Supplement to Wireless & Electrical Trader, November 24, 1951

"TRADER" SERVICE SHEET

1020

ETRONIC EPB4211

SPACE is provided for a combined large-capacity H.T. and L.T. dry battery in the Etronic EPB4211, a 4-valve, 2-band superhet all-dry portable battery receiver covering 190-500 m and 1,000-2,100 m. The two-colour plastic case fits over the chassis like a shroud, the chassis and battery compartments being accessible only through the bottom.

Release date and original price: June, 1950; £11 4s. 11d., less batteries. Purchase tax extra.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, C20** (M.W., or with the addition of loading coil **L2,** L.W.) precedes heptode valve **(V1, Osram X17)** which operates as frequency changer with internal coupling.

Oscillator grid coils **L3** (M.W.) and **L4** (L.W.) are tuned by **C21.** Parallel trimming by **C22** (M.W.), and **C5, C23** (L.W.); Series tracking by **C6** (M.W.) and **C7** (L.W.). Reaction coupling from anode by **L5** (M.W.), **L6** (L.W.) and the common impedance of the trackers.

Second valve **(V2, Osram W17)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C2, L7, L8, C3** and **C9, L9, L10, C10.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of diode pentode valve **(V3, Osram ZD17).** Audio-frequency component in rectified output is developed across volume control **R5,** which acts as diode load, and is passed via **C12** to control grid of pentode section which operates as A.F. amplifier.

D.C. potential developed across **R5** is fed back as bias, via decoupling circuit **R4** and **C1,** to F.C. and I.F. stages, giving automatic gain control. I.F. filtering by **C11** and **C14.**

Resistance-capacitance coupling by **R7, C15** and **R9** between **V3** and control grid of pentode output valve **(V4, Osram N18),** whose twin filament sections are wired in parallel. Tone correction in anode circuit by **C16.** Grid bias for **V4** is obtained from the drop across **R10** in the H.T. negative lead to chassis. **C17** decouples the H.T. battery circuit.

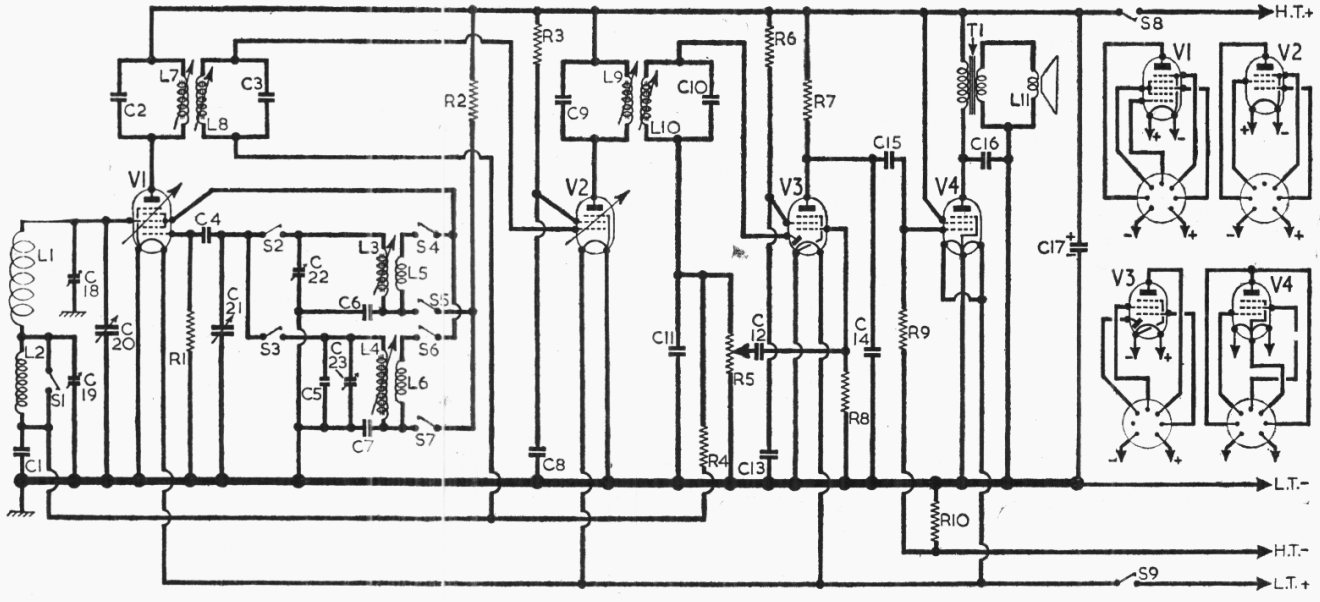
COMPONENTS AND VALUES

	CAPACITORS	Values	Locations
C1	A.G.C. decoupling	0·05μF	E5
C2	1st I.F. trans. tuning	120pF	B2
C3	1st I.F. trans. tuning	120pF	B2
C4	V1 osc. C.G.	0·002μF	E5
C5	L.W. fixed trim.	80pF	F4
C6	M.W. osc. tracker	500pF	F4
C7	L.W. osc. tracker	175pF	F4
C8	V2 S.G. decoup.	0·05μF	E4
C9	2nd I.F. trans. tuning	120pF	B2
C10	2nd I.F. trans. tuning	120pF	B2
C11	I.F. by-pass	100pF	E5
C12	A.F. coupling	0·005μF	D5
C13	V3 S.G. decoup.	0·1μF	D4
C14	I.F. by-pass	100pF	D5
C15	A.F. coupling	0·02μF	D5
C16	Tone corrector	0·002μF	D5
C17*	H.T. decoupling	8μF	D4
C18‡	M.W. aerial trim.	—	F4
C19‡	L.W. aerial trim.	—	F4
C20†	Aerial tuning	—	E4
C21†	Oscillator tuning	—	E4
C22‡	M.W. osc. trimmer	—	F4
C23‡	L.W. osc. trimmer	—	F4

* Electrolytic. † Variable. ‡ Pre-set.

	RESISTORS	Values	Locations
R1	V1 osc. C.G.	100kΩ	E5
R2	Osc. anode feed	8·2kΩ	E5
R3	V2 S.G. feed	15kΩ	E5
R4	A.G.C. decoupling	2·2MΩ	E5
R5	Volume control	500kΩ	C2
R6	V3 S.G. feed	3·3MΩ	E5
R7	V3 anode load	1MΩ	D5
R8	V3 C.G.	10MΩ	D5
R9	V4 C.G.	2·2MΩ	D5
R10	V4 G.B.	680Ω	D5

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Frame aerial	2·0	B1
L2	L.W. loading coil	9·5	F3
L3	Oscillator tuning coils	2·6	F4
L4	Oscillator tuning coils	13·0	F4
L5	Oscillator reaction coils	1·2	F4
L6	Oscillator reaction coils	6·0	F4
L7	1st I.F. trans. Pri.	10·0	B2
L8	1st I.F. trans. Sec.	10·0	B2
L9	2nd I.F. trans. Pri.	10·0	B2
L10	2nd I.F. trans. Sec.	11·5	B2
L11	Speech coil	2·0	E3
T1	O.P. trans. Pri.	500·0	E3
	O.P. trans. Sec.	0·5	
S1-S7	Waveband switches	—	F4
S8, S9	Mains sw., g'd R5	—	D4



Circuit diagram of the Etronic EPB4211 all-dry portable superhet. **L1** is the frame aerial winding.

DISMANTLING THE SET

Removing Chassis.—Remove three control knobs (pull off) with felt washers; stand set on its side, and remove four hexagon-head self-tapping screws (with washers) from the corners of the metal base plate;

the chassis may now be withdrawn, together with the base plate, access to the underchassis then being obtained by removing the remaining four hexagon-head screws securing the metal base plate to the legs supporting the chassis.

CIRCUIT ALIGNMENT

Remove chassis from carrying case and stand on its waveband-switch end.

I.F. Stages.—Connect output leads of signal generator, via an 0.1μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and chassis. Switch set to M.W.

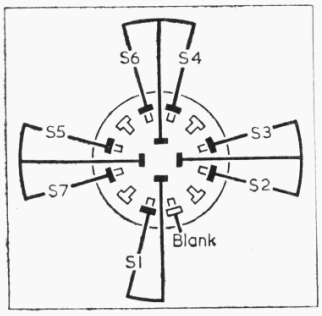
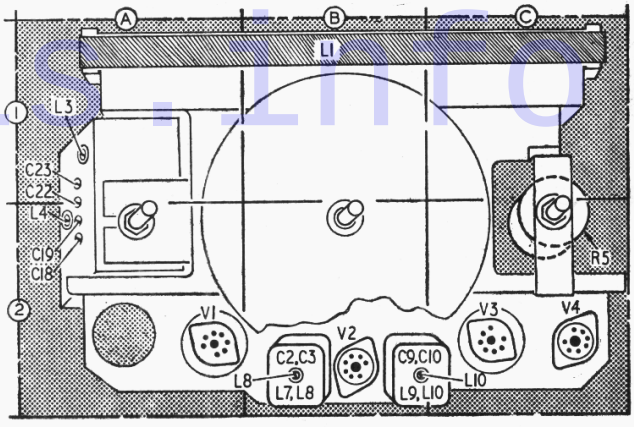


Diagram of the waveband switch unit, as seen in our underchassis view.

and turn gang to maximum. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L10** (location reference B2), **L9** (E5), **L8** (B2) and **L7** (E5) for maximum output. Repeat these adjustments.

R.F. and Oscillator stages.—As the cursor line is marked on the scale window, which remains in the carrying case when the chassis is withdrawn, a strip of card should be cut and marked as shown in col. 3 to represent the cursor line. The card should be fitted over the control spindles, and the following alignment points read off against the cursor lines on to the scales below it. Check that with the gang at maximum capacitance the cursor lines on the card coincide with the ends of the tuning scales. Transfer signal generator leads to an aerial loop placed in close proximity to the frame aerial winding.



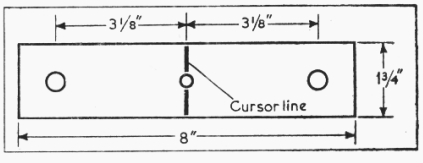
Plan view of the chassis, with the trimmer positions indicated on the left.

M.W.—Switch set to M.W., tune to 500 m on scale, feed in a 500 m (600 kc/s) signal and adjust **L3** (A1) for maximum output. Tune set to 200 m on scale, feed in a 200 m (1,500 kc/s) signal and adjust **C22** (A2) and **C18** (A2) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal and adjust the core of **L4** (A2) for maximum output. Tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal and adjust **C23** (A1) and **C19** (A2) for maximum output. Repeat these adjustments.

GENERAL NOTES

Switches.—**S1-S7** are the waveband switches, ganged in a single rotary unit at one end of the chassis. This is indicated in our underside chassis drawing, and shown in detail in the diagram in col. 1, where it is drawn as seen when viewed from the rear of an inverted chassis. It is seen in this position in our chassis illustration.



Dimensioned drawing of the substitute cursor plate, which should be cut from cardboard for alignment.

In the M.W. position (control knob anti-clockwise) **S1, S2, S4** and **S5** close; in the L.W. position **S3, S6** and **S7** close.

S8, S9 are the H.T. and L.T. circuit switches, of the Q.M.B. type, ganged with the volume control **R5.**

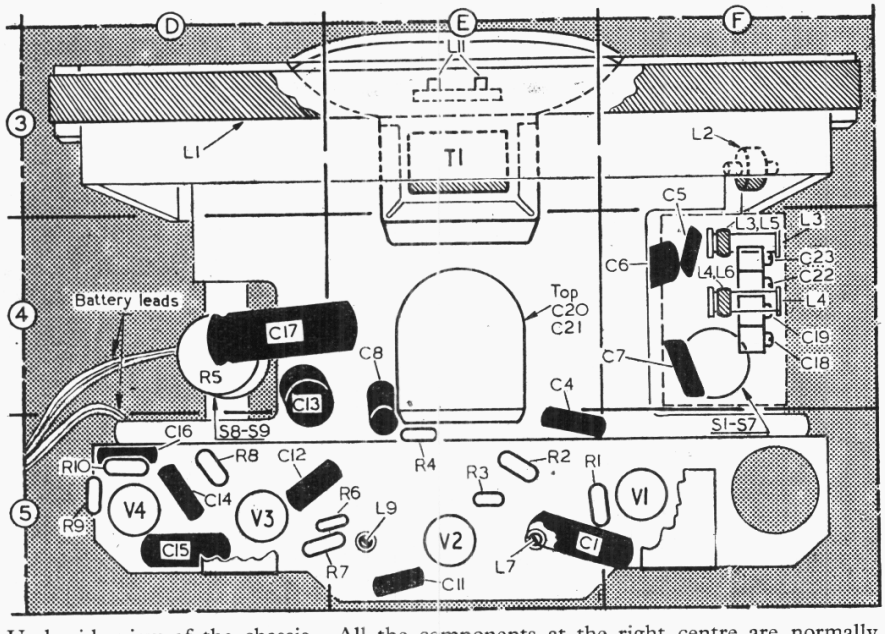
Battery.—The combined H.T. and L.T. battery unit recommended is an Ever Ready Batrymax B103, which comprises a 90V H.T. section and a 1.5V L.T. section. Connection is effected by a 4-pin English type valve base socket.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured on our receiver when it was operating from a new set of batteries. The set was tuned to the highest-wavelength end of M.W., with the volume control at maximum. There was no signal input.

Voltage readings were measured on an Avo Electronic Testmeter, and as there is no appreciable current drawn by this instrument allowance must be made for the current drawn by other types of meter.

Valve	Anode		Screen	
	V	mA	V	mA
V1 X17	80	1·0	65	1·9
V2 W17	80	1·5	63	0·5
V3 ZD17	10	0·07	20	0·02
V4 N18	78	5·0	80	1·2



Underside view of the chassis. All the components at the right centre are normally concealed by a screening shield, but they are drawn here as seen through it.

Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.