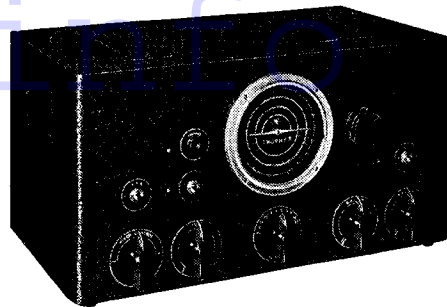


# Peto Scott AC Trophy Eight

Seven valve, plus rectifier, five waveband communication-type receiver with beat-frequency stage. Suitable for 200-250 volt, 50-100 cycle AC supplies, price 12 gns. Separate cabinet speaker, 2 gns.



## CIRCUIT OUTLINE

**T**HE normal input of the receiver is through a transmission line of the balanced type, coupled circuits being used on all five bands. There is no AVC on the first band.

The first valve, fed from these circuits, is an HF pentode. The cathode circuit contains a volume control which also operates on the third valve.

Coupling between V1 and V2, the injection valve, is by HF transformers and there is no AVC except on the fifth band. The oscillator, V8, uses electron coupling on all but the first band and injection into V2 is by a grid connection.

In the anode circuit of V2 there is the first IFT, which is trimmer tuned and works into the grid circuit of V3 in the normal manner. V3 is coupled by another IFT to the diode section of V4, a double-diode triode.

The diodes are strapped and the AF voltages are taken through a condenser from the top of the load to a volume control which operates on the grid of the triode section.

Between the anode circuit of V4 and the output valve, V5, there is conventional resistance-capacity coupling. Tone is controlled on the grid of V5. Choke-coupled output is provided, the anode circuit containing a stabilising resistance.

For code signal working necessitating a beat note on CW signals there is a separate local oscillator valve which beats with the IF. This is V7, an electron-coupled oscillator. The frequency of the beat is controlled by altering the generation frequency, for which purpose there is a small variable condenser.

Power is derived from V6, a full-wave rectifier, and the usual electrolytic condensers, in conjunction with a smoothing choke. It will be noticed that the smoothing circuit contains a fixed resistance.

## CONSTRUCTIONAL FEATURES

**T**HE chassis examined conformed to the maker's specification in most details. It will be noticed that there is a special switching arrangement on the oscillator circuit involving the use of a third wipe, for which purpose an additional wafer is used. As far as we could determine, this was not used and there were no connections to the contacts.

The resistance R25 and condenser C36 appeared to be permanently connected on all bands. When testing the set it should be remembered that the oscillator, V7, which beats with the IF should be switched off as otherwise whistles will be obtained.

Although not shown on the circuit an

*Continued on page 13*

## VALVE READINGS

V.	Type.	Anode.	Screen.	Cathode.
1	EF8	230	230	1.7
2	6TH8	230	120	5.5
3	6K7	230	90	3.5
4	6Q7	140	—	1.4
5	6F6	210	230	14
6	5Z4	320	—	—
7	6J7	100	140	—
8	6C5	130	—	—

Pilot lamps .. Osram MES 6.5 volt, .3 amp.

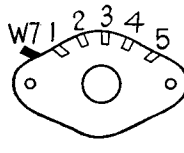
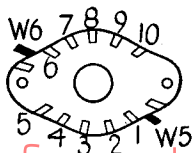
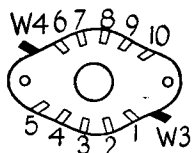
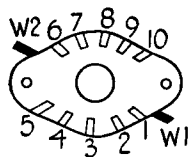
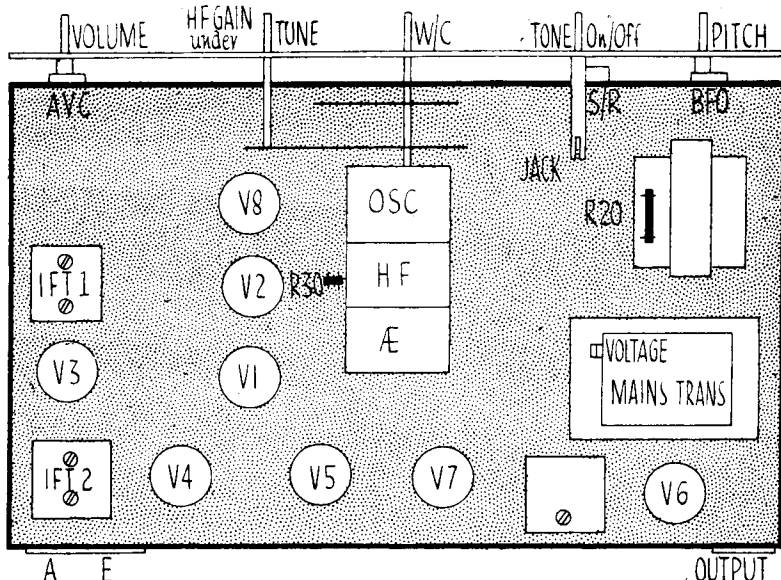
## CONDENSERS

		Mfd.s.
1	V1 AVC decouple	.1
3	V1 cathode shunt	.1
4	V1 anode decouple	.1
5	V2 AVC decouple	.1
6	V2 screen decouple	.1
9	V2 cathode shunt	.1
10	V2 cathode bypass	.002
12	V3 cathode shunt	.1
15	V3 AVC decouple	.1
16	IF filter	.0001
17	AF couple	.03
18	V4 anode decouple	.5
19	IF filter	.0001
20	V4 cathode shunt	.25
21	AF couple	.01
22	Tone control	.01
23	V5 grid shunt	.0001
24	HT smoothing	.8
25	V5 anode couple	.1
26	V5 cathode shunt	.25
27	HT smoothing	.8
29	Band 2 padder	.001
31	Band 3 padder	.000075-.001
36	Osc. anode couple (band 1)	.01
38	Osc. grid	.0001
40	V7 screen decouple	.1
41	V7 anode shunt	.1
42	V7 grid	.0001
55	V1 screen decouple	.1
56	V3 screen decouple	.1

## RESISTANCES

		Ohms.
1	V1 AVC decouple	500,000
2	V1 cathode bias	200
3	Gain control	10,000
4	V2 AVC decouple	500,000
5	V2 screen feed	30,000
6	V2 cathode bias	500
7	V3 screen decouple	20,000
8	V3 cathode bias	350
9	V4 cathode pot	20,000
10	IF filter	20,000
11	AVC decouple	1 meg.
12	Volume control	250,000
13	Diode load	250,000
14	V4 anode decouple	100,000

*Continued on opposite page*



Left, the switch banks with the unit nearest the "click" plate on the right. Left above, the top-of-chassis layout diagram. The under-chassis diagram adjoins the Alignment Notes on page 13.

## 10-MINUTE FAULT-FINDER

## TROPHY 8

### Power Tests

Voltages : V6 cathode, 320; HT line, 230.  
Resistances : L33 plus R20, 1,260 ohms.  
Feed current =  $320 - 230 \div 1,260 = 71$  ma.

### Output Stage, V5

Inject 5 volts AF at grid. If defective, check :—  
Voltages : Anode, 210; screen, 230; cathode, 14.

Resistances : Anode-HT, 600; cathode-chassis, 500; grid-chassis, 500,000 ohms.

### AF Stage, V4

Inject .5 volt at grid. If defective, check :—

Voltages : Anode, 140; cathode, 1.4.  
Resistances : Anode-HT, 150,000; cathode-chassis, 250; grid-chassis, 250,000 ohms.

### Demodulation, V4

Inject modulated 465-kc. signal at V3

anode. If defective, check :—

Resistances : L30, 6.9; L31, 7; diode-chassis, 270,000 ohms.

### IF Stage, V3

Inject modulated 465-kc. signal at grid. If defective, check :—

Voltages : Anode, 230; screen, 90; cathode, 3.5.

Resistances : Screen-HT, 20,000; cathode-chassis, 350 ohms; grid-chassis, 1.25 meg.

### Mixer Valve, V2

Inject modulated 465-kc. signal at grid. If defective, check :—

Voltages : Anode, 230; screen, 120; cathode, 5.5.

Resistances : Screen-HT, 30,000; cathode-chassis, 500; grid-chassis, 1.75 meg.

### Oscillator Valve, V8

Connect aerial through 5 mmfd. to V2 grid. If no signals, tune to known station

and inject that frequency plus 465 kc. at V2 injection grid.

If defective, check :—

Voltages : Anode, 130.  
Resistances : Anode-HT, 10,000; grid-chassis, 50,000 ohms.

### Beat Note, V7

If no beat note, inject 460 kc. at V7 grid. If defective, check :—

Voltages : Anode, 100; screen, 140.  
Resistances : Anode-HT, 25,000; screen-HT, 50,000 ohms.

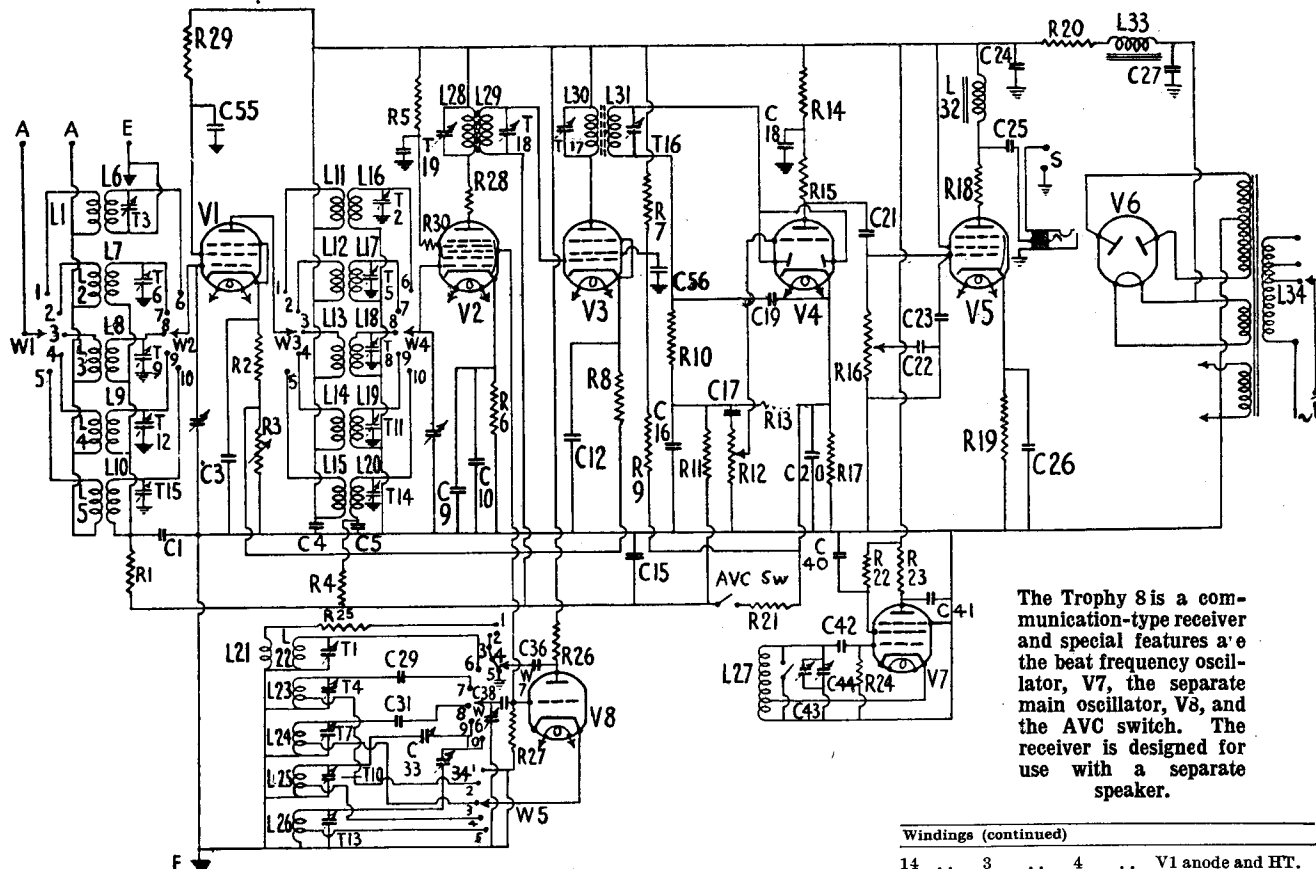
### Signal Stage, V1

Inject local station frequency at V1 grid. If defective, check :—

Voltages : Anode, 230; screen, 230; cathode, 1.7 volts.

Resistances : Screen-HT, 500; cathode-chassis, 200; grid chassis, 1.75 meg.

If still defective, check coils and switching.



The Trophy 8 is a communication-type receiver and special features are the beat frequency oscillator, V7, the separate main oscillator, V8, and the AVC switch. The receiver is designed for use with a separate speaker.

### Windings (continued)

14	3	4	V1 anode and HT.
15	7.8	5	V1 anode and HT.
16	Low	1	V2 grid and C5.
17	Low	2	V2 grid and C5.
18	Low	3	V2 grid and C5.
19	.2	4	V2 grid and C5.
20	3.5	5	V2 grid and C5.
21	Low	1	On tags.
22	Low	1	Across T1.
23	Low	2	Across T4.
24	Low	3	Across T7.
25	.1	4	Across T10.
26	1.4	5	Across T13.
28	5.6	—	R28 and HT.
29	5.6	—	V2 grid and C15.
30	6.9	—	V3 anode and HT.
31	7	—	Diode and C19.
32	500	—	R18 and HT.
33	760	—	On tags.
34	—	—	Mains lead.

### Resistances (continued)

15	V4 anode load	50,000
16	Tone control	500,000
17	V4 cathode bias	250
18	V5 anode stabiliser	100
19	V5 cathode bias	500
20	HT feed	500
21	AVC cut-out	100
22	V7 screen feed	50,000
23	V7 anode load	25,000
24	V7 grid leak	50,000
25	Het. volt control	13
26	V8 anode load	10,000
27	V8 grid leak	50,000
28	V2 anode stabiliser	50
29	V1 screen decouple	500
30	V2 grid stopper	150

### WINDINGS (D.C. Resistances)

L	Ohms.	Range.	Where measured.
1	Low	1	Aerial sockets.
2	1	2	Aerial sockets.
3	2	3	Aerial sockets.
4	3	4	Aerial sockets.
5	7.8	5	Aerial sockets.
6	Low	1	V1 grid and C1.
7	Low	2	V1 grid and C1.
8	Low	3	V1 grid and C1.
9	.2	4	V1 grid and C1.
10	3.5	5	V1 grid and C1.
11	Low	1	V1 anode and HT.
12	1	2	V1 anode and HT.
13	2	3	V1 anode and HT.

For more information remember

## 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 aeri- als 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 wiper 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.

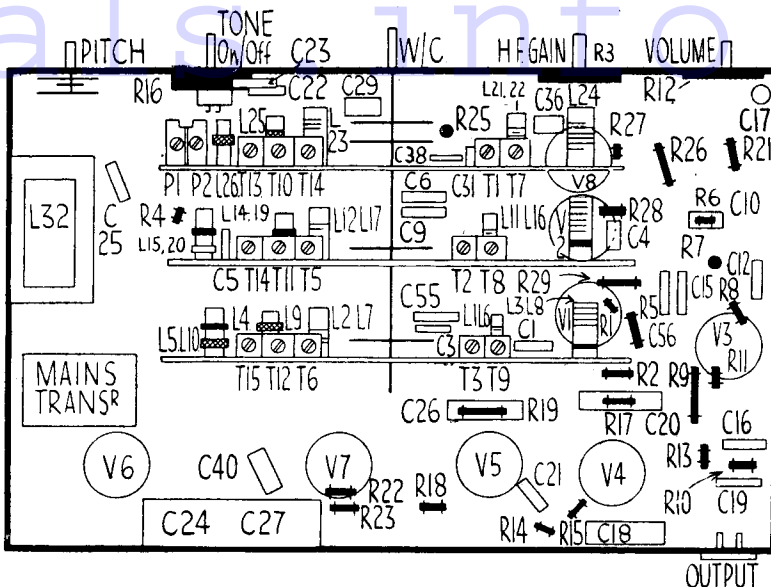
Tune set and generator to 3 mc. and adjust P1 for maximum. Band 5 (1,500-520 kc.)

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.

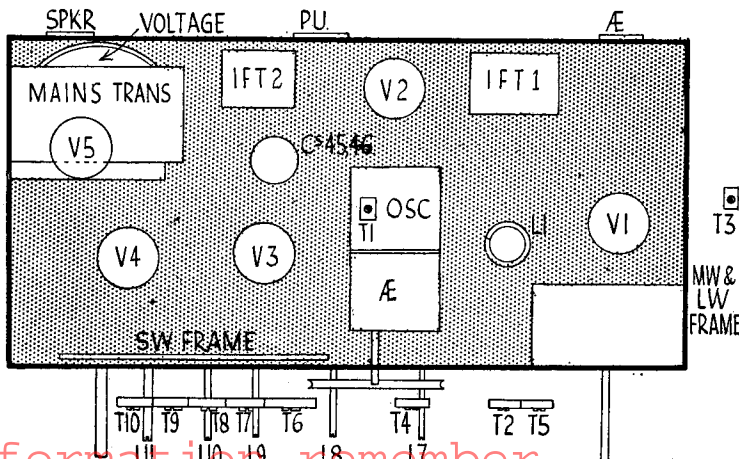
Tune set and generator to 1,300 metres and adjust T5 for maximum.

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.



# PETER SCOTT TROPHY 8

Seven valve, plus rectifier, covering five wavebands, communication-type receiver. Suitable for 200-250 volt, 50-100 cycle, AC mains. Marketed by Peto Scott Electrical Instruments, Ltd., Church Street, Stoke Newington, N.16.

INPUT is through a transmission line of the balanced type to the aerial coupling coils L1 (Band 1), L2 (Band 2), L3 (Band 3), L4 (Band 4) and L5 (Band 5), selected by the wave-range wipe W1.

The secondary coils L6 to L10, tuned by VC1 section of the ganged condenser, pass the RF signal through wipe W2 to the control grid of the RF pentode V1. The grid circuit is returned to the automatic volume control line for biasing, with the exception of Band 1 (L1-L6), which has no AVC.

A gain control R3, which also operates on V4, is included in the cathode circuit of V1 in addition to the biasing components R2 and C3. The screen is fed from the high-tension line through R29 and decoupled by C55.

Wipe W3 in the anode circuit of V1 feeds the signal to the primary windings L11 to L15 of the RF coupling transformer. The secondary windings L16 to L20, tuned by VC2 section of the gang transfer the signal via the wipe W4 to the control grid of the pentagrid mixer V2. This is AVC controlled on the fifth band only.

The AVC decoupling components are C1, C5, C15, R1 and R4. AVC can be put out of action by closing a switch which puts a 100-ohm resistor, R21, across the circuit.

A feature of this receiver is the use of a separate oscillator valve, V3, the grid of which is connected to a grid in V2, thereby giving electron coupling.

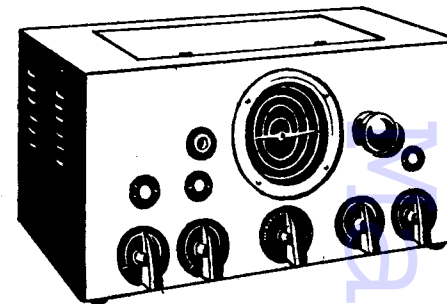
The anode load of V3 is R26, with C36 as the first band anode coupling condenser, and R27, C38 the grid leak and condenser. On four of the bands

Continued overleaf

## VALVE READINGS

V	Type	Electrode	Volts	Mas
1	EF8	Anode	230	—
		Screen	230	—
		Cathode	1.7	—
2	6TH8	Anode	230	—
		Screen	120	—
		Cathode	5.5	—
3	6C5	Anode	130	—
		Anode	230	—
4	6K7	Screen	90	—
		Cathode	3.5	—
		Anode	140	—
5	6Q7	Anode	140	—
		Cathode	1.4	—
6	6F6	Anode	210	—
		Screen	230	—
		Cathode	14	—
7	6J7	Anode	100	—
		Screen	140	—
8	5Z4	Anodes	320	—

Pilot lamps, Osram MES 6.5 v, .3 amp.



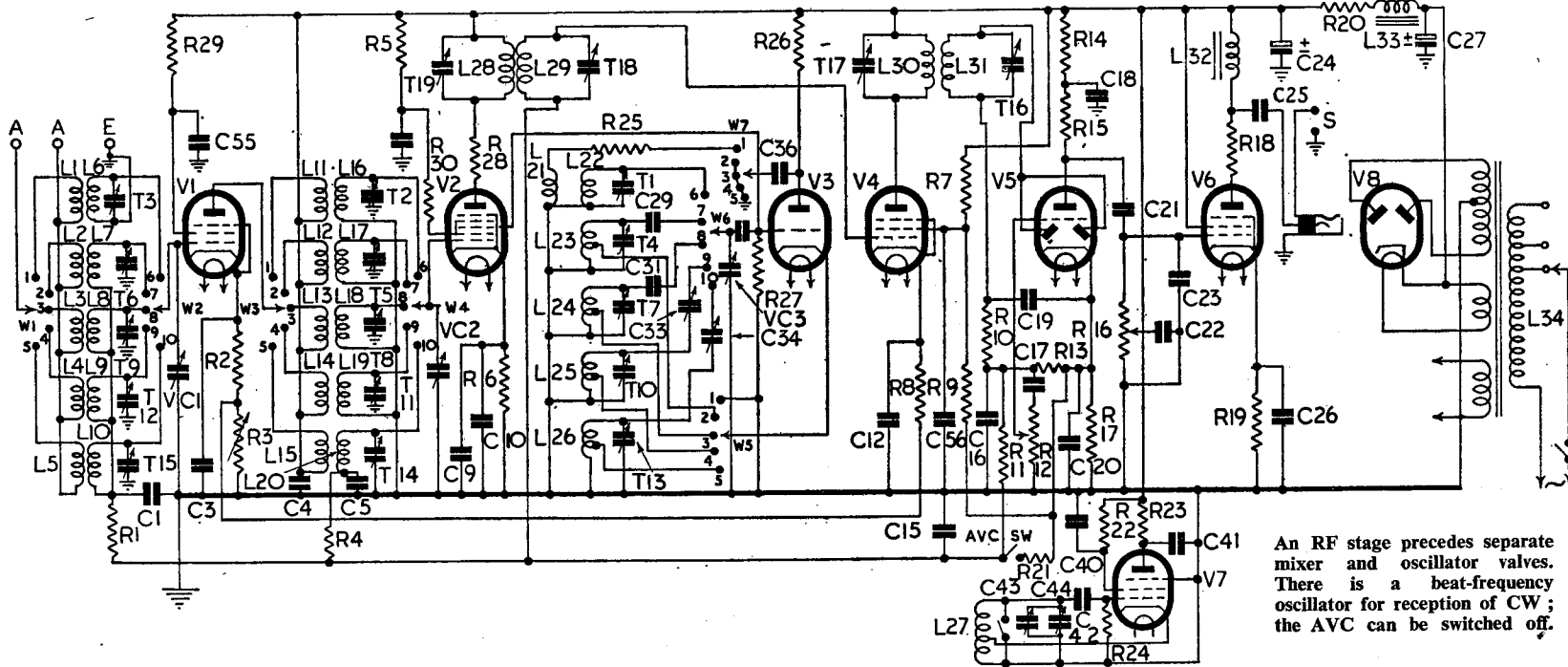
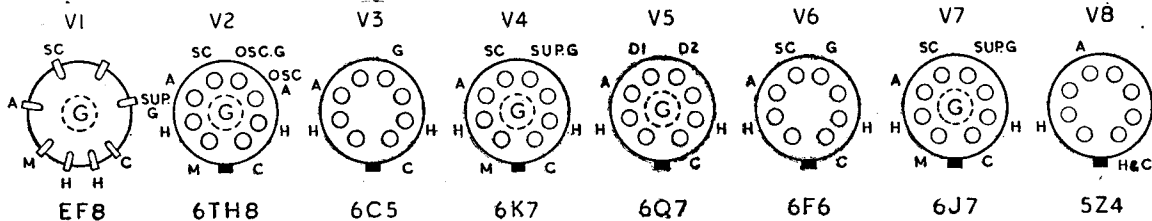
The Trophy 8 is a "popular" form of communication set with five bands and beat-frequency oscillator.

## CONDENSERS

C	Mfd's
1-6	.1
9	.1
10	.002
12	.1
15	.1
16	.0001
17	.03
18	.5
19	.0001
20	25.0
21	.01
22	.01
23	.0001
24	8.0
25	.1
26	25.0
27	8.0
29	.001
31	.000075-0.01
36	.01
38	.0001
40	.1
41	.1
42	.0001
55	.1
56	.1

## RESISTORS

R	Ohms
1	500,000
2	200
3	10,000
4	500,000
5	30,000
6	500
7	20,000
8	350
9 & 10	20,000
11	1 meg
12 & 13	250,000
14	100,000
15	50,000
16	500,000
17	250
18	100
19	500
20	500
21	100
22	50,000
23	25,000
24	50,000
25	13
26	10,000
27	50,000
28	50
29	500
30	150



An RF stage precedes separate mixer and oscillator valves. There is a beat-frequency oscillator for reception of CW; the AVC can be switched off.

# TROPHY EIGHT

Continued

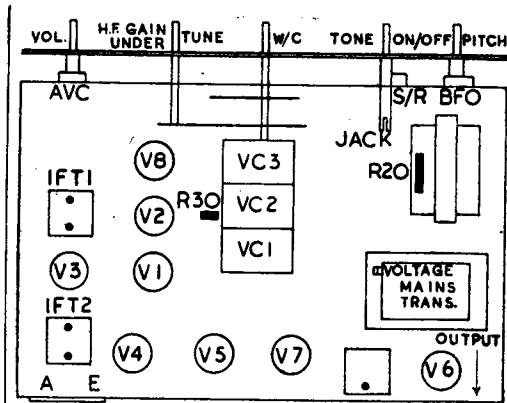
oscillation is produced by coupling the grid and cathode circuits by means of tapped coils.

The oscillator windings L22-L26 are selected by the wave-range wiper W5 and W6, while W7 controls the short-wave oscillator connection.

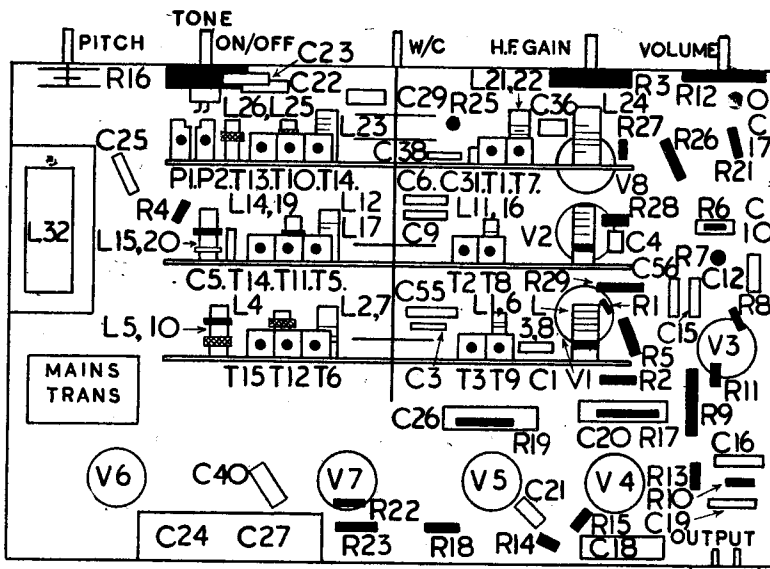
From the anode of V2 the signal passes through the anode stabiliser R28 to the intermediate frequency transformer L28, L29, which forms the coupling between V2 and the control grid of V4, the first IF amplifier.

The screen of V4 is fed through R7, decoupled by C56. R9 connected in series with R7 and R17 provides the cathode potential of V5.

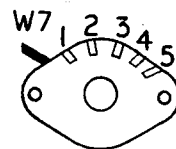
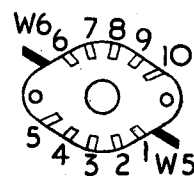
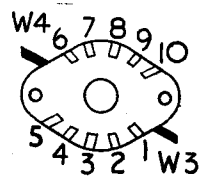
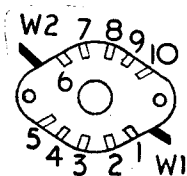
A second IF transformer couples V4 to the diode section of V5, a double diode triode, with its diodes strapped. The AF voltages are taken through C17 from the top of the diode load R13 to the volume



These two layout diagrams identify the parts on the Trophy 8 chassis. The orderly arrangement of the HF sections of the set will be noted.



Below, the switch-banks with wafer nearest click plate on the right. W7 may be on the same wafer as W5 and W6.



control R12, which operates on the grid of the triode section. Filtering is effected by R10, C19 and C16. R11 and C15 decouple the AVC line.

From V5 the AF signals are resistance-capacity coupled by R15 and C21 to the grid of the output pentode V6. Variable tone control is obtained through R16, C22 and C23.

The normal cathode bias is provided by R19 and C26.

Output from V6 is choke-coupled to the jack and separate loudspeaker, the coupling condenser being C25 and the choke L32, with R18 as stopper of parasitic HF oscillation.

Continued on opposite page

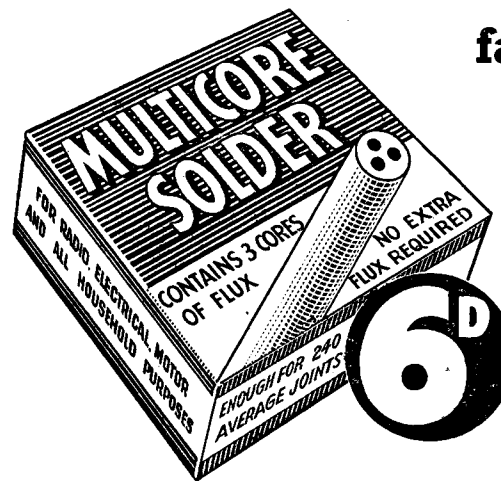
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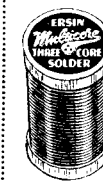


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## TROPHY 8

*Continued*

For code signal working, necessitating a beat note on continuous wave signals, there is a separate local oscillator valve, V7, which beats with the intermediate frequency. The frequency of the beat is controlled by a small variable condenser.

The LT and HT supply circuits are conventional, with HT derived from a full-wave indirectly heated rectifier V8, the smoothing components being L33 (choke), C24 and C27, with R20 as voltage dropper.

Although not shown on the circuit, an HT switch, marked "Send-Receiver," is incorporated, enabling it to be used for two-way communication in conjunction with a transmitter.

The first two switch wafers carry the wiper W1 to W4, which control the tuned and untuned windings of the 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 W7 wiper being mounted on the last wafer.

When testing it should be remembered that the oscillator valve V7 should be switched off, as otherwise whistles will be obtained.

**GANGING**

**IF Circuits**—Connect an output meter to receiver and oscillator to V2 grid or suppressor grid. Switch off the AVC.

Inject a signal of 465 kc and adjust T16, T17, T18 and T19 for maximum output, keeping input low.

**Band 1** (43-18 mc).—Switch receiver to first band, connect oscillator to aerial and earth. Earth second aerial socket.

Tune set to 41.5 mc and inject a signal of this frequency. Adjust T1, T2 and T3 for maximum output.

**Band 2** (19-7.5 mc).—Switch to this band and tune receiver to 15 mc. Inject a signal of this frequency and adjust T4, T5 and T6 for maximum output.

**Band 3** (7.5-3 mc).—Switch to band three. Inject and tune in a signal of 7.5 mc and adjust T7, T8 and T9 for maximum output. Check at 3 mc.

**Band 4** (1.3-3 mc).—Switch to this band and tune set to 1.5 mc. Inject a signal of this frequency and adjust T10, T11 and T12 for maximum output. Inject and tune in a 3 mc signal and adjust P1 for maximum output.

**Band 5** (1,500-520 kc) (200-576.9 m).—Switch receiver to MW and tune set to 1,500 kc. Inject a signal of this frequency and adjust T13, T14 and T15 for maximum output. Inject and tune in a signal of 750 kc and adjust P2 for maximum output.

**WINDINGS**

L	Ohms	L	Ohms
1 .. .. .	Low	16, 17, 18 ..	Low
2 .. .. .	1	19 .. .. .	2
3 .. .. .	2	20 .. .. .	3.5
4 .. .. .	3	21, 22, 23, 24 ..	Low
5 .. .. .	7	25 .. .. .	1
6, 7, 8 ..	Low	26 .. .. .	1.4
9 .. .. .	.2	28 .. .. .	5.6
10 .. .. .	3.5	29 .. .. .	5.6
11 .. .. .	Low	30 .. .. .	6.9
12 .. .. .	1	31 .. .. .	7
13 .. .. .	2	32 .. .. .	500
14 .. .. .	3	33 .. .. .	760
15 .. .. .	7.8	34 .. .. .	34