped to the centre of the wavelength dial assembly. The bulb is rated at 6.3 volts .35 amps, and is fitted with a bayonet type base.

R18, C20 and C23 are located inside the I.F.T2 coil can. C21 was not in our particular chassis.

Circuit Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer, i.e., the green and white leads, switch the set to the medium waveband, and fully engage the vanes of the gang condenser. Turn the volume control fully clockwise, and the tone control as far counter-clockwise as possible. Connect a

service oscillator between the top grid of V1 (with the grid lead still connected) and chassis.

Tune the service oscillator to 451 kcs. and adjust T1, T2, T3 and T4 in that order for maximum response, reducing the input from the oscillator as the circuits come into line to render the A.V.C. inoperative.

Signal Circuits.—Connect the oscillator to the aerial and earth sockets through a dummy aerial or fixed condenser. Leave

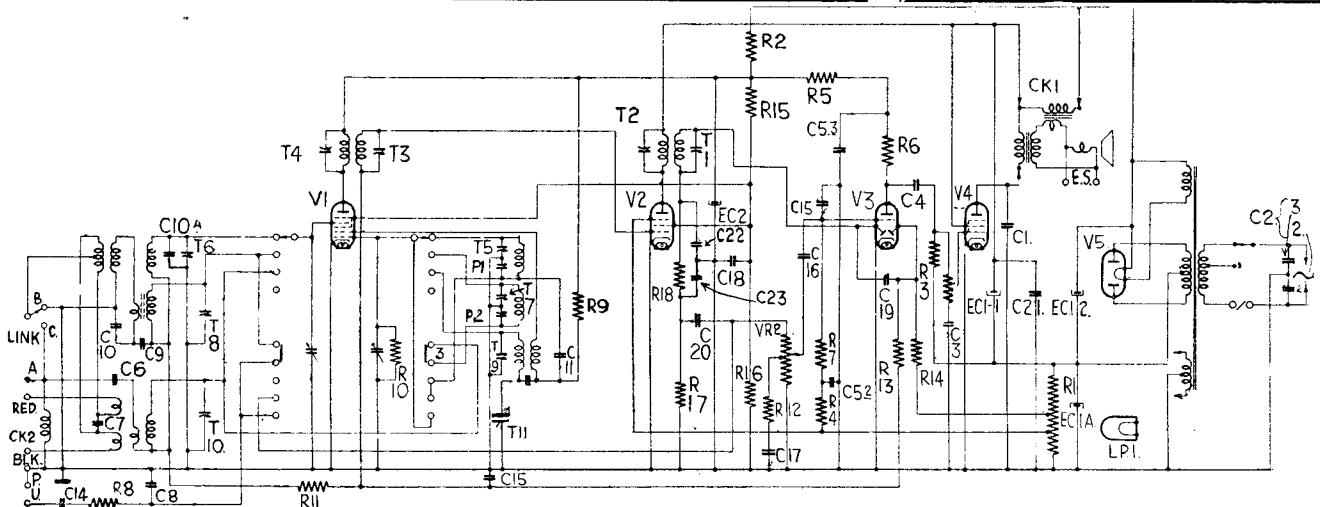
QUICK TESTS

Quick tests are available on this receiver. Volts measured between the leads to the speaker panel and chassis should be:—
Green and white lead . . . 310 volts, unsmoothed H.T.
Green lead . . . 245 volts, smoothed H.T.
White lead . . . 255 volts, smoothed H.T.

VALVE READINGS

No signal. Volume maximum. Medium waveband. 200 volts A.C. 1000 ohms/voltmeter.

V.	Type.	Electrode.	Volts.	Ma.
1	All Philco. 6A7 (7)	Anode . .	130	2.8
		Screen . .	75	2.1
		Osc. anode . .	105	1.8
2	78E (6)	Anode . .	252	5.8
		Screen . .	75	4.5
3	75 (6)	Anode . .	40	.3
4	42E (6)	Anode . .	245	34.
		Screen . .	255	7.5
5	80 (4)	Filament . .	310	—



Five valves, including rectifier, are used in the three-band circuit of the A537. Provision is made for a doublet aerial.

the output meter connected as before. Make sure that the connecting strip at the rear of the chassis is plugged in the socket marked B. Only feed sufficient input from the service oscillator to obtain definite peaks in the output meter so as to keep the A.V.C. inoperative. The receiver must be lined up in the following order of wavebands.

Long Waves.—Tune the set and oscillator to 1,034 metres (290 kes.) and adjust first T5 and then T6 for maximum.

Tune the set and oscillator to 1,875 metres (160 kes.) and adjust P1 (the nut of the paddler) for maximum, simultaneously rocking the gang to ensure optimum results.

Repeat both operations until no further improvement is noticed.

Medium Waves.—Tune the set and oscillator to 214 metres (1,400 kes.) and adjust first T7 and then T8 for maximum.

Tune the set and oscillator to 500 metres (600 kes.) and adjust P2 for maximum (the screw of the padding condenser) simultaneously rocking the gang for optimum results.

Repeat the operations until no further improvement is noticed.

Short Waves.—Feed the service oscillator to the aerial and earth sockets through a 400-ohms resistance instead of the dummy aerial or fixed condenser.

Tune the set and oscillator to 16.7 metres (18 mcs.), screw T9 right up, and then carefully unscrew until the second signal peak is heard.

Some sets may have a tendency to pull and change the frequency of the oscillator. If the set under test shows signs of doing this, then by shunting a .00035 variable condenser across the oscillator section of the gang and tuning it so that the second harmonic instead of the fundamental beats with the incoming signal, this pull may be minimised.

Connect the shunt condenser between the tag of T9 and tune it (about half open) for the signal at 18 mcs. Trim T10 for maximum. Disconnect the shunt condenser and retrim T9.

Check that the 18 mcs. image is received at 17.1 mcs. Feed and tune in a signal of 6 mcs. and check for correct calibration. If sensitivity is very low at 6 mcs., then slightly adjust the semi-fixed tracker T11 and then retrim T9 at 18 mcs.

Philco A537 on Test

MODEL A537.—For A.C. mains operation, 200-260 volts, 50-100 cycles. Price, 12 gns.

DESCRIPTION.—Three-waveband, five valve, including rectifier, superhet table model.

FEATURES.— Full-vision scale coloured for wavebands. Concentric slow-motion on tuning. Mains switch combined with tone control. Pick-up and extension L.S. sockets. Other controls for wave selection and volume. Can be used with doublet aerial.

LOADING.—56 watts.

Selectivity and Sensitivity

SHORT WAVES (52.6-16.4 metres).—Excellent selectivity and gain. Good background and excellent stability, with easy handling. Gain well maintained over entire band.

MEDIUM WAVES (176.4-545 metres).—Very good gain and selectivity. Absence of whistles with good general background. Local station spread on adjacent channels only.

LONG WAVES (937.5-2,000 metres).—Excellent gain and adequate selectivity. All main stations easily received. Only slight interference on Deutschlandsender.

Acoustic Output

Ample volume for an ordinary large room without overloading. Very well balanced tone with good top response and clean forward speech. Musical reproduction very pleasing and nicely balanced. Tone control not too vigorous.

Replacement Condensers

REPLACEMENT condensers for the A537 are available from A. H. Hunt, Ltd.

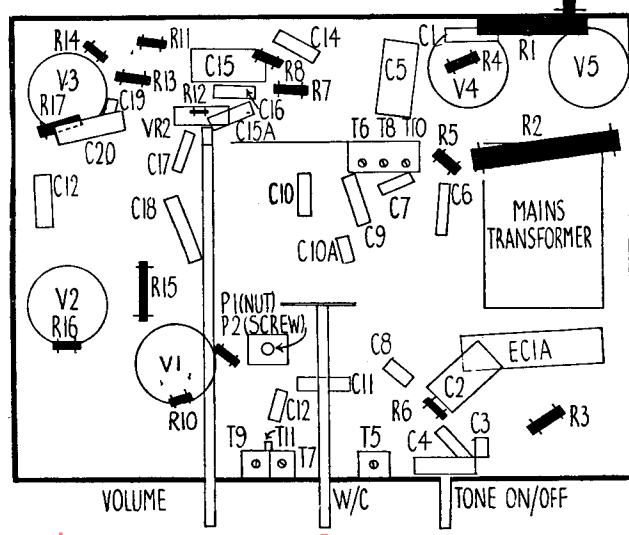
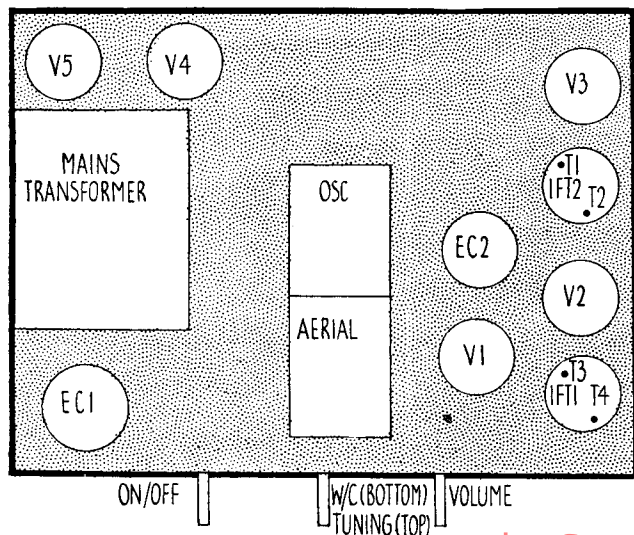
For EC1A there is unit 2985 at 1s. 4d.; EC2, unit 3076, 6s.; and for EC1, unit 3741, 7s.

CONDENSERS

C.	Purpose.	Mfds.
1	Pentode compensator	.002
2	Mains suppressors	.015 & .015
3	Tone control	.00041
4	L.F. coupling	.01
5(2)	V3 bias decoupling	.15
5(3)	V3 anode decoupling	.15
6	S.W. direct aerial coupling	.01
7	Doublet condenser	.00025
8	Pick up shunt	.00025
9	M.W. bottom coupling	.01
10	Aerial transformer coupling	.01
10a	L.W. aerial fixed trimmer	.00003
11	Regeneration feed	.001
12	S/W. osc. bottom coupling	.00005
14	Pick up coupling	.01
15	V2 A.V.C. decoupling	.05
15a	H.F. bypass	.00011
16	L.F. coupling	.01
17	Tone control	.01
18	V1, V2 screen decoupling	.25
19	A.V.C. diode coupling	.00011
20	L.F. coupling	.05
21	H.F. bypass	.05
22	H.F. bypass	.00011
23	H.F. bypass	.00011
EC1A	Bias shunt	10.
EC1	H.T. smoothing	8. & 8.
EC2	V1, V2 & V3 H.T. line decoupling.	16.

RESISTANCES

R.	Purpose.	Ohms.
1	Bias potr.	23 & 23 & 190
2	V1, V2 & V3 H.T. line decoupling.	10,000
3	V4 grid leak	1 meg.
4	V3 bias decoupling	490,000
5	V3 anode decoupling	99,000
6	V3 anode load	240,000
7	V3 grid leak	1 meg.
8	P.U. H.F. filter	51,000
9	Osc. anode feed	10,000
10	Osc. grid resistance	99,000
11	V1 A.V.C. decoupling	10,000
12	Tone control	99,000
13	V2 A.V.C. decoupling	1 meg.
14	A.V.C. diode load	1 meg.
15	V1 & V2 screen potr. (part).	10,000
16	V1 & V2 screen potr. (part).	25,000
17	Demodulating diode load (part).	330,000
18	Demodulating diode load (part).	51,000
	VR1 tone control	500,000
	VR2 volume control	2 meg.
CK1	Field coil	1,140



Top and underside views are given, left and right respectively, by these chassis layout diagrams of the A537. Note that to facilitate reference resistors are in black, condensers in outline.