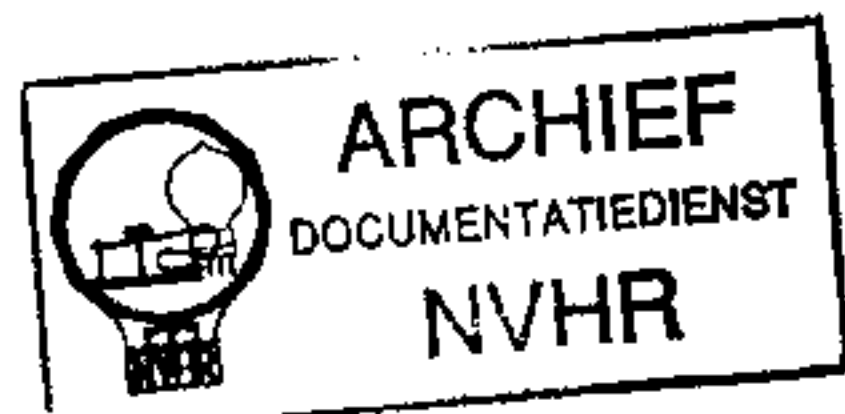


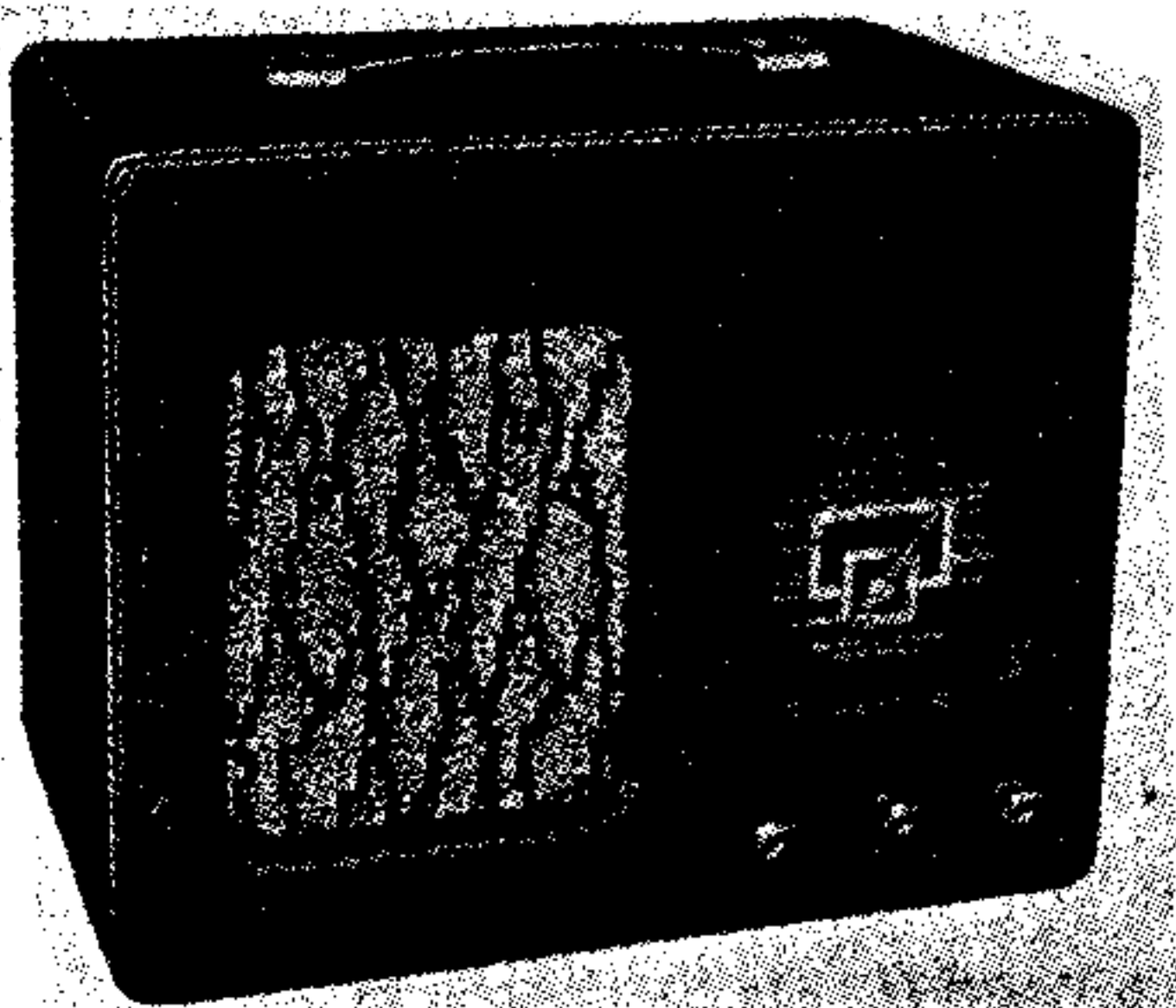
Ned. Ver. v. Historie v/d Radio

# FERGUSONIC 906B

## ALL-DRY SUPERHET PORTABLE



REVISED ISSUE OF  
SERVICE SHEET No. 445



The Fergusonic 906B all-dry portable.

**T**HE Fergusonic 906B receiver is a 4-valve all-dry battery superhet portable covering the medium and long wavebands. It is fitted with a frame aerial, and there is provision for an external aerial and earth. Our model was fitted with Mullard valves, but in some cases Mazda types may be used (see General Notes).

Release date and original price: November, 1939; £7 17s. 6d., complete with battery.

### CIRCUIT DESCRIPTION

Frame aerial input **L3** (MW) plus **L4** (LW), tuned by **C13** to heptode valve (**V1**, Mullard metallised **DK1**), which operates as frequency changer. Provision for connection of external aerial and earth via coupling coils **L1**, **L2**.

**V1** oscillator grid coils **L5** (MW), plus **L6** (LW) are tuned by **C14**; parallel trimming by **C15** (MW) and **C16** (LW); series tracking by **C17** (MW) and **C18** (LW). Reaction by coil **L7** and common impedance of trackers.

Second valve (**V2**, Mullard metallised **DF1**) operates as IF amplifier with tuned-primary, tuned-secondary transformer couplings **C19**, **L8**, **L9**, **C20** and **C21**, **L10**, **L11**, **C22**.

Intermediate frequency 470 kc/s.

Diode second detector is part of single diode triode valve (**V3**, Mullard metallised **DAC1**). Audio frequency component in rectified output is developed across load resistor **R5** and passed via IF filter **C4**, **R6**, **C5** and AF coupling **C6** and manual volume control **R9** to CG of triode-section.

DC potential developed across **R5** appears also across potential divider **R7**, **R8**, from which it is tapped off and fed back as GB to EC and IF valves, giving automatic volume control.

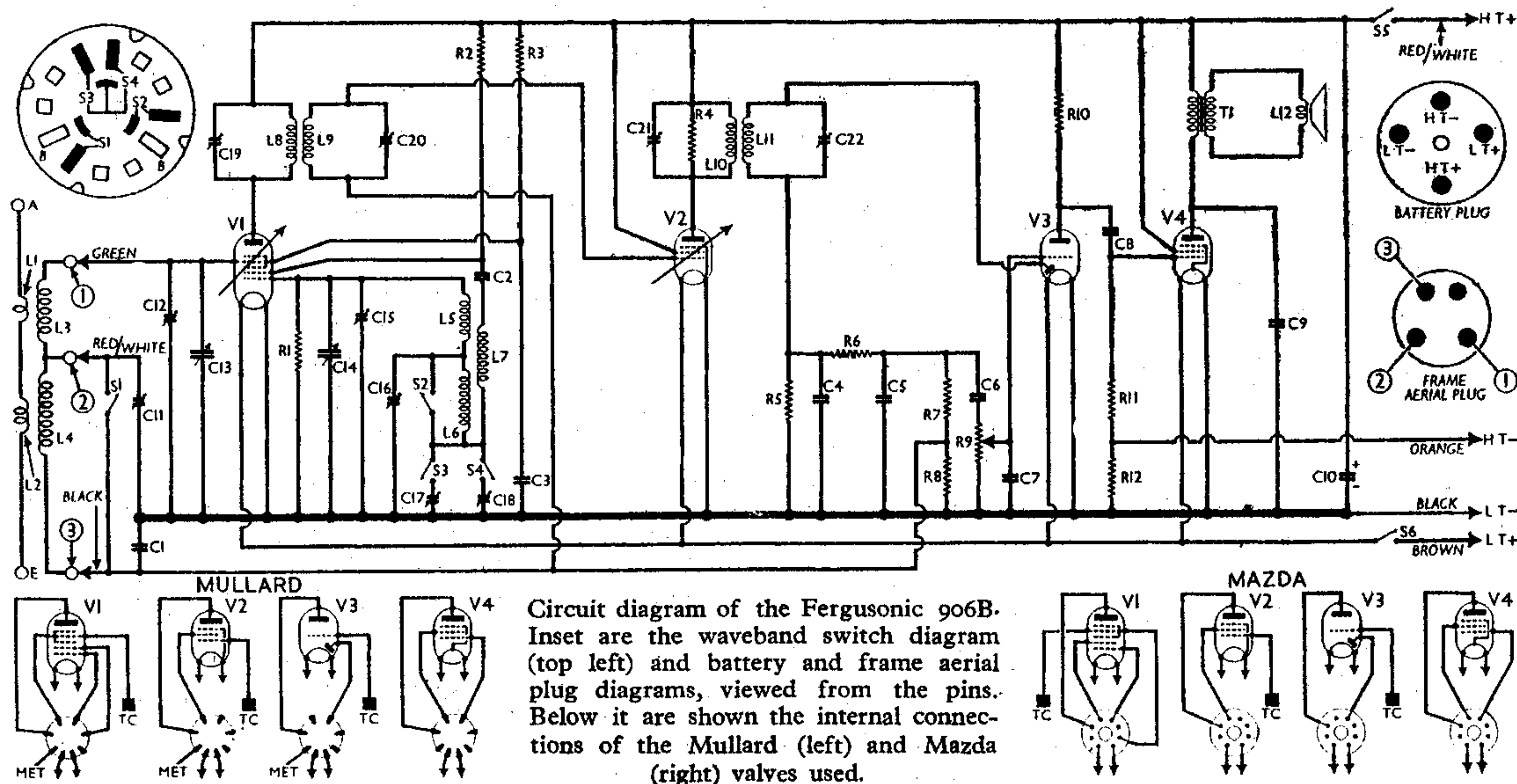
Resistance-capacitance coupling by **R10**, **C8**, **R11** between **V3** triode and pentode output valve (**V4**, Mullard **DL2**). Fixed tone correction by **C9**. GB potential is obtained automatically from drop along **R12** in negative HT lead to chassis.

### COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	V1 osc. CG resistor ...	250,000
R2	V1 osc. anode HT feed ...	25,000
R3	VW SG HT feed ...	50
R4	2nd IF trans. shunt ...	500,000
R5	V3 diode load ...	500,000
R6	IF stopper ...	25,000
R7	AVC line feed potential divider ...	4,000,000
R8		
R9	Manual volume control ...	2,000,000
R10	V3 triode anode load ...	1,000,000
R11	V4 CG resistor ...	1,000,000
R12	V4 auto GB resistor ...	600

CAPACITORS		Values (μF)
C1	AVC decoupling ...	0.1
C2	V1 osc. anode coupling ...	0.00025
C3	V1 SG decoupling ...	0.1
C4	IF by-pass capacitors ...	0.0001
C5		
C6	AF coupling to V3 ...	0.001
C7	IF by-pass ...	0.0001
C8	AF coupling to V4 ...	0.001
C9	Fixed tone corrector ...	0.001
C10*	HT reservoir capacitor ...	4.0
C11†	Aerial LW trimmer ...	—
C12†	Aerial MW trimmer ...	—
C13†	Frame aerial tuning ...	—
C14†	Oscillator circuit tuning ...	—
C15†	Osc. circuit MW trimmer ...	—
C16†	Osc. circuit LW trimmer ...	—
C17†	Osc. circuit MW tracker ...	—
C18†	Osc. circuit LW tracker ...	—
C19†	1st IF trans. pri tuning ...	—
C20†	1st IF trans. sec. tuning ...	—
C21†	2nd IF trans. pri tuning ...	—
C22†	2nd IF trans. sec. tuning ...	—

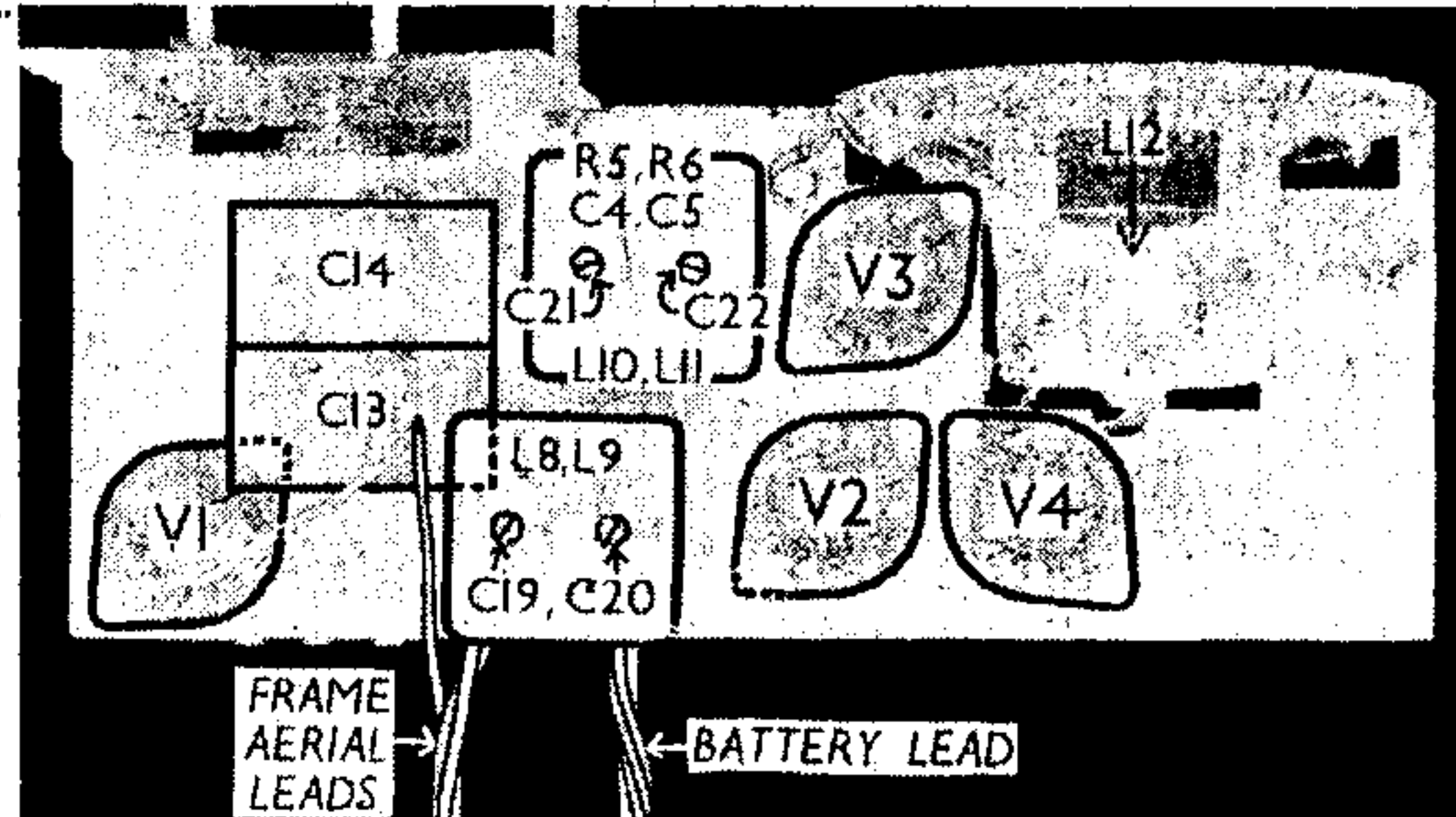
\* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Fergusonic 906B. Inset are the waveband switch diagram (top left) and battery and frame aerial plug diagrams, viewed from the pins. Below it are shown the internal connections of the Mullard (left) and Mazda (right) valves used.

OTHER COMPONENTS		Approx. Values (ohms)
L1	External aerial coupling windings ...	0.1
L2		0.7
L3	Frame aerial windings ...	1.0
L4		16.0
L5	Osc. MW tuning coil ...	2.0
L6	Osc. LW tuning coil ...	4.75
L7	Oscillator reaction coil ...	1.0
L8	1st IF trans. { Pri. ...	17.0
L9		{ Sec. ...
L10	2nd IF trans. { Pri. ...	17.0
L11		{ Sec. ...
L12	Speaker speech coil ...	2.5
T1	Speaker input trans. { Pri. ...	650.0
	{ Sec. ...	0.3
S1-S4	Waveband switches	—
S5	HT circuit switch	—
S6	LT circuit switch	—

Plan view of the chassis. R5, R6, C4 and C5 are housed in the L10, L11 unit. The IF trimmer adjustments are seen here, but the remaining trimmers are beneath the chassis.



**VALVE ANALYSIS**

Valve voltages and currents in the table below are those measured in our receiver when it was operating with a new battery, the 90 V HT section of which read 96 V on load. The receiver was tuned to the lowest wavelength on the MW band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 DK1	{ 90 Oscillator	{ 0.9 }	41	0.9
V2 DF1	90	1.4	90	0.4
V3 DAC1	16	0.03	—	—
V4 DL2	83	7.2	90	1.2

If the two chassis fixing bolts (with washers and lock-washers) are now removed, the chassis may be withdrawn complete as a single unit.

**GENERAL NOTES**

**Switches.**—S1-S4 are the waveband switches in a single rotary unit beneath the chassis. This is shown in detail in a diagram inset in the circuit diagram, where it is drawn as seen looking from the rear of the underside of the chassis. On MW (knob clockwise), S1, S2 and S3 are closed; on LW (knob anti-clockwise), S4 only is closed.

S5, S6 are the HT and LT circuit switches, of the QMB type, ganged with the volume control R9.

**Coils.**—L1-L4 are the frame aerial and external aerial coupling coils, wound on frames on the inside of the back of the cabinet. L1 and L3 are on the outer frame, and L2 and L4 are on the inner frame. L1 is one turn of wire and L2 three turns.

L5-L7 are in a tubular unit beneath the chassis, while L8, L9 and L10, L11 are in two screened units on the chassis deck. These two units contain their associated trimmers, while the second also contains R5, R6, C4 and C5. Note that C4 and C5 are built into one unit with C22.

**Frame Aerial Connections.**—The connections between the chassis and the frame aeriels are by a 4-pin plug and

socket, of which only three pins are used. The socket is on the frame, while the plug is at the end of a cable emerging from the chassis. The plug connections are numbered and colour coded in the circuit to agree with the diagram of the plug on the right of the circuit diagram.

**Battery Connections.**—A 4-pin plug is used for connection to the HT and LT battery. The connections are indicated on the right of the circuit diagram. The colour coding of the leads to the plug is: LT negative, black; LT positive, brown; HT negative, orange; HT positive, red/white.

**Battery.**—The battery fitted in our model was an Ever Ready All-dry No. 3, a combined 1.5 V LT and 90 V HT dry battery.

**Alternative Valves.**—In cases where Mazda valves are used, R12 becomes 1,000 Ω. The valve holders are then of the Mazda octal type, of course. The valve types used are: V1, FG141; V2, SP141; V3, H141D; V4, Pen141.

Base connection diagrams for both Mullard (left) and Mazda (right) valves are shown beneath the circuit diagram overleaf.

**CIRCUIT ALIGNMENT**

**IF Stages.**—Connect signal generator via a 0.1 μF capacitor to control grid (top cap) of V1 and chassis, and feed in a 470 kc/s (638.3 m) signal. Adjust C22, C21, C20 and C19 in turn for maximum output. Check these settings.

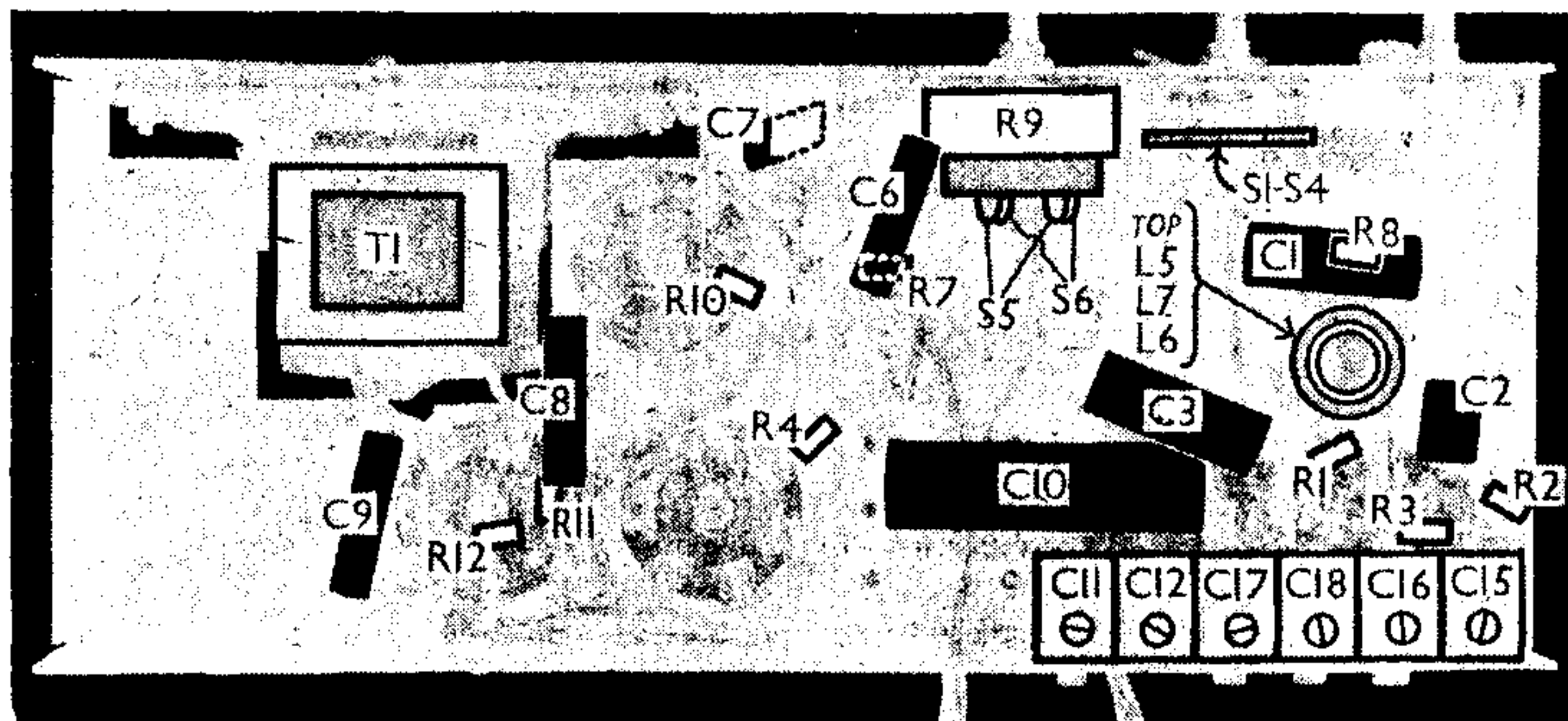
**RF and Oscillator Stages.**—With gang at maximum, pointer should be horizontal. Connect signal generator to external A and E sockets at rear of cabinet. The chassis and battery should be in situ in the cabinet, and the frame aerial in position. By inverting the cabinet the row of six trimmers can be reached through a slot in the case of the cabinet.

**MW.**—Switch set to MW, tune to 214 m on scale, feed in a 214 m (1,400 kc/s) signal, and adjust C15, then C12, for maximum output. Feed in a 500 m (600 kc/s) signal, tune it in, and adjust C17 for maximum output, while rocking the gang for optimum results.

**LW.**—Switch set to LW, tune to 1,250 m on scale, and adjust C16, then C11, for maximum output. Feed in a 2,000 m (150 kc/s) signal, tune it in, and adjust C18 for maximum output, while rocking the gang for optimum results.

**DISMANTLING THE SET**

**Removing Chassis.**—Remove the three control knobs (recessed grub screws); remove the back cover (two wood screws) on which are mounted the frame aeriels, and withdraw the aerial plug; invert the receiver, withdraw the battery plug, slide out the battery shelf and withdraw the battery.



Under-chassis view. The six pre-set trimmers C11, C12 and C15-C18 are reached through a hole in the bottom of the case. A diagram of the S1-S4 unit is inset in the circuit diagram overleaf.