'TRADER' SERVICE SHEET

173

HALCYON S.W. BATTERY 3

3-BAND RECEIVER

THE Halcyon S.W. Battery 3 is a 3-band model, covering 19-45 m. on the S.W. band, and using a straight 3-valve circuit. An interesting feature is a battery economiser circuit, which incorporates a Westector.

CIRCUIT DESCRIPTION

Aerial input on M.W. and L.W., via series condenser **C1,** choke **L1** and coupling coil **L2,** to single tuned circuit **L3, L4, C14,** which precedes variable-mu pentode H.F. amplifier (**V1, Mullard metallised VP2**). Gain control by variable potentiometer **R2** which varies G.B. applied.

Tuned-secondary transformer coupling by **L7, L9, L10** and **C19** between **V1** and triode detector valve (**V2, Mullard metallised PM1HL**) which operates on grid leak system with **C6** and **R3.** Reaction is applied from anode by coil **L8** and controlled by condenser **C16.**

On S.W. band **L1** forms choke input circuit to H.F. valve which is tuned-anode coupled by **L6** and **C19** to detector. Reaction is applied by coil **L5** and controlled by condenser **C16.**

H.F. filtering in **V2** anode circuit by S.W. choke **L11,** H.F. stopper **R5,** and by-pass condenser **C7.**

Parallel-fed auto-transformer coupling by **R4, C8** and **T1** between detector and output pentode (**V3, Mullard PM22A**). Tone correction in anode circuit by fixed condenser **C11.** Provision for connection of high-impedance external speaker across primary of **T2.**

The output valve is over-biased in order to limit its standing anode current. When a signal is received part of the A.C. output from the valve is by-passed via **C12** and **R9** to metal rectifier (**MR1, Westinghouse W6 Westector**) and the resultant rectified potential is developed across **R10.** This potential opposes that of the G.B. battery, with the result that the actual G.B. applied to **V3** C.G. is reduced to a normal value.

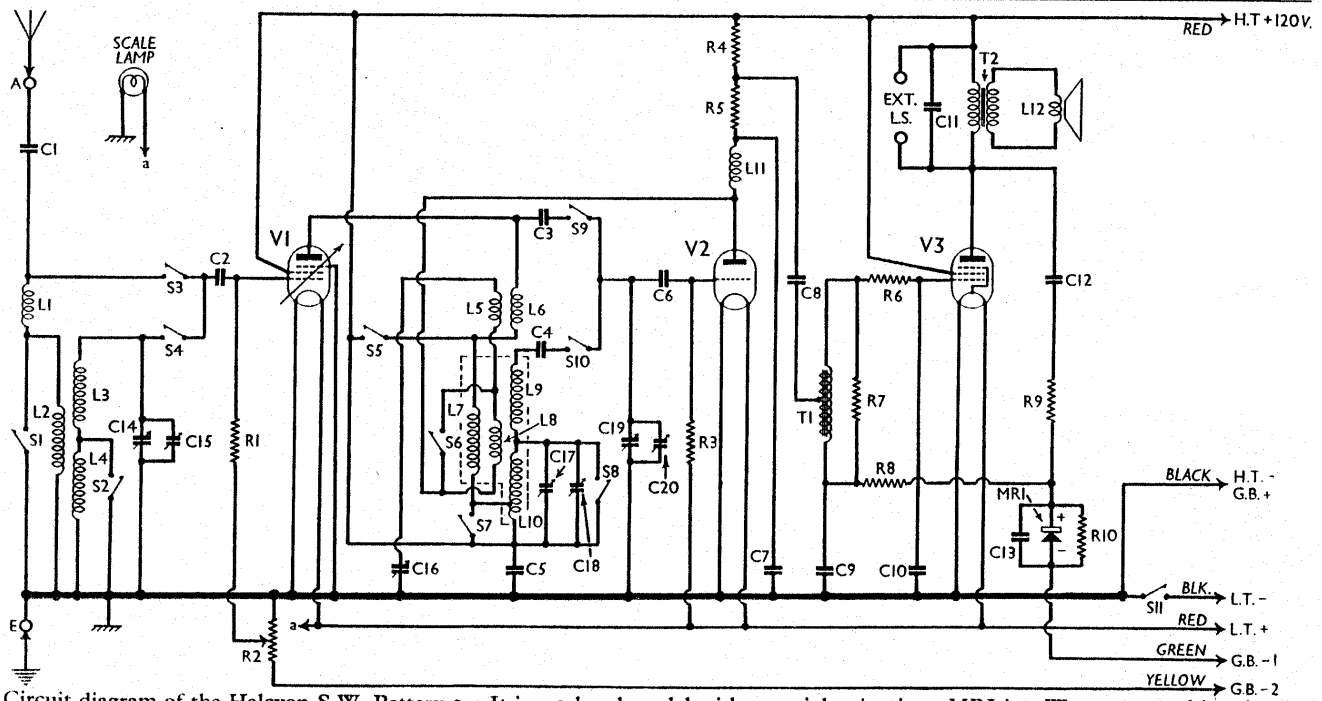
COMPONENTS AND VALUES

	CONDENSERS	Values (μF)
C1	Aerial series condenser	0·0005
C2	V1 C.G. condenser	0·0001
C3	H.T. blocking condensers	0·01
C4		0·1
C5	H.T. supply by-pass	0·5
C6	V2 C.G. condenser	0·0001
C7	V2 anode H.F. by-pass	0·0002
C8	L.F. coupling to T1	0·1
C9	V3 C.G. decoupling	0·1
C10	V3 C.G. H.F. by-pass	0·0001
C11	Tone corrector	0·001
C12	Battery economiser feed	0·01
C13	MR1 by-pass	0·01
C14†	Aerial circuit tuning	0·0005
C15‡	Aerial circuit trimmer	—
C16†	Reaction control	0·0005
C17‡	H.F. trans. L.W. trimmers	—
C18‡		—
C19†	H.F. trans. and S.W. tuning	0·0005
C20‡	H.F. trans. and S.W. trimmer	—

† Variable. ‡ Pre-set.

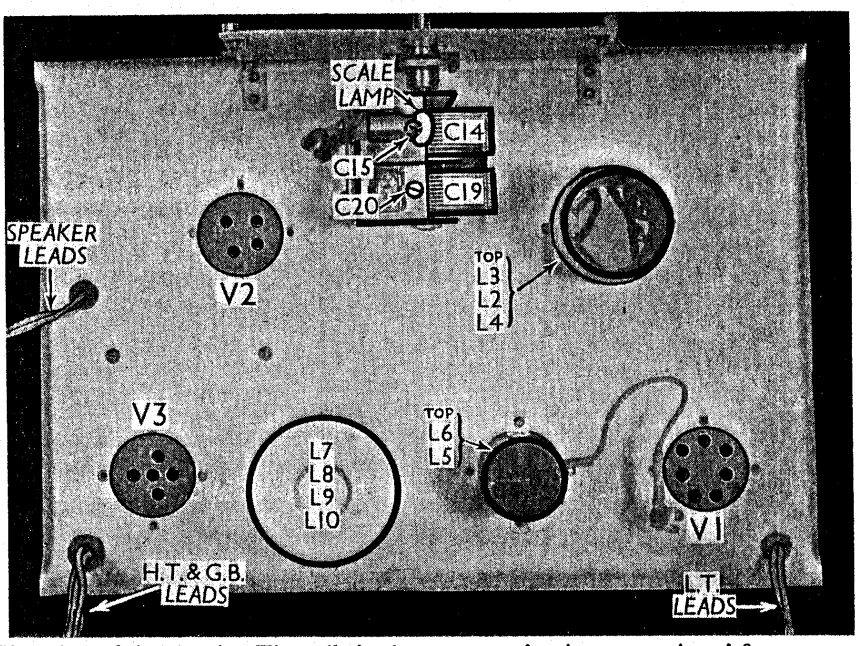
	RESISTANCES	Values (ohms)
R1	V1 C.G. resistance	2,000,000
R2	V1 gain control	100,000
R3	V2 grid leak	1,000,000
R4	V2 anode load	30,000
R5	V2 anode H.F. stopper	1,000
R6	V3 C.G. H.F. stopper	100,000
R7	T1 shunt	500,000
R8	V3 C.G. decoupling	1,000,000
R9	Battery economiser feed	250,000
R10	MR1 load	50,000

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial circuit S.W. choke	0·35
L2	Aerial M.W. and L.W. coupling	7·5
L3	Aerial M.W. and L.W. tuning coils	3·5
L4		7·5
L5	S.W. reaction coil	0·3
L6	S.W. tuning coil	0·05
L7	H.F. trans. pri. (M.W., L.W.)	24·0
L8	M.W. and L.W. reaction coil	7·0
L9	H.F. trans. secondary (M.W., L.W.)	2·5
L10		14·0
L11	V2 anode S.W. H.F. choke	0·7
L12	Speaker speech coil	2·0
T1	Intervalve auto-trans., total	3000·0
T2	Speaker input trans. Pri.	1000·0
	Sec.	0·3
S1-10	Waveband switches	—
S11	L.T. circuit switch	—



Circuit diagram of the Halcyon S.W. Battery 3. It is a 3-band model with a straight circuit. MR1 is a Westector used in a battery economiser circuit.

BVWS Trader Sheet CD-Rom



Plan view of the chassis. The coils in the unscreened units are numbered from top to bottom.

DISMANTLING THE SET

Removing Chassis.—If it is desired to remove the chassis from the cabinet first remove the four control knobs (recessed grub screws) and the four bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

Removing Speaker.—Should it be necessary to remove the speaker from the cabinet, remove the back of the battery compartment (two countersunk-head wood screws) and the nuts and lock washers from the three bolts 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 battery reading 120 V overall. 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.

The G.B.-2 lead was plugged into the 9 V tapping of the battery.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2 ..	110	1·6	111	0·5
V2 PM1HL	60	1·5	—	—
V3 PM22A	108	2·5	111	0·4

GENERAL NOTES

Switches.—**S1-S11** are the wavechange and L.T. switches in a single unit beneath the chassis. The individual switches are indicated in our under-chassis view. The table below gives the switch positions for the various control settings, O indicat- open and C, closed.

Switch	OFF	S.W.	M.W.	L.W.
S1	O	C	O	O
S2	O	O	C	O
S3	O	C	O	O
S4	O	O	C	C
S5	O	C	O	O
S6	O	C	O	O
S7	O	C	C	O
S8	O	O	C	O
S9	O	C	O	O
S10	O	O	C	C
S11	O	C	C	C

Coils.—**L1** and **L11** are both on tubular formers beneath the chassis. **L2-L4** and **L5, L6** are on two tubular formers on the chassis deck, while **L7-L10** are in a screened unit on the chassis deck.

Scale Lamp.—This is an Osram M.E.S. type, rated at 2·5 V, 0·2 A.

External Speaker.—Two sockets are provided at the rear of the chassis for an external high impedance (about 14,000 O) speaker.

Batteries.—L.T., 2 V 30 AH cell, size overall not greater than 3¼ in. by 3¼ in. by 7½ in. high. H.T. and G.B., any standard 120 V H.T. battery including 9 V G.B., size not greater than 13 in. by 9 in. by 4 in.

Battery Leads and Voltages.—Black lead, spade tag, L.T. negative; red lead, spade tag, L.T. positive 2 V; black lead and plug, H.T. negative and G.B. positive; red lead and plug, H.T. positive maximum; green lead and plug, G.B. negative 4·5 V (**PM22A**) or 6 V (**PP222**); yellow lead, green plug, G.B. negative 7·5 V or 9 V.

Condensers C17, C18.—These are two trimmers, wired in parallel in our chassis to give the correct value of capacity. They may be replaced by a single larger capacity type in other chassis.

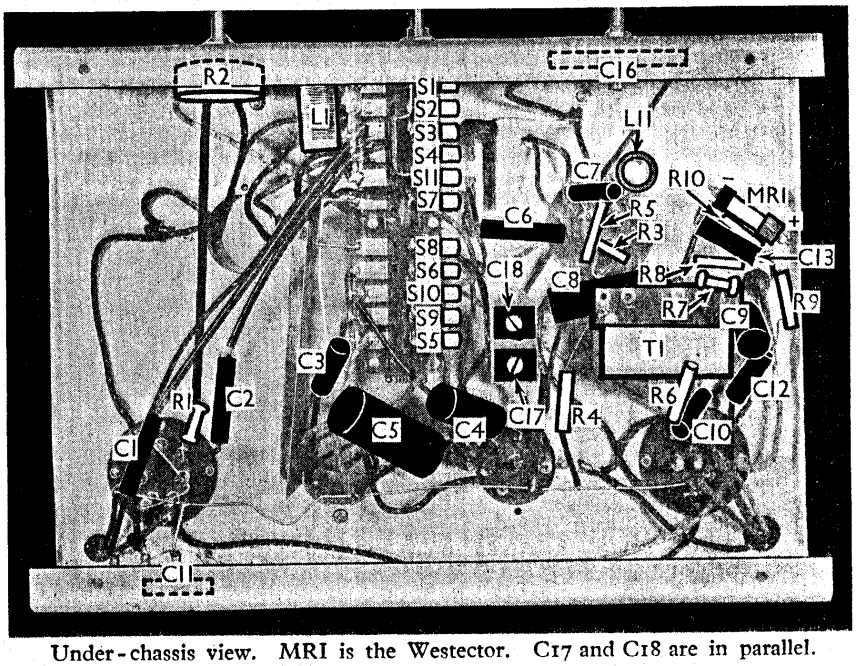
Chassis Divergencies.—Our chassis contains the resistance **R6** and the condenser **C9** which are not shown in the makers' circuit diagram.

Westector MR1.—This is a half-wave type, and the correct polarity should be observed if replacement should ever be necessary.

CIRCUIT ALIGNMENT

Connect a signal generator to the **A** and **E** sockets, and feed in a 250 m. signal. Switch set to M.W., turn gain control to maximum, and reaction to minimum, tune to 250 m. mark on scale, and adjust **C15** and **C20** for maximum output.

Switch set to L.W., tune to 1,500 m. on scale, feed in a 1,500 m. signal, and adjust **C17** and/or **C18** for maximum output, rocking the gang slightly if necessary for optimum results.



Under-chassis view. MR1 is the Westector. C17 and C18 are in parallel.