

'TRADER' SERVICE SHEET
206

FERRANTI 1237B AND 1137B

A BATTERY-OPERATED 4-valve all-wave superhet chassis is fitted in the Ferranti 1237B receiver, the output stage of which employs a double pentode valve in a Q.P.P. circuit. The short-wave range covered is 19-52 metres, and a feature of the set is the Magnascopic tuning dial.

An identical chassis is fitted in the 1137B receiver, the only difference between the two being that the 1237B has a wood cabinet, while the 1137B has a moulded cabinet.

This Service Sheet was prepared on a 1237B.

CIRCUIT DESCRIPTION

Aerial input on M.W. and L.W. via switch **S1**, coupling coils **L1** and **L2** and coupling condenser **C1** to mixed-coupled band-pass filter. Primary **L3**, **L4**, tuned by **C19**; secondary **L6**, **L7**, tuned by **C23**; coupling by coil **L5** and condenser **C2**. On S.W., aerial input is via switch **S2** and coupling coil **L8** to single tuned circuit **L9**, **C23**.

First valve (**V1**, Ferranti metallised **VHT2A**) is a heptode operating as frequency changer with electron coupling. Oscillator grid coils **L10**, **L11** (M.W. and L.W.) and **L14** (S.W.) and tuned by **C24**; anode reaction coils **L12**, **L13** (M.W. and L.W.) and **L15** (S.W.); tracking by pre-set condensers **C26** (M.W.) and **C27** (L.W.).

Second valve, a variable-mu R.F. pentode (**V2**, Osram metallised **VP21**) operates as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C29**, **L16**, **L17**, **C30** and **C31**, **L18**, **L19**, **C32**.

Intermediate frequency **125 KC/S.**

Diode second detector forms part of double diode triode valve (**V3**, Osram

metallised **HD22**). Audio frequency component in rectified output is developed across load resistance **R10** and passed via coupling condenser **C13** and manual volume control **R11** to C.G. of triode section, which operates as A.F. amplifier. I.F. filtering by **R9**, **C11** and **C12**.

Second diode of **V3**, fed from signal diode via **C14**, provides D.C. potential which is developed across load resistances **R13**, **R14** and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control.

Parallel-fed transformer coupling by **R12**, **C15** and **T1** between **V3** triode and output stage, comprising double-pentode valve (**V4**, Osram **QP21**) operating on quiescent push-pull system. Fixed tone correction by condenser **C17** across primary of **T2**; variable tone control by R.C. filter **R15**, **C16** across primary of **T1**.

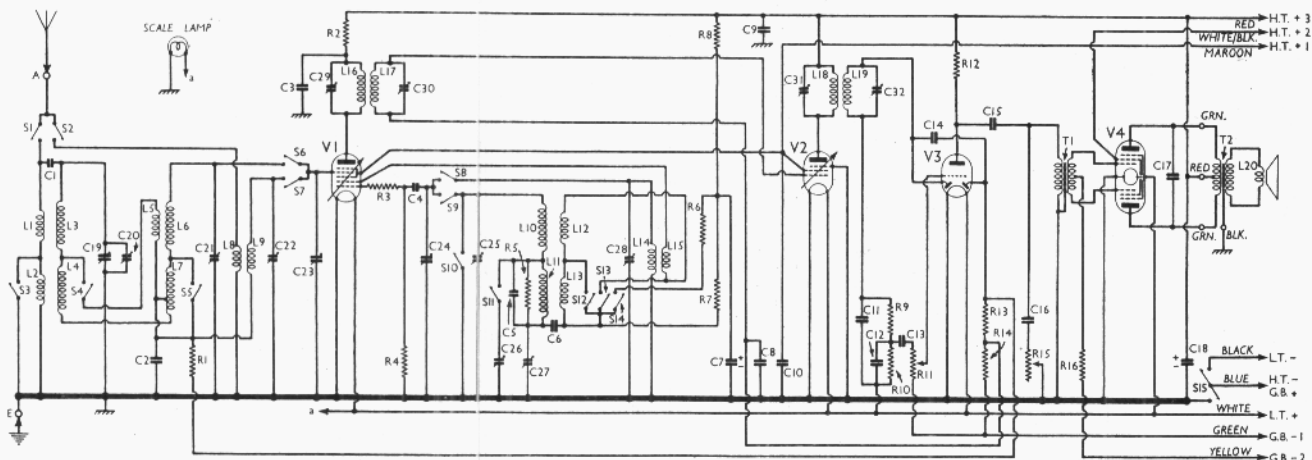
COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 tet. C.G. decoupling	1,000,000
R2	V1 anode decoupling	1,000
R3	V1 osc. C.G. stopper	70
R4	V1 osc. C.G. resistance	50,000
R5	L11 shunt	30,000
R6	V1 osc. anode feed (S.W.)	1,000
R7	V1 osc. anode feed (M.W. and L.W.)	30,000
R8	V1 osc. anode decoupling	5,000
R9	I.F. filter resistance	100,000
R10	V3 signal diode load	1,000,000
R11	Manual volume control	1,000,000
R12	V3 anode load	50,000
R13	V3 A.V.C. diode load pot.	2,000,000
R14	V3 A.V.C. diode load pot.	1,000,000
R15	Variable tone control	50,000
R16	V4 grids bias feed	100,000

CONDENSERS		Values (μF)
C1	Aerial top coupling (M.W. and L.W.)	0.000016
C2	Band-pass bottom coupling (M.W. and L.W.)	0.05
C3	V1 anode decoupling	0.1
C4	V1 osc. C.G. condenser	0.000005
C5	Osc. L.W. fixed trimmer	0.000018
C6	V1 osc. anode coupling	0.01
C7*	V1 osc. anode decoupling	2.0
C8	V2 A.V.C. line decoupling	0.05
C9	Max. H.T. line R.F. by-pass	0.1
C10	V1, V2 S.G. by-pass	0.1
C11	I.F. filter condenser	0.0001
C12	Signal diode load by-pass	0.0001
C13	A.F. coupling to vol. cont.	0.02
C14	V3 A.V.C. diode coupling	0.00015
C15	A.F. coupling to T1	0.1
C16	Part T.C. filter	0.03
C17	Tone corrector	0.002
C18*	Max. H.T. line reservoir	8.0
C19†	Band-pass pri. tuning	—
C20†	Band-pass pri. trimmer	—
C21†	Band-pass sec. trimmer	—
C22†	Aerial circuit trimmer (S.W.)	—
C23†	Band-pass sec. tuning	—
C24†	Oscillator tuning	—
C25†	Osc. trimmer (M.W. and L.W.)	—
C26†	Osc. M.W. tracker	—
C27†	Osc. L.W. tracker	—
C28†	Osc. trimmer (S.W.)	—
C29†	1st I.F. trans. pri. tuning	—
C30†	1st I.F. trans. sec. tuning	—
C31†	2nd I.F. trans. pri. tuning	—
C32†	2nd I.F. trans. sec. tuning	—

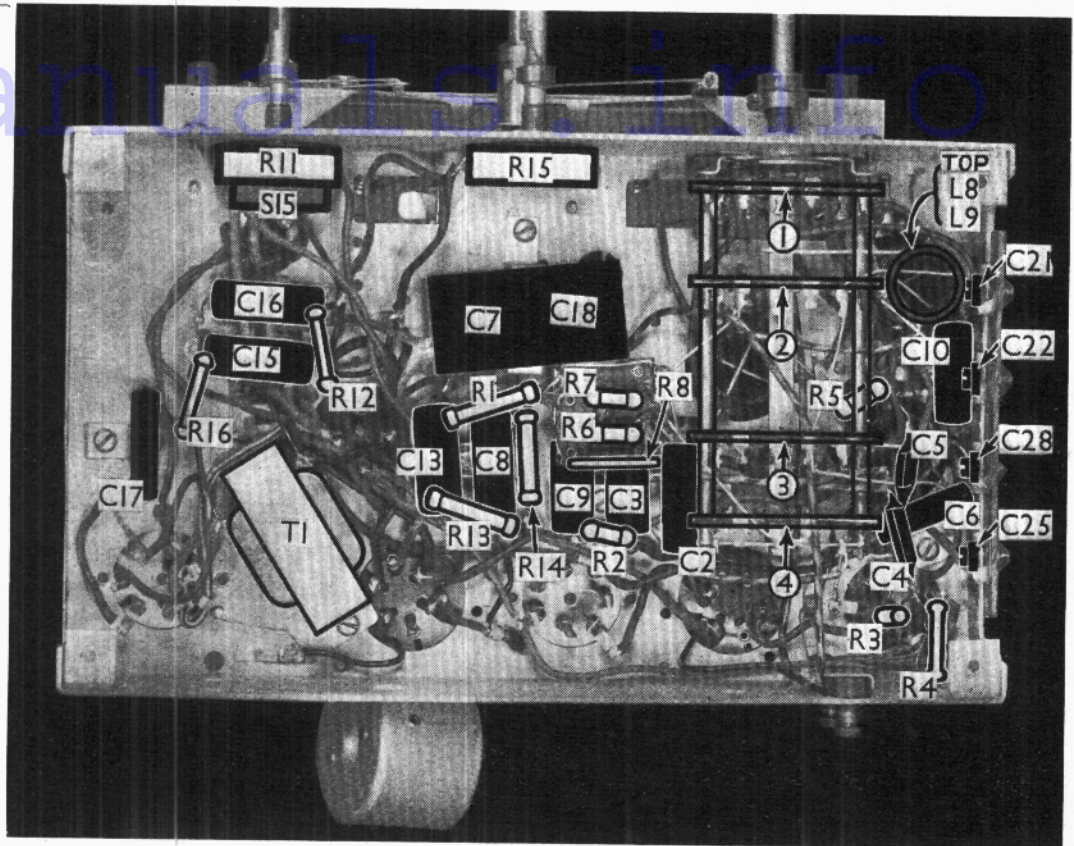
* Electrolytic; † Variable; ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils (M.W. and L.W.)	18.0
L2		70.0
L3	Band-pass primary coils	4.5
L4		45.0
L5	Band-pass coupling coil	0.2
L6	Band-pass secondary coils	4.5
L7		40.0
L8	Aerial coupling coil (S.W.)	1.3



Circuit diagram of the Ferranti 1237B and 1137B receivers. Band-pass input coupling is used on M.W. and L.W., with a single tuned circuit on S.W. The tone control circuit is across the primary of **T1**.

Under-chassis view. L8 and L9 are the S.W. aerial coils. The four ganged coil units are indicated by numbers in circles, and are shown in detail on page VIII. The four trimmers on the right are adjusted from the side of the chassis.



OTHER COMPONENTS (Continued)		Approx. Values (ohms)
L-9	Aerial tuning coil (S.W.)	0.05
L-10	Osc. tuning coils (M.W. and L.W.)	8.5
L-11	Osc. reaction coils (M.W. and L.W.)	23.0
L-12	Osc. reaction coils (M.W. and L.W.)	7.2
L-13	Osc. reaction coils (M.W. and L.W.)	8.0
L-14	Osc. tuning coil (S.W.)	0.05
L-15	Osc. reaction coil (S.W.)	0.8
L-16	1st I.F. trans. { Pri.	80.0
L-17	1st I.F. trans. { Sec.	80.0
L-18	2nd I.F. trans. { Pri.	80.0
L-19	2nd I.F. trans. { Sec.	80.0
L-20	Speaker speech coil	3.8
T1	Inter-valve trans. { Pri.	485.0
T2	Speaker input trans. { Pri.(total)	21,000.0
	trans. { Sec.(total)	510.0
	trans. { Sec.	0.2
Si-14	Waveband switches, ganged	—
Si5	Battery switch, ganged	—

DISMANTLING THE SET

Removing Chassis.—If it is necessary to remove the chassis from the cabinet, remove the five control knobs (pull off) and the four bolts (with washers) holding the chassis to the bottom of the cabinet. Now pull out the battery platform, when the chassis can be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free the chassis entirely, unplug the speaker leads from the strip on the chassis. *When replacing*, connect the leads as follows, numbering the sockets from front to back of the chassis:—1, green; 2, red; 3, green; 4, black.

Removing Speaker.—To remove the speaker from the cabinet, remove the nuts and spring washers from the four bolts holding it to the sub-baffle and

when replacing, see that the transformer is at the top.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from an H.T. battery reading 150 V. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

In our receiver V4 was marked with the letter V.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VHT2A*	150	0.3	60	1.1
V2 VP21	150	0.8	60	0.2
V3 HD22	90	1.1	—	—
V4 QP21	148†	0.9†	135	0.4

* Oscillator anode (G2) 110 V, 0.7 mA.
† Each anode.

GENERAL NOTES

Switches.—S1 to S14 are the wave-change switches, in ganged rotary units beneath the chassis. These are indicated in our under-chassis view, and are shown in detail in the diagrams on page VIII, drawn looking at the underside of the chassis, from the rear. The table (p. VIII) gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open, and C closed.

S15 is the 3-point battery switch, ganged with the gain control R11.

Coils.—L1-L4, L5-L7, L10-L15 and the I.F. transformers L16, L17 and L18, L19 are in five screened units on the chassis deck. The oscillator unit, L10-L15, also contains the M.W. and L.W. trackers C26 and C27, adjustable at the top of the screen. The second I.F. unit contains, besides its associated trimmers C31 and C32, the fixed condensers C11, C12 and C14, and the resistances R9, R10.

The S.W. coils L8, L9 are on a tubular former beneath the chassis, with L8, the fine wire winding, at the top.

Gang Condenser.—Note that only the front section of this has a trimmer fitted to it. It is beneath the Magnascopic scale optical unit.

Scale Lamp.—This is an Osram M.E.S. type, rated at 2.5 V, 0.2 A. The lamp is fitted on a metal unit clipping into the Magnascopic scale assembly. The unit is shown dotted in our plan view of the chassis, and by lifting the projecting tag on the right, it can be detached, with the lamp.

External Speaker.—No provision is made for this, but a low resistance (4 Ω) type could be connected across the tags on the speaker input transformer to which the speech coil leads are attached.

Trimmers.—Apart from the trimmers above the chassis deck, there is an assembly at the right-hand side of the chassis, carrying C21, C22, C25 and C28.

Condensers C7, C18.—These are two

Continued overleaf

FERRANTI 1237B—Continued

DIAGRAM AND TABLE OF SWITCH UNIT

dry electrolytics in a single carton beneath the chassis, with a common negative (black) lead. The yellow lead is the positive of C7 (2μF) and the red the positive of C18 (8μF).

Batteries.—Recommended types are: L.T., Exide CZ3 celluloid cased 2 V cell; H.T. and G.B., Drydex H1066 150 V H.T. plus 9 V G.B. dry battery.

Battery Leads and Voltages.—Black lead, black spade tag, L.T. negative; white lead, red spade tag, L.T. positive 2 V; blue lead, black plug, H.T. negative and G.B. positive; maroon lead, red plug, H.T. positive 60 V; red lead, red plug, H.T. positive 150 V; green lead, black plug, G.B. negative 1.5 V; yellow lead, black plug, G.B. negative 9 V. The position of the white and black lead with red plug depends on the lettering on the bulb of V4. The letters V, W and X are marked on the recommended battery to correspond with those on the valve. If a different type of battery is in use, the tappings for the white and black lead are: V, 18 V lower than the red lead; W, 12 V lower than the red lead; X, 6 V lower than the red lead.

Magnascopic Scale.—This comprises a large transparent dial and a system of mirrors and lenses which normally should give no trouble. If the scale numbers do not appear centrally in the scale opening the holder of the top mirror should be bent slightly, either backwards (to raise numbers) or forwards (to lower numbers).

CIRCUIT ALIGNMENT

I.F. Transformers.—Adjust signal generator to 125 KC/S and feed output between V1 control grid (top cap) and chassis. Adjust trimmers C32, C31, C30

Switch	S.W.	M.W.	L.W.
Sr1	O	C	C
Sr2	C	O	O
Sr3	O	C	C
Sr4	O	C	C
Sr5	O	C	C
Sr6	O	C	C
Sr7	C	O	O
Sr8	C	O	O
Sr9	C	O	O
Sr10	C	O	O
Sr11	C	O	O
Sr12	C	O	O
Sr13	C	O	O
Sr14	C	O	O

and C29, in that order, to obtain maximum reading on output meter.

Signal Frequency and Oscillator Circuits.—Set tuning pointer to 200 m. with the condenser vanes fully out of mesh (anti-clockwise). Set wavechange switch to M.W. and tuning condenser to 228 m. and feed in a 228 m. signal between V1 top cap and chassis. Screw oscillator trimmer C25 to maximum (anti-clockwise) and then slowly clockwise until the second maximum peak output is obtained.

Now apply the 228 m. signal to aerial circuit via an artificial aerial or 0.0002 μF condenser and adjust band-pass trimmers C20, C21 for maximum output. Adjust tuning condenser and signal generator to 500 m. and adjust M.W. tracker C26 for maximum output while rocking the gang. Switch to L.W. and adjust tracker C27 for maximum output at 1,807 m.

Switch to S.W., set tuning condenser to 19.7 m. (marked by black line at top of scale), and apply 19.7 m. signal to aerial. Screw oscillator trimmer C28 to maximum (anti-clockwise) and then slowly clockwise until second maximum peak output is obtained. To verify adjustment, turn tuning condenser slightly to right and the

The four switch units, looking from the rear of the underside of the chassis. The tags marked B are blank. The centre two tags in the fourth unit are joined together.

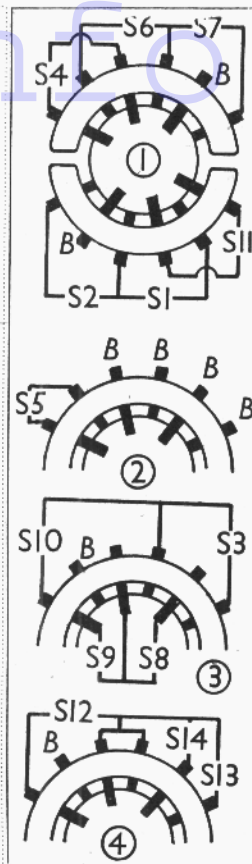
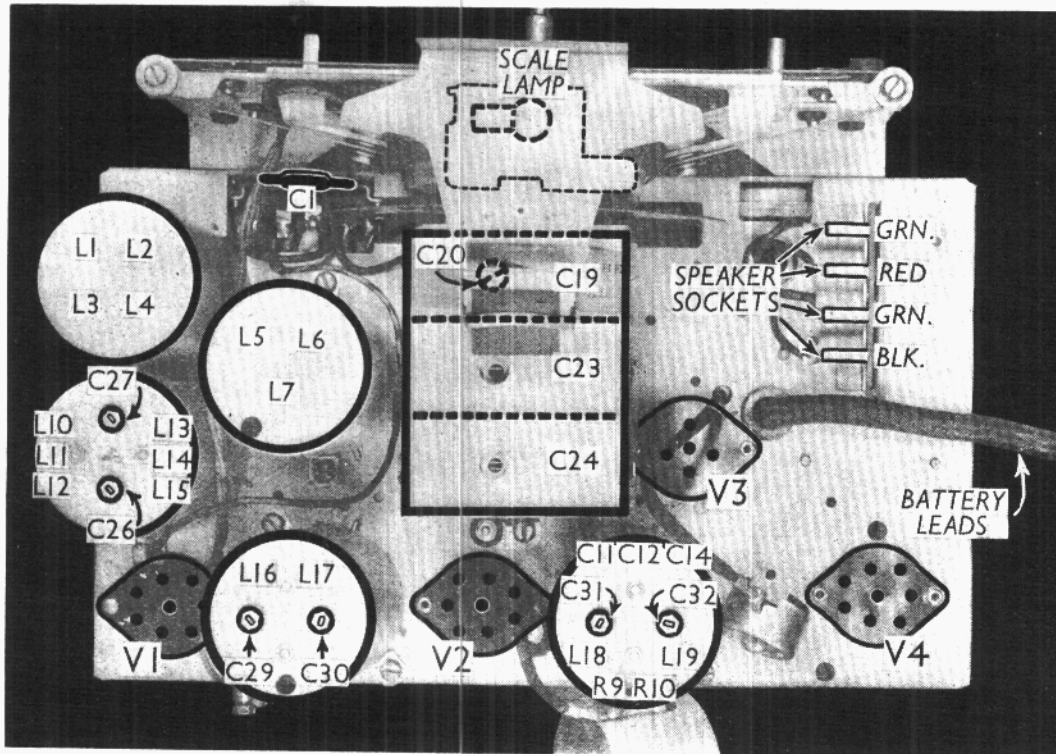


image output should be obtained. Go back to correct peak and adjust aerial trimmer C22 for maximum output.



Plan view of the chassis. The second I.F. transformer contains a number of components besides the trimmers. The scale lamp can be removed after lifting the projecting portion of the holder, shown dotted. The gang condenser has only one trimmer, C20, mounted on it.