

NUMBER 110

TRADER SERVICE SHEETS

TRUPHONIC UW5  
AND RG/UW5 RADIO-GRAMOPHONE

WAVELENGTHS of 16-50, 200-600 and 1,000-2,000 metres are covered by the Truphonic UW5 all-wave A.C./D.C. superhet receiver. This model has an octode frequency changer, a variable-mu pentode I.F. amplifier, a double diode triode and a pentode output valve, and is suitable for operation on mains of 200-250 V (40-80 c.p.s. in the case of A.C.).

Provision is made for a gramophone pick-up and for an extension speaker, and fitted at the back of the chassis are a sensitivity switch and a tone control.

This chassis is also available in radio-gramophone form, when it is known as the RG/UW5.

CIRCUIT DESCRIPTION

Aerial input on M.W. and L.W. via series condenser C1, switch S1 and coupling coils L1, L2 to capacity-coupled band-pass filter. Primary L3, L4 tuned by C26; secondary L5, L6 tuned by C30; coupling condensers C3 and C4. On short-wave band aerial input is via series condenser C1, switch S2, and coupling coil L7 to single-tuned circuit L8, C30.

First valve (V1, Mullard metallised FC13C) is an octode operating as

frequency changer with electron coupling. Oscillator grid coils L9, L10 (M.W. and L.W.) and L12 (S.W.) tuned by C31; anode reaction coils L11 (M.W. and L.W.) and L13 (S.W.); tracking by C7, C33 (M.W.) and C8, C34 (L.W.). Trimming on S.W. is effected by C35 and on M.W. and L.W. by C32.

Second valve, a variable-mu H.F. pentode (V2, Mullard metallised VP13C) operates as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings L14, L15 and L16, L17. Noise suppression by additional cathode resistance R11 which increases fixed G.B. applied when switch S16 is open.

Intermediate frequency 127 KC/S.

Diode second detector forms part of double diode triode valve (V3, Mullard metallised TDD13C) working with diode anodes strapped. Audio-frequency component in rectified output is developed across load resistance R13 and passed via coupling condenser C14 to grid of triode section, which operates as L.F. amplifier. I.F. filtering by stopper R12 and by-pass C18. Provision for connection of gramophone pick-up in V3 C.G. circuit.

D.C. potential developed across R12,

R13 is fed back through decoupling circuit R9, C10 as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacity coupling by R17, C16 and R19 (manual volume control) between V3 triode and output pentode (V4, Brimar 7D6). Tone correction in anode circuit by fixed condenser C19; variable tone control by R.C. filter R21, C20. Provision for connection of high-impedance external speaker across primary of internal speaker transformer T1.

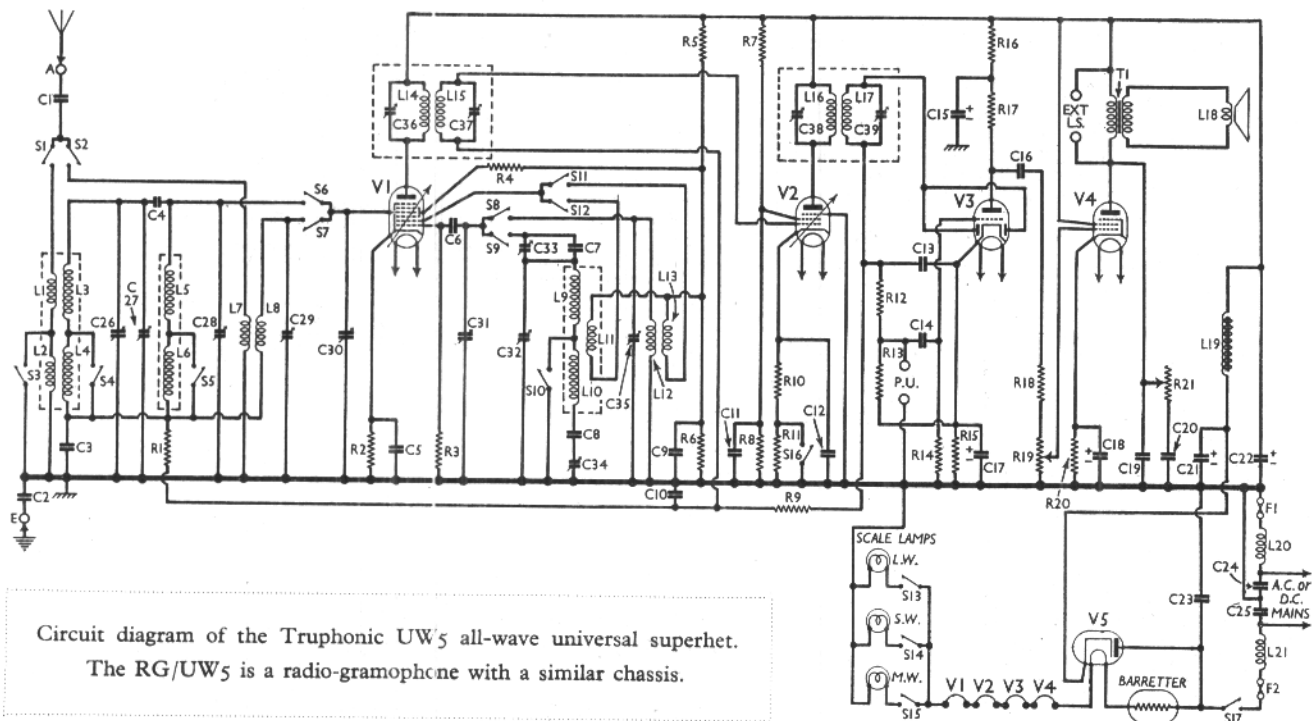
When the receiver is used with A.C. mains, H.T. current is supplied by a half-wave rectifying valve (V5, Brimar 1D5), which, with D.C. supplies, behaves as a resistance of low value. Smoothing is effected by choke L19 and dry electrolytic condensers C21, C22.

Valve heaters are connected in series together with scale lamps and automatic voltage regulating barretter lamp (Philips C1) across mains input circuit. Chokes L20, L21 and condensers C23, C24, C25 form a filter for the suppression of mains-borne interference.

DISMANTLING THE SET

Removing Chassis.—If it is necessary to remove the chassis from the cabinet, remove the back and the four control knobs (recessed grub screws). Unplug the speaker connections and remove the four bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis can now be withdrawn by lifting it up slightly.

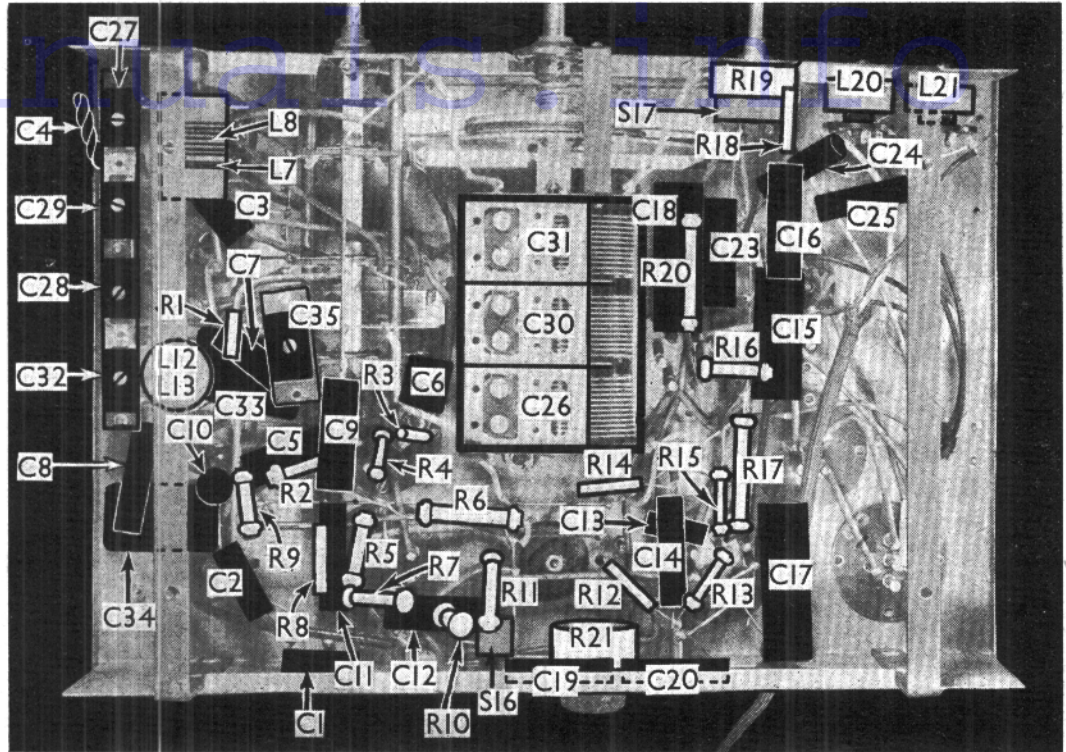
If it is desired to carry out tests with



Circuit diagram of the Truphonic UW5 all-wave universal superhet. The RG/UW5 is a radio-gramophone with a similar chassis.

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Under-chassis view. L7, L8 and L12, L13 are the S.W. coil units. The switch unit is to the left of the gang condenser, and a diagram of it is given overleaf. C4 is a small condenser formed of twisted wires.



the chassis in operation, the speaker leads must be extended.

**Removing Speaker.**—To remove the speaker, unplug the connections and remove the nuts and lock washers from the four bolts holding it to the sub-baffle. When replacing, see that the transformer is on the left.

**Removing Radio-Gramophone Chassis.**—The chassis can be removed from the radio-gramophone model by removing the knobs, disconnecting the motor and pick-up and unsoldering the earthing lead to the motor and pick-up. Now unscrew the chassis board, disconnect the speaker leads and remove the chassis fixing bolts.

**COMPONENTS AND VALUES**

Resistances		Values (ohms)
R1	V1 tetrode C.G. decoupling ..	100,000
R2	V1 fixed G.B. resistance ..	250
R3	V1 oscillator C.G. resistance ..	50,000
R4	V1 S.G.'s H.T. feed ..	1,000
R5	V1 S.G.'s and oscillator anode potential divider ..	15,000
R6	..	25,000
R7	V2 S.G. potential divider ..	10,000
R8	..	50,000
R9	A.V.C. line decoupling ..	1,000,000
R10	V2 fixed G.B. resistance ..	500
R11	Noise suppressor resistance ..	5,000
R12	I.F. stopper ..	50,000
R13	V3 diode load ..	250,000
R14	V3 C.G. resistance ..	500,000
R15	V3 G.B. resistance ..	1,000
R16	V3 anode decoupling ..	5,000
R17	V3 anode load ..	25,000
R18	V4 C.G. I.F. stopper ..	500,000
R19	Manual volume control ..	500,000
R20	V4 G.B. resistance ..	130
R21	Variable tone control ..	25,000

Condensers		Values (μF)
C1	Aerial series condenser ..	0.0001
C2	Earth blocking condenser ..	0.001
C3	Band-pass coupling condenser ..	0.02
C4	Band-pass top coupling ..	Very low
C5	V1 cathode by-pass ..	0.1
C6	V1 oscillator C.G. condenser ..	0.00005
C7	Oscillator M.W. tracker, fixed ..	0.001
C8	Oscillator L.W. tracker, fixed ..	0.002
C9	V1 S.G.'s and osc. anode decoupling ..	0.1
C10	A.V.C. line decoupling ..	0.005
C11	V2 S.G. by-pass ..	0.01
C12	V2 cathode by-pass ..	0.1
C13	I.F. by-pass ..	0.0002
C14	L.F. coupling to V3 triode ..	0.01
C15*	V3 triode anode decoupling ..	2.0
C16	V3 to V4 L.F. coupling ..	0.1
C17*	V3 cathode by-pass ..	50.0
C18*	V4 cathode by-pass ..	50.0
C19	Fixed tone corrector ..	0.002
C20	Part of tone control filter ..	0.05
C21*	H.T. smoothing ..	24.0
C22*	..	8.0
C23	..	0.1
C24	Mains circuit by-passes ..	0.01
C25	..	0.01
C26†	Band-pass primary tuning ..	0.0005
C27†	Band-pass primary trimmer ..	0.00005
C28‡	Band-pass secondary trimmer ..	0.00005
C29‡	Aerial circuit trimmer (S.W.) ..	0.00005
C30†	B.P. secondary and S.W. aerial tuning ..	0.0005
C31†	Oscillator tuning ..	0.0005
C32†	Oscillator trimmer (M.W. and L.W.) ..	0.00005
C33‡	Oscillator M.W. tracker ..	0.002
C34‡	Oscillator L.W. tracker ..	0.002
C35‡	Oscillator trimmer (S.W.) ..	0.00005
C36‡	1st I.F. trans. pri. tuning ..	—
C37‡	1st I.F. trans. sec. tuning ..	—
C38‡	2nd I.F. trans. pri. tuning ..	—
C39‡	2nd I.F. trans. sec. tuning ..	—

\* Electrolytic. † Variable. ‡ Pre-set.

Other Components		Approx. Values (ohms)
L1	Aerial coupling coils (M.W. and L.W.) ..	1.0
L2	..	2.5
L3	Band-pass primary coils ..	1.2
L4	..	13.5
L5	Band-pass secondary coils ..	3.5
L6	..	22.0
L7	Aerial coupling coil (S.W.) ..	0.1
L8	Aerial tuning coil (S.W.) ..	Very low
L9	Oscillator tuning coils (M.W. and L.W.) ..	2.6
L10	..	14.5
L11	Oscillator reaction coil (M.W. and L.W.) ..	7.0
L12	Oscillator tuning coil (S.W.) ..	Very low
L13	Oscillator reaction coil (S.W.) ..	0.35
L14	1st I.F. trans. Pri. ..	120.0
L15	.. Sec. ..	120.0
L16	2nd I.F. trans. Pri. ..	120.0
L17	.. Sec. ..	120.0
L18	Speaker speech coil ..	1.8
L19	H.T. smoothing choke ..	300.0
L20	Mains filter chokes ..	2.6
L21	..	2.6
T1	Speaker input trans. (Pri. ..	750.0
..	.. Sec. ..	0.25
St-S12	Waveband switches ..	—
S13	Scale lamp switches ..	—
S15	..	—
S16	Noise suppressor switch ..	—
S17	Mains switch, ganged R19 ..	—
Fr, F2	Mains circuit fuses, 0.5 A ..	—

**VALVE ANALYSIS**

Valve voltages and currents given in the table overleaf were measured with the receiver operating on A.C. mains of 225 V. The volume control was at maximum and the receiver was tuned to the lowest wavelength on the medium band, but there was no signal input. The sensitivity control was also in the

(Continued overleaf)

TRUPHONIC UW5

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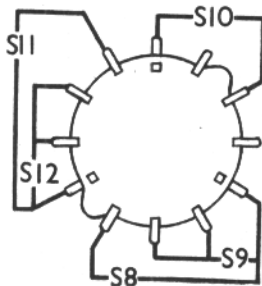
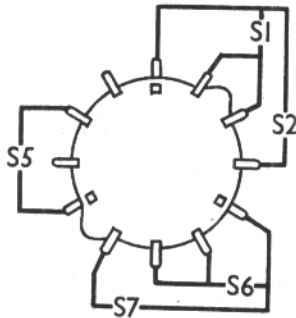
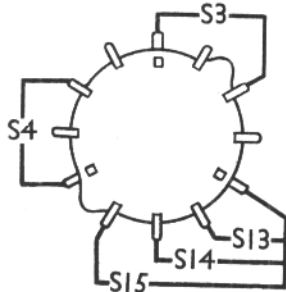
maximum position ("A.V.C." position).  
 Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 FCr3C*	248	1.1	80	3.4
V2 VPr3C	248	6.1	185	2.1
V3 TDDr3C	140	3.4	---	---
V4 7D6	220	35.0	250	6.2
V5 1D5†	---	---	---	---

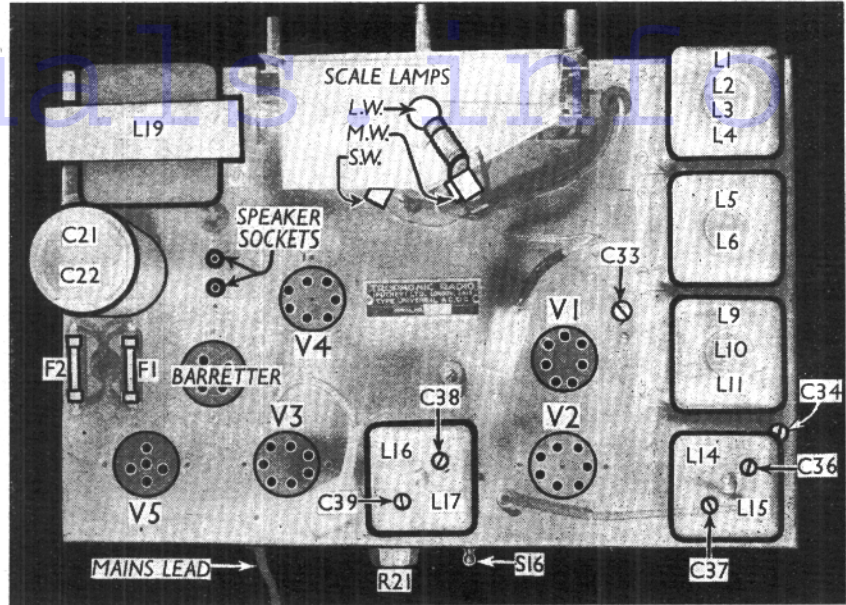
\* Osc. anode (G2) 90 V, 3.0 mA.  
 † Cathode to chassis, 268 V, D.C.

GENERAL NOTES

**Switches.**—The waveband and scale lamp switches, S1-S15, are in three ganged rotary units beneath the chassis.



Diagrams showing the switches in the three ganged units, as seen looking at the underside of the chassis, from the rear. The top unit is that nearest the control knob.



Plan view of the chassis. Note the trimmers C33 and C34. There are three scale lamps, in separate compartments. The leads from the speaker plug into the sockets indicated on the chassis deck.

The individual switches cannot be indicated in the under-chassis view, but are shown in a separate diagram, which gives the switch positions from the rear of the underside of the chassis. Note that some contacts are common to several switches, while others are blank. The table below gives the switch positions for the various control settings, O indicating open, and C closed.

Switch	S.W.	M.W.	L.W.
S1	O	C	C
S2	C	O	O
S3	O	C	O
S4	O	C	O
S5	O	C	O
S6	O	C	C
S7	C	O	O
S8	C	O	O
S9	O	C	C
S10	O	C	O
S11	C	O	O
S12	O	C	C
S13	O	O	C
S14	O	C	O
S15	C	O	O

S16, the noise suppressor switch, is a Q.M.B. single pole shorting type at the rear of the chassis. It is closed in the "A.V.C." position (knob down).

S17 is the Q.M.B. mains switch, ganged with the volume control R19.

**Coils.**—All the tuning coils, except those for the S.W. band, are in five screened units on the chassis deck. L7, L8 and L12, L13 are on small un-screened tubular formers beneath the chassis. L20 and L21, the mains filter

chokes are two multi-layer windings fitted to the inside of the front of the chassis.

**Scale Lamps.**—There are three of these, one for each waveband. They are all of the Osram M.E.S. type, rated at 4.5 V, 0.3 A.

**External Speaker.**—Two sockets are provided at the rear of the chassis for the connection of a high resistance external speaker.

**Condensers C21, C22.**—These are two dry electrolytic condensers in a single tubular metal unit mounted on the chassis deck. The black lead is the common negative, the yellow the positive of C21 (24 μF), and the red the positive of C22 (8 μF).

**Fuses F1, F2.**—These are both standard 1½ ins. glass tubular types, rated at 500 mA.

**Condenser C4.**—This is a very small condenser formed of twisted insulated wires.

CIRCUIT ALIGNMENT

**I.F. Transformers.**—Adjust C39, C38, C37 and C36 for maximum output at 127 KC/S.

**Signal Frequency and Oscillator Circuits.**—First, align for the M.W. band by adjusting tuning pointer to London National setting, and injecting a 1,149 KC/S signal. Adjust C32, C28 and C27 for maximum output, in that order. Turn pointer to North Regional, and adjust C33 so that this station is in alignment with the correct scale setting. Switch to L.W. band, turn pointer to Huizen, and adjust C34 to bring this station into alignment. Now switch to S.W. band, turn pointer to 16 m., inject a signal of 17,790 KC/S and adjust C35 for maximum output. Similarly adjust C29.