

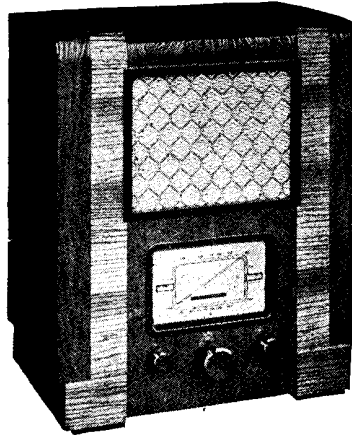
# SERVICE ENGINEER

## KOLSTER-BRANDES MODEL 428 A.C. SIX

**CIRCUIT.**—A six-valve including rectifier receiver for operation on 200-210 volt A.C. mains, covering the usual medium and long wavelengths, and having a special socket for plugging in a K.B. short-wave converter.

The aerial is inductively coupled to the H.F. valve, V1, an H.F. pentode, and signals then pass via an inductively-coupled H.F. coil to V2, a frequency changer. This is coupled to V3, an H.F. pentode, through an air-cored I.F. transformer tuned to 130 kc.

The output of V3 is fed to V4, a double diode, through a second I.F. transformer, having variable coupling to act as a selectivity control. One diode of V4 acts as a detector and the second diode is coupled to the first through a small fixed condenser. A small part of the signal voltage is rectified to provide A.V.C. volts for the preceding valves.



The popular Model 428 by Kolster Brandes, Ltd. (above) is a five valve plus rectifier superhet with provision for using a Rejectostat aerial.

The large diagrams (below) show the construction of the receiver chassis, the "tinted" one being the plan and the other (right) the underside view. Underneath these are similar views of the separate mains chassis. To remove this the leads have to be unsoldered from the output transformer. The order of the connections is given under "Exposing Chassis."

The L.F. output of V4 is passed by means of the volume control, VR1, to the output pentode V5, and then to the speaker through a matching transformer.

Mains equipment consists of transformer, full-wave rectifier, electrolytic condensers and the speaker field.

**Special Notes.**—The dial lamps are rated at 6.2 volt .3 amp. The holders are clipped vertically on the dial assembly.

An external speaker is connected on the low resistance side of the output transformer, and should have a speech coil impedance of from 1.5 ohms.

**Exposing Chassis.**—Most of the work that may be found necessary can be done without removing the chassis, by inverting (Continued on next page.)

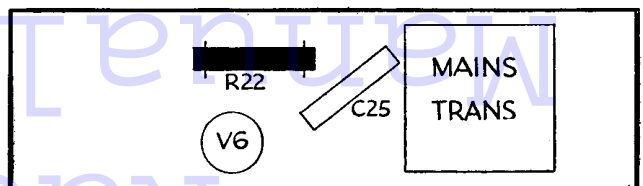
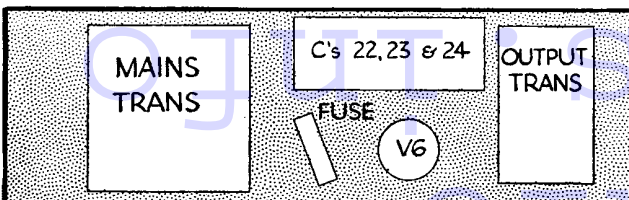
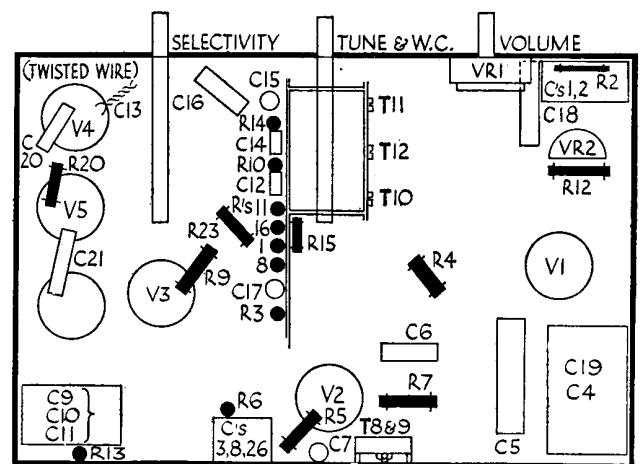
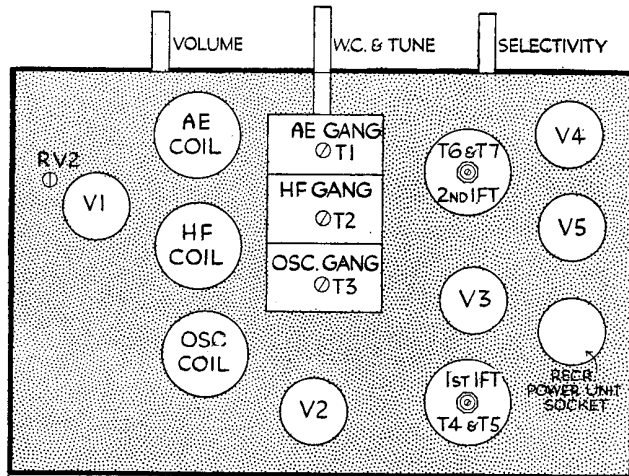
### QUICK TESTS

Quick tests are available on this receiver on the left-hand side of the terminal board on the output transformer.

Volts measured between this and the chassis should be:—

Red lead, 251 v, smoothed H.T.  
Blue lead, 240 v, smoothed H.T.  
Green lead, 330 v, unsmoothed H.T.

VALVE READINGS					
No signal. Volume at maximum. Selectivity turned fully clockwise. 200 volts A.C. mains.					
V.	Type.	Electrode.	Volts.	Ma.	
1	9D2 (7) ...	anode ...	205	4.5	
		screen ...	90	1	
2	15D1 (7) ...	anode ...	210	.25	
		screen ...	45	2.75	
		osc. anode ...	90	2.5	
3	9D2 (7) ...	anode ...	210	2.25	
		screen ...	95	1.1	
4	10D1 (5) ...	diode ...	—	—	
	(Above are Brimar)				
5	Pen4VB (7) (Mullard)	anode ...	210	35	
		screen ...	225	3.5	
6	R3 (4) (Micromesh)	filament ...	365	—	



# KOLSTER-BRANDES 428 A.C. SIX (Continued)

ing the cabinet and removing the inspection cover that will be found underneath the cabinet. This is secured by four wood screws.

Should it be found necessary to remove the chassis completely, the procedure is as follows:—

Remove the three knobs from the front of the cabinet (grub screws) and six bolts from underneath and release the plug connecting the power chassis to the receiver from its socket.

To remove the power unit, first unsolder the leads from the output transformer on the right of the cabinet. The connections (looking from the back of cabinet) are as follows:—

Primary (left), 1 and 2, red lead; 3, blue; 4, two green leads.

Secondary (right), A and G, yellow; B, yellow.

After removing the four bolts securing the unit to the platform, it can be completely removed from the cabinet.

## CONDENSERS

C.	Purpose.	Mfd.
1	V1 A.V.C. decoupling ...	.1
2	V1 cathode by-pass ...	.1
3	V2 A.V.C. decoupling ...	.1
4	H.T. decoupling ...	10
5	H.T. decoupling ...	.1
6	V2 osc. grid ...	.0001
7	Medium-wave padding ...	.001
8	V2 screen decoupling... ..	.1
9	H.T. decoupling ...	.5
10	V3 A.V.C. decoupling ...	.1
11	V3 cathode by-pass ...	.1
12	Filter ...	.0001
13	A.V.C. diode coupling ...	.000025
14	H.F. filter ...	.0001
15	L.F. coupling ...	.02
16	Selectivity compensating ...	.001
17	A.V.C. decoupling ...	.02
18	Tone compensating ...	.02
19	V5 cathode by-pass ...	25
20	Pentode compensating ...	.01
21	Pentode compensating ...	.0005
22	H.T. smoothing ...	8
23	H.T. smoothing ...	8
24	H.T. smoothing ...	8
25	Mains L.F. filter ...	.01
26	V2 cathode by-pass ...	.1

## RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. decoupling ...	250,000
2	V1 cathode bias ...	600
3	V2 A.V.C. decoupling ...	250,000
4	V2 grid stabiliser ...	400
5	V2 osc. grid leak ...	25,000
6	V2 cathode bias ...	300
7	V2 screen decoupling... ..	15,000
8	V3 A.V.C. decoupling ...	250,000
9	V3 cathode bias ...	600
10	Filter ...	100,000
11	Demodulator diode load ...	5 meg.
12	Tone compensating ...	20,000
13	Pick-up shunt ...	250,000
14	V5 cathode bias ...	140
15	A.V.C. decoupling ...	100,000
16	A.V.C. diode load part ...	5 meg.
17	V3 screen decoupling... ..	20,000 (2)
18	Tuning indicator feed ...	60,000
19	V5 screen decoupling... ..	3,000 (1)
20	Pentode compensating ...	20,000
21	Tuning indicator load ...	250,000
22	Voltage dropper ...	600 (3)
23	A.V.C. diode load part ...	100,000
24	V5 grid stopper ...	7,000
VR1	Volume control ...	½ meg.
VR2	Tuning indicator adjustment	25,000

## ALIGNMENT OF CIRCUITS

**I.F. Circuits.**—Connect a modulated oscillator tuned to 130 kc., through a .1 mfd. fixed condenser, to the grid cap of V1 and to earth.

With volume at maximum and sensitivity control turned fully clockwise, adjust T7, T6, T5 and T4 for maximum length of glow in the neon tuning indicator.

**Medium-wave Band.**—(1) Transfer oscillator to aerial and earth terminals and tune it and the receiver to 250 metres,

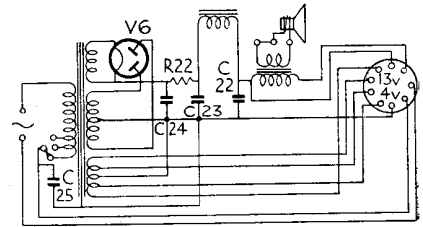
and adjust T1, T2 and T3 for maximum glow in the tuning indicator.

Two peaks will be found when adjusting T3. The first from the minimum position is the correct one.

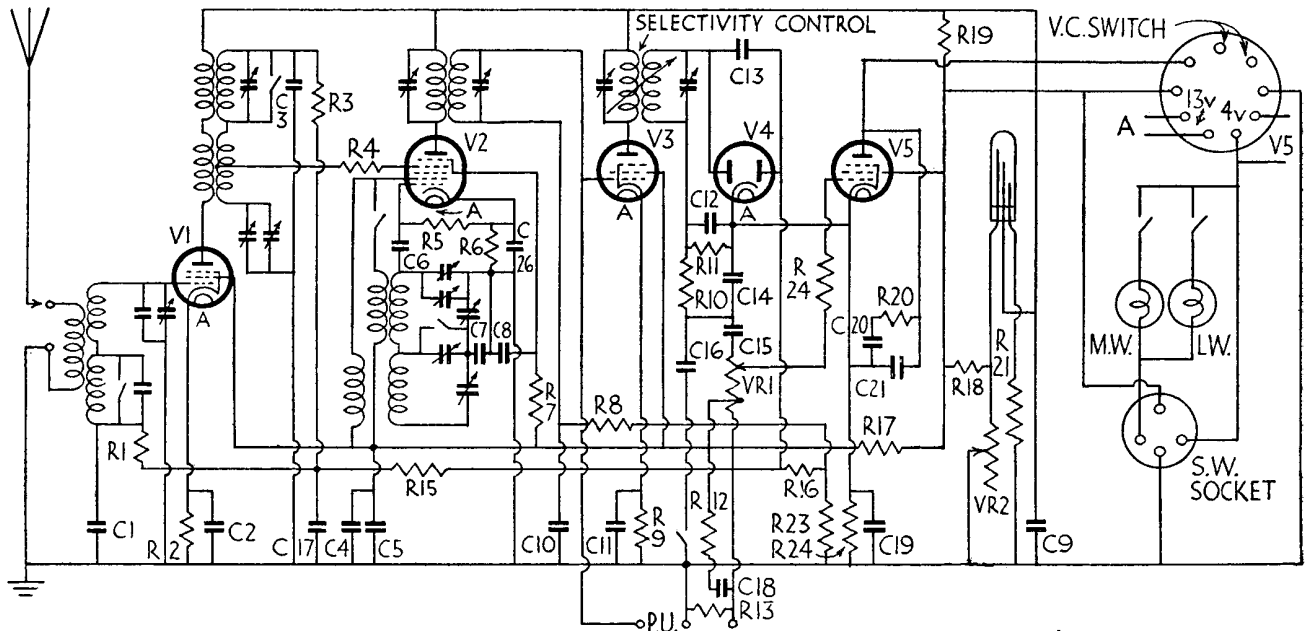
(2) Tune oscillator and set to 500 metres, and adjust T8 for maximum glow in T1, at the same time gently rocking the gang condenser.

**Long-wave Band.**—(1) Tune oscillator and receiver to 1,750 metres and adjust T9 for maximum glow in T1.

(2) Tune oscillator and receiver to 1,000 metres and adjust T12, T11 and T10 for maximum glow



The plug connections for the separate mains chassis of the K.B.428 are shown in this diagram.



In this diagram of the circuit of the K.B.428 the plug and socket connections to the mains chassis, given above, are clearly shown. Note also the separate 4-pin socket for a K.B. short wave adaptor. The selectivity control varies the coupling of the second I.F. transformer. The circuit of the separate mains unit is shown above, right.