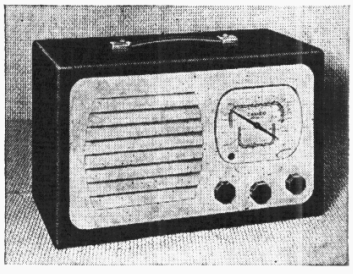
"TRADER" SERVICE SHEET

836

CAMEO SC70



AN accumulator is used for L.T. in the Rees Mace Cameo SC70 portable, permitting advantage to be taken of the robustness of the 2 V valve. A layer type H.T. battery is used, and a fuse lamp protects the filaments from the H.T. circuit.

The receiver is a 4-valve 2-band superhet. The frame aerial is adequate for local station reception, but provision is made for connecting an external aerial.

Release date and original price: April, 1947, £15 0s, plus £3 5s purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L3, C23** (M.W.) and **L4, C23** (L.W.) precedes triode-pentode valve **(V1, Mazda metallized TP25)** operating as frequency changer with internal coupling. Provision for connection of an external aerial via coupling coils **L1** (M.W.) and **L2** (L.W.).

Triode oscillator anode coils **L7** (M.W.) and **L8** (L.W.) are tuned by **C28.** Parallel trimming by **C26** (M.W.) and **C8, C27** (L.W.); series tracking by **C24** (M.W.) and **C25** (L.W.). Reaction coupling to grid by coils **L5** (M.W.) and **L6** (L.W.).

Second valve **(V2, Mazda metallized VP 23)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C3, L9, L10, C4** and **C11, L11, L12, C12.** Additional coupling is provided by fixed capacitors **C5** and **C13.**

Intermediate frequency 430 kc/s.

Diode second detector is part of double diode triode valve **(V3, Mazda HL23DD).** Audio frequency component in rectified output is developed across manual volume control **R5,** which is also the diode load resistor, and passed via A.F. coupling capacitor **C16,** C.G. resistor **R7,** and I.F. stopper **R8** to grid of triode section, which operates as A.F. amplifier.

Second diode of **V3,** fed from **V2** anode via **C15,** provides D.C. potential, which is developed across load resistor **R10** and fed back through a decoupling circuit as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacitance coupling by **R9, C17** and **R13** between **V3** triode and pentode output valve **(V4, Mazda PEN25).** Fixed tone correction in pentode anode circuit by **C19.**

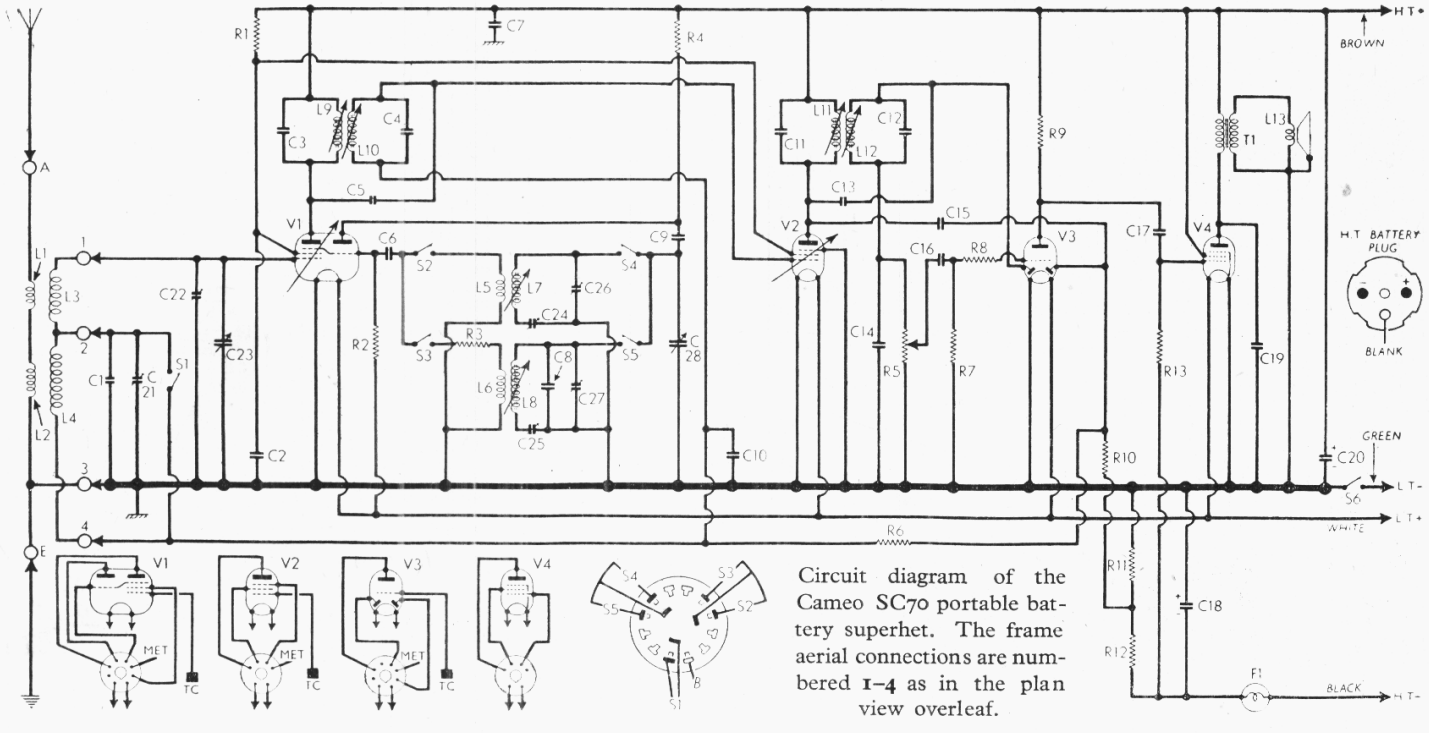
Grid bias potentials for **V1, V2** and **V4,** together with A.V.C. delay voltage, is obtained from the drop across resistors **R11, R12** in the H.T. negative lead to chassis. H.T. circuit R.F. filtering by **C7.**

COMPONENTS AND VALUES

	RESISTORS	Values (ohms)	Location
R1	V1, V2 S.G.'s H.T.	47,000	G5
R2	V1 osc. C.G. ...	22,000	I7
R3	Osc. stabilizer ...	6,800	I9
R4	Osc. H.T. feed ...	22,000	I6
R5	Volume control ...	1,000,000	G5
R6	A.V.C. decoupling	220,000	G7
R7	V3 triode C.G. ...	3,300,000	F6
R8	I.F. stopper ...	150,000	C3
R9	V3 anode load ...	100,000	F7
R10	A.V.C. diode load...	470,000	G7
R11	Fixed G.B. and	47	G6
R12	A.V.C. delay ...	180	G6
R13	V4 C.G.	100,000	G6

	CAPACITORS	Values (μF)	Location
C1	L.W. trimmer ...	0·00007	A1
C2	V1 S.G. decoup. ...	0·1	H5
C3	1st I.F. trans. tuning	0·0002	A4
C4	ing	0·0002	A4
C5	I.F. coupling ...	0·000003	I8
C6	V1 osc. C.G. ...	0·0003	J6
C7	H.T. R.F. by-pass	0·1	H6
C8	L.W. trimmer ...	0·0001	H9
C9	V1 osc. anode ...	0·0001	I6
C10	A.V.C. decoupling	0·05	H7
C11	2nd I.F. trans. tuning	0·0002	C4
C12	ing	0·0002	C4
C13	I.F. coupling ...	0·000003	G8
C14	I.F. by-pass ...	0·00047	H7
C15	A.V.C. coupling ...	0·0001	G8
C16	A.F. coupling ...	0·01	G6
C17	A.F. coupling ...	0·1	F7
C18*	G.B. by-pass ...	50·0	H7
C19	Tone corrector ...	0·004	G7
C20*	H.T. reservoir ...	4·0	H6
C21‡	Aerial L.W. trim....	0·00005	A1
C22‡	Aerial M.W. trim....	0·00005	A1
C23†	Frame aerial tuning	0·0005	B2
C24‡	M.W. tracker ...	0·00075	I9
C25‡	L.W. tracker ...	0·00035	I9
C26‡	M.W. trimmer ...	0·00005	G9
C27‡	L.W. trimmer ...	0·00005	G9
C28†	Osc. tuning ...	0·0005	B3

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Cameo SC70 portable battery superhet. The frame aerial connections are numbered 1–4 as in the plan view overleaf.

	OTHER COMPONENTS	Approx. Values (ohms)	Location
L1	Aerial coupling coils	3·5	E2
L2		0·3	E3
L3	Frame aerial windings	1·0	E3
L4		8·5	E3
L5	Osc. reaction coils	0·7	I8
L6		2·4	H8
L7	Osc. tuning coils	1·2	I8
L8		3·3	H8
L9	1st I.F. trans. Pri.	2·5	A4
L10	1st I.F. trans. Sec.	2·5	A4
L11	2nd I.F. trans. Pri.	2·5	C4
L12	2nd I.F. trans. Sec.	2·5	C4
L13	Speech coil	2·6	—
T1	Output trans. Pri.	560·0	—
	Output trans. Sec.	0·2	—
S1-S5	W/band switches	—	I6
S6	L.T. switch	—	G6
F1	200 mA fuse bulb	—	F9

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted by the manufacturers. Voltages were measured on the 100 V scale of a model 7 Avometer, chassis being the negative connection.

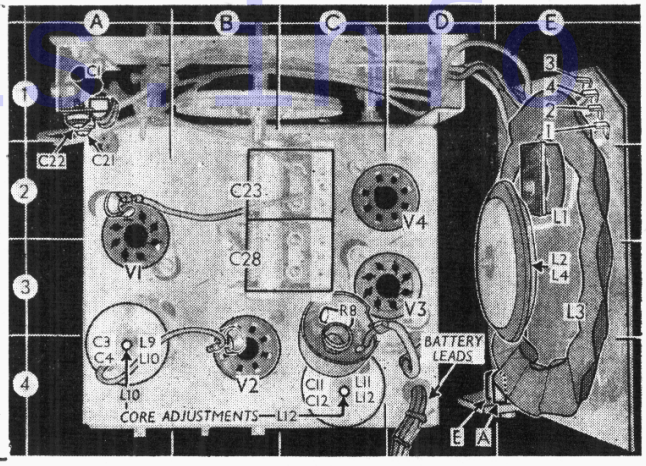
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TP25	88	0·4	40	0·65
	Oscillator			
	36	1·7		
V2 VP23	88	0·7	40	0·2
V3 HL23DD	27	0·4		
V4 PEN25	86	3·8	88	0·9

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws) and felt washers;
remove the two pieces of plywood which form the accumulator compartment inside the carrying case (four countersunk-head wood screws);
loosen the nut of the frame aerial lead cleat above the speaker, and lift out leads;
remove the four nuts (with washers) securing the frame aerial assembly to the carrying case, and lift it out;
from the tag strip on the speaker unsolder the three rubber-covered leads connecting it to chassis;
if the four cheese-head screws (with large claw washers) are now removed from the underside of the carrying case, the chassis may be slid out.

When replacing, first connect the earthing lead, which originates at a soldering tag between **V3** and **V4** beneath the chassis, to the centre tag of the strip on the speaker chassis, and then connect the remaining two speaker leads to the outer tags of this strip. Reconnect the frame aerial leads to the numbered tags on the assembly, shown in our plan view of the chassis, as follows:—lead from **C22** to 1; lead from **C21** to 2; earthing lead from chassis to 3; lead from waveband switch to 4.

Removing Speaker.—The speaker is secured to the sub-baffle by four nuts (with washers) and the output transformer **T1** is screwed to the carrying case beneath it (two round-head wood screws). The speaker speech coil connecting panel should face left, its lower tag being joined to the centre tag of the connecting strip mounted on the speaker frame. This latter tag is also joined to the frame of **T1** and one side of **T1** secondary winding, the other end of which is soldered to the upper tag on the speech coil connecting panel. The primary winding of **T1** is joined to the outer tags on the speaker connecting strip.



Plan view of the chassis, with the frame aerial panel (right) attached. The frame aerial connections are numbered **1–4** to agree with the circuit diagram overleaf. **R8** is mounted in **V3** top cap connector.

GENERAL NOTES

Switches.—**S1-S5** are the waveband switches, ganged in a rotary unit beneath the chassis. The unit is indicated in our under-chassis view, and shown in detail in the diagram inset with the valve diagrams in the circuit diagram overleaf. In the anti-clockwise position of the control (M.W.) **S1, S2** and **S4** are closed; in the L.W. position, these are open, and **S3** and **S5** are closed.

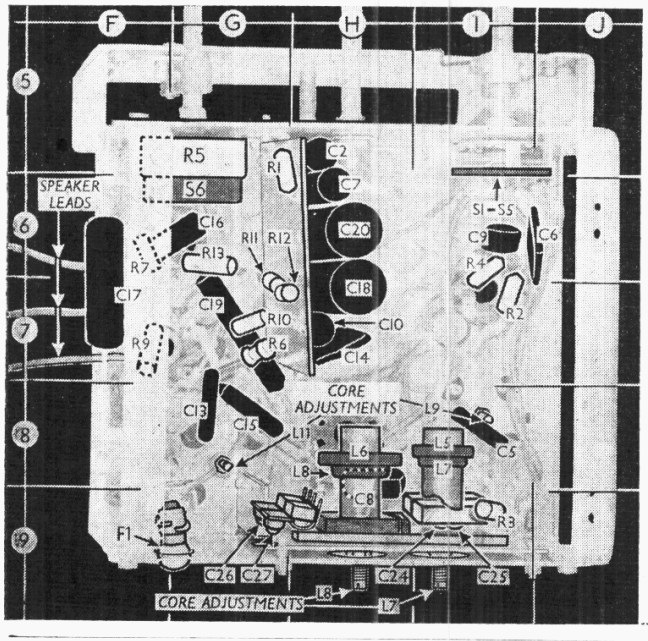
S6 is the Q.M.B. L.T. circuit switch, ganged with the manual volume control **R5**.

Coils.—The aerial circuit coils **L1-L4** are all mounted on a panel fixed to the side of the case, connected to the chassis by four leads. The panel is shown in our plan view of the chassis, where the four connecting tags in the upper front corner are identified by numbers 1, 2, 3, 4. These numbers are repeated in the circuit diagram, where the connections are indicated.

The oscillator coils **L5, L7** and **L6, L8** are in two unscreened tubular units mounted on the rear chassis member, their core adjustments projecting through the pressing.

Fuse Lamp F.1.—This is actually an ordinary lamp of the "Flashlamp" variety as used for scale lamps. It is rated at 2.5 V, 0.2 A, and has an M.E.S. base and a small spherical bulb. Its purpose is to protect the valve filaments should the positive filament lead come into contact wih some point at H.T. + potential.

Batteries and Leads.—L.T., Varley V40, 2 V, 20 A.H. accumulator, for which the conventional red and black spade tags are provided, the lead colours being green and white. H.T., Ever Ready "Batrymax" B107 or Drydex 507, 90 V, for which a plug is provided. The brown (positive) and black (negative) leads go to the two opposite pins on the plug, the third being blank. A diagram showing the plugs as seen from the free ends of the pins is inset in our circuit diagram overleaf. Grid bias is automatic.



Under-chassis view. A diagram of the waveband switch unit **S1-S5** is inset beneath the circuit diagram overleaf.

CIRCUIT ALIGNMENT

I.F. Stages.—For this operation the chassis must be removed from the carrying case. Connect signal generator leads to control grid (top cap) of **V1** and chassis. Switch set to M.W., turn volume control to maximum and gang to minimum capacitance. Feed in a 430 kc/s (697.6 m) signal, and adjust the cores of **L12, L11, L10** and **L9** (chassis locations C4, G8, A4, I8) in that order, for maximum output. An input signal of approximately 200 μV should give 50 mW output.

R.F. and Oscillator Stages.—For these operations the chassis, frame aerials and batteries should be in their correct positions in the carrying case, and the signal generator should be connected to the **A** and **E** sockets, via a suitable dummy aerial. The pointer should be horizontal with the gang at maximum capacitance.

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 **C26** (G9), then **C22** (A1), for maximum output. Tune to 300 m on scale, feed in a 300 m (1,000 kc/s) signal, and adjust the core of **L7** (I9) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust **C24** (I9) for maximum output. Repeat these adjustments. An input signal of approximately 80 μV should give 50 mW output over the M.W. band.

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 **C27** (G9), then **C21** (A1) for maximum output. Tune to 1,500 m on scale, feed in a 1,500 m (200 kc/s) signal, and adjust the core of **L8** (H9) for maximum output. Tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal and adjust **C25** (I9) for maximum output. Repeat these adjustments. An input signal of approximately 80 μV should give 50 mW output over the band.

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