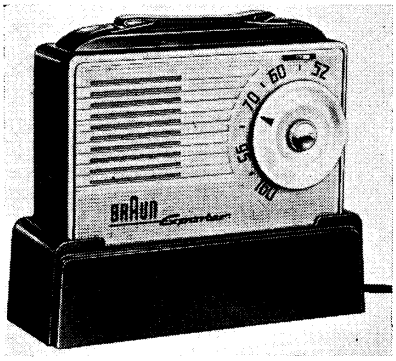
Supplement to Wireless & Electrical Trader, 6 August 1955

"TRADER" SERVICE SHEET

1210

BRAUN "EXPORTER"

All-dry Personal Portable and A.C. Mains Unit



Appearance of the Braun "Exporter" and its associated mains unit. The receiver is automatically connected to the unit when stood on it.

COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	V1 osc. C.G. ...	30kΩ	E2
R2	Osc. H.T. feed ...	10kΩ	D2
R3	V2 C.G.	10MΩ	D2
R4	A.G.C. decoupling	3MΩ	E2
R5	I.F. stopper ...	100kΩ	B1
R6	Volume control ...	1MΩ	D2
R7	V3 C.G.	10MΩ	E2
R8	V3 S.G. feed ...	5MΩ	E2
R9	V3 anode load ...	1MΩ	E2
R10	V4 C.G.	2MΩ	E2
R11	V4 G.B.	500Ω	C1
R12*	H.T. smoothing ...	2kΩ	G3
R13*	L.T. smoothing ...	25Ω	G3
R14*	G.B. shunt ...	2kΩ	G3

* In mains unit.

	CAPACITORS	Values	Locations
C1	A.G.C. decoupling	0·05μF	F2
C2	1st I.F.T. tuning...	60pF	B1
C3	1st I.F.T. tuning...	60pF	B1
C4	V1 osc. C.G. ...	50pF	C1
C5	Osc. anode decoup.	0·001μF	D2
C6	V2 C.G. decoup. ...	2,500pF	D2
C7	2nd I.F.T. tuning	60pF	B1
C8	2nd I.F.T. tuning	60pF	B1
C9	V2 reaction ...	5pF	E2
C10	I.F. by-pass ...	100pF	E2
C11	A.F. coupling ...	500pF	D2
C12	S.G. H.T. decoup.	0·05μF	F2
C13	I.F. by-pass ...	100pF	E2
C14*	H.T. decoupling ...	10μF	F2
C15	A.F. coupling ...	500pF	E2
C16	Tone corrector ...	0·001μF	E2
C17‡	Aerial trimmer ...	—	C1
C18†	Aerial tuning ...	—	C1
C19†	Osc. tuning ...	—	C1
C20‡	Osc. trimmer ...	—	C1
C21*	L.T. smoothing ...	100μF	G3
C22*	H.T. reservoir ...	16μF	G3

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Internal aerial ...	1·0	—
L2	Osc. tuning coil ...	1·5	C1
L3	Osc. reaction coup.	—	C1
L4	1st I.F.T. Pri. ...	20·0	B1
L5	1st I.F.T. Sec. ...	20·0	B1
L6	2nd I.F.T. Pri. ...	20·0	B1
L7	2nd I.F.T. Sec. ...	20·0	B1
L8	Speech coil ...	4·0	F2
T1	O.P. trans. a ...	450·0	F2
	O.P. trans. b ...	—	
T2*	Mains trans. a ...	55·0	G3
	Mains trans. b ...	—	
	Mains trans. c ...	—	
	Mains trans. d, total	1,200·0	
S1, S2	Battery switches...	—	D2
S3	Mains switches ...	—	G3
MR1*	H.T. rectifier, E250C50	—	G3
MR2*	L.T. rectifier, M20/8	—	G3

* In mains unit.

USING a ferrite rod aerial concealed in the carrying handle mount, the Braun "Exporter" is a personal portable receiver which can be operated either from its own self-contained batteries or from an optional A.C. mains power unit to which the set is automatically connected when stood on it. If the batteries are switched off, but the mains switch is left on, a warning hum is produced in the speaker.

Release date and original prices: July, 1954. Receiver £9 10s 6d (batteries and tax extra); mains power unit £4 4s (tax free).

CIRCUIT DESCRIPTION

Tuned aerial input **L1, C18,** the coil **L1** being mounted on a ferrite rod to form the internal aerial and covering the M.W. band.

First valve **(V1, Telefunken DK96)** is a heptode operating as frequency changer with electron coupling. Oscillator grid coil **L2** for the single waveband covered is tuned by **C19.** Parallel trimming is provided by **C20.** Tracking is effected by specially shaped vanes of **C19** and is corrected by adustment of the ferrous-oxide core. Reaction coupling from anode by **L3.**

Second valve **(V2, Telefunken DF96)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C2, L4, L5, C3** and **C7, L6, L7, C8.** Reaction feed-back between anode and control grid circuits by **C9.**

Intermediate frequency 460 kc/s

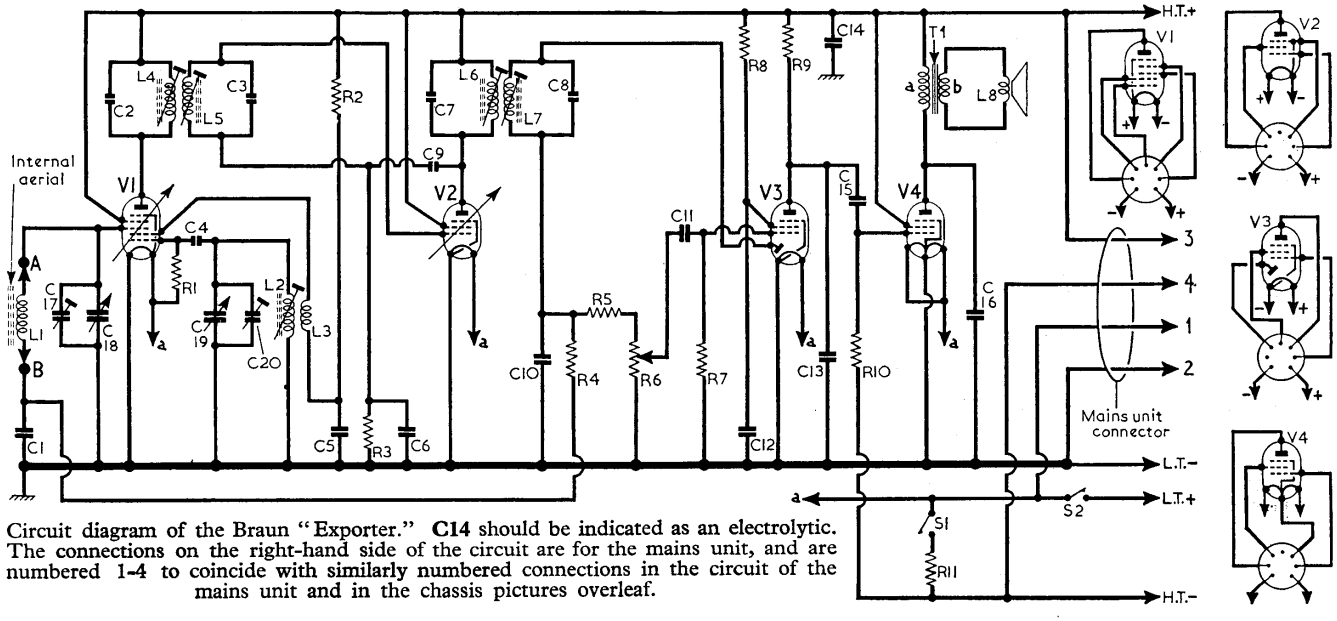
Diode signal detector is part of diode pentode valve **(V3, Telefunken DAF96).** Audio frequency component in rectified output is developed across the volume control **R6,** which operates as the load resistor, and passed via **C11** to triode section. I.F. filtering by **C10, R5** and lead capacitance in diode circuit, and by **C13** in triode anode circuit. D.C. component developed across **R5, R6** is tapped off and fed back via decoupling circuit **R4, C1** to the frequency changer valve only as automatic gain control.

Resistance-capacitance coupling by **R9, C15** and **R10** between **V3** and pentode output valve **(V4, Telefunken DL96).** Tone correction by **C16** in anode circuit.

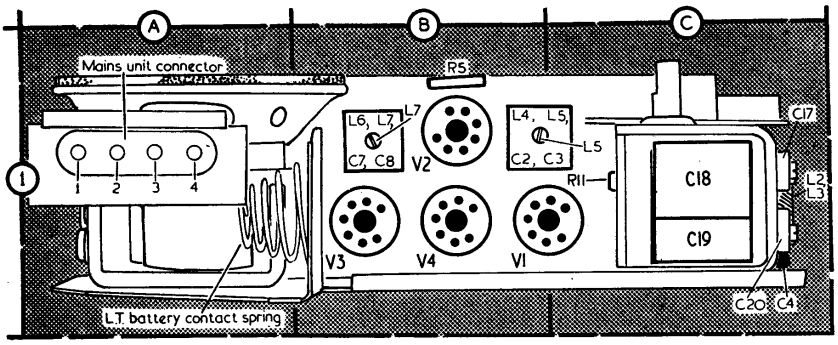
Power Supplies

H.T. and L.T. current is supplied either from self-contained batteries or from a separate A.C.

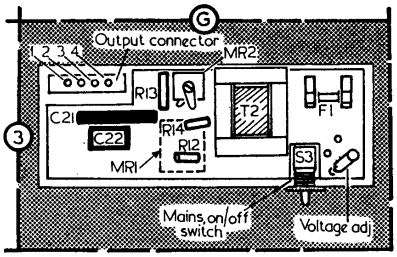
(Continued col. 1 overleaf)



Circuit diagram of the Braun "Exporter." **C14** should be indicated as an electrolytic. The connections on the right-hand side of the circuit are for the mains unit, and are numbered 1-4 to coincide with similarly numbered connections in the circuit of the mains unit and in the chassis pictures overleaf.

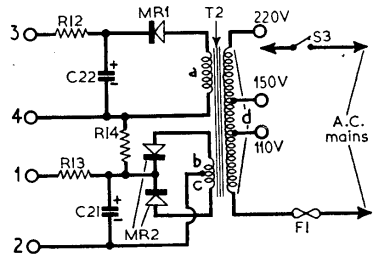


Plan view of the receiver chassis, showing the negative spring connection of the L.T. battery. The L.T. positive connection is on the L.T. cell cover-plate in the carrying case, and it makes contact to an internal clip.



Above: Underside illustration of the A.C. mains unit, identifying the output connections 1-4.

Below: Circuit diagram of the A.C. mains unit. The output connections are numbered 1-4 to coincide with similarly numbered input connections in the receiver circuit overleaf.



Circuit Description—*continued*

mains power unit which forms a plinth on which the set can be stood. When the set is placed on the plinth, the connections **1-4** shown in both circuit diagrams are automatically connected, and power is supplied from the mains by the circuit shown in the small diagram (col. 3) of the power unit.

When the receiver is operating from the mains, the batteries "float" across the power circuits. H.T. current is supplied by metal rectifier **MR1,** and filament current is supplied by full-wave metal rectifier **MR2.** The grid bias to **V4** is modified by shunting **R14** across **R11.** The power unit has its own mains switch **S3,** but when it is switched off, the battery switches **S1, S2** in the receiver must be switched off also, or the batteries will be run down. Conversely, if the batteries are switched off but the mains switch is left on, a hum is produced as a warning that the mains unit should be switched off.

CIRCUIT ALIGNMENT

Remove the chassis from its carrying case as described under "Dismantling." Stand the chassis in a convenient position beside the carrying case and reconnect the internal aerial leads. As these leads are short, they need to be extended to connect to the chassis. The extension leads should be kept as short as possible. The L.T. battery should be connected to its terminations via leads and clips.

I.F. Stages.—Turn gang to maximum, and connect signal generator, via an 0.1 μF capacitor in the "live" lead to control grid (pin 6) of **V1** and chassis. Feed in a 460 kc/s (652.1 m) signal and adjust the cores of **L4** (location reference E2), **L5** (B1), **L6** (E2) and **L7** (B1) for maximum output. Repeat these adjustments until no further improvement results.

R.F. and Oscillator Stages.—Transfer signal generator leads to a loop of wire placed near the ferrite rod aerial in the top of the carrying case. The scale is calibrated in kilocycles, 520 kc/s to 1,600 kc/s, with the final "nought" deleted. Thus the scale reads 52-160.

Tune receiver to calibration mark between 52 and 60 on tuning scale. Feed in a 550 kc/s (545.4 m) signal and adjust the core of **L2** (D2) for maximum output. Tune receiver to calibration mark between 95 and 160 on tuning scale, feed in a 1,400 kc/s (214.3 m) signal and adjust **C20** (C1) and **C17** (C1) for maximum output.

GENERAL NOTES

Switches.—**S1, S2** are the battery on/off switches ganged with the volume control **R6.** In order to allow a simple 3-contact switch unit to be used, the earthy end of the H.T. negative switch **S1** has been returned to the L.T. positive line instead of to chassis.

Batteries.—The batteries specified by the distributors are as follows: H.T., one Ever Ready B106, rated at 45 V; L.T., one Ever Ready U2, rated at 1.5 V.

Valves.—Philips or Valvo valves, employing the same type numbers as the Telefunken range, may be found in some receivers. When replacements are needed, Mullard valves of the same type number can be used for any of these valves.

Mains Unit.—When in use this unit forms a plinth on which to stand the receiver. The receiver should be carefully placed on top of the unit so that the connector on the unit engages with the connector in the base of the receiver. If the receiver and the mains unit are then picked up together, the mains unit should be supported from beneath as it is not securely attached to the receiver by the connector and will fall off.

Internal Aerial.—This consists of a length of ferrite rod on which is wound the aerial coil **L1.** The aerial is contained in the section of the carrying case to which the carrying handle is attached and is not accessible.

Modifications.—The following differences occur between the circuit of the sample receiver on which this *Service Sheet* was prepared and the manufacturers' circuit diagram.

R4 was connected to the other side of **R5** (junction **R5, R6**). **C16** was connected directly across **T1** primary winding **a.**

R14 was shown connected to the opposite end of **R13** in the power unit, so that it was connected directly between sockets **1** and **4** of the power unit connector.

DISMANTLING

Turn gang to minimum capacitance, and unscrew knurled securing screw from centre of tuning control knob;
remove tuning control knob (pull-off);
remove L.T. battery cover on left-hand side of carrying case (slide out);
remove front of carrying case by inserting a finger through the L.T. battery compartment and pressing against the front;
unsolder internal frame aerial from its terminations on the chassis;
slide chassis towards speaker end of case and remove chassis, disengaging the mains unit connector from its groove.

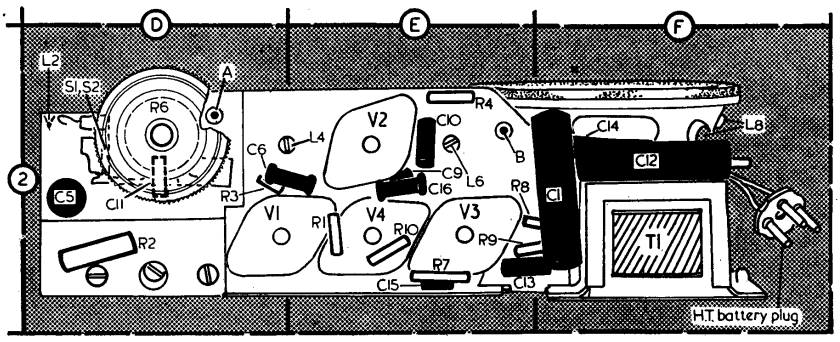
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our sample receiver when it was operating from a set of new batteries. The receiver was tuned to a point at the high wavelength end of the scale.

Valve voltages were measured with an Avo Electronic TestMeter, and as this instrument has a high internal resistance, allowance should be made for other types of meter. Chassis was the negative connection. The voltage measured across **R11** was 3.2 V.

Valve	Anode		Screen	
	V	mA	V	mA
V1 DK96 ...	48	0·16	48	*
	Oscillator			
	29	1·2		
V2 DF96 ...	48	0·7	48	0·4
V3 DAF96 ...	19	*	15	*
V4 DL96 ...	46	3·4	48	0·6

*Very low reading.



Underside view of the receiver chassis showing the internal aerial connections **A** and **B** (location references D2, E2). The internal aerial is located beneath the handle in the carrying case and is not visible.

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