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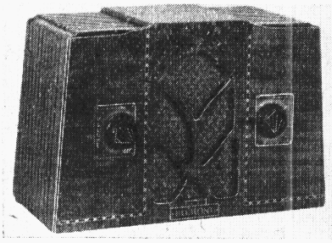
"TRADER" SERVICE SHEET 620

BELMONT 530 AC/DC MIDGET



DESIGNED to operate from 110 V AC or DC mains, the Belmont 530 is a 4-valve (plus rectifier) 2-band superhet midget. The heater ballast resistance is in the line cord, and an additional line cord is supplied for use with 220 V mains. The speaker unit plugs into the chassis deck like a valve, and is held there by two spring clips.

As the receiver is an American model, release date and price are not quoted.

CIRCUIT DESCRIPTION

Aerial input via isolating condenser **C1** and coupling coils **L1, L2** to single tuned circuit **L3, L4, C19** preceding heptode valve **(V1, American 6A7)** which operates as frequency changer with electron coupling.

Oscillator grid coils **L5** (MW) and **L6** (LW) are tuned by **C21.** Parallel trimming by **C22** (MW); series tracking by **C23** (LW) and special design of **C21.** Reaction from anode by coils **L7, L8,** with stabilising resistance **R3** connected between them.

Second valve **(V2, American 6D6)** is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C24, L9, L10, C25** and **C26, L11, L12, C27.**

Intermediate frequency 456 KC/S.

Diode second detector is part of double diode triode valve **(V3, American 75),** the two diode anodes being strapped together. Audio frequency component in rectified output is developed across load resistance **R6** and passed via IF filter **C8, R7, C9,** AF coupling condenser **C10** and manual volume control **R8** to CG of triode section, which operates as AF amplifier.

Provision for connection of gramophone pick-up across **C10, R8.** DC potential developed across **R6** is tapped off and fed back via **R7, R4** as GB to IF valve, giving automatic volume control. Screen voltage for **V1** and GB voltage for **V3** triode are obtained from an HT potential divider **R9, R10, R11,** and the positive potential thus applied to **V2** is counterbalanced by the drop along **R5** in **V2** cathode lead.

Resistance-capacity coupling by **R12, C12** and **R13** between **V3** triode and pentode output valve **(V4, American 43).** Fixed tone correction by **C13.**

When the receiver is operated from AC mains, HT current is supplied by voltage-doubler type rectifying valve **(V5, American 25Z5),** which, with DC mains, behaves as a low resistance. One section is used to supply HT current to the receiver and the other to provide a separate supply to energise the speaker field winding **L15.** The receiver supply is smoothed by iron-cored choke **L16,** in the negative HT lead to chassis, and the electrolytic condensers **C15, C16.**

Valve heaters, together with line cord ballast resistance **R15,** are connected in series across 110 V mains input circuit. An additional line cord containing **R16** may be connected for operation from 220 V mains.

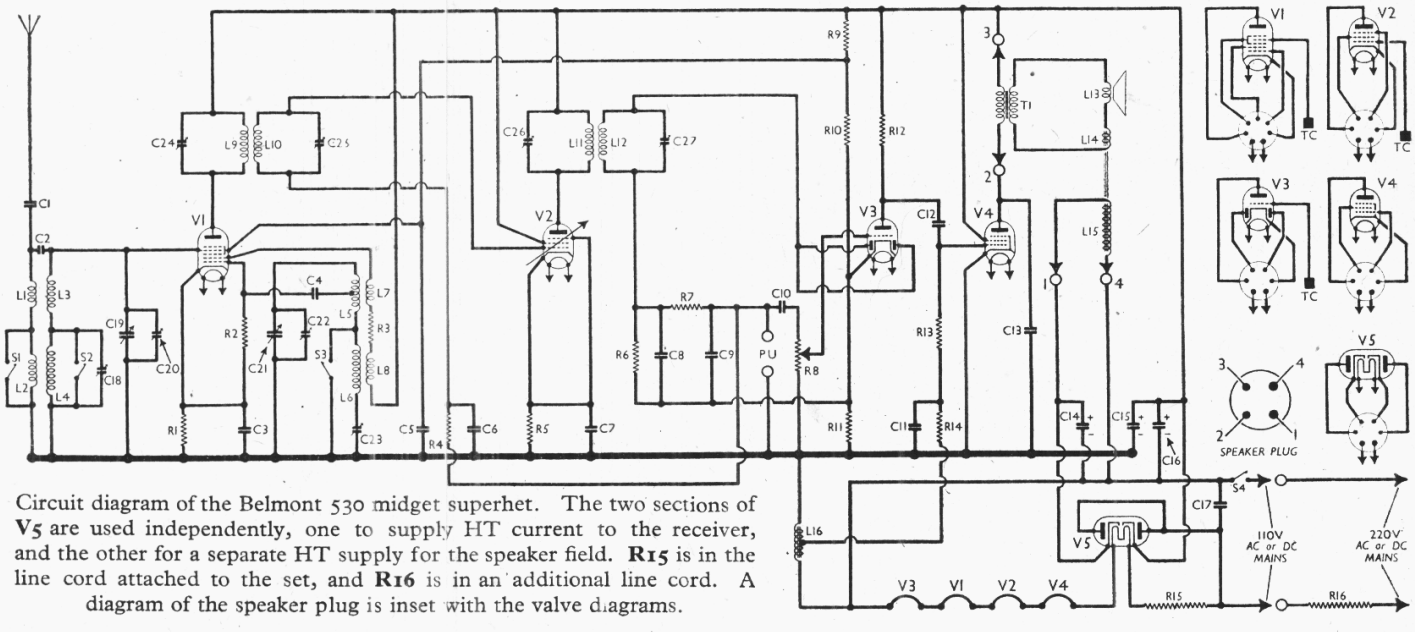
COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 GB resistance	300
R2	V1 osc. CG resistance ...	10,000
R3	Oscillator reaction damping	3,750
R4	V2 CG decoupling ...	250,000
R5	V2 fixed GB resistance ...	250
R6	V3 diode load	250,000
R7	IF stopper	50,000
R8	Manual volume control ...	500,000
R9	V1 SG HT feed and V3 triode GB potential divider	7,500
R10		10,000
R11		200
R12	V3 triode anode load ...	100,000
R13	V4 CG resistance	300,000
R14	V4 CG decoupling ...	250,000
R15	Heater circuit ballast ...	145
R16	High voltage ballast ...	260†

† Measured value.

	CONDENSERS	Values (μF)
C1	Aerial isolating condenser	0·001
C2	"Top" coupling	Very low
C3	V1 cathode by-pass ...	0·05
C4	V1 osc. CG condenser ...	0·00025
C5	V1 SG decoupling ...	0·05
C6	V2 CG decoupling ...	0·1
C7	V2 cathode by-pass ...	0·05
C8	IF by-pass condensers ...	0·0005
C9		0·0005
C10	AF coupling to V3 triode	0·01
C11	V4 CG decoupling ...	0·1
C12	V3 triode to V4 coupling	0·01
C13	Fixed tone corrector ...	0·025
C14*	Speaker field HT smoothing	5·0
C15*	HT smoothing condensers	7·0
C16*		18·0
C17	Mains RF by-pass ...	0·1
C18‡	Aerial circ. LW trimmer	—
C19†	Aerial circuit tuning ...	—
C20‡	Aerial circ. MW trimmer ...	—
C21†	Oscillator circuit tuning ...	—
C22‡	Osc. circ. MW trimmer ...	—
C23‡	Osc. circ. LW tracker ...	—
C24‡	1st. IF trans. pri. tuning	—
C25‡	1st. IF trans. sec. tuning	—
C26‡	2nd IF trans. pri. tuning	—
C27‡	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Belmont 530 midget superhet. The two sections of **V5** are used independently, one to supply HT current to the receiver, and the other for a separate HT supply for the speaker field. **R15** is in the line cord attached to the set, and **R16** is in an additional line cord. A diagram of the speaker plug is inset with the valve diagrams.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils	...	24·0
L2			31·0
L3	Aerial tuning coils	...	3·0
L4			21·0
L5	Oscillator tuning coils	...	2·2
L6			4·0
L7	Oscillator reaction coils	...	2·3
L8			3·2
L9	1st IF trans.	Pri. ...	11·0
L10		Sec. ...	11·0
L11	2nd IF trans.	Pri. ...	11·0
L12		Sec. ...	11·0
L13	Speaker speech coil	...	3·0
L14	Hum neutralising coil	...	0·4
L15	Speaker field coil	...	3,000·0
L16	HT smoothing choke	...	600·0*
T1	Speaker input trans.	Pri.	340·0
		Sec.	0·2
S1-S3	Waveband switches	...	—
S4	Mains switch, ganged R8		—

* Tapped at 400 Ω from chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on AC mains of 235 V, using the additional line cord.

The receiver was tuned to the lowest wavelength on the MW 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 Avometer, chassis being the negative connection.

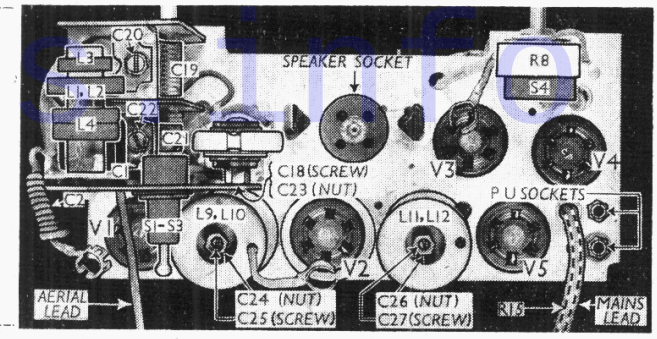
Valve		Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1	6A7	92	1·1	46	2·3
		Oscillator			
		76	3·1		
V2	6D6	92	5·2	92	2·0
V3	75	46	0·25	—	—
V4	43	87	14·0	92	5·5
V5	25Z5	92†	—	—	—

† Either cathode to chassis, DC.

DISMANTLING THE SET

Removing Chassis.—Remove the two control knobs (pull off);
remove the ornamental-headed screw and nut holding the top of the speaker rim to the front of the cabinet;
remove the four self-tapping screws holding the chassis to the bottom of the cabinet.
The entire chassis, complete with speaker, may now be withdrawn from the cabinet as a single unit.

Removing Speaker.—Remove chassis;
withdraw **V2**, **V3** and **V5** from their sockets;
place the palm of the right hand over the second IF transformer, and, with the thumb and forefinger, grip the two phosphor bronze levers beneath the speaker and lift out the speaker unit.
Care should be taken when handling the chassis while the speaker is in its socket, as it is held only by the plug and clips.



Plan view of the chassis. **R15** is in the mains lead. **C2** consists of a rubber covered wire wrapped round the top cap lead to **V1**.

GENERAL NOTES

Switches.—**S1-S3** are the waveband switches, in single toggle-switch unit mounted on a bracket attached to the gang frame on the chassis deck. On MW (toggle raised) all three switches are closed; on LW (toggle down) they are all open. **S4** is the QMB mains switch, ganged with the volume control **R8.**

Pre-set Condensers.—Apart from those mounted on the gang unit, there are three pairs of pre-set condensers, one variable section being fitted on either side of a porcelain mounting forming the main body of the unit in each case; the front section is adjusted by means of a nut, and the other by means of a screw which is concentric with the nut. **C18** and **C23** comprise one of these units, **C18** being adjusted by the screw, and **C23** by the nut.

The other two dual units are the IF transformer tuning condensers, located in the IF units. In each of these the nut adjusts the primary, and the screw the secondary.

Condensers C14, C15, C16.—These are three electrolytics, and they are shown in our under-chassis illustration as we found them in our sample, but the dual block marked "**C14, C16**" was actually a replacement of British make. The makers' instructions indicate that the three were originally in a single unit, which had four connecting leads: common positive for **C15, C16,** red; negative of **C15,** black; common negative of **C14, C16,** green; positive of **C14,** yellow. The values given in our table are those quoted by the makers.

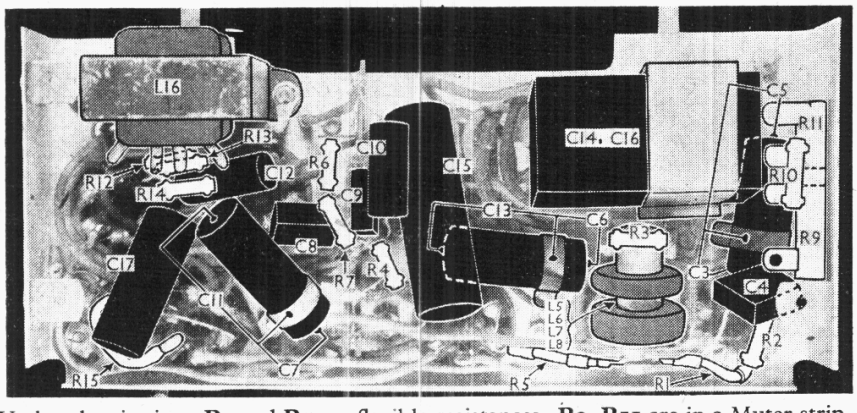
L16.—The HT smoothing choke is provided with a tapping for bias purposes for **V4.** If a tapped replacement choke were not available, an untapped one of suitable DC resistance could be used, and the tapping point could be obtained by shunting across the choke a 400,000 Ω and a 200,000 Ω resistance, connected in series, the 400,000 Ω going to chassis. **R14** could then be taken to their junction.

Components in IF Unit.—The makers' instructions indicate that **R4, R6, R7** and **C8, C9, C10** may be fitted in the **L11, L12** IF unit in some chassis. These components were all mounted on a connecting strip running across the underchassis in our sample.

Resistances R1, R5.—These are two short flexible resistances.

R16.—This is contained in an extension line cord lead, which is added to the line cord already attached to the receiver for operation from mains of 200-240 V. A plug and socket union forms the connection. The resistance does not, of course, appear in our chassis illustrations.

Speaker Connections.—A four-pin American valve socket fitted near the middle of the chassis deck provides the connections between the speaker and chassis. Its plug is mounted rigidly to the base of the speaker assembly, so that the speaker unit plugs in to the socket like a valve. When the chassis is mounted in its cabinet, the speaker rim is held to the front of the cabinet by a bolt, but when the chassis is withdrawn, care must be exercised to prevent a fracture of the plug, as the speaker is supported solely by the plug and two spring clips. The connections are indicated in our circuit diagram, and a diagram of the plug, viewed from the free ends of its pins, appears on the right of the circuit.



Under-chassis view. **R1** and **R5** are flexible resistances. **R9, R11** are in a Muter strip.

CIRCUIT ALIGNMENT

IF Stages.—Switch set to MW (switch lever raised), and turn the gang to maximum. Connect signal generator leads to control grid (top cap) of V1 and chassis, feed in 456 KC/S (657.9 m) signal, and adjust **C24, C25, C26** and **C27** for maximum output.

RF and Oscillator Stages.—With aerial lead coiled, transfer signal generator leads to **C1** and chassis, via a 0.00025 μF condenser.

MW.—With set switched to MW, turn gang to minimum, feed in a 200 m (1,500 KC/S) signal, and adjust **C22** for maximum output. Feed in 215 m (1,393 KC/S) signal, tune it in, and adjust **C20** for maximum output while rocking the gang for optimum results. Check response at 250 m, 300 m, 400 m and 500 m (1,200 KC/S, 1,000 KC/S, 750 KC/S and 600 KC/S), adjusting the slotted end plates of **C19** and **C21** if necessary.

LW.—Switch set to LW (switch lever down), turn gang to maximum, swing signal generator control until it resonates with set, then adjust **C23** (nut) for maximum output, while rocking the gang for optimum results.

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