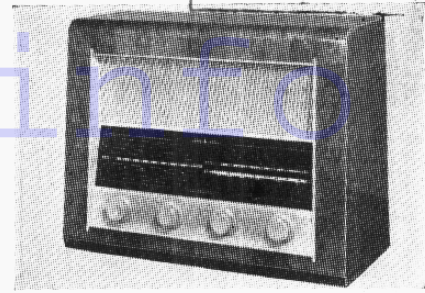


"TRADER" SERVICE SHEET

1149

BUSH DAC34
A.C./D.C. Transportable Superhet

THE Bush DAC34 is a 3-band 4-valve (plus rectifier) transportable table receiver, designed to operate from A.C. or D.C. mains of 200-250 V, 40-100 c/s in the case of A.C. The total mains consumption is approximately 35 watts. The waveband ranges are 16-50 m, 182-560 m and 833-2,068 m.
Release date and original price: August, 1953, £20 0s 3d. Purchase tax extra.



CIRCUIT DESCRIPTION

Aerial input via coupling coils L2, L3, L4 to single-tuned circuits L5, C39 (S.W.) L6, C39 (M.W.) and L7, C39 (L.W.), which precede triode hexode valve (V1, Mullard UGH42)

operating as frequency changer. Reception from an internal frame aerial L1 is provided on M.W. and L.W., the winding being connected in series with the chassis end of the two tuning circuits.

Oscillator grid coils L8, L9 and L10 are tuned by C40. Parallel trimming by C41 (S.W.), C42 (M.W.) and C43 (L.W.); series tracking by

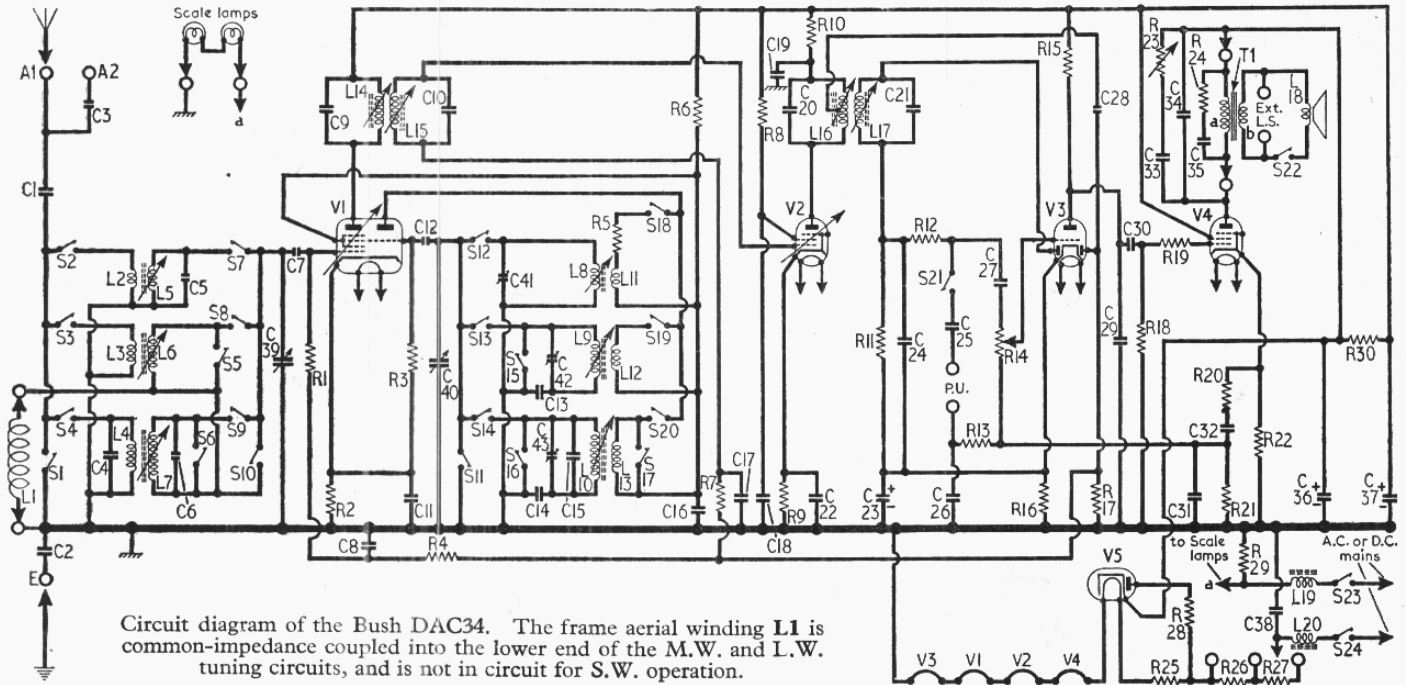
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CAPACITORS		Values	Locations
C1	Aerial and earth isolators	0.005µF	H4
C2	Aerial series	0.01µF	H4
C3	L.W. aerial shunt...	50pF	H4
C4	L.W. aerial trim...	800pF	G4
C5	S.W. aerial trim...	20pF	H4
C6	L.W. aerial trim...	60pF	G4
C7	V1 C.G.	50pF	G4
C8	A.G.C. decoupling	0.1µF	G4
C9	1st I.F. trans. tuning	110pF	B2
C10	ing	110pF	B2
C11	V1 cath. by-pass	0.05µF	G8
C12	V1 osc. C.G.	45pF	G4
C13	M.W. osc. tracker	556pF	G8
C14	L.W. osc. tracker...	390pF	G8
C15	L.W. osc. trim...	180pF	G8
C16	H.T. decoupling	0.05µF	G4
C17	A.G.C. decoupling	0.05µF	G4
C18	V2 S.G. decoupling	0.05µF	G4
C19	H.T. decoupling...	0.05µF	F4
C20	2nd I.F. trans. tuning	110pF	C2
C21	tuning	110pF	C2
C22	Cathode by-passes	0.05µF	F4
C23*		50µF	F3
C24	I.F. by-pass	100pF	F4
C25	P.U. isolators	0.005µF	H4
C26		0.1µF	F3
C27	A.F. coupling	0.01µF	F3
C28	A.G.C. coupling	50pF	F4
C29	Tone corrector	0.002µF	—
C30	A.F. coupling	0.01µF	F4
C31	Neg. feed-back	0.1µF	E4
C32		0.05µF	E4
C33	Part tone control...	0.05µF	E3
C34	Tone correctors	0.001µF	E4
C35		0.01µF	—
C36*	H.T. Smoothing	32µF	C1
C37*		16µF	C1
C38	Mains R.F. filter	0.01µF	D2
C39†	Aerial tuning	528pF	A2
C40†	Oscillator tuning...	528pF	A1
C41†	S.W. osc. trim...	40pF	H3
C42†	M.W. osc. trim...	40pF	H3
C43†	L.W. osc. trim...	40pF	G4

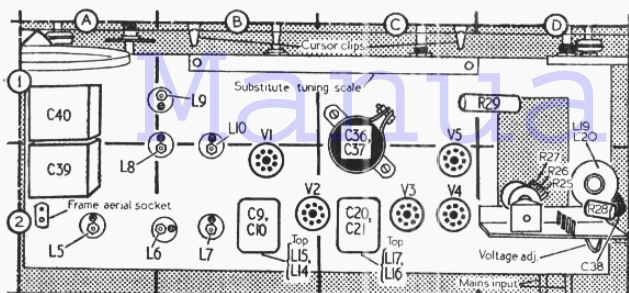
RESISTORS		Values	Locations
R1	V1 C.G.	470kΩ	G4
R2	V1 G.B.	220Ω	G4
R3	V1 osc. C.G.	47kΩ	G4
R4	A.G.C. decoupling	1MΩ	F4
R5	Osc. stabilizer	47Ω	H4
R6	H.T. feed	15kΩ	G4
R7	A.G.C. decoupling	2.2MΩ	F4
R8	V2 S.G. feed	47kΩ	F4
R9	V2 G.B.	330Ω	F4
R10	V2 anode decoupling	10kΩ	F4
R11	Signal diode load	330kΩ	F4
R12	I.F. filter	100kΩ	F3
R13	Neg. feed-back	47kΩ	F3
R14	Volume control	2.2MΩ	F3
R15	V3 anode load	150kΩ	F4
R16	V3 G.B.	5.6kΩ	F4
R17	A.G.C. diode load	1MΩ	F4
R18	V4 C.G.	470kΩ	F4
R19	V4 C.G. stopper	47kΩ	F4
R20		1kΩ	E4
R21	Neg. feed-back	10kΩ	E4
R22		220Ω	E4
R23	Tone control	50kΩ	E3
R24	Tone corrector	10kΩ	—
R25		950Ω	D2
R26	Heater ballast	150Ω	D2
R27		150Ω	D2
R28	V5 surge limiter	250Ω	D2
R29	Scale lamp shunt	250Ω	D1
R30	H.T. smoothing	10kΩ	E4

OTHER COMPONENTS		Approx Values (ohms)	Locations
L1	Frame aerial	0.5	—
L2		—	H4
L3	Aerial coupling coils	0.6	G4
L4		32.0	G4
L5		—	H4
L6	Aerial tuning coils	4.0	G4
L7		16.0	G4
L8	Oscillator tuning coils	—	G3
L9		3.2	G3
L10		4.0	G3
L11	Oscillator reaction coils	—	G3
L12		0.6	G3
L13		1.5	G4
L14	1st I.F. trans. { Pri.	12.5	B2
L15	{ Sec.	12.5	B2
L16	2nd I.F. trans. { Pri.	12.5	C2
L17	{ Sec.	12.5	C2
L18	Speech coil	2.5	—
L19	Mains R.F. filters...	3.0	D2
L20		3.0	D2
T1	O.P. trans. { a	500.0	—
	{ b	0.5	—
S1-	Waveband/gram switches...	—	H4
S21		—	—
S22	Speaker switch	—	—
S23,		—	—
S24	Mains sw., g'd R14	—	F3

* Electrolytic. † Variable. ‡ Pro-set.



Circuit diagram of the Bush DAC34. The frame aerial winding L1 is common-impedance coupled into the lower end of the M.W. and L.W. tuning circuits, and is not in circuit for S.W. operation.



Plan view of the chassis showing the substitute tuning scale referred to in "Circuit Alignment" below.

GENERAL NOTES

Switches.—S1-S21 are the waveband and radio/gram change-over switches, ganged in two rotary units beneath the chassis. These units are indicated in our underside illustration of the chassis and shown in detail in the switch diagram in column 1, where they are drawn as seen in the direction of the indicating arrows in the chassis view. In the associated switch table, a dash indicates open, and **c**, closed.

S22 is the internal speaker muting switch and is mounted, together with the external speaker

Switches	S.W.	M.W.	L.W.	Gram.
S1	—	—	—	c
S2	c	—	—	—
S3	—	c	—	—
S4	—	—	c	—
S5	c	—	—	—
S6	c	c	—	—
S7	c	—	—	—
S8	—	c	—	—
S9	—	—	c	—
S10	—	—	—	c
S11	—	—	—	c
S12	c	—	—	—
S13	—	c	—	—
S14	—	—	c	—
S15	c	—	—	—
S16	c	c	—	—
S17	c	c	—	—
S18	c	c	—	—
S19	—	c	—	—
S20	—	—	c	—
S21	—	—	—	c

sockets, in the top rear corner of the cabinet. **Scale Lamps.**—These are 3.5 V, 0.15 A lamps with large clear spherical bulbs and M.E.S. bases.

Drive Cord Replacemnt.—About 4ft 6in of nylon braided glass yarn is required for a new drive cord which should be run as shown in the sketch of the drive cord system, starting with the gang at maximum capacitance and running the cord off clockwise round the drum.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those derived from the manufacturer's information. They were measured on a receiver which was operated from A.C. mains of 230 V and tuned to the highest wavelength end of M.W. There was no signal input.

Voltages were measured on the 10 V and 1,000 V ranges of a Model 7 Avometer, chassis being the negative connection in every case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 UCH42...	{100 48	{2.4 1.2	48	1.2	1.0
V2 UF41 ...	68	2.8	50	1.2	1.2
V3 UBC41 ...	48	0.16	—	—	0.6
V4 UL41 ...	212	25.0	96	3.2	6.4
V5 UY41 ...	211*	—	—	—	226.0†

* A.C. reading. † Cathode current 37 mA.

Circuit Description—continued

C13 (M.W.) and C14 (L.W.). Reaction coupling from anode by L11, L12 and L13.

Second valve (V2, Mullard UF41) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C9, L14, L15, C10 and C20, L16, L17, C21.

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve (V3, Mullard UBC41). Audio fre-

CIRCUIT ALIGNMENT

I.F. Stages.—Switch receiver to medium waves and tune it to 300 m. Connect output of signal generator, via an 0.1 μF capacitor in each lead, to control grid (pin 6) of V2 and chassis, feed in a 470 kc/s (638.3 m) signal and adjust the cores of L17 (location reference C2) and L16 (C2) for maximum output. Transfer signal generator leads to control grid (pin 6) of V1 and chassis, and, feeding in a 470 kc/s signal adjust the cores of L15 (B2) and L14 (B2) for maximum output. Repeat these adjustments until no further improvement results.

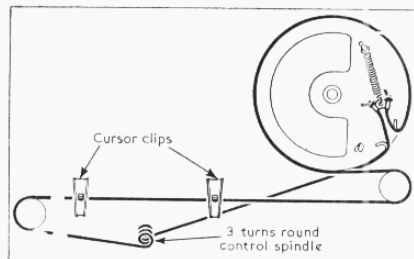
R.F. and Oscillator Stages.—In order that the receiver may be aligned with the chassis in its cabinet, three holes are provided in the cabinet base to give access to C41, C42 and C43. If, however, the chassis is removed from its cabinet for alignment, the frame aerial should be disconnected and a shorting link placed across the frame aerial sockets. As the tuning scale is fixed to the cabinet, reference should be made in this case to the substitute tuning scale fixed along the front of the chassis deck. A temporary cursor, such as a paper clip, should be fixed to the tuning drive, and, with the gang at maximum, aligned with the datum line on the substitute tuning scale.

L.W.—Switch receiver to L.W. and connect signal generator output leads to A and E sockets. Tune receiver to 2,000 m, feed in a 2,000 m (150 kc/s) signal and adjust the cores of L10 (B2) and L7 (B2) for maximum output. Tune receiver to 1,000 m, feed in a 1,000 m (300 kc/s) signal and adjust C43 (G4) for maximum output. Repeat these adjustments until no further improvement results.

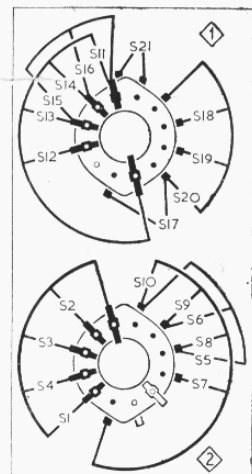
M.W.—Switch receiver to M.W., tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of L9 (B1) and L6 (B2) for maximum output. Tune receiver to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust C42 (H3) for maximum output. Repeat these adjustments until no further improvement results.

S.W.—Switch receiver to S.W., tune to 50 m, feed in a 50 m (6 Mc/s) signal and adjust the cores of L8 (B2) and L5 (A2) for maximum output. Tune receiver to 25 m, feed in a 25 m (12 Mc/s) signal and adjust C41 (H4) for maximum output. Repeat these adjustments until no further improvement results.

L.W. Check.—If alignment has been carried out with the chassis out of its cabinet, the cores of L7 and L10 should be re-adjusted for maximum output at 2,000 m (150 kc/s) after the chassis has been replaced in its cabinet and the frame aerial re-connected.



Above: Sketch of the tuning drive cord system as seen from the front of the chassis.



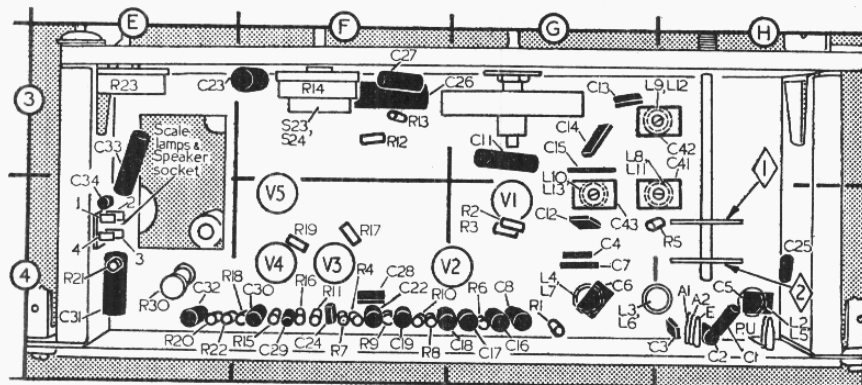
Left: Diagrams of the waveband switch units, drawn as seen in the direction indicated by the arrows in the under-chassis illustration.

quency component in its rectified output is developed across load resistor R11, and passed via C27 and volume control R14 to grid of triode section. I.F. filtering by C24, R12 and the capacitance of the screened leads.

Second diode of V3 is fed from V2 anode via C28, and the resulting D.C. potential developed across load resistor R17 is fed back as bias to V1 and V2, giving automatic gain control.

Resistance-capacitance coupling by R15, C30 and R18 between V3 and pentode output valve (V4, Mullard UL41). Tone correction in anode circuit by C34, R24 and C35. Variable tone control by R23 and C33. Negative feed-back tone correction between V4 cathode circuit and V3 grid circuit via R22, R20, C32, R21, C31 and R13.

H.T. current is supplied by I.H.C. half-wave rectifying valve (V5, Mullard UY41). H.T. smoothing by R30 and electrolytic capacitors C36, C37. Valve heaters, together with ballast resistors R25, R26, R27 and scale lamps, are connected in series across the mains input. Mains R.F. filtering by C38 and chokes L19, L20.



Underside view of chassis. Switch units, indicated here, are shown in detail in col. 1.