"TRADER" SERVICE SHEET

957

VIDOR 393

Portable A.C. Superhet

A PORTABLE receiver designed to operate only from A.C. mains of 200-250 V, 40-100 c/s, the Vidor 393 is one of the "Riviera" range of models, with a carrying strap and a hinged lid over the control panel, in which a switch operates automatically.

Release date and original price: October, 1949; £15 11s 5d, plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, C29** (S.W.) and **L2, L3, L4, C29** (M.W. and L.W.) On M.W., **L2** and **L3** are connected in parallel, and **L4** is in series with them; on L.W., **L3** and **L4** are in series, and **L2** is out of circuit. On S.W. only, provision is made for the connection of an external aerial. First valve **(V1, Brimar 6BE6)** is a heptode operating as frequency changer with electron coupling.

Second valve **(V2, Brimar 6BA6)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier.

Intermediate frequency 475 kc/s.

The diode signal detector is part of double diode triode valve **(V3, Brimar 6AT6).**

Second diode of **V3**, fed via **C17** from **V2** anode, provides D.C. potential which is developed across **R16** and fed back through decoupling circuit to I.F. valve only, giving automatic gain control.

Resistance-capacitance coupling by **R15, C22** and **R17** between **V3** triode and the pentode output valve **(V4, Brimar 6AM5).** Fixed tone correction by **C23** in anode circuit. A proportion of the speech voltage in **T1** secondary circuit is fed back via the potential divider **R18, R14** in inverse phase to **V3** cathode circuit.

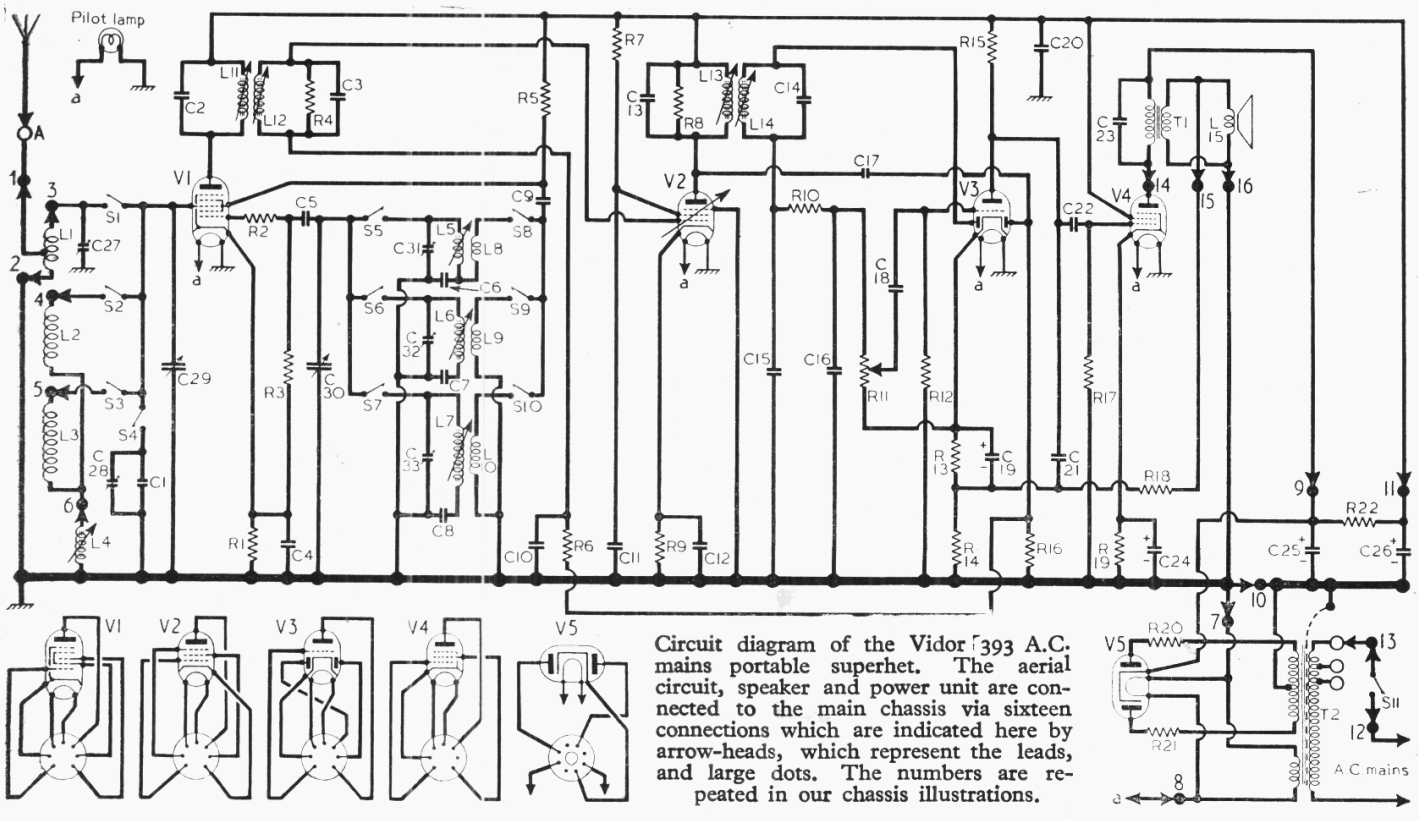
H.T. current is supplied by I.H.C. full-wave rectifying valve **(V5, Brimar 6X5GT)** whose heater is energized from the same secondary winding on **T2** as the other valves.

COMPONENTS AND VALUES

	CAPACITORS	Values	Locations
C1	L.W. fixed trimmer	15pF	B2
C2	1st I.F. transformer tuning	150pF	C2
C3	1st I.F. transformer tuning	150pF	C2
C4	V1 cath. by-pass	0·1μF	D3
C5	V1 osc. C.G.	100pF	E3
C6	Osc. S.W. tracker	0·005μF	B2
C7	Osc. M.W. tracker	635pF	B2
C8	Osc. L.W. tracker	230pF	F4
C9	Osc. coupling	0·01μF	E3
C10	A.G.C. decoupling	0·1μF	D4
C11	V2 S.G. decoup.	0·1μF	F3
C12	V2 cath. by-pass	0·1μF	F4
C13	2nd I.F. transformer tuning	150pF	A2
C14	2nd I.F. transformer tuning	300pF	A2
C15	I.F. by-passes	100pF	G3
C16	I.F. by-passes	100pF	G3
C17	A.G.C. coupling	50pF	G4
C18	A.F. coupling	0·002μF	H3
C19*	V3 cath. by-pass	50μF	F3
C20	H.T. R.F. by-pass	0·1μF	G4
C21	I.F. by-pass	300pF	G3
C22	A.F. coupling	0·01μF	H4
C23	Tone corrector	0·002μF	—
C24*	V4 cath. by-pass	25μF	F4
C25*	H.T. smoothing	40μF	J5
C26*	H.T. smoothing	40μF	J5
C27‡	S.W. aerial trim.	40pF	C1
C28‡	L.W. aerial trim.	80pF	B2
C29†	Aerial tuning	§532pF	B1
C30†	Oscillator tuning	§532pF	B1
C31‡	S.W. osc. trim.	30pF	C2
C32‡	M.W. osc. trim.	80pF	B1
C33‡	L.W. osc. trim.	240pF	B1

	RESISTORS	Values	Locations
R1	V1 G.B.	150Ω	D3
R2	Osc. grid stopper	47Ω	D3
R3	Osc. grid resistor	22kΩ	D3
R4	I.F. shunt	150kΩ	D4
R5	Osc. H.T. feed	18kΩ	F3
R6	A.G.C. decoupling	1MΩ	G3
R7	V2 S.G. feed	33kΩ	F3
R8	I.F. shunt	100kΩ	G4
R9	V2 G.B.	100Ω	F4
R10	I.F. stopper	100kΩ	G3
R11	Volume control	1MΩ	A1
R12	V3 C.G. resistor	1MΩ	G3
R13	V3 G.B.	3·3kΩ	F3
R14	Neg. feedback	47Ω	G3
R15	V3 anode load	270kΩ	G3
R16	A.G.C. diode load	470kΩ	H4
R17	V4 C.G. resistor	680kΩ	H4
R18	Neg. feedback	100Ω	G4
R19	V4 G.B.	750Ω	F4
R20	Surge limiters	220Ω	K5
R21	Surge limiters	220Ω	K5
R22	H.T. smoothing	1kΩ	J5

* Electrolytic. † Variable. ‡ Pre-set.
§ "Swing" value, min. to max.



Circuit diagram of the Vidor 393 A.C. mains portable superhet. The aerial circuit, speaker and power unit are connected to the main chassis via sixteen connections which are indicated here by arrow-heads, which represent the leads, and large dots. The numbers are repeated in our chassis illustrations.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial windings	Very low	—
L2		1·7	—
L3		19·0	—
L4	M.W. trimmer	1·6	B2
L5	S.W. Osc. tuning coil	Very low	C2
L6	M.W. Osc. tuning coil	1·4	B2
L7	L.W. Osc. tuning coil	3·5	B2
L8	S.W. Osc. reaction coil	Very low	C2
L9	M.W. Osc. reaction coil	0·5	B2
L10	L.W. Osc. reaction coil	0·8	B2
L11	1st I.F. trans. Pri.	4·8	C2
L12	1st I.F. trans. Sec.	4·8	C2
L13	2nd I.F. trans. Pri.	5·1	A2
L14	2nd I.F. trans. Sec.	3·6	A2
L15	Speech coil	2·8	—
T1	Output trans. Pri.	660·0	—
	Output trans. Sec.	0·3	—
T2	Mains trans. Pri. total	67·0	
	Mains trans. H.T. total	740·0	K5
	Mains trans. 6·3 V. htr.	0·3	
S1-S10	Waveband switches	—	C2
S11	Mains switch	—	C1

GENERAL NOTES

Switches.—**S1-S10** are the waveband switches, ganged in two rotary units on the chassis deck. These are indicated in our rear view of the chassis, where arrows show the direction in which they are viewed in the diagrams beside it. The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control. A dash indicates open, and **C**, closed.

S11 is the mains switch, operated by a spring-loaded plunger which is depressed when the lid is closed, opening the switch to switch off the receiver.

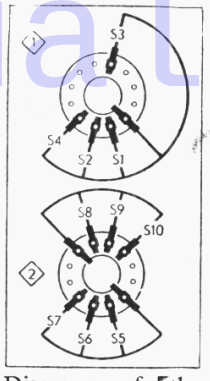
Pilot Lamp.—This is an Osram lamp, with a small clear spherical bulb and an M.E.S. base, rated at 6.5 V, 0.3 A.

Interconnecting Leads.—The four units comprising the complete receiver (aerial, chassis, power and speaker units) are interconnected by sixteen connecting leads which are numbered and shown with arrow-heads in our circuit diagram, the numbers being repeated in the chassis illustrations. **1-6** are the aerial connections, **7-13** are the power unit connections, including one from the speaker, and **14-16** are the remaining speaker connections.

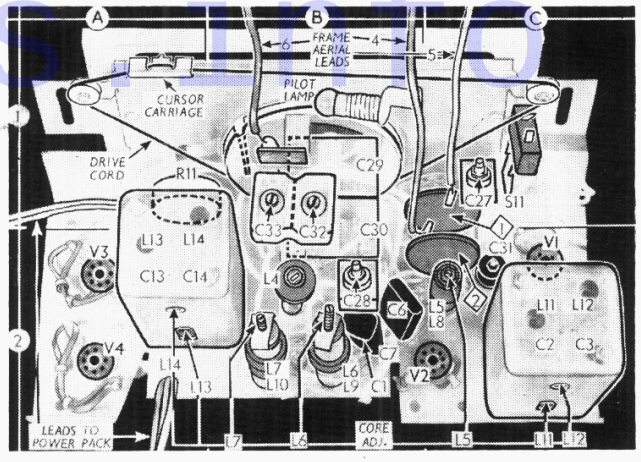
Drive Cord Replacement.—The tuning drive is a friction device, but a cord is used for the cursor drive. It is very straightforward, and its course can be seen in our rear chassis view. About 30 inches of cord is required, and it goes down under the drum from each side, then round it until it meets the slot, when it enters the drum.

CIRCUIT ALIGNMENT

I.F. Stages.—It is advisable to remove the chassis from the carrying case for these adjustments. Connect signal generator via a 0.001 μF capacitor to control grid (pin 7) of **V1** and chassis. Switch set to L.W., tune to 2,000 m on scale, turn the volume control to maximum, and short-circuit **C30**. Feed in a 475 kc/s (631.6 m) signal, and adjust the cores of **L14, L13, L12** and **L11** (location references A2, C2) for maximum output, reducing the input as the circuits come into line. Then remove the short-circuit from **C30** and disconnect signal generator leads.



Diagrams of the waveband switch units (above). Below is the associated switch table.



Rear view of the chassis, in which the tuning drive cord is shown.

Switch	L.W.	M.W.	S.W.
S1	—	—	C
S2	—	C	—
S3	C	C	—
S4	C	—	—
S5	—	—	C
S6	—	C	—
S7	C	—	—
S8	—	—	C
S9	—	C	—
S10	C	—	—

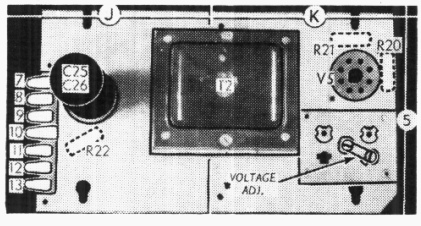
R.F. and Oscillator Stages.—These operations are best performed with the chassis in its case. Connect signal generator leads to a few turns of wire pinned to the bench near the receiver. With the gang at minimum capacitance, the cursor should cover the low wavelength ends of the scales.

S.W.—Switch set to S.W., tune to 17 m on scale, feed in a 17 m (17.64 Mc/s) signal and adjust **C31** (C2) and **C27** (C1) for maximum output. (If no output can be obtained, connect signal generator leads via a 0.0002 μF capacitor directly to the S.W. aerial). Tune to 50 m on scale, feed in a 50 m (6 Mc/s) signal, and adjust the core of **L5** (C2) for maximum output while rocking the gang for optimum results. Repeat these adjustments until no improvement can be obtained, then seal **C31** with wax.

M.W.—Switch set to M.W., tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C32** (B1) for maximum output. Feed in a 550 m (545.4 kc/s) signal, tune it in, and adjust the cores of **L4** and **L6** (B2) for maximum output while rocking the gang. Repeat these adjustments.

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust **C33** (B1) and **C28** (B2) for maximum output. Feed in a 2,000 m (150 kc/s) signal, tune it in, and adjust the core of **L7** (B2) for maximum output while rocking the gang. Repeat these adjustments.

Finally, fit the back cover in position, and readjust **L4** at 550 m and **C28** at 1,000 m, inserting the trimmer tool through the hole in the back cover.



Plan view of the power unit.

DISMANTLING THE SET

Removing Power Unit.—Remove the central wood screw near the rear edge of the unit, and slacken the wood screws either side of it, when the unit can be drawn slightly rearwards and lifted out to the extent of its connecting leads.

If the leads have been unsoldered, they should be connected as indicated by the numbered connections in our circuit diagram and our photograph of the unit.

Removing Receiver Chassis.—First remove the power unit, then unsolder from the tags at the top edge of the back cover the three leads from chassis and the yellow aerial lead from the locking-screw bracket at the top of the carrying case;

remove two 4BA nuts (with large plain washers), holding the sub-baffle, from the bottom corners of the carrying case;

remove two 4BA nuts (with lock-washers) and two wood screws (with plain washers) holding the scale assembly to the sloping roof of the case.

If the top of the chassis is now tilted backwards, the complete assembly, with speaker and S.W. frame aerial, can be lifted out of the case.

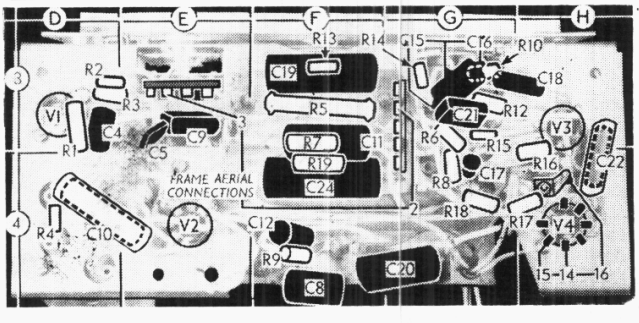
To separate chassis from sub-baffle, unsolder from the front (underside) of the chassis, now exposed, the two S.W. frame leads and the three speaker leads, numbered **1, 2** and **14, 15, 16** in our circuit diagram and front view of the chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 235 V, using the 240-250 V tapping. The receiver was tuned to the highest wavelength on the M.W. band, and the volume control was at maximum, but there was no signal input. Voltages, except cathode readings, were measured on the 400 V scale of a Model 7 Avometer, chassis being the negative connection.

Valve	Anode		Screen		Cathode
	V	mA	V	mA	V
6BE6	210	1·5	80	7·5	1·3
6BA6	210	8·7	100	3·2	1·3
6AT6	75	0·3	—	—	0·9
6AM5	225	13·0	210	1·7	10·0
6X5GT	220†	—	—	—	235·0

† Each anode A.C.



Front face of the chassis, in which two of the frame aerial connections are shown. The speaker connections **14, 15, 16** are seen at bottom right.

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