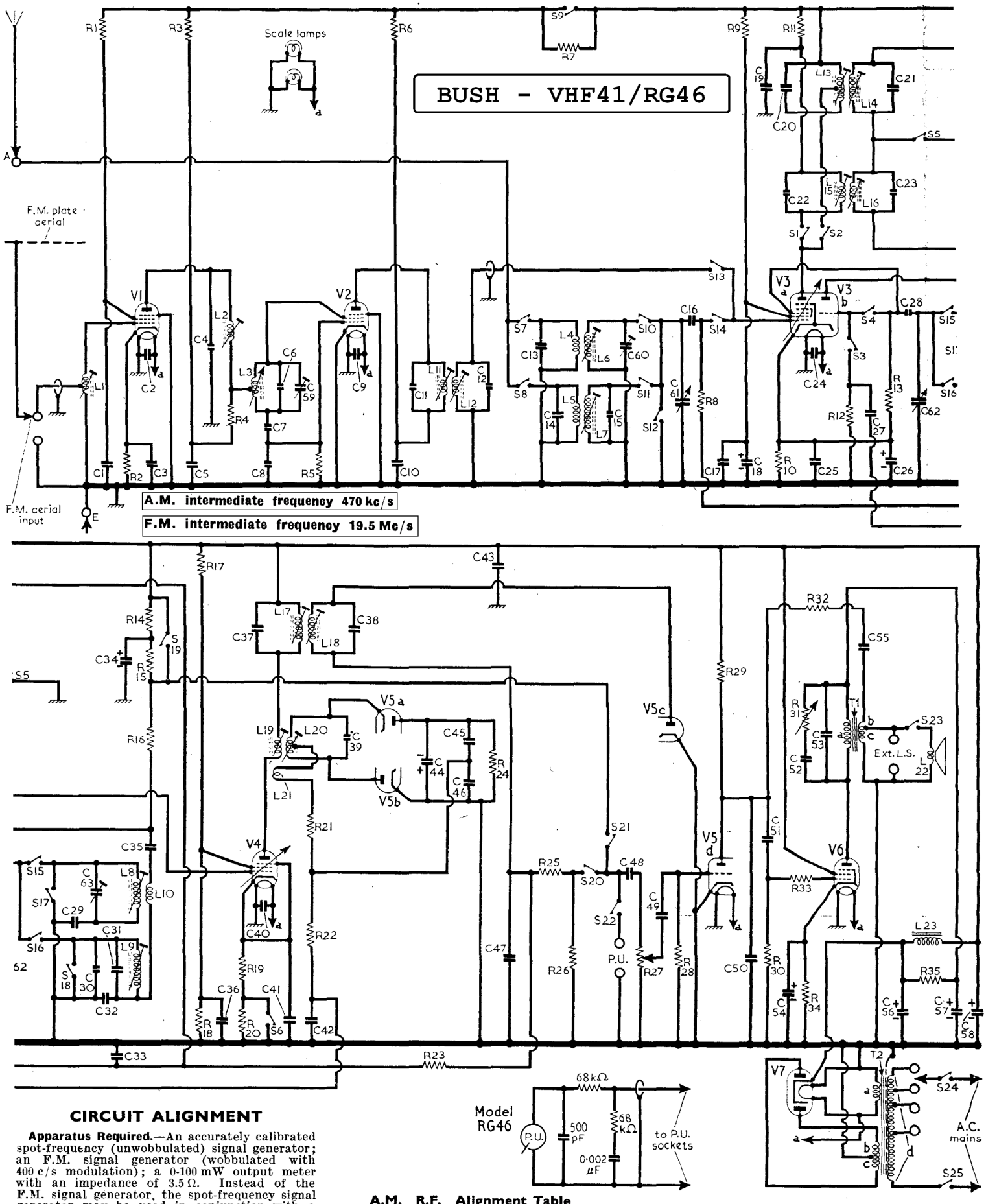


CIRCUIT ALIGNMENT

Apparatus Required.—An accurately calibrated spot-frequency (unwobbulated) signal generator; an F.M. signal generator (wobbulated with 400 c/s modulation); a 0-100 mW output meter with an impedance of 3.5 Ω. Instead of the F.M. signal generator, the spot-frequency signal generator may be used in conjunction with a D.C. valve voltmeter or a 20,000 Ω/V meter.

During alignment, an output meter reading of 50 mW (or 4V on valve voltmeter) should be maintained. It is necessary to remove the chassis from its cabinet to make the following adjustments accessible.

A.M. I.F. Stages.—Switch receiver to M.W. Connect the output of the spot-frequency signal generator to control grid (pin 2) of **V4** and chassis. Connect sound output meter across **T1** secondary winding, and disconnect the speech coil connection.

A.M. R.F. Alignment Table

Wave band	Sig. Gen. Output (kc/s)	Tune to	Adjust	Location
M.W.	600	0·6	L8	G2
M.W.	600	0·6	L6	G3
M.W.	1,500	1·5	C63	G2
M.W.	1,500	1·5	C60	G3
Repeat above and check calibration.				
L.W.	214	0·214	L9	G2
L.W.	214	0·214	L7	G3
Repeat last two operations and check calibration.				

F.M. R.F. Alignment Table

Sig. Gen. Output (Mc/s)	Tune to	Adjust	Location
87·5*	87·5	L3	A1
100·0*	100	C59	A1
94·0*	94	L2	A1
94·0*	94	L1	A1
Repeat above operations and check calibration.			

* Deviated by ±22·5kc/s.

RESISTORS		Values	Locations
R1	V1 S.G. H.T. feed	15kΩ	H4
R2	V2 G.B.	180Ω	H4
R3	V1 H.T. decoupling	470Ω	H4
R4	Part V1 load ...	2·2kΩ	H4
R5	V2 C.G.	47kΩ	H4
R6	V2 H.T. decoupling	2·2kΩ	H4
R7	H.T. bleed to V1, V2	100kΩ	G2
R8	V3a C.G.	680kΩ	F3
R9	V3a S.G. H.T. feed	22kΩ	F2
R10	V3 G.B.	180Ω	F2
R11	V3a H.T. decoupling ...	1kΩ	F3
R12	V3b A.F. C.G. ...	470kΩ	F3
R13	V3b osc. C.G. ...	47kΩ	F3
R14	V3b H.T. decoupling ...	47kΩ	G2
R15	V3b A.F. load ...	10kΩ	G2
R16	V3b osc. load ...	33kΩ	F2
R17	V4 S.G. H.T. ...	56kΩ	E2
R18*	pot. divider ...	100kΩ	E2
R19	V4 G.B. (F.M.) ...	150Ω	F2
R20	V4 stabilizing G.B. (A.M.)	1·2kΩ	F3
R21	A.F. feed ...	100Ω	E3
R22	Part de-emphasis...	100kΩ	E3
R23	A.G.C. decoupling	1·5MΩ	F3
R24	F.M. D.C. load ...	22kΩ	E3
R25	A.M. I.F. stopper	100kΩ	E3
R26	A.M. diode load ...	220kΩ	E3
R27	Volume control ...	500kΩ	E2
R28	V5a C.G.	15MΩ	E3
R29	V5a anode load	180kΩ	E3
R30	V6 C.G.	1MΩ	E3
R31	Tone control ...	50kΩ	D2
R32	Neg. feed-back ...	470kΩ	E2
R33	V6 C.G. stopper ...	3·3kΩ	E3
R34	V6 G.B.	220Ω	E3
R35	H.T. smoothing ...	1kΩ	D3

* Not fitted in early versions.

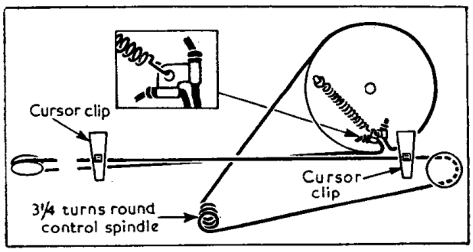
CAPACITORS		Values	Locations
C1	V1 S.G. decoupling	0·001μF	H4
C2	V1 heater by-pass	0·001μF	H4
C3	V1 cath. by-pass ...	0·001μF	H4
C4	R.F. tuning ...	4·7pF	H4
C5	V1 H.T. decoupling	0·001μF	H4
C6	Oscillator tuning ...	4·7pF	H4
C7	V2 C.G.	22pF	H4
C8		4·7pF	H4
C9	V2 heater by-pass	0·001μF	H4
C10	V2 H.T. decoupling	0·003μF	H4
C11	1st F.M. I.F. trans. tuning	39pF	A1
C12		22pF	A1
C13	Aerial shunts ...	800pF	G3
C14		600pF	G3
C15	L.W. aerial trim. ...	85pF	G3
C16	V3a C.G.	100pF	G3
C17	V3a S.G. decoupling ...	0·003μF	F2
C18*		1μF	F2
C19	V3a H.T. decoupling	0·003μF	F2
C20	1st A.M. I.F. trans. tuning	110pF	B1
C21		110pF	B1
C22	2nd F.M. I.F. trans. tuning	39pF	B1
C23		39pF	B1
C24	V3 heater by-pass	0·02μF	F3
C25	V3 cath. by-passes	0·02μF	F2
C26*		100μF	F2
C27	A.F. coupling ...	0·02μF	F3
C28	V3b osc. C.G. ...	56pF	G2
C29	M.W. osc. tracker...	515pF	G2
C30	L.W. osc. trimmers	33pF	G2
C31		240pF	G2
C32	L.W. osc. tracker...	365pF	G2
C33	A.G.C. decoupling	0·1μF	F3
C34*	H.T. decoupling ...	16μF	F2
C35	Osc. anode coup. ...	0·001μF	G2
C36	V4 S.G. decoupling	0·003μF	E2

* Electrolytic.

CAPACITORS (*Continued*)		Values	Locations
C37	2nd A.M. I.F. trans. tuning	110pF	B1
C38		110pF	B1
C39	3rd F.M. I.F. tun.	47pF	E2
C40	V4 heater by-pass	0·02μF	F3
C41	V4 cath. by-pass ...	0·02μF	F2
C42	Part de-emphasis...	500pF	E3
C43	H.T. decoupling ...	0·003μF	E3
C44*	F.M. D.C. reservoir	5μF	E3
C45	Ratio detector balancing capacitors	220pF	E3
C46		220pF	E3
C47	I.F. by-pass ...	100pF	E3
C48	A.F. couplings ...	0·01μF	E2
C49		0·01μF	E3
C50	I.F. by-pass ...	270pF	E2
C51	A.F. coupling ...	0·01μF	E3
C52	Part tone control...	0·1μF	E2
C53	Tone correction ...	0·001μF	D3
C54*	V6 cath. by-pass ...	50μF	D3
C55	Neg. feed-back ...	3,300pF	E2
C56*	H.T. smoothing ...	40μF	C1
C57*		40μF	C1
C58*		20μF	C1
C59‡	F.M. osc. trim. ...	8pF	H4
C60‡	M.W. aerial trim....	—	G3
C61†	Aerial tuning ...	—	A1
C62†	Oscillator tuning ...	—	A1
C63‡	M.W. osc. trim. ...	—	G2

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS			Approx. Values (ohms)	Locations
L1	F.M. aerial coup....		—	H4
L2	F.M. R.F. coil ...		—	H4
L3	F.M. osc. coil ...		—	A1
L4	A.M. aerial coupling coils		14·0	G3
L5			50·0	G3
L6	A.M. aerial tuning coils		14·0	G3
L7			20·0	G3
L8	A.M. oscillator tuning coils		5·0	G2
L9			5·0	G2
L10	M.W. reaction coup		1·0	G2
L11	1st F.M. I.F. trans.	Pri.	—	A1
L12		Sec. ...	—	A1
L13	1st A.M. I.F. trans.	Pri.	12·5	B1
L14		Sec. ...	12·5	B1
L15	2nd F.M. I.F. trans.	Pri.	—	B1
L16		Sec. ...	—	B1
L17	2nd A.M. I.F. trans.	Pri.	12·5	B1
L18		Sec. ...	12·5	B1
L19	3rd F.M. I.F. trans.	Pri.	—	B1
L20		Sec. ...	—	B1
L21		Tert.	—	B1
L22	Speech coil ...		2·5	—
L23	Smoothing choke...		550·0	B1
T1	O.P. trans.	a...	410·0	—
		b...	360·0	—
		c...	0·28	—
T2	Mains trans.	a...	0·1	
		b...	140·0	C1
		c...	140·0	
		d, total	27·0	
S1-S6	A.M./F.M. switches		—	F3
S7-S22	Waveband switches		—	G2
S23	Speaker switch ...		—	—
S24, S25	Mains sw., g'd R27		—	E2



Left: Drive cord system as seen from the chassis front. About 50in of nylon braided glass yarn is required. *Right:* Underside view of the F.M. tuner unit.

CIRCUIT ALIGNMENT

Apparatus Required.—An accurately calibrated spot-frequency (unwobbulated) signal generator; an F.M. signal generator (wobbulated with 400 c/s modulation); a 0-100 mW output meter with an impedance of 3.5 Ω. Instead of the F.M. signal generator, the spot-frequency signal generator may be used in conjunction with a D.C. valve voltmeter or a 20,000 Ω/V meter.

During alignment, an output meter reading of 50 mW (or 4V on valve voltmeter) should be maintained. It is necessary to remove the chassis from its cabinet to make the following adjustments accessible.

A.M. I.F. Stages.—Switch receiver to M.W. Connect the output of the spot-frequency signal generator to control grid (pin 2) of **V4** and chassis. Connect sound output meter across **T1** secondary winding, and disconnect the speech coil connection.

Feed in a 470 kc/s 30% modulated signal and adjust the cores of **L18** and **L17** (location reference B1) for maximum output.

Transfer "live" signal generator lead to control grid (pin 2) of **V3** and, still feeding in a 470 kc/s signal, adjust the cores of **L14** and **L13** (B1) for maximum output. Do not re-adjust the cores of **L17, L18.**

F.M. I.F. Stages.—Switch receiver to F.M. Connect the output leads of the F.M. signal generator to the F.M. aerial socket (alternative alignment using the spot-frequency signal generator and the high-resistance voltmeter is given at the end of this section).

Feed in a 19.5 Mc/s signal deviated by ±22.5 kc/s and adjust the cores of **L20** (E2), **L19** (B1), **L16** (B1), **L15** (F2), **L12** (A1), and **L11** (A1), in that order, for maximum output.

If an F.M. signal generator is not available, connect the output of the spot-frequency signal generator to the F.M. aerial socket, and connect a D.C. valve voltmeter (or 20,000 ohms-per-volt meter) across **R24** (positive connection to chassis) as output meter.

With the receiver switched to F.M., feed in an unmodulated 19.5 Mc/s signal and adjust the cores of **L19** (B1), **L16** (B1), **L15** (F2), **L12** (A1) and **L11** (A1) for maximum deflection on the output meter.

Disconnect output meter leads from **R24** and re-connect them across **C42** (positive connection to chassis). Unscrew the core of **L20** (E2) to its full extent. Then, feeding in an unmodulated 19.5 Mc/s signal as before, screw the core of **L20** slowly into its former, passing through a "dip" in the response (minimum meter deflection) and setting the core to the "peak" (maximum meter deflection) that occurs beyond this point.

Re-connect output meter across **R24,** and still feeding in an unmodulated 19.5 Mc/s signal, re-adjust the core of **L19** (B1) for maximum deflection on the output meter. Then adjust signal generator output for a 4V reading.

Re-connect output meter across **C42** and unscrew the core of **L20** (E2) in an anti-clockwise direction until the output meter reads 1.6V.

R.F. and Oscillator Stages.—As the tuning scale remains fixed in the cabinet when the chassis is withdrawn for alignment, reference must be made to the substitute tuning scale fixed to the front edge of the chassis. A temporary cursor should be clipped to the front horizontal run of the drive cord and adjusted so that with the gang at maximum capacitance the temporary cursor coincides with the datum line on the substitute scale. Calibration points on this scale are referred to under "Tune to" in the alignment tables.

Connect spot-frequency signal generator (using a 30% modulated signal) to A.M. aerial and earth sockets for A.M. alignment, and connect F.M. signal generator to F.M. aerial socket for F.M. alignment. If an F.M. signal generator is not available, the spot-frequency signal generator can be used (with an unmodulated output) and with a D.C. valve voltmeter (or 20,000 ohms-per-volt meter) connected across **R24** as an output indicator.

Where two peaks are found during F.M. alignment the peak should be chosen with the core nearer to the adjusting end of the coil former. Carry out the adjustments in the order shown in the alignment tables, commencing with the A.M. R.F. alignment table.

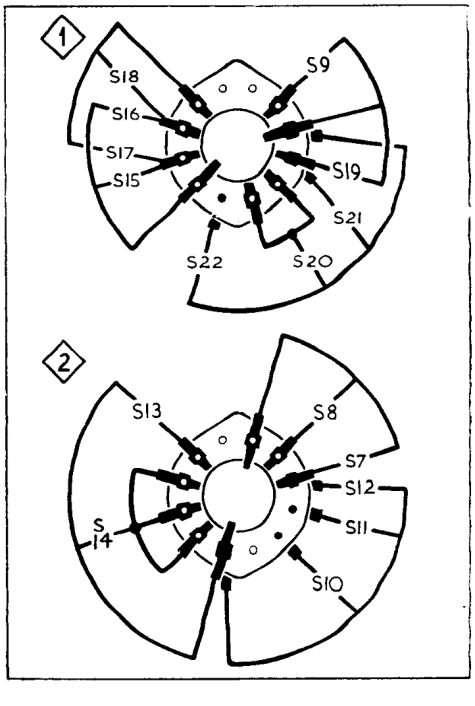


Diagram of the rotary waveband switch units, drawn as seen in the directions of the arrows in the underchassis view. Below is the associated switch table.