

PHILCO 237 BATTERY SUPERHET (Cont.)

from the H.T. and its resistance capacity coupled to the first L.F. valve. The circuit contains an H.F. stopper, with the necessary by-pass condensers.

The L.F. valve, "30" (V4), is coupled by a Class B driver transformer to the output valve. This is a Class B "19," working with bias. Tone compensation is obtained by a small condenser between each anode and H.T. +.

A large permanent magnet speaker is employed.

Special Notes.—In earlier models the chassis has to be removed to allow the valve screen to be unscrewed, but in later types the side of the cabinet can be opened to facilitate changing valves.

The battery leads have tags with the required voltages, but in case these are missing, the braids are coded:—

- White with black tracer L.T. +.
- Black with white tracer L.T. -.

Yellow with black tracer H.T. + 67½ v.
 Yellow, H.T. + 126v.
 Blue, -3v. G.B.
 Green, -9v. G.B.

Quick Tests.—Raise the "30" valve slightly in its socket and with a test prod on the H.T.+ lead of the voltmeter touch the inner rear valve leg (anode). The voltage should be practically full H.T.

Touching the outer rear leg (grid) should produce a loud pop in the speaker if the L.F. section is operating.

Touching the stator vanes of the rear tuning condenser (aerial tuner) should produce a loud click if the set is correct.

VALVE READINGS

Valve.	Type.	Electrode.	Volts.
1	...	15 anode	120
2	...	32 aux. grid	70
3	...	32 anode	120
		screen	70
4	...	30 anode	50
5	...	19 anode	110
		each anode	120

Removing Chassis.—To reach valves, it is advisable to remove the chassis by first removing the back board, pulling off the knobs, and removing the three holding screws underneath. The inclusion of long leads with the screen removed makes the H.F. side unstable.

General Notes.—C3 and R6 are mounted in the oscillator coil container.

Leads to the L.S. are green and white, H.T. +; green, anode; white, anode.

The valves have American bases, and the terminals are as follows (looking from underneath the valve-holder and counting clockwise from the two filament pins, which are the large ones together):—

- "15," anode, screen, cathode, grid at top.
- "32," anode, screen, grid at top.
- "30," anode, grid.
- "19," anode, grid; anode, grid (paired in this order).

Replacing Chassis.—Lay chassis into cabinet, and replace three holding screws and knobs. Replace back strut after fixing batteries and aerial and earth leads.

MURPHY A4 SUPERHET

Circuit.—A combined first detector-oscillator, an A.C./Pen. (V1), is preceded by a band-pass aerial tuner. Reaction is brought about by coupling between the anode and the auxiliary grid. Bias is obtained from a potentiometer across the L.S. field in the negative H.T. lead. V1 is coupled to the L.F. valve by a band-pass L.F. transformer (frequency 120 K.C.).

The L.F. valve, AC/SG/VM (V2), is a variable-mu type, and volume control is by a variable resistance, R7, in the cathode lead. The aerial is connected to the other end of the potentiometer so that the aerial coil is "damped" as the bias on the L.F. valve is increased. This valve is coupled to the next by a second band-pass L.F. transformer.

The second detector valve, AC/HL (V3), is used as an anode-bend detector. The anode circuit is decoupled and its resistance capacity coupled to the grid of the output valve.

The output valve is another AC/Pen (V4). In the grid circuit is a stabilising resistance R12, used in conjunction with R11 and C25 as an H.F. stopper. The grid leak R10 is of very low value (150,000 ohms).

Tone compensation, included in the anode circuit, consists of (1) a fixed condenser, and (2) a fixed condenser and a resistance in series, between the anode and earth.

A full-wave rectifier, a Philips 1807, is utilised, and smoothing is provided by a choke and the L.S. field in the negative H.T. lead. This is used in conjunction with 8, 4 and J mfd. electrolytic condensers. The choke is tuned by C31 to form a 100 cycle trap.

Special Notes.—The condenser C7 consists of two wires held together by systoflex.

All the biasing potentials are obtained from four resistances in series across the L.S. field.

The bias lead for "gram." is actually taken to one side of the jack.

A special diagram of the condenser unit is given.

Quick Tests.—Voltage between containers of C28 (-) and C30 (+) 120 volts.

This represents voltage drop across choke and field coil with bias potentiometer (C28 is insulated from chassis).

Removing Chassis.—Remove knobs by holding them firmly and unscrewing the nipple nuts. Remove three screws from underneath, pull out the L.S. field plugs and the L.S. plugs and lift out the chassis.

When the repair is finished and it is necessary to test components with the field and speech coil connected, release the leads from the clips and stand the chassis on the output transformer end.

To remove the speaker, lay the cabinet on

its face, and remove the four round-headed screws on the oval plates.

General Notes.—The resistance and condenser unit is the W907 assembly, and whenever a component is defective the complete unit may be replaced.

As a temporary measure an external resistance of the same rating or a condenser of the same capacity and working voltage may be used. It will, however, be necessary to check the remaining components particularly the resistances, as an open circuit or great increase in value of R14, 15, 16 or 17 might result in zero bias being applied to the valves.

The important sockets and terminals on the components are labelled so that there should be no confusion.

VALVE READINGS

V.C. max. no signal.

Valve.	Type.	Electrode.	Volts.	M.A.
1	AC/Pen	anode	100	1.5 to 2
		aux. grid	40	—
2	AC/SG/VM	anode	200	7 to 8
		screen	80	—
3	AC/HL	anode	140	.2
4	AC/Pen	anode	190	30
		aux. grid	210	5.5



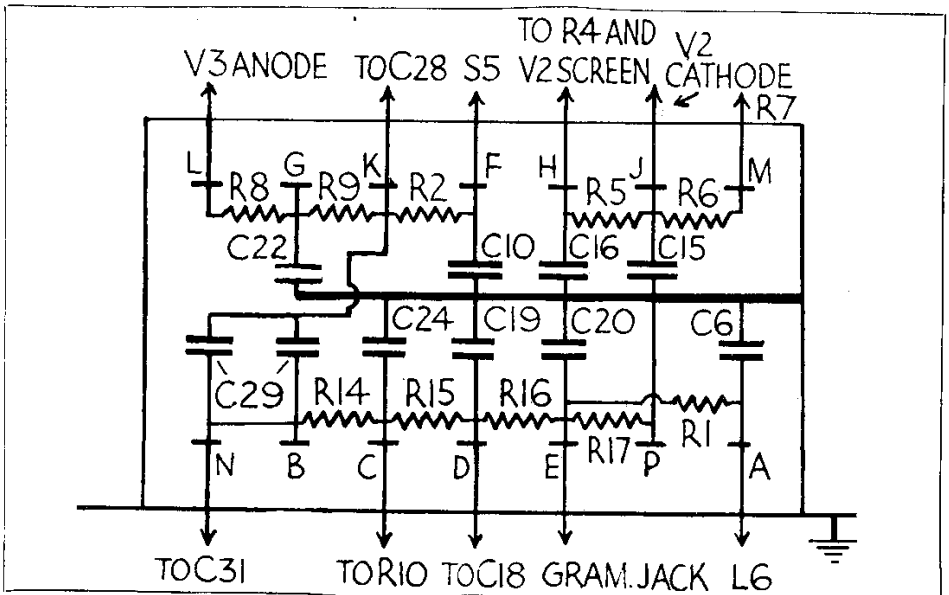
The A4 four-valve plus rectifier mains super-heterodyne by Murphy Radio Ltd.

The + field lead is the inner one which is at chassis potential.

Between the rectifying valve and the detector (V3) is a small insulating strip supporting several components. These are:—

On rectifier side, C25 and R10, R11 and R12. On V3 side, C21 (next base), and C23 (tubular).

(Continued on next page.)



The connections of the condenser block in the Murphy A4 receiver. The letters are those actually on the unit.

MURPHY A4 MAINS SUPERHET (Cont.)

Another assembly between V1 and V4 has :-

On V4 side, C26, R3 and C27 (tubular).

On V1 side, C12 (next base plate) and C11.

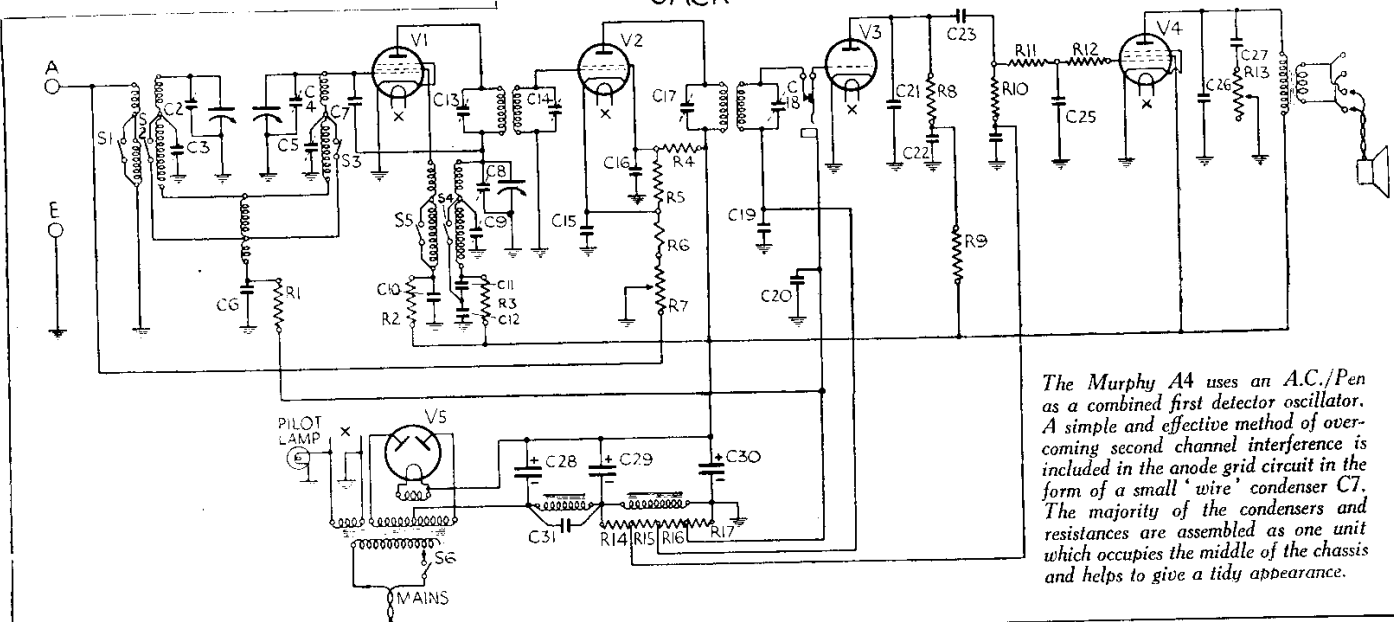
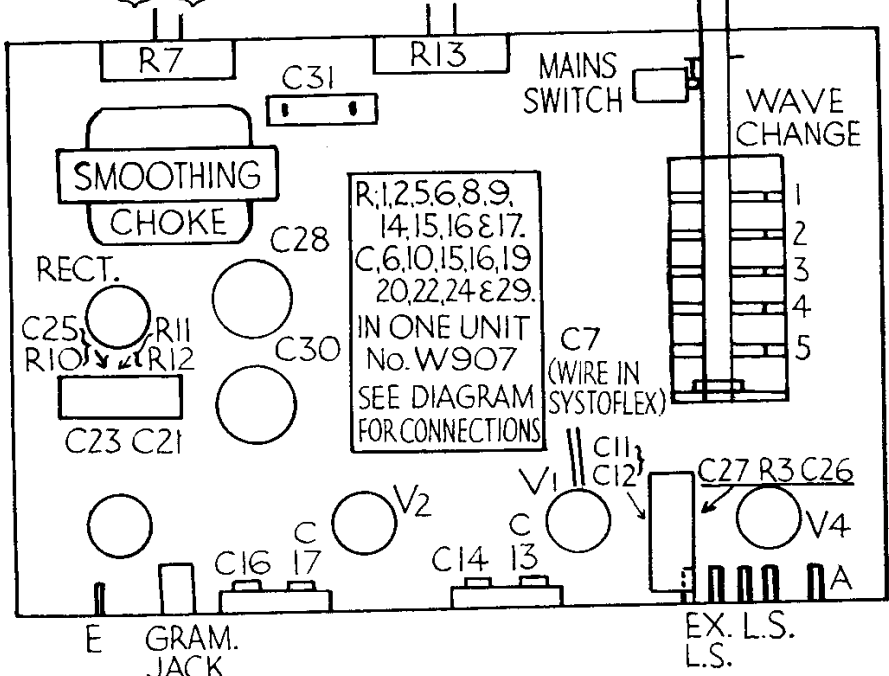
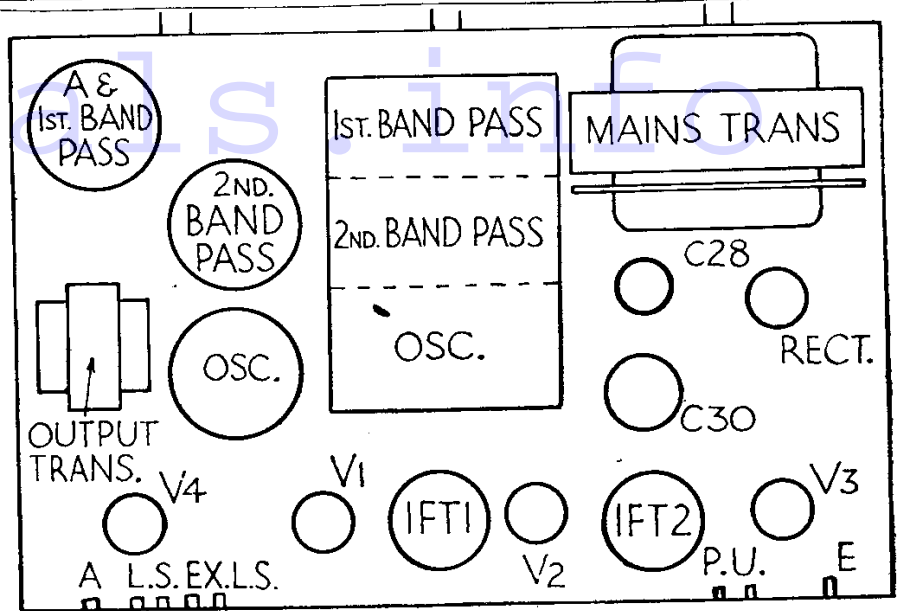
Replacing Chassis.—Slide chassis into cabinet, plug in speaker leads and replace knobs.

CONDENSERS

C.	Purpose.	Mfd.
6	Band-pass-filter coupling	.1
7	Image suppressor	Wire condenser.
10	V1 aux-grid decoupling	.1
11	Padding L.W. on oscillator coil	1,373
12	Tracking condenser on oscillator coil	2,000
15	V2 cathode	.1
16	V2 screen	.1
19	Decoupling bias V3	.5
20	Decoupling bias V3 for 'grams	.1
21	V3 anode by-pass	.001
22	V3 anode decoupling	1
23	L.F. coupling V3, V4	.025
24	V4 bias decoupling	1
25	H.F. by-pass grid V4	.0002
26	Pentode compensator anode V4	.002
27	Part of tone control circuit	.025
28	H.T. smoothing (electrolytic)	4
29	H.T. smoothing	1
30	H.T. smoothing (electrolytic)	8
31	Formus hum absorption trap with choke	.1 or .4

RESISTANCES

R.	Purpose.	Ohms.
1	Decoupling V1 bias	50,000
2	Decoupling aux. grid circuit (osc.), V1	300,000
3	Decoupling anode circuit (osc.) V1	50,000
4	Top part of screen ptr. to V2	20,000
5	Lower part of screen ptr. to V2	20,000
6	Fixed bias resistor cathode V2	200
7	Var. bias ptr. and volume control	8,000
8	L.F. coupling V3, V4	50,000
9	Decoupling anode V3	25,000
10	V4 grid leak	150,000
11	H.F. stopper grid V4	100,000
12	Stabiliser grid V4	100,000
13	Var. tone control circuit anode V4	50,000
14	Bias ptr. across L.S. field	400,000
15		20,000
16		15,000
17		15,000
—	L.S. field coil (between field coil plugs)	2,000
—	Smoothing choke (across C31)	300
—	Primary of output transformer	700
—	Speech coil	2



The Murphy A4 uses an A.C./Pen as a combined first detector oscillator. A simple and effective method of overcoming second channel interference is included in the anode grid circuit in the form of a small 'wire' condenser C7. The majority of the condensers and resistances are assembled as one unit which occupies the middle of the chassis and helps to give a tidy appearance.