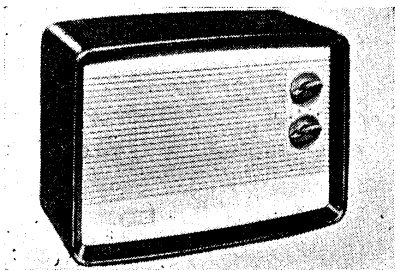
"TRADER" SERVICE SHEET
1109

EKCO U195

Transportable Pre-tuned Superhet



FOUR pre-set stations are provided in the Ekco U195, selection being by means of a rotary switch. The normal continuously variable tuning circuits have been omitted from this receiver which is a 3-valve (plus rectifier) superhet designed to operate from A.C. or D.C. mains of 200-250 V (50-100 c/s in the case of A.C.). The wavelength ranges of the four switch positions are : M.W.1, 188-343m; M.W.2, 244-438m; M.W.3, 311-555m; L.W., 1,200-1,875m. Although frame aerials are used on M.W. and L.W., provision is also made for the connection of an external aerial and earth.

Release date and original price: July 1953, £11 12s. Purchase tax extra.

CIRCUIT DESCRIPTION

Pre-set tuned frame aerial input **L2, C26** (M.W.1), **L2, C27** (M.W.2), **L2, C28** (M.W.3) and **L1, L2, C29** (L.W.) precedes first valve **(V1, Mullard UCH42)** which operates as frequency changer with internal coupling. Selection is made by switches **S2-S5.** On M.W. positions L.W. frame aerial winding is short-circuited by **S1.**

Provision is made for the connection of an external aerial and earth via isolating capacitors **C1** and **C2.** I.F. rejection by filter **L3, C5.**

Triode section of **V1** is connected in a Colpitts oscillator circuit with switched pre-set iron-dust cored coils **L4** (M.W.1), **L5** (M.W.2), **L6** (M.W.3) and **L7** (L.W.). Switching by **S6-S9.**

Second valve **(V2, Mullard UBF80)** is a double diode variable-mu R.F. pentode, its pentode section operating as intermediate frequency amplifier with tuned transformer couplings **C7, L8, L9, C8** and **C15, L10, L11, C16.**

Intermediate Frequency 470 kc/s.

One diode section of **V2** operates as signal detector, the audio frequency com-

(*Continued col. 1 overleaf*)

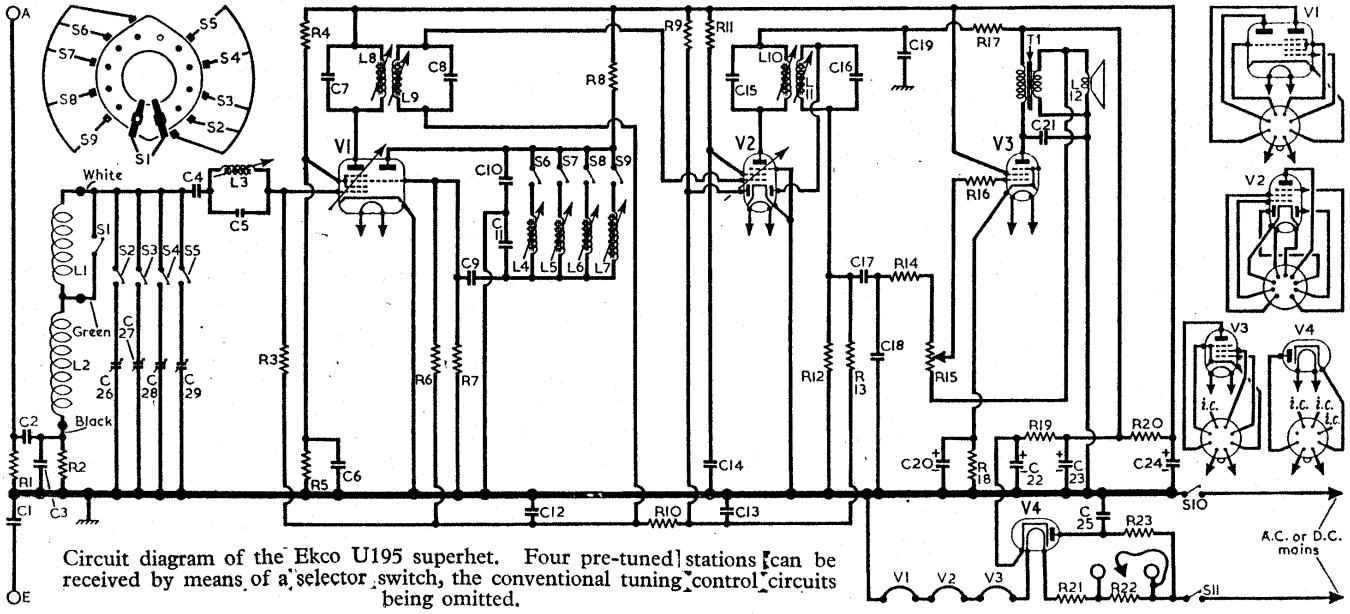
COMPONENT VALUES AND LOCATIONS

	RESISTORS	Values	Locations
R1	Anti-static shunt...	1·5MΩ	G4
R2	Aerial input shunt	22kΩ	G3
R3	V1 C.G.	680kΩ	F3
R4	V1 S.G. H.T. pot. divider	10kΩ	F3
R5		15kΩ	F3
R6	V1 osc. C.G.	10MΩ	F3
R7		47kΩ	F3
R8	V1 osc. anode feed	22kΩ	G3
R9	A.G.C. delay ...	10MΩ	F4
R10	A.G.C. decoupling	1·5MΩ	F3
R11	V2 S.G. feed ...	47kΩ	F4
R12	Signal diode load...	470kΩ	E3
R13	A.G.C. decoupling	2·2MΩ	F4
R14	I.F. stopper ...	47kΩ	E4
R15	Volume control ...	1MΩ	A1
R16	V3 C.G. stopper ...	47kΩ	E4
R17	H.T. decoupling	3·3kΩ	F4
R18	V3 G.B.	100Ω	F4
R19	H.T. smoothing	680Ω	C2
R20		4.7kΩ	F4
R21	Heater ballast	1,030Ω	C2
R22		300Ω	C2
R23	V4 surge limiter ...	150Ω	C2

	CAPACITORS	Values	Locations
C1	Chassis isolators	0·01μF	G4
C2		0·002μF	G4
C3	Aerial input shunt	3,700pF	G4
C4	V1 C.G.	100pF	A1
C5	I.F. filter tune ...	82pF	A2
C6	V1 S.G. decoupling	0·01μF	F3
C7	1st I.F. trans. tun.	100pF	A2
C8		100pF	A2
C9	V1 osc. C.G. ...	100pF	F3
C10	Oscillator tune	560pF	G3
C11		0·001μF	G3
C12	A.G.C. decoupling	0·04μF	F4
C13	A.G.C. decoupling	270pF	F3
C14	V2 S.G. decoupling	0·01μF	F4
C15	2nd I.F. trans. tun.	100pF	B2
C16		100pF	B2
C17	A.F. coupling ...	0·01μF	E4
C18	I.F. by-pass ...	100pF	E4
C19	H.T. decoupling ...	0·01μF	F4
C20*	V3 cath. by-pass ...	50μF	D4
C21	Tone corrector ...	0·0025μF	E4
C22*	H.T. smoothing	32μF	C1
C23*		32μF	C1
C24*		16μF	G4
C25	Mains R.F. by-pass	0·01μF	D4
C26†	Aerial Pre-sets	200pF	A2
C27†		380pF	A2
C28†		750pF	A2
C29†		750pF	A2

* Electrolytic. † Pre-set.

If the component numbers given here are used when ordering spares dealers are requested to say so, as they usually differ from those used in the manufacturer's diagram.



Circuit diagram of the Ekco U195 superhet. Four pre-tuned stations can be received by means of a selector switch, the conventional tuning control circuits being omitted.

OTHER COMPONENTS			Approx. Values (ohms)	Locations
L1	Frame aerials		1·0	—
L2			5·6	—
L3	I.F. filter		14·0	A2
L4	Oscillator pre-set tuning coils		1·5	A2
L5			1·5	A2
L6			1·5	A2
L7			2·0	A2
L8	1st I.F. trans.	Pri.	14·0	A2
L9		Sec.	14·0	A2
L10	2nd I.F. trans.	Pri.	14·0	B2
L11		Sec.	14·0	B2
L12	Speech coil		2·5	B1
T1	O.P. trans.	Pri.	270·0	E3
		Sec.	—	
S1-S9	Waveband switches		—	A1
S10, S11	Mains sw., g'd R15		—	A1

Circuit Description—*continued*

ponent in its rectified output being developed across **R12**, and passed via **C17** and volume control **R15** to pentode output valve **(V3, Mullard UL41)**. I.F. filtering by **C18, R14** and the capacitance of the screened leads to the volume control.

D.C. component developed across **R12** is fed back as bias to **V1** and **V2** giving automatic gain control. Second diode of **V2** is connected to the A.G.C. line, and is supplied with bias from the H.T. line via **R9**. This bias makes the diode conduct, holding the A.G.C. line to chassis potential until the A.G.C. voltage is sufficiently negative to cut it off, thus providing delayed A.G.C. The negative voltage developed across oscillator grid leak **R6** is fed to the A.G.C. line as standing bias.

Tone correction by **C21** in **V3** anode circuit, and by negative feed-back between **T1** secondary winding and **V3** grid circuit.

H.T. current is supplied by I.H.C. half-wave rectifying valve **(V4, Mullard UY41)**. Smoothing by **R19, R20** and electrolytic capacitors **C22, C23** and **C24**. Valve heaters, together with ballast resistors **R21, R22** are connected in series across the mains input. **R23** protects **V4** from current surges. R.F. filtering by **C25**.

GENERAL NOTES

Switches.—**S1-S9** are the pre-set station selector switches, ganged in a single four-position rotary unit beneath the volume control. This unit is indicated in our plan view of the chassis and shown in detail in the diagram inset in the top left-hand corner of the circuit diagram overleaf, where it is drawn as seen in the direction indicated by the arrow in location reference A1 on the plan view.

The table (above) gives the switch positions for the four control settings, starting from the fully anti-clockwise (M.W.1) position of the control knob. A dash indicates open, and **C**, closed.

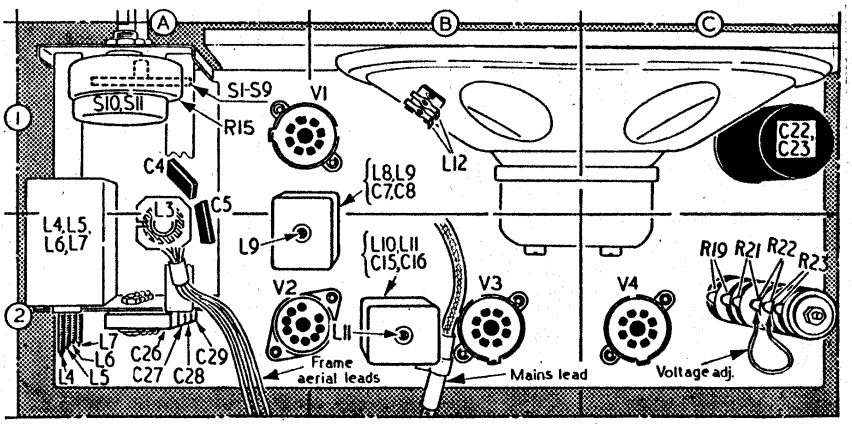
S10, S11 are the Q.M.B. mains switches, ganged with the volume control **R15**.

Frame Aerials L1, L2 are mounted on the cabinet back cover and connected to the receiver by flexible leads.

L3, C5 is the I.F. filter and is adjusted for minimum output at 470 kc/s to prevent I.F. break-through.

Pre-set Stations.—A special double-ended trimming tool is supplied with each receiver for the adjustment of the pre-tuned coils and trimmers in location reference A2.

Voltage Adjustment.—Two voltage adjustment tappings are provided on the ballast resistor **R21, R22**. The lower one is for mains supplies of between 200-225 V, and the upper one for supplies of between 225 V-250 V. The adjustment is made by bolting the lead indicated in the plan view (location C2) to the appropriate tag.



Plan view of the chassis. The four sets of pre-tuned adjustments are shown at the rear of the chassis, on the left, where they form a vertical column on the side of the tuning assembly.

Switch	M.W.1.	M.W.2.	M.W.3.	L.W.
S1	—	—	—	C
S2	C	—	—	—
S3	—	C	—	—
S4	—	—	C	—
S5	—	—	—	C
S6	C	—	—	—
S7	—	C	—	—
S8	—	—	C	—
S9	—	—	—	C

CIRCUIT ALIGNMENT

I.F. Stages.—Switch pre-set station control to M.W.3 position (third position from fully anti-clockwise), turn volume control to maximum, and connect signal generator output, via an 0.1μF capacitor in each lead, to control grid (pin 6) of **V1** and chassis.

Feed in a 470 kc/s (638.3m) signal and adjust the cores of **L11** (location reference B2), **L10** (F4), **L9** (A2) and **L8** (F4) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. effects. Repeat these adjustments.

I.F. Filter.—Transfer signal generator leads to **A** and **E** sockets, feed in a strong 470 kc/s signal and adjust **L3** (G4) for minimum output.

Pre-set Stations.—All of the adjustments are grouped together at the rear of the chassis (location reference A2). They are best adjusted on the transmission of the required station, using the special double-ended trimmer tool supplied with the receiver, and adjusting the oscillator coil first

Starting from the fully anti-clockwise position of the control knob, the four positions are M.W.1, M.W.2, M.W.3 and L.W. The associated adjustments run from top to bottom in the same order, and their ranges are: M.W.1, 188-343m; M.W.2, 244-438m; M.W.3, 311-555m; L.W., 1,200-1,875m.

DISMANTLING

Removing Chassis.—Remove two control knobs (pull-off);
remove two plastic runners from underside of cabinet, secured by self-tapping screws;
remove four 4BA cheese-head bolts with washers, and withdraw chassis from cabinet.

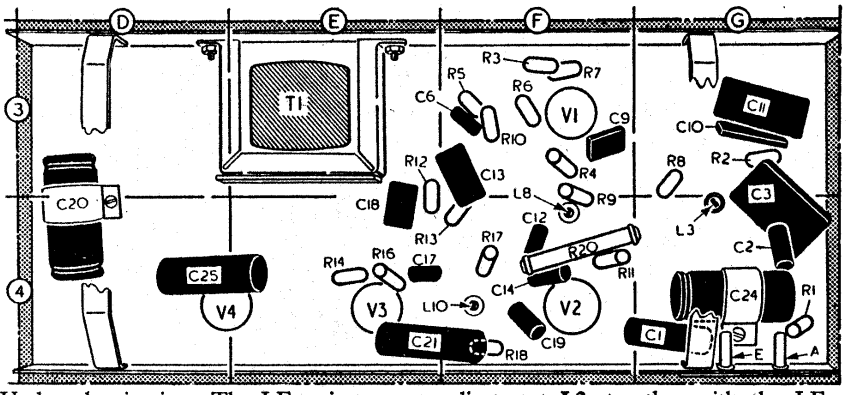
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from 230 V A.C. mains, the voltage adjustment being set to the 230-250 V tapping. The pre-set station control was turned fully anti-clockwise to M.W.1. The frame aerial should be turned to the null point if a signal is being received.

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 each case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 UCH42	120	1·5	55	2·1	—
	Oscillator				
	65	2·2			
V2 UBF80	180	3·7	62	2·0	—
V3 UL41	180	38·0	120	6·0	5·0
V4 UY41	205*	—	—	—	235.0†

* A.C. reading. † Cathode current 59mA.



Under chassis view. The I.F. rejector core adjustment **L3**, together with the I.F. transformer primary cores, are indicated in locations F4 and G4.

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