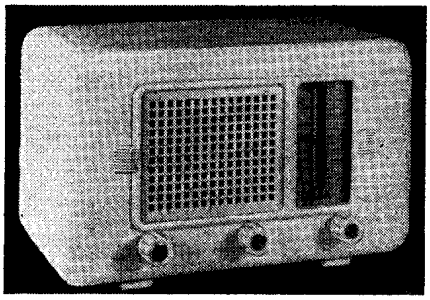
TRADER" SERVICE SHEET

840

ALBA C112

3-BAND A.C./D.C. MAINS MIDGET



A TRUE midget mains receiver of very small dimensions, the Alba C112 is a three-valve (plus rectifier) three-band superhet designed for direct application to A.C. or D.C. mains of any voltage between 200V and 240V without adjustment. The valve range used is the new Mullard Continental "21" series, with loctal bases.

Release date and original price: November, 1947, £13 13s plus purchase tax.

CIRCUIT DESCRIPTION

Input from attached aerial, via isolating capacitor **C1** and coupling coils **L1** (S.W.), **L2** (M.W.) and **L3** (L.W.), to single tuned circuits **L4, C24** (S.W.), **L5, C24** (M.W.) and **L6, C24** (L.W.), which precede a triode heptode valve **(V1, Mullard UCH21)** operating as frequency changer with injector grid coupling.

Oscillator grid coils **L7** (S.W.), **L8** (M.W.) and **L9** (L.W.) are tuned by **C25.** Parallel trimming by **C26** (M.W.) and **C27** (L.W.); series tracking by **C4** (S.W.), **C5** (M.W.) and **C6** (L.W.). Reaction coupling by anode coils **L10** (S.W.), **L11** (M.W.) and **L12** (L.W.).

Second valve **(V2, Mullard UCH21)** is another triode heptode, in which the heptode section operates as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C28, L13, L14, C29** and **C30, L15, L16, C31.**

Intermediate frequency 455 kc/s.

Diode second detector is part of double diode pentode output valve **(V3, Mullard UBL21).** Audio frequency component in rectified output is developed across load resistor **R5** and passed via A.F. coupling capacitor **C10** and manual volume control **R4** back to control grid of **V2** triode section, which operates as A.F. amplifier. I.F. filtering in diode circuit by **C12, R6, C13.**

Second diode of **V3,** fed from **L16** via **C15,** provides D.C. potential, which is developed across load resistor **R12** and fed back through a decoupling circuit as G.B. to F.C. (except on S.W.) and I.F. valves, giving automatic volume control.

Resistance-capacitance coupling by **R8, C14** and **R9,** via grid stopper **R10,** between **V2** triode and pentode section of **V3.** Fixed tone correction in **V3** anode circuit by **C16.** G.B. for **V3** pentode and A.V.C. delay voltage are obtained from the drop across **R11** in the cathode lead to chassis.

When the receiver is operated from A.C. mains, H.T. current is supplied by I.H.C. half-wave rectifying valve **(V4, Mullard UY21)** which, with D.C. mains, behaves as a low resistance. Smoothing by resistors **R13, R14** and electrolytic capacitors **C17, C18** and **C19.** Valve heaters, together with line cord ballast resistor **R15,** are connected in series across mains input.

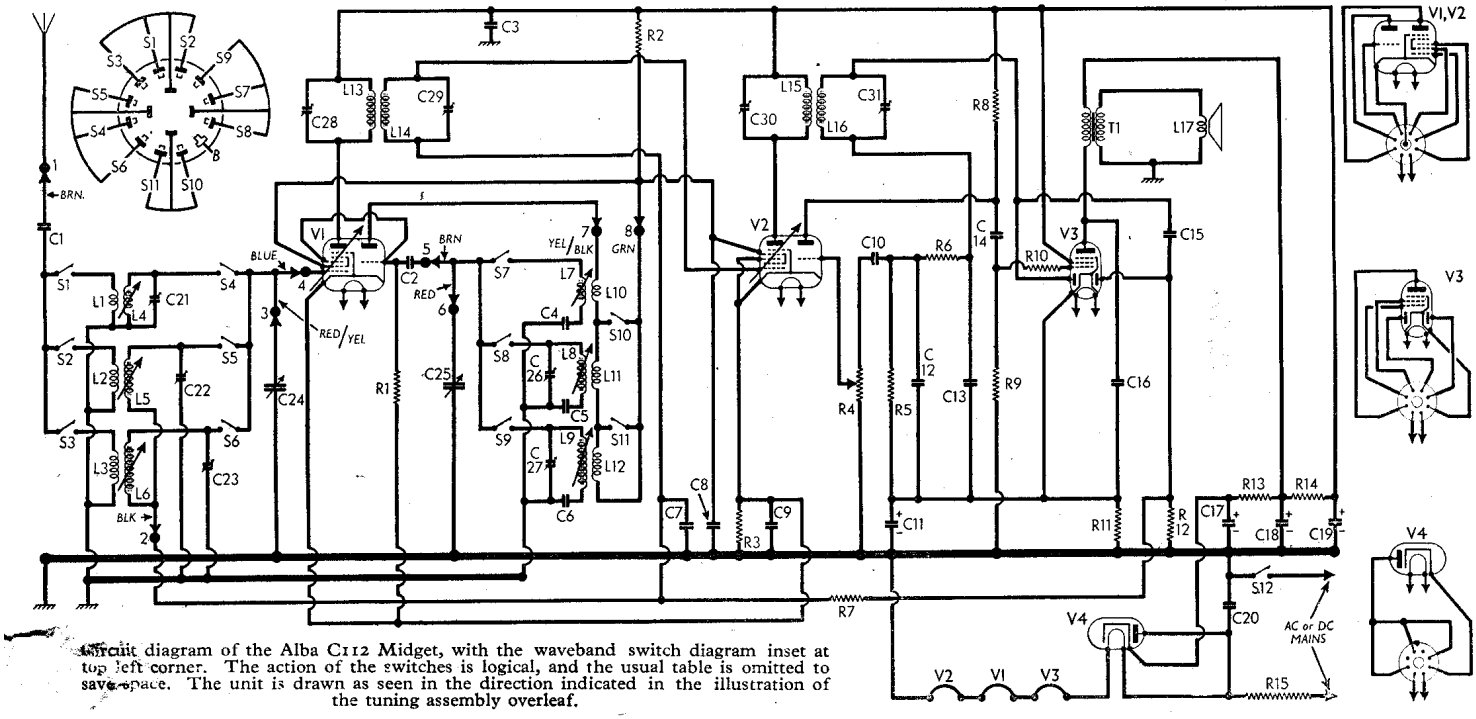
COMPONENTS AND VALUES

	RESISTORS	Values (ohms)	Location
R1	V1 osc. C.G. ...	47,000	J6
R2	H.T. feed resistor...	10,000	F6
R3	V1, V2 fixed G.B....	150	G6
R4	Volume control ...	1,000,000	F4
R5	Signal diode load ...	470,000	B2
R6	I.F. stopper ...	47,000	B2
R7	A.V.C. decoupling .	2,000,000	G6
R8	V2 triode load ...	47,000	G6
R9	V3 pent. C.G. ...	560,000	F6
R10	V3 C.G. stopper ...	47,000	F6
R11	V3 G.B., A.V.C. delay	150	F6
R12	A.V.C. diode load...	1,000,000	G6
R13, R14	H.T. smoothing resistors	270	E6
		1,000	E5
R15	Heater ballast† ...	680	E6

† Line cord.

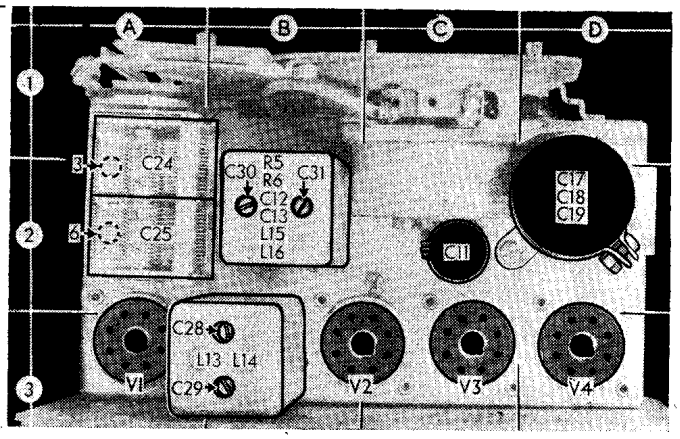
	CAPACITORS	Values (μF)	Location
C1	Aerial isolator ...	0·00025	K9
C2	V1 osc. C.G. ...	0·0001	J7
C3	H.T. R.F. by-pass .	0·1	H5
C4	Osc. S.W. tracker...	0·0039	N9
C5	Osc. M.W. tracker	0·00039	N9
C6	Osc. L.W. tracker...	0·00014	M10
C7	A.V.C. decoupling .	0·1	G6
C8	H.T. feed decoup....	0·1	F6
C9	V1, V2 cath. by-pass	0·25	H6
C10	A.F. coupling ...	0·005	E5
C11*	V3 cath. by-pass ...	50·0	C2
C12	I.F. by-pass ...	0·0001	B2
C13		0·0001	B2
C14	A.F. coupling ...	0·005	G6
C15	A.V.C. coupling ...	0·0001	G7
C16	Tone corrector ...	0·01	F7
C17*	H.T. smoothing capacitors ...	8·0	D2
C18*		16·0	D2
C19*		16·0	D2
C20	R.F. by-pass ...	0·01	E6
C21‡	Aerial S.W. trim. .	0·00001	L9
C22‡	Aerial M.W. trim....	0·00001	N8
C23‡	Aerial L.W. trim. ...	0·00003	K8
C24†	Aerial tuning ...	0·00037	A1
C25†	Osc. tuning ...	0·00037	A2
C26‡	Osc. M.W. trim. ...	0·00001	N8
C27‡	Osc. L.W. trim. ...	0·00003	K8
C28‡	1st I.F. transformer tuning	0·0002	B3
C29‡		0·0002	B3
C30‡	2nd I.F. transformer tuning ...	0·0002	B2
C31‡		0·0002	B2

* Electrolytic. † Variable. ‡ Pre-set.

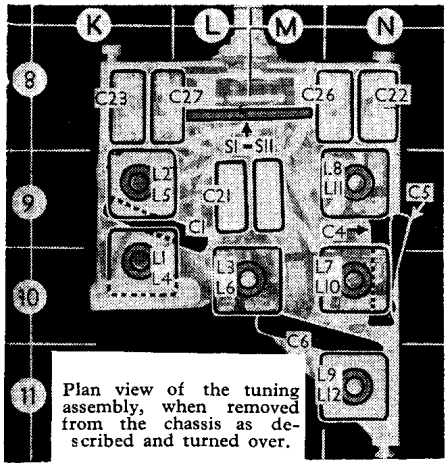


Circuit diagram of the Alba C112 Midget, with the waveband switch diagram inset at top left corner. The action of the switches is logical, and the usual table is omitted to save space. The unit is drawn as seen in the direction indicated in the illustration of the tuning assembly overleaf.

	OTHER COMPONENTS		Approx. Values (ohms)	Location
L1	Aerial coupling coils		0·1	K10
L2			1·7	K9
L3			65·0	L10
L4	Aerial tuning coils		Very low	K10
L5			4·5	K9
L6			23·0	L10
L7	Oscillator tuning coils		Very low	N10
L8			5·6	N9
L9			13·0	N11
L10	Oscillator reaction coils		0·2	N10
L11			3·0	N9
L12			6·0	N11
L13	1st I.F. trans.	Pri.	6·5	B3
L14		Sec.	6·5	B3
L15	2nd I.F. trans.	Pri.	6·5	B2
L16		Sec.	6·5	B2
L17	Speech coil ...		2·7	C1
T1	Output trans.	Pri.	140·0	G5
		Sec.	0·4	G5
S1-S11	W/band switches ...		—	L8
S12	Mains switch, ganged R4		—	F5



Plan view of the chassis. Two leads pass through the chassis deck to the gang from the tuning assembly below.



Plan view of the tuning assembly, when removed from the chassis as described and turned over.

DISMANTLING THE SET

Removing Chassis.—Remove three control knobs (recessed grub screws);

remove the four cheese-head screws securing the top and bottom corners of the back cover to the rear of the cabinet, and slide out the chassis, speaker and back cover as a single unit.

Removing Tuning Assembly.—Remove two cheese-head screws at the extreme left and right corners of the chassis pressing, beneath the tuning scale, and a single cheese-head screw from the chassis deck, close to the gang;

remove the receiver back cover (two cheese-head screws) and the single countersunk head screw from the rear edge of the chassis;

unsolder the eight leads from the tuning assembly at points indicated in our chassis pictures by the numbers one to eight, and lift out the assembly.

When replacing, the eight leads should be reconnected to the numbered points indicated in our chassis illustrations, as follows: brown from **C1**, to 1; black to 2; red/yellow to 3; blue to 4; brown from **S7-S9**, to 5; red to 6; yellow/black to 7; green to 8. Connections 3 and 6 are on the gang, the leads passing through holes in the chassis deck.

CIRCUIT ALIGNMENT

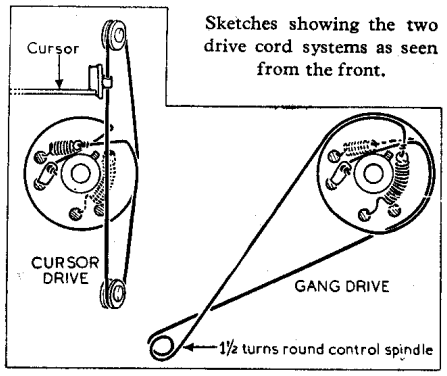
I.F. Stages.—Switch set to M.W., turn volume control to maximum and gang to minimum capacitance. Connect signal generator, via an isolating capacitor in each lead, to control grid (pin 6) of **V1** and chassis, and feed in a 455 kc/s (659.3 m) signal. Adjust **C28, C29, C30** and **C31** (chassis locations B3 and B2) for maximum output.

R.F. and Oscillator Stages.—With the gang at maximum the pointer should coincide with the 550 m calibration mark on the scale. Transfer "live" signal generator lead to receiver end of attached aerial, via a suitable dummy aerial.

M.W.—With set still switched to M.W., tune to 215 m on scale, feed in a 215 m (1,396 kc/s) signal, and adjust **C26** (I4) and **C22** (H4) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the cores of **L8** (H5) and **L5** (J5) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to 1,100 m on scale, feed in an 1,100 m (273 kc/s) signal, and adjust **C27** (J4) and **C23** (J4) for maximum output. Tune to 1,900 m on scale, feed in a 1,900 m (157.8 kc/s) signal, and adjust the cores of **L9** (H6) and **L6** (I6) for maximum output. Repeat these adjustments.

S.W.—Switch set to S.W., tune to 50 m on scale, feed in a 50 m (6.0 Mc/s) signal, and adjust the cores of **L7** (H6) and **L4** (J5) for maximum output. Tune to 16 m on scale, feed in a 16 m (18.75 Mc/s) signal, and adjust **C21** (J5) for maximum output. Repeat these adjustments.

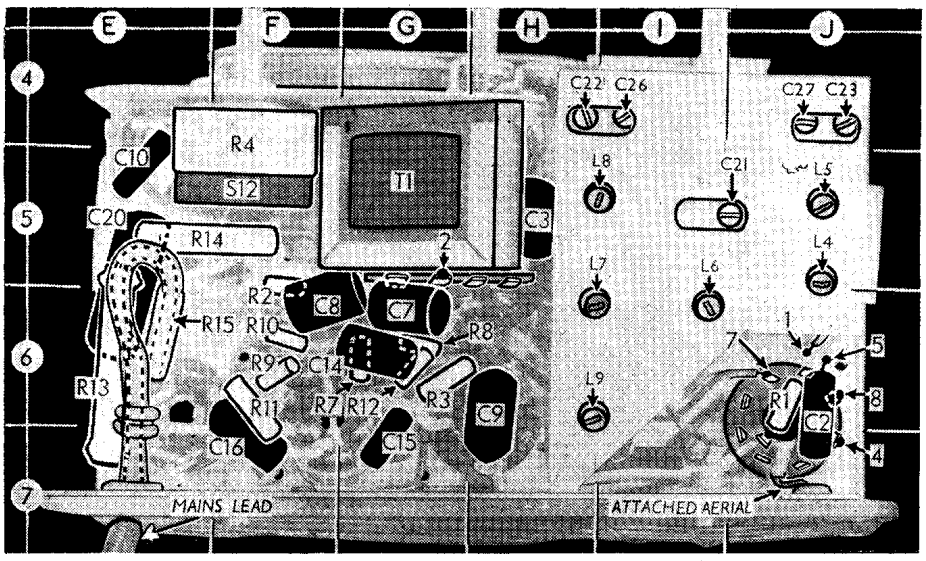


Sketches showing the two drive cord systems as seen from the front.

DRIVE CORD REPLACEMENT

The gang drive cord is of normal thickness and should be fitted first as it goes behind the cursor drive cord, which is of thinner twine. The former is a little longer than the latter, but 18 inches is sufficient for either of them, including some spare for knotting.

Each has its own tension spring, but the fixed ends are tied to a common hooked plate. The course of each is shown separately in the sketch above, where they are viewed from the front with the gang at maximum, the drum in each case being common to both. Access is obtained to the drum by removing the scale (four countersunk-head 8BA screws).



Under-chassis view. Six of the eight connections from the tuning assembly are seen here.

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 230 V.

Voltages were measured on the 400 V scale of a model 7 universal Avometer, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 UCH21	85	1·15	40	2·1
	Oscillator			
	40	1·1		
V2 UCH21	85	1·2	40	1·5
	Triode			
	40	0·7		
V3 UBL21	92	25·0	85	5·0
V4 UY21†	—	—	—	—

† Cathode to chassis, 105 v, D.C.

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