"TRADER" SERVICE SHEET

1042

KOLSTER-BRANDES FP11

All-dry Battery Portable

DESIGNED to give rapid access to most parts of the chassis immediately upon opening the carrying case, the Kolster-Brandes FP11 is nevertheless provided with a means of removing the chassis in a matter of seconds. The receiver is a 4-valve 2-band all-dry battery superhet in a hinged plastic case with similar front and rear contours. The waveband ranges are 186-560 m and 910-2,150 m.

Release date and original price: January 1951, £11 11s 1d, including batteries. Purchase tax extra.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L2, C20** (M.W.), or with loading coil **L3** (L.W.), precedes first valve **(V1, Brimar 1R5),** a heptode operating as frequency changer with electron coupling. For reception in areas of weaker signal strength, provision is made for the connection of an external aerial and earth, the aerial being coupled to **L2** via a second frame aerial winding **L1.**

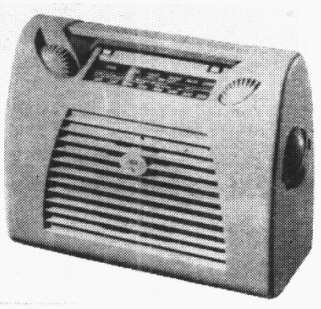
Oscillator grid coils **L4** (M.W.) and **L5** (L.W.) are tuned by **C21.** Parallel trimming by **C22** (M.W.) and **C6, C22** (L.W.); series tracking by **C7** (M.W.) and **C7, C8** (L.W.). Inductive reaction coupling from oscillator anode by **L6** (M.W.) and **L7** (L.W.). Stabilization by **R2.**

Second valve **(V2, Brimar 1T4)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C3, L8, L9, C4** and **C10, L10, L11, C11.**

Intermediate frequency 422 kc/s.

Diode signal detector is part of diode pentode valve **(V3, Brimar 1U5).** Audio frequency component in rectified output is developed across volume control **R5,** which acts as diode load, and is passed via **C13** to control grid of pentode section, which operates as A.F. amplifier. I.F. filtering by **C12** and **C15.** D.C. potential developed across **R5** is tapped off and fed back as bias via decoupling circuit **R4, C1** to F.C. and I.F. stages, giving automatic gain control.

Resistance-capacitance coupling by **R8, C16** and **R11** between **V3** pentode anode and control grid of pentode output valve **(V4, Brimar 3V4).** Tone correction by **C17** in anode circuit and by negative feedback between the anodes of **V4** and **V3** via **R9.** Bias for **V4** is obtained from the voltage drop across **R10,** which is in series with the H.T. negative lead to chassis. **C18** by-passes the H.T. battery.



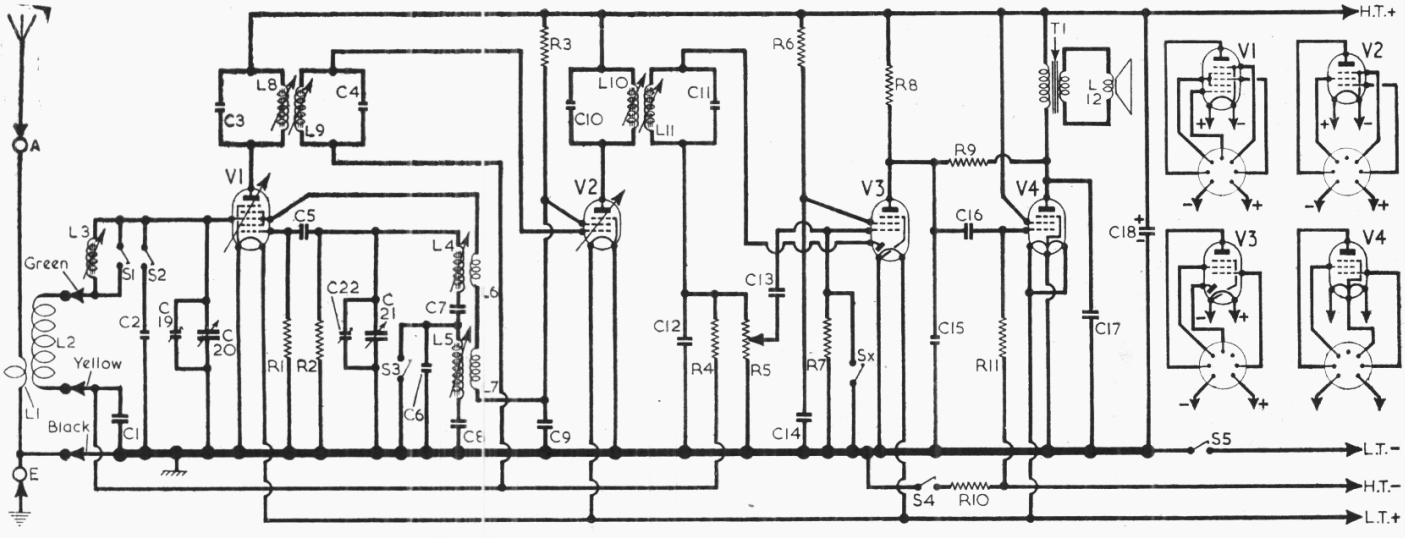
The appearance of the K-B FP11. Its plastic carrying case looks very much the same from either side.

COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	V1 osc. C.G. ...	100kΩ	F4
R2	Oscillator shunt ...	33kΩ	A1
R3	V1, V2 S.G. feed ...	22kΩ	E4
R4	A.G.C. decoupling	2·2MΩ	E4
R5	Volume control ...	1MΩ	C1
R6	V3 S.G. feed ...	3·3MΩ	D4
R7	V2 C.G.	10MΩ	D4
R8	V3 anode load ...	1MΩ	D4
R9	Neg. feed back ...	6·8MΩ	D4
R10	V4 G.B.	680Ω	D3
R11	V4 C.G.	3·3MΩ	D4

	CAPACITORS	Values	Locations
C1	A.G.C. decoupling	0·05μF	F4
C2	L.W. trimmer ...	60pF	A1
C3	1st I.F. trans. tuning	88pF	B2
C4		88pF	B2
C5	V1 osc. C.G. ...	100pF	G4
C6	L.W. trimmer ...	45pF	A1
C7	Oscillator trackers	600pF	A1
C8		400pF	A1
C9	Screen decoupling	0·02μF	A1
C10	2nd I.F. trans. tuning	88pF	B2
C11		88pF	B2
C12	I.F. by-pass ...	230pF	E4
C13	A.F. coupling ...	0·005μF	C2
C14	V3 S.G. decoup. ...	0·02μF	E3
C15	I.F. by pass ...	50pF	E4
C16	A.F. coupling ...	0·002μF	D4
C17	Tone corrector ...	0·005μF	D4
C18*	H.T. reservoir ...	8μF	C2
C19‡	M.W. aerial trim.	35pF	A2
C20†	Aerial tuning ...	—	A2
C21†	Oscillator tuning...	—	A2
C22‡	M.W. osc. trim. ...	35pF	A2

*Electrolytic. †Variable. ‡Pre set.



Circuit diagram of the Kolster-Brandes FP11 all-dry portable superhet. **L1** is a loop on the frame aerial winding to couple an external aerial if required. Switch **Sx** is an incidental switch that closes only in the "off" position of the battery switch. It occurs because a switch tag is used as an anchorage for **C13.**

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Aerial coupling ...	—	—
L2	Frame aerial ...	—	—
L3	L.W. loading coil...	16·0	B2
L4	Oscillator tuning coils	3·0	A1
L5		6·0	A1
L6	Oscillator reaction coils	2·0	A1
L7		6·0	A1
L8	1st I.F. trans. Pri.	15·0	B2
L9	1st I.F. trans. Sec.	15·0	B2
L10	2nd I.F. trans. Pri.	15·0	B2
L11	2nd I.F. trans. Sec.	15·0	B2
L12	Speech coil ...	3·0	—
T1	O.P. trans. Pri. ... Sec. ...	900·0 —	C1
S1-S3	Waveband switches	—	G3
S4, S5	Battery switches...	—	D3

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a new set of batteries. The receiver was tuned to the highest wavelength end of M.W., with the volume control at maximum, but there was no signal input.

Voltage readings were measured with an Avo Electronic TestMeter, which draws no appreciable current, and allowance should be made for the current drawn by other types of meter Chassis was the negative connection. The voltage measured across **R10** was 6 V.

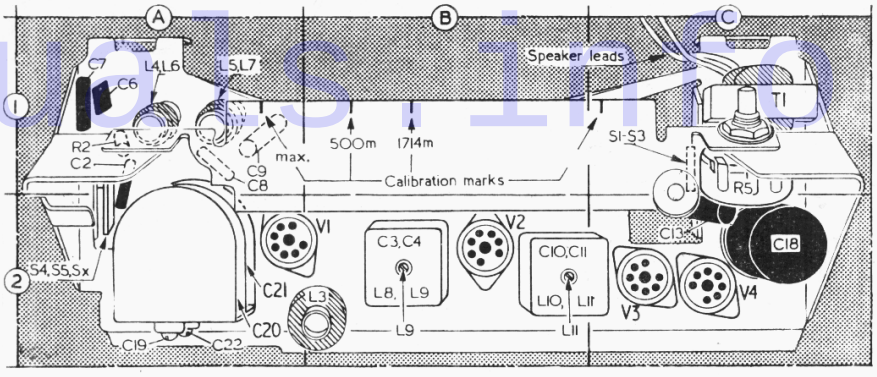
Valve	Anode V	Anode mA	Screen V	Screen mA
V1 1R5	82	0·3	39	1·4
V2 1T4	82	1·2	39	0·4
V3 1U5	18	0·06	19	0·015
V4 3V4	77	4·4	82	1·0

DISMANTLING THE SET

The majority of components are easily accessible upon opening the carrying case.

Removing Chassis.—Depress the two chromium-plated spring catches beneath the carrying handle, and open the carrying case;
unplug the battery leads and withdraw the batteries from the carrying case;
unsolder the yellow and green leads from the frame aerial tags in the rear half of case;
unsolder the leads from speech coil tags on speaker;
remove two metal pins securing carrying handle and top chassis flanges to front of carrying case (pull out);
slide chassis down to release lower edges from retaining slots in carrying case, and withdraw chassis.

When replacing, connect the green lead to the upper frame aerial tag, and the yellow lead to the lower tag. Insert the carrying handle pins square cut ends first, and check that they locate in the sockets in the rear half of the case when closing the case.



Plan view of the chassis. The calibration marks shown on the scale are provided for alignment purposes where this is performed with chassis removed from the cabinet.

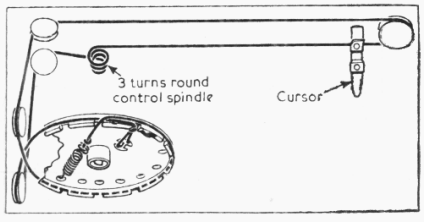
GENERAL NOTES

Switches.—**S1-S3** are the waveband switches, ganged in a small rotary unit at one end of the chassis, and indicated in both of our chassis illustrations. In the M.W. position (control knob clockwise) **S1** and **S3** close; in the L.W. position, **S2** closes.

S4, S5 are the H.T. and L.T. circuit switches, ganged in a second small rotary unit at the opposite end of the chassis. They switch off when the control knob is tuned anti-clockwise.

Sx is an incidental switch formed by using a spare tag on the unit as an anchorage for a connection to **C13.** It closes only in the "off" position, and has no effect on the working of the receiver, but we show it to explain a possible short-circuit that might otherwise mystify the operator during service work.

Batteries.—The H.T. battery for this receiver is rated at 90 V. Types recommended by the makers are Ever Ready B126, Drydex 4526 and Vidor L5512. Connection is effected by means of a 3-pin plug, of which one pin is unused except as a means of location. The L.T. battery is rated at 1.5 V, and types recommended by the makers are Ever Ready "Alldry 4," Drydex H1158 and Vidor L5041. Connection is effected by means of a 2-pin plug, whose thick pin is the positive connection.



Sketch showing the drive cord system, drawn as seen from a three-quarter rear perspective.

Drive Cord Replacement.—About 40 inches of high-grade flax fishing line, plaited and waxed, is required for a new tuning drive cord, which should be fitted as shown in the sketch (col. 2). Here the system is drawn as seen when looking obliquely at the outer face of the drive drum, while the chassis is still in its carrying case.

A start is made by hooking a loop at one end of the cord to one of the projecting lugs in the drum moulding while the gang is at minimum capacitance, and making a quarter-turn anti-clockwise round the drum, thereafter pulling against the gang stop. The cursor can be fitted afterwards, being held in position by a dab of cement and being adjusted to cover the datum mark with the gang at maximum before the cement sets.

CIRCUIT ALIGNMENT

As all the core and trimmer adjustments are accessible on opening the carrying case, it is not necessary to remove the chassis for the following alignment adjustments.

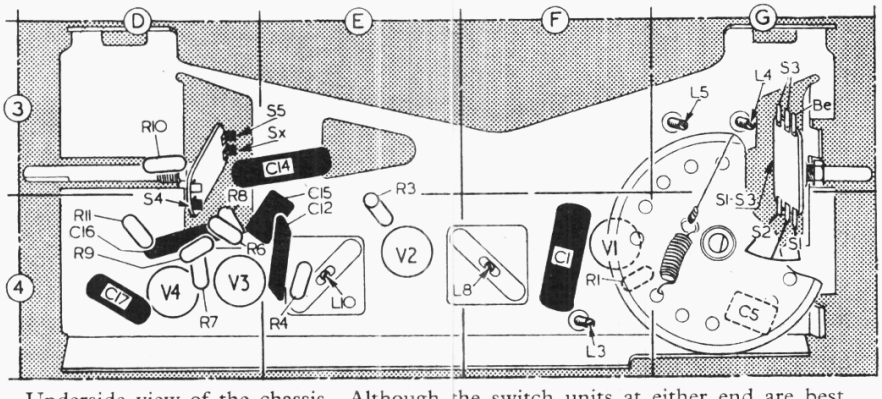
I.F. Stages.—Connect output of signal generator, via an 0.1 μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and chassis. Switch receiver to M.W., turn gang to minimum capacitance, feed in a 422 kc/s (710.8 m) signal and adjust the cores of **L11** (location reference B2), **L10** (E4), **L9** (B2) and **L8** (F4) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. effects.

R.F. and Oscillator Stages.—As the tuning scale is fixed to the carrying case, reference must be made to the four calibration marks along the lower edge of the scale backing plate if the chassis is withdrawn for alignment. A corresponding set of four calibration dots are marked on the tuning scale, above and below the line separating the M.W. and L.W. scales. The calibration points on both the backing plate and the tuning scale are as follows, from left to right: 200 m; 1,714 m; 500 m; Max. capacitance.

Check that with the gang at maximum the cursor coincides with the "Max. capacitance" point on the backing plate or on the scale. Transfer signal generator output, via a dummy aerial to **A** and **E** sockets.

M.W.—Switch receiver to M.W., tune to 500 m calibration point, feed in a 500 m (600 kc/s) signal and adjust the core of **L4** (G3) for maximum output. Tune receiver to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C22** (A2) and **C19** (A2) for maximum output. Repeat these adjustments, rocking the gang when adjusting **C19** for optimum results.

L.W.—Switch receiver to L.W., tune to 1,714 m, connect a small capacitor of approximately 1 pF across **L2** (about an inch of lighting flex would do), feed in a 1,714 m (175 kc/s) signal and adjust the core of **L5** (G3) and **L3** (F4) for maximum output. Repeat these adjustments, and finally remove the 1 pF capacitor from **L2.**



Underside view of the chassis. Although the switch units at either end are best viewed from below, they are actually mounted above the chassis deck.

Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.