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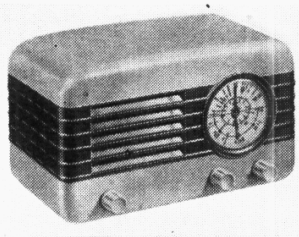
"TRADER" SERVICE SHEET

927

CHAMPION "METEOR"

and "COMET" Superhets



THREE wavebands are covered in the Champion "Meteor," a 4-valve (plus rectifier) superhet of compact design. The waveband ranges are 16-49 m, 200-500 m and 800-2,000 m. The receiver operates from A.C. or D.C. mains of 200-250 V.

The "Comet" is also covered in this *Service Sheet*, the differences being explained overleaf, but our information was prepared from a "Meteor."

Release dates and original prices: Meteor, February 1949, £9 19*s.* 6*d.*; *Comet, October* 1947, £14 14*s. P.T. extra.*

CIRCUIT DESCRIPTION

Tuned frame aerial input, on M.W. only, by **L1, C24** which precedes a triode-hexode valve **(V1, Brimar 12K8GT)** operating as frequency changer with electron coupling. For S.W. and L.W. operation **L1** acts as an aperiodic frame aerial, and is inductively coupled by **L2** (S.W.), **L3** (L.W.) to single-tuned circuits **L4, C24** (S.W.) or **L5, C24** (L.W.). Provision is made for the connection of an external aerial, via series capacitor **C1.**

Triode oscillator anode coils **L9** (S.W.), **L10** (M.W.), **L11** (L.W.) are tuned by **C28,** with parallel trimming by **C27** (S.W.), **C25** (M.W.), **C7, C26** (L.W.), and series tracking by **C5** (M.W.), **C6** (L.W.). Inductive reaction coupling to C.G. is employed on all bands, with additional capacitative coupling on M.W. and L.W. due to the common impedance of trackers in grid and anode circuits.

Second valve **(V2, Brimar metal 12SK7)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C29, L12, L13, C30** and **C31, L14, L15, C32.**

Intermediate frequency 465 kc/s.

Diode second detector is part of double diode triode valve **(V3, Brimar 12Q7GT).** Audio frequency component in rectified

(*Continued col.* 1 *overleaf*)

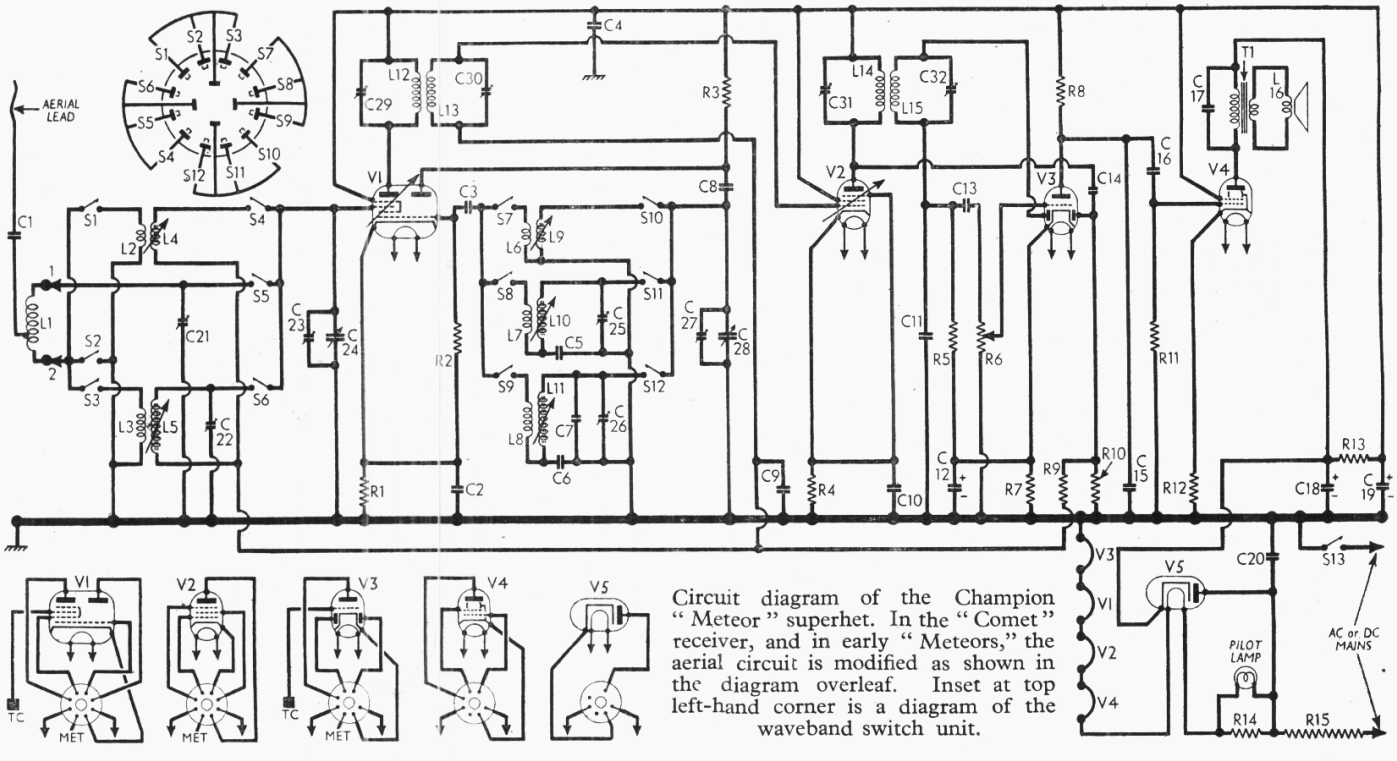
COMPONENTS AND VALUES

	RESISTORS	Values (ohms)	Locations
R1	V1 fixed G.B. ...	220	H5
R2	V1 osc. C.G. ...	47,000	G5
R3	Osc. anode load ...	22,000	G3
R4	V2 fixed G.B. ...	470	F4
R5	Diode load ...	470,000	D5
R6	Volume control ...	500,000	D3
R7	V3 G.B., A.G.C. delay	6,800	C4
R8	V3 triode load ...	220,000	D4
R9	A.G.C. decoup. ...	2,200,000	C4
R10	A.G.C. diode load ...	1,000,000	D4
R11	V4 C.G. resistor ...	470,000	C5
R12	V4 G.B. resistor ...	470	C4
R13	H.T. smoothing ...	3,000	E4
R14	Pilot lamp shunt ...	40§	F3
R15	Heater ballast ...	620†	E4

§ 100 Ω + 68 Ω in parallel. † Line cord.

	CAPACITORS	Values (μF)	Locations
C1	Aerial series ...	0·0003	B2
C2	V1 cath. by-pass ...	0·1	F5
C3	V1 osc. C.G. ...	0·0001	G4
C4	H.T. R.F. by-pass	0·1	E5
C5	Osc. M.W. tracker	0·000576	H5
C6	Osc. L.W. tracker ...	0·000168	H5
C7	Osc. L.W. trim ...	0·00005	G4
C8	Osc. anode coup. ...	0·0001	H4
C9	A.G.C. decoup. ...	0·1	G5
C10	V2 cath. by-pass ...	0·1	E5
C11	I.F. by-pass ...	0·0003	D5
C12*	V3 cath. by-pass ...	25·0	C4
C13	A.F. coupling ...	0·01	D4
C14	A.G.C. coupling ...	0·00005	D4
C15	I.F. by-pass ...	0·0003	C3
C16	A.F. coupling ...	0·01	C4
C17	Tone corrector ...	0·02	E4
C18*	H.T. smoothing	32·0	E4
C19*	H.T. smoothing	32·0	D4
C20	Mains R.F. by-pass	0·002	F4
C21‡	Aerial M.W. trim. ...	—	H5
C22‡	Aerial L.W. trim. ...	—	H4
C23‡	Aerial S.W. trim. ...	—	A2
C24†	Aerial tuning ...	—	A2
C25‡	Osc. M.W. trim. ...	—	H4
C26‡	Osc. L.W. trim. ...	—	H5
C27‡	Osc. S.W. trim. ...	—	A1
C28†	Oscillator tuning ...	—	A1
C29‡	1st I.F. trans-	—	F5
C30‡	former tuning ...	—	F5
C31‡	2nd I.F. trans-	—	D5
C32‡	former tuning ...	—	E5

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Champion "Meteor" superhet. In the "Comet" receiver, and in early "Meteors," the aerial circuit is modified as shown in the diagram overleaf. Inset at top left-hand corner is a diagram of the waveband switch unit.

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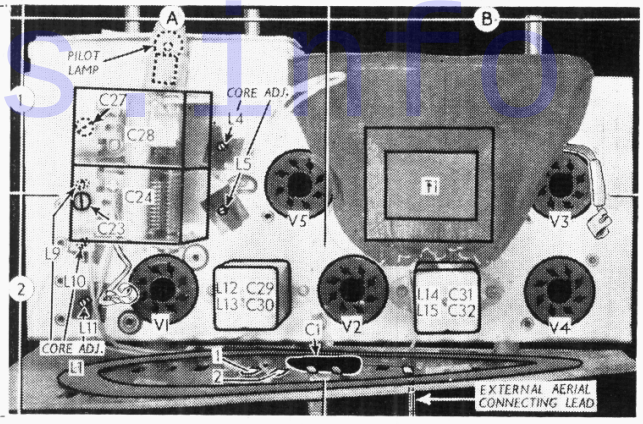
	OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial, total		1·0	A2
L2	Aerial coupling coils		8·0	G3
L3			53·0	G4
L4	Aerial tuning coils		Very low	G3
L5			16·5	G4
L6	Oscillator reaction coils		7·0	H4
L7			1·1	H4
L8			2·0	H5
L9	Oscillator tuning coils		Very low	H4
L10			3·0	H4
L11			8·5	H5
L12	1st I.F. trans.	Pri.	3·5	A2
L13		Sec.	3·5	A2
L14	2nd I.F. trans.	Pri.	3·5	B2
L15		Sec.	3·5	B2
L16	Speech coil		2·4	—
T1	Speaker trans.	Pri.	550·0	B1
		Sec.	0·4	
S1–S12	W/band switches		—	H3
S13	Mains sw., g'd R6		—	D3



Plan view of the chassis, with the back cover, carrying the frame winding **L1** and external aerial isolating capacitor **C1**. The frame connecting tags **1** and **2** are indicated. The external aerial connection is a short piece of flexible wire.

Circuit Description—*continued*

output is developed across load resistor **R5** and passed, via **C13** and volume control **R6**, to grid of triode section, which operates as A.F. amplifier. I.F. filtering by **C11** in diode circuit, and **C15** in triode anode circuit.

Second diode of **V3**, fed from **V2** anode via **C14**, provides D.C. potential which is developed across load resistor **R10** and fed back, through a decoupling circuit **R9, C9,** as G.B. to F.C. (except on M.W.) and I.F. valves, giving A.G.C.

Resistance-capacitance coupling by **R8, C16, R11** between **V3** triode and beam tetrode output valve **(V4, Brimar 35L6GT).** Fixed tone correction by **C17** in tetrode anode circuit.

When the receiver is operated from A.C. mains H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Brimar 35Z4GT)** which, with D.C. mains, behaves as a low resistance. Smoothing by resistor **R13** and electrolytic capacitors **C18, C19.**

Valve heaters, together with pilot lamp (shunted by **R14**) and line cord ballast resistor **R15,** are connected in series across mains input. Mains R.F. filtering by **C20.**

DISMANTLING THE SET

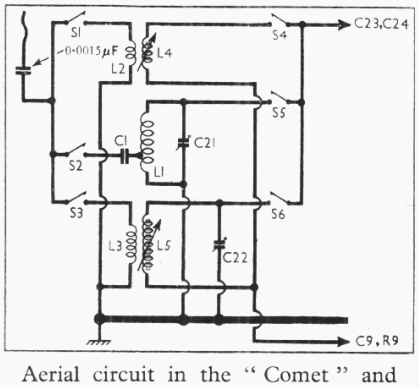
Removing Chassis.—Remove the three control knobs (recessed grub screws) and the three self-threading screws (with washers) located inside rubber feet on the base of the cabinet. The chassis and speaker may now be slid from the cabinet as a single unit.

GENERAL NOTES

Switches.—**S1-S12** are the waveband switches, ganged in a single rotary unit beneath the chassis. This is indicated in our under-chassis view, and shown in detail in the diagram inset in the top left-hand corner of the circuit diagram, where it is drawn as seen from the rear of an inverted chassis. **S1, S4, S7, S10,** close on S.W., **S2, S5, S8, S11** close on M.W. and **S3, S6, S9, S12** close on L.W. (knob fully clockwise).

Pilot Lamp.—This is rated at 2.5 V, 0.15 A. It has a small clear spherical bulb and an M.E.S. base.

Drive Cord Replacement.—The tuning drive cord is very simple, and a sketch to describe is unnecessary. A single loop of good quality fine gauge twine twelve inches in circumference makes about three-quarters of a turn round the drum and 1½ turns in the same direction round the V-shaped groove on the control spindle. The join in the cord is hooked on to the tension spring. Access is gained to the drive by removing the pointer and scale.



Aerial circuit in the "Comet" and early "Meteor."

Chassis Divergencies.—Some early Meteor receivers had large I.F. transformer units with the trimmers on top and **R14** may not consist of a 100Ω and a 68Ω resistor connected in parallel. In some early cases the aerial circuit was different from that in our diagram, the frame aerial operating only on M.W. The early circuit is shown in the diagram above.

Comet Model.—The Comet is in general very much like the early Meteor, but the aerial isolating capacitor is 0.002μF, and a 0.005μF tracking capacitor is inserted between the junction of **L6** and **L9** and chassis. The line cord is different, too, having four leads at the receiver end, two coming from tappings on the resistance element which forms **R14, R15** and a surge limiter. The arrangement is as follows:

Two scale lamps are used, connected in series across **R14** which becomes 200Ω. The next tapping is 600Ω further on, to supply **V5** anode. A third section of 200Ω completes the line cord.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang and volume control to maximum, connect signal generator (via an 0.1 μF isolating capacitor in each lead) to control grid (top cap) of **V1** and chassis, feed in a 465 kc/s (645.16 m) signal, and adjust **C32, C31, C30, C29** (location references E5, D5, F5) for maximum output.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the pointer should be horizontal. Transfer "live" signal generators lead and series capacitor to aerial connecting lead, via a suitable dummy aerial.

S.W.—Switch set to S.W., tune to 16 m on scale, feed in a 16 m (18.75 Mc/s) signal, and adjust **C27** (A1) and **C23** (A2) for maximum output. Tune to 49 m on scale, feed in a 49 m (6.12 Mc/s) signal and adjust the cores of **L9** (A1) and **L4** (A1) for maximum output. Repeat these operations until no improvement results.

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 **C25** (H4) and **C21** (H5) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the core of **L10** (A2) for maximum output. Repeat these operations until no improvement results.

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 **C26** (H5) and **C22** (H4) for maximum output. Tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal, and adjust the cores of **L11** (A2) and **L5** (A2) for maximum output. Repeat these adjustments until no improvement results.

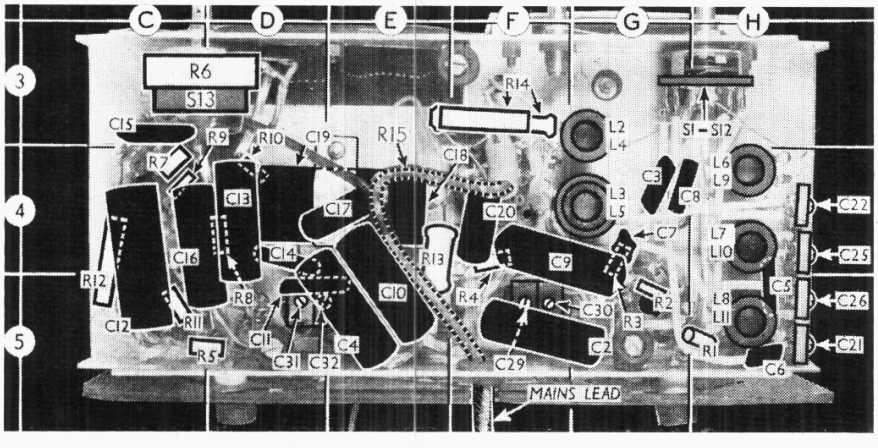
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from A.C. mains of 233 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 range of a model 7 Avometer, except cathode voltages, which were measured on the most convenient range, and chassis was the negative connection.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 12K8GT...	73	1·3	73	2·5	1·0
	Oscillator				
	42	1·1			
V2 12SK7	73	4·3	73	1·2	2·5
V3 12Q7GT	22	0·1	—	—	0·5
V4 35L6GT	103	13·0	73	0·6	6·3
V5 35Z4GT	110†	—	—	—	110

† A.C.



Under-chassis view. A diagram of the **S1-S12** switch diagram is given overleaf.

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