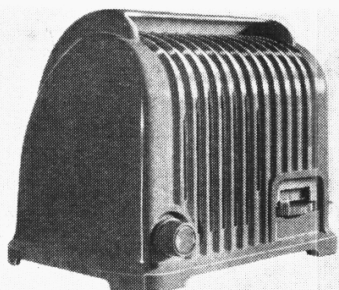


"TRADER" SERVICE SHEET
939

SOBELL 439

"Sobellette" and 419TG Radiogram



The appearance of the 439 "Sobellette."

A SUPERHET circuit with a single I.F. transformer, with pre-set reaction coupling, and screen grid manual volume control, distinguish the Sobell 439 "Sobellette" from conventional receivers. It is a 3-valve (plus rectifier) 2-band portable, with an attached aerial lead, designed to operate from A.C. or D.C. mains are 200-250 V, 40-100 c/s. The wave-band ranges are 190-550 m and 800-2,200 m.

The 419TG table radiogram employs a similar chassis to that in the 439, with the addition of the pick-up circuit, but it operates on A.C. mains only. The modifications are explained in full overleaf.

Release dates and original prices: 439, May 1949, £7 7s 10d; 419TG, August 1949, £17 13s. Purchase tax extra.

CIRCUIT DESCRIPTION

Aerial input via series capacitor C1 and coupling coils L1 (M.W.) and L2 (L.W.) to single tuned circuits L3, C19 (M.W.) and L4, C19 (L.W.), which precede the first valve (V1, Brimar 145T), a triode-heptode operating as frequency changer with internal coupling.

Oscillator grid coils L5 (M.W.) and L6 (L.W.) are tuned by C21. Parallel trimming by C22 (M.W.); series tracking by C9 (M.W.) and C10 (L.W.). Inductive reaction coupling by oscillator anode coils L7 (M.W.) and L8 (L.W.). Manual volume control by R2 which varies V1 heptode screen voltage.

Tuned intermediate frequency transformer coupling by C5, L9, L10, L11, C6 between V1 heptode and R.F. pentode valve (V2, Brimar 12J7GT) which operates as leaky-grid detector with C8 and R5. Pre-set reaction coupling is provided by L10 and C23 between grid and anode circuits.

Intermediate Frequency 465 kc/s.

In the radiogram model only, pick-up connection is provided in the screen grid circuit of V2, as shown in dotted line in our circuit diagram, C11 being connected to the slider of R16 instead of to chassis. S6 closing to short the P.U. when the control is turned to minimum.

Resistance-capacitance coupling by R7, C13 and R10 between V2 and beam tetrode output (Continued col. 1 overleaf)

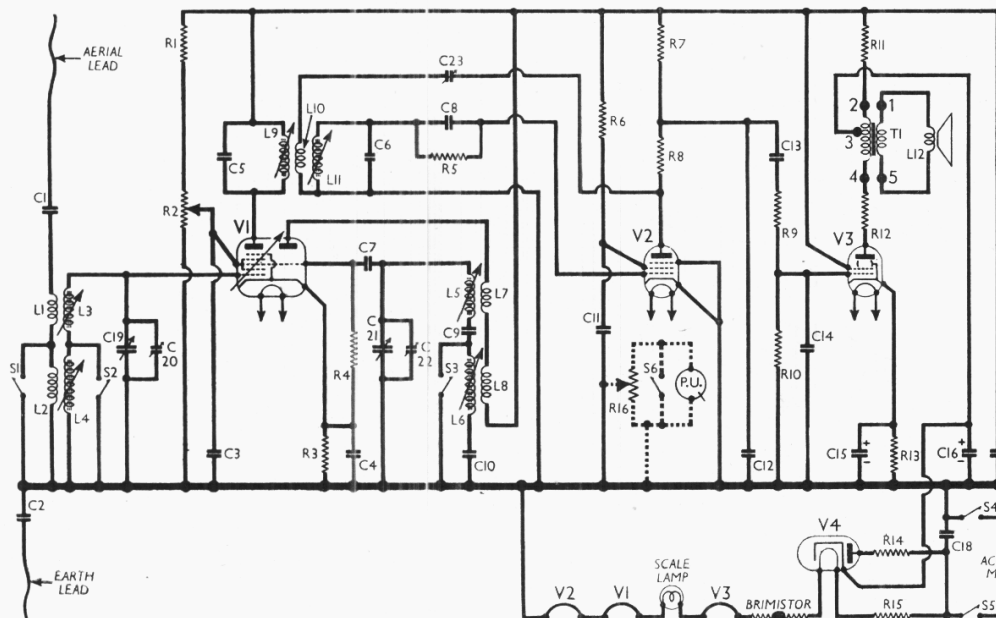
CAPACITORS		Values (µF)	Locations
C1	Aerial series ...	0-001	A2
C2	Earth isolator ...	0-001	F4
C3	V1 S.G. decoup. ...	0-1	J4
C4	V1 cath. by-pass ...	0-1	J4
C5	1st I.F. transformer ...	0-0001	B1
C6	tuning ...	0-00009	B1
C7	V1 osc. C.G. ...	0-0001	H4
C8	V2 C.G. capacitor ...	0-0001	B1
C9	Osc. M.W. tracker ...	0-00035	K4
C10	Osc. L.W. tracker ...	0-0001	K4
C11	V2 S.G. decoup. ...	0-1	H4
C12	I.F. by-pass ...	0-0001	G4
C13	A.F. coupling ...	0-01	G4
C14	I.F. by-pass ...	0-0001	F4
C15*	V3 cath. by-pass ...	50-0	F4
C16*	Smoothing ...	32-0	G3
C17*	capacitors ...	32-0	G3
C18	Mains R.F. by-pass ...	0-01	E3
C19†	Aerial tuning ...	0-000405	A1
C20‡	Aerial M.W. trim. ...	—	A1
C21†	Osc. tuning ...	0-000405	A1
C22‡	Osc. M.W. trim. ...	—	A1
C23‡	I.F. reaction ...	0-00011	C2

* Electrolytic. † Variable. ‡ Pre-set.

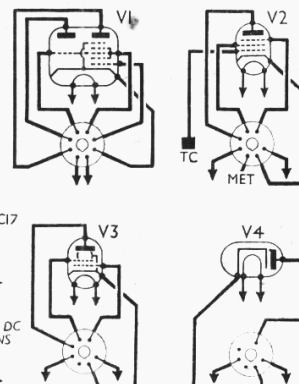
COMPONENTS AND VALUES

RESISTORS		Values (ohms)	Locations
R1	V1 S.G. H.T. feed ...	33,000	F3
R2	Volume control ...	100,000	E3
R3	V1 G.B. resistor ...	220	J4
R4	V1 osc. C.G. ...	47,000	H4
R5	V2 grid leak ...	1,000,000	B1
R6	V2 S.G. H.T. feed ...	1,100,000	F3
R7	V2 anode load ...	220,000	G4
R8	I.F. stopper ...	22,000	G4
R9	I.F. stopper ...	47,000	F4
R10	V3 C.G. resistor ...	470,000	F4
R11	H.T. smoothing ...	4,700	E4
R12	V3 anode stopper ...	100	C1
R13	V3 G.B. resistor ...	220	F4
R14	V4 surge limiter ...	280	C2
R15	Heater ballast ...	745	C2
R16	Gram. vol. control ...	100,000	—

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Aerial coupling coils ...	42-0	A2
L2	coils ...	200-0	A2
L3	Aerial tuning coils ...	5-0	A2
L4	coils ...	30-0	A2
L5	Oscillator tuning coils ...	3-5	J4
L6	coils ...	11-0	J4
L7	Oscillator reaction coils ...	2-0	J4
L8	coils ...	4-0	J4
L9	I.F. trans- former	15-0	—
L10	React. Sec.	0-9	B1
L11	Sec.	15-0	—
L12	Speech coil	3-5	—
T1	Output trans- former	1-2 ... 2-3 ... 4-5 ...	31-0 ... 350-0 ... 0-5
S1-S3	W/band switches ...	—	J3
S4, S5	Mains sw., g'd R2	—	E3
S6	P.U. switch ...	—	—



Circuit diagram of the Sobellette 439 A.C./D.C. midget. Advantage is taken of the single I.F. transformer pre-set reaction via the feed-back winding L10. V2 is a grid leak detector. Beneath V2, dotted, is the added circuit in the radiogram.



Circuit Description—continued

valve (V3, Brimar 35L6GT). I.F. filtering by R8, C12 in V2 anode circuit and R9, C14 in V3 control grid circuit.

When the receiver is operating from A.C. mains, H.T. current is supplied by half-wave rectifying valve (V4, Brimar 35Z4GT), which with D.C. mains behaves as a low resistance. Smoothing is effected by R11 and C16, C17, residual hum being neutralized by passing the H.T. current through part of the output transformer primary.

Valve heaters, together with scale lamp, ballast resistor and surge limiter (Brimistor CZ2) are connected in series across mains input circuit. Mains R.F. filtering by C18.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from A.C. mains of 200 V. The receiver was tuned to the lowest wavelength on the M.W. 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 Avometer, except where otherwise stated, chassis being the negative connection.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	
V1 14S7	123	0.93	52	1.6	†1.0
	123	3.8			
V2 12J7GT	18	0.38	14	0.1	—
V3 35L6GT	150	35.0	123	2.2	†8.3
V4 35Z4GT	185§	—	—	—	165

§ A.C. † 10v. range.

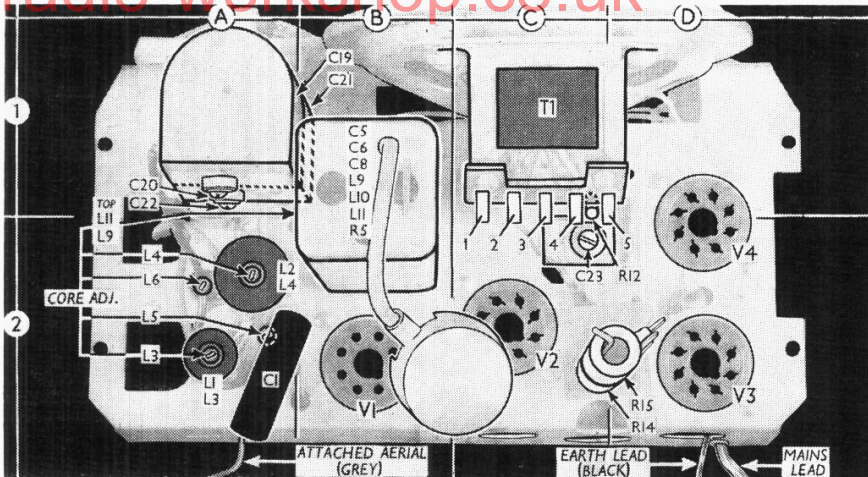
GENERAL NOTES

Switches.—S1-S3 are the waveband switches, ganged in a rotary unit beneath the chassis. This unit is shown in our under-chassis view, where the switch tags are identified. All three switches close on M.W. (control lever moved to the left) and open on L.W. (control lever to right).

S4, S5 are the Q.M.B. double-pole mains switches, ganged with the manual volume control R2. S6 is used only in the radiogram.

Scale Lamp.—This is an Ediswan M.E.S. type, with a large clear spherical bulb, rated at 12 V, 2.2 W. Its rated current is 180 mA (0.18 A). It is connected into a 150 mA circuit, but the "Brimistor" protects it against current surges.

Brimistor.—This is a Brimar non-linear resistor, known as a "Brimistor" type CZ2. It has a negative temperature co-efficient, its resistance reducing as it warms up, and it is included in the heater chain to prevent a current surge when first switched on. It is rated at 100Ω when working, 2.25 W. The measured resistance of our sample when cold



Plan view of the chassis. R14 and R15 together form a single tapped unit. All the alignment adjustments are indicated here, and the five tags of T1 are identified. C23 is the pre-set reaction control.

was about 6,000Ω. Its dimensions are approximately 1/2 x 1/2 inch.

Chassis Divergencies.—The aerial isolating capacitor C1 may be 0.01 μF, 0.001 μF or 0.0025 μF. The smaller value reduces the effect of the slight shock that may sometimes be experienced with A.C./D.C. circuits. C2 has the same range of possible values.

Instead of separate intervalve filter components for C12, R9, C14 between V2 and V3, a Dubilier CRC1 unit may be used. In such cases C12 will be connected to the junction of C13 and R9. The values remain unaltered. Another change concerns the position of the Brimistor. It may be connected between R15 and V4 heater and be mounted above R15 on the chassis.

Radiogram Modifications.—The 419TG table radiogram employs a 439 chassis in which all the foregoing divergencies are incorporated. The only other electrical modification as compared with the 439 is concerned with the introduction of the pick-up, but the 419TG operates only from A.C. mains, not from D.C.

The pick-up circuit is shown in our circuit diagram in dotted line. C11 is disconnected from chassis and connected instead to the slider of R16. S6 is ganged with the pick-up volume control R16, and is arranged to close when the control is turned to minimum. This earths C11 and short-circuits the pick-up. The value of R16 is 100,000Ω.

In operation, when the control is advanced, C11 acts as a coupling capacitor and V2

screen grid operates as the control grid in a triode valve. To mute radio, the radio volume control R2 should be turned as near to minimum as is possible without switching off.

CIRCUIT ALIGNMENT

In order to effect a complete re-alignment it is necessary to remove the receiver from its cabinet as described under "Dismantling the Set."

I.F. Stage.—Switch set to M.W., turn ganged volume control to maximum, connect signal generator (via an 0.1 μF capacitor in the "live" lead) to control grid (pin 6) of V1 and the E wire at the rear of the chassis. Fully unscrew C23 and feed in a 465 kc/s (645.16 m) signal, and adjust the cores of L9 and L11 (location references B2, B1) for maximum output.

Test for instability by tuning the receiver completely through both M.W. and L.W. bands, and if stable tune to 550 m on scale and adjust C23 (C2) for maximum output, then check again for instability. If instability is experienced at any point, reduce the capacitance of C23 and re-check for instability. Considerable care should be given to this procedure as the overall receiver sensitivity is dependent upon the accuracy with which it is carried out.

M.W.—Switch set to M.W., connect signal generator via a suitable dummy aerial to the aerial and earth leads. Tune receiver to 207 m on scale, feed in a 207 m (1,450 kc/s) signal, and adjust C22 (A1) and C20 (A1) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust core of L5 (A2) for maximum output.

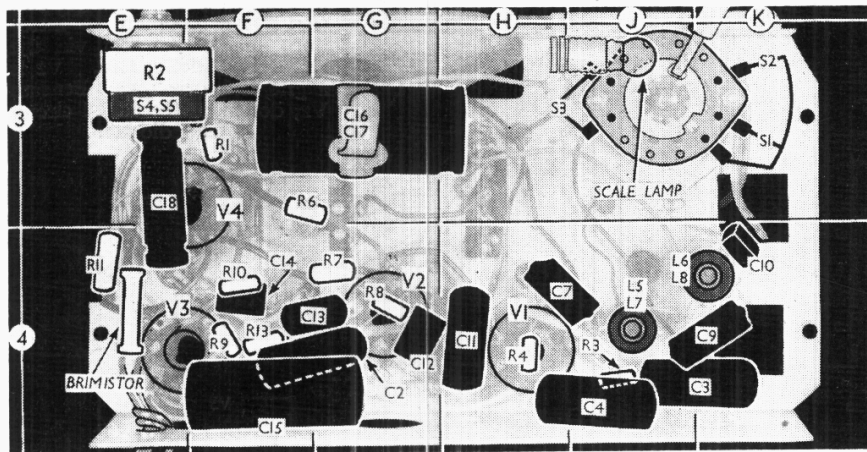
Return to 207 m and check calibration against a 207 m (1,450 kc/s) signal. Return to 500 m, feed in a 500 m (600 kc/s) signal and adjust L3 (A2) for maximum output. Recheck at 207 m (1,450 kc/s), 300 m (1,000 kc/s) and 500 m (600 kc/s).

L.W.—Switch set to L.W., tune to 900 m on scale, feed in a 900 m (333 kc/s) signal, and adjust the cores of L6 (A2) and L4 (A2) for maximum output. Tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal, and re-adjust L6 and L4 if necessary. Repeat these operations until satisfactory balance is obtained between 1,000 m and 2,000 m, with least attenuation below 1,000 m.

DISMANTLING THE SET

Removing Chassis.—Pull off the left-hand control knob and invert the receiver; remove the bottom cover (four 4BA screws) when access will be gained to all the under-chassis components; remove two 4BA screws from each end of the chassis, draw chassis one inch backwards and lift out, taking care to ensure that the tuning scale is not damaged during withdrawal.

When replacing, care should again be taken not to damage the tuning scale or the tops of the valves, which may foul the back of the cabinet.



Underside view of the chassis. The Brimistor is seen on the left. The lever-operated waveband switch unit is seen at top right, and its five connecting tags are identified.