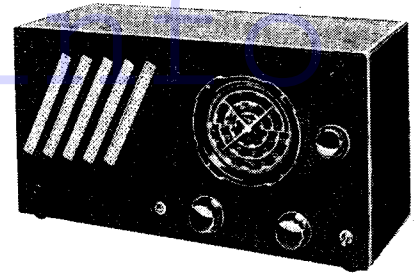


B.T.S. "TROPHY 5" SUPERHET



The Trophy 5, by British Television Supplies, is an inexpensive type of "communication" receiver.

CIRCUIT.—Aerial coupling to the signal grid of V1, the frequency changer, is by H.F. transformers on all bands. Provision is made for connecting either a doublet or a single wire aerial. The oscillator section follows standard practice.

An I.F. transformer, tuned to the coupling forms between V1 and another frequency changer valve V2. The hexode section operates as an I.F. amplifier and the triode section works as a beat frequency oscillator, the coupling between the I.F. amplifier and the beat frequency oscillator being effected internally. A Q.M.B. switch controls the oscillator.

Another I.F. transformer provides the coupling to the strapped diodes of V3, a double diode triode. The secondary of the transformer is also connected to the potentiometer, R10, which forms the manual volume control and the diode load. A.V.C. potentials are fed from R10 to the signal grid of V1 via R9. A Q.M.B. switch across C6 shorts out the A.V.C. when the beat frequency oscillator is used.

The triode section of V3 is resistance capacity coupled to the output pentode V4. A condenser, C15, effects a fixed tone modification. A headphones connection is made from the anode of the output valve.

Mains equipment consists of a transformer, a full-wave rectifying valve, V5, electrolytic smoothing condensers, and a smoothing choke (the speaker field).

Radio Chassis Removal.—Slots are cut in the cabinet to allow access to the oscillator trimmers.

Remove the three grub-screw-fixed control knobs and take off the nuts securing the A.V.C. and beat frequency oscillator control switches. Remove the three chassis-securing screws from the base. One of the chassis-securing screws is the rubber foot on the front right-hand corner.

Unsolder the connecting leads from the radio chassis to the tags on the power-pack chassis. When replacing, refer to the drawing of power-pack chassis for the connections.

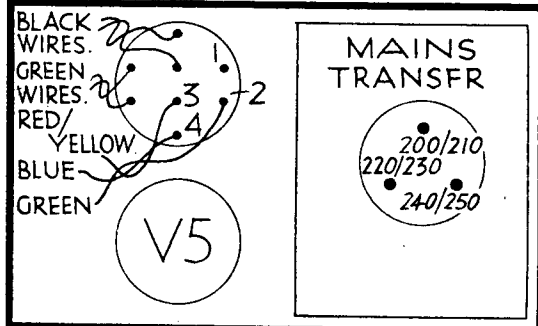
Power Pack Removal.—If the inter-connecting wires to the power-pack chassis are connected and the three screws on the base of the cabinet

CONDENSERS

C.	Purpose.	Mfds.
1	L.W. aerial shunt	.00005
2	V1 cathode bias	.1
3	V1 screen decoupling	.1
4	Osc. grid	.0001
5	Osc. anode coupling	.01
6	V1 A.V.C. decoupling	.05
7	V2 cathode bias shunt	.1
8	B.F.O. grid	.001
9	B.F.O. anode coupling	.001
10	V3 cathode bias shunt	.0001
11	H.F. bypass	.1
12	V3 cathode bias shunt	.1
13	L.F. coupling	.01
14	L.F. coupling	.01
15	V4 cathode bias shunt	.25
16	Pentode compensator	.01
17	H.T. smoothing	8
18	H.T. smoothing	8
19	Headphones coupling	.1
20	B1 osc. fixed padder	.0005
21	B2 osc. fixed padder	.01
22	B2 osc. fixed padder	.002

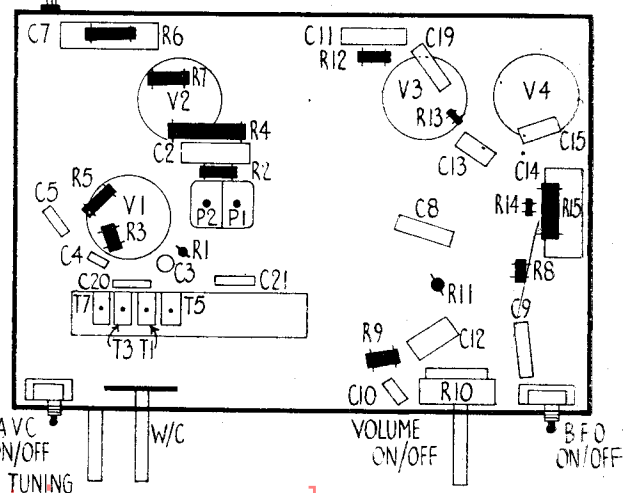
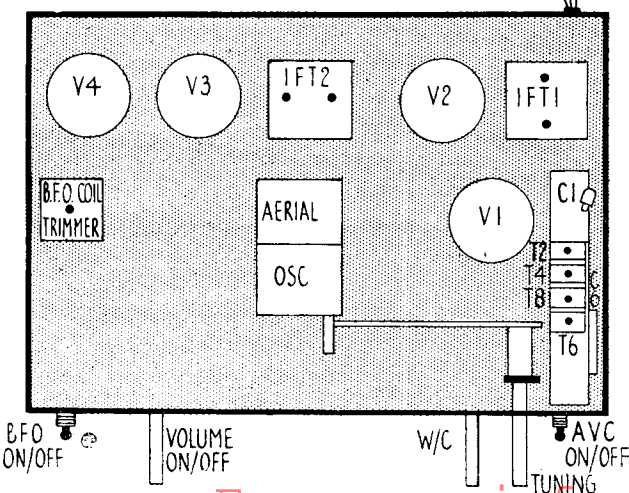
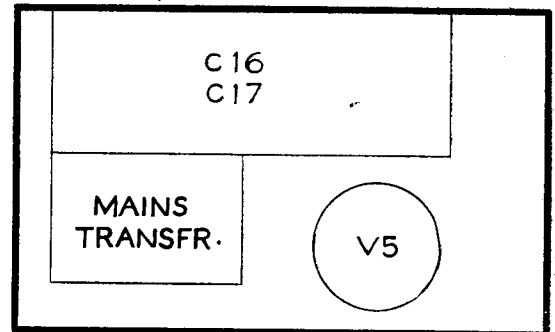
RESISTANCES

R.	Purpose.	Ohms.
1	V1 screen pot. (part)	25,000
2	V1 cathode bias	150
3	Osc. grid leak	25,000
4	V1 screen pot. (part)	15,000
5	Osc. anode load	15,000
6	V2 cathode bias	200
7	B.F.O. grid leak	100,000
8	B.F.O. anode load	50,000
9	V1 A.V.C. decoupling	1 meg.
10	V3 diodes load and volume control	250,000
11	V3 grid leak	1 meg.
12	V3 cathode bias	5,000
13	V3 anode load	250,000
14	V4 grid leak	250,000
15	V4 cathode bias	500



Left and right are diagrams giving practical details of the separate power pack.

Below are diagrams identifying all the parts on the chassis proper. Details of connections between the two chassis are given in the text.



(securing the power-pack chassis) are removed, it will be found possible to operate the receiver just clear of the cabinet.

Should it be found necessary to remove the power-pack chassis to effect replacements, the systoflex wires should be unsoldered from the panel on the chassis deck. The power-pack chassis may then be completely removed from the cabinet and replacements effected.

Looking from the rear of the chassis and counting from left to right, the first tag on the speaker panel is connected to No. 1 (see drawing), the second tag to No. 2, the fourth and fifth tags to No. 3, whilst to No. 4 is connected the lead from the headphone jack.

Special Notes.—A jack on the front enables headphones to be used, and insertion of the plug cuts off the internal speaker. The D.C. component is blocked by C18. If hum is experienced, try reversing the mains plug.

A Q.M.B. switch near the volume knob controls the beat frequency oscillator. The frequency of the beat may be adjusted by a trimmer on the top of the can.

A similar switch near the wave section switch enables the A.V.C. to be cut out.

When using a doublet, the brown and blue leads should be connected and no earth connection made. With a single-wire aerial, the blue lead should be connected to the aerial and the black lead to an earthing system.

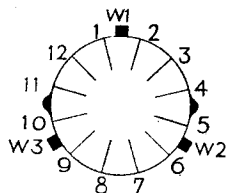
C18, the headphones coupling condenser, is suspended in the wiring to the jack.

I.F. Circuits.—Connect an output meter across the primary of the output transformer.

VALVE READINGS

No signal. Volume max. M.W. min. capacity 200 volt A.C. mains. A.V.C. on, B.F.O. off.

V.	Type.	Electrode.	Volts.	Ma.
1	6 TH8	Anode ..	215	5
		Screen ..	90	10.3
		Osc. anode ..	110	7
2	6 F7	Anode ..	212	7
		Screen ..	90	2.8
		Osc. anode ..	85	2.5
3	6 Q7G	B.F.O. on ..	64	.3
		Anode ..	190	22.5
4	6 P6G	Anode ..	212	4
		Screen ..	348	—
5	5 Z4G	Cathode ..	—	—



The switch bank of the Trophy 5 with contacts numbered to correspond with the circuit given below.

switch set to M.W., turn gang to maximum and volume control to maximum. Switch off the beat frequency oscillator and the A.V.C. Connect a service oscillator between the top grid cap of V1 and chassis.

Tune service oscillator to 465 kc. and adjust the trimmers of I.F.T.2 and then I.F.T.1 for maximum.

Signal Circuits.—Connect the service oscillator via a dummy aerial to the blue and black (earth) leads of the receiver.

Medium Waves.—Tune set and oscillator to 200 metres (1,500 kc.) and adjust T1 and then T2 for maximum.

Tune set and oscillator to 450 metres (670 kc.) and adjust P1 for maximum, simultaneously rocking the gang.

B3 (68-200 metres).—Tune set and oscillator to 80 metres (3,560 kc.) and adjust T3 and then T4 for maximum.

Tune set and oscillator to 200 metres (1,500 kc.) and adjust P2 for maximum, simultaneously rocking the gang.

B2 (23-70 metres).—Tune set and oscillator to 40 metres (7,500 kc.) and adjust T5 and then T6 for maximum.

B1 (10-23 metres).—Tune set and oscillator to 10 metres (30 mc.) and adjust T7 and then T8 for maximum response.

WINDINGS (D.C. Resistances)

L.	Ohms.	Range.	Where measured.
1	.3	—	Brown and blue aerial wires.
2	1.1	—	Brown and black wires.
3	Very low	B1	Top grid V1 and earth wire (A.V.C. off).
4	.1	B2	Top grid V1 and earth wire (A.V.C. off).
5	.3	B3	Top grid V1 and earth wire (A.V.C. off).
6	3	B4	Top grid V1 and earth wire (A.V.C. off).
7	Very low	B1	C4 and C20.
8	Very low	B2	C4 and C21.
9	.7	B3	C4 and P2.
10	2.5	B4	C4 and P1.
11	.15	B1	C5 and earth wire.
12	.45	B2	C5 and earth wire.
13	.7	B3	C5 and earth wire.
14	1.15	B4	C5 and earth wire.
15	8.4	—	White and red wires IFT1.
16	8.3	—	Top grid V2 and blue wire IFT1.
17	8.2	—	White and red wires IFT2.
18	8.2	—	Green and blue wire IFT2.
19	210	—	C8 and earth wire.
20	207	—	C9 and earth wire.
21	2200	—	End tags speaker panel.
O.T. prim.	760	—	2nd and 4th tags spkr. panel.

B.T.S. Trophy Five

MODEL Trophy 5.—For A.C. mains, 200-250 volts, 40-100 cycles. Price £9.

DESCRIPTION.—Four-valve, plus rectifier, four-band communication type superhet.

FEATURES.—Full-vision airplane type scale with mechanical band spread using a vernier pointer with scale length equivalent to 8 ft. Scale calibrated in metres and 200 degrees round the periphery. Three short bands and medium, no long waves. Controls for combined volume and master switch, wave selection, tuning and separate Q.M.B. switches for beat oscillator on-off and A.V.C. on-off. Jack for phones. Provision for doublet or single-wire aerial. Receiver contained in metal cabinet with black crackle finish.

LOADING.—55 watts.

Sensitivity and Selectivity

SHORT WAVES (10-23, 23-70 and 68-200 metres).—Good sensitivity for the valve combination and adequate selectivity. Tuning control ratio suitable, although sprung chassis detracts a little from the ease of tuning.

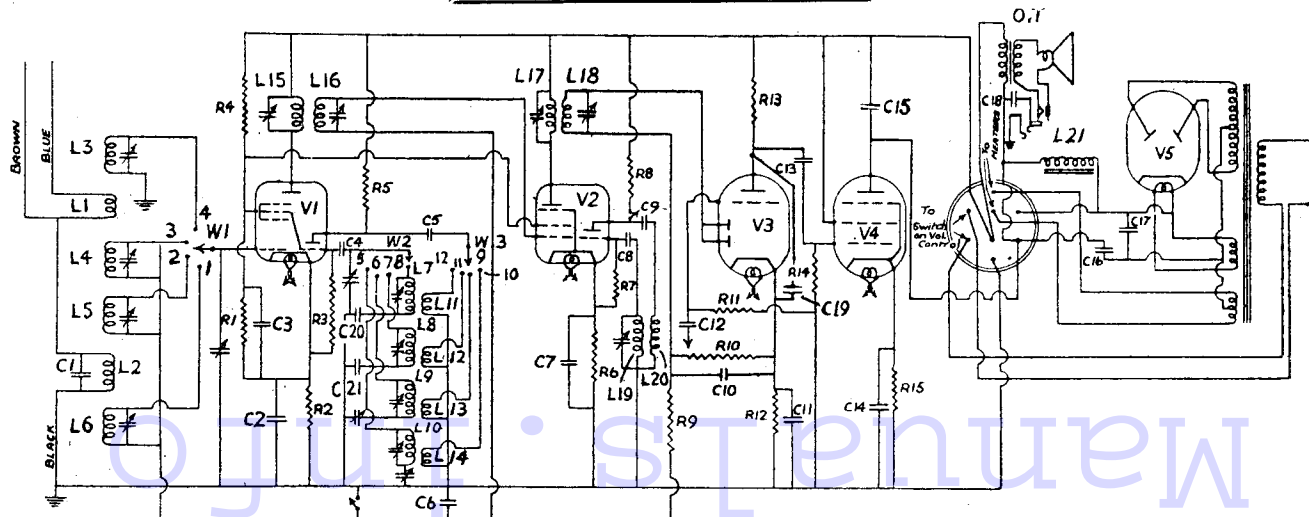
MEDIUM WAVES (200-550 metres).—Reasonable medium wave performance with all main stations easily received, slight double tune point noted on local stations. Good background.

Acoustic Output

Ample volume for communication purposes and good volume for broadcast work in an average-sized room. Well balanced tone and no undue colouration on speech.

Replacement Condensers

Replacement condensers available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18, are: For C14, 2918, 1s. 9d.; and for the block containing C's 16 and 17, 4188, 6s. 9d.



Three short bands and the medium waves are covered by the Trophy 5. There are no long waves. The triode section of V2 is used as a beat frequency oscillator.