MARCONIPHONE 260 BATTERY SET

Circuit.—An H.F. valve, VS2 met. (V1) has a band-pass aerial coupling, with alternative series aerial-condenser feeds. Volume is controlled by a two-gang resistance, one section of which is in series with the aerial while the other provides dual control of reaction and the screening grid voltage.

The following coupling is a tuned secondary H.F. transformer with a reaction winding connected to the detector valve anode through a condenser and the other end connected to the variable V1 screen potentiometer.

The detector valve, HL2 met. (V2), operates as a leaky-grid detector and is coupled to the output valves by a parallel fed transformer.

The output valves are two PT2's used in Q.P.P. Matching of these is given under "Special Notes."

Special Notes.—The battery is a 175-volt combined H.T. and G.B. unit. The connections are :—

H.T.+3, 175 volts.

H.T.+2 (two leads), these are connected to

(*Continued on opposite page.*)

RESISTANCES

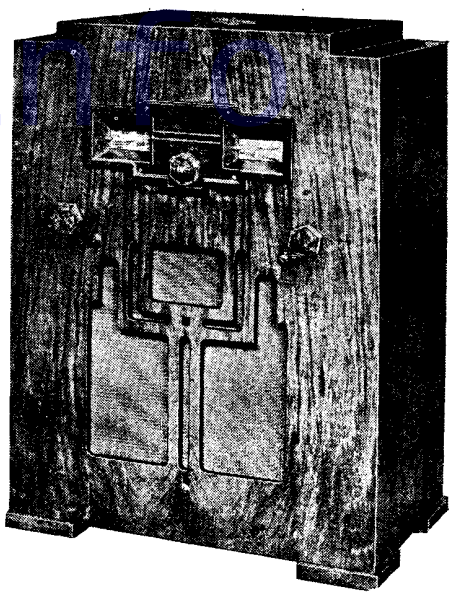
R.	Purpose.	Ohms.
1	Top part of V1 screen ptr. ..	75,000
2	Lower part of V1 screen ptr.	10,000
3	V2 grid leak	2 meg.
4	V2 anode, L.F. coupling ..	50,000
VR1*	Aerial volume control	14,000
VR2*	Reaction control..	100,000

* Ganged.

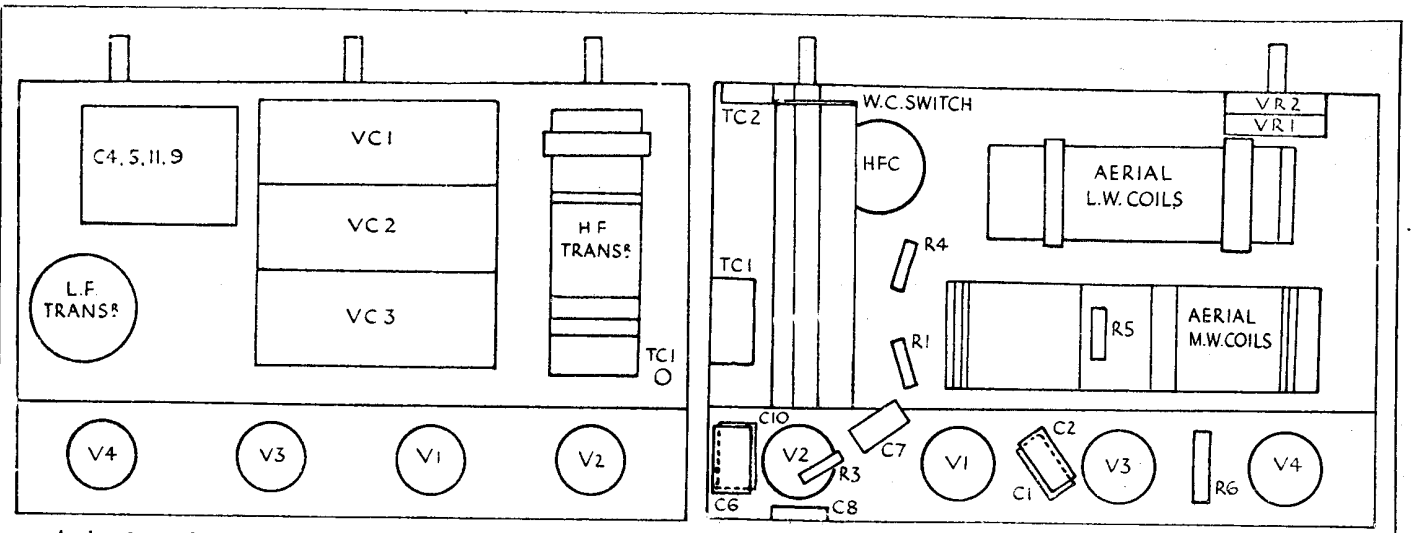
CONDENSERS

C.	Purpose.	Mfd.
1	Series aerial	.0003
1	Series aerial	.0001
4*	Decoupling V1 grid	.1
5*	Decoupling V1 screen	.1
6	Reaction feed	.0002
7	V2 grid reservoir	.0002
8	V2 anode H.F. by-pass ..	.0002
9*	Decoupling H.T...	1
10	Part of H.F. filter in V2 anode	.001
11*	L.F. coupling to transformer ..	.1
12	Stabilising V3, V4 anodes ..	.002

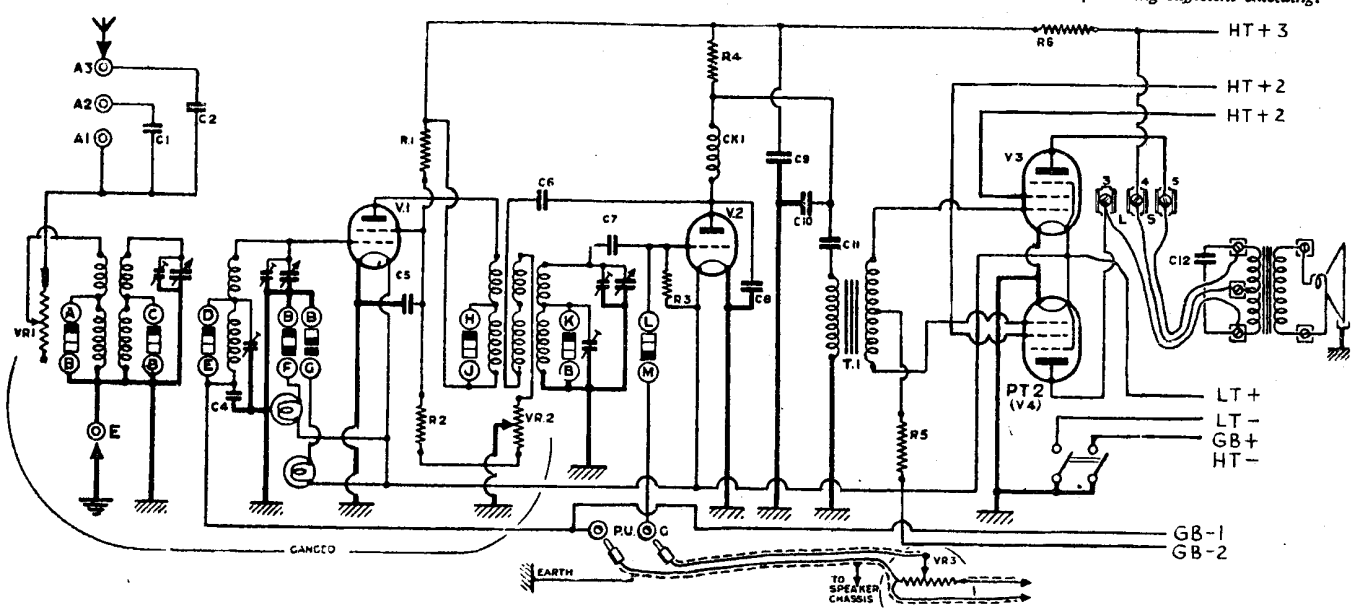
* In condenser block.



The model 260 is a four-valve battery set with Q.P.P. output and was marketed by the Marconiphone Co. Ltd., during the 1933–4 season.



As these layout diagrams show the construction of the model 260 is straightforward. Unscreened coils are used, the chassis providing sufficient shielding.



Screen-grid, detector and two pentodes, used in quiescent push-pull, are the valves which form the basis of the circuit of the Marconiphone 260.

MARCONIPHONE MODEL 260 (Cont.)

the auxiliary grids of the pentodes, and the correct position for matching should be found by connecting the m.a. meter in each anode lead (between the leads and terminals 3 and 5 on the speaker transformer) and inserting the plugs into the sockets which give the same anode current for each valve. The no-signal current for each should not exceed 1.2 m.a.

The pilot lamps are 2 v. .06 amp. type.

Removing Chassis.—Remove the knobs (grub screws, centre screw on small adjustment). Disconnect the speaker leads from the transformer. Remove accumulator case by undoing two screws on platform and one at the back of the case. Remove the four holding bolts from underneath the battens.

VALVE READINGS

No signal. V.C. just below oscillation point.

Valve.	Type.	Electrode.	Volts.	M.A.
1	VS2 met. (4) ..	anode ..	145	1
		screen ..	50	
2	HL2 met. (4) ..	anode ..	60	1.5
3 & 4	PT 2 (5) ..	anode* ..	166	1.2
		aux.grid.*		

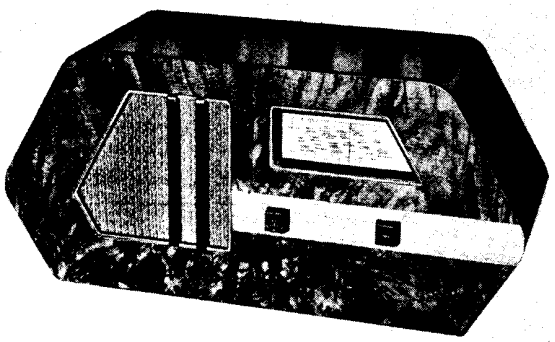
* See special notes.

General Notes.—Connections to the condenser block :—

C11, yellow leads..
C9, red leads.
C5, yellow and red lead.
C4, green and black lead.
Black lead is common to C9, C5, and C4.

Replacing Chassis.—Slide the chassis on to the battens and replace the four holding screws, remembering the earthing lead and washers. Replace the battery case with three screws, reconnect the speaker leads, and replace the knobs.

McMICHAEL 235



The 235 is one of the most distinctively-housed receivers on the market.

Circuit.—The combined first-detector oscillator valve, A.C./T.P. met. (V1), a triode pentode, has a band-pass aerial coupling, and is followed by a band-pass I.F. transformer (frequency, 128.5 kc.).

Bias for the pentode section is by A.V.C. and cathode resistance, and the oscillator grid circuit contains a harmonic suppressor R4.

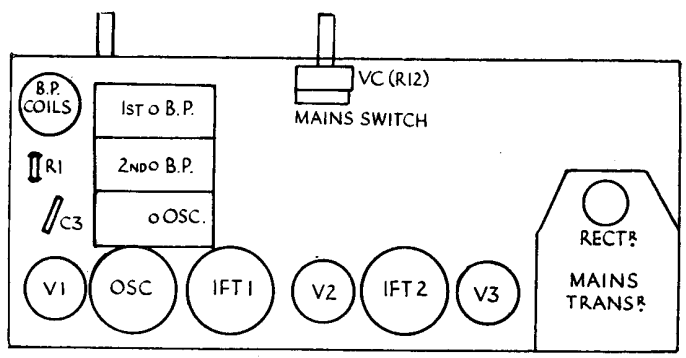
The I.F. valve, MVS Pen. met. (V2), is also biased by A.V.C. and cathode resistance, and is followed by a second band-pass I.F. transformer.

The second detector and output valve, A.C.2 Pen. DD. (V3), is a double-diode output pentode. The diode anodes are used in the conventional manner, with the volume control forming the grid leak of the pentode section.

Mains equipment consists of : Transformer with screened primary, full-wave 442 BU rectifier, and the speaker field in the positive H.T. lead with electrolytic condensers.

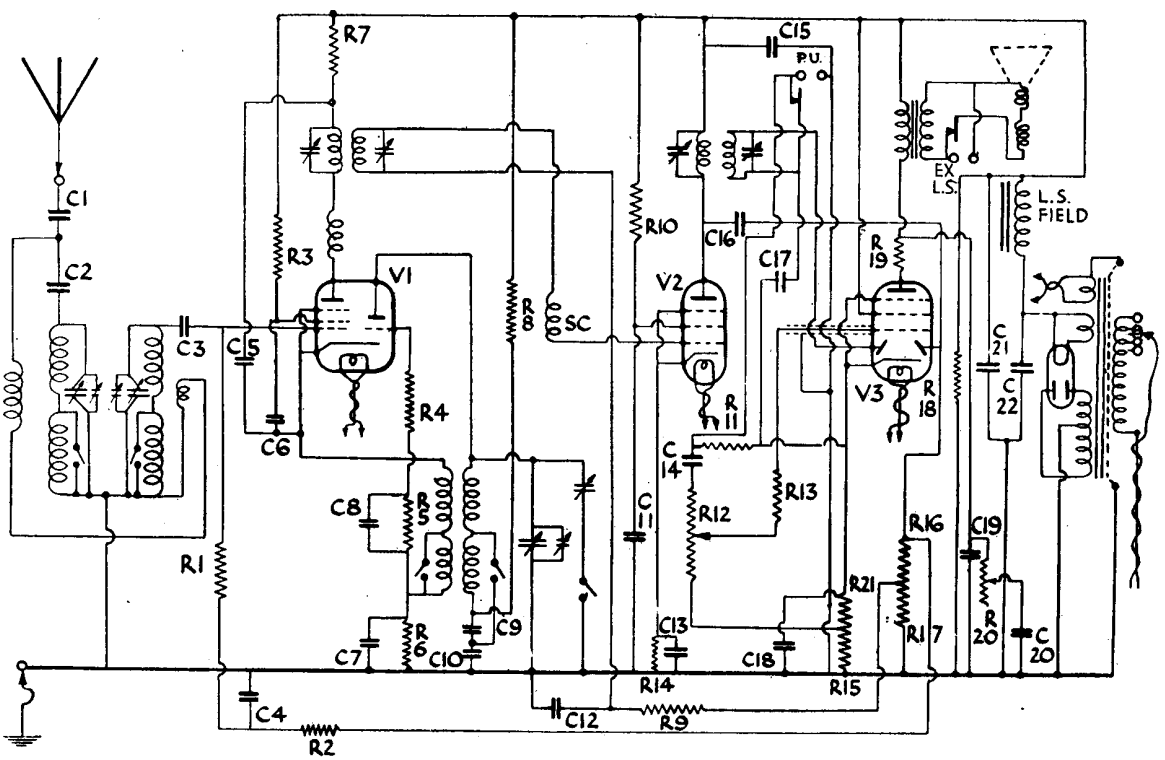
Special Notes.—The external low-impedance speaker plug operates a jack switch

(*Continued on next page.*)



As the under chassis layout diagram shows (above, right) the output transformer is inaccessible for Quick Test purposes. The first tests of the 235 should be, therefore, volve tests.

A triode-pentode frequency-changer is followed by a variable-mu H.F. pentode and a combined double diode output pentode.



MARCONI 260 and 285 COLUMBIA 1001 and 1003

Four-valve, two-waveband, TRF battery receiver, incorporating pick-up sockets and extra loudspeaker terminals. The Columbia Models 1001 *(table) and* 1003 *(radiogram) and Marconiphone Model* 260 *(table) incorporate the same chassis. The first two models were reissued with a slightly modified circuit incorporating Ferrocart tuning coils without any change of model number. The Marconiphone model was re-issued with the modified chassis in Model* 285*(table). Marketed* 1933 *(first issue) and* 1934 *(second issue) by the Columbia and Marconiphone Companies, Hayes, Middlesex.*

THREE aerial sockets are provided, A1 for distant stations, A2 and A3 for nearer stations or where more selectivity is required. Signals are fed via a series resistance, VR1, to the aerial coupling coils, L1 (MW), L2 (LW). These pass the signals to the band-pass tuning circuit L3, L5 (MW), L4, L6 (LW), tuned by sections VC1 and VC2 respectively of the triple ganged condenser. Pilot lamps associated with the wave-change switch illuminate the respective MW and LW tuning scales.

From VC2 the signal is fed to the variable mu screen grid valve, V1, operating as an HF amplifier. An HF transformer with untuned primaries, L7 (MW), L8 (LW) and tuned secondaries L11 (MW) and L12 (LW) pass on the signal to the leaky grid detector valve, V2. R3 and C6 are the grid leak and condenser.

From the anode of V2 the HF component is rejected by CK1 and passed *via* C5 to the reaction coils L9, L10, which have VR2 in series with them to earth.

VR2 is also part of the screen grid feed circuit comprising R1 and R2 of V1, so that the operation of VR2 varies the sensitivity of V1 and also the feed back between the anode and grid circuits of V2. VR1, the aerial damping resistance, is ganged to VR2.

The LF signals in the anode circuit of V2 are resistance capacity fed *via* R4 and C10 to the primary L13, of the push-pull intervalve transformer.

C9 effects a certain amount of tone correction while R6 and C8 decouple the HT circuit.

The tapped secondary, L14, L15, of the intervalve transformer, feeds the grids of the two pentode valves, V3, V4, operating in QPP. A common bias is derived from a 9-volt negative tapping on the HT battery *via* the decoupling resistance, R5.

The output from V3 and V4 is coupled by the push-pull output transformer, L16, L17, to the permanent magnet moving-coil loudspeaker of which L18 is the speech coil. C11 is the pentode tone corrector.

On gram the grid of V2 is biased 1.5-volt negative which is also the standing bias for V1.

VALVE READINGS

V	Type	Electrode	Volts	Mas
1	VS2(met)	Anode	145	0—1
		Screen	15—50	0—.6
2	HL2(met)	Anode	60	1.5
3	PT2	Anode	166	1.2
4		Screen	*	(no signal) .5 (no signal)

* Depends on white reference letter on valve. V = 132v, W = 140v, X = 147v, Y = 155v, Z = 162v.

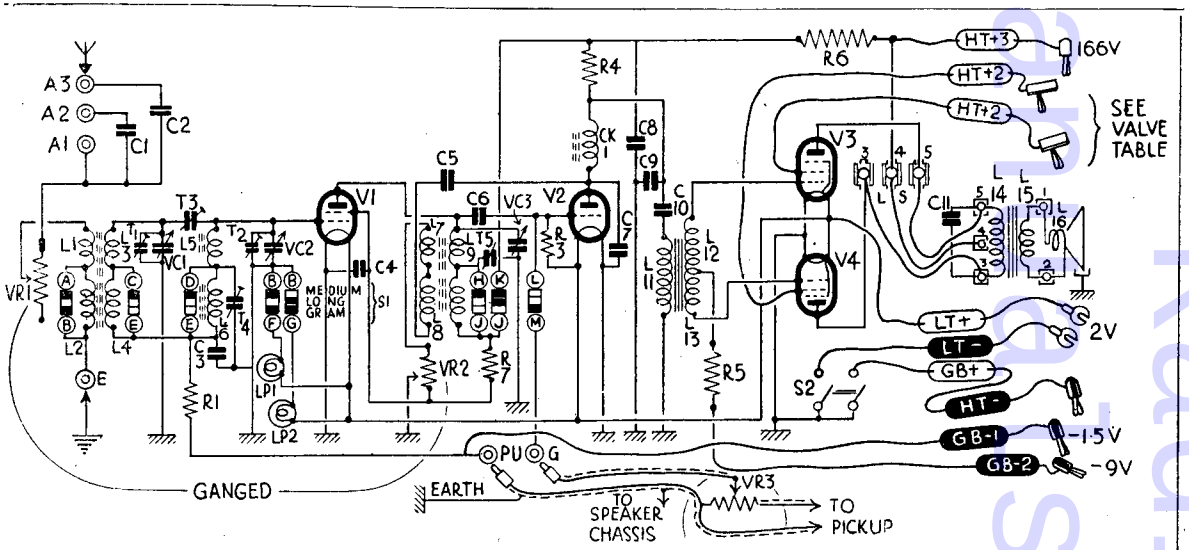
NOTE.—Lower grid bias as battery voltage falls to prevent distortion and excessive current drain. If accumulator leads are reversed HT current will be increased 100 per cent.

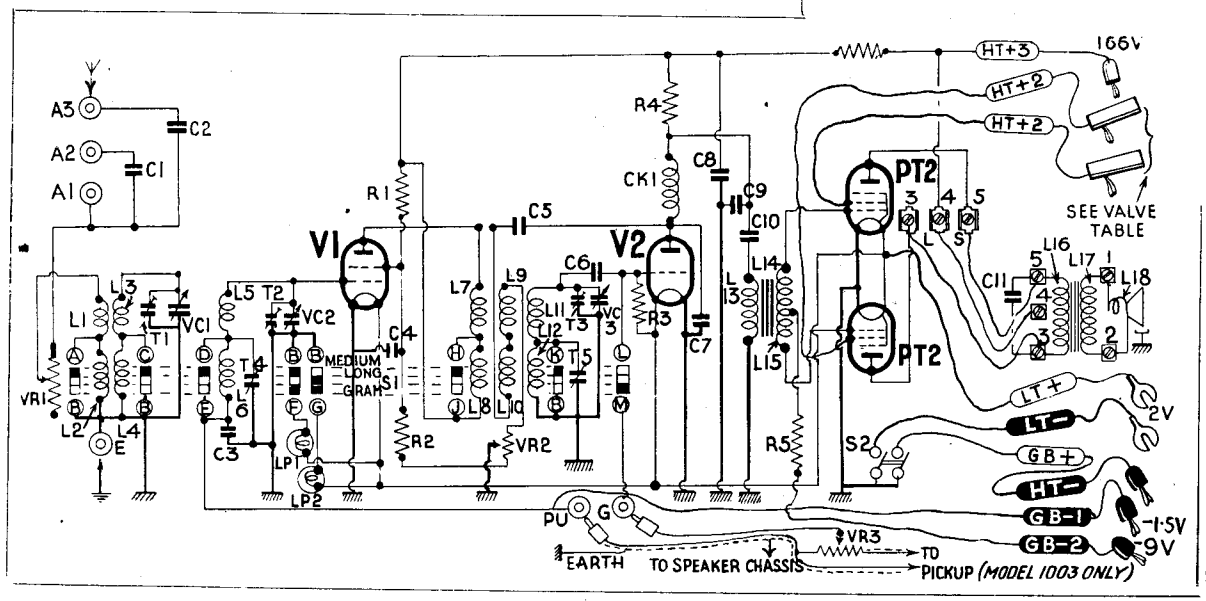
Total HT feed, 6.5 ma (no signal), 16 ma on loud signal peaks.

GANGING

MW CIRCUITS.—Switch receiver to MW. Inject and tune in a 220-m signal *via* the aerial socket A1, using as weak a signal as possible. Advance the volume control to a point where the circuit is on the verge of oscillating.

Continued on opposite page





Left, the circuit of the original model introduced in 1933 and, above, the circuit of the second issue released in 1934. These popular receivers still bring numerous service inquiries and existing data has been out of print.

WINDINGS

L	Ohms	L	Ohms
(1st issue)			
1	2.5	11	2.5
2	8.5	12	13.5
3	2.5	13	465
4	13.5	14	3,900
5	2.5	15	3,900
6	13.5	16* ..	400+400
7	6	17*	1
8	9	18*	4
9+10	4	CK1	90
(2nd issue)			
1	5	10	11.5
2	16	11	465
3	1.5	12	3,900
4	11.5	13	3,900
5	1.5	14* ..	400+400
6	11.5	15*	1
7+8	4	16*	4
9	1.5	CK1	90

* On R/G Model 1003, 300+300, .5, 11.

RESISTANCES

R	Ohms	R	Ohms
(1st issue)			
1 ..	75,000	6 ..	7,500
2 ..	10,000	VR1 ..	14,000
3 ..	2 meg	VR2 ..	100,000
4 ..	50,000	VR3* ..	50,000
5 ..	100,000		

*Model 1003 only.

(2nd issue)			
1 ..	10,000	4 ..	50,000
2 ..	75,000	5 ..	230,000
3 ..	2.3 meg	6 ..	7,500

Other values as in 1st issue above.

CONDENSERS

C	Mfds	C	Mfds
(1st issue)			
1 ..	.0003	7 ..	.0002
2 ..	.0001	8 ..	1
3 ..	.1	9 ..	.001
4 ..	.1	10 ..	.1
5 ..	.0002	11 ..	.002
6 ..	.0002		
(2nd issue)			
1 ..	.0003	7 ..	.0005
2 ..	.0001	8 ..	1
3 ..	.04	9 ..	.001
4 ..	.1	10 ..	.1
5 ..	.0005	11 ..	.002
6 ..	.0001		

MARCONI 260, 285

Continued from opposite page

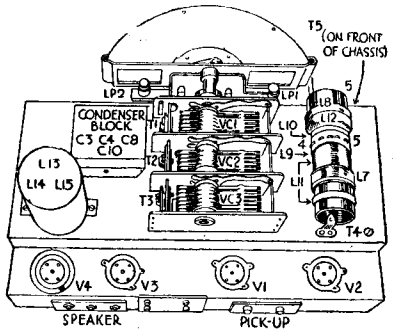
Adjust T1 and T2 for maximum output.

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

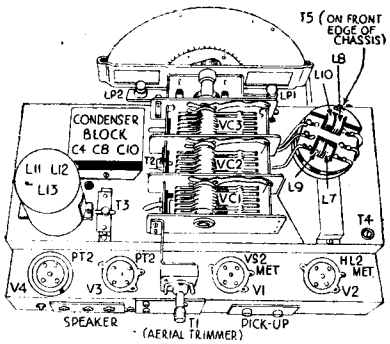
LW Circuits.—Switch receiver to LW. Inject and tune in a 1,200-m signal. Adjust T4 and T5 for maximum output.

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.

EKCO AW 108

Continued from page iv

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.

BUSH DAC 63

Continued from page v

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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