FERRANTI MODEL 49B BATTERY FOUR

CIRCUIT.—The frequency changing valve, V1, is an octode, and derives its input either from a single aerial transformer with a tuned secondary on the short-wave band or from a special band-pass circuit on the medium and long waves.

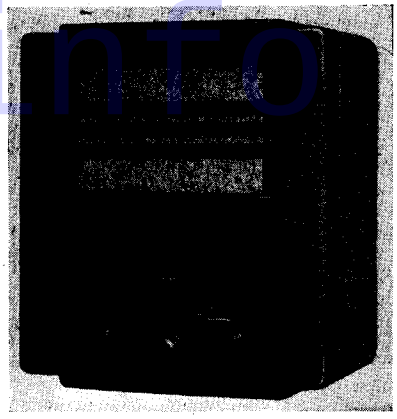
On the medium band the first tuned circuit has coupled aerial windings with a small top capacity coupling in addition. There is a bottom band-pass condenser, C5, as well as a special link circuit, which is provided with switching on the medium wave band. The gain of the frequency changer is controlled from the full A.V.C. voltage. The oscillator section of the mixing valve is perfectly conventional, and has switched windings for both grid and anode on the three bands.

Use is made of trimmer-tuned I.F. transformers, which work at 125 kc. The primary winding of the first transformer is located in the anode circuit of V1, and the secondary is connected to the input of the next valve.

This valve, V2, is a variable-mu pentode, and is controlled by half the A.V.C. voltage through a simple decoupling network. A second I.F. transformer works into one of the diodes of V3.

V3 is a double-diode triode, and the other diode is used for A.V.C. No decoupling is used in the anode circuit of the triode portion, and the connection to the output valve is through the usual condenser and grid leak.

Use is made of a beam output valve for V4, and the bias of this, as well as of the triode section of the preceding valve, is obtained from a common resistance network in the negative H.T. lead. Tone compensation is provided across the speaker transformer by a fixed condenser and resistance.



The Ferranti 49B is a 4-valve, three band battery set in a walnut cabinet. A similar set in bakelite is listed as the 48B.

Chassis Removal.—The chassis is removed by withdrawing the three spring-controlled knobs on the front and releas-

VALVE READINGS

Medium waves. Volume maximum. 120 volts H.T.

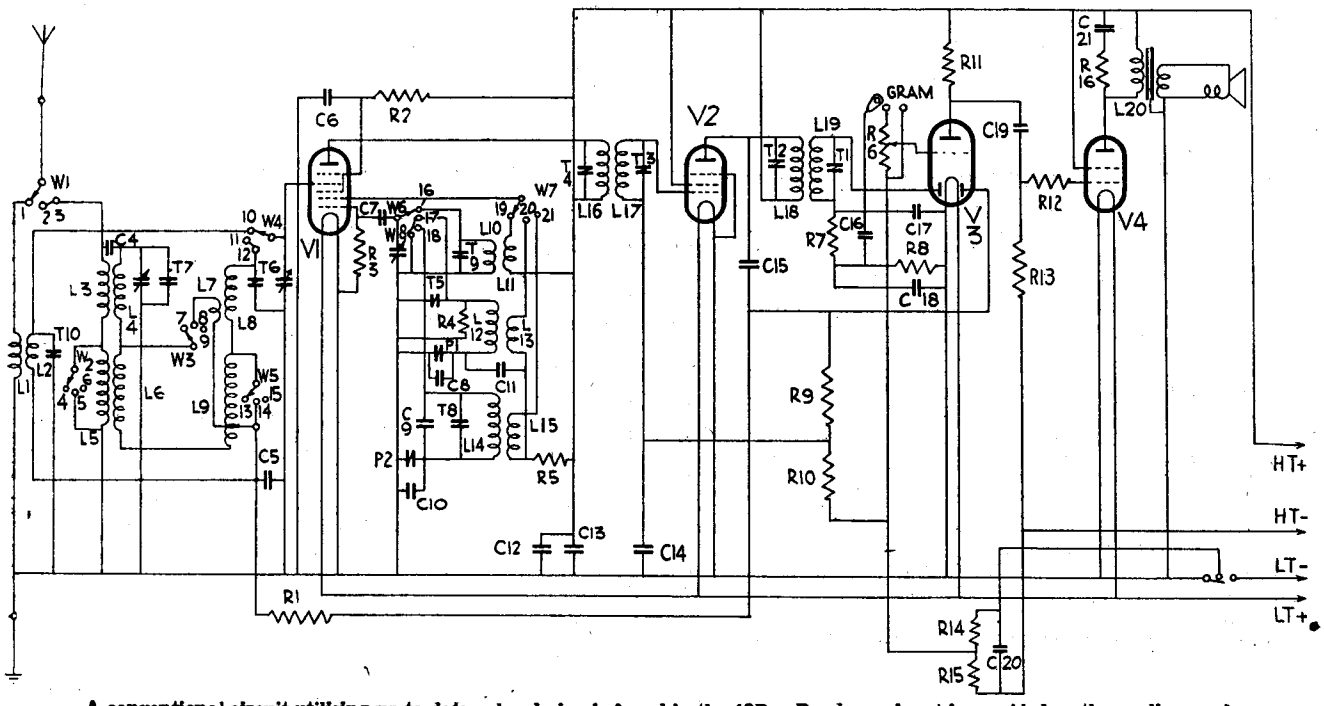
V.	Type.	Electrode.	Ma.	Volts.
1	FC2A .. .. (Mullard)	Anode ..	120	.046
		Screen ..	30	.9
		Osc.anode	75	1.5
2	VP2 .. .. (Mullard)	Anode ..	120	.7
		Screen ..	120	.21
3	TDD2A .. (Mullard)	Anode ..	90	.6
4	KT2 .. .. (Osram)	Anode ..	116	4.8
		Screen ..	120	1

CONDENSERS

C.	Purpose.	Mfds.
4	Top aerial coupling ..	.00002
5	Band pass coupling ..	.05
6	V1 screen decoupling ..	.1
7	V1 osc. grid	.00006
8	M.W. osc. fixed padder ..	.0037
9	L.W. osc. fixed trimmer ..	.00003
10	L.W. osc. fixed padder ..	.0005
11	M.W. osc. coupling	.01
12	H.T. line by-pass	.2
13	H.T. line H.F. by-pass ..	.1
14	V2 A.V.C. decoupling ..	.05
15	A.V.C. coupling	.00006
16	L.F. coupling	.02
17	Diode load condenser ..	.0001
18	H.F. filter	.00015
19	L.F. coupling	.01
20	Bias shunt	200
21	V4 tone condenser	.002

RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. decoupling ..	1 meg.
2	V1 screen decoupling ..	100,000
3	V1 osc. grid leak	50,000
4	M.W. osc. grid decoupling..	40,000
5	V1 osc. anode feed	30,000
6	Volume control	1 meg.
7	H.F. filter	100,000
8	Demodulating diode load ..	1 meg.
9	A.V.C. diode load (part) ..	1 meg.
10	A.V.C. diode load (part) ..	1 meg.
11	V3 anode load	50,000
12	V4 grid stopper	100,000
13	V4 grid return	1 meg.
14	Auto bias resistance (part)..	140
15	Auto bias resistance (part)..	250
16	Tone filter	25,000



A conventional circuit utilising up-to-date valve design is found in the 49B. Band-pass input is provided on the medium and long waves.

ing the four chassis-retaining bolts. If it is desired to disconnect the speaker, only three leads have to be removed.

The black tag earths the frame and the red and green go to the transformer primary winding. As there are only two tags, the order of connection does not matter. The red is actually the positive H.T., and the green the anode of the output valve. The speaker itself can be removed by releasing the four retaining nuts.

Special Notes.—C8 and C10, the two fixed padders, are located inside the coil assembly, that is, in the can adjacent to V1.

While there is no difference in the circuit arrangements of the receiver from those shown in the diagram, in the model examined there was a slight divergence in the switch connection.

It will be observed that the function of W2, for example, is to short-circuit the long-wave aerial winding on the medium band. In the circuit, the switch wipe is shown on the top of the long-wave aerial winding, whereas in practice it is actually on the earth side. The point W2 and the contact 5 are for all practical purposes interchanged.

The same applies to W5, where the wipe is on the low-potential side of the coil, that is, the contact shown on No. 14.

WINDINGS (D.C. RESISTANCES)

Winding.	Ohms.	Range.	Where measured.
1	1.3	S.W.	Aerial and chassis.
2	Very low	S.W.	V1 grid and chassis.
3	18	M.W.	Aerial and chassis.
4	4.5	M.W.	Aerial gang and C5+R1.
5	70	L.W.	W2 and chassis.
6	45	L.W.	W3 and C5+R1.
7	.2	M.W.	C5+R1 and L7.
8	4.5	M.W.	V1 grid and C5+R1.
9	40	L.W.	W5 and C5+R1.
10	Very low	S.W.	W6 and chassis.
11	.8	S.W.	W7 and H.T. positive.
12	8.5	M.W.	W6 and C11+P1.
13	7.2	M.W.	W7 and R5+C11.
14	17.5	L.W.	W6 and P2.
15	6	L.W.	W7 and R5+C11.
16	80	—	V1 anode and H.T. positive.
17	80	—	V2 grid and R9+R10
18	80	—	V2 anode and H.T. positive.
19	80	—	V3 demodulating diode and R7+C17.
20	620	—	On speaker tags.

Alignment Notes

I.F. Circuits.—Connect the signal generator to the grid of V1, set the tuning control to minimum and the wave-change switch to the long wave position. Adjust the signal generator to 125 kc.

Trim the second I.F. transformer by means of T1 and T2 for maximum output, and then trim the first transformer by adjusting T3 and T4.

It is important to inject the minimum possible signal which will give a reasonable reading to avoid working above the A.V.C. voltage.

Medium Waves.—Connect the signal generator to the aerial and earth terminals through a dummy aerial, set the signal generator to 200 metres (1,500 kcs.) and put the tuning condenser at minimum. Adjust T5 for maximum output.

A low input must be used, and if two tune points are found that, due to the minimum capacity of the trimmer T5, is the correct one.

Next set the generator to 230 metres and tune in the signal. Adjust T6 and T7 for maximum.

Set the generator at 500 metres and simultaneously adjust P1 and the tuning control until the output is a maximum.

Long Waves.—Switch the set to the long waves and adjust the generator and set to 1,100 metres. Adjust T8.

Next set the signal generator to 1,800 metres and tune in. Adjust P2 and the tuning control alternatively for maximum.

Short Waves.—Connect the generator through a 400-ohm non-inductive resistance to the aerial and earth terminals. Tune set and generator to 20 metres.

Adjust T9 for maximum output, making certain that the adjustment is obtained on the lowest value of this trimmer.

Then adjust T10 for maximum output.

Ferranti 49B on Test

MODEL 49B.—For battery operation and requiring Drydex H1006 Red Triangle battery and 2-volt accumulator. Price, 9½ gns. Model 48B, similar but in bakelite cabinet, 8½ gns.

DESCRIPTION.—Four-valve superhet, with manual control and covering three bands. Walnut cabinet.

FEATURES.—Full-vision scale calibrated in names and wavelengths. Aeroplane type of pointer. Controls for tuning, range, and volume combined with master switching. Terminals for aerial, earth and pick-up. Batteries connected by a multiple cable.

LOADING.—9.75 ma.

Sensitivity and Selectivity

SHORT WAVES (19-51 metres).—Very good sensitivity for a battery receiver, particularly well maintained at the lower end. Easy handling and no drift trouble.

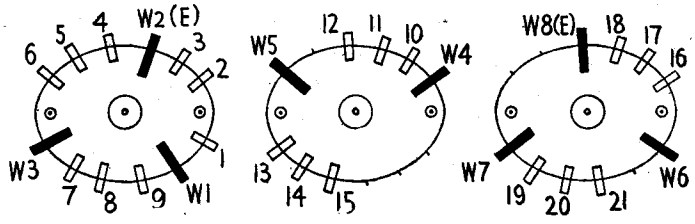
MEDIUM WAVES (200-580 metres).—Good gain and selectivity, with local station spread on adjacent channels only, and a good background.

LONG WAVES (900-2,000 metres).—Very good gain and selectivity, with very little interference on Deutschlandsender and a well maintained sensitivity.

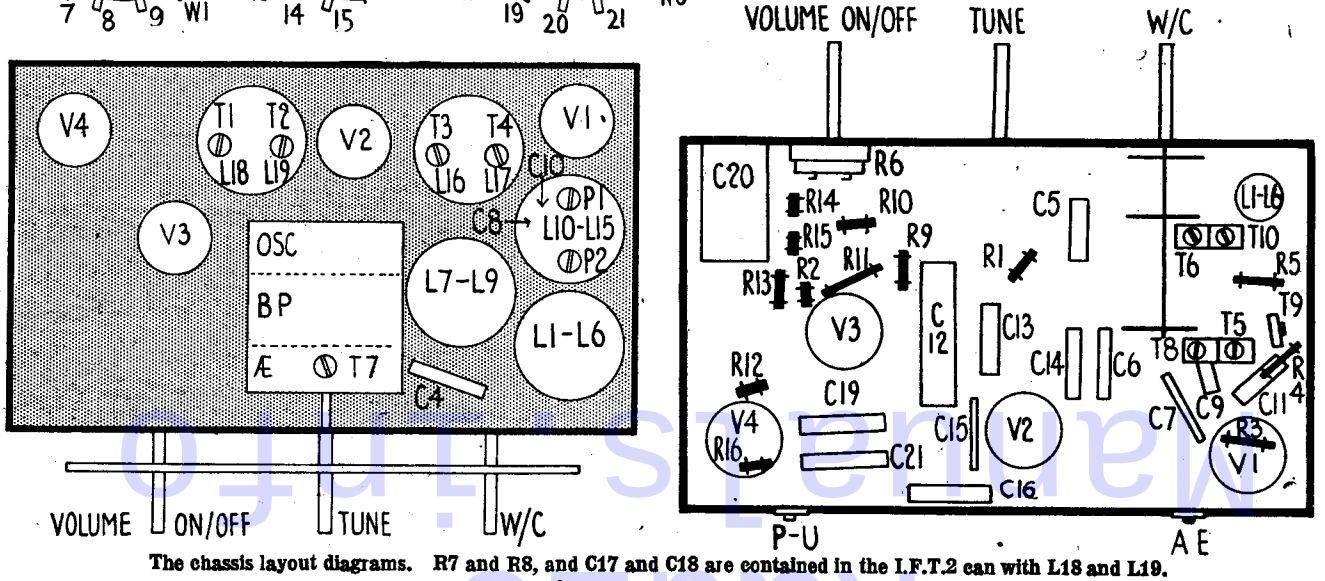
Acoustic Output

Good tone for a battery receiver, with a reasonable consumption. Tone is a little on the mellow side, the balance being fixed. At the same time, there is a reasonable amount of crispness and the medium and low registers are well balanced. Speech is not unduly coloured and there is ample volume for an ordinary room.

AN exact replacement is available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18, for £20. This is unit 1,130, price 3s. 9d.



The switch banks as seen from the rear of the chassis with the one nearest the click plate on the left.



The chassis layout diagrams. R7 and R8, and C17 and C18 are contained in the I.F.T.2 can with L18 and L19.