SEVEN-VALVE three-waveband AM/FM chassis incorporated in three receivers as listed. AC mains coverage is 200–250V at 50c/s.

Table model G63A, in moulded cabinet, was released in September, 1956, at 31gns., inclusive of tax, while the G64A, a table model in wood cabinet, first appeared in September, 1956, at 36gns., inclusive. Model G62A is a radiogram fitted with Philips record changer type AG1003; released in September, 1956, it cost 69gns., inclusive of tax.

Maker is Philips Electrical, Ltd., Century House, Shaftesbury Avenue, London, WC2.

Service department. Waddon Factory Estate, Purley Way, Croydon, Surrey.

Valves

V1, FM RF amplifier, type EF80.
V2, FM frequency-changer, type EF80.
V3, acts as AM frequency-changer and FM IF amplifier and is an ECH81.
V4, is an IF amplifier for AM and FM, type EF85.
V5, functions as AM detector and FM ratio detector, type EABC80.
V6, power output, is an EL84.
V7, mains rectifier, type EZ80.

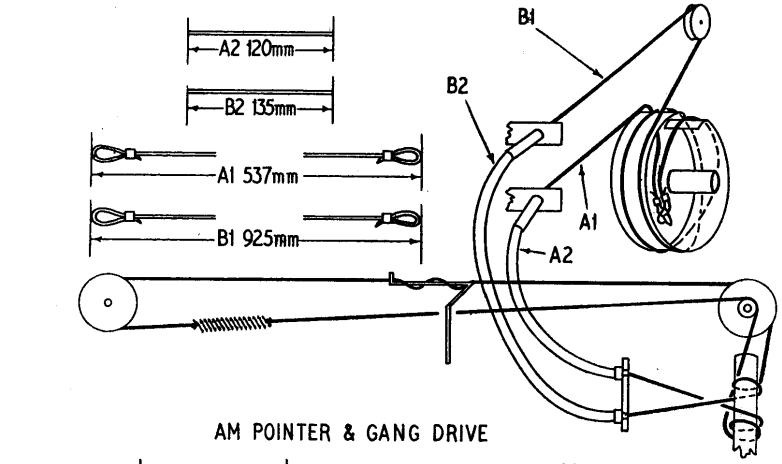
Pilot lamp is type 8028D-00.

Waveband coverage. MW, 527-1604kc/s. LW, 150-255kc/s. FM, 87.5-100mc/s.

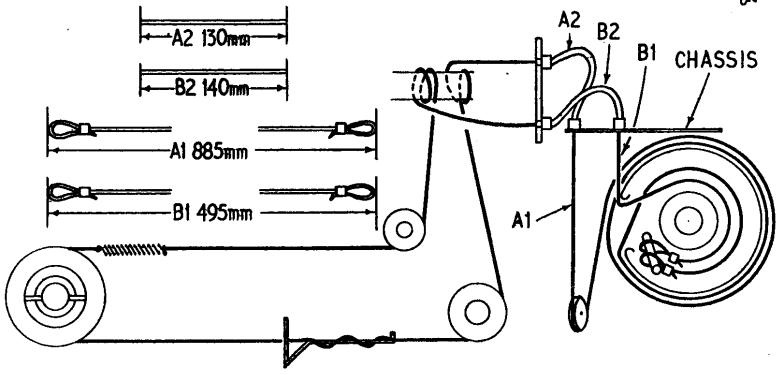
Switches. Receiver is controlled by five push-buttons. Each of the five switches operated by the buttons, therefore, has two positions. The contacts in the off position are shown on the push-button diagram. Circuit is drawn in the MW position.

Switch contacts M rise one position when any but the off button is depressed—thus joining contacts M16/18 ; M2/M4 ; M6/M7. Depressing the off button releases this switch, and these contacts are opened. On depressing the gram button, the two contacts drop one position —opening contacts P6/P7 and P18/P10, and closing P17/P18.

The LW and FM buttons operate in a similar manner, but the FM button operates both switch banks F. MW button operates M contacts only —switches receiver on.



AM POINTER & GANG DRIVE



FM POINTER & GANG DRIVE

PRACTICAL NOTES

AM pointer and gang drive replacement. Overall cord lengths are given in the diagrams, but initially the cords should be made up with one loop only.

Make up cord A1 and with gang closed, fit loop in cord to hook in drive drum. Pass cord through opening in drum and slide ferrule and outer case A2 on to cord. Engage the ferrule in lower bracket and the other end of cable sheath in upper bracket situated to left of tuning spindles. Pass cord round front groove in die-cast spindle, winding on two turns clockwise, winding from back to front on spindle. Pass cord over smaller pulley, and make the second loop in cord. Attach this loop to spring and fasten other end to a convenient temporary anchor point—bracket in front of volume control.

Make up cord B1 and fit the loop to hook in drive drum. Pass the end through opening in drum, and wind on approximately 1¾ turns clockwise round drum, and ½ turn anti-clockwise round pulley.

Slide on ferrule and outer case B2, and fit ferrule to upper bracket. Other end of outer sheath fits to lower bracket to left of spindles. Pass cord round rear groove in die-cast spindle, winding on 1¼ turns anti-clockwise, winding from front to back on spindle. Pass cord up and over larger pulley, across the ½-turn anti-clockwise round the pulley—above volume control spindle. Make the second loop in cord, and attach it to spring.

Pointer fits to upper cord—with gang at minimum, pointer should line up with end stroke line on scale.

FM pointer and gang drive replacement. Stand chassis on mains transformer end. Make up cord B1 complete with ferrule and outer sheath B2 (see diagrams). Pass cord through rear hole in chassis—above FM gang.

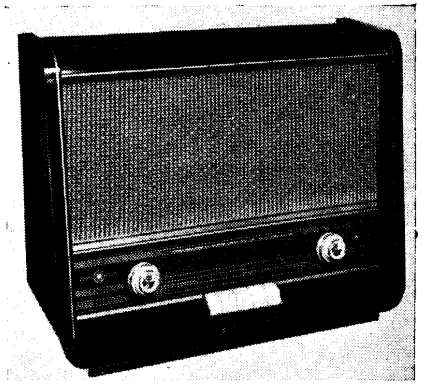
With gang at minimum, attach loop in cord to stud in drum. Pass cord anti-clockwise round centre of drum, and out through slot at 6 o'clock. Pull cord through chassis and fit ferrule and outer sheath between the smaller hole in chassis and the right-hand slot in bracket above tuning spindle. Pass cord round front groove of brass pulley, winding on two turns clockwise from front to back on pulley. Attach tension spring to cord and fit the free end to a convenient temporary anchorage.

Make up cord A1 complete with ferrules and outer sheath A2. Attach loop to stud in drum, and wind cord anti-clockwise round centre of drum. Lead cord through slot in drum, and wind on two turns anti-clockwise round drum. Pass cord round pulley (clockwise) and up through hole in chassis. Engage ferrule and outer sheath. Wind on 1¼ turns anti-clockwise round rear groove of brass spindle, winding from front to back, and then ¾ turn round the plastic pulley. Lead cord round pulley (at volume control end) and hook the end to spring. Pointer is fixed to lower cord—with gang at maximum, pointer should line up with the 87mc/s mark on scale.

VALVE VOLTAGES

The readings when switched to VHF are shown in brackets.

		Anode	*Screen*	*Cathode*
V1	EF80	(180)	(160)	(1.9)
V2	EF80	(180)	(180)	—
V3	ECH81 (pen)	230 (200)	65 (75)	—
	,, (tri)	115		
V4	EF85	180 (210)	65 (90)	2.3 (2.35)
V5	EABC80 (tri)	70 (65)	—	—
V6	EL84	235 (230)	230 (240)	6.7 (5.8)
V7	EZ80	—	—	240 60mA
	,,	—	—	(240 75mA)



ALIGNMENT

AM section

IF stages. Set volume control to maximum and gang to about mid-position. Connect an output meter to speaker sockets. Set IF coil cores about ⅛ in. from the screwed-out position.

Inject 470kc/s at g1 V3.

S33, S32, S27, S26, S32, trim for maximum output. After S32 has been finally trimmed, do not alter position of other cores.

IF filter. Inject resonant frequency at aerial socket via a dummy aerial.

S11, S10, adjust for minimum output.

Pointer setting. With gang at minimum, pointer should line up with end stroke line on scale.

Aerial and oscillator. Oscillator frequency is higher than the signal frequency. Turn volume control to maximum and tone control to " brilliant." Connect an output meter to speaker sockets. Apply input to aerial socket via a dummy aerial. Short-circuit S4.

MW oscillator. Switch to MW, trim gang to maximum Inject 525kc/s.

S23, trim for maximum output.

Set gang to minimum, inject 1,610kc/s.

C23, tune for maximum output. Repeat as necessary.

LW aerial and oscillator. Switch to LW, inject 172kc/s. C38, trim for correct calibration.

S4, remove short-circuit and adjust for maximum output.

MW aerial. Switch to MW, tune receiver to 640kc/s. S5, trim for maximum output.

Set gang to minimum and inject 1,610kc/s.

C22, tune for maximum output. Repeat as necessary.

FM section

Switch to FM, set volume control to maximum and tone control to "brilliant." Turn gang to maximum, connect a valve voltmeter (via 100k resistor) across R25. Connect an output meter to speaker. Unscrew cores of S29/S30, S25 and S21 so that they are flush with tops of bobbins.

In all IF trimming, the valve voltmeter should read about 2.5V—adjusting input accordingly.

Ratio detector. Disconnect C4 and connect an oscilloscope (via 100k resistor) across R25. Apply wobbulator input at 10.7mc/s (deviation 200kc/s at 50c/s) to g1 V4.

S28, trim so that the 10.7mc/s marker is at top of response curve.

S29/S30, tune for maximum curve width and symmetry.

Check ratio detector curve. Connect oscilloscope across C47, restore the connection to C4. Displayed curve should be straight over approximately 200kc/s. Apply an AM signal modulated to 30 per cent at 500c/s. Straight part of curve should remain unchanged.

IF stages. Connect oscilloscope across R25. Disconnect C4. Inject 10.7mc/s (deviation 200kc/s at 50c/s) at g1 V3.

S24, trim for maximum height with central trace.

S25, trim for maximum curve height and symmetry, consistent with central trace.

Inject 10.7mc/s at g1 V2.

S20, tune for maximum height and central trace.

S21, trim for maximum height and symmetry.

Check ratio detector curve from g1 V2 by connecting the oscilloscope across C47, and restoring connection to C4. Displayed curve should be straight over approximately 200kc/s. Apply an AM signal modulated to 30 per cent at 500c/s. Straight part of curve should remain unchanged. Potential across C4 should be 6-8V.

IF curve check. Adjust input (10.7mc/s unmodulated) to give 8V across C4. Swing the frequency on either side until the output drops to 5V. Bandwidth at this point should be greater than 250kc/s. Middle frequencies should be between 10.67mc/s and 10.73mc/s. Peak output should not exceed 8.5V.

Swing frequency on either side until output drops to 0.8V. Bandwidth at this point should be greater than 450kc/s.

Pointer setting. With gang at maximum, pointer should line up with the 87mc/s mark on scale.

RF oscillator, radiation filter and aerial trimming. Disconnect C4, connect a valve voltmeter (via 100k resistor) across R25; output on meter should be between 6V and 8V. Oscillator coil core should be screwed in. Deviation should be 200kc/s at 50c/s. Input should be applied at aerial sockets via a matching pad—see suggested circuit.

Set gang at maximum and inject 87mc/s.

S14, S12 trim for maximum output on valve voltmeter.

With a detector—see suggested circuit—connected between the anode and spigot of V1, and gang at mid-position, trim C16, for minimum output on the detector valve voltmeter—maximum detector voltage 50mV.

Repeat trimming of S14 as above, also C16, as necessary.

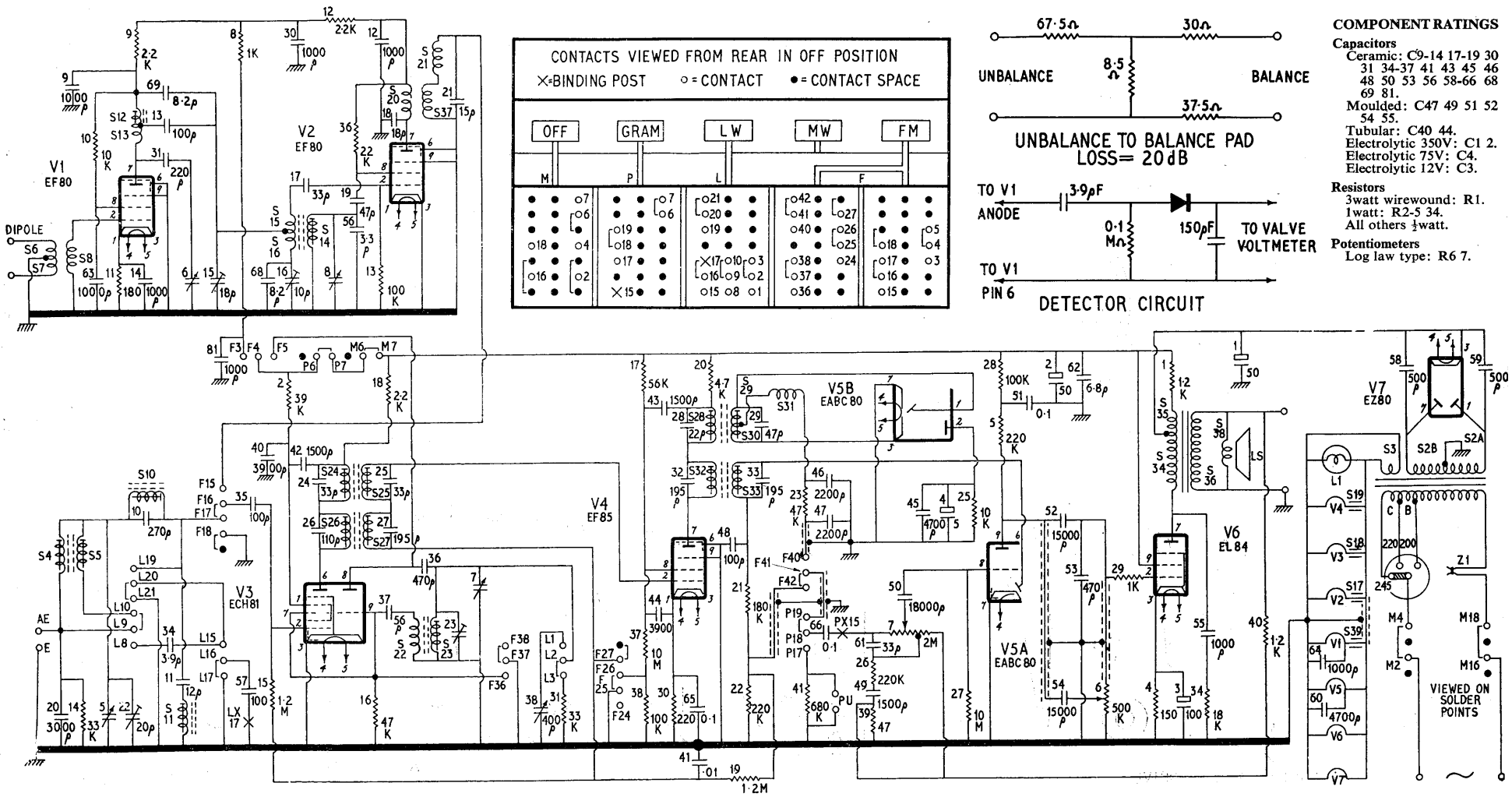
Inject 100mc/s, tune receiver for maximum output and trim C15, for maximum on valve voltmeter.

Repeat, as above, trimming of S12 and C15 as necessary.

Inject 94mc/s, tune receiver, and trim S8 for maximum indication on valve voltmeter.

FM alignment with AM instruments

IF stages. Switch to FM, set volume control to minimum, gang to maximum. Connect a valve voltmeter via 100K resistor across C4. Inject 10.7mc/s



COMPONENT RATINGS

Capacitors

Ceramic: C9-14 17-19 30 31 34-37 41 43 45 46 48 50 53 56 58-66 68 69 81.
Moulded: C47 49 51 52 54 55.
Tubular: C40 44.
Electrolytic 350V: C1 2.
Electrolytic 75V: C4.
Electrolytic 12V: C3.

Resistors

3watt wirewound: R1.
1watt: R2-5 34.
All others ¼watt.

Potentiometers

Log law type: R6 7.

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unmodulated to g1 V3 via a 1,500pF ceramic capacitor. During alignment, input should be such that the voltage across C4 does not exceed 8V.

S24, damp with 4.7K resistor.
S25, trim for maximum output on voltmeter.
S24, remove damper.
S25, damp with 4.7K
S24, trim for maximum output.
S25, remove damper.
S28, trim for maximum output, and then adjust input to give an output of 8V.
Transfer voltmeter connection to junction of R23/C47.
S30, tune to give 4V on meter.
Reconnect valve voltmeter via 100K resistor across C4. Change input point to g1 V2.
S21, damp with 4.7K
S20, trim for maximum output.
S21, remove damper and trim for maximum output.
Adjust input to give 8V on meter.

Tune receiver to find the maximum output on meter—this should not be more than 8.5V and should occur at a frequency between 10.67mc/s and 10.73mc/s. If these conditions are not met, IF circuits should be retrimmed.

RF circuits. Set pointer to 87mc/s. Connect a valve voltmeter across C4. Inject unmodulated 87mc/s at FM aerial sockets (via the matching pad).

S14, S12, trim for maximum output.

Connect a detector (as above under RF oscillator, radiation filter and aerial trimming, section) to V1.

C16, trim for minimum radiation at mid-band position —minimum output from the detector.

S14, S12, retrim at 87mc/s.

Inject 100mc/s, tune receiver, and trim C15 for maximum output.

S12, retrim at 87mc/s.

With an input of 94mc/s, tune receiver, and trim S8 for maximum output.

Inductors

S	*Ohms*
1	51.5
2	284
5	1
10	10
11	50
20	1.5
21	2
22	6.5
23	11
26	7.5
27	5
32, 33	5
34	600
35	12.9
All others	very low