

Valve	Anode (V)	Screen (V)	Cath. (V)
V1 EF80 ...	180†	175†	2†
V2 EF80 ...	195†	—	—
V3 ECH81 { a ...	105	115	2.5
V4 EF85 ...	240	110	3.5†
V5 EABC80 { a-c ...	85	—	—
V6 EL84 ...	245	240	8.0
V7 EZ80 ...	220§	—	260.0
T.I. EM80 ...	215	—	—

* No reading quoted.

† Receiver switched to F.M.

‡ 1.3 V on F.M.

§ A.C. reading, each anode; total current 66mA.

Valve	Anode (V)	Screen (V)	Cath. (V)
V1 UF80 ...	155†	150†	1.5†
V2 UF80 ...	170†	—	—
V3 UCH81 { a ...	115	95	2.2
V4 UF85 ...	200	90	2.9†
V5 UABC80 { a-c ...	195	—	—
V6 UL85 ...	70	—	—
V7 UY85 ...	190	165	12.0
T.I. UM4 ...	220§	—	210.0
T.I. UM4 ...	170	—	—

* No reading quoted.

† Receiver switched to F.M.

‡ 1.2 V on F.M.

§ A.C. reading; total current 60mA.

BUSH - VHF54, VHF55

Switch Table

Switches	F.M.	M.W.	L.W.	Gram.
S9	—	—	—	—
S10	—	—	—	—
S11	—	—	—	—
S12	—	—	—	—
S13	—	—	—	—
S14	—	—	—	—
S15	—	—	—	—
S16	—	—	—	—
S17	—	—	—	—
S18	—	—	—	—
S19	—	—	—	—
S20	—	—	—	—
S21	—	—	—	—
S22	—	—	—	—
S23	—	—	—	—
S24	—	—	—	—
S25	—	—	—	—

CAPACITORS		Values	Locations
C1	V1 S.G. decoupling	0.001μF	H5
C2	R.F. by-pass	0.001μF	H5
C3	V1 cath. by-pass	0.001μF	H5
C4	H.T. decoupling	0.001μF	H5
C5	F.M. R.F. tuning	4.7pF	H5
C6	V2 C.G.	22pF	H5
C7		4.7pF	H5
C8		4.7pF	H5
C9	F.M. osc. tuning	8pF	H5
C10	R.F. by-pass	0.001μF	H5
C11	H.T. decoupling	0.003μF	H5
C12	1st F.M. I.F.T.	39pF	A2
C13	tuning	22pF	A2
C14	A.M. aerial coup.	50pF	G4
C15	A.G.C. decoupling	0.01μF	F3
C16	L.W. aerial shunt	600pF	G4
C17	L.W. aerial trim	120pF	G4
C18	M.W. aerial trim	40pF	G4
C19	A.M. aerial tuning	528pF	A2
C20	V3b C.G.	100pF	G4
C21	V3b S.G. decoupling	0.003μF	F3
C22	V3 cath. by-pass	0.02μF	F4
C23	A.F. coupling	0.02μF	F4
C24	V3 cath. by-pass	100μF	F4
C25	V3a C.G.	56pF	G3
C26	A.M. osc. tuning	528pF	A1
C27	M.W. osc. tracker	515pF	G3
C28	L.W. osc. trimmer	33pF	G3
C29	L.W. osc. tracker	365pF	G3
C30	M.W. osc. trimmer	40pF	G3
C31	L.W. osc. trimmer	240pF	G3
C32	A.M. osc. coupling	0.001μF	G3
C33	A.G.C. decoupling	0.1μF	F4
C34	2nd F.M. I.F.T.	39pF	B1
C35	tuning	39pF	B1
C36	H.T. decoupling	0.003μF	F3
C37	1st A.M. I.F.T.	110pF	B2
C38	tuning	110pF	B2
C39	V4 S.G. decoupling	0.003μF	E4

(Continued next col.)

CAPACITORS (continued)		Values	Locations
C40	V4 cath. by-pass	0.1μF	F4
C41	H.T. decoupling	0.01μF	E4
C42	F.M. I.F.T. tuning	47pF	E4
C43	2nd A.M. I.F.T.	110pF	B2
C44	tuning	110pF	B2
C45	I.F. by-pass	100pF	B2
C46	T.I. decoupling	0.01μF	F4
C47	D.C. reservoir	5μF	E4
C48	De-emphasis	500pF	E4
C49	Discriminator bal-	300pF	E4
C50	ancing capacitors	300pF	E4
C51	T.I. decoupling	0.005μF	E4
C52	P.U. tone correc-	500pF	G4
C53	tion	0.002μF	G4
C54	A.F. coupling	0.01μF	E3
C55	H.T. decoupling	20μF	C1
C56	A.F. coupling	0.01μF	E4
C57	I.F. by-pass	300pF	E4
C58	A.F. coupling	0.01μF	E4
C59	Part tone control	0.1μF	D3
C60	Tone corrector	0.001μF	D3
C61	Neg. feed-back	0.003μF	D4
C62		40μF	C1
C63	H.T. smoothing	40μF	C1

RESISTORS		Values	Locations
R1	V1 S.G. feed	15kΩ	H5
R2	V1 G.B.	180Ω	H5
R3	H.T. feed	470Ω	H5
R4	Part V1 load	2.2kΩ	H5
R5	V2 C.G.	47kΩ	H5
R6	H.T. feed	2.2kΩ	H5
R7	H.T. bleed to V1, V2	100kΩ	F3
R8	A.G.C. decoupling	1MΩ	F4

(Continued next col.)

RESISTORS (continued)		Values	Locations
R9	V3b C.G.	680kΩ	F4
R10	V3b S.G. feed	22kΩ	F3
R11	V3 G.B.	180Ω	F3
R12	V3a A.F. C.G.	470kΩ	F4
R13	V3a osc. C.G.	47kΩ	F4
R14	V3a A.F. load	10kΩ	F3
R15	V3a osc. load	15kΩ*	F3
R16	H.T. feed	1kΩ	E3
R17	V4 S.G. H.T. pot.	56kΩ	E4
R18	divider	100kΩ	E4
R19		150Ω	F4
R20	V4 G.B.	470Ω	F4
R21	H.T. feed	1kΩ	E4
R22	F.M. balancing	100Ω	E4
R23	A.G.C. decoupling	1.5MΩ	F4
R24	T.I. C.G. feed	2.2MΩ	F4
R25	I.F. stopper	100kΩ	F4
R26	A.M. detector load	220kΩ	F4
R27	Part F.M. de-		
	emphasis	100kΩ	E4
R28	F.M. D.C. load	22kΩ	E4
R29	T.I. C.G. feed	2.2MΩ	E4
R30	P.U. tone	68kΩ	G4
R31	correction	68kΩ	G4
R32	Volume control	2MΩ†	E3
R33	T.I. load	470kΩ	D4
R34	V5d C.G.	15MΩ	E4
R35	H.T. feed	4.7kΩ	D4
R36	V5d load	180kΩ	D4
R37	V6 C.G.	1MΩ	E4
R38	Neg. feed-back	470kΩ	D4
R39	Tone control	50kΩ	D3
R40	C.G. stopper	3.3kΩ	E4
R41	V6 G.B.	220Ω	E4

*6.8kΩ in VHF55.

†500kΩ in VHF55.

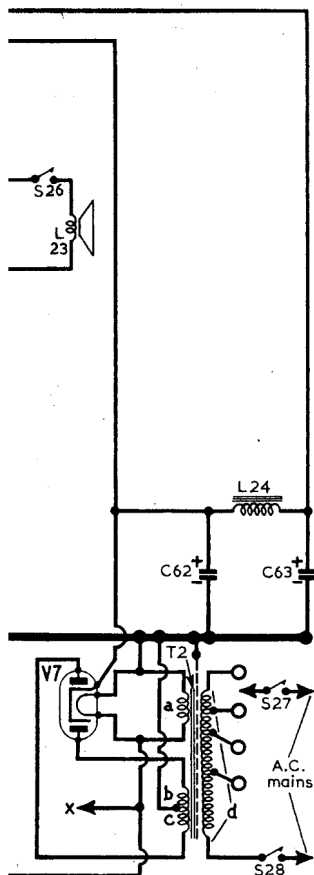
OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	F.M. aerial coup.	—	H5
L2	F.M. R.F. coil	—	H5
L3	F.M. osc. coil	—	A1
L4	1st F.M. { Pri.	—	A2
L5	I.F.T. { Sec.	—	A2
L6	A.M. frame aerial	—	G4
L7	A.M. aerial coupling	2.0	G4
L8	coils	50.0	G4
L9	A.M. aerial tuning	6.5	G4
L10	coils	20.0	G4
L11	A.M. osc. tuning	5.0	G3
L12	coils	5.0	G3
L13	M.W. osc. reaction	1.0	G3
L14	2nd F.M. { Pri.	—	B1
L15	I.F.T. { Sec.	—	B1
L16	1st A.M. { Pri.	12.5	B2
L17	I.F.T. { Sec.	12.5	B2
L18	3rd F.M. { Pri.	—	B2
L19	I.F.T. { Sec.	—	B2
L20	I.F.T. { Tert.	—	B2
L21	2nd A.M. { Pri.	12.5	B2
L22	I.F.T. { Sec.	12.5	B2
L23	Speech coil	2.5	—
L24	H.T. smoothing choke	550.0	B1
		410.0	
T1	O.P. trans. { a	360.0	—
	{ b	0.28	
	{ c	—	
T2	Mains trans. { a	140.0	C1
	{ b	140.0	
	{ c	27.0	
	d, total	—	
S1-S8	A.M./F.M. switches	—	F4
S9-S25	Band switches	—	G3
S27		—	—
S28	Mains sw., g'd R32	—	E3

Drive Cord Replacement.—About 50in of nylon-braided glass yarn is required for a new drive cord, which should be run as indicated in the diagram at the top of columns 5 and 6.

of L16 and L17 (B2) for maximum output.

F.M. I.F. Stages

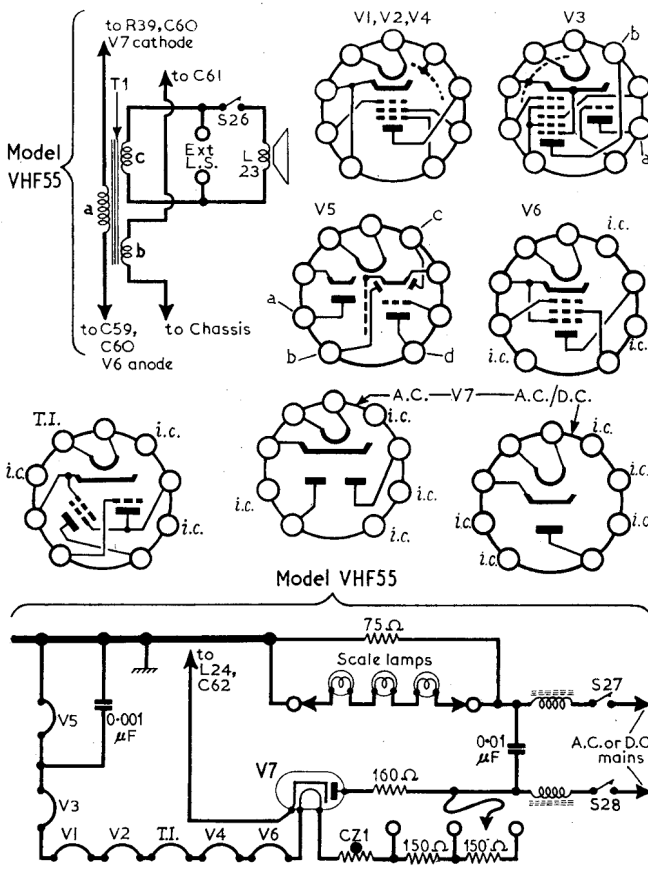
- 4.—Switch receiver to F.M. Connect two 47 kΩ resistors in series across R28 (E4). Connect Model 8 Avometer (switched to 10 V D.C.), or D.C. valve voltmeter, across R28, taking the positive meter connection to chassis.
- 5.—Connect output of signal generator to control grid (pin 2) of V3 and chassis. Feed in an unmodulated 19.5 Mc/s signal and adjust the cores of L18 (B2), L15 (B1), L14 (F4), L5 (A2) and L4 (H5) for maximum output on meter.
- 6.—Connect Model 8 Avometer (switched to 50 μA D.C.), or D.C. microammeter, between junction of 47 kΩ resistors and R27, C48 (E4).



CIRCUIT ALIGNMENT

Apparatus Required.—An accurately calibrated A.M. signal generator covering the frequencies of 150-1,500 kc/s, 19.5 Mc/s and 87.5-100 Mc/s; a 0-100 mW output meter with an impedance of 3.5Ω; a Model 8 Avometer, or a D.C. valve voltmeter and a 50 μA D.C. microammeter; two 47 kΩ matched resistors.

During alignment an output meter reading of 50 mW (or 4 V on Avometer or valve voltmeter) should be maintained. The chassis should be removed from its cabinet to make the following adjustments accessible.



A.M. I.F. Stages

- 1.—Switch to M.W. Connect output of A.M. signal generator to control grid (pin 2) of V4 and chassis. Connect sound output meter across T1 secondary winding. Disconnect speaker.
- 2.—Feed in a 470 kc/s 30% modulated signal and adjust the cores of L21 and L22 (location reference B2) for maximum output.
- 3.—Transfer "live" signal generator lead to control grid (pin 2) of V3 and, feeding in a 470 kc/s signal, adjust the cores

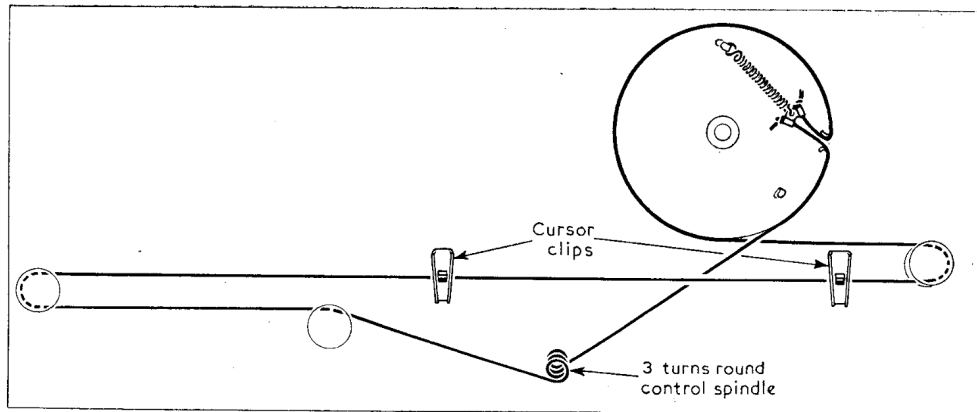
BUSH - VHF54, VHF55

- 7.—Adjust the core of **L19** (E4) for zero output on meter.
- 8.—Re-connect Model 8 Avometer, or D.C. valve voltmeter, across **R28**. Re-adjust the core of **L18** (B2) for maximum output on meter.
- 9.—Repeat operations 6 and 7.

F.M. R.F. Alignment Table

Sig. Gen. Output (Mc/s)	Tune to	Adjust	Location
87.5	87.5	L3	A1
100.0	100	C9	A1
94.0	94	L2	A1
94.0	94	L1	A1

Repeat above operations and check calibration.



Sketch of the drive cord system as seen from the front of an upright chassis with the gang at maximum capacitance.

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 signal generator (using a 30% modulator output) to A.M. aerial and earth sockets for A.M. alignment, and to F.M. aerial sockets (using an unmodulated output) for F.M. alignment. Use

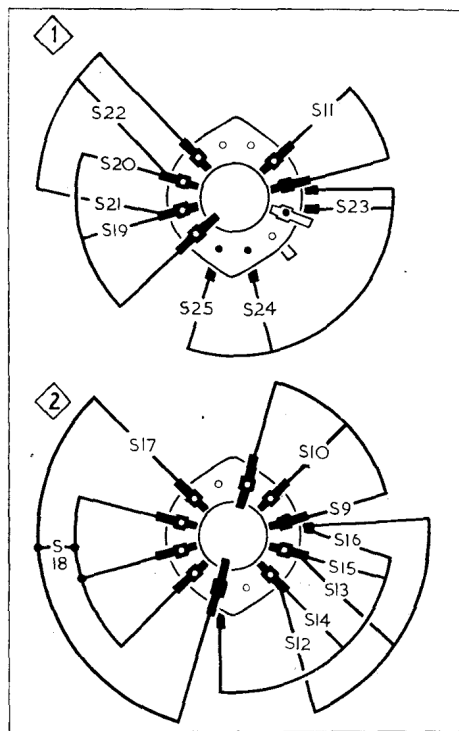
the output meter connected across winding **c** on **T1** for A.M. alignment, and use the D.C. voltmeter connected across **R28** for F.M. alignment.

Where two peaks are found during F.M.

A.M. R.F. Alignment Table

Wave band	Sig. Gen. Output (kc/s)	Tune to	Adjust	Location
M.W.	600	0.6	L11	G3
M.W.	600	0.6	L9	G4
M.W.	1,500	1.5	C30	G3
M.W.	1,500	1.5	C18	G4
Repeat above and check calibration.				
L.W.	150	0.15	L12	G3
L.W.	150	0.15	L10	G4
L.W.	300	0.3	C17	G4

Repeat last two operations and check calibration. 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. table.



Diagrams of the band switch units seen in the directions indicated by the numbered arrows in the underside illustration of the chassis (location reference G3).