Supplement to Wireless & Electrical Trader, February 28, 1953

"TRADER" SERVICE SHEET

1082

ALBA C114

A.C./D.C. Midget Superhet

A MIDGET receiver of very compact design, the Alba C114 is a 4-valve (plus rectifier) 3-band superhet designed to operate from A.C. or D.C. mains of 200-250 V, but arrangements are made to adjust it for operation from mains of 100-120 V or 130-150 V. The method is explained overleaf. The waveband ranges are 16-52 m, 190-570 m and 950-2,000 m.

Release date and original price: September 1951, £12 12s. Purchase tax extra.

CIRCUIT DESCRIPTION

Input from an attached "throw-out" aerial is coupled by **L1** (S.W.), **L2** (M.W.) or **L3** (L.W.) to single-tuned circuits **L4, C33** (S.W.), **L5, C33** (M.W.) and **L6, C33** (L.W.) which precede triode hexode valve **(V1, Mullard UCH42)** operating as frequency changer with internal coupling.

Oscillator grid coils **L7** (S.W.), **L8** (M.W.) and **L9** (L.W.) are tuned by **C34.** Parallel trimming by **C35** (S.W.), **C36** (M.W.) and **C37** (L.W.); series tracking by **C10** (S.W.), **C11** (M.W.) and **C12** (L.W.). Reaction coupling from anode across common impedance of the trackers with additional inductive coupling via **L10** (S.W.) and **L11** (L.W.).

Second valve **(V2, Mullard UF41)** is a variable-mu R.F. pentode with tuned transformer couplings **C4, L12, L13, C5** and **C16, L14, L15, C17.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve **(V3, Mullard UBC41).** A.F. component in rectified output is developed across **R11,** and passed via **C21** and volume control **R12** to grid of triode section. I.F. filtering by **C19, R10** and **C20.**

Second diode of **V3** is fed from **V2** anode via **C22,** and the resulting D.C. potential developed across diode load **R16** is fed back as bias to **V1** and **V2,** giving automatic gain control. A.G.C. delay bias, together with bias for the triode section, is developed across cathode resistor **R15.**

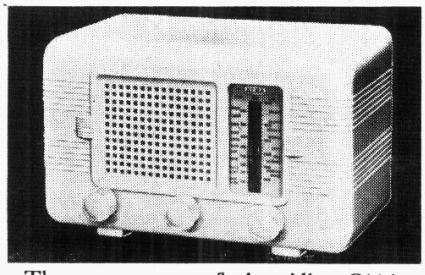
Resistance-capacitance coupling by **R14, C24** and **R18** between **V3** triode and pentode output valve **(V4, Mullard UL41).** Tone correction by **C25** in **V4** anode circuit.

H.T. current is supplied by I.H.C. rectifying valve **(V5, Mullard UY41).** Smoothing by **R21** and electrolytic capacitors **C28** and **C29.** Valve heaters, together with ballast resistors **R22** and **R23,** are connected in series across the mains input. Mains R.F. filtering by **C27.**

COMPONENTS AND VALUES

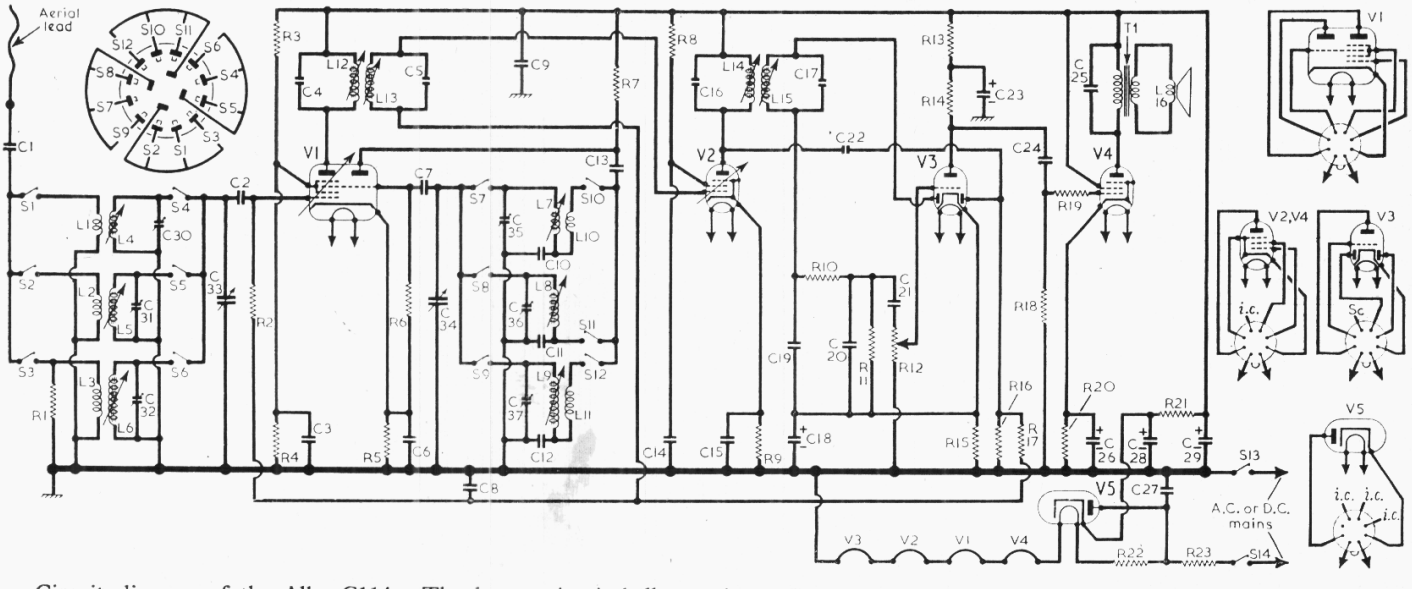
	CAPACITORS	Values	Locations
C1	Aerial coupling ...	200pF	G3
C2	V1 C.G.	100pF	G4
C3	V1 S.G. decoupling	0·05μF	G4
C4	1st I.F. trans. tuning	100pF	A2
C5		100pF	A2
C6	V1 cath. by-pass	0·05μF	F4
C7	V1 osc. C.G. ...	100pF	G3
C8	A.G.C. decoupling	0·05μF	F4
C9	H.T. R.F. by-pass	0·25μF	D3
C10	S.W. osc. tracker...	5,300pF	E3
C11	M.W. osc. tracker	600pF	F3
C12	L.W. osc. tracker	270pF	F4
C13	Osc. reaction coup.	100pF	G3
C14	V2 S.G. decoupling	0·05μF	F4
C15	V2 cath. by-pass	0·05μF	F4
C16	2nd I.F. trans. tuning	100pF	B2
C17		100pF	B2
C18*	V3 cath. by-pass	20μF	E3
C19	I.F. by-passes ...	100pF	E3
C20		100pF	E4
C21	A.F. coupling ...	0·01μF	E3
C22	A.G.C. diode coup.	12pF	F4
C23*	V3 anode decoup.	32μF	C1
C24	A.F. coupling ...	0·01μF	E4
C25	Tone corrector ...	0·01μF	C2
C26*	V4 cath. by-pass	20μF	E3
C27	Mains R.F. by-pass	0·02μF	D3
C28*	H.T. smoothing ...	16μF	C1
C29*		32μF	C1
C30‡	S.W. aerial trim.	25pF	B1
C31‡	M.W. aerial trim.	50pF	B1
C32‡	L.W. aerial trim.	125pF	B1
C33†	Aerial tuning ...	523pF	A1
C34†	Oscillator tuning ...	523pF	A1
C35‡	S.W. osc. trim. ...	50pF	B1
C36‡	M.W. osc. trim. ...	50pF	B1
C37‡	L.W. osc. trim. ...	200pF	B1

* Electrolytic. † Variable. ‡ Pre-set.



The appearance of the Alba C114 midget receiver. No "line cord" ballast is used.

	RESISTORS	Values	Locations
R1	L.W. aerial shunt	47kΩ	A1
R2	V1 C.G.	1MΩ	G4
R3	V1 S.G. pot. ...	33kΩ	G4
R4	divider	47kΩ	G4
R5	V1 G.B.	200Ω	G4
R6	V1 osc. C.G. ...	47kΩ	G4
R7	Osc. anode load ...	47kΩ	G4
R8	V2 S.G. feed ...	47kΩ	F4
R9	V2 G.B.	330Ω	F4
R10	I.F. stopper ...	47kΩ	E3
R11	Diode load ...	360kΩ	E3
R12	Volume control ...	250kΩ	D3
R13	H.T. decoupling ...	47kΩ	D4
R14	V3 anode load ...	47kΩ	E4
R15	V3 G.B.	3·3kΩ	E4
R16	A.G.C. diode load	1MΩ	E4
R17	A.G.C. decoupling	1MΩ	E4
R18	V4 C.G.	560kΩ	D3
R19	V4 C.G. stopper ...	47kΩ	D4
R20	V4 G.B.	150Ω	D4
R21	H.T. smoothing ...	500Ω	D3
R22	Heater ballast ...	300Ω	B2
R23		500Ω	B2



Circuit diagram of the Alba C114. The heater circuit ballast resistors **R22, R23** are rigid wire-wound resistance units, not parts of a line cord. Inset in the top left-hand corner of the diagram is a diagram of the waveband switch unit.

OTHER COMPONENTS			Approx. Values (ohms)	Locations
L1	Aerial coupling coils		0·1	G3
L2			1·1	A1
L3			42·0	A1
L4	Aerial tuning coils		—	G3
L5			3·0	A1
L6			22·0	A1
L7	Oscillator tuning coils		—	F3
L8			3·4	F3
L9			7·0	G3
L10	Oscillator reaction coils		—	F3
L11			3·0	G3
L12	1st I.F. trans.	Pri.	10·0	A2
L13		Sec.	10·0	A2
L14	2nd I.F. trans.	Pri.	10·0	B2
L15		Sec.	10·0	B2
L16	Speech coil ...		2·6	C1
T1	O.P. trans.	Pri.	250·0	B1
		Sec.	0·3	
S1-S12	Waveband switches		—	G3
S13, S14	Mains sw., g'd R12		—	D3

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver while it was operating from A.C. mains of 230 V. The receiver was switched to M.W. and tuned to the high wavelength end of the band with the volume control at maximum, but there was no signal input.

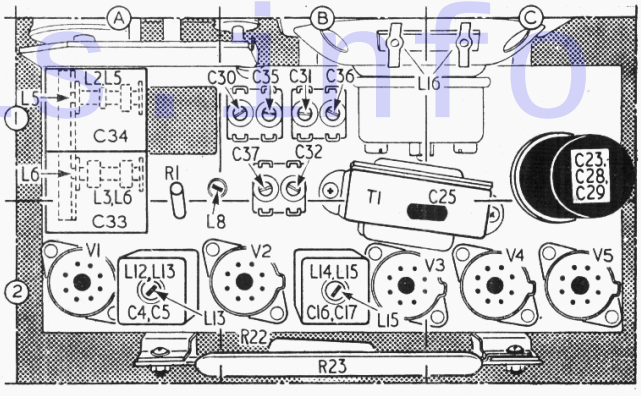
Voltages were measured with an Avo Electronic TestMeter, and as this instrument has a high internal resistance, allowance should be made for the current drawn by other types of meter. Chassis was the negative connection in every case.

Valve	Anode V	Anode mA	Screen V	Screen mA	Cath. V
V1 UCH42	115	1·0	43	1·7	1·0
	Oscillator				
	46	1·8			
V2 UF41	115	3·0	63	1·0	1·4
V3 UBC41	76	0·37	—	—	1·1
V4 UL41	106	27·0	115	5·0	5·4
V5 UY41	133†	—	—	—	130·0

† A.C. reading.

CIRCUIT ALIGNMENT

I.F. Stages.—Remove chassis from cabinet and place on bench. Connect signal generator output, via an 0.1 μF capacitor in each lead, to control grid (pin 6) of **V1** and chassis. Switch receiver to M.W. and turn gang to maxium capacitance. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L15** (location reference B2), **L14** (E4), **L13** (A2) and **L12** (F4) for maximum output. Repeat these adjustments.



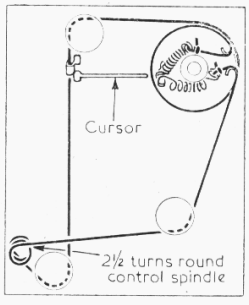
Plan view of the chassis. The tuning capacitors in the I.F. transformers form an integral part of the structure of the assemblies, and are not separate components.

R.F. and Oscillator Stages.—Transfer "live" signal generator lead to junction of **C1** and "throw-out" aerial lead.

S.W.—Switch receiver to S.W., tune it to 50 m, feed in a 50 m (6 Mc/s) signal and adjust the cores of **L7** (F3) and **L4** (G3) for maximum output. Tune receiver to 16.67 m, feed in a 16.67 m (18 Mc/s) signal and adjust **C35** (B1) and **C30** (B1) for maximum output. Repeat these adjustments until no further improvement results.

M.W.—Switch receiver to M.W., tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of **L8** (A1) and **L5** (A1) for maximum output. Tune receiver to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C36** (B1) and **C31** (B1) for maximum output. Repeat these adjustments until no further improvement results.

L.W.—Switch receiver to L.W., tune to 1,949 m, feed in a 1,949 m (154 kc/s) signal and adjust the cores of **L9** (G3) and **L6** (A1) for maximum output. Tune receiver to 1,000 m, feed in a 1,000 m (300 kc/s) signal and adjust **C37** (B1) and **C32** (B1) for maximum output.



Sketch of the tuning drive system, drawn as seen from the front after removal of the scale.

GENERAL NOTES

Switches.—**S1-S12** are the waveband switches, ganged in a single 3-position rotary unit beneath the chassis. The unit is indicated in our underside chassis illustration, and shown in detail in the diagram inset in the top left-hand corner of our circuit diagram overleaf.

The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control. A dash indicates open, and **C,** closed.

S13, S14 are the Q.M.B. mains switches, ganged with the volume control **R12.**

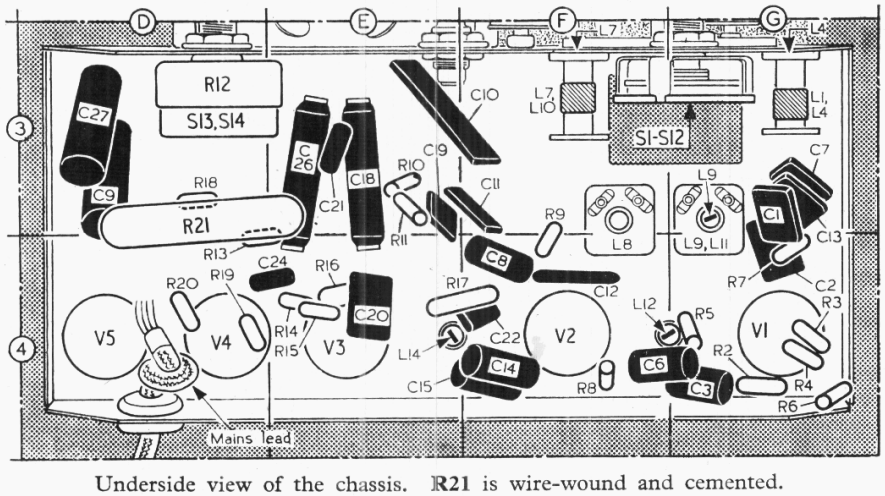
Resistors R21, R22, R23.—These are all wire-wound and cemented heavy-duty resistors. **R21** and **R22** are both rated at 5 W. **R23** is a special type made by E.R.G., of flattened tubular construction, rated at 500 Ω, 40 W.

Mains Voltage Adjustment.—Connected as shown in our circuit diagram, the mains input circuit is suitable for operation from mains of 200-250 V. It can be adjusted to operate from mains of 100-120 V by short-circuiting **R22** and **R23**; or it can be adjusted to 130-150 V by short-circuiting **R23.** These adjustments can be made directly to the connecting tags of the two resistance units, at the rear of the chassis, upon removing the back cover.

I.F. Transformers.—The two pairs of fixed tuning capacitors **C4, C5** and **C16, C17** are contained within the cans of the transformers, but they are not visible even when the cans are removed because they form an integral part of the top insulating plates. The four support wires holding the plate provide the connections.

Drive Cord Replacement.—About two feet of special fine fishing line is required for a new drive cord, which should be run as shown in the accompanying sketch, where the system is drawn as seen from the front with the gang at maximum and the scale panel removed (4 countersunk screws).

Ordinary drive cord is too thick for this receiver, and supplies of the correct grade and gauge should be obtained from A. J. Balcombe, Ltd., 52-58, Tabernacle Street, London, E.C.2. The cord is made by Houndsells of Bridport, Ltd., Bridport, Dorset.



Underside view of the chassis. **R21** is wire-wound and cemented.

Waveband Switch Table

Switch	M.W.	S.W.	L.W.
S1	—	C	—
S2	C	—	—
S3	—	—	C
S4	—	C	—
S5	C	—	—
S6	—	—	C
S7	—	C	—
S8	C	—	—
S9	—	—	C
S10	—	C	—
S11	C	—	—
S12	—	—	C

Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.