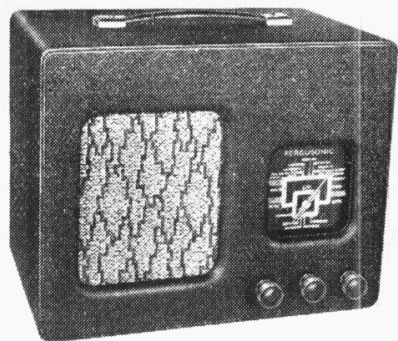


"TRADER" SERVICE SHEET

## 445

# FERGUSONIC 906 B

## BATTERY SUPERHET PORTABLE



The Fergusonic 906 B battery portable.

THE Fergusonic 906B receiver is a 4-valve all-dry battery superhet portable covering the medium and long wavebands. It is fitted with 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: November, 1939.

### CIRCUIT DESCRIPTION

Frame aerial input **L3** (MW) plus **L4** (LW) tuned by **C13** to octode 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 resistance **R5** and passed via IF filter **C4**, **R6**, **C5**, condenser **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 FC and IF valves, giving AVC.

Resistance-capacity 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.

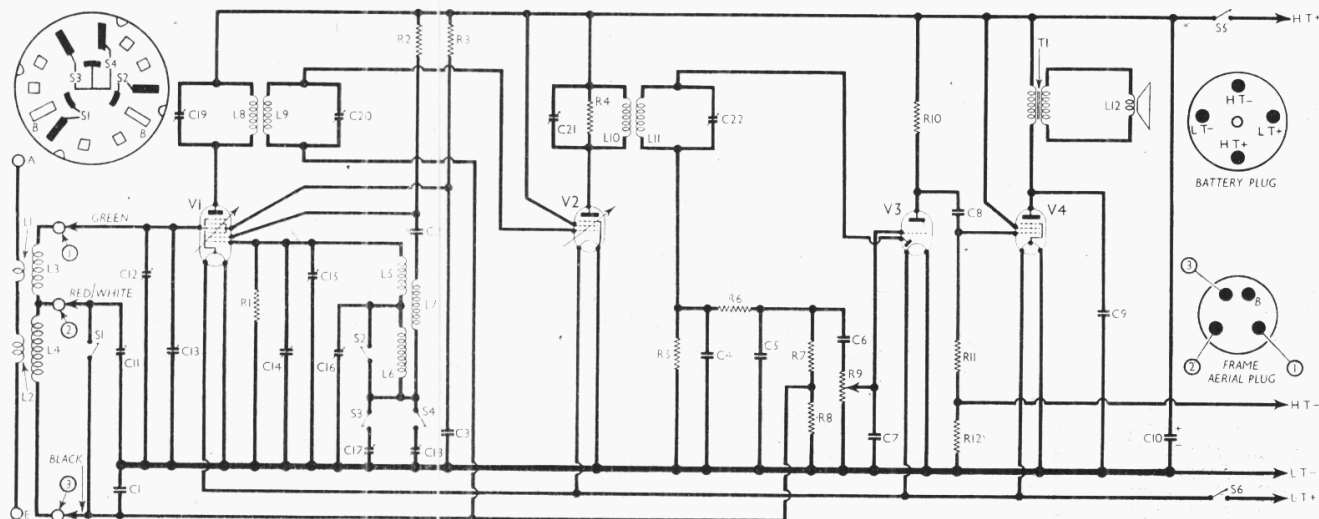
### COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 osc. CG resistance	250,000
R2	V1 osc. anode HT feed	25,000
R3	V1 SG HT feed	50,000
R4	2nd IF trans. pri. damping	500,000
R5	V3 diode load	5,300,000
R6	IF stopper	25,000
R7	AVC line feed potential divider resistances	4,000,000
R8	Manual volume control	2,000,000
R9	V3 triode anode load	1,000,000
R10	V4 CG resistance	1,000,000
R11	V4 auto GB resistance	600
R12		

CONDENSERS		Values (μF)
C1	AVC decoupling	0.1
C2	V1 osc. anode coupling	0.00025
C3	V1 SG decoupling	0.1
C4	IF by-pass condensers	0.0001
C5	IF by-pass	0.0001
C6	AF coupling to V3 triode	0.001
C7	IF by-pass	0.0001
C8	V3 triode to V4 AF coupling	0.001
C9	Fixed tone corrector	0.001
C10	HT reservoir condenser	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.

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



Circuit diagram of the Fergusonic 906 B all-dry battery portable. Inset at the top left hand corner is the wavechange switch diagram, while inset on the right are diagrams of the battery and frame aerial plugs, looking at the free ends of the pins.

FERGUSONIC—Continued

**DISMANTLING THE SET**

**Removing Chassis.**—First remove the three control knobs (recessed grub screws) and the back cover (two wood screws) on which are mounted the two frame aerials, and withdraw the aerial plug.

Now invert the receiver, withdraw the battery plug, slide out the battery shelf, and remove the battery when, if the two chassis fixing bolts (with washers and lock washers) are removed, the chassis can be withdrawn as a single unit.

**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 90V HT section of which read 95V 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 400V 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 60	0.9 Oscillator 0.8	41	0.9
V2 DF1	90	1.4	90	0.4
V3 DAC1	16	0.03	—	—
V4 DL2	83	7.2	90	1.2

**GENERAL NOTES**

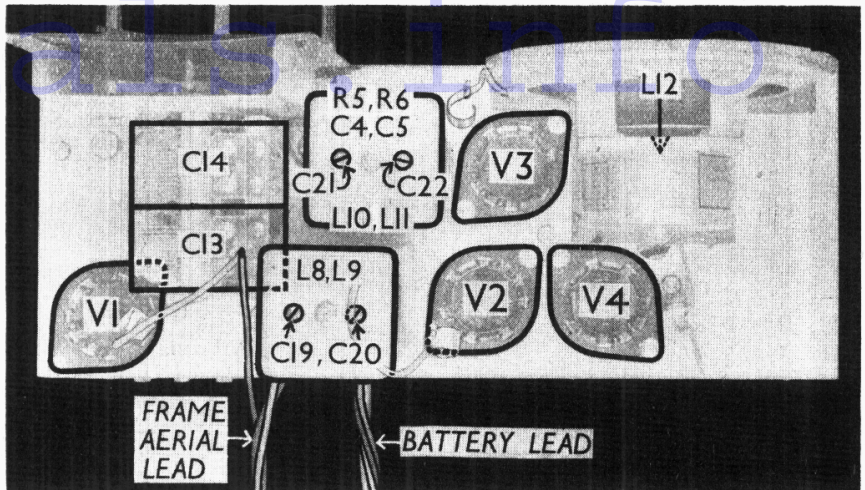
**Switches.**—S1-S4 are the waveband switches in a single rotary unit beneath the chassis. This is shown in detail in a diagram inset in the circuit diagram, where it is drawn as seen looking from the rear of the underside of the chassis. On MW (knob clockwise), S1, S2 and S3 are closed; on LW (knob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

Underneath view of the chassis of the Fergusonic 906B. A diagram of the S1-S4 unit is inset in the circuit diagram.



Plan view of the chassis of the Fergusonic 906B.

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 aerials are by a 4-pin plug and socket, of which only three pins are used. The socket is on the frames, 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.

**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 1.5V LT and 90V HT dry battery.

**Alternative Valves.**—In cases where Mazda valves are used, R12 becomes 1,000 O. The valve-holders are then of the Mazda octal type, of course. The valve types used are: V1, FC141; V2, SP 141; V3, H 141D; V4, Pen 141.

**CIRCUIT ALIGNMENT**

**IF Stages.**—Connect signal generator via a 0.1µF condenser to grid (top cap) of V1 and chassis, and feed in a 470 KC/S 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 the slot in the base of the cabinet.

**MW.**—Switch set to MW, tune to 214m on scale, feed in a 214m (1,400 KC/S) signal, and adjust C15, then C12, for maximum output. Feed in a 500m (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 1,250m on scale, feed in a 1,250m (240 KC/S) signal, and adjust C16, then C11, for maximum output. Feed in a 2,000m (150 KC/S) signal, tune it in, and adjust C18 for maximum output, while rocking the gang for optimum results.

