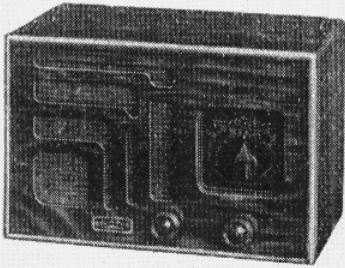


'TRADER' SERVICE SHEET
293

BELMONT 500

AND 505 MIDGET SETS



The Model 500 receiver. Model 505 is similar, but has a leather cloth covered case, with carrying handle.

Of the midget type, the Belmont 500 has a 3-valve (plus rectifier) A.C./D.C. chassis with a variable-mu pentode R.F. amplifier, a pentode detector and a pentode output valve. It is suitable for mains of 100-260 V (25-100 C/S in the case of A.C.) and has a length of wire attached for use as an aerial.

An identical chassis is fitted in the 505 but this has a different cabinet and a carrying handle on the top.

CIRCUIT DESCRIPTION

Aerial input via series condenser **C1** and coupling coils **L1**, **L2** to single-tuned circuit **L3** (M.W.) plus **L4** (L.W.) tuned by **C14** which precedes variable-mu pentode valve (**V1**, **Tungsram 6D6**) operating as R.F. amplifier with gain control by variable potentiometer **R3** which also progressively damps the aerial input circuit as the gain is reduced.

Tuned-secondary R.F. transformer coupling by **L5**, **L6**, **L7**, tuned by **C17**,

between **V1** and R.F. pentode detector valve (**V2**, **Tungsram 6C6**) which operates on grid leak system with **C4**, **R4**. Reaction, in the normal manner, is not employed. R.F. filtering in anode circuit by **C6**.

Resistance-capacity coupling by **R6**, **C7** and **R7**, between **V2** and pentode output valve (**V3**, **Tungsram 43**). Fixed tone correction in anode circuit by **C9**.

When the receiver is used with A.C. mains H.T. current is supplied by rectifying valve (**V4**, **Tungsram 25Z5**) with both anodes and both cathodes strapped to operate as half-wave rectifier, which, with D.C. supplies, behaves as a low resistance. Smoothing is effected by iron-cored choke **L10** and dry electrolytic condensers **C10**, **C11**, the speaker field coil **L9** being connected across the H.T. circuit. Mains R.F. filtering by **C12**.

Valve heaters are connected in series, together with ballast resistances (**R9**, **R10**, resistance tube **K52H**), **R9** shunting the scale lamp. **R11**, which is located in the mains lead, forms a voltage adjustment for use on 200 V-250 V mains, being short-circuited by the voltage adjustment plug, when the receiver is used with 100 V mains.

DISMANTLING THE SET

Removing Chassis.—To remove the chassis from the cabinet, remove the three control knobs (recessed grub screws) and the three self-tapping screws (with washers) holding the chassis to the bottom of the cabinet. The chassis and speaker can now be withdrawn together.

Removing Speaker.—If it is desired to remove the speaker from the cabinet, first remove the chassis as described above, then unsolder the leads and remove

the three self-tapping screws holding the speaker to the front member of the chassis. When replacing, see that the transformer is at the top and connect the leads as follows:—Yellow to cathode of **V4**; black to chassis; brown to **V3** screen; green to **V3** anode.

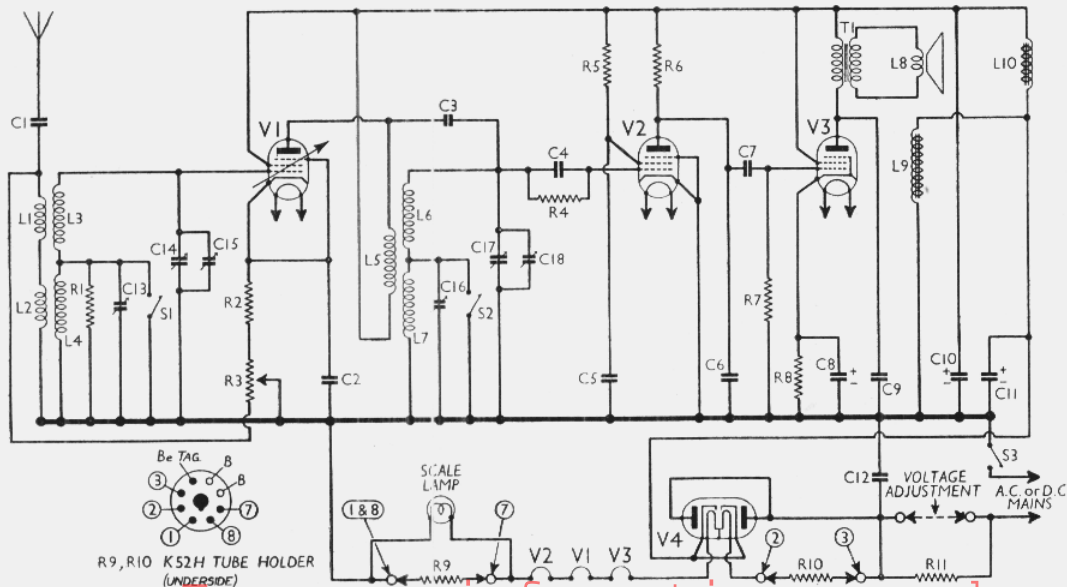
COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	Aerial circuit L.W. damping ..	250,000
R2	V1 fixed G.B.	500
R3	V1 gain control	50,000
R4	V2 grid leak	3,000,000
R5	V2 S.G. H.T. feed	6,000,000
R6	V2 anode load	1,000,000
R7	V3 C.G. resistance	750,000
R8	V3 G.B. resistance	650
R9	Part heater circuit ballast and scale lamp shunt ..	*28
R10	Part heater circuit ballast ..	*140
R11	Voltage adjustment	†310

* K52H tube. † In mains lead.

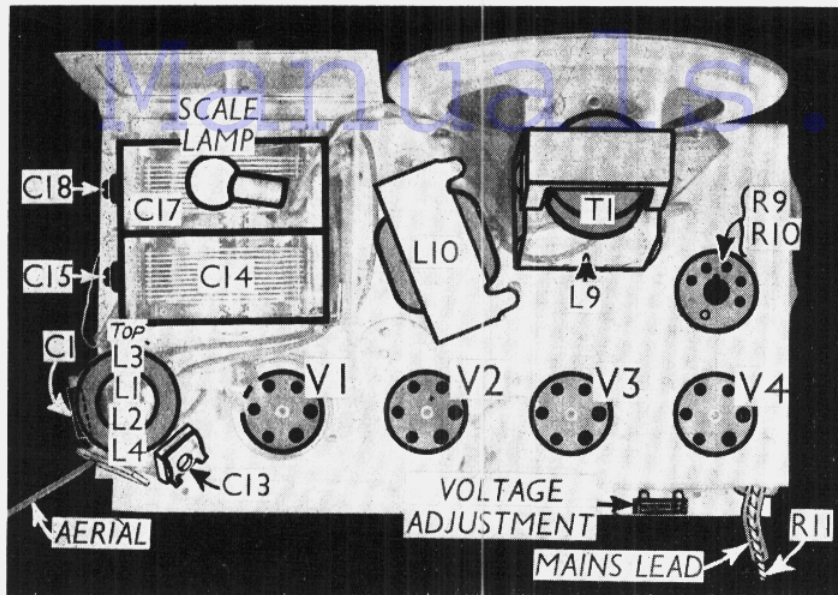
CONDENSERS		Values (μF)
C1	Aerial series condenser ..	0.0003
C2	V1 cathode by-pass	0.1
C3	V1 to V2 small coupling ..	Very low
C4	V2 C.G. condenser	0.005
C5	V2 S.G. decoupling	0.1
C6	V2 anode R.F. by-pass	0.0001
C7	V2 to V3 A.F. coupling ..	0.01
C8*	V3 cathode by-pass	5.0
C9	Fixed tone corrector	0.01
C10*	H.T. smoothing	8.0
C11*	H.T. smoothing	8.0
C12	Mains R.F. by-pass	0.05
C13†	Aerial circuit L.W. trimmer ..	—
C14†	Aerial circuit tuning	—
C15†	Aerial circuit M.W. trimmer ..	—
C16†	R.F. trans. sec. L.W. trimmer ..	—
C17†	R.F. trans. sec. tuning	—
C18†	R.F. trans. sec. M.W. trimmer ..	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Belmont 500 and 505 receivers. **R11** is the line cord resistor, and can be shorted out by a 2-pin plug when the set is to be used on 100-110 V mains. **R9** and **R10** are in the K52H resistance tube, and a diagram of the underside of the holder of this is below the circuit.

Radio



Plan view of the chassis. The voltage adjustment shorts out R11 when the plug is inserted, and makes the set suitable for 100-110 V mains. On 200-250 V mains the plug should be removed.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils	25·0
L2		
L3		
L4		
L5		
L6	Aerial circuit tuning coils	3·0
L7		
L8	R.F. transformer primary	73·0
L9	R.F. trans. sec. coils	2·7
L10		
L11	Speaker speech coil	29·0
L12	Speaker field coil	2·1
L13	H.T. smoothing choke	2,500·0
L14	Speaker input trans.	260·0
L15		
T1	Waveband switches	470·0
S1, S2	Mains switch, ganged R3	0·6
S3		—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on A.C. mains of 226 V. The receiver was tuned to the lowest wavelength on the medium 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 Universal Avometer, chassis being negative.

If, as in our case, V1 should become unstable when its anode and screen currents are being measured, it can be stabilised by connecting a non-inductive condenser of about 0·1 μF from grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6D6	88	4·7	88	1·3
V2 6C6*	6	0·1	3	Very low
V3 43	81	14·0	88	2·9
V4 25Z5†	—	—	—	—

* With different meters the readings for V2 may vary considerably. † Cathode to chassis 95 V, D.C.

GENERAL NOTES

Note.—The chassis of this receiver is live, and as no isolated earth socket is fitted, an earth lead must not be attached

to the chassis unless a suitable isolating condenser is used in series with it.

Switches.—S1 and S2 are the waveband switches, in a simple rotary unit at the front of the chassis. The switches are identified in our under-chassis view. Both close on M.W. and open on L.W. S3 is the Q.M.B. main switch, ganged with the gain control R3.

Coils.—L1-L4 are in a tubular un-screened unit on the chassis deck, while L5-L7 are in a similar unit beneath the chassis. L5 is inside the tubular former.

Scale Lamp.—This is an Osram M.E.S. type, rated at 6·2 V, 0·3 A.

External Speaker.—There is no provision for this, and if one is ever fitted, it must be connected across the secondary of T1, unless isolating condensers are used.

Condensers C8, C10, C11.—These are three dry electrolytics in a single tubular carton beneath the chassis, having a common negative (black) lead. The yellow lead is the positive of C8 (5 μF 25 V peak), the red lead to bearer tag on R9, R10 holder is the positive of C10 and the red lead to V4 holder is the positive of C11. Both C10 and C11 are 8 μF, 120 peak volt types.

Resistances R9, R10.—These are contained in an American K52H resistance tube, with an octal base. The pins to which they are connected are indicated by numbers in the circuit diagram, and the connections of the holder, looking from beneath the chassis, are in the diagram beneath the circuit. In the tube, there is an extra resistance between pins 1 and 8, but on the holder these pins are shorted.

Resistance R11.—This is a ballast resistor, incorporated in the mains lead. Note that the actual resistor connection at the chassis end is the blue lead, and not the black lead covered with asbestos.

Voltage Adjustment.—This is for adjustment to 100-110 V, or to 200-250 V only. A 2-pin shorting plug fits into sockets at the rear of the chassis when 100-110 V mains are in use, and shorts out R11. The plug must not be inserted when the set is used on 200-250 V mains.

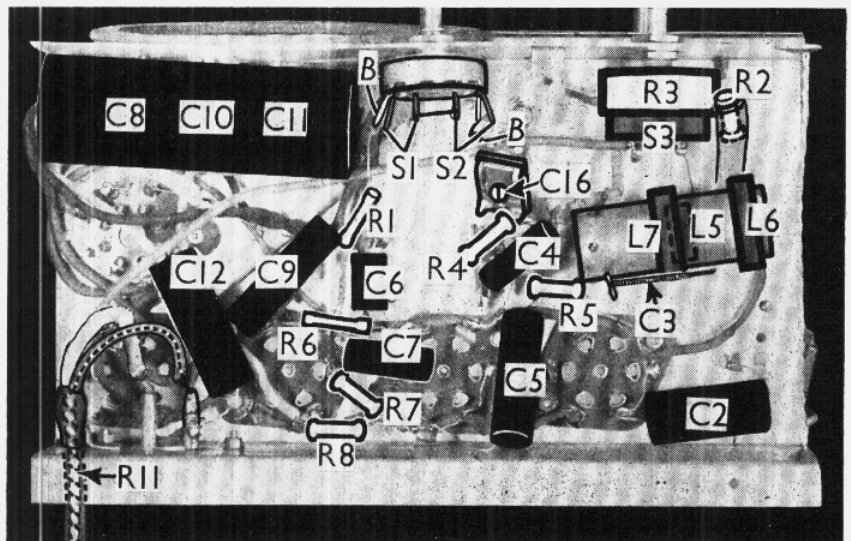
Condenser C3.—This is a small coupling formed of insulated wire twisted round another wire. It is not shown in the makers' diagram.

CIRCUIT ALIGNMENT

The signal generator must be connected to the aerial side of C1 (preferably with the aerial removed, or coiled up) and to chassis via a 0·1 μF or similar high voltage test condenser. Turn gain control to maximum.

Switch set to M.W., tune to 225 m. on scale, feed in a 225 m. (1,333 KC/S) signal, and adjust C15 and C18 for maximum output.

Switch set to L.W., tune to 1,000 m. on scale, feed in a 1,000 m. (300 KC/S) signal, and adjust C13 and C16 for maximum output.



Under-chassis view. R11 is incorporated in the mains lead. C3 is a small fixed capacity. S1 and S2 are ganged in a simple rotary unit, of which two tags are blank.

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