

The above and below "deck" arrangements of the Portadyne S/A.C. receiver. All the components are easily accessible and there is no need to disturb the wiring. Doing so may introduce new capacities which will upset the ganging.

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undo four screws holding mains switch. Remove screws holding speaker baffle to cabinet.

**General Notes.**—Do not disturb the wiring any more than is necessary. All the components can be reached comfortably.

The mains transformer is a standard one with the various secondaries labelled. There is no multiple condenser bank and

the single or double types are easily recognisable.

**Replacing the Chassis.**—Slide it to within 4 in. of the front of the cabinet.

Push the local-distance switch leads through the aperture, and, easing the mains transformer carefully past the mains switch, press the chassis home.

Replace four screws underneath (self-threading screws). Resolder L.D. switch leads. Replace knobs and L.S. lead cleat.

**VALVE READINGS**

V.C. max. No signal.

Valve.	Connection.	Volts.	M.A.
V1 ACS2 Pen.met.	anode ...	240	2.7
	screen ...	65	—
V2 VP4 Pen.met.	anode ...	230	1.8
	screen ...	110	—
V3 ACHLDDmet.	triode anode	140	2.7
V4 AC2 Pen.	anode ...	250	20
	aux. grid ...	205	6

**EKCO A.C.74 FIVE-VALVE SUPERHET**

**Circuit.**—The combined oscillator first detector (V1) SP4 follows a band-pass aerial circuit. Anode, cathode-grid reaction is applied by an H.F. choke, and the band-pass intermediate transformer is on the low H.F. potential side of the choke. The intermediate frequency is 110 kc.

The I.F. valve (V2) is another SP4, and the coupling following it is a second band-pass I.F. transformer.

The second detector is a double diode triode (V3) A.C.HL.DD. Rectification for L.F. amplification takes place at the diode anode fed from the secondary of the second

I.F. transformer, and D.C. for the delayed A.V.C. is obtained from the other, which is coupled by a condenser to the primary of the second I.F. transformer. Resistance-capacity coupling is used following the triode section.

The output valve (V4) A.C./Pen. is compensated by a .0025 condenser connected between the anode and earth.

Full-wave rectification IW3 is used, and the field coil is included in the positive H.T. lead.

The mains transformer has a screened primary.

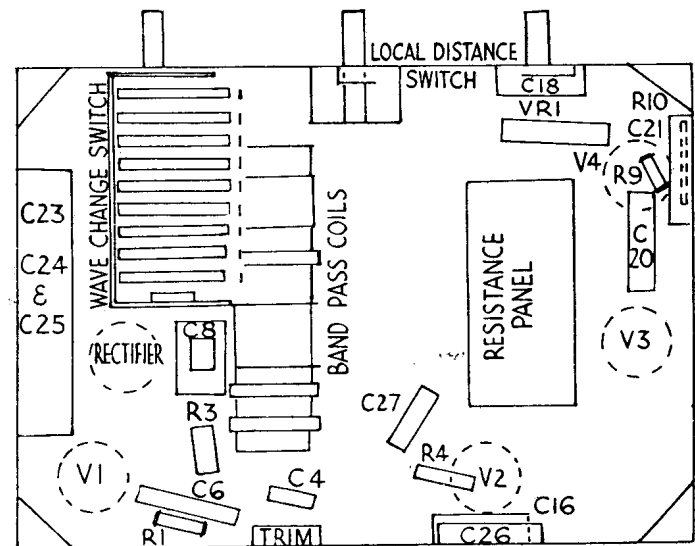
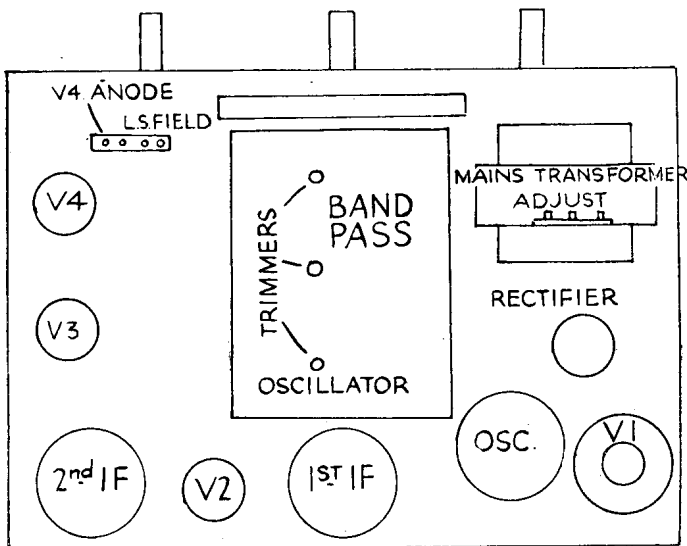
**VALVE READINGS**

(V.C. max.)

Valve.	Connection.	Volts.	M.A.
V1 SP4 plain	anode ...	225	.8
	screen ...	90	—
V2 VP4 met.	anode ...	225	2.2
	screen ...	90	—
V3 ACHLDD met.	triode anode	110	1.8
V4 AC/Pen.	anode ...	280	30
	aux. grid ...	250	5

ALTERNATIVE VALVES are:—

- V1 ... MS Pen.
- V2 ... MVS Pen.
- V3 ... TDD4 or DDT.
- V4 ... Pen. LVA.



Component layout diagrams for the Ekco A.C.74 by E.K. Cole, Ltd. A detail drawing for the resistance panel inside the chassis is given on the opposite page.



As we were unable to obtain from the makers of the Ekco 74A.C. the schematic wiring diagram in time for publication, this service review is to that extent incomplete.

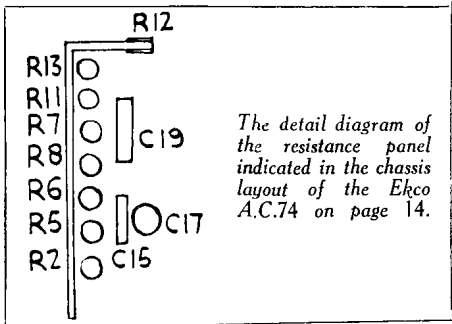
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**Quick Tests.**—Terminals on L.S. transformer :—  
 Top. 1 and 2 joined H.T.+ (smoothed) 275v.  
 3 V4 anode 255v.  
 4 H.T.+ (unsmoothed) 365v.  
 Valves. (V1) SP4 anode, 225v.  
 (V2) " " 225v.

**Removing Chassis.**—Remove knobs, grub screw (two on tuning). Pull out speaker plug and remove four screws at sides of bottom of cabinet (not the buffer supports).

Lift chassis out.  
 For tests, the speaker leads are sufficiently long to allow the plug to be inserted with the chassis outside the cabinet.

**General Notes.**—The set functions equally well with the alternative valves. If the condenser drive appears to slip, this is



most probably caused by the load thrown on the drive.

(a) Apply a little vaseline to the brass rod on which the indicator travels and/or to the pulleys.

(b) The drum is set too far back on the condenser spindle. Undo the grub screw and ease it forward a little, taking care that the L.T. terminals and leads are not fouled.

(c) If the calibration is wrong through the drum moving on the condenser spindle, tune in a fairly distant station (identified), and, after undoing grub screw, set drive to correct position and tighten grub screw.

Note that the L.T. wires to the pilot lamps pass over the pulleys at the sides. These

latter are insulated from the chassis and care should be taken to ensure that they are not short-circuited.

When the A.V.C. system is inoperative, test for short circuit between A.V.C., anode and earth. Diode side of C14 may be making contact with the screen. Try a new double-diode-triode.

**Condenser Bank.**—The three condensers in the container, Cs 23, 24 and 25, are similar.

**Replacing Chassis.**—Make sure the drive is correct. Replace chassis in cabinet and replace the four holding screws. Replace knobs and replace speaker plug.

CONDENSERS		
C.	Purpose.	Mfd.
4	Aerial series condenser ..	.001
6	Cathode osc. circuit V1 ..	.002
8	Series with anode osc. coil V1 ..	.00055
13	Anode feed condenser to osc. coil V1 ..	.0001
14	Coupling to AVC anode V2 ..	.0001
15	H.F. by-pass ..	.001
16	Screens V1 and V2 ..	.1
17	L.F. coupling diode to grid V3 ..	.01
18	Across grid of triode V3 ..	.0005
19	Anode by-pass V3 ..	.002
20	Coupling condenser V3 to V4 ..	.1
21	Cathode V4 ..	.25
22	Compensator anode V4 ..	.0025
23	Smoothing ..	4
24	Smoothing ..	4
25	Smoothing ..	4
26	Cathode V2 ..	.1
27	Across lower half of AVC ptr. ..	.1

RESISTANCES		
R.	Purpose.	Ohms.
1	Bias resistor V1 ... ..	4,000
2	Bias resistor V2 ... ..	300
3	Across aerial input (L.D. switch) ..	20
4	Part of AVC ptr. ... ..	(wire) 1 meg.
5	Part of AVC ptr. ... ..	.25 meg.
6	Across rectifying diode ..	.25 meg.
7	Anode coupling V3 to V4 ..	80,000
8	Bias resistor triode V3 ..	300
9	Grid leak V4 ... ..	.25 meg.
10	Bias resistor V4 ... ..	450
11	Part of screen ptr. V1, V2 ..	(wire) 50,000
12	Voltage dropping to aux. grid V4 and H.F. of set ... ..	4,000
13	Part of screen ptr. V1, V2 ..	(wire) 50,000
—	L.S. field ... ..	2,000
—	Output transformer primary ..	750 to 825

## Mains Hum and Radio Interference

The subject of hum in loudspeaker output and interference are somewhat closely associated. Interference can be classified under three headings—pure inductive hum, ripples and surges transferred to a set through the mains supply, and radio frequency interference.

Pure inductive hum can originate in a receiver itself and also outside the set. Hum which has its origin in a receiver is due entirely to incorrect design. The most prolific cause is inadequate smoothing, and the cure is just a matter of increasing the smoothing by using more efficient chokes of high inductance and increasing the capacity.

Hum which still persists is then invariably due to induction caused by relatively strong fields adjacent to grid wires, or even interaction amongst the low-frequency components and the mains transformer or smoothing chokes. This is easily detected by moving any components or leads which are suspected of causing trouble, and seeing if this has the effect of increasing or diminishing the hum.

Care must be taken particularly with regard to long leads connected to the input of the amplifying portion, as, for example, the pick-up connection. An earthed screened lead will usually cure the trouble. It sometimes happens on a set with which an external pick-up is used that the mains lead is brought too near to the pick-up or even to the aerial or earth lead of the set. In this manner hum is sometimes introduced, and the remedy, of course, is obvious.

The first rule is always to disconnect the aerial from the receiver, and then the earth, to determine if the interference is being picked up on the radio-frequency side of the set. Interference which comes in strongly with the aerial connected, and is almost absent without the aerial must be eliminated at its source.

These remarks are taken from the large service section of the 1934 "BROADCASTER Annual" (post free 2s. 6d. to subscribers of THE BROADCASTER). They are followed by practical tips on curing man-made static.

## PHILCO 260-261 FIVE-STAR CHASSIS

**Circuit.**—A band-pass aerial coupling precedes the combined first detector oscillator V1, a heptode (6A7). Oscillation takes place between the osc. grid and osc. anode with osc. transformer. The valve anode is coupled to the I.F. valve V2 (78) by the first I.F. transformer (125 kc.), and V2 is coupled in the same manner to the strapped anodes of V3, a double diode triode (75). Full compensating A.V.C. is applied by biasing the grids of both V1 and V2.

Resistance coupling is used between the triode anode of V3 and V4, a pentode (42), and tone compensation and control are employed with a multi-point switch. The speaker is of the energised type with a hum-bucking coil, and the field is used for smoothing in the positive H.T. lead.

The full-wave rectifier is an (80), and the bias for the grid of the triode section of V3 is taken from a potentiometer in the H.T.—lead of the whole set. An H.F. by-pass con-

denser is connected between one side of the mains and chassis, and the voltage adjustment is by a two-way switch.

**Special Notes.**—Nearly all the screws in the assembly are self-threading.

American valves with 6.3 volt filaments are used, and the table of connections can be obtained from the makers.

Sets of replacement resistors can also be obtained.

**Removing the Chassis.**—Pull off knobs, stand set on chassis end and remove four screws from underneath. Lift chassis out (speaker leads are long).

Stand chassis on mains transformer end.

**General Notes.**—The heptode (6A7) connections, looking from underneath and counting clockwise, are: anode, screen, osc. anode, osc. grid, cathode. The det. grid is at the top and the two thick pins are filament.

Double diode triode (75) connections, as above, are: filaments (thick), triode anode, diode anode, diode anode, cathode.

Remember that V1 and V3 have grid terminals on top of the bulbs.

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VALVE READINGS			
(VC max., no signal.)			
Valve.	Connections.	Volts.	M.A.
V1 6A7E	anode ...	240	Owing to the absence of suitable split adaptors the makers recommend trying new valves when voltages on electrodes are high (i.e., when current is presumably low).
	hsc anode ...	247	
	screen grid ..	51	
V2 78E	anode ...	240	
	screen ...	88	
V3 75E	anode ...	153	
	aux. grid ...	245	
V4 42E	anode ...	230	
	aux. grid ...	245	