EKCO AW 108

Four-valve, plus rectifier and tuning indicator, three-waveband superhet table model with variable selectivity. Sockets are provided for a pickup and low impedance extra loudspeaker. Suitable for operation from AC mains 200–250v, 40–80 cycles. Made by E. K. Cole Ltd., Service Department, Southend-on-Sea.

THREE sub-assemblies accommodate the various circuits, an HF sub-chassis comprising the frequency changer, aerial, and oscillator circuits, an IF and LF main chassis assembly, and a power pack assembly. The accompanying circuit diagram is arranged so that the stages follow on consecutively.

The aerial input may be either from an open aerial system or a dipole connected to terminals A and DA, with the dipole switch open. If an ordinary aerial is connected to A with the dipole switch closed, the signal input is *via* the wave-change and dipole switches and the coupling coils L2 (MW), L3 (SW), and L4 (LW).

With a dipole the two ends of the input cable are connected across L3 on SW and together on L2 and L4 on MW and LW. An IF filter across the aerial and earth comprises L1 and C1.

From the coupling coils the signal is transferred to a band-pass circuit tuned by VC1 and VC2 sections of the triple-gang condenser. There is no band-pass on SW, there being only the grid tuning coil L8.

From the grid coils L7, L8, L9, the signal is fed to the grid of the frequency changer triode hexode V1, which is biased by R1, decoupled by C4. The oscillator triode section incorporates tapped coils for coupling between anode and grid circuits, C6 and R2, being the grid condenser and leak.

The IF signal from V1 is coupled by inductively tuned dust core transformer L13, L15 to the grid of the pentode IF amplifier V2. Variable selectivity is obtained by switching in to circuit the coupling coil L14 in the "Brilliant" position (clockwise) of the Fidelity Control switch S5. A second inductively tuned dust core IF transformer passes on the signal to the signal diode of the double diode triode V3.

Filtering is effected by R12, C20 and C23, the load resistance being R13. From here the LF signal passes *via* C21 to the volume control VR1 and thence to the grid of the triode section of V3.

The control grid of the visual tuner V6 is also fed *via* a potential divider R25, R27 and decoupler R26 from R13.

The AVC diode of V3 is fed from the anode of V2, *via* C19, R10 and R11 being the load resistances. Full AVC is applied from R11 *via* decouplers R8, C13, R6, C5, to the grid of V1, while a smaller AVC bias is applied *via* the switch S5 to the grid of V2. V3 is cathode biased by R17 decoupled by C26, and the LF signal is resistance-capacity coupled by R16 and C27 to the tapped LF coupling choke L18 and thence to the pentode output valve V4.

A top note tone control comprises C28, VR3, and R19, while a bass boost at low volume levels is arranged by R18 and VR2, which is ganged to the volume control VR1. Compensated negative feedback is arranged into the grid circuit of V4 from a third winding L20 on the output transformer. This is in circuit on MW and LW only.

V4 is permanently biased by the cathode resistance R23, decoupled by C26, these components being in the power pack assembly. A permanent degree of tone correction is effected by C25, while a filter comprising L19 (three sections), R22, C33, C34, and R28 attenuate frequencies above 9 kcs.

The output from V4 is finally passed to the energised loudspeaker *via* the output transformer L21, L22.

The HT circuit comprises the full-wave rectifier V5 with smoothing effected by the field coil L27 and condensers C37, C38, and C39.

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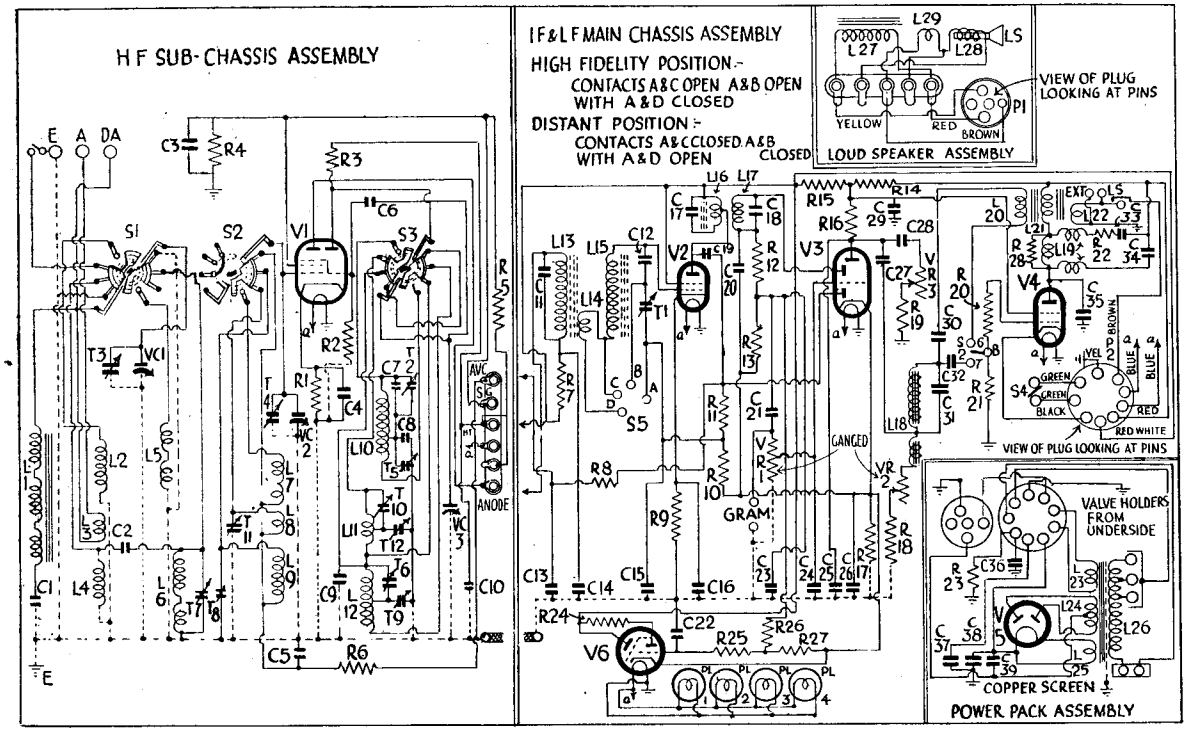

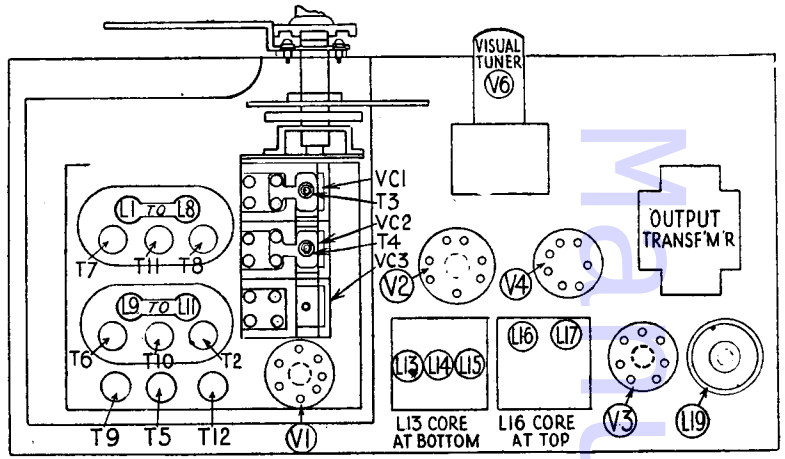

RESISTANCES

R		Ohms	R		Ohms
1	..	325	17	..	1,000
2	..	25,000	18	..	3,000
3	..	25,000	19	..	1,500
4	..	60,000	20	..	100,000
5	..	25,000	21	..	100,000
6	..	100,000	22	..	400
7	..	1,000	23	..	200
8	..	1 meg	24	..	2 meg
9	..	600	25	..	500,000
10	..	500,000	26	..	1 meg.
11	..	500,000	27	..	500,000
12	..	50,000	28*	..	3,000
13	..	250,000	VR1	..	500,000
14	..	2,000	VR2	..	50,000
15	..	1,000	VR3	..	60,000
16	..	50,000			

*Not in all receivers.

CONDENSERS

C		Mfds	C		Mfds
1	..	40 mmfd	21	..	.1
2	..	20 cm	22	..	.1
3	..	.1	23	..	.0001
4	..	.1	24	..	.0001
5	..	.02	25	..	.0005
6	..	.0001	26	..	25
7	..	10 cm	27	..	.25
8	..	.00033	28	..	.05
9	..	.00004	29	..	2
10	..	.25	30	..	.25
11	..	75 mmfd	31	..	.2
12	..	75 mmfd	32	..	.05
13	..	.01	33	..	.01
14	..	.02	34	..	.01
15	..	.01	35	..	.0025
16	..	.1	36	..	50
17	..	80 mmfd	37	..	4
18	..	75 mmfd	38	..	8
19	..	5 cm	39	..	8
20					

VALVE READINGS

V	Type	Electrode	Volts	Mas
1	TH4 (Mullard)	Anode	215	2.5
		Osc anode	—	5.5
		Screen	75	5.5
		Cathode	4	13.3
2	VP4B	Anode	220	8.5
		Screen	220	3
		Cathode	5.7	11.5
3	TDD4	Anode	100	2.6
		Cathode	2	2.6
4	PEN428	Anode	300	56
		Screen	240	8
		Cathode	12.5	64
5	IW4/350		—	—
6	TV4		—	—

Above with no A and E; gang at minimum switch to MW; high resistance meter.

WINDINGS

L		Ohms	L		Ohms
1	..	15	16	..	(half) 5.1
2×3	..	26	17	..	10
3	..	—	18	..	4,500+2,750
4×3	..	155	19	..	170
5	..	2.7	20	..	18.5
6	..	20	21	..	160
7	..	2.8	22	..	.2
8	..	Very low	23	..	Very low
9	..	20	24	..	180+180
10	..	1.5	25	..	Very low
11	..	Very low	26	..	20
12	..	10	27	..	1,150
13	..	8	28	..	—
14	..	2.7	29	..	—
15	..	8.3			

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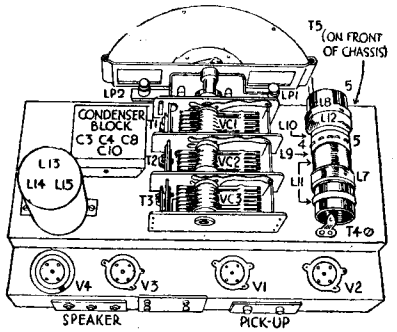
Adjust T1 and T2 for maximum output.

The trimmer, T3, on VC3 section of the ganged condenser need not be adjusted and should be left unscrewed.

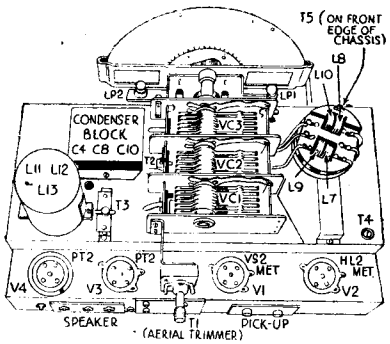
LW Circuits.—Switch receiver to LW. Inject and tune in a 1,200-m signal. Adjust T4 and T5 for maximum output.

Ferrocart Circuit.—As will be seen from the circuit diagram, the circuit differs very little from that of the original issue. Instead of HF transformer coupling a tuned anode circuit is employed with reaction applied via reaction coils and variable resistance to earth.

The screening grid of V1 is also controlled by VR2 as before, but there is no potential divider network, R1-R2, HT being fed directly from the HT line *via* R2.



The top of chassis layout diagram for issue 1 of these Marconiphone and Columbia sets. It will be seen that a horizontal coil assembly is employed and the aerial section of the gang condenser is at the dial end.



In issue 2 of this chassis a different coil unit is employed and the condenser block is also different. The aerial gang section is at the rear of the chassis.

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GANGING

Note.—A special wax is used for sealing the cores, and this should be melted by a hot soldering iron with ¼-in. diameter bit. A screwdriver should not be used for dislodging the wax, as the coil formers may break from their mountings. These remarks do not apply to later models, in which cores are fixed by a plastic substance.

IF Circuits.—The manufacturers do not recommend the adjustment of T1 in any circumstances.

Leave chassis in cabinet and adjust volume control to maximum. Keep input signal low and use a 0.5v output meter across EXT LS sockets.

Set gang condenser to minimum and wavechange switch to MW. Turn Fidelity Control switch to "Normal" (anti-clockwise).

Inject a 460 kc signal *via* a .02 mfd condenser to grid cap of V1. Adjust primary and secondary cores of 1st, then 2nd, IF transformers for maximum meter reading. (First IF primary core should first be screwed right out, then slowly in to the first peak.)

Repeat adjustment of all four and reseal cores.

Calibration Check.—If station tuning positions do not correspond with scale markings, check that pointer covers the line representing 1,950m when gang condenser is turned to its electrical maximum. The pointer is held to gang by spring-loaded screws and, if incorrectly set, may be pushed through a small angle. The mounting plate is accessible from back of receiver.

MW Band.—Leave chassis in cabinet. Set wavechange switch to MW and turn tuning indicator to 200m.

Inject a 1,500 kc (200m) signal into A and E sockets *via* a dummy aerial with dipole switch closed.

Fully unscrew T2, then screw it in slowly for maximum meter reading.

Inject and tune in a 550m signal, and adjust T3 and T4 for maximum output while rocking gang.

Then adjust T5 for maximum output while rocking gang.

Check adjustments of T3 and T4 at 200m for maximum output.

LW Band.—Switch receiver to LW. Tune receiver to 1,000m and inject a 300 kc signal.

Adjust T6 for maximum output.

Tune receiver to 1,700m and inject a 176.3 kc signal. Adjust T7 and T8 for maximum output.

Adjust T9 for maximum output while rocking gang.

Check adjustments of trimmers T7 and T8 at 1,000m for maximum output.

Turn wavechange switch to SW, scale pointer to 15 mc, and inject a 15 mc signal. Adjust T10 for maximum output; peak at the setting requiring less trimmer capacity.

Check T10 adjustment to ensure that oscillator is not tuned to image signal. With high service oscillator input the image should be heard at approximately 14.1 mc on receiver scale. If the signal is not at this point but at 15.9 mc, trimmer T10 should be readjusted until signal can be tuned in at 15 mc and image at 14.1 mc.

Reduce oscillator input to previous low level, and adjust T11 for maximum output while rocking gang.

Leave service oscillator set to 15 mc and tune in image signal at 14.1 mc. If the latter is as strong as the 15 mc signal, readjust T11.

Tune receiver and service oscillator to 6 mc. Adjust T12 for maximum output while rocking gang.

Check adjustment of T11 at 15 mc.

IF Filter.—Adjust service oscillator for maximum output at 460 kc. Screw in dipole switch and tune receiver to 560 metres. Adjust L12 core for *minimum* meter reading. Reseal core.

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Inject signal into control grid of V1, and adjust core of L19 (top of coil can) for maximum output. Adjust the core of L18 (underside of chassis) for maximum output.

Recheck the four adjustments with the signal generator still connected to the control grid of the V1.

Manual Tuning Circuits (Buttons 6, 7, and 8).—Before trimming check the position of the tuning pointer. With the vanes fully meshed the centre of the pointer should coincide with the top of the wavelength lines on the scale. Remove the escutcheon plate from the front of the cabinet by means of the two fixing screws if the chassis has not been removed.

It is important to see that the celluloid protection plate over the adjustments is fixed into position after servicing.

SW Band.—With volume at max., press the SW button No. 7, set pointer to 18 metres.

Inject a 18m signal *via* dummy aerial and adjust T1 and T2 for maximum output. Check calibration on 50m (6.00 mc).

MW Band.—Press MW button (No. 8), set pointer to 300m. Inject a 300m signal, and adjust T3 and T4 for maximum output.

Check calibration on 500m.

LW Band.—Press LW button No. 6; set pointer to 1,500m. Inject a 1,500m signal, and adjust T5 and T6 for maximum output. Check calibration on 1,900m.

Adjustment of the LW oscillator trimmer T5 (painted red) will affect the tuning of the pre-selected stations (buttons 1 to 5) after manual circuit adjustments; therefore the oscillator adjustments L13 to L17 must be readjusted.

Adjustment of the MW aerial tuning trimmer T4 will necessitate readjustment of the MW pre-set station trimmers T7 to T9. Also, any adjustment of the LW aerial tuning trimmer T6 will affect the tuning of the LW pre-set station trimmers T10 and T11.

Pre-set Station Buttons 1 to 5.—Connect the aerial and earth to their sockets. It may be found helpful to ascertain the nature of the desired programme by first tuning the station on the manual tuner.

Press the button allocated to the particular station. Turn the core adjustment (clockwise for increase in wavelength) above the button so that index mark coincides approximately with the wavelength required. Then carefully rotate the core for maximum output.

Adjust the aerial tuning trimmer below the button (clockwise for increase in wavelength) for maximum output.

Finally make a careful readjustment of each tuned circuit. The remainder of the tuned circuits associated with each button should be adjusted in the same manner as outlined above.

Console Modifications.

Same chassis as in table model, minus "Teleflic" and tuning indicator and associated components. A larger speaker is fitted.

RG and Auto RG

C33, C34, deleted. PU (700 ohms) connected *via* radiogram switch to top of VR1 and chassis *via* 5-pin plug and socket. Mains on/off switch incorporated with VR2. Mains input *via* pins three and four of 4-pin plug associated with VR2.

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January-December, 1943