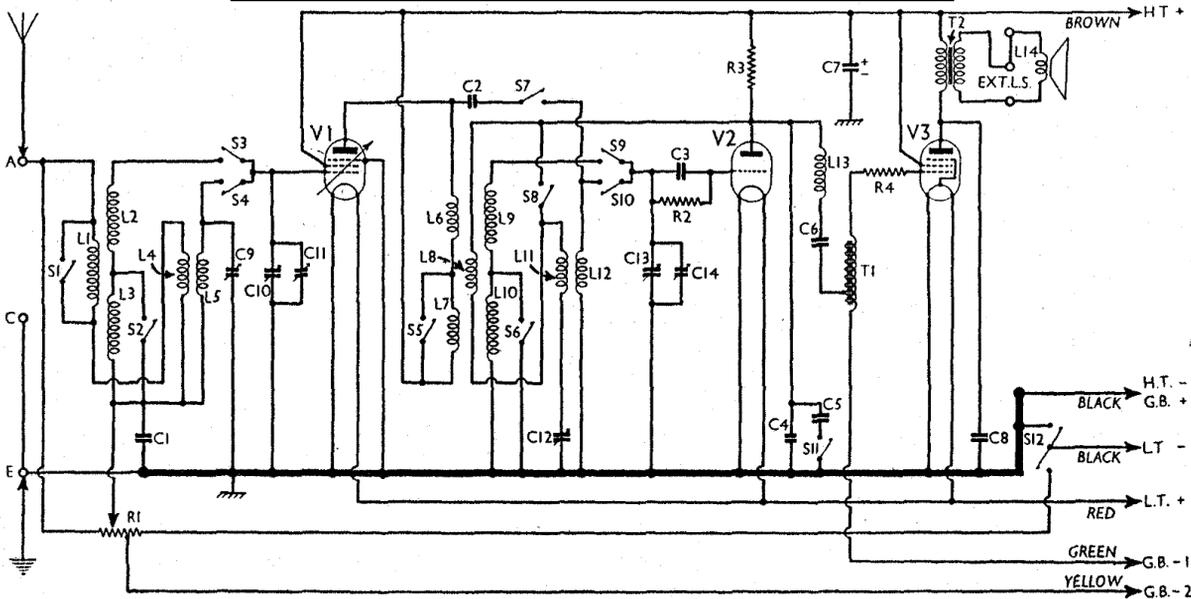


# KOLSTER-BRANDES - 535



Circuit diagram of the K.B.535 3-band battery receiver. R1 varies the G.B. applied to V1 and at the same time acts as a variable aerial-earth shunt. C4 is an R.F. by-pass condenser, and on M.W. and L.W. C5 is connected in parallel with it.

## COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 gain control	50,000*
R2	V2 grid leak	2,000,000
R3	V2 anode load	25,000
R4	V3 C.G. R.F. stopper	100,000

\* Tapped at 10,000 O.

CONDENSERS		Values (μF)
C1	V1 C.G. decoupling	0.1
C2	V1 anode coupling (S.W.)	0.00005
C3	V2 C.G. condenser	0.0001
C4	V2 anode R.F. by-pass (S.W., M.W. and L.W.)	0.00005
C5	V2 anode R.F. by-pass (M.W. and L.W. only)	0.001
C6	A.F. coupling to T1	0.1
C7*	H.T. supply reservoir	2.0
C8	Tone corrector	0.0005
C9†	Aerial circuit trimmer (S.W.)	0.00003
C10†	Aerial circuit tuning	0.0005
C11†	Aerial circuit trimmer	—
C12†	Reaction control	0.0005
C13†	R.F. circuit tuning	0.0005
C14†	R.F. circuit trimmer	—

\* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coil (M.W. and L.W.)	11.5
L2	Aerial tuning coils (M.W. and L.W.)	4.8
L3		9.7
L4	Aerial coupling coil (S.W.)	0.05
L5	Aerial tuning coil (S.W.)	Very low
L6	R.F. transformer primary (M.W. and L.W.)	6.8
L7		15.6
L8	Reaction coil (M.W. and L.W.)	4.2
L9	R.F. transformer secondary coils (M.W. and L.W.)	4.6
L10		10.0
L11	Reaction coil (S.W.)	0.05
L12	R.F. tuning coil (S.W.)	Very low
L13	R.F. choke	7.5
L14	Speaker speech coil	3.5
T1	A.F. auto-transformer, total	6,000.0
T2	Speaker input trans.	Pri... 870.0
		Sec... 0.9
S1-S10	Waveband switches	—
S11	V2 anode by-pass switch	—
S12	L.T. and G.B. switch, ganged R1	—

## VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a battery reading 120 V on the H.T. section, on load. The set was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	120	1.9	120	0.6
V2 PM2HL	80	1.3	—	—
V3 PM22A	120	2.5	118	0.4

## GENERAL NOTES

**Switches.**—S1-S11 are the waveband switches, ganged in a single unit beneath the chassis. The individual switches are indicated in our under-chassis view and it will be noted that two sets of contacts (those between S1 and S11, and between S2 and S5) are not used, while S6 is mounted on an extension at the front of the unit. The table below gives the switch positions for the various control settings starting from fully anti-clockwise, O indicating open and C closed.

Switch	S.W.	M.W.	L.W.
S1	C	O	O
S2	O	C	O
S3	O	C	C
S4	C	O	O
S5	O	C	O
S6	O	C	O
S7	C	O	O
S8	C	O	O
S9	O	C	C
S10	C	O	O
S11	O	C	C

S12 is a 3-point switch, ganged with the gain control (R1), and controlling the filament circuit and G.B. supplied to V1.

**Coils.**—L1-L3 and L6-L10 are the M.W. and L.W. coils and are in two screened units on the chassis deck, while the S.W. coils (L4, L5 and L11, L12) are wound on tubular unscreened formers beneath the

chassis. The thick enamelled wire windings on these units are L5 and L12 respectively. L13 is an R.F. choke mounted horizontally near the V2 valve holder.

**External Speaker.**—A low resistance (2-4 O) external speaker may be connected in parallel with the internal speaker speech coil by using tags 3 and 4 (numbered from bottom to top with the transformer on the left). Tags 4 and 5 are connected by a wire and by removing this and inserting a switch, the internal speaker speech coil circuit may be broken, when required.

**Batteries.**—L.T., Exide 2 V cell, type OCG3. H.T. and G.B., Drydex combined 120 V H.T. and 9 V G.B. battery, type H1070. Kolster-Brandes point out that there is room in the accumulator compartment for an Exide type CZG4, which is of higher capacity than the OCG3.

**Battery Leads and Voltages.**—Black lead, spade tag, L.T. negative; Red lead, spade tag, L.T. positive 2 V; Black lead, black plug, H.T. negative (and G.B. positive); Brown lead, red plug, H.T. positive 120 V; green lead, black plug, G.B. negative, 3 V, 4.5 V or 6 V; yellow lead, black plug, G.B. negative 9V.

**Alternative Valve.**—Some models may have a PM1HL in place of the PM2HL.

## CIRCUIT ALIGNMENT

Turn the gang condenser fully clockwise and make sure that the pointer is in line with the horizontal datum line. If it is not, loosen the drive, adjust the pointer, and re-fix the drive.

Connect a signal generator to the A and E sockets and inject a 214 m. (1,400 KC/S) signal. Tune the receiver to 214 m., set the gain control at maximum (fully clockwise) and the reaction control at minimum (fully anti-clockwise) and adjust C11 and C14 for maximum output. Calibration should now be correct for M.W. and L.W.

To align the S.W. band, inject a 20 m. (15 MC/S) signal, keep the gain control at maximum, advance the reaction control to a point just short of oscillation, and tune the receiver for maximum output. Now adjust C9 for maximum output, rocking the gang meanwhile.