

# PILOT B344 BATTERY ALL-WAVE FOUR

**CIRCUIT.**—Either a doublet or ordinary single wire aerial can be used, a shorting link being provided for use with the latter. The aerial is coupled to the grid of V1, a heptode frequency changer, via a set of tuned secondary H.F. transformer coils. An I.F. wavetrapp is incorporated in the aerial circuit.

The output of V1 passes via an iron core I.F. transformer to the grid of V2, a tetrode acting as the I.F. amplifier, and thence through another I.F. transformer (this time of air core construction) to the demodulating diode of V3, a double diode triode.

The other diode of V3 provides a D.C. potential which is fed back to the preceding stages to give automatic volume control. The grid of the triode section of V3 is fed through a volume control that operates so as to vary the input to the grid of the valve in question. A variable resistance and condenser, connected in series, is shunted across the primary of an L.F. transformer in the anode circuit of V3, giving tone control.

The secondary of the L.F. transformer feeds the twin grids of V4, a double pentode output valve, the two halves working in a push-pull arrangement. The output of the twin anodes passes through a push-pull output transformer, located on the speaker frame, to the voice coil of a permanent magnet speaker.

Power is provided by a medium-size 135 volt H.T. battery tapped at 90 volts, 2 volts low tension battery and a 10.5 volt grid bias unit giving 4.5, 9 and 10.5 volts negative. The makers of the receiver recommend Ever-Ready P.49, Siemens 1337, Pertrix 357, or Hellesen TP/B for the H.T. battery.

**Special Notes.**—There are two dial lights in the receiver located one at the top and the other at the bottom of the wavelength

dial assembly. They are rated at 2 volts .06 amp., and are of the bayonet-type fitting in holders clamped to the dial assembly.

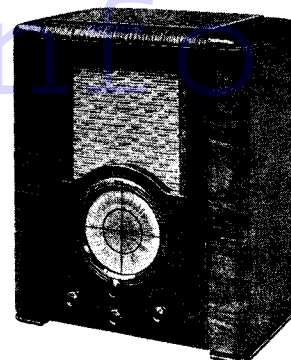
A jack provided at the rear of the chassis enables a pick-up to be connected. The pick-up should be of the high impedance type.

A metallic bridging contact is provided adapted to short A1 to the earth terminal of the receiver when using the set with an ordinary single wire aerial. If it is desired to use a doublet aerial with the receiver this shorting bar must be removed.

Fixed condenser C16 was found to have a capacity of 6 mfd. in our particular chassis.

**Chassis Removal.**—The back of the cabinet is secured by four screws. The tuning control knob is of the grub-screw type, and the other three are spring secured. Turn the cabinet up on its side and remove the four bolts and washers observed on the base, taking the usual precautions to prevent the chassis from falling to the bench.

Turn the cabinet to its usual upright position and remove the speaker cable plug



Octal valves are used in this battery all-wave superhet four made by Pilot Radio, Ltd., and listed at 11½ gns.

from its place on the top rear of the chassis. The chassis can then be completely removed.

The speaker is secured by four bolts with sliding clip tops and can be taken out if desired with the chassis.

## Circuit Alignment Notes

**I.F. Circuits.**—Connect a service oscillator between the grid of V2 (the I.F. amplifying valve) and chassis via a .1 mfd. fixed condenser and connect an output meter in the usual manner. Turn the wavechange switch to medium waves and gang condenser to maximum capacity. Turn volume control to maximum.

Tune the external oscillator to 456 kc. and adjust the trimmers of the second I.F. transformer until maximum response is obtained in the output meter.

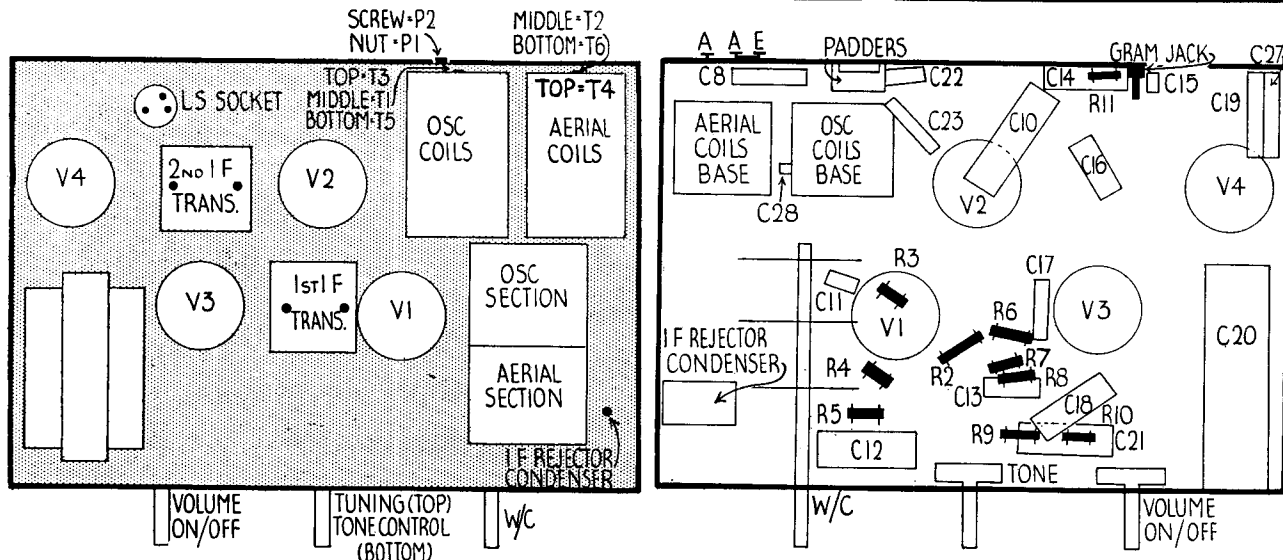
## VALVE READINGS

No signal. 128 volts H.T. 9 volts negative grid bias. Volume maximum.

V.	Type.	Electrode.	Volts.	Ma.
1	All Octal bases Pilot valves. 1C7G	Anode ...	128	1.5
		Screen ...	105	1.3
		Osc. anode ...	112	3
2	1D5G	Anode ...	128	3.5
		Screen ...	105	1.6
3	1H6.6	Anode ...	125	.5
		Anode ...	127	2.4
4	1E7G	Anode ...	127	2.2
		Screen ...	128	1.4

## QUICK TESTS

These are available on the speaker transformer leads. Volts measured between these and the chassis should be:—  
Red lead, 129 volts.  
Blue leads, 127 volts.



Every component, including trimmers, can be identified easily with the aid of the chassis diagrams. The tinted drawing (left) gives the top view.

For more information remember  
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Then connect the oscillator to the grid of V1 (the frequency changer) and adjust the trimmers of the first I.F. transformer for maximum response, reducing the input from the service oscillator as the circuits come into line so as to render the A.V.C. inoperative.

**Signal Circuits.**—Leave the output meter connected as before but connect the service oscillator to the aerial and earth terminals of the receiver through a fixed condenser having a capacity of .0002 mfd.

**Medium Waves.**—Tune set and oscillator to 200 metres (1,500 kc.) and adjust the M.W. oscillator trimmer T1 and aerial circuit trimmer T2 for maximum.

Tune set and oscillator to 500 metres (600 kc.) and adjust medium-wave padding condenser P1 for maximum response simultaneously rocking the gang.

Repeat the 200 metres adjustment to ensure correct calibration and maximum sensitivity.

**Long Waves.**—Tune set and oscillator to 800 metres (375 kc.) and adjust long-wave oscillator trimmer T3 and trimmer T4 respectively for maximum. Tune set and oscillator to 2,000 metres (150 kc.) and

adjust long wave padding condenser P2 for maximum simultaneously rocking the gang condenser to ensure optimum results.

Repeat the 800 metres adjustment to ensure correct calibration and maximum sensitivity.

**Short Waves.**—Tune the set and oscillator to 16.6 metres (18 mg.) and adjust T5 and T6 respectively for maximum response. The 16.6 metres position on the wavelength dial is indicated by a long thin line adjacent to the 17 metres calibration mark.

The short wave padding condenser is fixed.

**I.F. Wavetrap.**—Tune oscillator to 456 kc. and set the tuning condenser gang to maximum capacity and the wavechange switch to the medium wave position.

Adjust the rejector condenser (located as in layout and diagram) for minimum.

Two exact service replacement condensers for the Belmont B344 are available from A. H. Hunt, Ltd.

These are: For C20, unit list number 2633, price 3s. 3d; for C21, unit 2985, price 1s. 4d

## Pilot B344 on Test

**MODEL B 344.**—Standard model for battery operation, requiring 135-volt H.T. battery, 10½ G.B. battery tapped at 4½, 9 and 10½ volts, 2-volt 45-amp. accumulator. Recommended H.T.s: Ever Ready P49, Siemens 1337, Pertrix 357 and Hellesen TP/B. Price, without batteries, 11½ gns.

**DESCRIPTION.**—Three-waveband, four-valve, battery superhet table model.

**FEATURES.**—Full-vision circular scale with wavelength and name calibration. Controls for tuning, volume, tone and waveband. Pick-up connection by jack. No extra speaker connection.

**LOADING.**—H.T., 17 ma.; L.T., 0.45 amp.

**Sensitivity and Selectivity**  
SHORT WAVES (16-52 metres).—Very good sensitivity and standard selectivity. No drift and easy handling.

MEDIUM WAVES (168-555 metres).—Excellent gain and good selectivity. Low background. Local station spread on adjacent channels only. General performance comparable with mains superhet.

LONG WAVES (740-2,200 metres).—Representative performance with adequate gain and selectivity. Slight overlap on Deutschland-sender.

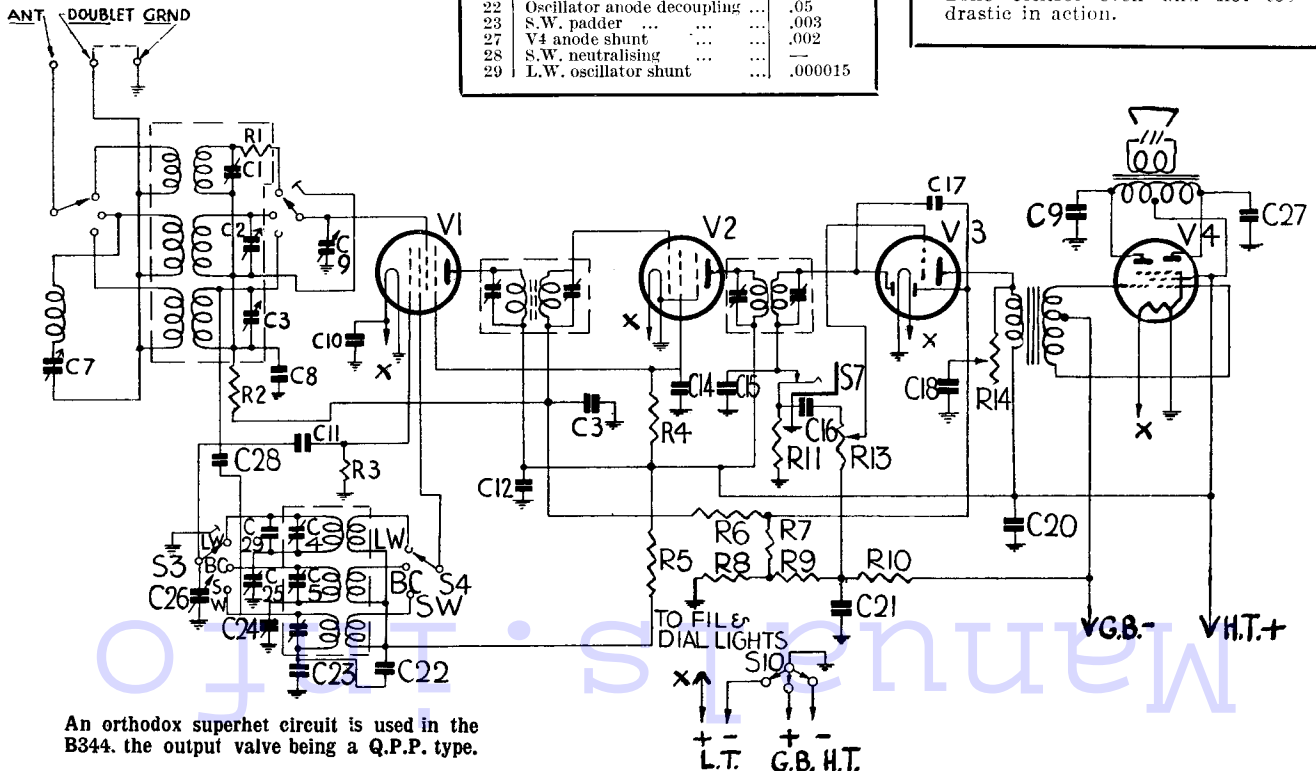
**Acoustic Output**  
Excellent volume for a battery receiver. Well balanced characteristic and good top response. Tone control even and not too drastic in action.

### RESISTANCES

R.	Purpose.	Ohms.
1	V1 series grid ...	50
2	V1 A.V.C. decoupling ...	100,000
3	Oscillator grid leak ...	50,000
4	V1, V2, screen decoupling ...	22,000
5	Oscillator anode decoupling ...	3,000
6	V2 A.V.C. decoupling ...	1 megohm
7	A.V.C. diode load (part) ...	1 megohm
8	A.V.C. diode load (part) ...	10,000
9	Bias potentiometer (part) ...	10,000
10	Bias potentiometer (part) ...	50,000
11	Demodulator diode load ...	500,000
13	Volume control ...	1 megohm
14	Tone control ...	100,000

### CONDENSERS

C	Purpose.	Mfcs.
8	V1 A.V.C. decoupling ...	.05
10	V1 filament H.F. bypass ...	.25
11	Oscillator grid ...	.00005
12	V1, V2 anode decoupling ...	.5
13	V2 A.V.C. decoupling ...	.05
14	V1, V2 screen decoupling ...	.25
15	H.F. bypass ...	.0001
16	L.F. coupling ...	.01
17	A.V.C. diode coupling ...	.00005
18	Tone control ...	.01
19	V4 anode shunt ...	.002
20	H.T. reservoir ...	8
21	Bias decoupling ...	10
22	Oscillator anode decoupling ...	.05
23	S.W. padder ...	.003
27	V4 anode shunt ...	.002
28	S.W. neutralising ...	—
29	L.W. oscillator shunt ...	.000015



An orthodox superhet circuit is used in the B344, the output valve being a Q.P.P. type.