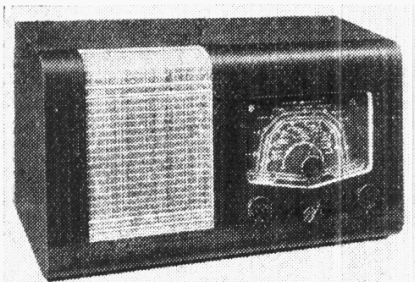


"TRADER" SERVICE SHEET

501

K.B. 875

AC/DC SUPERHET



MAINS input circuit filtering and three-position tone control are provided on the Kolster-Brandes model 875.

The receiver is a four-valve (plus valve rectifier) AC/DC three-band superhet, designed to operate from mains of 200 V to 250 V, 40-60 C/S in the case of AC.

The chassis is divided into two units: the main receiver chassis and the power unit. The connections between the two units are effected by an octal-type plug on a flexible lead.

Release date: May, 1940.

CIRCUIT DESCRIPTION

Aerial input is developed across the aerial circuit choke coil **L1** via aerial and earth mains isolating condensers **C1** and **C2**, and the signal across **L1** is then fed to the tuned circuits via the coupling potential divider **C3**, **C4** and the short wave coupling coil **L2** in the following manner: on SW, the impedance of **C3** and **C4** is negligible, and practically the whole signal is developed across **L2** and passed to the single-tuned circuit **L3**, **C30**.

On MW and LW, the impedance of **L2** is negligible, and the signal voltage is divided between **C3** and **C4**, that across **C4**, which is included the tuning circuits, being passed to the single tuned circuits **L4**, **C30** (MW) and **L5**, **C30** (LW).

First valve (**V1**, **Brimar 6A8G**) is a heptode operating as frequency changer with electronic coupling. Oscillator section grid coils **L6** (SW), **L7** (MW) and **L8** (LW) are tuned by **C31**. Parallel trimming by **C32** (SW), **C33** (MW) and **C8**, **C34** (LW); series tracking by **C35** (MW) and **C10**, in series with **C35** (LW). There is no tracking condenser in the SW band. Reaction coupling is accomplished on

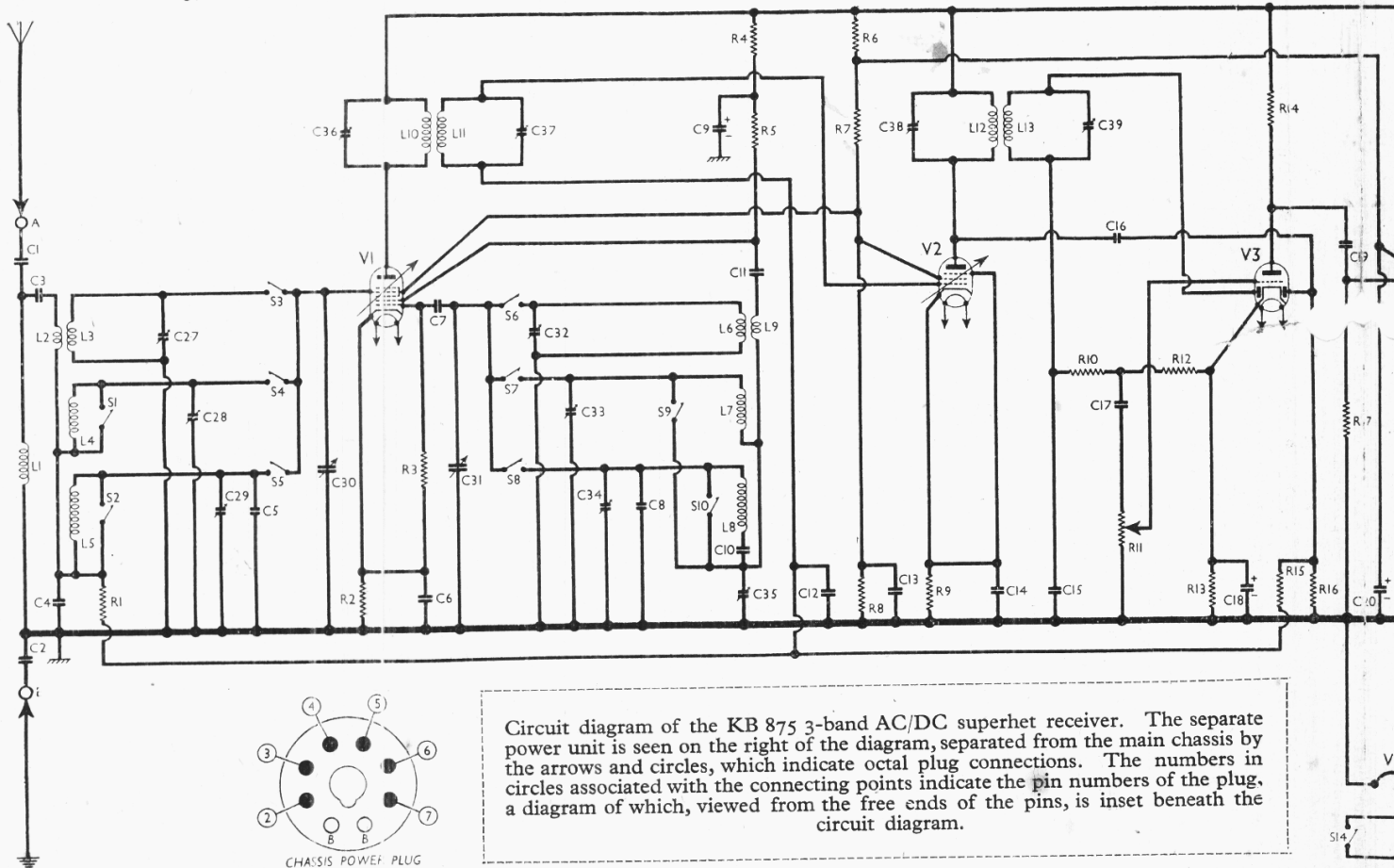
the SW band by means of the coupling coil **L9**, and on the MW and LW bands by the common impedance of the tracker **C35** in grid and anode circuits.

Second valve (**V2**, **Brimar 6U7G**) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings, **C36**, **L10**, **L11**, **C37** and **C38**, **L12**, **L13**, **C39**.

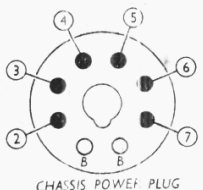
Intermediate frequency 464 KC/S.

Diode second detector is part of double diode triode valve (**V3**, **Brimar 6Q7G**). Audio frequency component in rectified output is developed across load resistance **R12** and passed via AF coupling condenser **C17** and manual volume control **R11** to control grid of triode section, which operates as audio frequency amplifier. IF filtering by **C15**, **R10** in diode circuit.

Second diode of **V3**, fed from **V2** anode via **C16**, provides DC potential which is developed across load resistance **R16** and fed back through decoupling circuits as GB to FC (except on SW band) and IF valves, giving automatic volume control. Delay voltage, together with GB for



Circuit diagram of the KB 875 3-band AC/DC superhet receiver. The separate power unit is seen on the right of the diagram, separated from the main chassis by the arrows and circles, which indicate octal plug connections. The numbers in circles associated with the connecting points indicate the pin numbers of the plug, a diagram of which, viewed from the free ends of the pins, is inset beneath the circuit diagram.



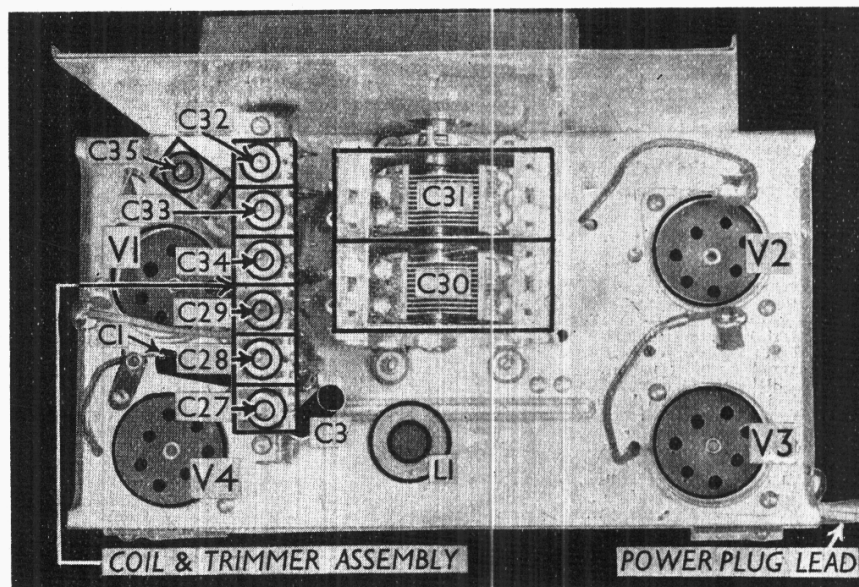
triode section, is obtained from drop along resistance **R13** in cathode lead.

Resistance-capacity coupling by **R14**, **C19** and **R17** between **V3** triode section and pentode output valve (**V4**, **Brimar 25A6G**). Fixed tone correction by **C22** in anode circuit. Three-position tone control by condenser **C23**, the resistances **R19** and **R20** and switches **S11**, **S12** and **S13**, also in anode circuit. The condenser and resistances are arranged in series between anode and chassis via one of the switches, additional resistances progressively reducing the high-note attenuation.

Connections between the main receiver chassis and the separate power unit and speaker assembly are shown in the circuit diagram, to the right of **V4**. The output of this valve is taken to the speaker input transformer **T1** via the power unit.

When the receiver is used with AC mains, HT current is supplied by IHC rectifying valve (**V5**, **Brimar 25Z6G**), which operates with its two halves strapped in parallel as a half-wave rectifier; with DC mains it behaves as a low resistance. Smoothing is effected by the speaker field **L16** in conjunction with the electrolytic condensers **C24**, **C25**.

Valve heaters, together with ballast resistance **R23**, are connected in series, in the order shown in the diagram, across the mains input circuit. Filter circuit, comprising air-cored chokes **L17**, **L18** and the by-pass condenser **C26** suppresses mains-borne interference.



Plan view of the chassis. A detailed view of the coil and trimmer assembly is shown in cols. 2 and 3 overleaf.

DISMANTLING THE SET

Removing Chassis.—Remove the four control knobs (recessed grub screws) from the front of the cabinet, taking care not to lose the felt washer on the tuning control spindle;

withdraw from the power unit the octal plug connecting it to chassis; remove the two round-head wood screws holding the top of the scale backing plate to the front of the cabinet; remove the staples holding the protective insulating strips to the bottom of the cabinet, and lift the strips, to expose the heads of the chassis fixing screws (four round-head set-screws, with claw washers and lock-washers) which remove.

When replacing, fit a flat metal washer to each fixing bolt, between the chassis and the bottom of the cabinet;

replace the protective strips over the heads of the fixing screws, slipping a felt pad between the strip and head of each of the two front fixing screws;

note that two felt washers are fitted to the tuning control spindle, one going between the scale pointer and the celluloid window, and a thinner one between the window and the control knob. Finally, re-wax the heads of the grub-screws.

Removing Power Unit.—Withdraw the octal connecting plug; unsolder the four leads from the speaker transformer; remove the three round-head set-screws (with claw washers and lock-washers) holding the unit to the bottom of the cabinet.

When replacing, the speaker leads should be connected as follows, numbering the tags on the speaker transformer from left to right:

- 1, no external connection;
- 2, blue;
- 3, red from power unit and red from speaker field;
- 4, brown.

The black (earthing) lead should be connected to the frame tag on the right at the foot of the transformer.

Removing Speaker.—Unsolder the four connecting leads; remove the four japanned round-head wood screws (with paxolin washers) holding the speaker assembly to the sub-baffle.

When replacing, see that the transformer is at the top, and connect the leads as described above.

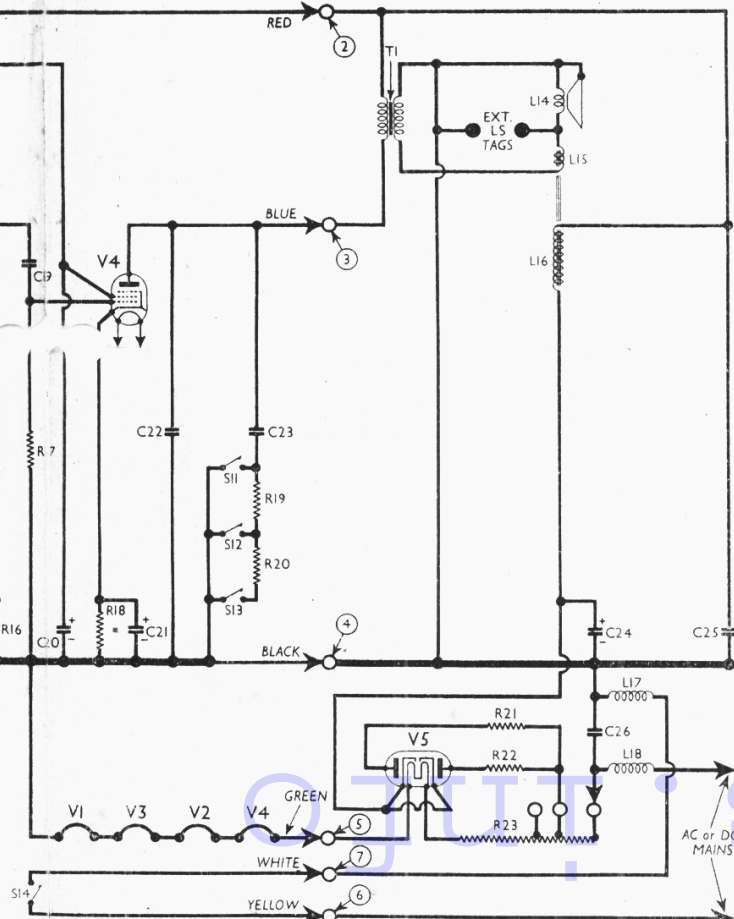
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on AC mains of 235 V, using the 250 V tapping on the mains resistance.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6ASG	170	3.4	74	2.9
	{ Oscillator 102	{ 3.2		
V2 6U7G	170	5.0	74	1.6
V3 6Q7G	55	0.25	—	—
V4 25A6G	150	35.0	126	6.3
V5 25Z6G	220†	—	—	—

† Cathode to chassis, DC.

The receiver was tuned to the lowest



wavelength on the medium band, and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

If valve adaptors are used to obtain current readings, the valve screens should be slipped over the valves and earthed while the reading is taken.

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial isolating condenser	0-01
C2	Earth isolating condenser	0-01
C3	Aerial coupling potential divider condensers	0-005
C4		0-005
C5	Aerial LW fixed trimmer	0-00025
C6	V1 cathode by-pass	0-1
C7	V1 osc. CG condenser	0-0001
C8	Osc. circ. LW fixed trimmer	0-00015
C9*	V1 osc. anode decoupling	2-0
C10	Osc. circuit LW tracker	0-00023
C11	V1 osc. anode coupling	0-01
C12	V2 CG decoupling	0-1
C13	V1, V2 SG's decoupling	0-1
C14	V2 cathode by-pass	0-1
C15	IF by-pass	0-0005
C16	Coupling to V3 AVC diode	0-00025
C17	AF coupling to V3 triode	0-01
C18*	V3 cathode by-pass	25-0
C19	V3 triode to V4 AF coupling	0-02
C20*	V4 SG decoupling	2-0
C21*	V4 cathode by-pass	25-0
C22	Fixed tone corrector	0-005
C23	Part of tone control	0-03
C24*	HT smoothing condensers	16-0
C25*		8-0
C26	Mains RF by-pass	0-01
C27†	Aerial circuit SW trimmer	0-00004
C28†	Aerial circuit MW trimmer	0-00004
C29†	Aerial circuit LW trimmer	0-00004
C30†	Aerial circuit tuning	—
C31†	Oscillator circuit tuning	—
C32†	Osc. circuit SW trimmer	0-00004
C33†	Osc. circuit MW trimmer	0-00004
C34†	Osc. circuit LW trimmer	0-00008
C35†	Osc. circuit MW tracker	0-00075
C36†	1st IF trans. pri. tuning	0-00022
C37†	1st IF trans. sec. tuning	0-00022
C38†	2nd IF trans. pri. tuning	0-00022
C39†	2nd IF trans. sec. tuning	0-00022

* Electrolytic. † Variable. ‡ Pre-set.

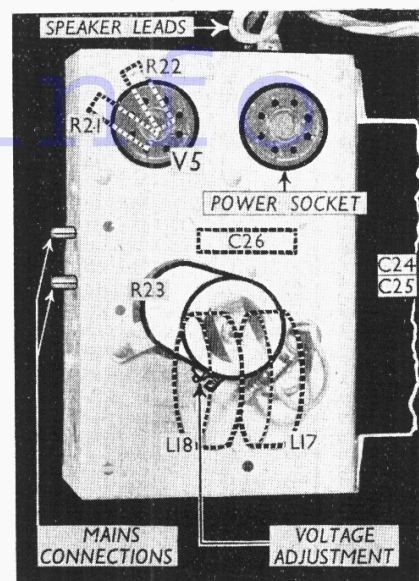
RESISTANCES		Values (ohms)
R1	V1 pentode CG decoupling	500,000
R2	V1 fixed GB resistance	300
R3	V1 osc. CG resistance	50,000
R4	V1 oscillator anode HT feed resistances	5,000
R5		15,000
R6	V1, V2 and V4 SG's HT feed potential divider	3,000
R7		10,000
R8		50,000
R9	V2 fixed GB resistance	300
k10	IF stopper	50,000
R11	Manual volume control	500,000
R12	V3 signal diode load	500,000
R13	V3 triode GB; AVC delay	5,000
R14	V3 triode anode load	250,000
R15	AVC line decoupling	500,000
R16	V3 AVC diode load	500,000
R17	V4 CG resistance	250,000
R18	V4 GB resistance	400
R19	Parts of tone control	5,000
R20		50,000
R21	V5 anodes surge limiters	100
R22		100
R23		Heater circuit ballast

* Tapped at 430 Ω + 85 Ω + 70 Ω from V5 heater.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial circuit choke	27-0
L2	Aerial SW coupling coil	0-4
L3	Aerial SW tuning coil	Very low
L4	Aerial MW tuning coil	2-5
L5	Aerial LW tuning coil	30-0
L6	Osc. circuit SW tuning coil	Very low
L7	Osc. circuit MW tuning coil	5-0
L8	Osc. circuit LW tuning coil	16-0
L9	Oscillator SW reaction	0-5
L10	1st IF trans. { Pri. Sec. }	7-5
L11		7-5
L12	2nd IF trans. { Pri. Sec. }	7-5
L13		7-5
L14	Speaker speech coil	2-5
L15	Hum neutralising coil	0-2
L16	Speaker field coil	800-0
L17	Mains filter chokes	2-8
L18		2-8
T1	Speaker input trans. { Pri. Sec. }	540-0
S1-S10	Waveband switches	—
S11-S13	Tone control switches	—
S14	Mains switch, ganged R11	—

GENERAL NOTES

Switches.—S1-S10 are the waveband switches, in a single rotary unit beneath the chassis. This is indicated in our under-chassis view, mounted behind the front member of the chassis. The unit is shown in detail in the lower half of the diagram in col. 1, where it is seen as viewed from the rear of the underside of the chassis.



Plan view of the power unit.

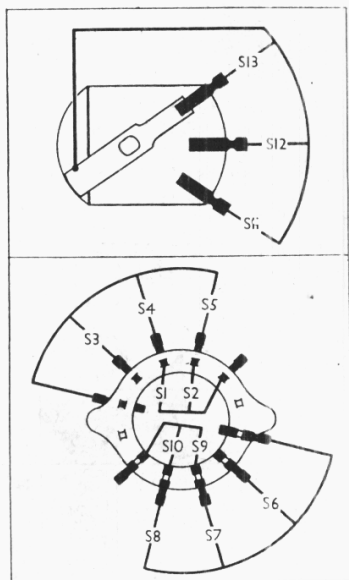
The table (col. 4) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C, closed.

S11-S13 are the tone control switches. They are comprised in a three-position rotary unit, which is shown mounted at the middle of the front chassis member in our under-chassis view. The unit is shown in the upper half of the diagram in col. 1, where it is seen as viewed from the rear of the underside of the chassis.

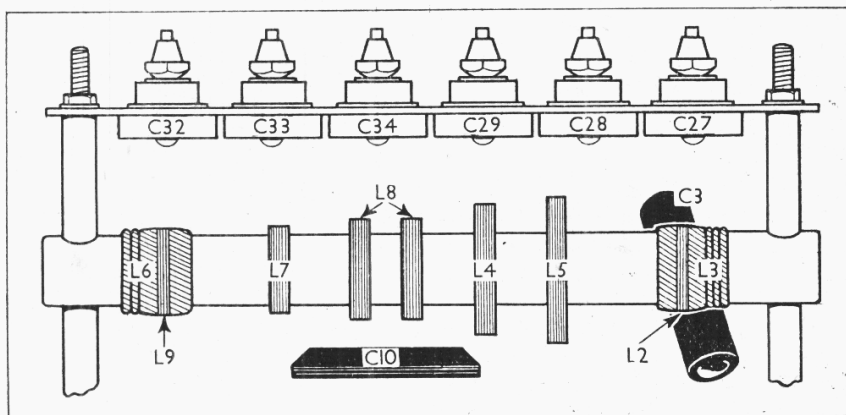
In the fully anti-clockwise position of the control spindle, S11 is closed, giving "deep" response; in the next position, S12 is closed; in the fully clockwise position, S13 is closed, giving maximum treble response.

S14 is the QMB mains switch, ganged with the volume control R11. It is, therefore, located in the main chassis, and is connected to the power unit via pins 6 and 7 on the octal power plug.

Coils.—With the exception of the aerial choke L1, which is mounted unscreened on a vertical former on the chassis deck, all the RF and oscillator coils L2-L9, with their associated pre-set trimmers, are mounted unscreened in a row on a single



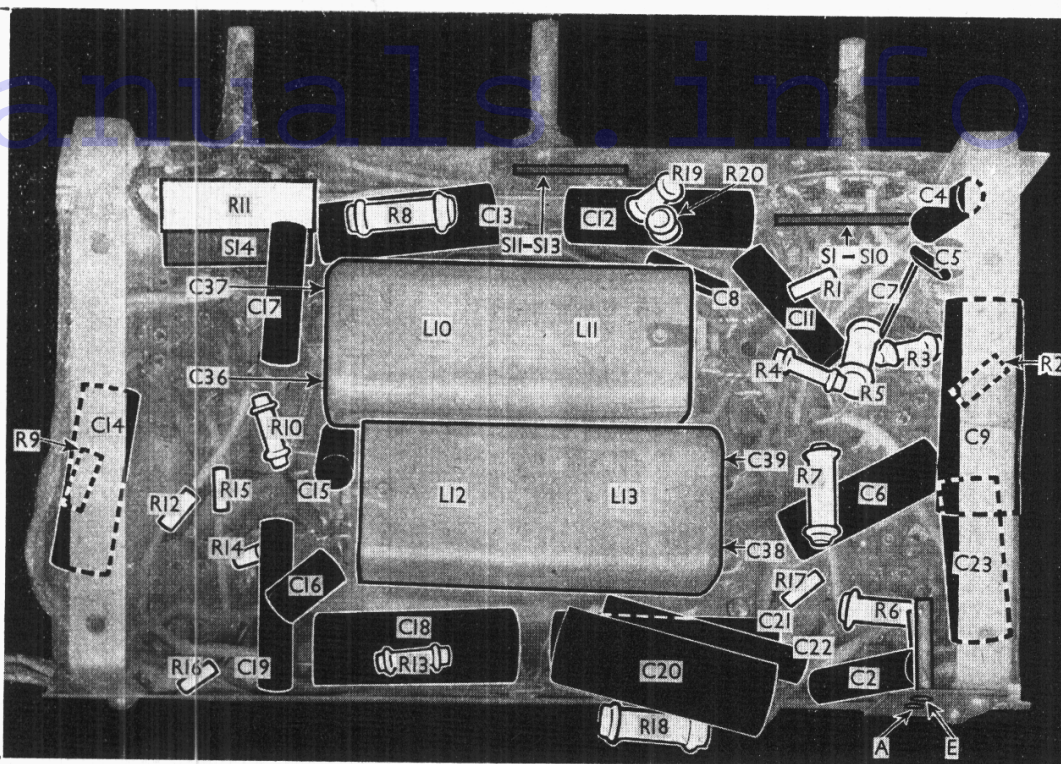
Diagrams of the two switch units:
Above: The tone control unit.
Below: The waveband unit.



Detailed sketch of the coil and trimmer assembly, drawn as seen looking in the direction of the arrow in the plan view.

Manuals.info

Under-chassis view. The two switch units are indicated here, and shown in detail in the diagrams in col. 1 opposite. The IF transformers are mounted horizontally in the centre of the chassis, their trimmers in pairs facing opposite directions. S14 is connected to the power unit via pins 6 and 7 of the power plug.



tubular paxolin former running transversely from back to front above the chassis deck. The position of the assembly is indicated in our plan view, where the trimmers are indicated in the usual way, but a drawing of the assembly, showing the positions of the individual coils, is shown in cols. 2 and 3, where it is viewed as seen when looking over V1 holder. Several other components are also shown in the drawing.

The IF transformer coils L10, L11; and L12, L13, are mounted in two screened units side by side, facing opposite directions, beneath the chassis deck, with their associated trimmers, whose positions are indicated in our under-chassis view.

External Speaker.—No sockets are provided for this, but a low impedance (about 2.5 Ω) speaker could be connected to the left-hand tag on the speaker input transformer T1 and chassis, in parallel with the internal speaker speech coil L14. It must be borne in mind then, however, that one side is connected directly to chassis and is "live" to the mains.

Condensers C9, C20.—These are the decoupling condensers for V1 oscillator anode and V4 screen grid. They are contained in two separate cardboard tubular cases, and are both rated at 2 μF, the voltage ratings being 250 V working and

Switch Table

Switch	LW	MW	SW
S1	—	—	○
S2	—	○	○
S3	—	—	○
S4	—	○	—
S5	○	—	—
S6	—	—	○
S7	—	○	—
S8	○	—	—
S9	—	—	○
S10	—	○	○

325 V surge in the case of each condenser.

Condensers C18, C21.—These are two dry electrolytics, in separate cardboard tubular containers, mounted at the rear beneath the chassis. They are both rated at 25 μF, 25 V working, 35 V surge.

Condensers C24, C25.—These are two dry electrolytics in a single rectangular cardboard container, mounted on the front member of the power unit. They are indicated in our illustration of the power unit, where they extend beyond the right-hand edge of the illustration.

The red lead is the positive of C24 (16 μF), and is connected to pin 1 of the power socket; the yellow lead is the positive of C25 (8 μF), and is connected to pin 2 of the power socket; the black lead (common negative) is connected to pin 4.

Pre-set Condensers.—All the pre-set condensers, excepting the IF trimmers, are on the chassis deck, and are indicated in our plan view. C27, C28, C29; and C32, C33, C34 are the RF and oscillator trimmers, mounted in a row above the coil assembly.

Power Plug.—A standard American octal valve type plug and socket is used to connect together the receiver chassis and the power supply unit. The plug is connected to the receiver via six colour-coded leads, indicated in the circuit diagram.

The socket is mounted on the power unit, at the side of V5 holder.

CIRCUIT ALIGNMENT

IF Stages.—Short-circuit C31, turn volume control to maximum. Connect signal generator, via a 0.1 μF non-inductive condenser, to control grid (top cap) of V1 and chassis. Feed in a 464 KC/S (646.55 m) signal, and adjust C36, C37 and C38, C39 in turn for maximum out-

put. Re-check these settings. Remove short-circuit from C31.

RF and Oscillator Stages.—With the gang at maximum, the pointer should cover the lines at the high-wavelength ends of the scales. Connect signal generator, via a suitable dummy aerial, to A and E sockets, and keep volume control at maximum.

MW.—Before commencing the MW alignment, it is necessary first to bring the LW oscillator circuit roughly into line. Therefore, switch set to LW, tune to 1,200 m (white mark on scale), feed in a 1,200 m (250 KC/S) signal, and adjust C34 roughly for maximum output. Then tune to 1,714 m (white mark on scale), feed in a 1,714 m (175 KC/S) signal, and adjust C35 roughly for maximum output.

Switch set to MW, tune to 214 m (white mark on scale), feed in a 214 m (1,400 KC/S) signal, and adjust C33, then C28, for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust C35 for maximum output, while rocking the gang for optimum results. Repeat the 214 m adjustment as a check.

LW.—Switch set to LW, tune to 1,200 m (white mark on scale), feed in a 1,200 m (250 KC/S) signal, and adjust C34, then C29, for maximum output. There is no variable tracker on this band, but the setting should be checked at 2,000 m (150 KC/S).

SW.—Switch set to SW, replace dummy aerial with a 400 Ω resistance, tune to 20 m (white mark on scale), feed in a 20 m (15 MC/S) signal, and adjust C32 for maximum output. Two peaks will be found: use that involving the lesser trimmer capacity (nearer the fully unscrewed position). Now adjust C27 for maximum output.