EKCO U354

F.M. Table Receiver

THE Ekco U354 is an F.M. table receiver housed in a two-tone plastics cabinet and designed to operate from A.C. or D.C. mains of 200-250V, 40-100c/s in the case of A.C. It is fitted with an internal aerial and sockets for the connection of an external aerial and an external speaker.

Release date and original price: August 1959, £13 2s 4d. Purchase tax extra.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those derived from the manufacturers' information.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	(V)
V1 UCC85					
a ..	164	7·5	—	—	1·65
b ..	151	5·0	—	—	—
V2 UF80	85	4·5	85	1·5	0·9
V3 UF80	60	2·0	60	1·0	1·0
V4 UABC80	75	0·45	—	—	—
V5 UL84	220	55·0	175	3·5	10·2
V6 UY85	228[1]	—	—	—	230·0[2]
T.I. DM70	80	0·15	—	—	—

[1] *A.C. reading.*
[2] *Cathode current 98mA.*

CIRCUIT ALIGNMENT

Equipment Required.—An F.M. signal generator, deviated by ±25kc/s; an A.C. voltmeter for use as an audio output meter; an 0-50µA meter for use as a D.C. output meter; a matched pair of 220kΩ resistors; and a damping unit comprising a 4.7kΩ resistor and 0.001µF capacitor connected in series.

I.F. Alignment

1.—Connect the matched pair of 220kΩ resistors in series across C27 (location reference B2). Connect the 0-50µA meter between chassis and the junction of the two 220kΩ resistors, and the signal generator to the control grid (pin 2) of V3.

2.—Tune the receiver to a point on the band free from any incoming signals and turn the volume control to maximum. Feed in an unmodulated 10.7Mc/s signal and adjust the core of L11 (F3) for maximum reading on the meter.

3.—Transfer the micro-ammeter chassis connection to the junction of R12, R13 (location reference C2). Feed in an unmodulated 10.7Mc/s signal and adjust the core of L12 (F3) for a zero reading on the meter. This will occur midway between a positive and negative peak.

4.—Repeat operations 2 and 3.

5.—Remove the 50µA meter and the two 220kΩ resistors. Connect the audio output meter across the external speaker sockets and transfer the signal generator to the control grid (pin 2) of V2.

6.—Connect the damping unit across L9. Feed in a 10.7Mc/s signal, deviated by ±25kc/s, and adjust the core of L10 (E3)

Capacitors

C1	1,800pF	H4	C34	0·03µF	B2	R26	47kΩ	B2
C2	0·001µF	H4	C35	0·01µF	E3	R27	150Ω	B2
C3	30pF	E3	C36	0·001µF	H4	R28	33Ω	A1
C4	0·001µF	H4	C37	0·01µF	H4	R29	350Ω	G3
C5	8·2pF	H4	C38	0·03µF	D2	R30	300Ω	G3
C6	6pF	H4	C39	0·01µF	C2	R31	100Ω	G3
C7	3pF	H4						
C8	12pF	H5				**Coils***		
C9	10pF	H5	**Resistors**			L1	—	E3
C10	17pF	H5	R1	220Ω	H4	L2	—	E3
C11	44pF	H5	R2	1·5MΩ	E3	L3	—	E3
C12	8·2pF	H5	R3	1·5kΩ	E3	L4	—	H4
C13	0·01µF	D2	R4	1MΩ	H4	L5	—	H5
C14	0·03µF	D2	R5	4·7kΩ	E3	L6	—	H5
C15	1,500pF	C2	R6	150Ω	D2	L7	—	H5
C16	0·03µF	D2	R7	15kΩ	C2	L8	—	H5
C17	15pF	E3	R8	10kΩ	C2	L9	—	E3
C18	50pF	E3	R9	5·6kΩ	C2	L10	—	E3
C19	0·003µF	C2	R10	330Ω	C2	L11	—	F3
C20	0·01µF	C2	R11	62kΩ	C2	L12	—	F3
C21	0·01µF	C2	R12	100Ω	C2	L13	—	F3
C22	0·005µF	B2	R13	22kΩ	C2	L14	3·0	—
C23	0·003µF	C1	R14	250kΩ	C2			
C24	25pF	F3	R15	1MΩ	A1			
C25	0·01µF	B2	R16	10MΩ	B2	**Miscellaneous***		
C26	220pF	B2	R17	5kΩ	B2	T1 {a	165·0	} A2
C27	2µF	B2	R18	27kΩ	B2	{b	0·35	
C28	32µF	B1	R19	22kΩ	B2	{c	0·23	
C29	0·001µF	B2	R20	1MΩ	B1	FB1	—	H4
C30	0·01µF	B2	R21	220kΩ	B2	S1, S2	—	A1
C31	470pF	B2	R22	47kΩ	B2			
C32	40µF	B2	R23	1MΩ	B2			
C33	40µF	B2	R24	820Ω	B1			
			R25	820Ω	A2			

Approximate D.C. resistance in ohms.

Circuit diagram of the Ekco U354. Differences in early versions of this receiver are described under " General Notes " overleaf.

Right: *Underside view of the chassis. The adjustment of the pre-set resistor R17 (in B2) is described in col. 2 below.*
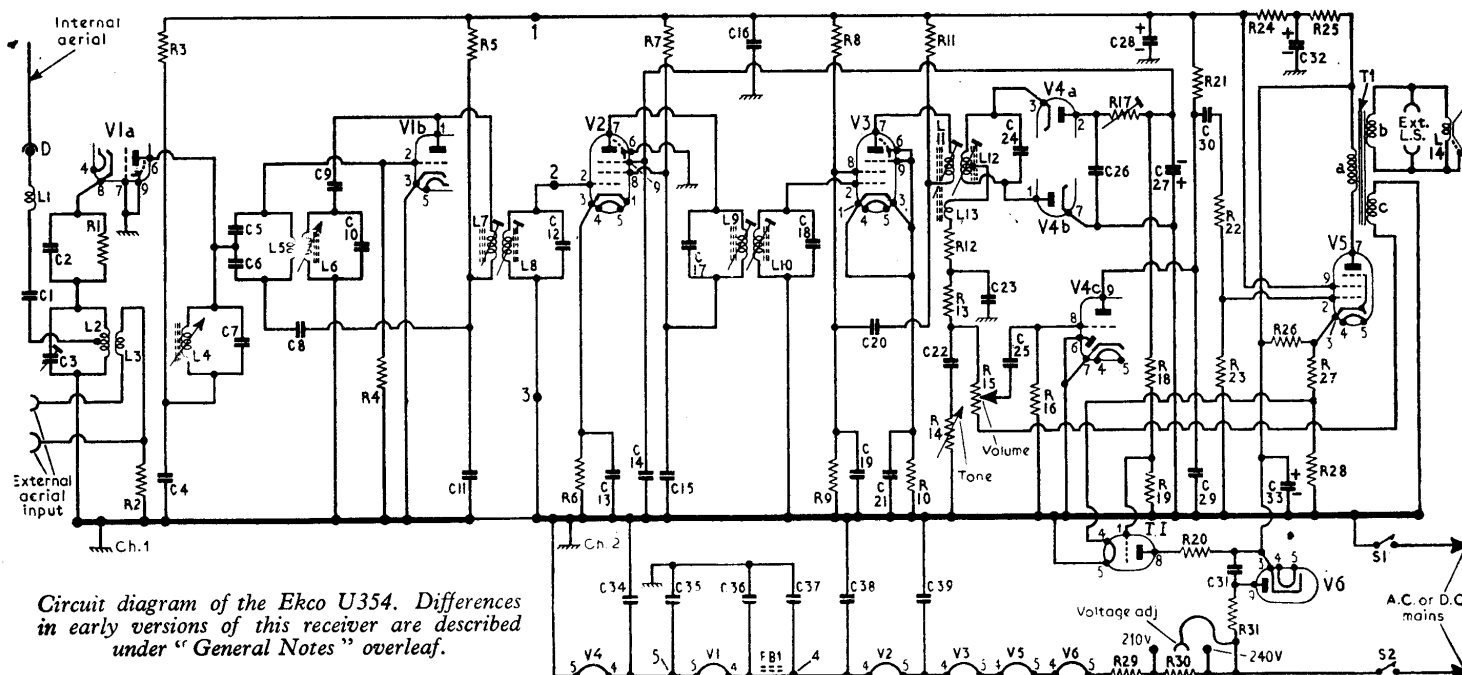
Below: *Diagram of the tuning drive system drawn as seen from the front of the chassis with the tuning control turned fully clockwise.*

Circuit Alignment—*continued*
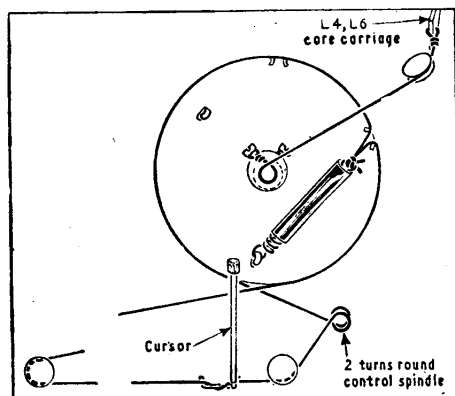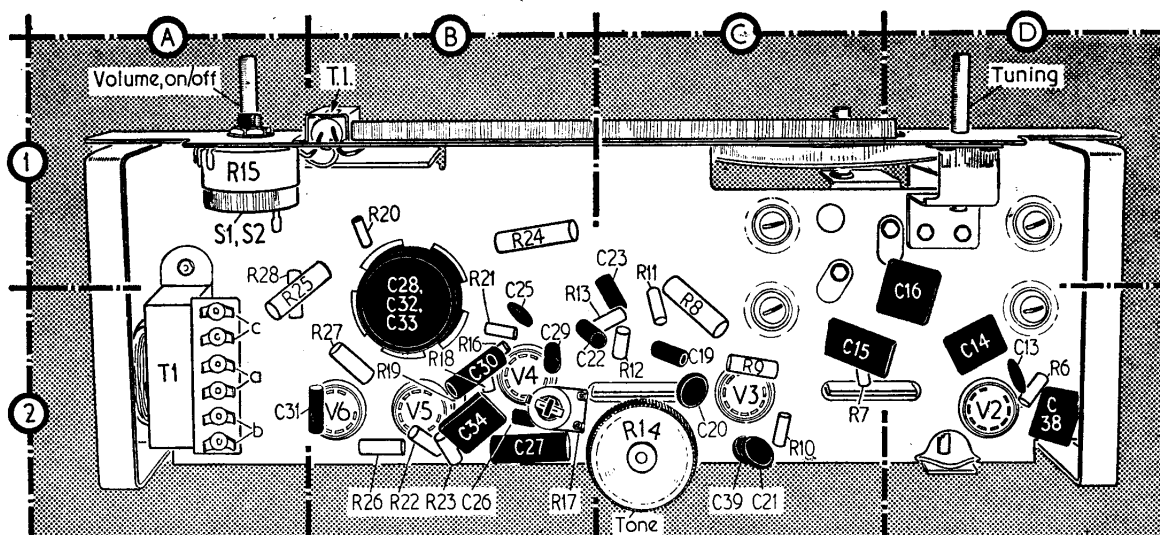
for maximum output, keeping the signal generator output as low as practicable. Transfer the damping unit to **L10** and adjust **L9** (E3) for maximum output.

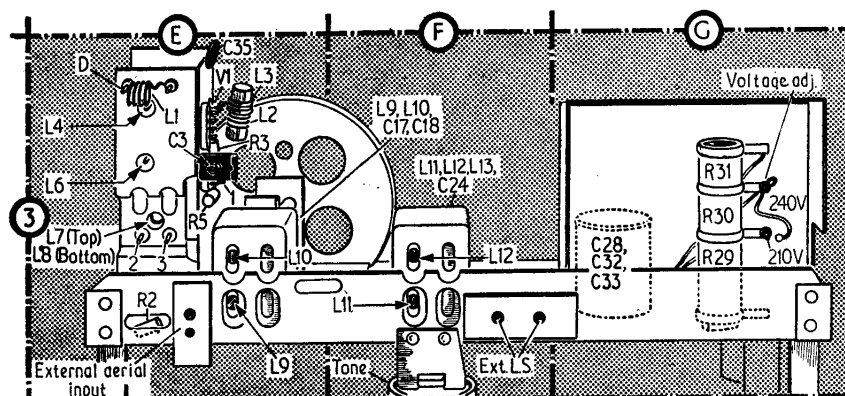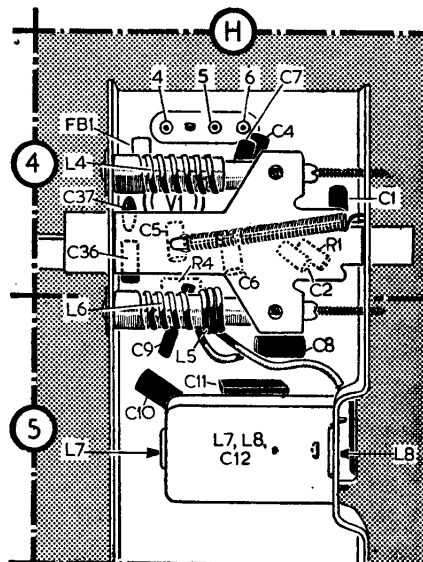7.—Remove the screening cover from the tuner unit. Transfer the signal generator to the junction of **R3, C4** (location reference H4), taking care to use a blocking capacitor as this point is at H.T. potential. Transfer the damping unit to **L7**. Feed in a 10.7Mc/s signal, deviated by ±25kc/s, and adjust the core of **L8** (H5) for maximum output. Then damp **L8** and adjust **L7** (H5) for maximum output.

R.F. Alignment

1.—Check that with tuning control turned fully clockwise the carriage of **L4, L6** cores is 1/32in from its fully open position, and that the cursor coincides with the datum marks at the right-hand end of the tuning scale. If necessary, the position of the core carriage may be adjusted by

loosening the two screws on the drive drum and rotating it on its spindle.

2.—Connect the signal generator to the aerial socket, and the output meter across the external speaker sockets.

3.—Turn the volume control to maximum and tune the receiver to 92Mc/s. Feed in a 92Mc/s signal and adjust the cores of **L6** (H5) and **L4** (H4) for maximum output.

4.—Check that the calibration at 87Mc/s, 94Mc/s and 99Mc/s is within ±0.3Mc/s. Check that the oscillator is operating below the carrier frequency by tuning the receiver to 100Mc/s and identifying the image at 78.6Mc/s.

5.—Disconnect the signal generator and connect the internal aerial. Tune the receiver to a transmission and adjust the aerial trimmer **C3** (E3), if fitted, for maximum output.

Adjustment of R17

The pre-set resistor **R17** has been adjusted in the factory for optimum A.M. rejection and it should not require re-adjustment unless the discriminator transformer **L11, L12, L13**, or an associated component is replaced. Its adjustment requires the use of an A.M./F.M. signal generator capable of providing A.M. signals which are entirely free from F.M. If such a generator is available **R17** may be adjusted as follows:

Connect the signal generator to the aerial socket and the output meter to the exernal speaker sockets. Feed in a 92Mc/s F.M. signal at a level of 10μV and carefully tune it in on the receiver for maximum output. Then switch the signal generator to A.M. and adjust **R17** (B2) for *minimum* output.

If a suitable generator is not available, a rough setting for **R17** may be obtained by adjusting it to give a resistance reading of 3.5kΩ, then finally adjust it, for minimum residual noise.

GENERAL NOTES

Cursor Drive Cord Replacement.—A length of nylon cord approximately 36in long is required for a new cursor drive cord. To fit a new cord, turn the tuning drum fully clockwise; pass one end of the cord through the hole in the edge of the drum and secure it to the free end of the tension spring. Then run it (clockwise) as in the sketch (col. 1), tying the remaining end to the spring. Attach the cursor to the cord so that it coincides with the datum marks at the right-hand end of the tuning scale, when **L4, L6** core carriage is 1/32in from its fully returned position.

Tuner Drive Cord Replacement.—A length of nylon cord about 8½in long is required. It should be run as indicated in the sketch of the tuning drive system shown in column 1. With the tuning control turned fully clockwise the core carriage should be 1/32in from its fully returned position. The position of the carriage may be adjusted by loosening the two screws on the drive drum and rotating the drum on its spindle.

Modifications.—In earlier versions of this receiver the internal aerial is mounted on the back cover. Aerial trimmer capacitor **C3** and the internal aerial coupling components **L1, C1** are omitted. A 1,800pF capacitor is connected in parallel with **R2**, and **L2** is tuned by a 8.2pF fixed capacitor. The secondary winding b of output transformer **T1** is connected to the aerial input socket at the junction of **R2, L3**. **C39** is omitted.

Right: *View of the tuner unit with its screening cover removed.*

Left: *Rear view of the chassis.*