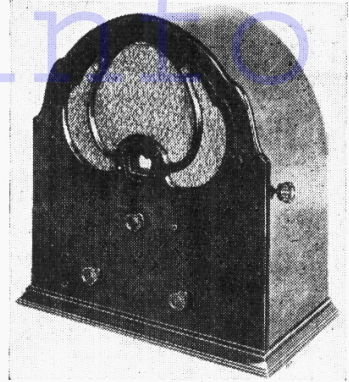


"TRADER" SERVICE SHEET 717

PHILCO 55

COVERING 55A and 55E



TWO RF amplifying stages are used in the Philco 55, a 4-valve (plus rectifier) 2-band TRF receiver. The 55A is designed to operate from AC mains of 100-130 V, 25-60 c/s, and the 55E from AC mains of 200-240 V, 50-100 c/s.

This Service Sheet was prepared from a model 55E, but the principal differences in the 55A are explained overleaf.

Release date and original prices, both models: Table (Baby Grand), £16 16s.; Console (Lowboy), £23 2s.; later reduced to £14 14s. and £19 19s. respectively.

CIRCUIT DESCRIPTION

Aerial input is developed across gain control potentiometer R1 and fed from it to coupling coils L1, L2 and single tuned circuit L3, L4 and C14. "Top" capacitive coupling by L5, which precedes tetrode RF amplifier (V1, Philco 24).

Tuned-secondary RF transformer coupling by L6, L7, L8 and C16 between V1 and second tetrode RF amplifier (V2, Philco 24). "Top" coupling by L9. Gain control of V1 and V2 by potentiometer R4, which is ganged with R1 and forms part of HT circuit potential divider R2, R3, R4, R5. The two cathodes are returned to R4 slider, and R5 limits their negative excursion.

Tuned-secondary RF transformer coupling by L10, L11, L12 and C18 between V2 and a third RF tetrode (V3, Philco 24), this one operating as anode bend detector. RF filtering by C7, R9, C8 in anode circuit.

Resistance-capacitance coupling by R8, C9 and R11 between V3 and pentode output valve (V4, Philco 47E). Fixed tone correction by C11 in anode circuit.

HT current is supplied by full-wave rectifying valve (V5, Philco 80). Smoothing by speaker field L15, in the negative HT lead to chassis, and electrolytic capacitors C12, C13. GB for V4 is obtained from the junction of resistors R12 and R13, which form a potential divider across L15.

DISMANTLING THE SET

Removing chassis.—Remove the three control knobs (pull-off) from the front of the cabinet; from the top of the screening cowl round V1-V3 slip off the top plate which covers the waveband switch assembly, then remove the cowl itself by lifting it after slackening the wood screw in its base at the rear.

Now remove the wavechange control, at the side of the cabinet, first turning it to MW (anti-clockwise), then slackening the fixing screw in the boss at the front of the switch assembly and withdrawing knob and spindle.

Remove the three hexagon self-tapping screws holding the chassis to the bottom of the cabinet, when the chassis may be withdrawn to the extent of the speaker leads; or, if these are unsoldered from the speaker, freed entirely.

When replacing, the leads should be connected as follows, numbering the tags from left to right: 1, green; 2, black/white; 3, black; 4, yellow.

When fitting the cowl, note that its front member slides into a spring clip on the chassis deck; and replace the top plate.

Removing speaker.—Remove the three square nuts holding the speaker to the sub-baffle. When replacing, the transformer should be at the top and the connecting panel at the bottom.

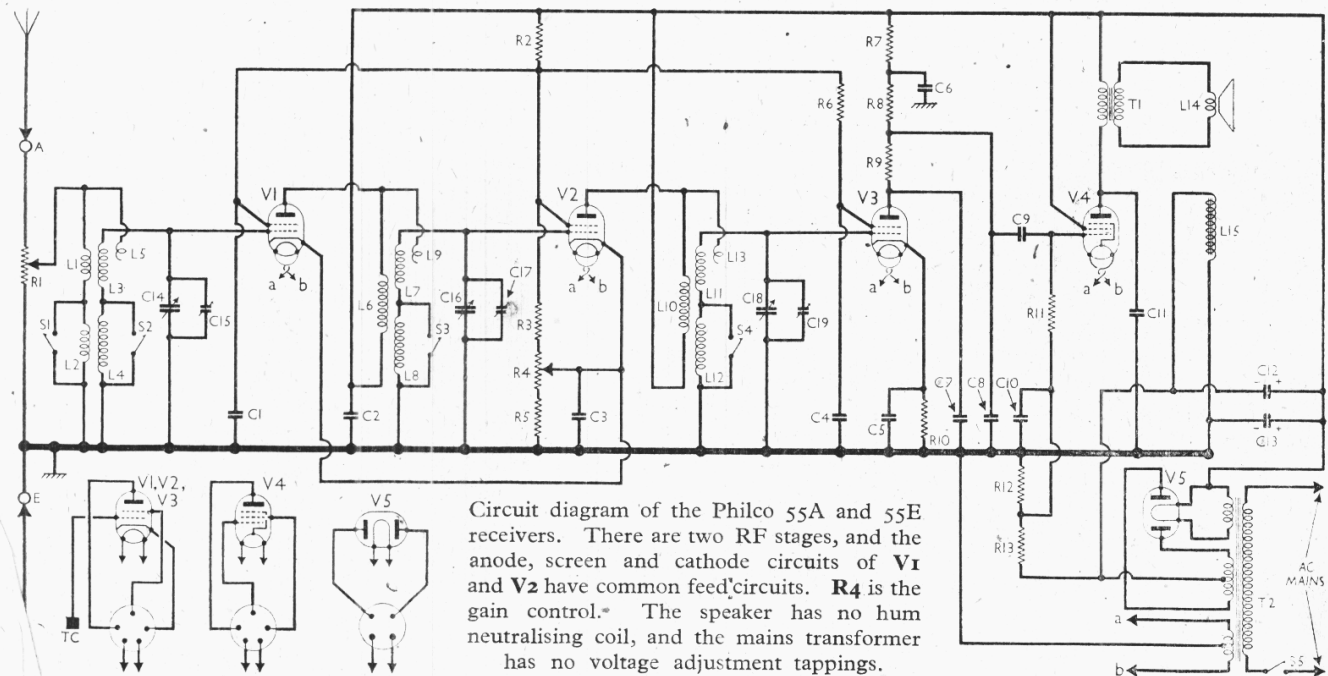
If the leads have been unsoldered, they should be connected as described above.

COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	Aerial input control ...	5,000
R2	V1, V2 SG potential divider resistors ...	25,000
R3		15,000
R4	V1, V2 gain control ...	1,000
R5	V1, V2 fixed GB resistor ...	150
R6	V3 SG HT feed ...	99,000
R7	V3 anode decoupling ...	99,000
R8	V3 anode load ...	240,000
R9	V3 anode RF filter ...	10,000
R10	V3 GB resistor ...	32,000
R11	V4 CG resistor ...	490,000
R12	V4 GB potential divider, shunting L15 ...	160,000
R13		490,000

CAPACITORS		Values (µF)
C1	V1, V2 SG's decoupling ...	0.5
C2	HT circuit RF by-pass ...	0.05
C3	V1, V2 cathodes by-pass ...	0.18
C4	V3 SG decoupling ...	0.25
C5	V3 cathode by-pass ...	0.5
C6	V3 anode decoupling ...	0.15
C7	RF filter capacitors ...	0.00025
C8		0.00025
C9	V3 to V4 AF coupling ...	0.01
C10	V4 CG decoupling ...	0.1
C11	Fixed tone corrector ...	0.01

(continued overleaf)



Circuit diagram of the Philco 55A and 55E receivers. There are two RF stages, and the anode, screen and cathode circuits of V1 and V2 have common feed circuits. R4 is the gain control. The speaker has no hum neutralising coil, and the mains transformer has no voltage adjustment tappings.

CAPACITORS (Continued)		Values (μ F)
C12*	} HT smoothing capacitors {	6.0
C13*		6.0
C14†	Aerial circuit tuning ...	—
C15‡	Aerial MW trimmer ...	—
C16†	1st RF trans. sec. tuning	—
C17‡	1st RF trans. MW trimmer ...	—
C18†	2nd RF trans. sec. tuning	—
C19‡	2nd RF trans. MW trimmer ...	—

* Electrolytic. † Variable. ‡ Pre-set.

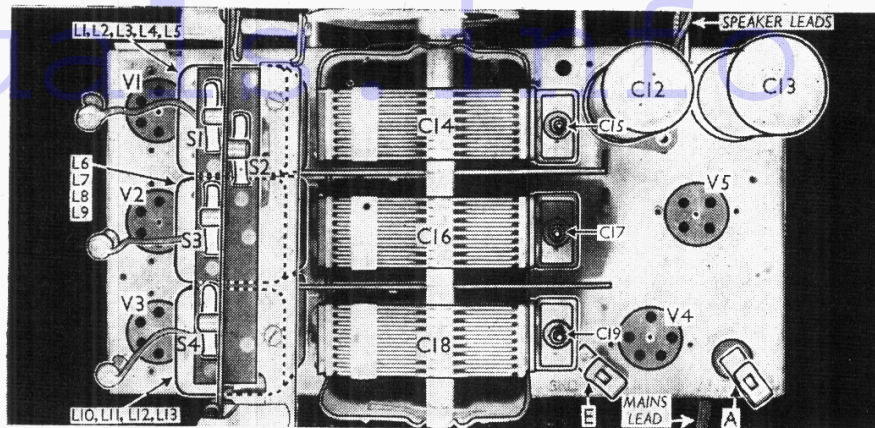
OTHER COMPONENTS		Approx. Values (ohms)
L1	} Aerial coupling coils ... {	25.0
L2		100.0
L3		7.0
L4		46.0
L5	"Top" coupling ...	—
L6	1st RF trans. pri. coil ...	70.0
L7	1st RF trans. secondary	7.0
L8	tuning coils ...	46.0
L9	"Top" coupling ...	—
L10	2nd RF trans. pri. coil ...	70.0
L11	2nd RF trans. secondary	7.0
L12	tuning coils ...	46.0
L13	"Top" coupling ...	—
L14	Speaker speech coil ...	2.0
L15	Speaker field coil ...	1,140.0
T1	Speaker input trans. { Pri., total ... 350.0 } Sec. ... 0.2	
T2	Mains { Pri., total ... 30.0 } Heater sec. ... Very low } Rect. heat. sec. ... Very low } HT sec., total ... 640.0	
S1-S4	Waveband switches ...	—
S5	Mains switch ...	—

GENERAL NOTES

Switches.—S1-S4 are the waveband switches, ranged in an external assembly bolted to the tops of the tuning coil cans and shown in our plan view of the chassis, where the switches are identified. They are operated by a bar which links them, the bar being attached to a lever whose boss accepts the waveband control spindle. The spindle projects through the side of the cabinet, and the waveband positions, when facing the spindle, are: anti-clockwise, MW; clockwise, LW. All four switches close on MW and open on LW.

S5 is the QMB mains switch, of the rotary type, on the front member.

Coils.—The aerial and RF transformer coils, L1-L5, L6-L9 and L10-L13, are in three screened units on the chassis deck. LW have been added for the European



Plan view of the chassis. The waveband switches are added externally on the coil units.

market, and the waveband switches are mounted on top of the cans. L5, L9 and L13 are small coils with one end free.

Moulded Capacitor Blocks.—These are the small moulded blocks beneath the chassis with connecting strips across them. They may contain variously one or two capacitors, and the actual connections are therefore indicated in our under-chassis view. In one case, a unit contains a capacitor C2 and a resistor R5. Where tags have no internal connection to them, but are connected externally, they are marked "Bearer tag."

External Speaker.—No provision is made for connecting an external speaker, but one of high impedance (about 7,000 Ω) or low impedance (about 3-5 Ω) could be connected across the appropriate winding of the internal speaker transformer T1.

Metal Capacitor Block.—C1, C4, C5, C6 and C10 are contained in a single metal-clad unit mounted on the rear chassis member. All five capacitors have one side returned to the case, and their free ends are attached to flexible leads which emerge from one end of the case. The colour coding of these leads is indicated in our under-chassis view. The makers' part number for the unit is 03459.

Model 55A.—Model 55E is designed to operate from AC mains of 200-240 V, 50-

100 c/s, whereas 55A is suitable only for AC mains of 100-130 V, 24-60 c/s.

This involves the use of a different mains transformer from that used in the 55E and a change in two capacitor values. C12 becomes 10 μ F instead of 6 μ F, and C10 becomes 0.05 μ F instead of 0.1 μ F. The connecting leads from the metal-clad capacitor block are also different. The red lead comes from a 0.5 μ F section, the black lead from another 0.5 μ F, the green from a 0.15 μ F, the short white lead from a 0.25 μ F and the long white lead from a 0.05 μ F. The makers' part number is 03455.

VALVE ANALYSIS

Valve voltages and currents given in the table below are approximate values to be expected when the receiver is working with the volume control at maximum, with no signal input. Voltages are measured with a high resistance meter whose negative lead is connected to cathode.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 24	225	4.0	75	1.7
V2 24	225	4.0	75	1.7
V3 24	95	0.7	55	0.3
V4 47E	220	31.0	230	6.0
V5 80	300†	—	—	—

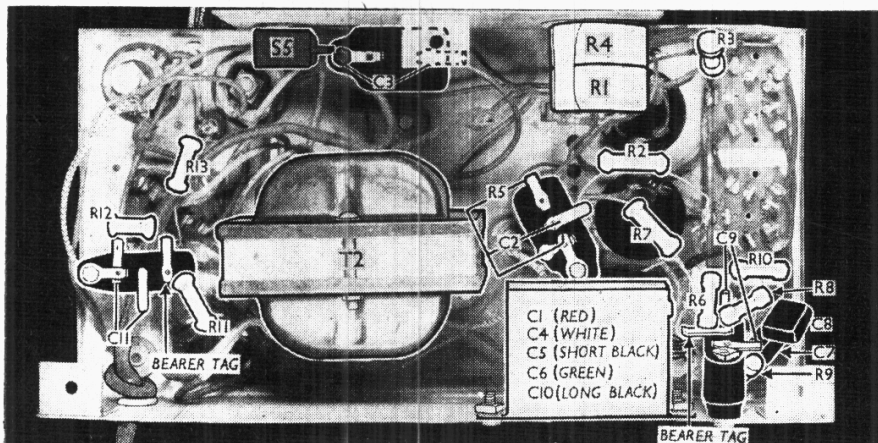
† Each anode to chassis, AC.

CIRCUIT ALIGNMENT

With the gang at maximum, the calibration mark at the end of the MW scale beyond the "55" mark should be vertical. The scales are calibrated in tens of kilocycles: that is, kc/s with the final nought omitted. Turn the volume control to maximum.

MW.—Connect signal generator via a 0.0002 μ F capacitor to A and E clips, and connect a good earth to the E clip. Tune to 1,400 kc/s (140 on scale), switch set to MW (control anti-clockwise), feed in a 1,400 kc/s (214 m) signal, and adjust C19 for maximum output, using a fibre spanner. Then adjust C17 and C15 for maximum output.

There are no further adjustments, but the calibration should be checked at several points on both wavebands.



Under-chassis view. The capacitor block lead colours are indicated.