

KB 740

Four-valve, plus rectifier and cathode-ray tuning indicator, three-waveband push-button superhet with alternative manual tuning. PU sockets are fitted and provision made for an external low impedance speaker with an internal speaker muting switch. Suitable for AC mains 200-250 volts, 40-60 cycles. Made by Kolster-Brandes, Ltd., Sidcup, Kent.

The aerial input (shunted by R1) is inductively coupled by L1 on SW and capacity-coupled by C2 on MW and LW to the tuned grid circuit of the triode-

hexode frequency changer V1. The tuning coils are L2 (SW), L3 (MW) and L4 (LW), and they are tuned either by VC1 section of the twin gang condenser on manual tuning or by a selected trimmer on push-button.

The screen of V1 is fed from the HT potential divider network R4, R5 decoupled by C3 while the cathode is permanently biased by R6 decoupled by C4. The grid circuit is returned to the AVC line via R3 and C19 decoupling components.

The oscillator section of V1 employs tuned grid circuits, R7 and C5 being the grid leak and condenser.

L6 (SW), L7 (MW) and L8 (LW) are the oscillator grid coils tuned either by VC2 or a selected trimmer on push-button. L5 is the oscillator anode reaction coil with additional coupling via C6 and T8 on MW and LW.

The IF signals from V1 are transferred by L9, L10 to the IF amplifier pentode V3, which is cathode biased by R11. AVC is also applied to this valve.

A second IF transformer L11, L12 passes on the signal to the signal diode

VALVE READINGS

V	Type	Electrode	Volts	Max
1	20A1 Brimar	Anode	280	1.6
		Osc anode	100	3.4
		Screen	70	1
		Cathode	1.7	—
		Anode	280	.8
2	TV4	Mullard	280	4
		9D2	70	1
		Brimar	2.6	—
4	11D3 Brimar	Anode	150	.32
		Cathode	1.6	—
		Anode	265	37
5	7D5 Brimar	Screen	280	6.5
		Cathode	18	—
		Anodes	310AC	—
6	R2 Brimar	Cathode	360DC	60
		Pilot lamps, 13-16 volts, .3 amps.		

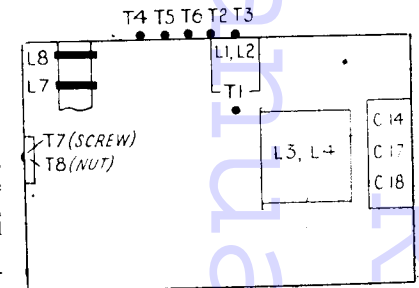
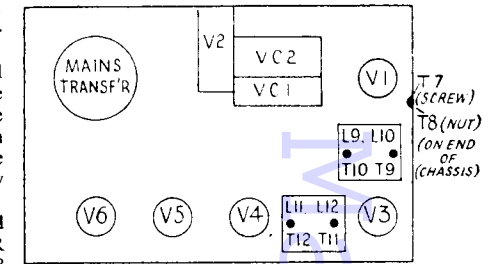
of the double-diode-triode V4, R14 being the signal load resistance filtered by C8.

The LF signal is further filtered by R12 and passed via C9 to the volume control R13, and thence to the grid of the triode section of V4. The cathode of this valve is biased by R17 decoupled by C10.

The AVC diode of V4 is fed from the anode of V3 via C11, R19 being the load resistance. R18 and C19 decouple the AVC line from which the grid of the cathode ray tuning indicator V2 is fed in addition to the grid circuits of V1 and V3.

From V4 the LF signal is resistance-capacity coupled by R15, C12 and R20 to the grid of the output pentode V5 which is cathode biased by R21 decoupled by C14. A permanent degree of tone correction is effected by C16, while variable tone control is provided by C15 and R22.

The low impedance energised loud-speaker is coupled to V5 by the matching transformer L13, L14.



Top-of-chassis layout identifying major features, and, below, underside view of chassis showing the trimmer positions.

The HT supply circuit comprises the usual arrangement of a full-wave rectifier V6, smoothing condensers C17, C18 and field winding L15. Note that V1 and V2 heaters are fed from a 4-volt tap on the 13-volt heater winding.

GANGING

IF Circuits.—Inject a 464 kcs signal into the grid of V1 and adjust T9, T10, T11 and T12 for maximum output keeping the input low.

MW Band.—Check that pointer coincides with horizontal lines at top of scale when vanes of gang are fully in mesh. Switch receiver to MW and set pointer on dot at the 1,400 kcs calibration mark.

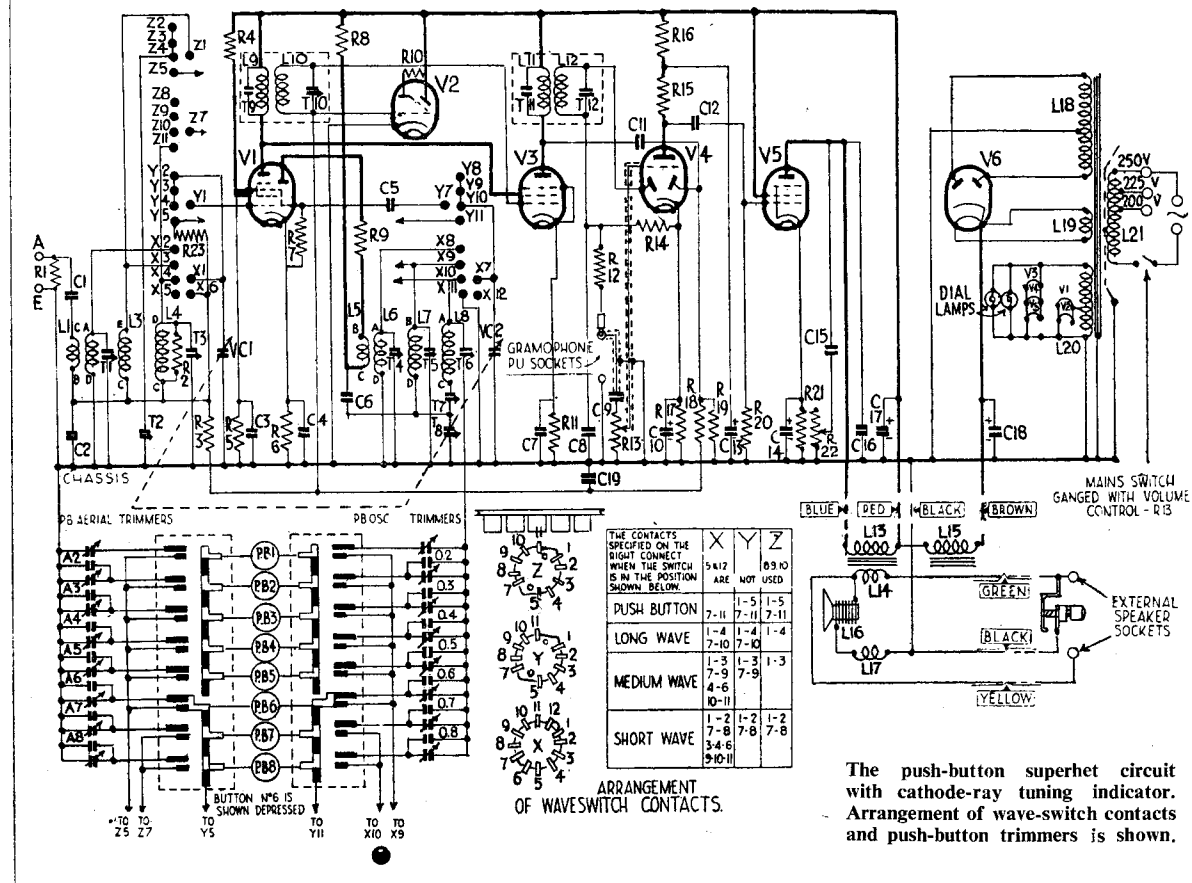
Inject a 1,400 kcs signal into the A and E sockets and adjust T5 and then T2 for maximum output.

Tune receiver to 600 kcs; inject a signal of this frequency and adjust T8 for maximum output.

Check adjustments of T5 and T2. Whenever the medium or long-wave circuits are re-aligned it will be necessary to readjust all the push-button trimmers.

LW Band.—Switch receiver to LW and set pointer to 300 kcs. Inject a 300 kcs signal into the A and E-sockets

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EKCO AD 36

Three-valve, plus rectifier, two-waveband TRF receiver for operation from AC or DC mains 200/250v, 50/100 cycles. Marketed by E. K. Cole, Ltd., Southend-on-Sea.

AERIAL input is via C1 to a differential variable coupling condenser VC1, which is the volume control, and thence to the tapped tuned grid circuit coils L2, L3 (MW), L4, L5 (LW). On LW a further coil, L1, is in circuit to prevent MW interference.

Aerial tuning is effected by VC2 section of the twin ganged condenser, and signals are passed direct to the grid of the HF pentode V1. This valve is cathode biased by R1 decoupled by C3.

The output from V1 on MW is by means

of the HF choke L11 and coupling condenser C4 to the grid coil L8 tuned by VC3. On LW, L11 is shorted and L10 functions as a coupling coil to L9, the LW grid coil.

Leaky grid rectification is employed, C5 and R2 being the grid condenser and grid leak in the grid circuit of the detector triode V2. Reaction from the anode circuit of this valve is via the variable condenser reaction control VC4 and the windings L6, L7. C6 is the anode to cathode HF by-pass.

Low frequency signals are resistance capacity coupled by R3, C8 and R5 to the grid of the pentode output valve V3. This valve is cathode biased by R6 decoupled by C9.

A permanent degree of tone correction is effected by C10, and the low impedance energised moving coil loudspeaker is coupled by the matching transformer L12, L13 to the output valve. L14 is the hum bucking coil and L15 the speech coil, while the field winding is L16.

The high- and low-tension supply circuits are taken from the mains through HF

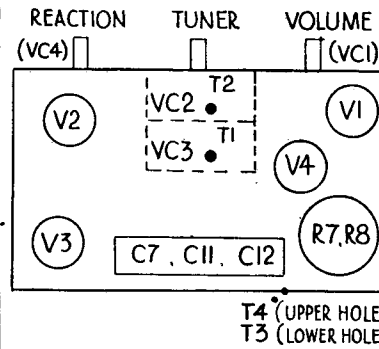
filter chokes L17, L18, with C13 as the HF by-pass condenser.

High tension supply is obtained through the fullwave rectifier V4, which has its anodes strapped so that it functions as a half-wave rectifier, and smoothing is effected by the speaker field L16 and condensers C11, C12.

The heater circuit comprises the normal arrangement of valve heaters in series with the mains voltage dropping resistance R8 with a shunt, R9, across the pilot lamp. A separate winding on the mains voltage dropping resistance assembly is shunted across the HT supply and is shown as R7 in the accompanying circuit diagram.

VALVE READINGS

V	Type	Electrode	Volts	Ma
1	SP13	Anode	190	6
2	Mullard HL13	Screen	190	2.4
		Anode	41	2.5
3	PEN 3520	Anode	166	34.5
	Mazda	Screen	190	8
		Cathode	7	—
4	ID 5	Cathode	222	—
	Brimar			
	Pilot Lamp		6.2v.	.3 amp.



Chassis layout showing position of trimmers. T1 and T2 are accessible through holes in the base of the cabinet.

GANGING

MW Band.—Switch receiver to MW and inject a 250 metre signal into the aerial and earth sockets. Adjust T1 and T2 for maximum output. At the same time the reaction control should be manipulated and the gang rocked to obtain good results under normal conditions.

LW Band.—Switch receiver to LW and inject a 1,500 metre signal; adjust T3 for maximum output.

CONDENSERS

C	Mfds	C	Mfds
1	.001	8	.01
2	.1	9	.25
3	.1	10	.01
4	.00001	11	.24
5	.0001	12	.8
6	.001	13	.1
7	.2		

RESISTANCES

R	Ohms	R	Ohms
1	300	6	165
2	1 meg.	7	5,000
3	50,000	8	560 + 100 + 100
4	4,000	9	100
5	500,000		

WINDINGS

L	Ohms	L	Ohms
1	13	10	2.75
1A	.2	11	.36
2	2.5	12	.650
3	2.5	13	.25
4	27.5	14	.1
5	27.5	15	1.5
6	3.75	16	400
7	2.5	17	2.5
8	2.5	18	2.5
9	27.5		

Circuit diagram of the three-valve TRF universal receiver employing leaky grid rectification and resistance capacity LF coupling to the pentode output valve.

AERIAL BALANCING CIRCUIT

This circuit comprises trimmers T4 and backing-off coil L1A, wound the aerial end of the aerial coil former.

To adjust this circuit tune in to a loud signal on MW, and set volume control to minimum position and the reaction control to maximum usable position. Adjust T4 (top aperture at the rear of the chassis) until signal disappears or is reduced to a minimum.

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and adjust T6 and then T3 for maximum output.

Tune receiver to the dot adjacent to the 175 kcs calibration mark. Inject a signal of this frequency and adjust T7 (screw) for maximum output.

SW Band.—Switch receiver to SW and set pointer to 17 mcs where a dot will be seen. Inject a signal of this frequency into the receiver and adjust T4 for maximum output, employing the minimum capacity setting of T4 as two positions of maximum output will be found. Then adjust T1 for maximum output while rocking gang.

There is no padding trimmer on the SW band.

Push-Button Alignment

Turn the wavechange switch to the push-button position, i.e., fully counter clockwise, and depress the push-button concerned. Now adjust the oscillator trimmer (screw), immediately behind the button, to give the maximum signal from the desired station.

The correct setting is obtained when the illuminated pattern on the tuning indicator is at its maximum size.

Next adjust the aerial trimmer with the special box spanner to give the maximum signal as indicated by the tuning indicator. It is important to adjust the oscillator trimmer first and to check the setting after any adjustment made to the aerial trimmer.

Faulty Output Stage

AN Ekco set was being tested for weak reception, and although the components, valves and voltages were OK, the output stage seemed faulty.

As a test, the detector was fed into a separate amplifier and this gave full output.

Further tests revealed that the anode current of the output valve was low, and the filament volts were only half the value normally used. The separate filament winding to this valve was found faulty.—F.D.L.

