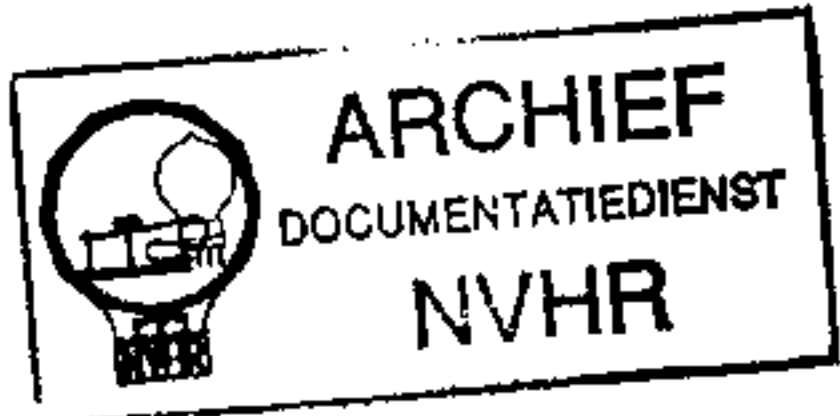
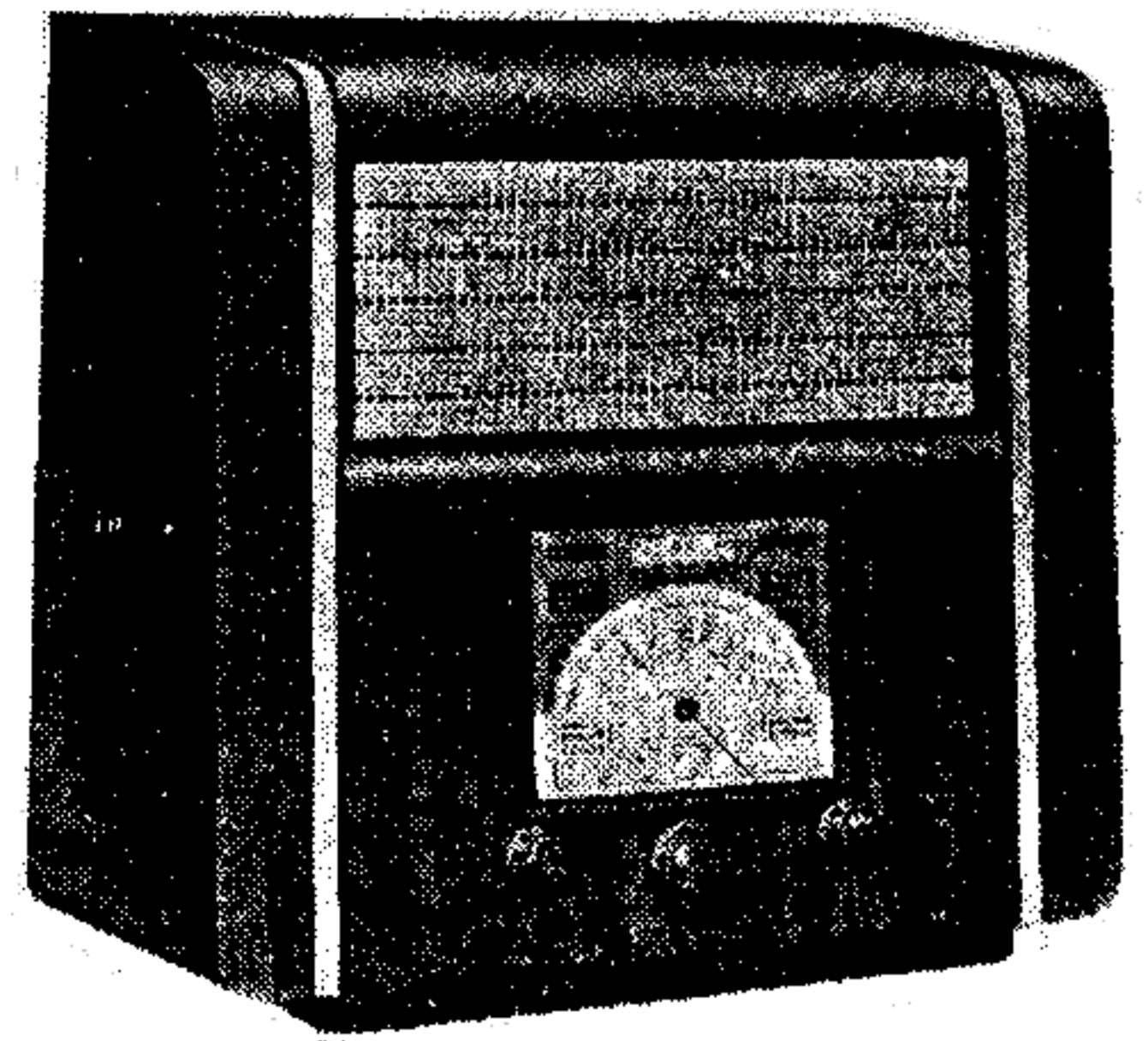


Ned. Ver. v. Historie v/d Radio



FERRANTI

1137, 1037 & 837



The Ferranti 1137 superhet.

REVISED ISSUE OF SERVICE SHEET No. 242

THREE wavebands, including a SW range of 16.7-53 m, are covered in the Ferranti 1137. The receiver is a 4-valve (plus rectifier) superhet, designed to operate from AC mains of 200-270 V, 40-100 c/s. It is fitted with a "Magnascopic" vernier scale. The 1037 is similar, but it has a different cabinet. The model 837 employs a similar chassis, but the "Magnascopic" scale is omitted and the chassis is housed in a plastic cabinet.

Release date: all, 1937. Original prices: 1137, £11 11s. (later, £12 12s.); 1037, £11 0s. 6d.; 837, £8 8s. (later, £9 9s.).

CIRCUIT DESCRIPTION

Aerial input via coupling coils L3 (SW), L4 (MW) and L5 (LW) to single tuned circuits L6, C29 (SW), L7, C29 (MW) and L8, C29 (LW). IF filter L1, C27 is connected across aerial input circuit. Image filter L2, C28 on LW only.

First valve (V1, Ferranti metallised VHT4) is a heptode operating as frequency changer with electron coupling. Oscillator grid coils L9 (SW), L10 (MW) and L11 (LW) are tuned by C31; parallel trimming by C32 (SW), C33 (MW) and C8, C34 (LW); series tracking by G7 (fixed, SW), C35 (MW) and C9, C36 (LW); reaction by L12, C11 (SW), and L13, L14 (MW and LW).

Second valve (V2, Ferranti metallised VPT4) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings.

Intermediate frequency 450 kc/s.

Diode second detector is part of double diode pentode output valve (V3, Ferranti PT4D).

Audio frequency component in rectified output is developed across load resistor R9 and passed via C16 and manual volume control R8 to CG of pentode section. IF filtering by R7, C17 and C18. Fixed tone correction in anode circuit by RC filter C20, C21 and R12. Provision for connection of low impedance external speaker across secondary of T1.

Second diode of V3, fed from L18 via C19, provides DC potentials, which are developed across load resistors R14, R15 and fed back through decoupling circuits as GB to FC and IF valves, giving automatic volume control. Delay voltage is obtained from drop along R10, R11 in cathode circuit of V3.

HT current is supplied by directly heated full-wave rectifying valve (V4, Ferranti R4). Smoothing by speaker field L21 and dry electrolytic capacitors C23, C24, and C25. RF filtering in HT circuit by C10.

VALVE ANALYSIS

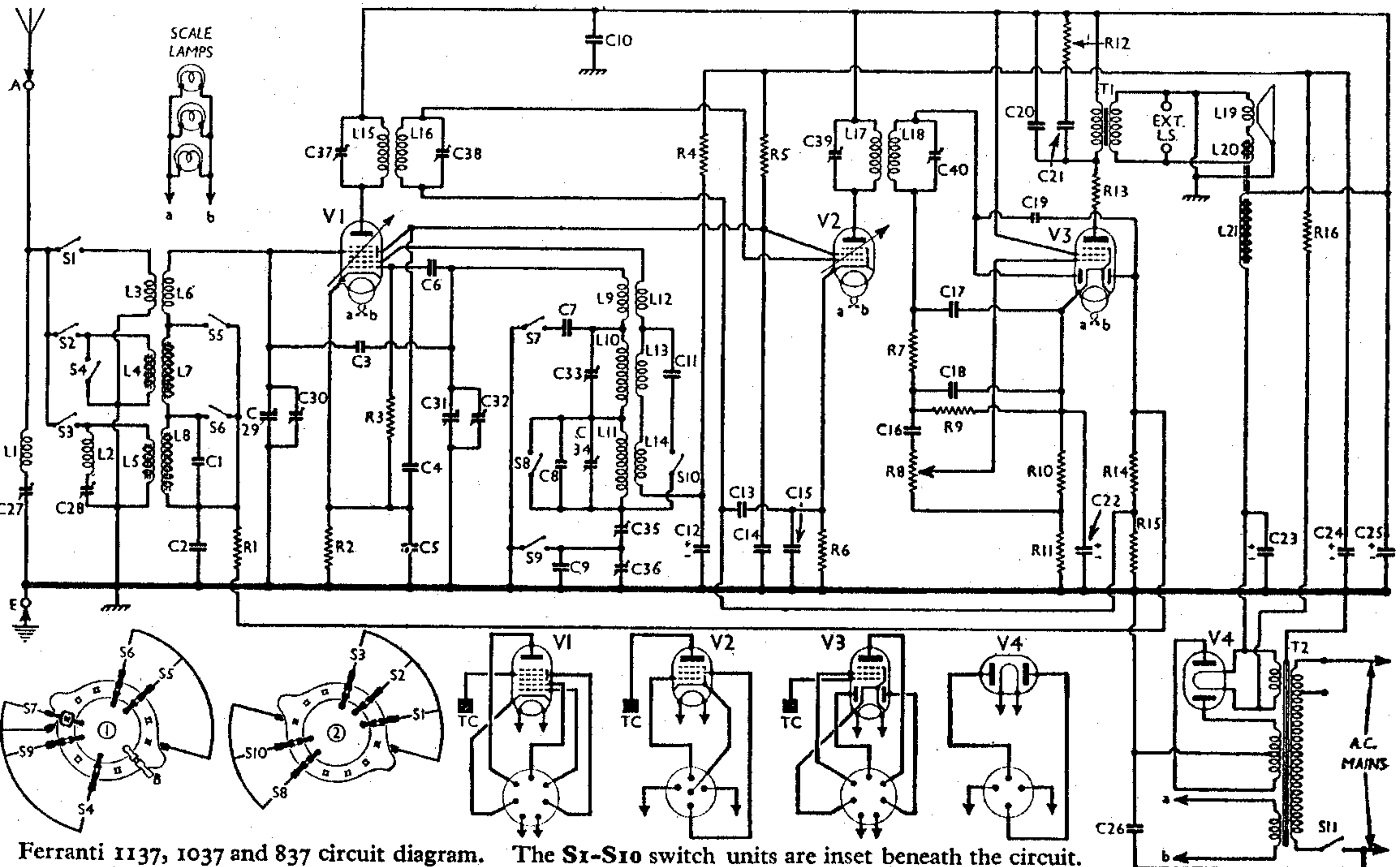
Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains on 230 V, with the receiver adjusted for 200-240 V. The set was tuned to the lowest wavelength on the

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VHT4	260	2.3	90	3.3
	Oscillator	6.0		
V2 VPT4	170	5.5	90	2.7
V3 PT4D	260	31.0	260	6.3
V4 R4	335†	—	—	—

Each anode, A.C.

COMPONENTS AND VALUES

RESISTORS	Values (ohms)
R1	V1 tet. CG decoupling ... 1,000,000
R2	V1 fixed GB resistor ... 200
R3	V1 osc. CG resistor ... 50,000
R4	V1 osc. anode decoupling ... 10,000
R5	V1, V2 SG's HT feed ... 25,000
R6	V2 fixed GB resistor ... 300
R7	IF stopper ... 100,000
R8	Manual volume control ... 1,000,000
R9	V3 signal diode load ... 500,000
R10	V3 GB and AVC delay ... 140
R11	resistors ... 600
R12	Part tone correction filter ... 10,000
R13	V3 anode stabiliser ... 140
R14	V3 AVC diode load re- ... 4,000,000
R15	sistors ... 1,000,000
R16	HT smoothing resistor ... 10,000



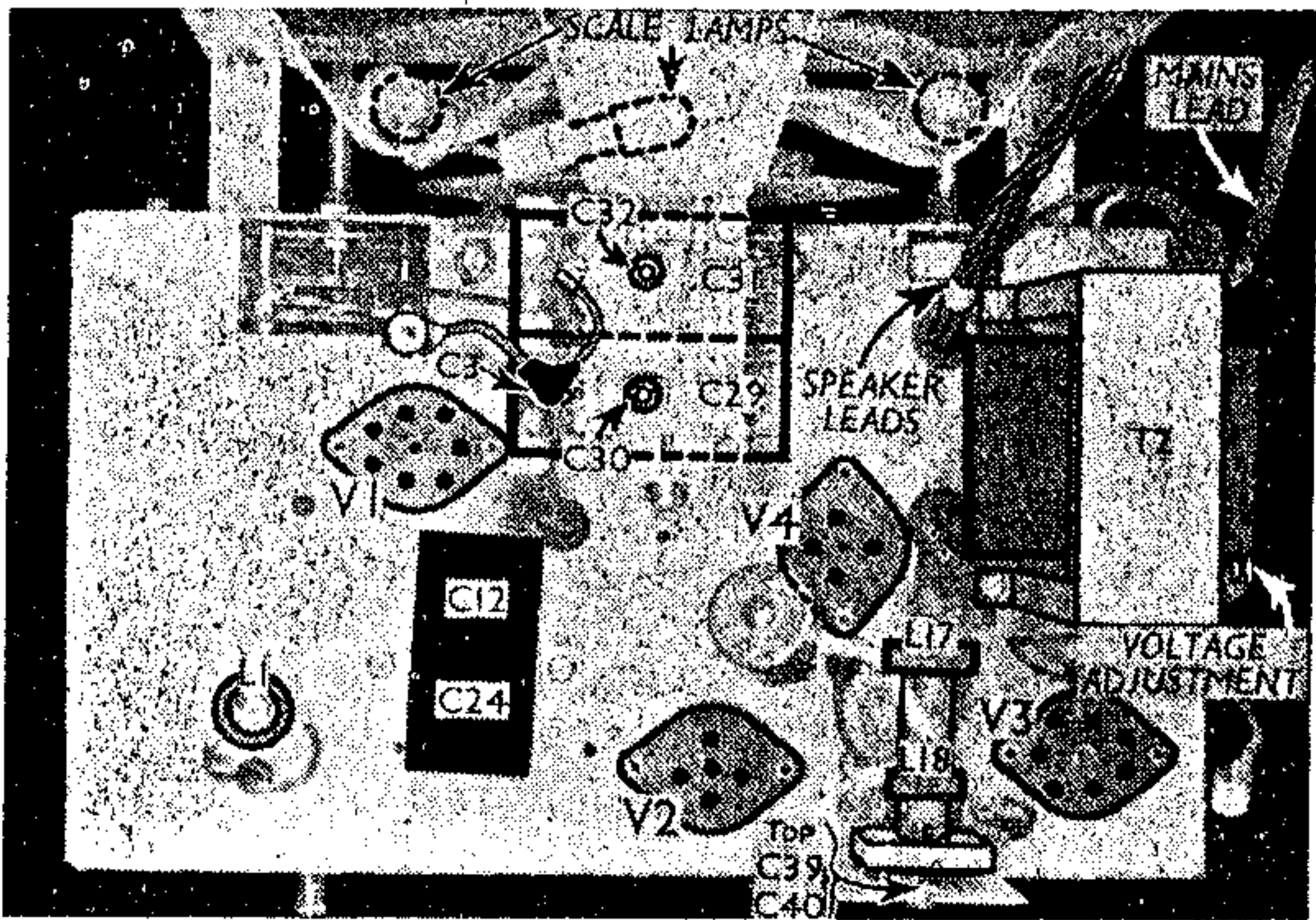
Ferranti 1137, 1037 and 837 circuit diagram. The S1-S10 switch units are inset beneath the circuit.

CAPACITORS		Values (μ F)
C1	Aerial circ. LW trimmer	0.00006
C2	V1 tet. CG decoupling ...	0.05
C3	Neutralising coupling	Very low
C4	V1 SG to cathode shunt	0.0005
C5	V1 cathode by-pass ...	0.05
C6	V1 osc. CG capacitor ...	0.0001
C7	Osc. circ. SW tracker ...	0.004
C8	Osc. LW fixed trimmer	0.00006
C9	Osc. LW fixed tracker ...	0.00018
C10	HT circ. RF by-pass ...	0.1
C11	Osc. SW reaction coup.	0.001
C12*	V1 osc. anode decoupling	4.0
C13	V2 CG decoupling ...	0.05
C14	V1, V2 SG's decoupling	0.1
C15	V2 cathode by-pass ...	0.1
C16	AF coupling to V3 pen.	0.01
C17	IF by-pass capacitors ...	0.00015
C18		0.00015
C19		0.00005
C20	V3 AVC diode coupling	0.002
C21	Parts of fixed tone cor-	0.05
C22*	rection filter ...	
C23*	V3 cathode by-pass ...	25.0
C24*	HT smoothing capacitors	8.0
C25*		4.0
C26		8.0
C27	Mains RF by-pass ...	0.002
C28†	Aerial IF filter tuning ...	—
C29†	Image filter tuning ...	—
C30†	Aerial circuit tuning ...	—
C31†	Aerial circ. MW trimmer	—
C32†	Oscillator circuit tuning	—
C33†	Osc. circ. SW trimmer ...	—
C34†	Osc. circ. MW trimmer ...	—
C35†	Osc. circ. LW trimmer ...	—
C36†	Osc. circ. MW tracker ...	—
C37†	Osc. circ. LW tracker ...	—
C38†	1st IF trans. pri. tuning	—
C39†	1st IF trans. sec. tuning	—
C40†	2nd IF trans. pri. tuning	—
	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial IF filter coil ...	21.0
L2	Image filter coil ...	5.75
L3	Aerial SW coupling coil ...	1.25
L4	Aerial MW coupling coil ...	22.0
L5	Aerial LW coupling coil ...	60.0
L6	Aerial SW tuning coil ...	Very low
L7	Aerial MW tuning coil ...	2.25
L8	Aerial LW tuning coil ...	11.0
L9	Osc. SW tuning coil ...	0.05
L10	Osc. MW tuning coil ...	5.0
L11	Osc. LW tuning coil ...	8.5
L12	Osc. anode SW reaction	0.5
L13	Oscillator MW and LW reaction, total ...	4.0
L14		
L15	1st IF trans. { Pri. ...	9.0
L16	{ Sec. ...	12.0
L17	2nd IF trans. { Pri. ...	12.0
L18	{ Sec. ...	9.0
L19	Speaker speech coil ...	4.0
L20	Hum neutralising coil ...	0.25
L21	Speaker field coil ...	2,000.0
T1	Speaker input { Pri. ...	200.0
	{ Sec. ...	0.3
T2	Mains { Pri., total ...	33.0
	{ Heater sec. ...	0.1
	{ Rect. heat. sec. ...	0.15
	{ HT sec., total ...	350.0
S1-S10	Waveband switches ...	—
S11	Mains switch, ganged R8	—

Plan view of the chassis. C3 consists of a piece of insulated wire connected to C31, wrapped round the lead from C29 to V1 top cap and taped up.



DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull off) and the four bolts (with washers) holding chassis to base of cabinet; free speaker leads from the rubber band holding them to mains transformer. Chassis may now be withdrawn to the extent of the speaker leads, or freed entirely if these are unsoldered. When replacing, connect leads as follows, numbering tags from left to right: 1, blue; 2, green; 3, red; 4, black. **Removing Speaker.**—This is held to the sub-baffle by four bolts with nuts and washers. When replacing, the transformer should be at the top, and the leads should be connected as described above.

GENERAL NOTES

Switches.—S1-S10 are the waveband switches, ganged in two rotary units beneath the chassis. These are indicated in our under-chassis view and shown in detail in the diagrams beneath the circuit diagram overleaf. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C, closed. S11 is the QMB mains switch, ganged with the volume control R8.

Switch	SW	MW	LW
S1	C	—	—
S2	—	C	—
S3	—	—	C
S4	—	—	C
S5	C	—	—
S6	C	C	—
S7	C	C	—
S8	C	C	—
S9	C	C	—
S10	C	—	—

Scale Lamps.—The two scale lamps are Ever Ready MES types rated at 6.2 V, 0.3 A. In the 1137 they are clear, and in the 837 they are sprayed white. The 1137 also uses an extra bulb in the Magnascopic dial. This is a special Ever Ready

MES type, with a tubular bulb, rated at 6.2 V, 0.3 A. **External Speaker.**—Two terminals are provided on the internal speaker for a low impedance (about 4 Ω) external speaker, such as the Ferranti M7. **Capacitors C12, C24.**—These are two 4 μ F dry electrolytics in a single carton on the chassis deck, having a common negative (black) lead. The red lead to the junction of R4 and L14 is the positive of C12, while the red lead to the junction of R4, R5 and R16 is the positive of C24. **Capacitor C3.**—This consists of an insulated wire from C31 twisted round the lead from C29 to the top cap of V1, and taped up. **Capacitors C23, C25.**—These are two 8 μ F dry electrolytics in a single carton beneath the chassis, having a common negative (black) lead. The red lead to V4 valve-holder is the positive of C23, and the red lead to V3 valve-holder the positive of C25. **Voltage Adjustment.**—Two tags on the right-hand side of T2 are provided for this. The red lead from the mains cord should be soldered to the upper tag for 200/240 V mains, and to the lower tag for 210/270 V mains. **Chassis Divergencies.**—C26 in the makers' diagram is connected to the T2 side of S11, while R16 goes to the same side of V4 filament as the bottom of L21. We show the connections as in our chassis.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator between the grid (top cap) of V1 and the frame of the tuning gang. Turn the volume control to maximum. Feed in a 450 kc/s (666.67 m) signal, and adjust C40, C39, C38 and C37 in that order for maximum output. **RF and Oscillator Stages.**—S.W.—Connect signal generator via a SW dummy aerial to A and E terminals. Switch set to SW; feed in an 18 Mc/s (16.7 m) signal, turn gang to minimum, and adjust C32 for maximum output. The correct peak is that involving the lower trimmer capacitance. **MW.**—Use a standard dummy aerial. Switch set to MW, and keeping gang at minimum, feed in a 200 m (1,500 kc/s) signal and adjust C33 for maximum output, selecting the peak requiring the lower capacitance. Tune to 228 m on scale, feed in a 228 m (1,316 kc/s) signal, and adjust C30 for maximum output. Tune to 500 m on scale, inject a 500 m (600 kc/s) signal, and adjust C35 for maximum output, rocking the gang slightly for optimum results. Repeat the MW adjustments. **LW.**—Switch set to LW, feed in a 1,128 m (206 kc/s) signal, tune to 1,128 m on the scale, and adjust C34 for maximum output, rocking the gang for optimum results. Feed in an 1,818 m (165 kc/s) signal, tune to 1,818 m on scale, and adjust C36 for maximum output, again rocking the gang. Any adjustment of C34 affects C36 and vice versa, so continue adjusting these alternately until no further improvement in output is obtained. **Image Filter.**—Keep set switched to LW, feed in a 261 m (1,150 kc/s) signal, tune in the image at about 1,200 m and adjust C28 for minimum output. **IF Filter.**—Feed in a 450 kc/s signal, switch set to MW, and turn gang to maximum. Adjust C27 for minimum output.

