PILOT B43 BATTERY SUPERHET FOUR

CIRCUIT.—A set of H.F. transformer coils couples the aerial to the signal grid of V1, a TP23 frequency changer. The oscillator section incorporates a tuned anode circuit with a coupling condenser to the reaction windings. A higher oscillator voltage is applied on the short wave band.

An iron-core I.F. transformer, tuned to 451 kcs., couples V1 to the grid of V2, an H.F. pentode operating as the I.F. amplifier. Both V1 and V2 are A.V.C. controlled.

Another I.F. transformer of similar construction provides the coupling between V2 and the demodulating diode of V3, a double diode triode. The other diode, fed by a coupling condenser C16, provides a D.C. potential utilised for A.V.C. The coupling arrangements to the grid of the triode section include a manual volume control R11.

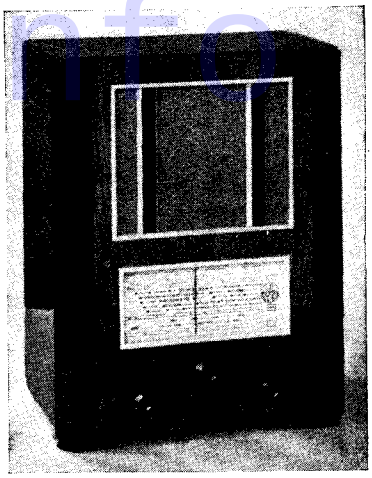
V3 is resistance capacity coupled to V4, a Pen.24 output valve. A pentode compensator condenser C21 provides fixed modification of tone. Bias for V4 and V3 is obtained automatically by resistances connected between L.T. negative and H.T. negative.

The receiver requires a 120 volt H.T. battery and a 45 a.h. L.T. accumulator.

Chassis Removal.—Remove back of cabinet, secured by sliding clips, and all batteries. Remove the two spring fixed knobs, the grub screw fixed tuning knob, and four chassis-securing bolts from the base. The chassis may then be withdrawn to the extent of the speaker cable.

The speaker may be removed if desired or, alternatively, the two leads to the speaker transformer may be unsoldered. These are connected to the second and fourth tags, the blue being taken to the second tag from the top.

Special Notes.—A two-pin plug is provided for an extension speaker connection. The plug when inserted in the L.S. sockets, operates a switch when twisted, so that one or both speakers may be operated.



The model B43 by Pilot Radio, Ltd., is a four-valve American-type battery superhet covering three wavebands. It retails at 9 gns. without batteries.

A pilot light with a bayonet-type base fits into a holder clamped to the wavelength dial. The bulb is rated at 2 volts .06 amp. and is painted red.

The frequency changer is a seven-pin valve, and the others have octal bases.

VALVE READINGS

No signal. Volume maximum. M.W. min. cap. New batteries.

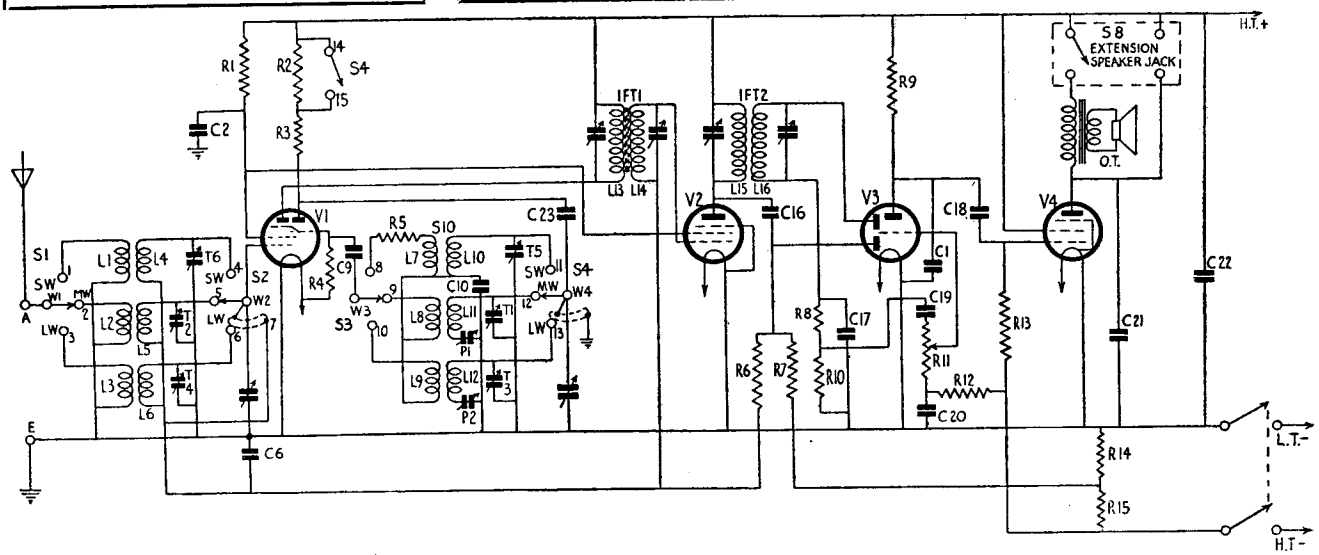
V.	Type.	Electrode.	Volts.	Ma.
	All Mazda.			
1	TP23 (7) ..	Anode ..	115	.8
		Screen ..	54	1.3
		Osc.anode	54	1.8
2	VP22 (octal) ..	Anode ..	115	1.3
		Screen ..	54	.2
3	L22 DD (octal)	Anode ..	115	.4
4	Pen 24 (octal)	Anode ..	112	4.5
		Screen ..	115	.8

WINDINGS (D.C. Resistances)

Winding.	Ohms.	Range.	Where measured.
L1 ..	.5	S.W.	Aerial socket and chassis.
L2 ..	16.5	M.W.	Aerial socket and chassis.
L3 ..	100	L.W.	Aerial socket and chassis.
L4 ..	.1	S.W.	Top grid V1 and "7."
L5 ..	2	M.W.	Top grid V1 and "7."
L6 ..	19	L.W.	Top grid V1 and "7."
L7 ..	.1	S.W.	Coil side R5 and C10.
L8 ..	1	M.W.	W3 and C10.
L9 ..	3.7	L.W.	W3 and C10.
L10 ..	1	S.W.	W4 and C10
L11 ..	2.7	M.W.	W4 and P1
L12 ..	16.5	L.W.	W4 and P2
L13 ..	3.5	—	Anode V1 and H.T.+ lead.
L14 ..	3.5	—	Top grid V2 and C6.
L15 ..	12.3	—	Anode V2 and H.T.+ lead.
L16 ..	12.5	—	Across tags.
O.T.prim.	510	—	C21 and H.T.+ lead.

CONDENSERS

C.	Purpose.	Mfds.
1	V3 anode shunt	.00015
2	V1 and V2 screen decoupling. .	.1
6	A.V.C. line decoupling ..	.05
9	Osc. grid.	.0004
10	S.W. osc. fixed padder ..	.006
16	A.V.C. diode coupling ..	.00015
17	H.F. coupling	.00015
18	L.F. coupling	.01
19	L.F. coupling	.01
20	V3 bias decoupling	10
21	Pentode compensator ..	.002
22	H.T. reservoir	8
23	Osc. anode coupling	.00015



The B43 is equivalent to a mains superhet in circuit and follows conventional lines. Transformer aerial coils are employed and the first I.F. transformer has an iron core.

Circuit Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the output transformer. Switch the receiver to M.W. band, turn gang to maximum capacity and volume control to maximum. Connect a service oscillator between the top grid cap of V1 (via a .1 mfd. condenser) and chassis.

Tune the service oscillator to 451 kcs. and adjust the trimmers of I.F.T.2 and then I.F.T.1 for maximum, reducing the input from the oscillator as the circuits come into line so as to keep below the point at which A.V.C. begins to operate.

Signal Circuits.—Connect the service oscillator to the A and E sockets via a dummy aerial or .0002 mfd. condenser, only feeding sufficient input to obtain reliable peaks in the output meter.

Medium Waves.—Tune set and oscillator to 200 metres (1,500 kcs.) and adjust first T1 and then T2 for maximum.

Set oscillator to 500 metres (600 kcs.), tune in on receiver and adjust P1 for maximum, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

Long Waves.—Tune set and oscillator to 800 metres (375 kcs.) and adjust T3 and then T4 for maximum.

Set oscillator to 2,000 metres (150 kcs.), tune in on receiver and adjust P2 for maximum, simultaneously rocking the gang.

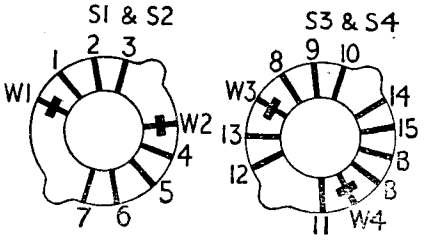
Repeat both operations until no further improvement results.

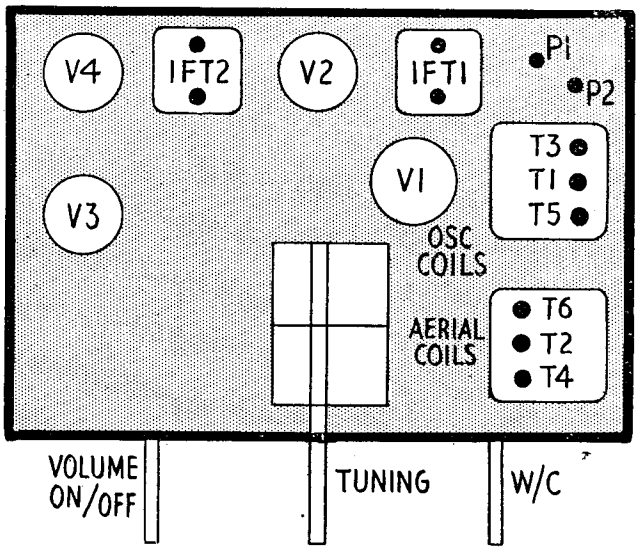
Short Waves.—Tune set and oscillator to 17 metres (17,646 kcs.) and adjust T5 and then T6 for maximum response.

The short-wave padding is fixed, but check calibration throughout the range covered.

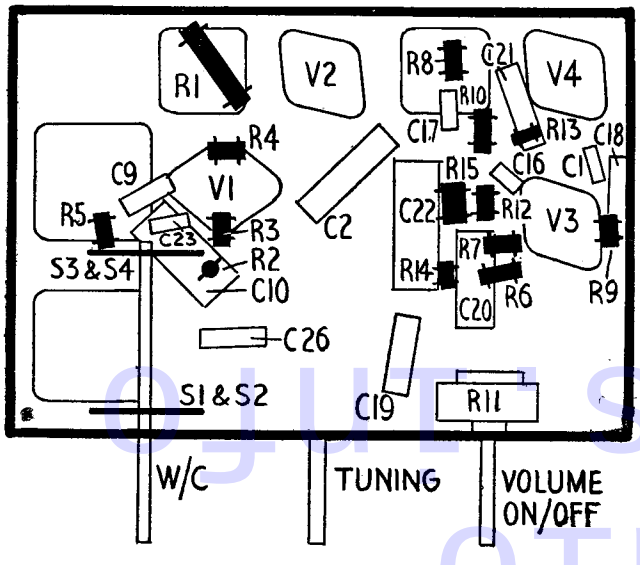
RESISTANCES

R.	Purpose.	Ohms.
1	V1 and V2 screens decoupling	30,000
2	S.W. regeneration modifier	20,000
3	Osc. anode load	6,000
4	Osc. grid leak	50,000
5	Regeneration modifier	30
6	A.V.C. line decoupling	1 meg.
7	A.V.C. diode load	1 meg.
8	H.F. stopper	50,000
9	V3 anode load	100,000
10	Demodulating diode load	500,000
11	Volume control	750,000
12	V3 grid decoupling	50,000
13	V3 grid resistance	500,000
14	Bias potr. (part.)	140
15	Bias potr. (part.)	190





Top right are shown the two switch banks with contacts numbered to accord with the circuit. The top of chassis diagram (right) reveals a logical layout and clean design.



Left, is the under chassis layout diagram for the Pilot B43. The location of components for identification purposes is simplified if it is remembered all resistors are in solid black and condensers in outline.

Replacement units available from A. H. Hunt, Ltd., are C23, 3477, 1s. 9d.; C20, 2985, 1s. 4d.

Pilot B43 on Test

MODEL B.43.—Standard model for battery operation requiring a 45-a.h. accumulator and a 120-volt H.T. battery. Price 9 gns. without batteries.

DESCRIPTION.—Four-valve, three-band, table model superhet.

FEATURES. — Full-vision scale, traversed by vertical pointer, calibrated in metres and station names with certain stations marked in bold type. A pilot light provides an illuminated red circle on scale. Controls for combined volume control and master switch, wave selection switch and concentric tuning. Sockets for extension speaker with control of internal speaker.

LOADING.—H.T., 11.1 ma.; L.T., .3 amp.

Sensitivity and Selectivity

SHORT WAVES (16.5-52 metres).—Good gain and selectivity, well maintained over band. No noticeable drift and easy handling.

MEDIUM WAVES (180-565 metres).—Excellent gain and selectivity, tending to be above average. Local station spread very small. Clean background and ample reserve sensitivity.

LONG WAVES (750-2,200 metres).—Similar performance to medium band. Deutschlandsender received with only very slight interference.

Acoustic Output

Good crisp tone for a battery set, not over corrected and sufficient volume for a reasonable sized room without overloading.

What Whistles Mean

MUCH can be learnt of the cause of a whistle simply by listening to it. Does it vary with the tuning? If it does, does it vary in pitch and intensity or in intensity only?

Whistles which do not alter are usually due to L.F. instability. Whistles which do not vary in pitch with the tuning are generally easily identified as being caused by an interfering transmitter.

The third type of whistle is due to H.F. instability or occurs in superhets in the form of second channel interference.