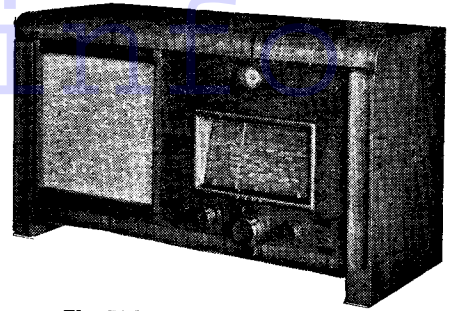


KOLSTER BRANDES MODEL 660



The Kolster-Brandes 660 is a five-valve plus rectifier A.C. superhet covering four wavebands.

CIRCUIT.—The aerial coupling to the grid of V1, a triode-hexode frequency changer, is a set of band-pass coils on the medium and long waves. On the short waves coupling is transformer.

An I.F. transformer, tuned to 464 kc., couples V1 to V2, an H.F. pentode, and a further transformer couples V2 to a second I.F. amplifier V3, also an H.F. pentode. The cathode bias for V2 is provided by two resistances, one of which is cut out on the short waves to give greater sensitivity.

A third I.F. transformer couples V3 to the demodulating diode of V4, a double-diode triode. It will be noticed that the earthy end of the demodulating diode load is connected to a further resistance R16, that is cut out by the muting switch.

The coupling arrangements to the grid of the triode section of V4 include a muting circuit, a manual volume control and also a tone control. A 50,000-ohms resist-

ance connected between the top end of the volume control and the L.F. coupling condenser C16 is shunted by a 100,000-ohms resistance on closing the muting switch.

The volume control is tone compensated by R15 and C17, whilst C19 and T.C. constitute a variable tone control. The input to the grid of V4 can be either radio or pick-up, according to the position of the wander plug leading from the volume control

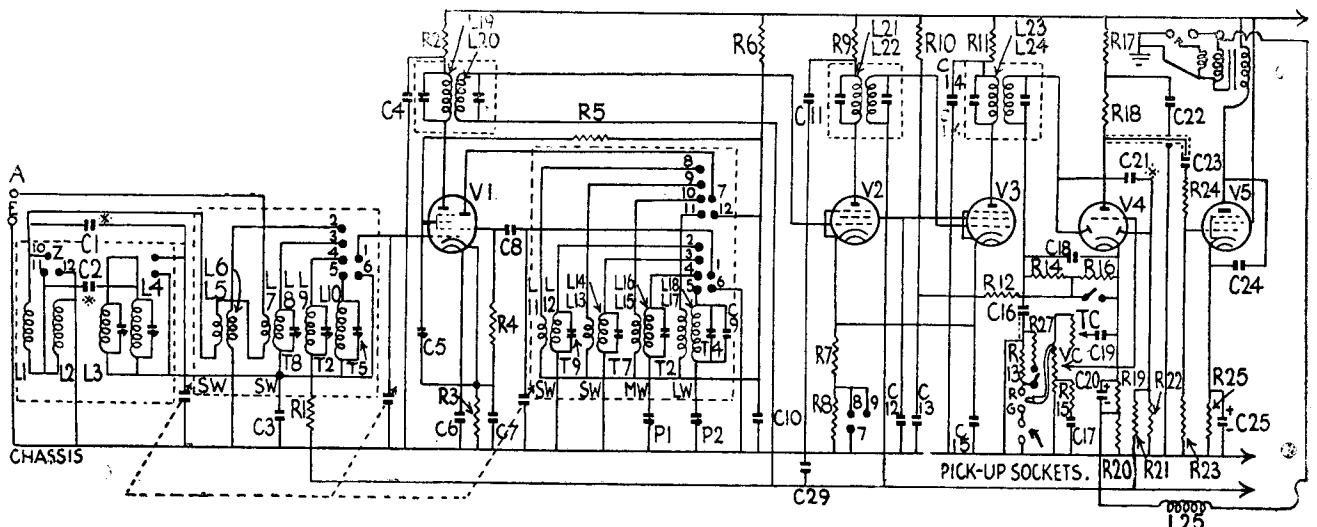
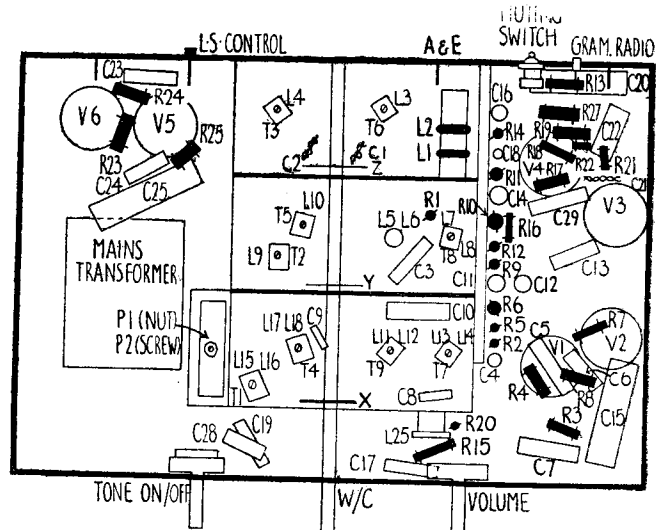
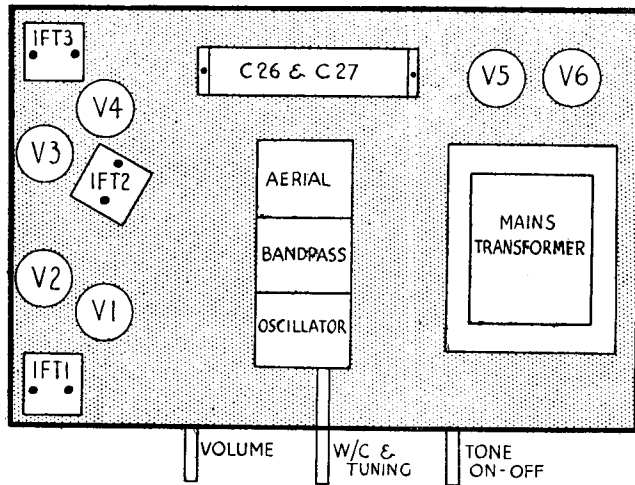
V4 is resistance capacity coupled to the output pentode V5, in whose anode circuit the speaker matching transformer is connected. A pentode compensator condenser C24 is connected between anode and chassis.

Mains equipment consists of a mains transformer, a full-wave rectifying valve V6, electrolytic condensers and a smoothing choke (the speaker field). It should be noted that the dial lamp is connected

across the primary of the mains transformer.

Chassis Removal.—The cabinet has a false bottom secured by four wood screws. Removal of these enables the underside of the chassis to be completely exposed.

Remove back of cabinet and the four control knobs from the front of the cabinet. The two larger knobs are removed by detaching the grub screw from the tuning control knob, when the



Notable feature of the 660 is that it has two I.F. stages, while the frequency changer is the first valve. Switch diagrams are not given, twelve in clockwise order, starting above the left-hand bolt, and looking from the back towards the

two can be pulled off. The two smaller knobs are of the spring fixing type.

Remove the four chassis securing bolts and washers from the base of the cabinet and the wood screws from the cleats securing the speaker cable and the cable to the visual tuning indicator. Remove the two nuts from the visual tuning indicator holder. The chassis and tuning indicator may then be completely removed.

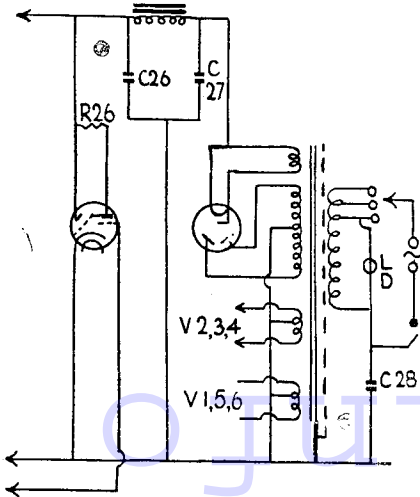
If the leads to the speaker panel are unsoldered, when replacing connect the black lead to the speaker frame and to the speech coil, the yellow and green leads to top and bottom tags of the end of the transformer remote from the speaker, and the blue, red and brown leads to the top, middle and bottom tags respectively of the transformer panel nearest the speaker.

Special Notes.—The receiver has a single dial illuminating light located in a shielding tube clamped to the glass of the wavelength dial assembly. The bulb is rated at 230 volts 15 watts, and is an Osram bulb type SBC.

A pair of sockets at the rear of the chassis enable an extension speaker to be operated. This should be of the permanent magnet type, with an impedance of 2 ohms. Removal of the wander plug cuts out the internal speaker.

At the back of the chassis on the
(Continued on page 48).

VALVE READINGS				
No signal. Volume maximum. M.W. min. cap. 200 volt A.C. mains.				
V.	Type.	Electrode.	Volts.	Ma.
1	TH4A (7) (Mullard)	Anode ..	245	1.8
		Screen ..	55	5.2
		Osc. anode ..	115	13
2	9D2 (7) (Brimar)	Anode ..	235	3.2
		Screen ..	95	1
3	9D2 (7) (Brimar)	Anode ..	238	3.5
		Screen ..	95	1
4	11D3 (7) (Brimar)	Anode ..	72	.125
5	Pen B4 (7) (Mullard)	Anode ..	250	75
		Screen ..	260	9.7
6	R2 (4) .. (Brimar)	Heater ..	345	—



as on all banks the contacts run one to front of the set

WINDINGS (D.C. Resistances)

Inductance.	Ohms.	Wave-band.	Where measured.
L1	13.6	MW	Wires to Z10 and Z11.
L2	35.6	LW	Wires to Z11 and chassis.
L3	2.8	MW	Across T3.
L4	25.2	LW	Across T6.
L51	SW2	Wire to Z10 and coil tag.
L6	Below .1	SW2	Y2 and chassis.
L72	SW1	Coil tags.
L8	Below .1	SW2	Across T8.
L9	2.5	MW	Across T2.
L10	25.2	LW	Across T5.
L11	Below .1	SW2	Across coil tags.
L12	Below .1	SW2	Across T9.
L131	SW1	Across coil tags.
L14	Below .1	SW1	Across T7.
L15	1.7	MW	Across coil tags.
L16	3.3	MW	Across T1.
L17	2	LW	Across coil tags.
L18	6.5	LW	Across T4.
L19	18	Optional	Anode of V1 and R2+C4.
L20	17.5	—	Top grid connector V2 and A.V.C. line.
L21	19	—	Anode of V2 and R9 + C11.
L22	17.5	—	Top grid connector of V3 and A.V.C. line.
L23	18.5	—	Anode of V3 and R11+C14.
L24	18	—	Diode end C21 and top end R14.
L25	29	—	Across coil tags.
L26	134	—	Blue and red leads on speaker panel.
L27	690	—	Red and brown leads on speaker panel.
Mains transf. prim.	16	—	Across mains plug pins.
Total H.T. sec.	286	—	Across anode of V6 rectifier sockets.

CONDENSERS

C.	Purpose.	Mfds.
1	Top aerial coupling M.W. ..	.000018
2	Top aerial coupling L.W. ..	.000018
3	Bottom band pass coupling ..	.02
4	V1 anode decoupling ..	.1
5	V1 screen decoupling ..	.1
6	V1 heater H.F. by-pass ..	.0001
7	V1 cathode bias shunt ..	.1
8	Oscillator grid ..	.00005
9	L.W. osc. fixed trimmer ..	.00007
10	Osc. anode decoupling ..	.1
11	V2 anode decoupling ..	.1
12	V2 and V3 screens decoupling (part) ..	2
13	V2 and V3 screens decoupling (part) ..	.1
14	V3 anode decoupling ..	.1
15	V2 and V3 cathode bias shunt ..	.25
16	L.F. coupling ..	.02
17	Tone compensator ..	.05
18	H.F. by-pass ..	.0005
19	Tone control ..	.003
20	V4 cathode bias shunt ..	.25
21	A.V.C. diode coupling ..	.000012
22	V4 anode decoupling ..	.2
23	L.F. coupling ..	.02
24	Pentode compensator ..	.0005
25	V5 cathode bias shunt ..	.25
26	H.T. smoothing ..	.16
27	H.T. smoothing ..	.16
28	Mains suppressor ..	.01
29	V2 A.V.C. decoupling ..	.1

Kolster-Brandes 660 on Test

MODEL 660.—Standard Model for A.C. mains operation, 200-250 volts, 40-100 cycles. Price, £17 6s. 6d.
DESCRIPTION.—Five-valve, plus rectifier, four-band superhet, table model.

FEATURES.—Alphabetical, full-vision tuning scale calibrated in metres and station names and traversed by vertical pointer. Concentric tuning control together with lever-operated wavechange switch. Combined tone control and master switch. Tone compensated volume control. Speaker at side of chassis. Sockets for extension L.S. and pick-up. Muting switch for interstation noise suppression. Negative feedback.

LOADING.—113 watts.

Sensitivity and Selectivity.

SHORT WAVES (29.94 and 12.5-38 metres).—Excellent gain and selectivity, easy handling, no appreciable drift. Good all-round performance.

MEDIUM WAVES (195-565 metres).—High gain and adequate selectivity, well maintained. No noticeable whistles and a reasonable background.

LONG WAVES (970-2,300 metres).—Similar performance to medium band and excellent separation, Deutschlandsender being subject to very slight interference.

Acoustic Output.

Ample volume for an ordinary room, with crisp clean top and good freedom from colouration, particularly on speech. Tone control quite vigorous in action. General balance satisfactory.

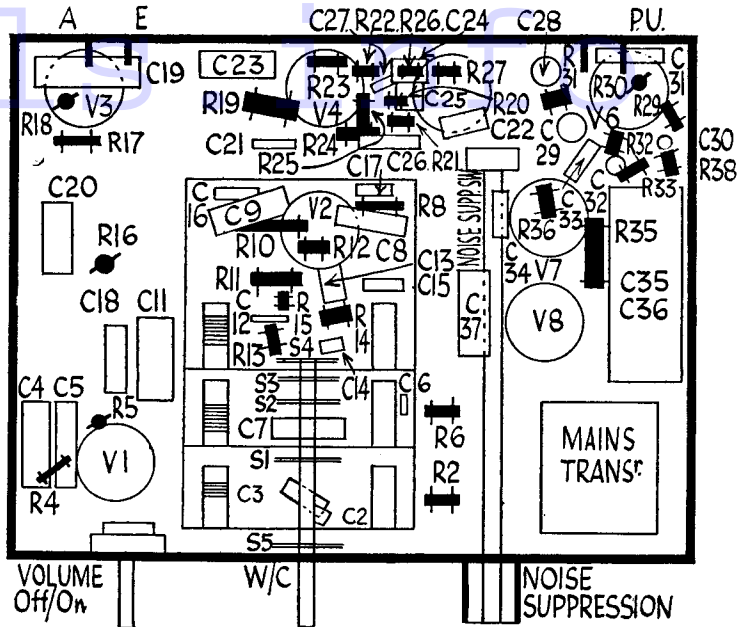
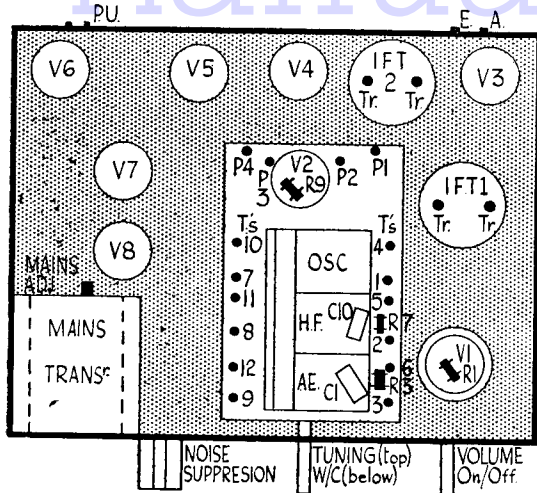
RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. decoupling ..	100,000
2	V1 anode decoupling ..	5,000
3	V1 cathode bias ..	75
4	Osc. grid leak ..	25,000
5	V1 screen decoupling ..	15,000
6	Osc. anode decoupling ..	10,000
7	V2 and V3 cathode bias (part) ..	300
8	V2 and V3 cathode bias (part) ..	250
9	V2 anode decoupling ..	5,000
10	V2 and V3 screens pot. (part) ..	20,000
11	V3 anode decoupling ..	5,000
12	V2 and V3 screens pot. (part) ..	10,000
13	Muting resistance ..	500,000
14	Demodulating diode load ..	500,000
15	Tone compensator ..	5,000
16	Muting resistance ..	2,000
17	V4 anode decoupling ..	50,000
18	V4 anode load ..	250,000
19	V4 cathode bias (part) ..	300
20	V4 cathode bias (part) ..	40
21	V2 A.V.C. decoupling ..	500,000
22	A.V.C. diode load ..	500,000
23	V5 grid leak ..	100,000
24	V5 grid stopper ..	7,000
25	V5 cathode bias ..	150
26	T1 anode feed ..	2 meg.
27	H.F. stopper ..	100,000
V.C.	Volume control ..	—
T.C.	Tone control ..	—

REPLACEMENT condensers for the K.B.660 are available from A. H. Hunt, Ltd. For the block containing C26 and C27 there is unit 4040 at 10s. 6d.; for C25, unit 2918, at 1s. 9d.; and for either C12 or C22, unit 3479, 1s. 9d.

Burndept Model 281

(Continued from previous page.)



The use of a tuning sub-assembly is a feature of the Burndept chassis. As the top deck view (left) shows, the grouped trimmers are conveniently accessible from above.

the output meter so as to prevent operation of the A.V.C. network.

Long Waves.—Tune set and oscillator to 750 metres (400 kc.) and adjust T1, T2 and T3 for maximum response.

Tune set and oscillator to 2,000 metres (150 kc.) and adjust P1 for maximum response, simultaneously rocking the gang. Repeat both operations until no further improvement results.

Medium Waves.—Tune set and oscillator to 170 metres (1,765 kc.) and adjust T4, T5 and then T6 for maximum.

Tune set and oscillator to 550 metres (545 kc.) and adjust P2 for maximum response, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

Short Waves.—Band 2 (50 to 172 metres).—Tune set and oscillator to 50 metres (6 mc.) and adjust T7, T8 and then T9 for maximum response.

Tune set and oscillator to 170 metres (1,765 kc.) and adjust P3 for maximum, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

Band 1 (13.5 to 51 metres).—Connect the service oscillator to the A. and E. terminals *via* a .00003 fixed condenser instead of *via* the dummy aerial.

Tune set and oscillator to 13.5 metres (22.2 mc.), fully unscrew T10 as far as possible (without removing screw, of course), then slowly screw up until the first peak is heard. Then adjust T11 and T12 for maximum response.

Tune set and oscillator to 50 metres (6 mc.) and adjust P4 for maximum, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

WINDINGS (D.C. Resistances)

Inductance.	Ohms.	Wave-band.	Measured between.
L1	1	B1	V1 and chassis.
L2	1	B2	Coil end of C2 and chassis.
L3	1	MW	W1 and chassis.
L4	101	LW	W1 and chassis.
L5	Below .1	B1	Top aerial gang and chassis.
L6	Below .1	B2	Top aerial gang and chassis.
L7	2	MW	Top aerial gang and chassis.
L8	8	LW	Top aerial gang and chassis.
L9	Below .1	B1	W3 and HT line.
L10	1	B2	W3 and HT line.
L11	78	MW	W3 and HT line.
L12	1	LW	W3 and HT line.
L13	.6	B1	Top HF gang and chassis.
L14	1	B2	Top HF gang and chassis.
L15	2	MW	Top HF gang and chassis.
L16	9	LW	Top HF gang and chassis.
L17	Below .1	B1	W5 and chassis.
L18 + R14	533	B2	W5 and chassis.
L19	69	MW	W5 and chassis.
L20 + R15	530	LW	W5 and chassis.
L21	Below .1	B1	W6 and various padders.
L22	Below .1	B2	W6 and various padders.
L23	3	MW	W6 and various padders.
L24	5	LW	W6 and various padders.
L25	6	—	IF pins.
L26	6	—	V2 top cap and IF pin.
L27	6	—	IF pins.
L28	4	—	IF pins.
L29	1,000	—	Speaker panel.
Output trans. prim.	510	—	Speaker panel.
Mains trans. prim.	12	—	Mains plug pins.
Total H.T. sec.	237	—	V8 anode pins.

Replacement Condensers

Exact replacement condensers for the 281 are available from A. H. Hunt, Ltd. For the block containing C35 and C36 there is unit 3831 at 8s. 6d.; for either C32 or C38, unit 4039, 2s. 3d.; C28, 2792, 2s. 3d.; and C29, 2918, 1s. 9d.

Kolster-Brandes 660

(Continued on page 45.)

extreme right is a double socket panel, for connecting a pick-up. Near this panel is a similar pair of sockets with a flying lead terminated in a wander plug. When working on gramophone the wander plug should be inserted in the top socket. It should be replaced in the bottom socket when radio is required.

In our particular chassis R3 was found to be 150 ohms and R12 to be 12,000. R26 is located on the T.I. valve holder.

Negative feed back is introduced from the secondary of the speaker transformer in conjunction with a resistor in the cathode circuit of the output valve.

Inter-station muting is provided by the alteration of the bias on the demodulating diode load via a resistance network.

Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer. Switch receiver to M.W. band, gang condenser to maximum, volume control to maximum, and tone to "high" position. Short circuit the oscillator section of the gang.

Connect a service oscillator between the top grid cap of V1 and chassis, tune oscillator to 464 kc., and adjust the trimmers of IFT3, IFT2 and then IFT1 for maximum response. Repeat the input from the oscillator as the circuits come into line so as to render the A.V.C. inoperative.

Signal Circuits.—Remove the short circuit from the oscillator section of the gang. Connect the oscillator via a dummy aerial to the A. and E. terminals of the receiver. Only feed sufficient input to obtain reliable peaks in the output meter.

Medium Waves.—Tune set and oscillator to 214 metres (1,400 kc.) and adjust T1, T2 and then T3 for maximum response.

Tune set and oscillator to 500 metres (600 kc.) and adjust P1 (the nut of the double padding condenser) for maximum, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

Long Waves.—Tune set and oscillator to 1,200 metres (250 kc.) and adjust T4, T5 and then T6 for maximum.

Tune set and oscillator to 1,714 metres (175 kc.) and adjust P2 (the screw of the double padding condenser) for maximum, simultaneously rocking the gang.

Repeat both operations until no further improvement results.

Short Waves (Band S.W.1).—Tune set and oscillator to 33 metres (9 mc. approx.) and adjust T7 and T8 for maximum response.

(Band S.W.2).—Tune set and oscillator to 13.6 metres (22 mc. approx.) and adjust T9 for maximum response.

For more information remember

www.savoy-hill.co.uk