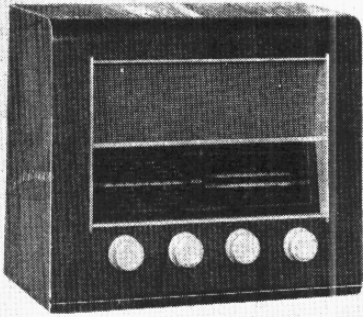


"TRADER" SERVICE SHEET
1186

BUSH AC41
3-band A.C. Superhet

ternal coupling. Oscillator grid coils L8 (S.W.), L9 (M.W.) and L10 (L.W.) are tuned by C29. Parallel trimming by C30 (S.W.), C31 (M.W.) and C9, C12 (L.W.); series tracking by C10
(Continued col. 1 overleaf)



EMPLOYING the triode section of the frequency changer as a pick-up pre-amplifier when switched to gram, the Bush AC41 is a 3-valve (plus rectifier) 3-band table superhet receiver designed to operate from A.C. mains of 100-120 V, 200-250 V, 50 c/s. The waveband ranges are 14.3-35.5 m, 176-575 m, 1,000-2,000 m.

Release date and original price: May 1954, £16 4s 9d. Purchase tax extra.

CIRCUIT DESCRIPTION

Aerial input via coupling coils L1 (S.W.) and L2 (L.W.) to single tuned circuits L3, C28 (S.W.) and L6, C28 (L.W.).

First valve (V1 Mullard ECH42) is a triode hexode operating as frequency changer with in-

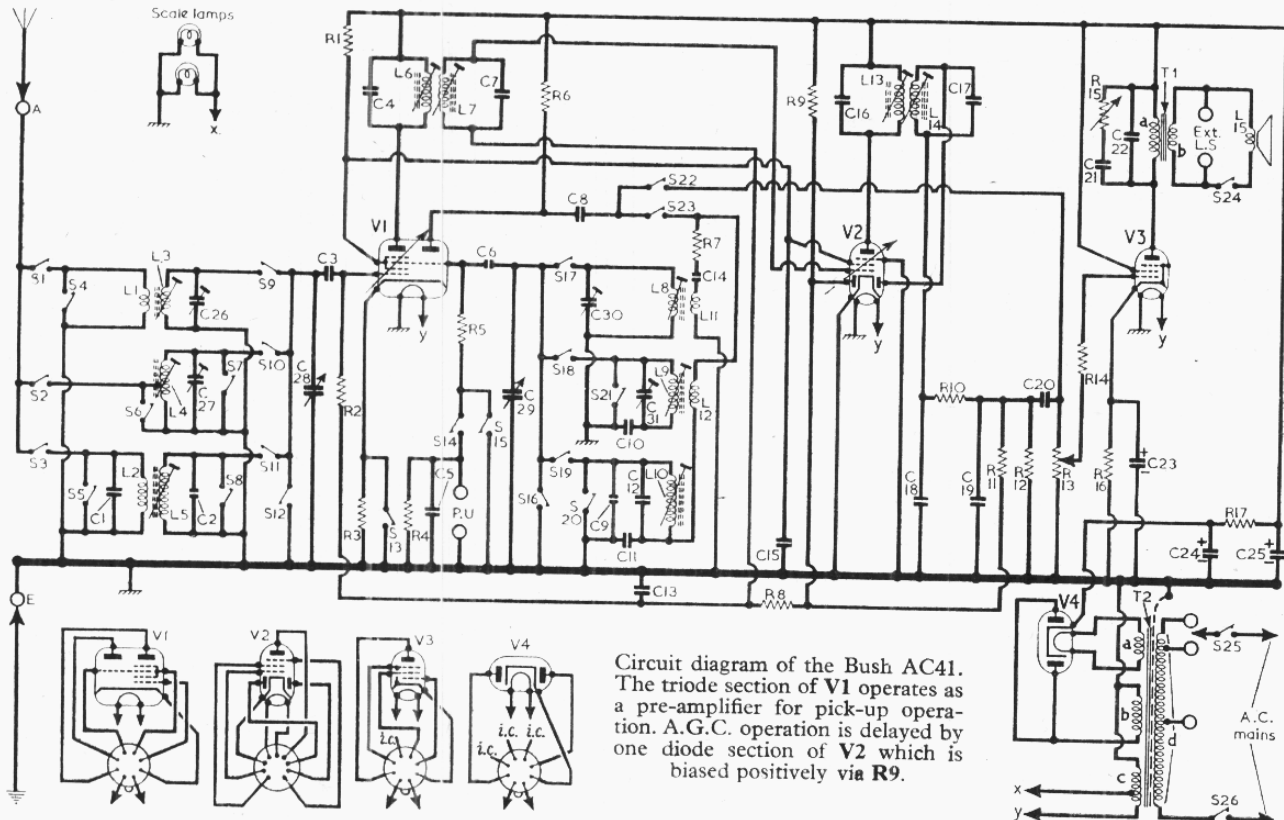
COMPONENTS AND VALUES

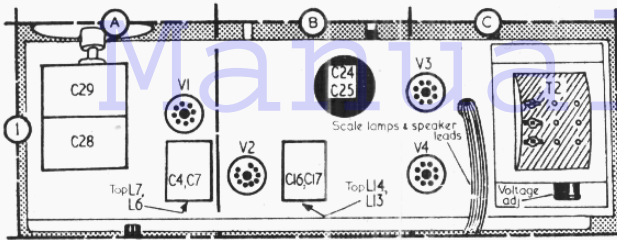
CAPACITORS		Values	Locations
C1	L.W. aerial shunt...	600pF	G3
C2	L.W. aerial trim...	85pF	G3
C3	V1 C.G.	100pF	G3
C4	I.F. tuning	110pF	A1
C5	P.U. tone correction	0.002µF	G3
C6	V1 osc. C.G.	56pF	G2
C7	I.F. tuning	110pF	A1
C8	Osc. reaction coup.	0.001µF	F2
C9	L.W. osc. trim.	33pF	G2
C10	} Osc. trackers	515pF	G2
C11		365pF	G2
C12	L.W. osc. trim.	240pF	G2
C13	A.G.C. decoupling	0.05µF	F2
C14	Osc. reaction coup.	56pF	G2
C15	S.G. decoupling	0.05µF	F2
C16	} 2nd I.F. trans. tuning	110pF	B1
C17		110pF	B1
C18	} I.F. by-passes	100pF	E3
C19		100pF	E3
C20	A.F. coupling	0.002µF	E3
C21	Part tone control	0.05µF	D2
C22	Tone correction	0.005µF	E2
C23*	V3 cath. by-pass	50µF	E2
C24*	} H.T. smoothing	32µF	B1
C25*		32µF	B1
C26†	S.W. aerial trim.	—	G3
C27†	M.W. aerial trim.	—	G3
C28†	Aerial tuning	—	A1
C29†	Oscillator tuning	—	A1
C30†	S.W. osc. trim.	—	A1
C31†	M.W. osc. trim.	—	G2

RESISTORS		Values	Locations
R1	S.G. H.T. feed ...	39kΩ	F2
R2	V1 C.G.	680kΩ	F3
R3	V1 G.B.	330Ω	G3
R4	P.U. shunt ...	680kΩ	G3
R5	V1 osc. C.G.	47kΩ	G2
R6	Osc. anode feed ...	22kΩ	F2
R7	Osc. stabilizer ...	100Ω	G2
R8	A.G.C. decoupling	1.5MΩ	F2
R9	Delay diode bias	20MΩ	E2
R10	I.F. stopper ...	47kΩ	E3
R11	A.G.C. decoupling	680kΩ	E2
R12	Signal diode load...	330kΩ	E2
R13	Volume control ...	500kΩ	E2
R14	V3 C.G. stopper ...	47kΩ	E2
R15	Tone control ...	50kΩ	D2
R16	V3 G.B.	180Ω	E2
R17	H.T. smoothing ...	1.5kΩ	E3

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	} Aerial coupling coils	—	G3
L2		50-0	G3
L3		—	G3
L4	} Aerial tuning coils	7-0	G3
L5		20-0	G3
L6	} 1st I.F. trans. { Pri.	12.5	A1
L7		12.5	A1
L8	} Oscillator tuning coils	1-0	G2
L9		5-0	G2
L10	} Oscillator reaction coils	5-0	G2
L11		—	G2
L12	} 2nd I.F. trans. { Pri.	12.5	B1
L13		12.5	B1
L14	} Speech coil	2.5	—
L15		410-0	—
T1	} O.P. trans. { a	—	—
T2		b	—
T2	} Mains trans. { c	140-0	C1
T2		d, total	45-0
S1-S23	Waveband/gram sw.	—	G2
S24	Speaker switch	—	—
S25	—	—	—
S26	Mains sw., g'd R18	—	E2

* Electrolytic. † Variable. ‡ Pre-set.





Plan view of the chassis indicating the positions of the I.F. core adjustments in locations A1 and B1.

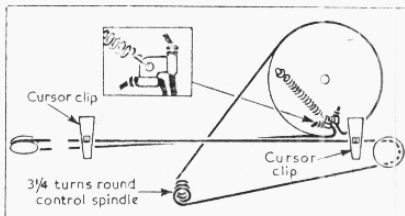
Circuit Description—continued

(M.W.) and C11 (L.W.). Reaction coupling from oscillator anode via L11 (S.W.), L12 (M.W.) and the common impedance of tracker C11 (L.W.).

Second valve (V2, Mullard EBF80) is a double diode R.F. pentode, its pentode section operating as intermediate frequency amplifier with tuned transformer couplings C4, L6, L7, C7 and C16, L13, L14, C17.

Intermediate frequency 470 kc/s. One diode section of V2 operates as signal detector. The audio frequency component in its rectified output being developed across load resistor R12 and passed via C20 and volume control R13 to control grid of pentode output valve (V3, Mullard EL41).

Sockets are provided for the connection of a gramophone pick-up, whose output is fed via S14 to triode section of V1, which operates as pick-up pre-amplifier. The amplified A.F. output is developed across R6, and is coupled via C8, S22 to the top of R13. S13 opens in the gram position of the waveband control, applying bias to V1 triode.



Sketch of the tuning drive cord system.

VALVE ANALYSIS

Valve voltages and currents given in the table below are derived from the manufacturers' information, and were measured on a receiver operating from 230 V A.C. mains. The receiver was tuned to the high wavelength end of the M.W. band, but 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 each case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	
V1 ECH42	230	2.0	60	3.0	—
	Oscillator	5.0	—	—	—
V2 EBF80	230	*	60	*	—
V3 EL41	220	32.0	230	5.0	6.8
V4 EZ40	300†	—	—	—	283.0‡

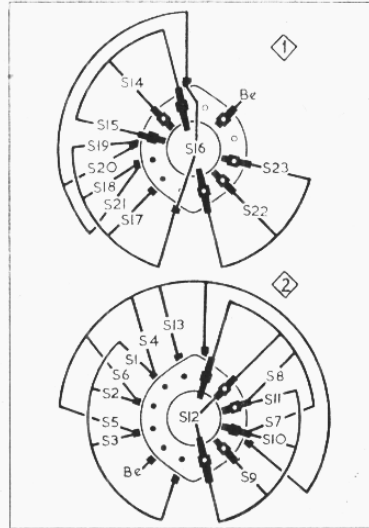
* No reading quoted; cathode current 4mA.
† A.C. reading. ‡ Cathode current 53 mA.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch receiver to M.W. and set gang to about two thirds maximum capacitance. Connect output of signal generator, via an 0.1 μF capacitor in the "live" lead, to control grid (pin 2) of V2 and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of L14 (location reference B1) and L13 (B1) for maximum output. Transfer signal generator "live" lead, together with the 0.1 μF capacitor, to control grid (pin 6) of V1 and chassis. Feeding in a 470 kc/s signal, adjust the cores of L7 (A1) and L6 (A1) for maximum output.

R.F. and Oscillator Stages.—As the tuning

Waveband Switch Diagrams and Table



Switches	S.W.	M.W.	L.W.	Gram.
S1	C	—	—	—
S2	—	C	—	—
S3	—	—	C	—
S4	—	C	—	—
S5	—	—	—	C
S6	—	—	C	—
S7	C	—	—	—
S8	C	C	—	—
S9	C	—	—	—
S10	—	C	—	—
S11	—	—	C	—
S12	—	—	—	C
S13	C	C	C	—
S14	—	—	—	C
S15	C	C	C	—
S16	—	—	—	C
S17	C	—	—	—
S18	—	C	—	—
S19	—	—	C	—
S20	C	C	—	—
S21	C	—	—	—
S22	—	—	—	C
S23	C	C	C	—

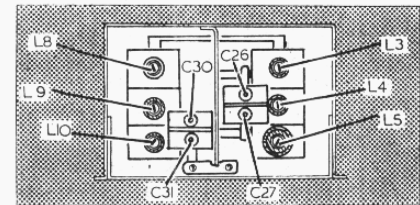
scale remains fixed to the cabinet when the chassis is withdrawn, reference is made in the following alignment to the substitute tuning scale fixed to the back of the tuning drive drum. This scale has the trimming and tracking points marked on it in wavelengths, and is read off against the top sloping edge of the fixed metal pointer. Check that with the gang at maximum capacitance, the pointer coincides with the datum line on the substitute scale.

When the chassis is finally replaced in its cabinet, check that with the gang at maximum capacitance, the cursors coincide with the short vertical lines at the high wavelength ends of the tuning scales. The positions of all the R.F. and oscillator adjustments are shown in the sketch (below) where they are drawn as seen from the aerial input end of an upright chassis. Connect output of signal generator, via a dummy aerial, to A and E sockets.

L.W.—Switch receiver to L.W., tune to 1,400 m on substitute scale, feed in a 1,400 m (214 kc/s) signal and adjust the cores of L10 and L5 for maximum output. Check calibration over band.

M.W.—Switch the receiver to M.W., tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of L9 and L4 for maximum output. Tune receiver to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust C31 and C27 for maximum output.

S.W.—Switch receiver to S.W., tune to 30 m, feed in a 30 m (10 Mc/s) signal and adjust the cores of L8 and L3 for maximum output. Tune receiver to 15 m, feed in a 15 m (20 Mc/s) signal and adjust C30 and C26 for maximum output.



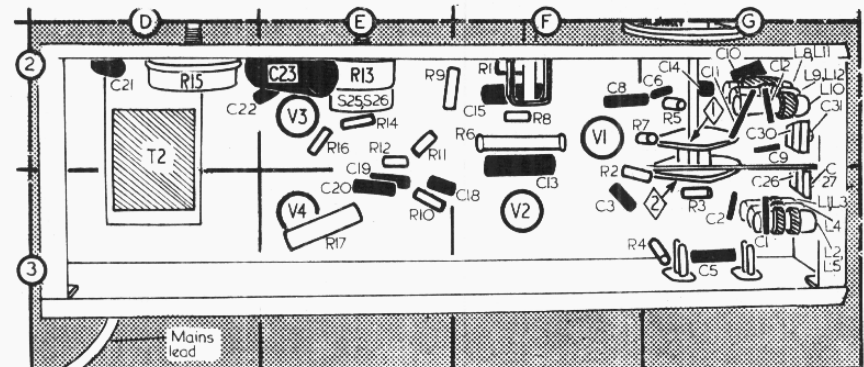
The R.F. and oscillator adjustments.

GENERAL NOTES

Switches.—S1-S23 are the waveband and radio/gram change-over switches, ganged in two rotary units beneath the chassis. These units are indicated in our underside view of the chassis, and shown in detail in the diagrams in column 2, where they are viewed in the directions indicated by the arrows in the under-chassis illustration. The associated switch table gives the switch operations for the four control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and C, closed.

Scale Lamps.—These are 6.2 V, 0.3 A lamps, with large clear spherical bulbs and M.E.S. bases.

Drive Cord Replacement.—About 50 inches of nylon-braided glass yarn is required for a new drive. The cord should be run as shown in the sketch of the tuning drive system (col. 1) which is drawn as seen from the front with the gang at maximum capacitance.



Underside view of the chassis. 1 and 2 in diamonds indicate the waveband switch units.