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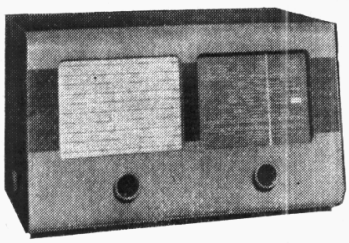
"TRADER" SERVICE SHEET

439

K.B. 830, 831

TABLE AND CONSOLE MODELS



The K.B.830 table receiver.

THE K.B. 830 receiver is a 4-valve (plus valve rectifier) AC 3-band superhet, covering a SW range of 16-52m. It is suitable for use on 100-250V, 50-60 C/S mains. There is provision for connection of a pick-up and an external speaker, and screw switches are provided for muting radio on gram, and for cutting out the internal speaker.

A very similar chassis is used in the model 831 console, the differences being explained under "Model 831 divergencies."

Release dates: 830, July, 1939; 831, August, 1939.

CIRCUIT DESCRIPTION

Two alternative aerial input sockets are provided, **A1** and **A2.** Input from **A1** is via **C1** and coupling coil **L1** (SW) or via **C1** and **C2,** which form a potential divider joined by **L1,** whose impedance is then negligible (MW and LW) to single tuned circuits **L2, C30** (SW), **L3, C30** (MW), and **L4, C30** (LW).

Input from **A2** is via potential divider comprising resistances **R1, R2,** from which signals are fed to **A1** and thence as described above.

First valve **(V1, Brimar 20D2)** is a triode hexode operating as frequency changer with internal coupling. Triode oscillator grid coils **L5** (SW), **L6** (MW), and **L7** (LW) are tuned by **C31;** parallel trimming by **C32** (SW), **C33** (MW), and **C7, C34** (LW); tracking by series condensers **C10** (MW) and **C9** (LW), and variable iron cores of **L6** and **L7.** Reaction coupling by coil **L8** (SW), and common impedance of **C10** in grid and anode circuits (MW and LW).

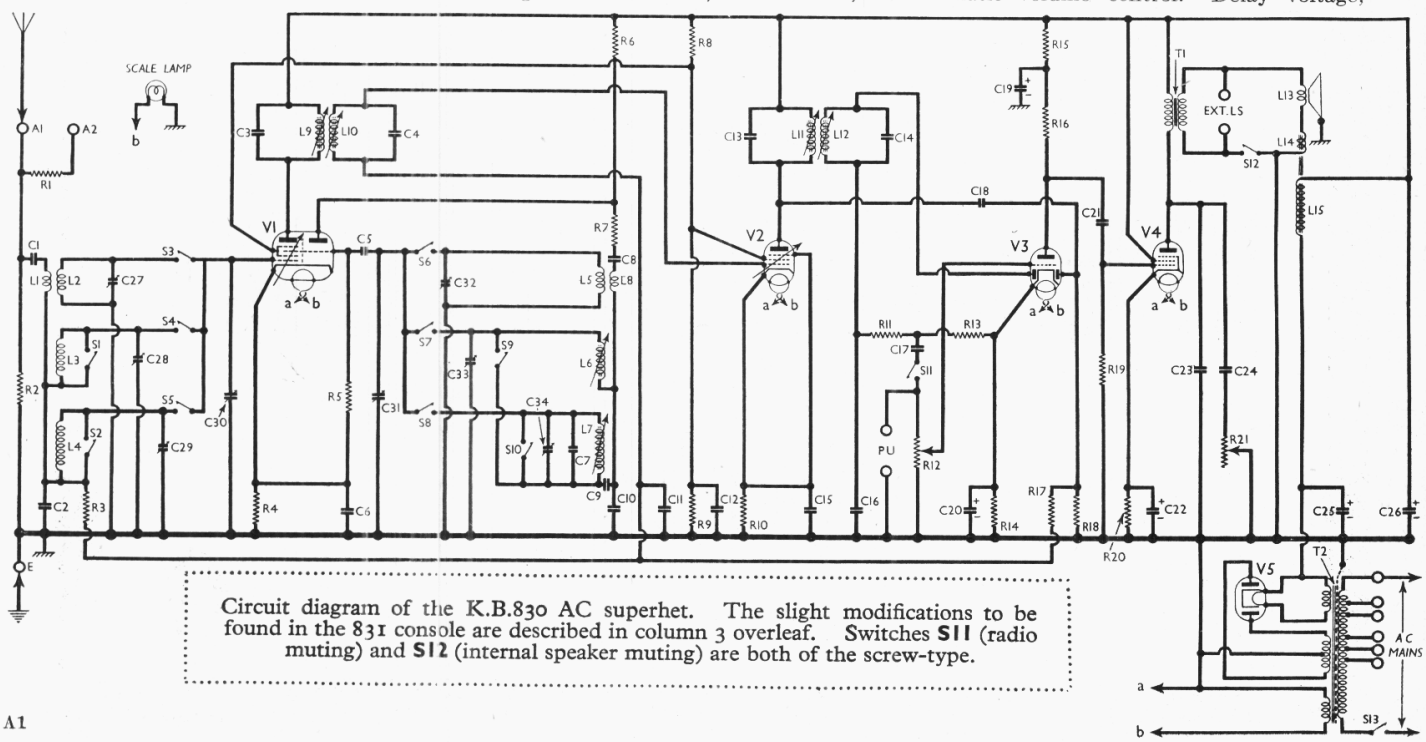
Second valve **(V2, Brimar 9D2)** is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C3, L9, L10, C4,** and **C13, L11, L12, C14,** tuning adjustments being effected by means of variable iron cores.

Intermediate frequency 464KC/S.

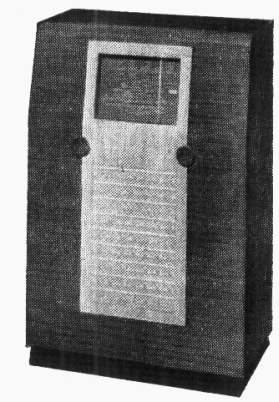
Diode second detector is part of double diode triode valve **(V3, Brimar 11D5).** Audio frequency component in rectified output is developed across load resistance **R13** and passed via AF coupling condenser **C17,** switch **S11,** and manual volume control **R12** to CG of triode section, which operates as AF amplifier. IF filtering by **R11** and **C16.**

Provision for connection of gramophone pick-up across **R12** when radio is muted by unscrewing the knob controlling **S11.**

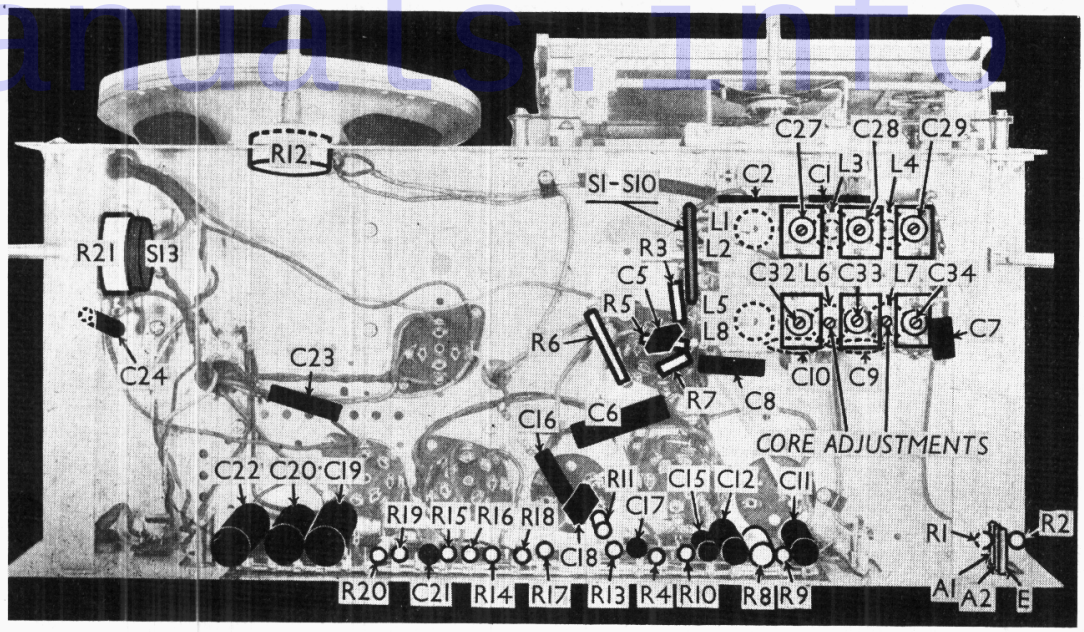
Second diode of **V3,** fed from **V2** anode via **C18,** provides DC potential, which is developed across load resistance **R18** and fed back through decoupling circuits as GB to FC (except on SW) and IF valves, giving automatic volume control. Delay voltage,



Circuit diagram of the K.B.830 AC superhet. The slight modifications to be found in the 831 console are described in column 3 overleaf. Switches **S11** (radio muting) and **S12** (internal speaker muting) are both of the screw-type.



The K.B.831 console.



Under-chassis view. A diagram of the **SI-SI0** unit, viewed from the tone control (**R2I**) end of chassis is in column 1 overleaf. Note the assembly on the right containing the tuning coils, trimmers and associated components. The core adjustments of **L6** and **L7** are indicated.

together with GB for triode section, is obtained from drop along **R14** in cathode lead to chassis.

Resistance-capacity coupling by **R16, C21** and **R19** between **V3** triode and pentode output valve **(V4, Brimar 7D5).** Fixed tone correction in anode circuit by **C23.** Variable tone control by **C24, R21,** also in anode circuit.

Provision for connection of low impedance external speaker across secondary of internal speaker input transformer **T1.** Switch **S12** permits internal speaker to be muted if desired.

HT current is supplied by IHC full-wave rectifying valve **(V5, Brimar R2).** Smoothing by speaker field **L15** and dry electrolytic condensers **C25, C26.**

DISMANTLING THE SET

The cabinet is fitted with a detachable bottom, upon removal of which access can be gained to most of the components beneath the chassis, including the trimmers.

Removing Chassis.—Switch set to SW, then remove the two control knobs from the front of the cabinet (recessed grub screws) and two further knobs from the sides of the cabinet (round-head screws, reached through holes in the bottom of the cabinet). Now slacken the screws holding the two clamps on the sub-baffle to the speaker frame, swivel the clamps aside and remove the four bolts (with claw-washers and lock-washers) holding the chassis to the bottom of the cabinet, when the complete receiver can be withdrawn as a single unit.

When replacing, it may be advisable to fit the two side control knobs before the chassis fixing bolts are finally tightened up.

Removing Speaker.—First remove chassis as described above, then unsolder from the speaker transformer the six leads connecting it to the chassis, and remove the four fixing screws (with lock-nuts and lock-washers) which are screwed into two channelled cross-bars beneath the chassis and hold the speaker assembly to the chassis deck.

When replacing, note that a metal-lined rubber grommet is fitted in each of the mounting holes in the chassis deck, and connect the leads as follows, numbering from left to right when facing the rear of the chassis. Row towards front of chassis: 1, no external connection; 2, green; 3, yellow. Row towards rear of chassis: 1, brown; 2, red; 3, blue. The black lead goes to the tag under one of the **T1** mounting screws.

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial coupling condensers	0·005
C2	Aerial coupling condensers	0·004
C3	1st IF transformer fixed tuning condensers	0·00015
C4	1st IF transformer fixed tuning condensers	0·00015
C5	V1 osc. CG condenser	0·00005
C6	V1 cathode by-pass	0·1
C7	Osc. circuit LW fixed trimmer	0·000025
C8	V1 osc. anode coupling	0·001
C9	Osc. circuit LW tracker	0·00023
C10	Osc. circuit MW tracker	0·0004
C11	V2 CG decoupling	0·1
C12	V1, V2 SG's decoupling	0·1
C13	2nd IF transformer fixed tuning condensers	0·00015
C14	2nd IF transformer fixed tuning condensers	0·00028
C15	V2 cathode by-pass	0·02
C16	IF by-pass	0·0005
C17	AF coupling to V3 triode	0·005
C18	Coupling to V3 AVC diode	0·000025
C19*	V3 triode anode decoupling	2·0
C20*	V3 cathode by-pass	25·0
C21	V3 triode to V4 AF coupling	0·02
C22*	V4 cathode by-pass	25·0
C23	Fixed tone corrector	0·001
C24	Part of variable tone control	0·03
C25*	HT smoothing condensers	16·0
C26*	HT smoothing condensers	16·0
C27‡	Aerial circuit SW trimmer	—
C28‡	Aerial circuit MW trimmer	—
C29‡	Aerial circuit LW trimmer	—
C30†	Aerial circuit tuning	—
C31†	Oscillator circuit tuning	—
C32‡	Osc. circuit SW trimmer	—
C33‡	Osc. circuit MW trimmer	—
C34‡	Osc. circuit LW trimmer	—

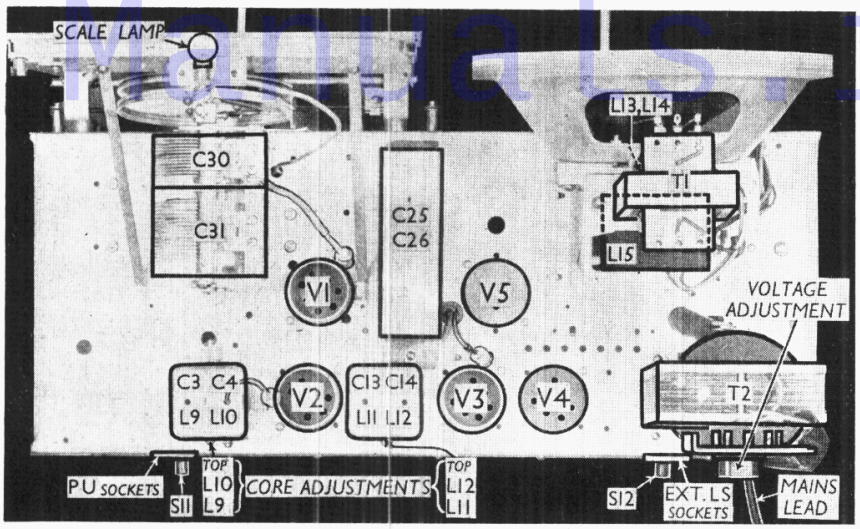
* Electrolytic. † Variable. ‡ Preset.

RESISTANCES		Values (ohms)
R1	A2 aerial potential divider resistances	10,000
R2	A2 aerial potential divider resistances	2,000
R3	V1 hexode CG decoupling	500,000
R4	V1 fixed GB resistance	300
R5	V1 osc. CG resistance	50,000
R6	V1 osc. anode HT feed	50,000
R7	Oscillator reaction damping	150
R8	V1, V2 SG's HT feed potential divider	20,000
R9	V1, V2 SG's HT feed potential divider	25,000
R10	V2 fixed GB resistance	300
R11	IF stopper	50,000
R12	Manual volume control	500,000
R13	V3 signal diode load	500,000
R14	V3 triode GB; AVC delay	7,000
R15	V3 triode anode decoupling	50,000
R16	V3 triode anode load	150,000
R17	AVC line decoupling	500,000
R18	V3 AVC diode load	500,000
R19	V4 CG resistance	500,000
R20	V4 GB resistance	400
R21	Variable tone control	50,000

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil	0·5
L2	Aerial SW tuning coil	0·05
L3	Aerial MW tuning coil	2·4
L4	Aerial LW tuning coil	35·0
L5	Osc. circuit SW tuning coil	0·05
L6	Osc. circuit MW tuning coil	5·0
L7	Osc. circuit LW tuning coil	11·0
L8	Oscillator SW reaction	0·5
L9	1st IF trans. Pri.	4·0
L10	1st IF trans. Sec.	4·0
L11	2nd IF trans. Pri.	4·0
L12	2nd IF trans. Sec.	2·5
L13	Speaker speech coil	2·0
L14	Hum neutralising coil	0·1
L15	Speaker field coil	1,200·0
T1	Speaker input. trans. Pri.	420·0
T1	Speaker input. trans. Sec.	0·3
T2	Mains trans. Pri., total	29·0
T2	Mains trans. Heater sec.	0·4
T2	Mains trans. Rect. heat. sec.	0·2
T2	Mains trans. HT sec., total	190·0
S1-S10	Waveband switches	—
S11	Radio muting switch	—
S12	Speaker switch	—
S13	Mains switch, ganged R21	—

VALVE ANALYSIS

Valve voltages and currents given in the table overleaf are those measured in our receiver when it was operating on mains of 232 V, using the 225 V



Plan view of the chassis. **S11** is a screw-type radio muting switch, while **S12** is a similar internal speaker switch. The positions of the IF transformer core adjustments are indicated.

tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 20D2	268 Oscillator 100	2·3 3·5	106	3·5
V2 9D2	268	7·6	106	1·8
V3 11D5	95	0·6	—	—
V4 7D5	251	38·0	268	7·0
V5 R2	316†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—**S1-S10** are the waveband switches, in a single rotary unit beneath the chassis. It is indicated in our under-chassis view, and shown in detail in the diagram below, where it is drawn as seen from the tone control end of the chassis. The table (col. 2) gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the spindle. A dash indicates open, and **C**, closed.

S11 and **S12** are the radio muting (on gram) and internal speaker muting switches respectively. Both are of the screw type, having small knobs for adjustment. They are mounted at the rear of the chassis, and are associated with the pick-up and external speaker sockets respectively.

S13 is the QMB mains switch, ganged with the tone control **R21.**

Coils.—**L1, L2; L3; L4; L5, L8; L6** and **L7** are on six tubular formers beneath the chassis, where they form a unit with their associated trimmers and the wavechange switch unit. The core adjustments of **L6** and **L7** project through the metal screen over the coils, which also carries the six trimmers.

The IF transformers **L9, L10** and **L11, L12** are in two screened units on the chassis deck, the core adjustments being towards the rear of the chassis. Their positions are indicated in our plan chassis view. Each IF unit contains its associated fixed trimmers.

External Speaker.—Two sockets are provided at the rear of the chassis for a low impedance (2—5 Ω) external speaker. Unscrewing the knob of **S12** mutes the internal speaker.

Scale Lamp.—This is a Tre-Vita MES type, rated at 12-14V, 0·3A.

Condensers C25, C26.—These are two 16μF dry electrolytics (550V peak) in a single carton on the chassis deck, having a common negative (black) lead. The yellow lead (to **V5** holder) is the positive of **C25**, while the red lead is the positive of **C26.**

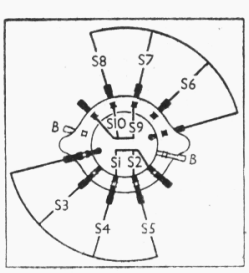


Diagram of the wavechange switch unit, viewed from the tone control end of the chassis.

SWITCH TABLE

Switch	SW	MW	LW
S1	C	—	—
S2	C	C	—
S3	C	—	—
S4	—	C	—
S5	—	—	C
S6	C	—	—
S7	—	C	—
S8	—	—	C
S9	C	—	—
S10	C	C	—

SUGGESTIONS INVITED

Service engineers who have any suggestions for the makes and types of receivers which might be covered in future Service Sheets are invited to communicate with the Technical Editor.

It is our endeavour to publish information which will be of use to the greatest number of readers, and any suggestions received will be carefully considered.

MODEL 831 DIVERGENCIES

The console model 831 is very similar to the 830 table model. One difference is that the speaker is removed from the chassis, and is mounted on the baffle below the chassis, while the tuning scale is located centrally on the chassis. The speaker is connected to the chassis by an octal plug and socket device. The colour coding of the wires to the speaker is the same as in the table model, and their connections to the speaker socket, looking at its underside, and numbering the pins as usual are: 1, brown; 2, blue; 3, red; 4, green; 5, yellow; 6 and 7, blank; 8, black.

In the 831, **C21** becomes 0·01μF (instead of 0·02μF), while an extra condenser of 0·0003μF is connected between the slider of **R12** and the junction of **R12** with **S11.** This condenser is located adjacent to the volume control.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator via a 0·1μF condenser to control grid (top cap) of **V1**, and chassis. Switch set to MW, and turn gang to maximum. Feed in a 464KC/S signal, and adjust cores of **L9, L10, L11** and **L12** in turn for maximum output. Repeat these adjustments.

RF and Oscillator Stages.—With gang at maximum, pointer should cover the vertical lines at the right hand ends of the three scales. Connect signal generator, via a suitable dummy aerial, to **A1** and **E** sockets.

MW.—Switch set to MW, tune to 500m on scale, feed in a 500m (600 KC/S) signal, and adjust core of **L6** for maximum output. Tune to 214m (white spot) on scale, feed in a 214m (1,400 KC/S) signal, and adjust **C33,** then **C28,** for maximum output. Repeat the 500m adjustment, rocking the gang slightly for optimum results, then repeat the 214m adjustments.

LW.—Switch set to LW, tune to 1,714m (white spot) on scale, feed in a 1,714m (175KC/S) signal, and adjust core of **L7** for maximum output. Tune to 857m on scale, feed in an 857m (350 KC/S) signal, and adjust **C34,** then **C29,** for maximum output. Repeat the 1,714m adjustment, rocking the gang slightly for optimum results, then repeat the 857m adjustments.

SW.—Switch set to SW, tune to 20m on scale, feed in a 20m (15 MC/S) signal, and adjust **C32,** then **C27,** for maximum output.