

PYE "CAMBRIDGE" A.C. MAINS SUPERHET

Circuit.—An H.F. valve, AC/SG/VM met. (V1) is preceded by an aperiodic coupling coil and a tuned grid coil. Bias is obtained entirely from the A.V.C. line. Coupling to the next valve is by H.F. choke and condenser filter.

The combined first detector-oscillator, AC/S2/Pen. met. (V2) operates with reaction applied through a coupling coil in the cathode circuit. Bias is fixed, and is obtained by cathode resistance. Coupling to the next

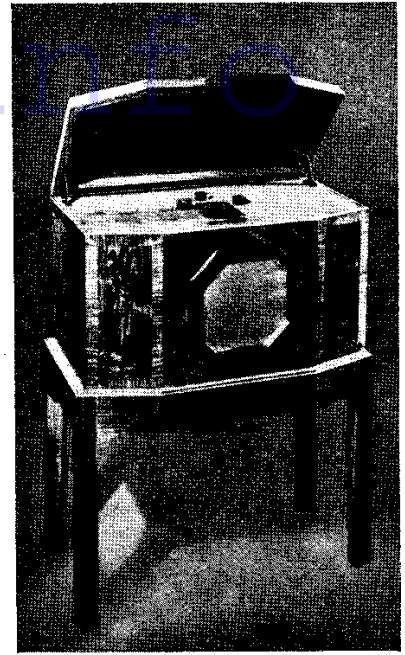
valve is by tapped-primary band-pass I.F. transformer (frequency, 114 kc.).

The I.F. valve, AC/S1/VM (V3), also controlled entirely by A.V.C., is coupled to the second detector by a second band-pass I.F. transformer.

The second detector and L.F. amplifying valve, AC/HL/DD (V4), a double diode triode, provides amplified delayed A.V.C. Coupling to the output valve is by parallel-fed transformer.

A triode output valve, PP3/250 (V5), ob-

(Continued on opposite page.)



The "Cambridge" CR/A.C. receiver by Pye Radio, Ltd.

RESISTANCES

R.	Purpose.	Ohms.
1	"Damping" resistance for local reception	7.5
2	V1 anode decoupling	20,000
3	V1 screen decoupling	8,500
4	V1 and V3 screen top part of ptr.	25,000
5	V2 grid leak	50,000
6	V2 cathode bias	2,000
7	V2 screen decoupling	20,000
8	V1 and V3 screen lower part of ptr.	12,500
9	V3 anode decoupling	15,000
10	V4 triode bias feed	2 meg.
11	H.F. stopper, grid V4	5,000
12	Manual V.C.	40,000
13	V4 grid stabilising	2 meg.
14	V4 cathode bias	500
15	In parallel, giving amplified A.V.C.	50,000
16	Decoupling A.V.C. line	50,000
17	Decoupling A.V.C. line	.25 meg.
18	Bias feed to A.V.C. diode anode	.5 meg.
19	V5 grid decoupling	50,000
20	V5 bias ptr.	40,000
21	V5 bias ptr.	28,000
22	Delay bias resistance	64
23	V4 anode L.F. coupling	15,000
24	Shunted across tuning indicator	1,000 or 1,700
25	Decoupling A.V.C. to V1	100,000

CONDENSERS

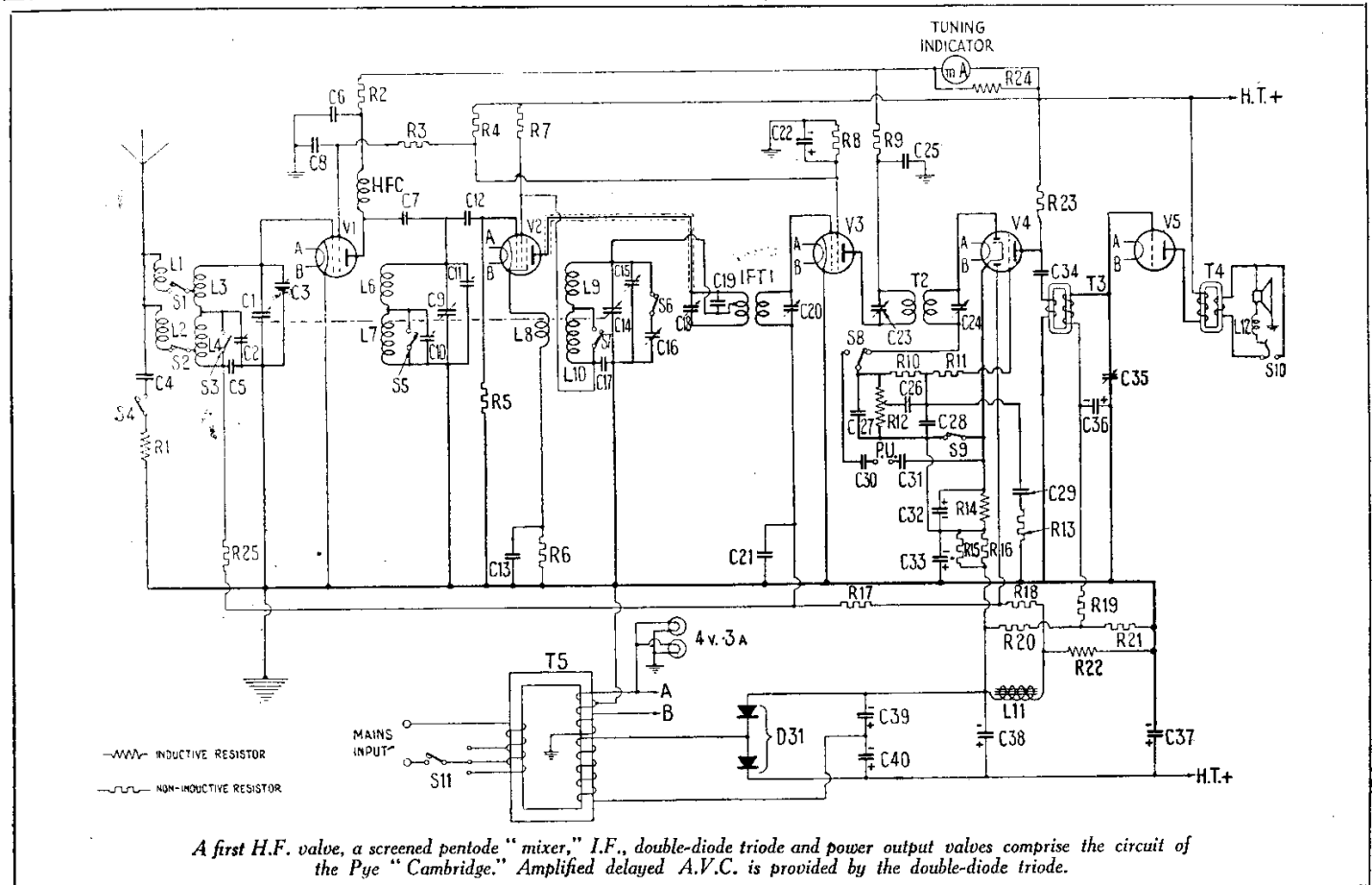
C.	Purpose.	Mfd.
4	Series with L.D. resist.	.01 N
5	Blocking bias to V1	.25 N
6	V1 anode decoupling	.1 N
7	H.F. coupling V1 V2	.0002
8	V1 screen	.1 N
12	V2 grid	.00002
13	V2 cathode	.01 N
17	V2 anode decoupling	.1 N
19	Across part of IFT1 primary	.0003
21	V3 grid decoupling from A.V.C.	.25 N
22	V3 screen	4 el.
25	V3 anode decoupling	.1 N
26	J.F. feed from diode	.25
27	H.F. by-pass from diode	.0002
28	H.F. by-pass from V 4 grid stopper	.001
29	V4 grid stabilising V	.01
30	Series with P.V. leads	.25
31	Series with P.V. leads	.25
32	V4 cathode	25 el.
33	Decoupling amplified bias	4 el.
34	L.F. feed to transformer	.25
36	V5 grid decoupling	4 el.
37	H.T. smoothing	8 el.wet
38	H.T. smoothing	16 el.wet
39	Voltage doubling circuit	4 el.wet
40	Voltage doubling circuit	4 el.wet

N = non-inductive

VALVE READINGS

[No signal.]

V.	Type.	Electrode.	Volts.	M.A.
1	AC/SG/VM met.	anode ...	145	6.6
		screen ...	45	2
2	AC/S2/Pen. met.	anode ...	185	4.8
		screen ...	186	—
3	AC/S1/VM met.	anode ...	200	5.3
		screen ...	63	2
4	AC/HL/DD met.	anode ...	146	7.7
5	PP3/250	anode ...	275	25



PYE "CAMBRIDGE" A.C. SUPERHET (Cont.)

tains its bias from a potentiometer, R20, and R21 across the speaker field and a resistance R22 in the negative H.T. lead. A variable condenser, C35, connected between the grid and chassis acts as a tone control.

The output circuit is conventional, except that the jack for the external speaker can operate a switch to cut out the internal speaker, making its use optional.

Mains equipment, as usual, consists of transformer, metal rectifier on voltage doubler principle, and electrolytic condensers.

Special Notes.—The tuning indicator consists of a meter movement in series with the H.T. lead to the two controlled valves V1 and V3.

The amplified delayed A.V.C. is obtained by the delay bias from R22 and from the change in voltage drop across R15 and R16 in parallel. The cathode is connected through these and the bias resistor, R14, to negative of the H.T. supply.

Quick Tests.—Between end (+) plate of rectifier and chassis (earth socket or rivet) 280 volts (H.T. smoothed).

The output transformer is not accessible in this set, and so valve tests should be used.

The local-distance switch at the back operates by connecting R1 and C4 across the aerial coil.

Removing Chassis.—Remove ten wood screws round the top panel and pull off the knobs.

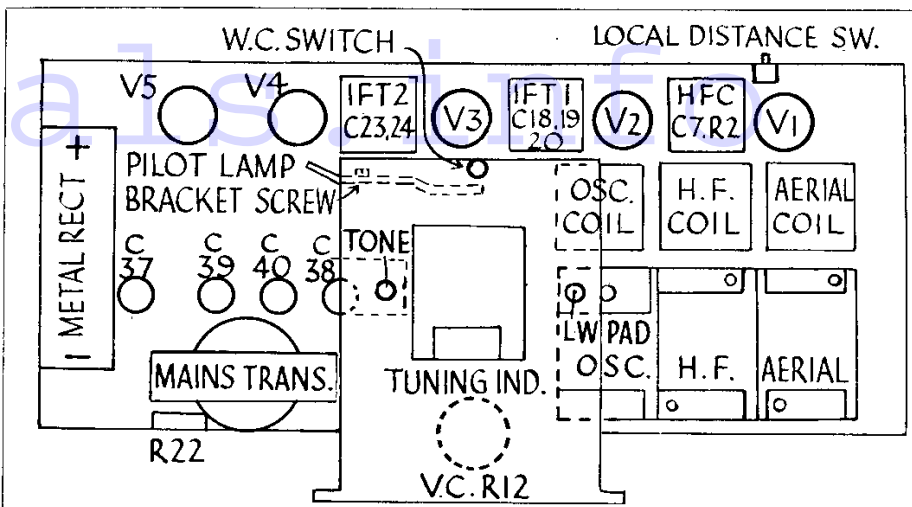
Removing the inside top panel is rather tricky, as the lid stops must be freed from the springs inside. One very easy method appears to be to face the back of the set and force the left-hand spring apart with the right hand while easing the stop upwards with the left hand (on the upper side), in which position the rear part of the spring will engage against the end of the "stop" lever.

Holding the lid steady, open the spring on the right side, and the stop levers will come clear of the springs. Alternatively, wood blocks can be used to keep the springs apart.

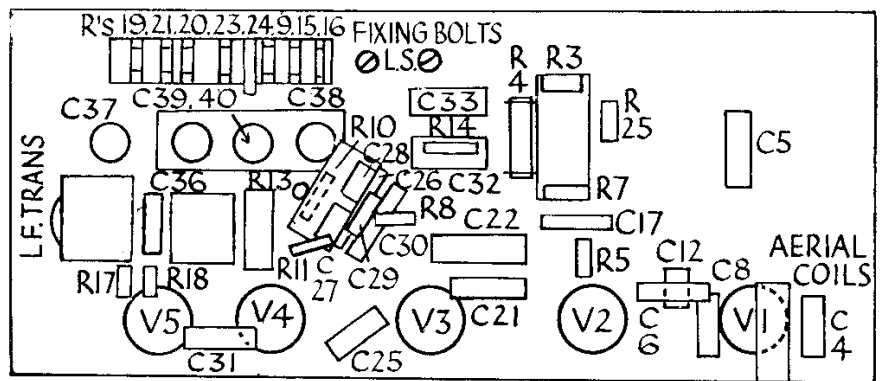
After removing the panel, undo the cleats holding the various leads to the cabinet, remove the extra speaker panel and the mains switch. Slacken, but do not remove, the two long screws fixing the speaker (these can be reached through the holes in the bottom of the cabinet), and ease the speaker away from the baffle.

Standing the set with alternate corners projecting over the bench, remove the four nuts underneath. Remove the two screws holding the front of the chassis to the cabinet, taking care of the rubber washers.

The chassis can then be manoeuvred out of the cabinet by raising the rectifier end in advance of the other.



The positions of the escutcheon and the various controls are indicated in this plan of the "Cambridge" chassis.



Most of the larger components are situated on top of the chassis, and consequently the resistances and components underneath are accessibly spaced.

General Notes.—Despite its complicated appearance this set is remarkably simple.

The wiring is coded as follows:—Aerial, white; H.T. + and screen, red; A.V.C. circuit, black with red tracer; heaters, black; mains, A.C. H.T., red with yellow tracer.

Valve circuit code:—V1, grid, violet; V2, grid, blue; anode, blue with yellow tracer; V3, grid, green; V4, anode, pink with yellow tracer; diode anodes, yellow; V5, grid, brown; anode, brown with yellow tracer.

The tuning indicator is shunted by the resistance, R24, which is, adapted to the resistance of the particular meter movement. In our model the value was 2,600 ohms to give the requisite deflection.

Replacing Chassis.—Lower H.F. end of chassis first, and let holding bolts fall into holes. Replace nuts underneath. Clip the leads under the cleats and replace the speaker and switch panels.

Replace the two screws with metal centring pieces on the front of the chassis above the speaker. Slide the speaker forward and, keeping it pressed against the baffle, tighten the holding screws underneath. Replace the top panel and ten wood screws.

To engage the lid stops lift the lid up and arrange the pulley wheels on the springs so that the curved under side of the stops are resting in the tops of the grooves. A gentle pressure on the lid will open the springs and allow the lid to close.

PHILIPS MODEL 834 C FOUR-STAGE RECEIVER FOR D.C. MAINS

Circuit.—The first H.F. valve, SP20 (V1), is preceded by a single tuned aerial circuit with a coil identical with those in other Superinductance models. Bias is limited by a fixed cathode resistance and is varied by a potentiometer forming part of a screen feed potential divider.

Coupling to the next valve is by a tuned secondary coil of similar dimension to the aerial coil.

The second H.F. valve, SP20 (V2), is used with fixed bias. The grid lead is taken from a tapping on the coil and a grid stabiliser is included immediately in the grid lead. Coupling to the detector is by another H.F. transformer with a semi aperiodic secondary. Next, an H20 (V3) operates as an anode

bend detector. The leads to the pick-up terminals include blocking condensers.

The L.F. coupling is by resistance capacity filter and the anode circuit is properly decoupled.

Two Pen. 20 output valves are connected in parallel in both grid, cathode and anode circuits though the filaments are in series.

CALIBRATION SCHEME.

Subscribers may have their oscillators and own standard components calibrated at THE BROADCASTER laboratory. The charges are the lowest possible. Write for details.

Bias is obtained by resistance in the common cathode lead.

To protect the leads to the extra speaker the feed is taken through two D.C. blocking condensers. The speaker is the usual permanent magnet type.

D.C. mains equipment consists of a barretter lamp in the positive lead and a smoothing choke with reservoir condensers.

Special Notes.—The chassis is at mains negative potential though the speaker is at earth. C31 is the condenser connecting the two potentials.

The valves are of the 20-volt, .18 amp. type, and the current is limited by means of

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