

# Pye PP/AC Mains Portable

Four valve, plus rectifier, three-band table model superhet with self-contained aeri-als, five pre-set push-buttons and manual tuning. Suitable for 200-250 volts, 50-100 cycles, price 14 gns.

## CIRCUIT OUTLINE

**SELF-CONTAINED** aeri-als and a connection for an external aerial provide the input which is applied to the grid of V1 through a press-button switch assembly which also has buttons for five preselected stations.

One aerial is used for the SW band and the other for the MW band, additional loading being used on the LW band. Pre-selection on the input is provided by trimmers. The first valve has AVC on all but the SW range.

V1, a triode hexode, is connected conventionally, with the exception that there is fixed padding on the MW band. Pre-selection oscillator tuning is obtained by additional single inductances permeability adjusted and selected by the push-button switch.

In the anode circuit of V1 is the usual

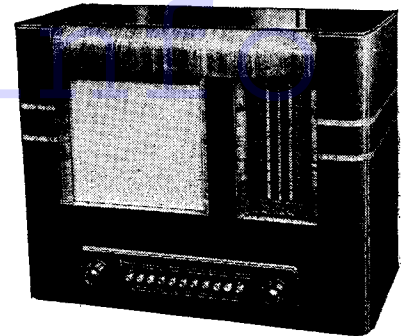
change switch, all the switching operations being carried out on a single multiple press-button unit.

The precise form of the switch is shown in the circuit diagram, and no further diagram is necessary. In the input position the switches are numbered 1 to 8. These are respectively ganged with Nos. 9 to 16.

The control knobs are in line on the front of the chassis. It should be observed, however, that the row is preceded by S18, which cuts the top response, and ends in S17, which cuts the bass. These two switches have separate locking detents which do not release the others.

The mains switch, S19, is operated by one of the ordinary rods, although it is a special QMB type carried on the press-button bank.

For replacement and adjustment pur-

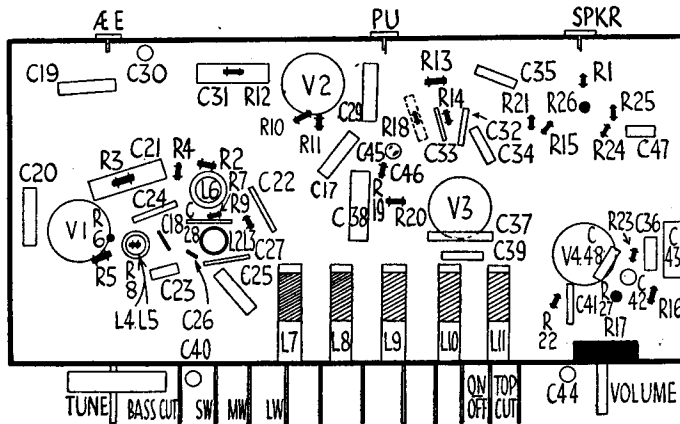


extra resistances are used. These are C47 and C48, and R26 and R27. The purpose of these will be found in the condenser and resistance tables. In our chassis, C45 and C46 are both 16 mfd.

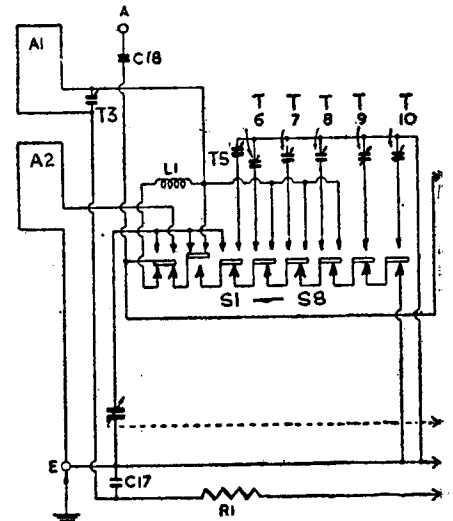
In the chassis layout diagrams the press-button switch rods have been omitted so as to show the trimmer and inductance adjustment rods clearly.

As the set has a self-contained frame aerial, the makers recommend the use of a radiated input from the generator in place of the usual dummy aerial.

If the service generator has practically



Left, layout diagram identifying parts on the underside of the chassis. Top "deck" view with trimmers is on page 13 with the alignment notes. The circuit, right, is shown divided only for presentation reasons.



IF transformer which is permeability tuned. This works into the grid of V2, an HF pentode with AVC. A further similar transformer couples this to the diode section of V3, a double-diode triode.

One diode provides AVC and the other signal demodulation. The diode load circuit is conventional with a resistance-capacity IF filter. Audio frequency voltages are condenser coupled to the grid of the triode section, the volume control having a tone compensation network connected to a tapping point.

Conventional resistance-capacity coupling is used between the triode and the output pentode, V4. The coupling condenser is in two parts, one being shorted out by a switch to increase the bass. Feed-back is arranged between the output transformer secondary and the grid of the triode, and top cut is provided by switching into circuit an anode shunt condenser.

Power is derived from V5, a full-wave rectifier, working in conjunction with the speaker field and electrolytic condensers.

In this receiver there is no normal wave-

poses here is a list of pre-set coils and trimmers with waveranges covered :-

Wave-band	Osc. Coil	Aerial Trimmer
190-330	Type 78192	Type 80121
250-470	78193	80122
280-560	78193	80123
900-2,000	78915	80123

## SPECIAL NOTES

**C**ERTAIN additions have been made to the circuit since the set was first issued, and the chassis layout has been modified. Two extra condensers and two

## VALVE READINGS

V.	Type.	Anode.	Screen.	Cathode.
1	TH4B	227	58	2.1
2	VP4B	244	170	1.7
3	TDD4	100	—	1.8
4	PEN A4	228	244	5.3
5	DW4	330AC	—	325

(All Mullard.)  
Pilot Lamps, M.E.S., 6.5 volt, 500 ma.

no stray field, which should be the case with a good-class instrument, it should be fitted with a small frame comprising a few turns of wire, connected between the output and the earthed case. This will give sufficient field to enable the ganging to be correctly carried out.

## Chassis Removal

Removal of the inspection cover will not give sufficient room for all repairs. To remove the chassis, the two knobs on the front should be pulled off and the chassis-retaining bolts taken out.

There are flying leads to the two frames, held by bolts and soldering tags. On the larger frame the black lead goes to the upper tag, and on the SW frame the white lead is at the top.

It is best to leave the speaker assembly in position, and the leads to this are in the following order, reading from the top: Red, white, green and blue. On the

Continued on page 13

## 10-MINUTE FAULT-FINDER

PYE PP/AC

### Power Test

Voltages : V5 cathode, 325; HT line, 244.  
Resistances : L12, 425 ohms.  
Feed current =  $325 - 244 \div 425 = 64$  ma.  
Power consumption : 70 watts.

### Output Stage, V4

Inject 5 volts at V4 grid. If defective, check :—  
Voltages : Anode, 228; screen, 244; cathode, 5.3.

Resistances : Anode—HT, 425; grid—chassis, 150,000; cathode—chassis 150 ohms.

### AF Stage, V3

Inject .5 volt AF at V3 grid. If defective, check :—  
Voltages : Anode, 100; cathode, 1.8.

Resistances : Anode—HT, 69,000; cathode—chassis, 1,500 ohms.

### Demodulation, V3

Inject modulated 465-kc. signal V2 anode. If defective, check :—  
Resistances : L16, 7.5; L17, 7.5; diode—chassis, 571,500 ohms.

### IF Amplification, V2

Inject modulated 465-kc. signal at V2 grid. If defective, check :—  
Voltages : Anode, 244; screen, 170; cathode, 1.7.  
Resistances : Screen—HT, 10,000; grid—chassis, 2 megohms.

### Mixer Hexode, V1

Inject modulated 465-kc. signal at V1

grid. If defective, check :—

Voltages : Anode, 227; screen, 58; cathode, 2.1.

Resistances : Anode—HT, 2,200; screen—HT, 30,000; L14, 7.5; L15, 7.5 ohms.

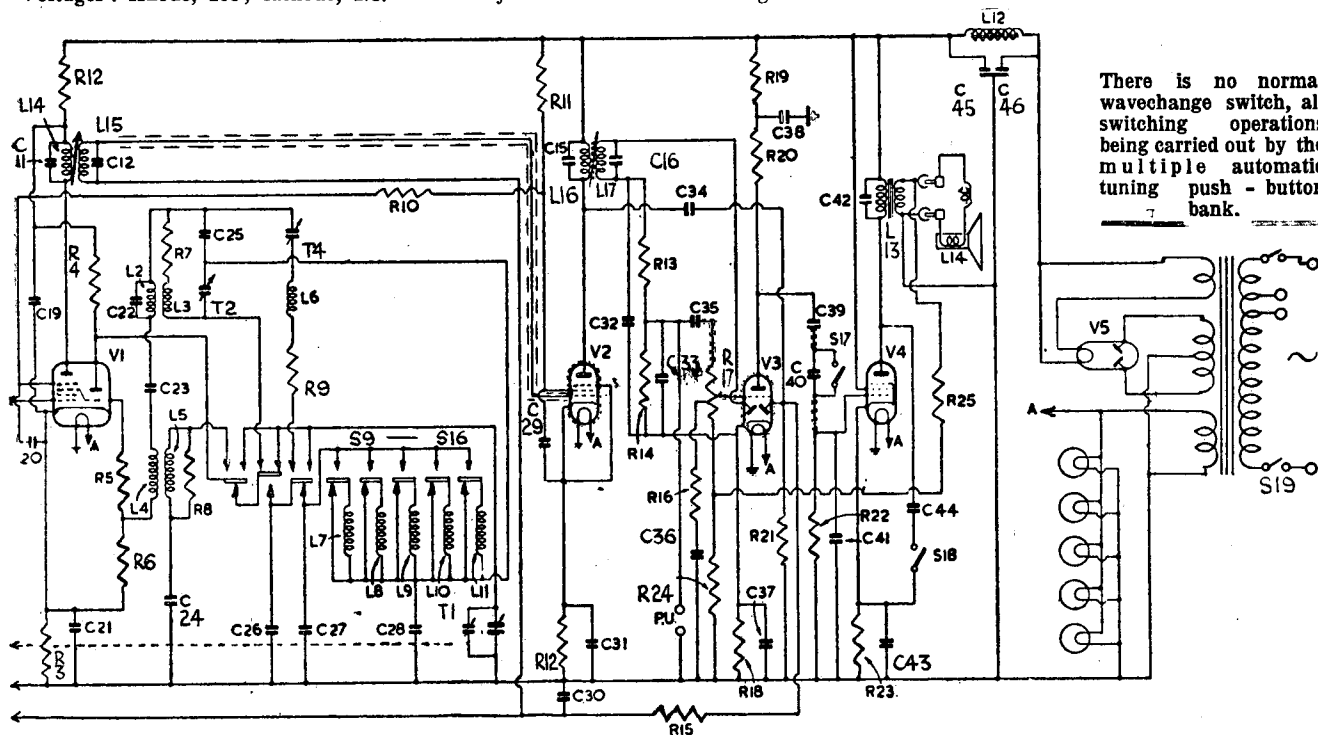
### Oscillator Test, V1

Tune to local station and inject that frequency plus 465 kc. at oscillator grid. If defective, check :—

Voltage : Oscillator anode, 160.

Resistances : Oscillator anode—HT, 12,200; oscillator grid—chassis, 47,300 ohms.

If still defective, check input and oscillator coils and switches.



### WINDINGS

L.	Ohms.	Range.	Where measured.
1	15.4	LW	On tags.
2	2.25	MW	On tags.
3	Low	MW	On tags.
4	9	SW	On tags.
5	Low	SW	On tags.
6	4.5	LW	On tags.
7	.6	MW Pre.	On tags.
8	2.1	MW Pre.	On tags.
9	2.1	MW Pre.	On tags.
10	5.4	LW Pre.	On tags.
11	5.4	LW Pre.	On tags.
12	1,250	—	On tags.
13	425	—	On tags.
14	7.5	—	V1 anode and R2.
15	7.5	—	V2 grid and R15.
16	7.5	—	V2 anode and HT positive.
17	7.5	—	Signal diode and R13.

### RESISTANCES

	Ohms.
1	V1 AVC decouple .. 1 meg.
2	V1 anode decouple .. 2,000
3	V1 cathode bias .. 150
4	Osc. anode load .. 10,000
5	Osc. grid stabiliser .. 150
6	Osc. grid leak .. 47,000

### Resistances (continued)

7	Het. volts control .. 22
8	Het. volt control .. 10,000
9	Het. volt control .. 100
10	V1 screen decouple .. 20,000
11	V2 screen decouple .. 10,000
12	V2 cathode bias .. 150
13	IF filter .. 100,000
14	Signal diode load .. 470,000
15	V2 AVC decouple .. 1 meg.
16	Tone compensation .. 33,000
17	Volume control .. 1 meg.
18	V3 cathode bias .. 1,500
19	V3 anode decouple .. 22,000
20	V4 anode load .. 47,000
21	AVC diode load .. 1 meg.
22	V4 grid leak .. 150,000
23	V4 cathode bias .. 150
24	Feedback injection .. 24
25	Feedback injection .. 100
26	Pick-up shunt .. 500,000
27	V4 anode compensation .. 10,000

### CONDENSERS

	Mfds.
11	IFT1 primary tune .. .00013
12	IFT1 secondary tune .. .00014
15	IFT2 primary tune .. .00013
16	IFT2 secondary tune .. .00014
17	V1 AVC decouple .. .05

### Condensers (continued)

18	Aerial couple .. .000005
19	V1 anode decouple .. .1
20	V1 screen decouple .. .1
21	V1 cathode shunt .. .1
22	MW osc. shunt .. .0005
23	Osc. grid .. .0002
24	SW padder .. .005
25	MW padder .. .00083
26	LW padder .. .0009
27	Osc. preset tune .. .00041
28	Preset padder .. .002
29	V2 screen decouple .. .1
30	V2 AVC decouple .. .005
31	V2 cathode shunt .. .1
32	IF filter .. .001
33	IF filter .. .00002
34	AVC couple .. .00002
35	LF couple .. .005
36	Tone compensation .. .01
37	V3 cathode shunt .. .20
38	V3 anode decouple .. .2
39	LF coupling .. .05
40	Base cut .. .0025
41	V4 grid shunt .. .0005
42	Tone correction .. .005
43	V4 cathode shunt .. .50
44	Top cut .. .01
45	HT smoothing .. .8
46	HT smoothing .. .16
47	Tone compensation .. .0002
48	V4 anode shunt .. .001

## Trophy Eight by Peto Scott

Continued from page 10

HT switch marked "Send-Receiver" is now incorporated so that the operation of the set can be cut off without cooling the valves, enabling it to be used for two-way communication in conjunction with a transmitter.

When injecting a signal from a generator it is important to remember to earth the second aerial socket, as the two aerials are intended for a balanced input.

### Wave-range Switches

There are four wafers in this receiver, although, as explained in the Special Notes, only three are employed. The first two wafers carry the wiper W1 to W4 which control the tuned and untuned windings of the input and HF circuits.

The third wafer has two wipers, W5 and W6 for the oscillator circuits, but six contacts are used, two being employed for earthing purposes in conjunction with an earthing ring. W7 controls the short wave oscillator connection, this wafer being mounted on the last wafer.

### Chassis Removal

The chassis and front panel are assembled as a single unit and accordingly there is no need to remove the knobs from the receiver.

To remove the complete assembly it is only necessary to take the small self-tapping screws out of the edge of the front panel and remove the four chassis retaining bolts. The chassis and panel can then be lifted out of the case. This operation requires a little care and the chassis should be slightly raised as soon as it commences to come forward.

## Alignment

### IF Circuits (465 kc.)

Connect output meter to set and generator to V2 grid, and adjust generator to 465 kc.

Trim T16, T17, T18 and T19 for maximum, using a small input below AVC level. Band 1 (43-18 mc.)

Connect generator to aerial and earth and tune set and generator to 41.5 mc.

Adjust T1, T2 and T3 for maximum. Band 2 (19-7.5 mc.)

Tune set and generator to 15 mc. and adjust T4, T5 and T6 for maximum. Band 3 (7.5-3 mc.)

Tune set and generator to 7.5 mc. and adjust T7, T8 and T9 for maximum. Check at 3 mc. Band 4 (1.3-3 mc.)

Tune set and generator to 1.5 mc. and adjust T10, T11 and T12 for maximum.

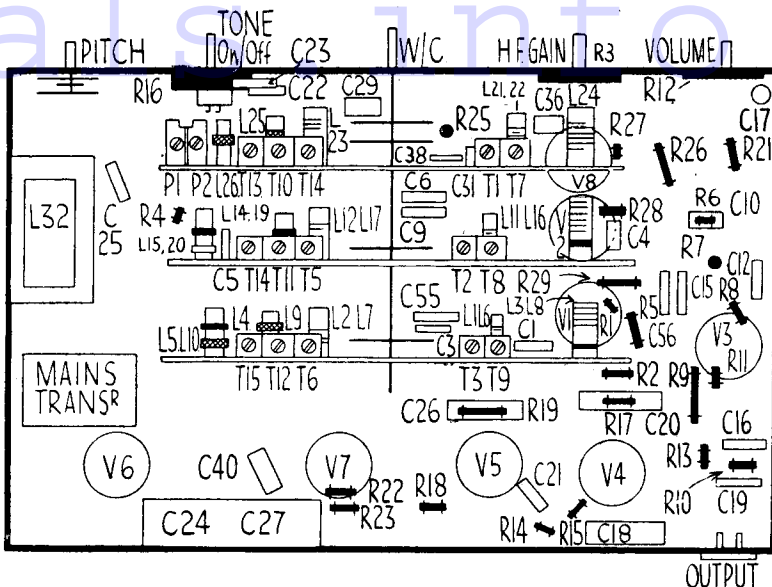
Tune set and generator to 3 mc. and adjust P1 for maximum. Band 5 (1,500-520 kc.)

Tune set and generator to 1,500 kc. and adjust T13, T14 and T15 for maximum.

Tune set and generator to 750 kc. and adjust P2 for maximum.

### Replacement Condensers

EXACT replacement electrolytics are available from A. H. Hunt, Ltd., Carratt-lane, Wandsworth, London, S.W.18. For the block containing C24 and C27 there is unit 1573A, 6s. 6d., and for either C20 or C25, unit 2915, 1s. 9d.



The under-chassis layout diagram identifying the majority of the components and trimmers. The HF sections of the receiver are arranged in orderly fashion.

## Pye PP/AC Portable

Continued from page 8

speaker strip itself there is a single red lead and a red and black lead joined to the lower tag.

Care should be taken not to disturb the trimmer on the larger frame.

## Alignment

### IF Circuits (465 kc.)

Connect output meter to set and either the generator to grid of V1 or pick-up radiation on frame coil.

Adjust the cores of the IFTs for maximum output, using a small input below the AVC value.

As permeability tuning is used, alignment is rarely necessary.

### Short Waves (15 to 52 metres)

Pick up radiation on frame coil from generator and adjust set and generator to 20 metres (15 mc.).

Trim T1 for maximum.

### Medium Waves (200 to 550 metres)

Tune set and generator to 200 metres (1,500 kc.) and pick up radiation from generator.

Adjust T2 and T3 for maximum.

### Long Waves (900 to 2,000 metres)

Pick up radiation as before and tune set and generator to 1,800 metres (1,665 kc.).

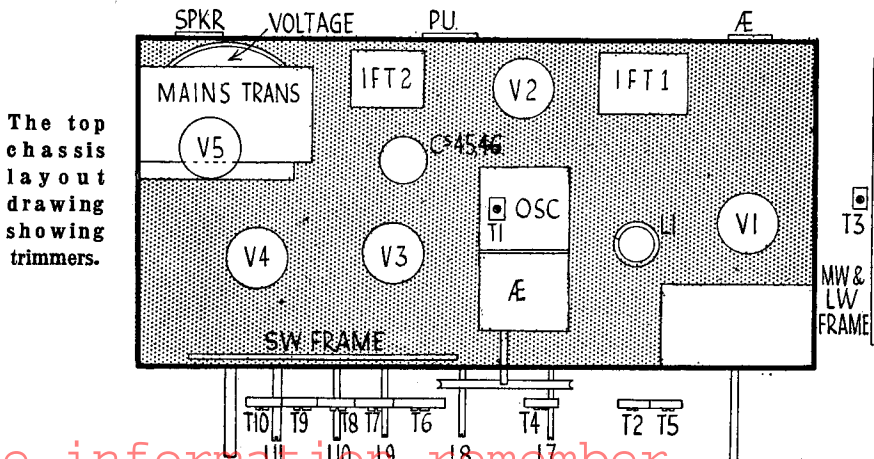
Adjust T4 for maximum.

Tune set and generator to 1,300 metres and adjust T5 for maximum.

Repeat the operations until no improvement results.

EXACT replacement condensers are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18.

For C45 + C46, there is unit 1267, price 8s.; for C43, unit 2915, 1s. 9d.; C37, unit 4105, 1s. 6d., and for C38, unit 2964, price 1s. 10d.



The top chassis layout drawing showing trimmers.