'TRADER' SERVICE SHEET

223

VIDOR 273

3-VALVE BATTERY RECEIVER

TWO alternative aerial sockets, one of which brings into circuit a series condenser, are fitted in the Vidor 273 3-valve battery operated receiver. It has a variable-mu pentode R.F. amplifier, a triode detector and a pentode output valve.

CIRCUIT DESCRIPTION

Two alternative aerial connections, **A1** direct and **A2** via pre-set series condenser **C9**, to mixed coupled band-pass filter via coupling coil **L1**. Primary coils **L2** (M.W.) and **L3** (L.W.) are tuned by **C11**; Secondary coils **L4** and **L5** are tuned by **C16**. Capacitative coupling by **C1**, and **C2**.

First valve (**V1, Mullard metallised VP2**) is a variable-mu pentode R.F. amplifier, with gain control by potentiometer **R2**.

Tuned anode coupling **L7, L8, C20** to triode detector (**V2, Mullard metallised PM2HL**) operating on grid leak system with **C3** and **R4**. The latter is returned to centre-tapped potentiometer **R5, R6** across **V2** filament.

Reaction is applied from anode of **V2** by coil **L6** via series resistance **R3**; control is by variable condenser **C17**. R.F. filtering by choke **L9** and condensers **C5, C6**.

Transformer coupling by **T1** between **V2** and pentode output valve (**V3, Mullard PM22D**). Fixed tone correction in anode circuit by condenser **C7**. Bias for **V3** obtained by drop along resistance **R8** in H.T. negative line. Electrolytic condenser **C4** acts as H.T. reservoir.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	Gain control fixed minimum	500
R2	V1 gain control	15,000
R3	Reaction series resistance ..	300
R4	V2 C.G. resistance	1,000,000
R5	V2 filament potentiometer	200
R6	V2 filament potentiometer	200
R7	T1 secondary shunt	150,000
R8	V3 G.B. resistance	150

	CONDENSERS	Values (μF)
C1	Band-pass bottom coupling ..	0·1
C2	Band-pass top coupling (L.W.)	0·000009
C3	V2 C.G. condenser	0·0001
C4*	H.T. supply reservoir ..	8·0
C5	V2 anode R.F. filter condensers	0·0001
C6	V2 anode R.F. filter condensers	0·0002
C7	V3 anode fixed tone corrector	0·002
C8*	V3 G.B. by-pass	50·0
C9‡	Aerial series condenser ..	—
C10‡	Band-pass primary trimmer (L.W.)	0·00003
C11†	Band-pass primary tuning ..	—
C12‡	Band-pass primary trimmer ..	—
C13‡	Band-pass primary extra trimmer	—
C14‡	Band-pass secondary trimmer (L.W.)	0·00003
C15‡	Band-pass secondary trimmer (M.W.)	0·00006
C16†	Band-pass secondary tuning ..	—
C17†	Reaction control	0·0005
C18‡	V1 anode circuit trimmer (L.W.)	0·00003
C19‡	V1 anode circuit trimmer (M.W.)	0·00006
C20†	V1 anode circuit tuning ..	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial coupling coil	3·5
L2	Band-pass primary coils	4·5
L3	Band-pass primary coils	19·5
L4	Band-pass secondary coils	4·9
L5	Band-pass secondary coils	21·0
L6	Reaction coil	2·8
L7	V1 anode M.W. tuning coil ..	4·8
L8	V1 anode L.W. tuning coil ..	20·0
L9	V2 anode circuit choke ..	170·0
L10	Speaker speech coil	2·5
T1	Intervalve trans. Pri. ..	1,050·0
	Intervalve trans. Sec. ..	5,000·0
T2	Speaker input trans. Pri. ..	650·0
	Speaker input trans. Sec. ..	0·3
S1-S3	Waveband switches	—
S4	H.T. circuit switch (Ganged R2)	—
S5	L.T. circuit switch (Ganged R2)	—
S6	Scale lamps switch	—

DISMANTLING THE SET

Removing Chassis.—If it is desired to remove the chassis from the cabinet, remove the four control knobs (recessed grub screws) and the four bolts (with washers) holding the chassis to the cabinet bottom. Now free the battery leads from the two cleats holding them to the battery platform, when the chassis can be withdrawn to the extent of the speaker leads, which should be just sufficient for normal purposes.

When replacing, note that the knob without a dot goes on the spindle of the tuning drive and that the knob with red and blue dots goes on the spindle of the wave-change switch. There is no flat on this latter spindle but the knob should be fixed so that the dot is uppermost when the receiver is switched to the medium band.

To free the chassis entirely, unsolder the speaker leads.

Removing Speaker.—To remove the speaker from the cabinet, remove the nuts and lock washers from the four screws holding it to the sub-baffle. *When replacing*, see that the transformer is on the left.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new H.T. battery reading 125 V overall, on load. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input.

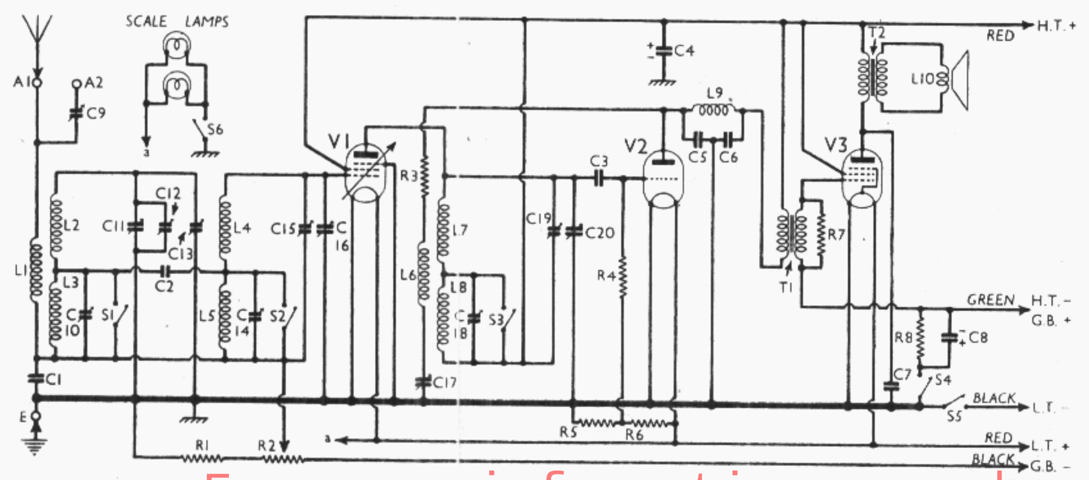
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	110	1·7	110	0·8
V2 PM2HL	107	2·9	—	—
V3 PM22D	108	5·7	110	0·9

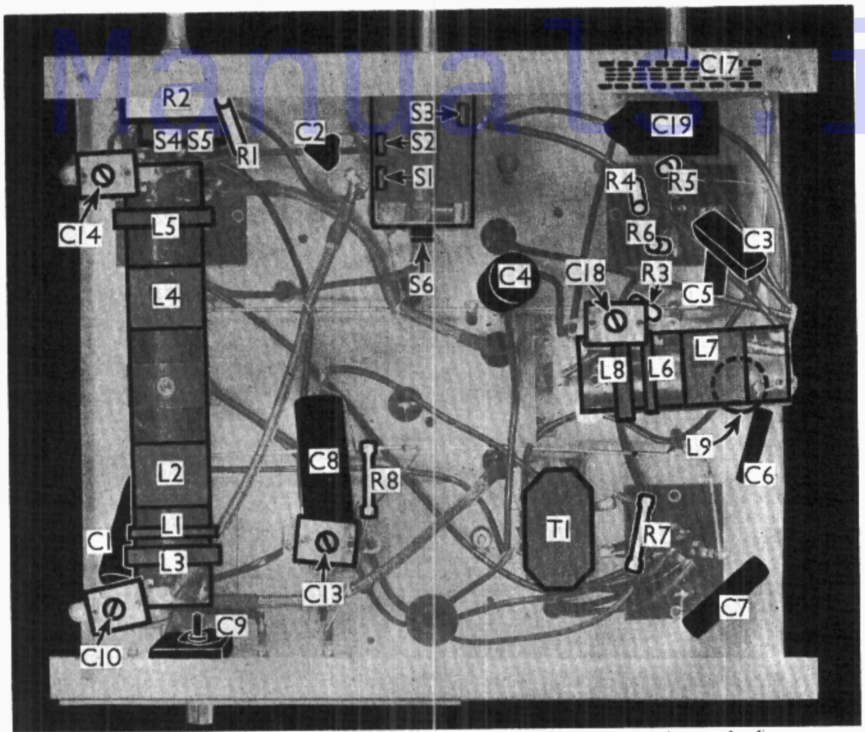
GENERAL NOTES

Switches.—**S1-S3** are the waveband switches in a single unit beneath the chassis. They are identified in our underchassis view. All these switches are *closed* on the M.W. band and *open* on the L.W. band.

S4 and **S5** are the H.T. and L.T. circuit



Circuit diagram of the Vidor 273 3-valve battery receiver. The bottom of **C15** in our receiver is connected to the slider of **R2**, and not to the chassis as in makers' diagram.



Under-chassis view. The wave-change switches are clearly marked.

switches, of the Q.M.B. type, ganged with the gain control, **R2**. One contact of each is common. The L.T. negative lead goes to the other contact belonging to **S4**. **S6** is the scale lamps switch, at the back of the **S1-S3** unit, which closes when the wave-change knob is pushed in.

Coils.—**L1-L5** and **L6-L8** are in two unscreened units, with tubular formers beneath the chassis. The choke **L9** is beneath the **L6-L8** unit.

Scale Lamps.—These are two M.E.S. types, rated at 2·6 V, 0·3 A. They do not light unless the wavechange switch knob is pushed in.

External Speaker.—No provision is made for this, but a high resistance type could be connected across the two tags (primary winding) on the internal speaker transformer.

Gang Condenser.—Note that only the rear section is fitted with a trimmer.

Trimmers C15, C19.—These are adjusted through two rubber-bushed holes in the chassis deck, near the front.

Chassis Divergency.—The makers' diagram shows **C15** returned to chassis. In our model it is taken to the slider of **R2**, as shown in our circuit diagram.

Batteries.—The H.T. and G.B. battery recommended is a Vidor, Type 14,480, 111 V H.T. plus 9 V G.B. No particular L.T. accumulator is recommended.

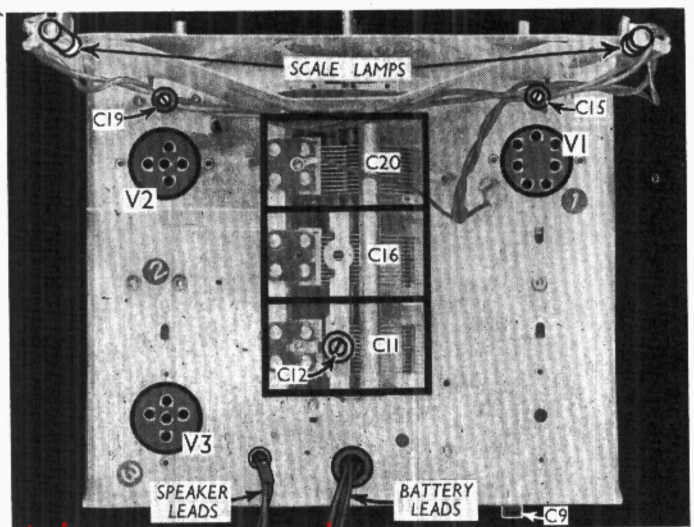
Battery Leads and Voltages.—Black spade tag, L.T. negative; red spade tag, L.T. positive 2 V; green plug, H.T. negative and G.B. positive; red plug, H.T. positive, 111 V; black plug, G.B. negative, —9 V.

CIRCUIT ALIGNMENT

First see that the pointer travels fully to each end of the scale as the gang condenser is rotated.

Feed a 250 m. (1,200 KC/S) signal into **A2** and **E** sockets, with **C9** (rear of chassis) near its maximum position. Switch set to M.W., tune to 250 m. on scale, turn gain control (**R2**) to maximum, and advance reaction until set is just short of oscillation. Adjust **C19** (through hole in chassis deck) for maximum output. Then adjust **C15** (also through hole in chassis deck) for maximum output. **C12** (on gang condenser) should then be adjusted. If it is found to be already at maximum, and more capacity is needed, adjust **C13** (beneath chassis). Reaction should be kept advanced as far as possible without causing the set to oscillate.

Switch set to L.W., and inject a 1,000 m. (300 KC/S) signal. Tune to 1,000 m. on scale, and adjust **C18, C14** and **C10** in that order for maximum output, keeping reaction advanced, as on the M.W. band.



Plan view of the chassis. Note the adjusting screws of **C15** and **C19**.

COSSOR HINTS FOR SERVICE

SHOULD hum be encountered in a Cossor 358, make sure that the scale lamps are not shorting to chassis. Another cause sometimes met with is a disconnection of the static screen of the mains transformer. If it is not possible to get down to this, try a 0·1 μF condenser of high voltage rating between one end of the H.T. secondary and earth.

Hum in a 378 can be caused by one half of the 25 O centre-tapped resistance having become O/C.

INTERMITTENT signals, distortion, low output and side-band tuning in a 535 superhet is probably due to a dry joint. In looking for this joint, special attention should be paid to the A.V.C. line. An intermittent short in the same part of the circuit can also cause this trouble.

If, particularly on weak signals, a 535 is found to give a kind of gurgling noise, not unlike motor-boating, try replacing the MVS/Pen valve. If this does not effect a cure, the cause will almost certainly be a dry joint or disconnection in the bias circuit of this valve.

INSTABILITY at the lower end of both the medium and long wave bands in a "straight" receiver, such as the 363, can often be cured by earthing the speaker frame, or by reversing the speaker leads.

WHEN an MVSG valve is fitted to a 337 receiver as a replacement, loud modulation hum often results. This is due to the increased efficiency of these valves and can be cured without lowering the efficiency of the receiver, by increasing the value of the fixed bias resistance in the cathode circuit of the MVSG by 100 O.—WITH ACKNOWLEDGEMENTS TO *The Cossor Courier*.