

TRADER SERVICE SHEET

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HALCYON B333

BATTERY BAND-PASS RECEIVER

A BAND-PASS input filter is incorporated in the Halcyon B333 3-valve battery-operated 2-band receiver. It has a variable-mu hexode R.F. amplifier, a pentode detector, and a pentode output valve, while the wave-change switch is at the right-hand side of the cabinet. No provision is made for either a gramophone pick-up or an extension speaker.

CIRCUIT DESCRIPTION

Aerial input via series condenser **C1** on M.W., and direct on L.W., to tappings on input coils of capacity coupled band-pass filter. Primary coils **L1** (M.W.) plus **L2** (L.W.) are tuned by **C10**; secondary coils **L3** (M.W.) plus **L4** (L.W.) by **C12**; coupling by common capacity **C2**.

First valve (**V1**, Mullard metallised **VP2B**) is a variable-mu hexode operating as R.F. amplifier with gain control by potentiometer **R3**, which is connected in series with **R1** across G.B. section of H.T. battery, and varies G.B. applied. No switch is provided in the G.B. circuit, so that the G.B. battery is continuously discharged at a low rate, even when the set is not in use.

Tuned-anode coupling by **L6**, **L7** (M.W.), plus **L8** (L.W.), tuned by **C15**, between **V1** and R.F. pentode detector valve (**V2**, Mullard metallised **SP2**) which operates on grid leak system with **C4** and **R6**. Feed-back by **R5** and **C5** between anode and grid circuits.

Choke-capacity coupling by **L9**, **C7** and **R9**, via R.F. filter **R10**, **C8**, between **V2** and pentode output valve (**V3**, Mullard **PM22A**). Fixed tone correction by **C9** in anode circuit.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 fixed G.B. resistance	10,000
R2	V1 C.G. decoupling	10,000
R3	V1 gain control	100,000
R4	V1 anode H.T. feed	10,000
R5	Feed-back resistance	10,000,000
R6	V2 grid leak	1,000,000
R7	V2 S.G. H.T. feed	33,000
R8	V2 anode R.F. stopper	1,000
R9	V3 C.G. resistance	500,000
R10	V3 C.G. R.F. stopper	100,000

CONDENSERS		Values (μF)
C1	Aerial M.W. series condenser	0.0003
C2	Band-pass bottom coupling	0.025
C3*	V1 anode decoupling	2.0
C4	V2 C.G. condenser	0.0001
C5	Feed-back condenser	0.0005
C6	V2 S.G. decoupling	0.1
C7	V2 to V3 A.F. coupling	0.01
C8	V3 C.G. R.F. by-pass	0.0003
C9	Fixed tone corrector	0.002
C10†	Band-pass pri. tuning	—
C11‡	Band-pass pri. M.W. trimmer	—
C12‡	Band-pass sec. tuning	—
C13‡	Band-pass sec. M.W. trimmer	—
C14†	Reaction control	0.0005
C15†	V1 anode circuit tuning	—
C16‡	V1 anode M.W. trimmer	—

* Electrolytic. † Variable. ‡ Pre-set.

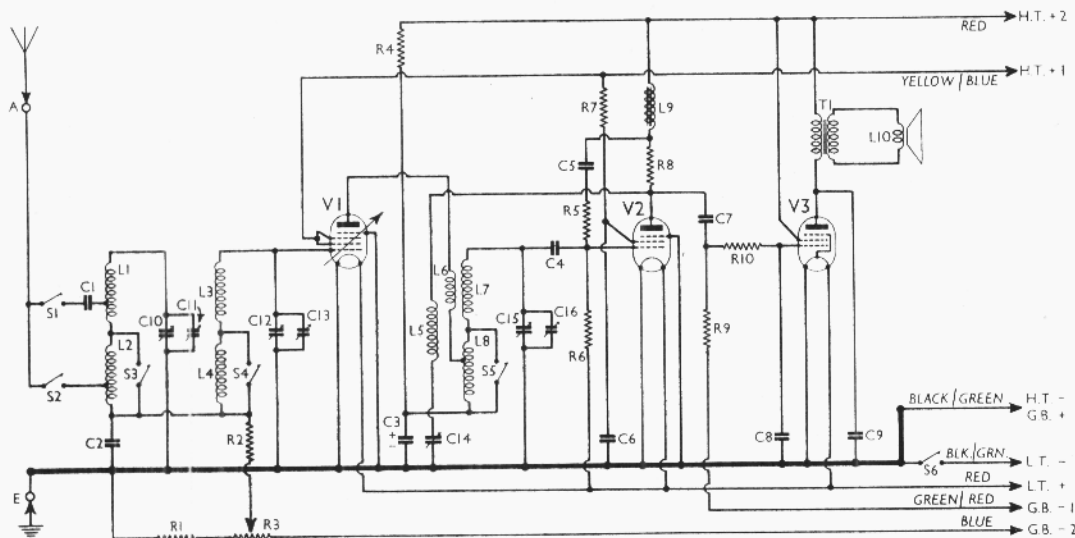
OTHER COMPONENTS		Approx. Values (ohms)
L1	Band pass primary coils	2.75
L2		14.0
L3	Band-pass secondary coils	2.5
L4		14.75
L5	Reaction coil	7.0
L6	V1 anode circuit coupling coil	7.8
L7	V1 anode M.W. tuning coil	2.5
L8	V1 anode L.W. tuning coil	32.0
L9	V2 anode A.F. coupling choke	4,000.0
L10	Speaker speech coil	1.5
T1	Speaker input trans. (Pri.)	700.0
	Speaker input trans. (Sec.)	0.15
S1-S5	Waveband switches	—
S6	L.T. circuit switch, gauged R3	—

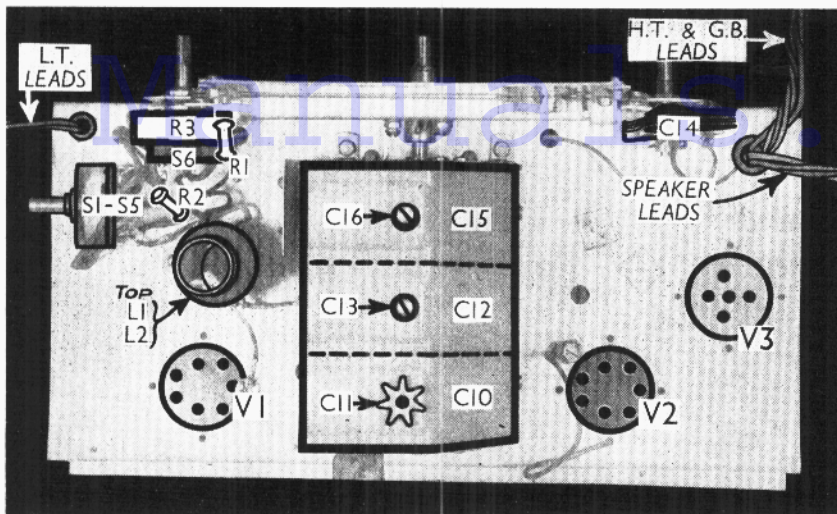
DISMANTLING THE SET

Removing Chassis.—If it is desired to remove the chassis from the cabinet, remove the three control knobs at the front of the cabinet (recessed grub screws) and remove the switch knob at the side of the cabinet together with its extension (grub screw accessible from the inside of the cabinet).

Next remove the battery platform (three countersunk-head wood screws) and the two round-head wood screws holding the flange at the back of the chassis to the cabinet. Now remove the screw (with washer) holding the front of the chassis to the bottom of the cabinet, when the chassis can be withdrawn to the extent of the speaker leads, which should be sufficient for normal

Circuit diagram of the Halcyon B333 3-valve battery receiver. **V1** is a hexode, operating as a pentode. Note the choke capacity coupled A.F. stage and the feed-back circuit of **V2**.





Plan view of the chassis. A diagram of the S1-S5 waveband switch unit is in the centre column. The band-pass primary trimmer C11 is fitted with a star-wheel adjuster.

purposes. When replacing, note that the knob with the white mark goes on the spindle of the reaction control.

To free the chassis entirely, unsolder the speaker leads and when replacing, connect them as follows, numbering the tags on the speaker transformer terminal panel from bottom to top:—2, yellow/green; 4, red. The black/green lead goes to a soldering tag on one of the speaker fixing screws.

Removing Speaker.—Should it be necessary to remove the speaker from the cabinet, remove the nuts and lock washers from the four screws holding it to the sub-baffle. When replacing, see that the transformer is pointing to the bottom right-hand corner of the cabinet and do not forget to replace the earthing tag on the right-hand speaker fixing screw.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an H.T. battery reading 114 V on the H.T. section, on load. 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 400 V scale of a model 7 Universal Avometer, chassis being negative.

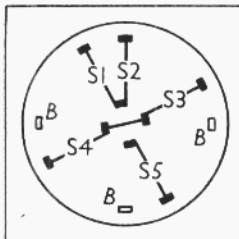
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2B	70	4.0	72	2.0
V2 SP2	105	0.8	60	0.3
V3 PM2A	110	5.5	114	0.9

GENERAL NOTES

Switches.—S1-S5 are the waveband switches in a rotary unit mounted on a bracket on the chassis deck, and operated by a knob at the side of the chassis. A diagram of the unit, looking towards the rear of it, is given on this page. The table

below gives the switch positions for the two control settings, starting from fully anti-clockwise. A dash indicates open, and C closed.

Switch	M.W.	L.W.
S1	C	—
S2	—	C
S3	C	—
S4	—	—
S5	C	—



Switch diagram, looking towards the rear of the S1-S5 unit mounted above the chassis.

S6 is the Q.M.B. L.T. circuit switch, ganged with the gain control R3.

Coils.—L1 and L2 are in an unscreened unit on the chassis deck. L3, L4 and L5-L8 are in two unscreened units beneath the chassis. The individual coils are indicated in our under-chassis view.

L9 is an iron-cored choke beneath the chassis.

External Speaker.—No provision is made for this, but a high impedance type could be connected across the appropriate tags on the speaker input transformer T1.

Batteries.—L.T., 2 V 45 AH L.T. cell is recommended, size not greater than 3 1/4 in. by 3 1/2 in. by 7 3/8 in. high. H.T. and G.B., 120 V combined H.T. and G.B. battery, with 6 V of G.B. and 114 V of H.T., size not greater than 9 in. by 7 3/8 in. by 3 in.

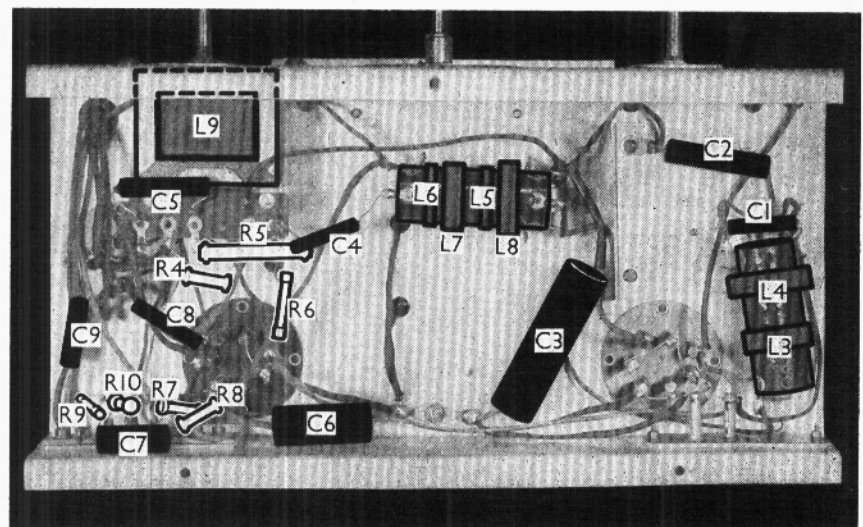
Battery Leads and Voltages.—Black/green lead, spade tag, L.T. negative; red lead, spade tag, L.T. positive 2 V; black/green lead, black plug, H.T. negative and G.B. positive; yellow/green lead, yellow plug, H.T. positive 72 V; red lead and plug, H.T. positive 114 V; green/red lead, green plug, G.B. negative 3 V; blue lead and plug, G.B. negative 4.5 V. Note that the G.B. is across R1 and R3 continuously, and thus has a steady drain of 0.04 mA approximately, even when the set is off.

Valve V2.—V2 is shown by the makers as being a VP2B hexode (as V1), but in our chassis it was an SP2 pentode.

CIRCUIT ALIGNMENT

Connect signal generator to A and E sockets, switch set to M.W., tune to 210 m. on scale and feed in a 210 m. signal. Adjust C16, C13 and C11 for maximum output. Advance the reaction control C14, and keeping the set just short of oscillation, re-adjust C16, and also C13 and C11, if necessary.

Check performance at 500 m., 1,000 m. and 1,875 m., making slight readjustments as a compromise, if necessary.



Under-chassis view. L9 is the choke in the anode circuit of V2. All the coils except L1 and L2 (which are on the chassis deck) are indicated.