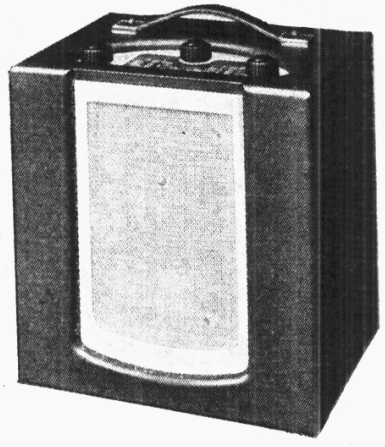
"TRADER" SERVICE SHEET 520

K.B. 817 ALL-DRY PORTABLE



The KB 817 portable superhet

SEPARATE dry HT and LT batteries are used in the Kolster-Brandes model 817 all-dry portable 2-band 4-valve battery superhet.

A MW frame aerial is used, and there is provision for external aerial and earth connection. A loading coil is used for LW operation.

Release date: March, 1940.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, C15** (MW), plus loading coil **L2** (LW) to heptode valve **(V1, Brimar 1A7G)** which operates as frequency changer with electron coupling. Provision for connection of external aerial via **C1,** and an earth via **C3.**

Oscillator grid coils **L3** (MW), plus **L4** (LW), are tuned by **C16.** Parallel trimming by **C17** (MW) and **C18** (LW). Reaction from anode by coils **L5** and **L6.**

Second valve **(V2, Brimar 1N5G)** is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C19, L7, L8, C20** and **C21, L9, L10, C22.**

Intermediate frequency 464 KC/S.

Diode second detector is part of single diode triode valve **(V3, Brimar 1H5G).** Audio frequency component in rectified output is developed across manual volume control **R5,** which also operates as load resistance, and passed via AF coupling condenser **C8** to CG of triode section, which operates as AF amplifier. IF filtering by **C7, R3.**

DC potential developed across **R5** is fed back through decoupling circuit as GB to FC and IF valves, giving automatic volume control.

Parallel-fed auto-transformer coupling by **R7, C9** and **T1** between **V3** triode and pentode output valve **(V4, Brimar 1C5G).** Fixed tone correction by **C10** in anode circuit.

GB potential for **V4** is obtained automatically from drop along resistance **R9** in negative HT lead to chassis.

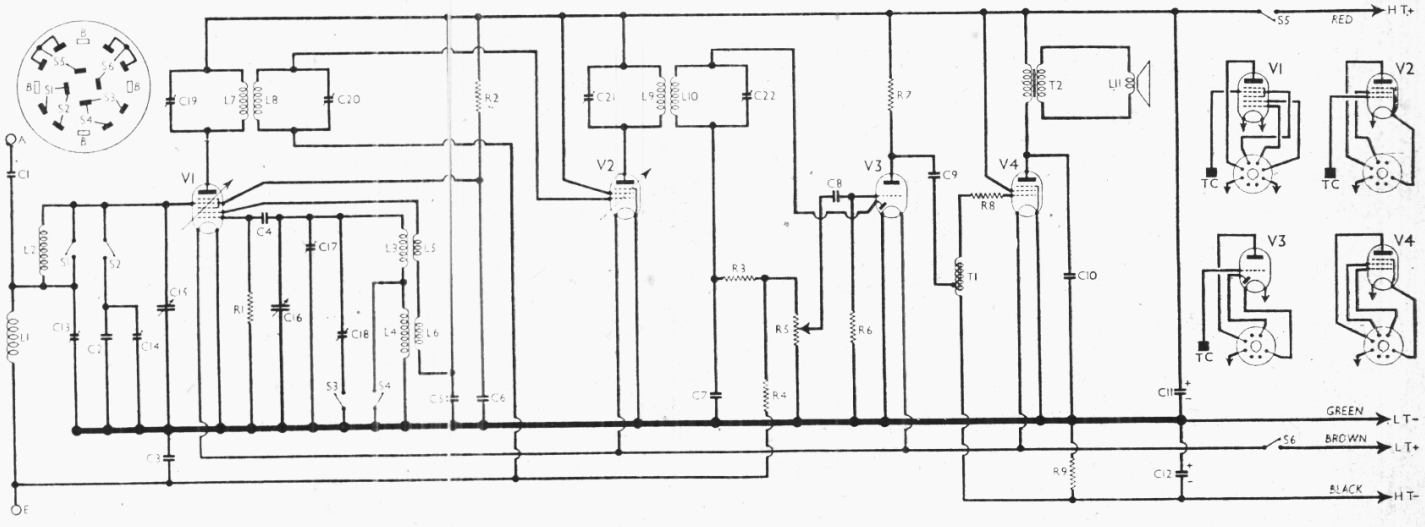
COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 osc. CG resistance ...	250,000
R2	V1 SG HT feed	50,000
R3	IF stopper	50,000
R4	AVC line decoupling ...	2,000,000
R5	Manual volume control; signal diode load ...	1,000,000
R6	V3 triode CG resistance ...	2,000,000
R7	V3 triode anode load ...	250,000
R8	V4 grid stopper	50,000
R9	V4 GB resistance ...	800

	CONDENSERS	Values (μF)
C1	External aerial series ...	0·000005
C2	Aerial LW fixed trimmer	0·0001
C3	AVC line decoupling ...	0·1
C4	V1 osc. CG condenser ...	0·0001
C5	HT circuit RF by-pass ...	0·1
C6	V1 SG decoupling ...	0·1
C7	IF by-pass	0·0002
C8	AF coupling to V3 triode	0·02
C9	AF coupling to T1 ...	0·02
C10	Fixed tone corrector ...	0·005
C11*	HT circuit reservoir ...	2·0
C12*	V4 GB by-pass	25·0
C13‡	MW frame aerial trimmer	0·00004
C14‡	LW aerial trimmer ...	0·00004
C15†	Aerial circuit tuning ...	—
C16†	Oscillator circuit tuning...	—
C17‡	Osc. circuit MW trimmer	0·00004
C18‡	Osc. circuit LW trimmer...	0·00075
C19‡	1st IF trans. pri. tuning...	0·00022
C20‡	1st IF trans. sec. tuning...	0·00022
C21‡	2nd IF trans. pri. tuning...	0·00022
C22‡	2nd IF trans. sec. tuning...	0·00022

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	MW frame winding ...	0·7
L2	Frame LW loading coil...	7·5
L3	Osc. circ. MW tuning coil	1·8
L4	Osc. circ. LW tuning coil	0·4
L5	Oscillator reaction coils, total	4·3
L6		
L7	1st IF trans. Pri. ...	12·0
L8	1st IF trans. Sec. ...	8·0
L9	2nd IF trans. Pri. ...	8·0
L10	2nd IF trans. Sec. ...	6·0
L11	Speaker speech coil ...	2·5
T1	Intervalve auto-trans., total	3,500·0
T2	Speaker input trans. Pri. ...	600·0
	Sec. ...	0·3
S1-S4	Waveband switches ...	—
S5	HT circuit switch ...	—
S6	LT circuit switch ...	—



Circuit diagram of the KB 817 all-dry portable superhet. **L1** is the MW frame aerial winding, and **L2** the LW loading coil. The diagram inset in the top left-hand corner is that of the waveband switch unit.

VALVE ANALYSIS

Valve voltages and currents given in the table below were obtained when the receiver was operating with a new 90 V HT battery and a new 1.5 V LT cell.

The receiver was switched to the MW band, and the volume control was at maximum. The frame aerial was disconnected, and its two connecting tags were short-circuited.

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

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 1A7G	80	0·42	31	0·57
	Oscillator			
	80	1·04		
V2 1N5G	80	0·66	80	0·16
V3 1H5G	39	0·05	—	—
V4 1C5G	76	5·5	80	1·2

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull-off), and remove the valves from their sockets;

unsolder from the top of the coil unit **L1** near **V1** and **V4** the flat twin frame aerial lead;

unsolder the two leads from the speaker;

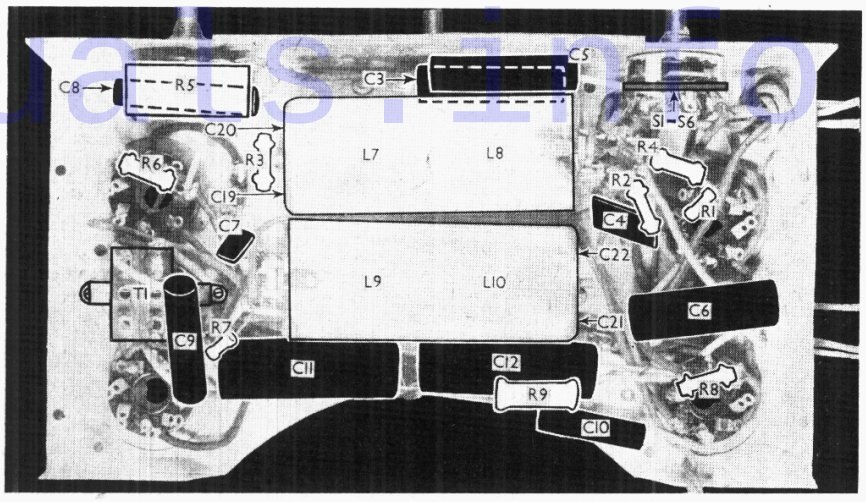
remove the four wood screws holding the chassis to the mounting blocks on the sides of the case;

lower chassis until the control spindles clear the scale, then withdraw chassis spindle first. Care must be taken during this operation that the spindles do not scratch the celluloid scale window.

When replacing, connect the lead from the bottom frame socket to the bottom tag on the coil unit **L1,** and the other lead (from the middle socket) to the left-hand tag on **L1,** as seen in our plan view. There is no direct connection to the top (aerial) socket.

Removing Speaker.—Unsolder the two leads and remove the four wood screws (with paxolin washers) holding the speaker to the sub-baffle.

When replacing, the transformer should be on the left.



Under-chassis view. The **S1-S6** switch unit is indicated here and shown in detail inset in the top left-hand corner of the circuit diagram overleaf.

GENERAL NOTES

Switches.—**S1-S4** are the waveband, **S5** the HT circuit and **S6** the LT circuit switches, in a single three-position rotary unit mounted beneath the chassis. This is indicated in our under-chassis view and shown in detail in the diagram in the top left-hand corner of the circuit diagram, where it is drawn as seen when viewed from the rear of the underside of the chassis. **S1** and **S4** close on MW, and **S2** and **S3** on LW. **S5** and **S6** close on MW and LW.

Coils.—**L1** is the MW frame aerial winding. It is wound on the back cover of the receiver, on which are also mounted the external aerial and earth sockets, and is not shown in our chassis illustrations.

The LW aerial loading coil **L2** and the oscillator coils **L3-L6** are in two unscreened units on the chassis deck. The IF transformers **L7, L8** and **L9, L10** are mounted horizontally beneath the chassis.

Batteries.—Separate dry HT and LT batteries are used. Those supplied with the receiver are: LT, Alpha type 217, 1.5V; HT, Alpha type 233, 90V.

Battery Leads and Voltages.—The two-pin plug terminating the brown and green pair of battery leads is the LT battery plug. The large pin is positive 1.5V. Black lead and plug is HT negative; red lead and plug HT positive 90V.

Condenser C1.—This is made by winding a few turns at one end of the frame aerial winding round the aerial socket, which is not otherwise connected to the receiver.

R4.—This was 2,000,000 Ω in our chassis, but may in some cases be 1,000,000 Ω.

Valves.—In some cases the type number may be followed by the suffix E (before the G; i.e.: 1A7EG). Such types are equivalents, and may be used in the receiver.

CIRCUIT ALIGNMENT

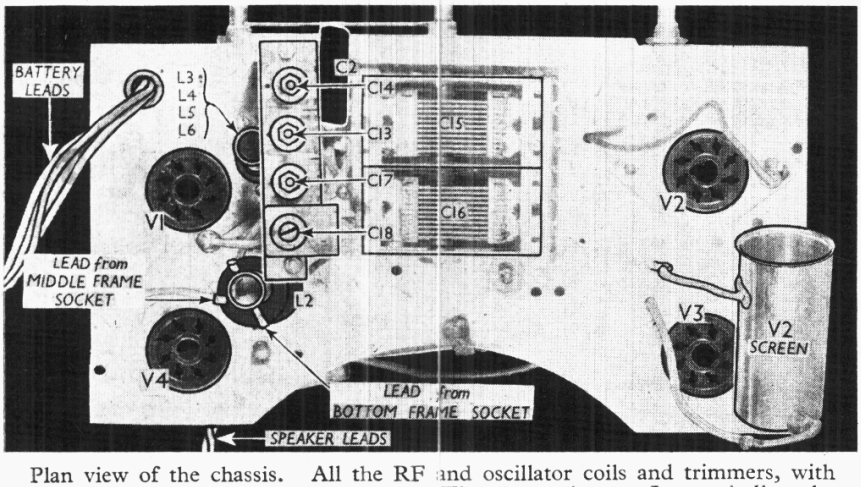
IF Stages.—Switch set to MW and tune to 580m on scale. Connect signal generator to control grid (top cap) of **V1,** via a 0.1 μF condenser, and chassis. Feed in a 464 KC/S (646.55m) signal, and adjust **C22, C21, C20** and **C19** in turn for maximum output.

RF and Oscillator Stages.—With the gang at maximum, the pointer should be horizontal. Connect signal generator to external aerial and earth sockets.

MW.—Switch set to MW, tune to 214m (mark on scale), feed in a 214m (1,400 KC/S) signal, and adjust **C17,** then **C13,** for maximum output.

LW.—Switch set to LW, tune to 1,200m (mark on scale), feed in a 1,200m (250 KC/S) signal, and adjust **C18,** then **C14,** for maximum output.

There are no tracking adjustments, but final adjustment must be made with the back cover on the receiver. Therefore, replace the back, with the batteries in position. Disconnect signal generator leads from receiver and, instead, connect a length (about 2 feet) of wire to the generator output and allow it to trail a foot or two from the receiver. Then, inserting trimming tool through hole in back cover, finally adjust **C13** at 214m, and **C14** at 1,200m, without any direct connection.



Plan view of the chassis. All the RF and oscillator coils and trimmers, with the exception of **L1,** are shown here. The connections to **L1** are indicated.

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