

**PORTADYNE JUBILEE-YEAR SET (Cont.)**

waveband is trimmed by both padding and tracking condensers as shown in the diagrams. These are adjustable from above. The I.F. transformer trimmers are at the back of the chassis. The two for I.F.T.I. are slightly to the left of V2.

Pilot lamps are 6 v. .3 amp. type.  
**Quick Tests.**—Between the terminals on the speaker transformer and chassis :—  
 Top (1) H.T. unsmoothed, 320 volts.  
 (2) and (3) H.T. smoothed, 225 volts.  
 (4) V4 anode, 200 volts.  
**Removing Chassis.**—Remove the knobs

(two grub screws each), remove four holding screws underneath, pull out the three speaker connecting plugs, and free the earthing lead from underneath the nut.

Release the speaker leads from the cleat and lift the chassis out.

**General Notes.**—The condensers C16 and C17 are in one container. The red lead is C16 of 8 mfd. and the blue C17 of 4 mfd.

There is a small capacitative coupling between the band-pass coils, consisting of two wires looped together. This should not be disturbed.

The connections on the mains transformer are :—Terminals on top, counting from the outside :—

(1) and (2) rectifier heater; (3) and (4), set heaters; (5) and (6), mains and switch. Underneath (in same order) :—

(1) chassis, (2) rectifier anode, (3) chassis, (4) rectifier anode.

The centre taps of the high voltage winding and the case are actually earthed through the earthed lead of the set heaters.

**Replacing Chassis.**—Lay the chassis inside the cabinet and pull the mains lead through the aperture. Replace the holding screws and the knobs. Connect the speaker leads (the panel is coloured to correspond) and clip them. Fix the speaker earthing lead under the nut.

# KOLSTER-BRANDES MODEL 935 A.C. MAINS RECEIVER

**Circuit.**—There is a close similarity between this set and the Model 666, but as the differences are of a character likely to mislead the engineer, it is simpler to give the complete details below.

The H.F. valve, 9A1 (V1), is preceded by a tuned secondary aerial transformer. Bias is controlled partly by cathode limiting resistance and partly by A.V.C.

The following coupling is a tuned secondary H.F. transformer, the grid lead being taken through a stabilising resistance from a tapping on the coil.

The combined first detector oscillator, M.S.Pen.V. or A.C.S.2 Pen. met. (V2), has the oscillator coupling in the cathode lead, and is coupled to the next valve by a band-pass I.F. transformer (frequency 130 kc.).

The I.F. valve, 9A1 (V3), is biased by cathode resistance common to V1 and by A.V.C., and is followed by a second band-pass I.F. transformer.

The second detector and L.F. amplifier,

11A2 (V4), is used as a full-wave rectifier, the D.C. and L.F. being taken from an artificial centre tap formed by R27 and R28. R6 and R5 form the load and C16 is the grid coupling condenser.

Volume is controlled by the grid leak potentiometer of the triode section, and the grid circuit contains a tone-correction circuit, a choke used with R29, C17 and C22. Coupling

to the output valve is by resistance capacity filter.

The MPT4 (V5) output pentode is provided with a variable condenser across the grid input for tone control, and is tone compensated by a condenser across the output.

Mains equipment consists of transformer, full-wave R2 rectifier, and the speaker field in the negative H.T. lead.

**Special Notes.**—The pilot lamp is a 5.5-volt .3-amp. type, and is clipped on to a bracket standing alongside the condenser drum.

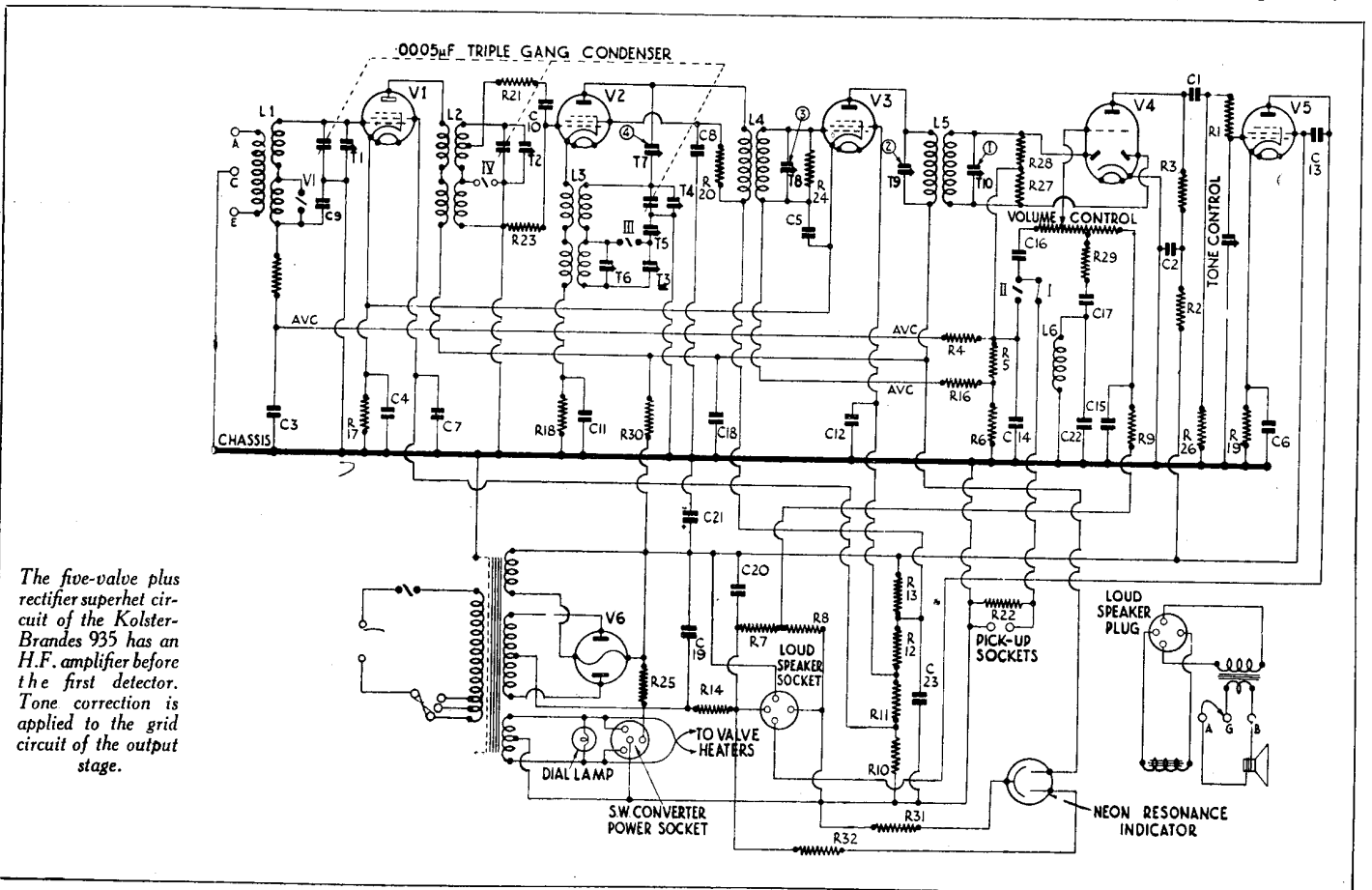
C19, C20 and C21 are each 6-mfd. electrolytic condensers and are in one block. Note that the common lead is the red H.T. + wire.

**Quick Tests.**—Between the terminals on the speaker transformer and chassis (note the polarity).

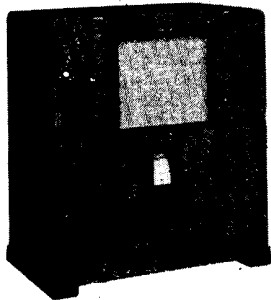
Outer row, top, (1) red and black, H.T. —, 80 v. negative;  
 (2) red, H.T. smoothed, 232 v. positive;

**VALVE READINGS**  
No signal.

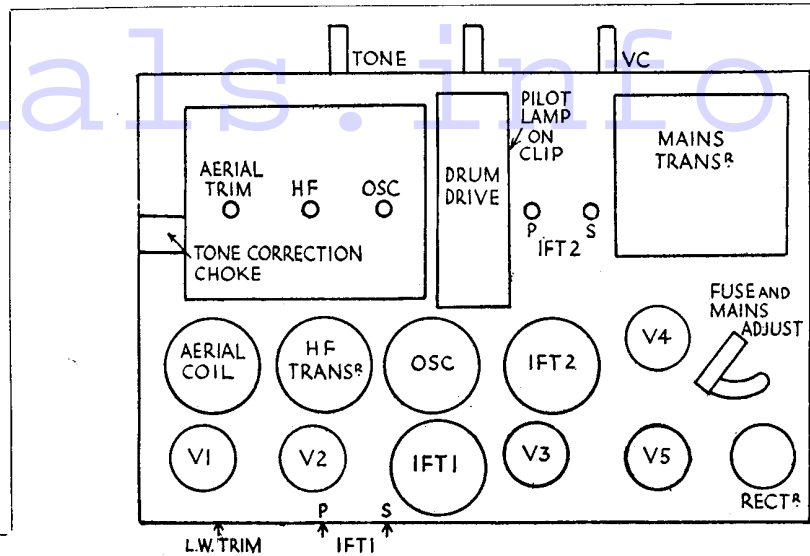
Valve.	Type.	Electrode.	Volts.	M.a.
1	9A1 met. (5) ..	anode ..	200	.8
		aux. grid ..	44	
2	A.C.S.2 Pen. met. (5).	anode ..	200	.8
		aux. grid ..	30	
3	9A1 met. (5) ..	anode ..	200	4
		aux. grid ..	80	
4	11A2 met. (7) ..	anode ..	100	1
		anode ..	220	30
5	MPT4 (7) ..	aux. grid ..	230	4



KOLSTER-BRANDES 935 SUPERHET (Cont.)

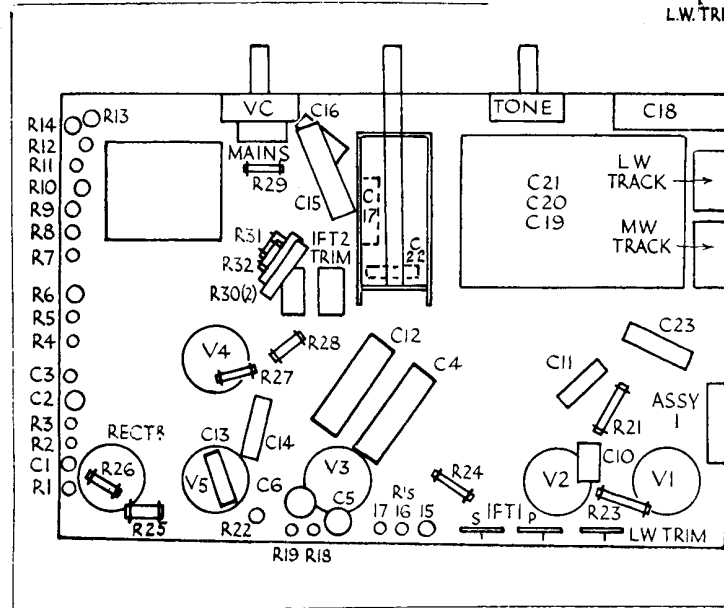


The model 935 6-valve A.C. superhet made by Kolster-Brandes, Ltd.



The positions of the trimmers are shown in the above diagram of the top of the K.-B. chassis. It is necessary to remove the chassis from the cabinet in order to gang the receiver.

Left shows the arrangement of components below the chassis of the model 935 superhet. The components in the Assembly 1 on the extreme right are C9, R20, C8 and C7.



(Continued from previous page.)  
 (3) blue, V5 anode, 220 v. positive;  
 (4) black, chassis negative.  
 (1) and (4) are speaker field,  
 (2) and (3) are primary of output transformer.

**Removing Chassis.**—Remove four holding screws underneath, pull off the knobs, remove the speaker plug and, holding the holder of the neon tube, slide the tube and holder to the right. The chassis can then be lifted out.

**General Notes**—Alignment of the circuits:—  
 Remove the chassis from the cabinet. Short circuit the cathode of V2 to the end of C11 (i.e., short the oscillator coil), and inject 130 k.c. between R21 and C10 on one side and chassis on the other. Turn switch to long waves and rotate condenser to maximum.

Trim the I.F. transformers, beginning with the secondary of I.F.T.2.

Remove the short circuit from the oscillator and inject 1,400 kc. to aerial and earth sockets.

Turn to medium waveband and set dial to read "short-wave converter." Unscrew all the trimmers on the gang condenser and then tune in the signal on the oscillator. Note that the fundamental is the first signal encountered when turning clockwise. Finally, tune the H.F. and aerial circuits.

Inject 600 kc. and tune by the tuning control. Adjust the medium-wave tracking condenser and set the pointer at 500 metres.

Inject 300 kc. and switch over to 1,000 metres on the long waveband and adjust by the long-wave trimmer.

A slight improvement may be effected by

RESISTANCES		
R.	Purpose.	Ohms.
1	H.F. stopper V5 grid .. ..	100,000 (‡)
2	V4 anode decoupling .. ..	70,000 (‡)
3	L.F. coupling V4, V5 .. ..	70,000 (‡)
4	Decoupling A.V.C. line .. ..	250,000 (‡)
5	A.V.C. ptr. and diode load .. ..	250,000 (‡)
6	A.V.C. ptr. and diode load .. ..	100,000 (‡)
7	V4 bias ptr. across L.S. field .. ..	250,000 (‡)
8	V4 bias ptr. across L.S. field .. ..	10,000 (‡)
9	Decoupling V4 grid .. ..	30,000 (‡)
10	H.T. potentiometer feed .. ..	15,000 (‡)
11	H.T. potentiometer feed .. ..	10,000 (‡)
12	H.T. potentiometer feed .. ..	25,000 (1)
13	H.T. potentiometer feed .. ..	3,000 (1)
14	H.T. smoothing and voltage dropping.	600 (2)
15	Decoupling V1 grid .. ..	250,000 (‡)
16	Decoupling A.V.C. to V3 .. ..	250,000 (‡)
17	V1 cathode bias .. ..	300 (‡)
18	V2 cathode bias .. ..	3,000 (‡)
19	V5 cathode bias .. ..	400 (‡)
20	Voltage dropping to V2 aux. grid .. ..	500,000 (‡)
21	Stabiliser from H.F. trans. tapping.	500 (‡)
22	Across P.U. .. ..	250,000 (‡)
23	V2 grid leak .. ..	2 meg. (‡)
24	Across IFT1 secondary .. ..	500,000 (‡)
25	H.T. feed to S.W. converter .. ..	5,000 (1)
26	V5 grid leak .. ..	250,000 (‡)
27	Ptr. across IFT2 secondary .. ..	250,000 (‡)
28	Ptr. across IFT2 secondary .. ..	250,000 (‡)
29	Part of tone correction circuit .. ..	5,000 (‡)
30	Decoupling H.T. to V1 and V3 (2 in series).	20,000 (1)
31	Cathode return of neon tube .. ..	5,000 (‡)
32	Pilot feed to neon anode .. ..	250,000 (‡)

returning to the medium waveband and readjusting the oscillator.

**Replacing Chassis.**—Lay chassis inside cabinet, clip on the neon tube, replace the speaker plug, the holding screws and the knobs.

When the output is poor and distorted but meter tests do not reveal faults, an insensitive speaker may be the cause. The bad quality may be due to overloading in attempting to obtain good volume.

CONDENSERS		
C.	Purpose.	Mfd.
1	V4, V5 L.F. coupling .. ..	.006
2	V4 anode decoupling .. ..	.1
3	Decoupling V1 grid .. ..	.0005
4	V1 cathode by-pass .. ..	.5
5	Decoupling V3 grid .. ..	.1
6	V3 cathode by-pass .. ..	25 (25) el.
7	V1 aux. grid by-pass .. ..	.1
8	V2 aux. grid by-pass .. ..	.1
9	Preventing short circuit of A.V.C. bias.	.1
10	V2 grid .. ..	.0001
11	V2 cathode by-pass (from osc.) .. ..	.01
12	V3 aux. grid by-pass .. ..	.5
13	Tone compensating V5 anode .. ..	.001
14	H.F. by-pass from diode .. ..	.0002
15	Decoupling bias to V4 .. ..	25 (25) el.
16	L.F. coupling to V4 grid .. ..	.02
17	Tone correction circuit .. ..	.05
18	Decoupling H.T. to V1 and V3 .. ..	1
19	H.T. smoothing .. ..	6 (450) el.
20	H.T. smoothing .. ..	6 (450) el.
21	H.T. smoothing .. ..	6 (450) el.
22	Tone correction circuit .. ..	.01
23	Decoupling V2 anode .. ..	.01