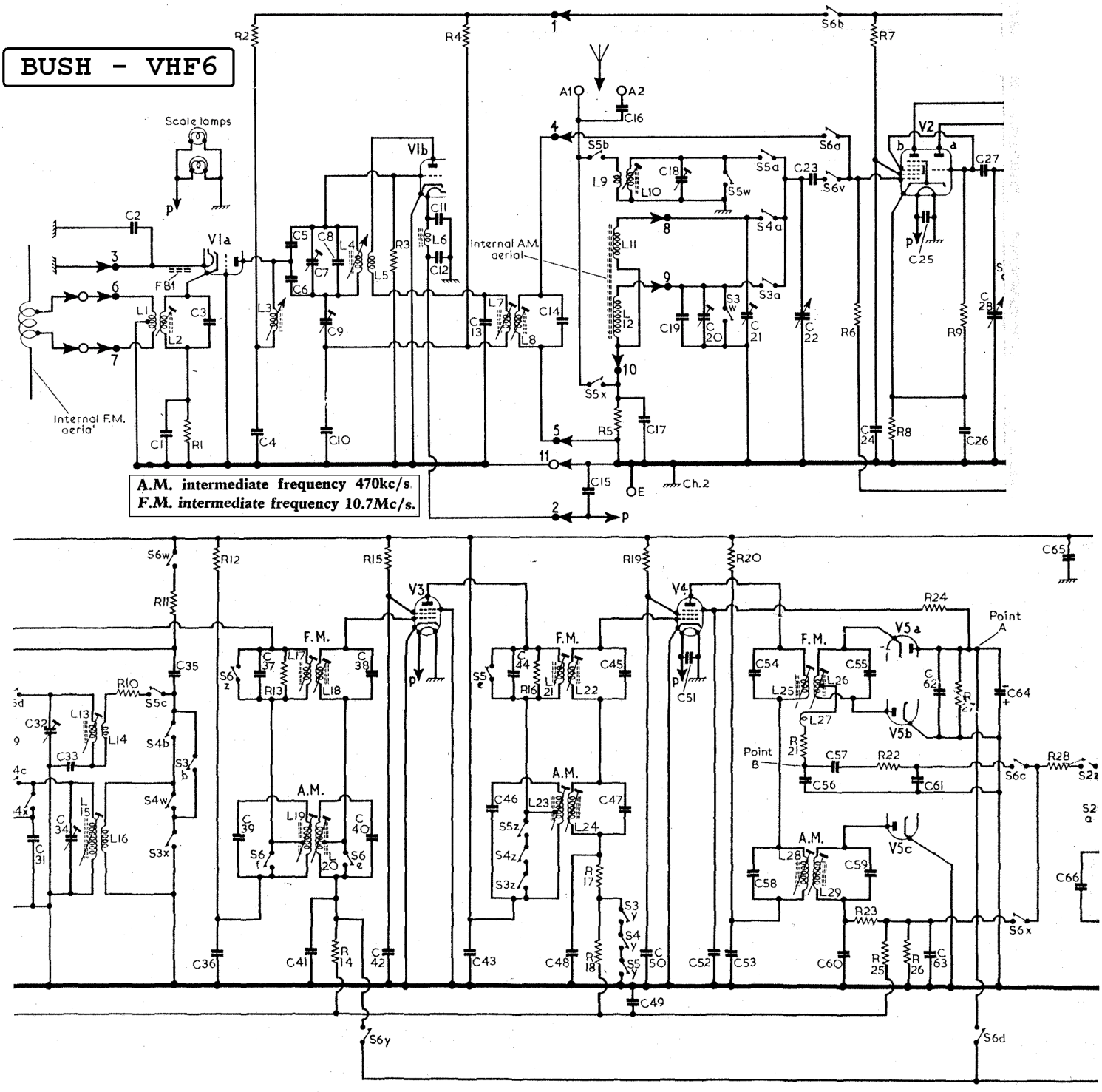
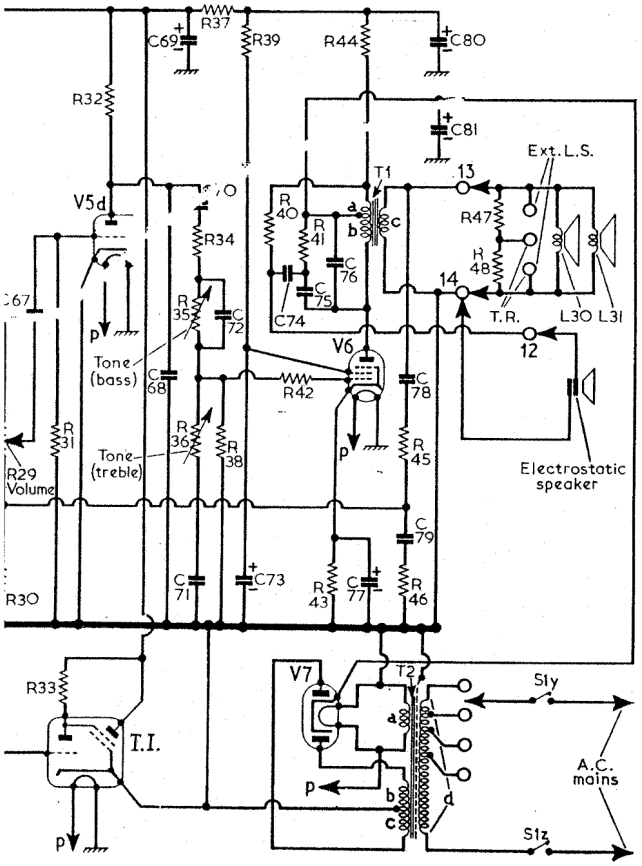
BUSH - VHF6



A.M. intermediate frequency 470kc/s.
F.M. intermediate frequency 10.7Mc/s.



MODIFICATIONS

Earlier Versions.—Receivers of earlier production than our sample one had minor differences as follows: There was no hum neutralization winding (winding **a** in our circuit diagram) on **T1.**

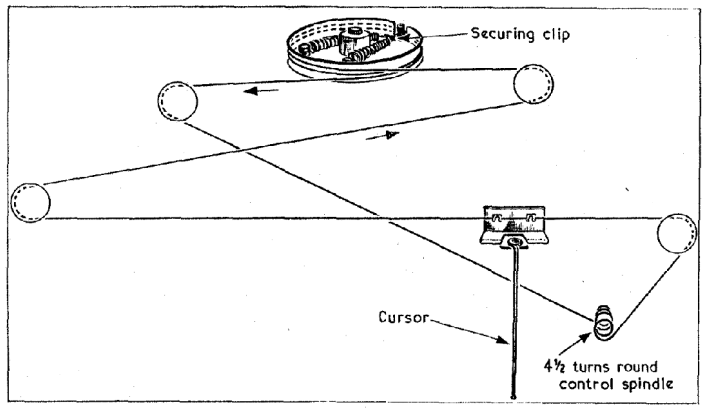
R39 was connected from unsmoothed H.T. and **C73** was returned to the cathode of **V6** instead of chassis. **R30** was positioned and supported by the volume control **R36** instead of being supported on **T1. R46** and **C79** were omitted. **R40** may be connected to tag 2 on **T1** (to the same point as **R41, C76**) in some receivers only.

Valve			Anode (V) A.M.	Anode (V) F.M.	Screen (V)[1]	Cath. (V)[1]
V1	ECC85	a	—	155	—	1·4
		b	—	140	—	—
V2	ECH81	a	*	—	—	2·0
		b	190	170	100	2·0
V3	EF89	..	200	180	100[2]	—
V4	EF89	..	200	160	75	—
V5	EABC80[3]	..	70	70	—	—
V6	EL84	..	290	290	240	7·0
V7	EZ81	..	*	*	—	300·0[4]
T.I.	EM81	..	*	*	—	*

**No reading quoted.*
[1]Voltage variation slight between A.M. and F.M. operation.
[2]78V on F.M.
[3]No readings quoted for sections a-c.
[4]Smoothed H.T. voltage to V1-V5 is: (A.M.) 200V, (F.M.) 180V. Total H.T. current is: (A.M.) 90mA, (F.M.) 100mA.

CIRCUIT ALIGNMENT

Equipment Required.—An accurately calibrated signal generator covering the A.M. alignment frequencies of 200-1,500kc/s and the F.M. alignment frequencies of 10.7Mc/s and 87.5-100Mc/s; a model 8 Avometer, or alternatively a D.C. valve voltmeter and a 0-50μA D.C. microammeter; a sound output meter; two matched 47kΩ resistors; a 1kΩ resistor for use as damping unit; a non-metallic trimming tool.



Sketch showing the tuning drive system, which is used for both A.M. and F.M. tuning. It is drawn as seen when viewed from the front of the chassis, and the cursor and drum are shown in the position of highest wavelength.

A.M. I.F. Alignment

Check that scale cursor coincides with the calibration dots at each end of the tuning scale, if not, adjust then carry out the following sequence of operations.

1.—Switch receiver to M.W. and tune to 300m. Connect output of signal generator to control grid (pin 2) of **V4** and chassis. Connect the sound output meter to the extension speaker sockets.

2.—Feed in a 470kc/s modulated signal and adjust the cores of **L29** (location reference C2) and **L28** (F5) for maximum output on meter.

3.—Transfer live signal generator lead to the control grid (pin 2) of **V3.** Feeding in a 470kc/s signal, adjust the cores of **L24** (B2) and **L23** (G5) for maximum output.

4.—Transfer live signal generator lead to control grid (pin 2) of **V2b.** Feeding in a 470kc/s signal, adjust the cores of **L20** (B2) and **L19** (G5) for maximum output.

A.M. R.F. Stages

5.—Transfer live signal generator lead to the A.M. aerial socket. Switch receiver to M.W. and tune to 500m, feed in a 600kc/s modulated signal and adjust the core of **L15** (F4) for maximum output.

6.—Tune receiver to 200m, feed in a 1,500kc/s signal and adjust **C34** (G5) for maximum output.

7.—Repeat operations 5 and 6 for optimum output.

8.—Switch receiver to L.W., tune it to 1,400m, feed in a 214kc/s signal and adjust **C30** (G5) for maximum output.

9.—Repeat operation 8 for optimum output.

10.—Switch receiver to S.W., tune to 50m, feed in a 6Mc/s signal and adjust cores of **L13** (G4) and **L10** (G4) for maximum output.

11.—Tune receiver to 20m, feed in a 15Mc/s signal and adjust **C32** (G5) and **C18** (G4) for maximum output.

12.—Disconnect signal generator leads, connect them to a single-turn (5in in diameter) loop of wire. Place this loop about 12-18in from the internal A.M. aerial. Switch receiver to M.W., tune it to 200m, feed in a 1,500kc/s signal and adjust **C21** (F4) for maximum output.

13.—Switch receiver to L.W., tune it to 1,400m, feed in a 214kc/s signal and adjust **C20** (F4) for maximum output.

F.M. I.F. Stages

14.—Switch receiver to F.M. Connect the two 47kΩ resistors in series, between point A (E4) and chassis. Connect the model 8 Avometer (10V D.C. range) or the valve-voltmeter across the resistors.

15.—Connect output of signal generator

BUSH - VHF6

RESISTORS

R1	150Ω	J6
R2	2·2kΩ	J6
R3	100kΩ	J6
R4	6·8kΩ	J6
R5	10kΩ	B1
R6	1MΩ	G5
R7	22kΩ	H4
R8	150Ω	H4
R9	47kΩ	G5
R10	47Ω	G4
R11	18kΩ	G4
R12	2·2kΩ	F5
R13	22kΩ	B2
R14	2·2MΩ	G5
R15	33kΩ	F5
R16	22kΩ	B2
R17	39kΩ	F5
R18	2·2MΩ	G5
R19	33kΩ	F5
R20	2·2kΩ	F5
R21	100Ω	F5
R22	22kΩ	F4
R23	27kΩ	F4
R24	10kΩ	F5
R25	2·2MΩ	H5
R26	220kΩ	F5
R27	22kΩ	E5
R28	180kΩ	F4
R29	1MΩ	E3
R30	1·5kΩ	C1
R31	6·8MΩ	F5
R32	220kΩ	F5
R33	470kΩ	C1
R34	68kΩ	F5
R35	2MΩ	E3
R36	500kΩ	H3
R37	1·2kΩ	E5
R38	1MΩ	F5
R39	1·5kΩ	E5
R40	39kΩ	C1
R41	10kΩ	C1
R42	2·2kΩ	F5
R43	150Ω	E5
R44	1kΩ	E4
R45	8·2kΩ	C1
R46	470Ω	C1
R47	100Ω	D2
R48	10Ω	D2

CAPACITORS

C1	560pF	J6
C2	560pF	J6
C3	10pF	A1
C4	560pF	J6
C5	22pF	J6
C6	22pF	J6
C7	15pF	J6
C8	5·6pF	J6
C9	15pF	J6
C10	47pF	J6
C11	560pF	J6
C12	560pF	J6
C13	10pF	J6
C14	47pF	A2
C15	0·04μF	H4
C16	47pF	H5
C17	7,500pF	B1
C18	30pF	G3
C19	140pF	F3
C20	30pF	F3
C21	30pF	F3
C22	528pF	B1
C23	560pF	G4
C24	0·04μF	G5
C25	0·001μF	G5
C26	0·04μF	G5
C27	68pF	G4
C28	528pF	B2
C29	515pF	G4
C30	30pF	G4
C31	450pF	F5
C32	30pF	G4
C33	0·005μF	G5
C34	30pF	G4
C35	150pF	G4
C36	0·01μF	G5
C37	47pF	B2
C38	47pF	B2
C39	110pF	B2
C40	110pF	B2
C41	0·01μF	G5
C42	0·04μF	G5
C43	0·01μF	H4
C44	47pF	B2
C45	47pF	B2
C46	110pF	B2
C47	110pF	B2
C48	0·001μF	F5
C49	0·02μF	H5
C50	0·04μF	F5
C51	0·01μF	F5
C52	0·04μF	F5
C53	0·01μF	F5
C54	10pF	C2
C55	47pF	C2
C56	0·001μF	F4
C57	0·04μF	F4
C58	110pF	C2
C59	110pF	C2
C60	47pF	F5
C61	270pF	G4
C62	0·04μF	F5
C63	100pF	F5
C64	5μF	F4
C65	0·01μF	G5
C66	560pF	H5
C67	0·04μF	F5
C68	560pF	F5
C69	20μF	E4
C70	0·05μF	F5
C71	0·01μF	H3
C72	560pF	E3
C73	8μF	E5
C74	0·005μF	C1
C75	0·01μF	C1
C76	0·001μF	E5
C77	50μF	E5
C78	0·02μF	C1
C79	0·02μF	C1
C80	40μF	E4
C81	40μF	E4

COILS*

L1	—	A1
L2	—	A1
L3	—	J6
L4	—	J6
L5	—	J6
L6	—	J6
L7	—	A2
L8	—	A2
L9	—	G3
L10	—	G3
L11	—	—
L12	12·0	—
L13	—	G4
L14	—	G4
L15	4·5	F4
L16	1·0	F4
L17	—	B2
L18	—	B2
L19	14·0	B2
L20	14·0	B2
L21	—	B2
L22	—	B2
L23	14·0	B2
L24	14·0	B2
L25	—	C2
L26	—	C2
L27	—	C2
L28	14·0	C2
L29	14·0	C2
L30	3·2	—
L31	3·2	—

TRANSFORMERS*

T1	a, b (total)	230·0 C1
	c	—
T2	a	—
	a, b (total)	188·0 D1
	d (total) ...	18·5

MISCELLANEOUS

FB1	—	J6
S1-S3	—	F3
S4-S6	—	G3

* Approx. D.C. resistance in ohms.

BUSH - VHF6

between control grid (pin 2) of **V2** and chassis. Turn volume control to minimum and feed in a 10.7Mc/s unmodulated signal. During the following adjustments, adjust the output of the signal generator to maintain a 4V reading on the meter.

16.—Set core of **L25** (C2) $\frac{3}{4}$in inside former then adjust the core for maximum D.C. on meter. (Correct peak is the second one from the adjusting end of the former.)

17.—Connect the 1kΩ resistor across **L22** and adjust the core of **L21** (G5) for maximum D.C. on meter.

18.—Connect the 1kΩ resistor across **L21** and adjust the core of **L22** (B2) for maximum D.C. on the output meter.

19.—Connect the 1kΩ resistor across **L18** and adjust the core of **L17** (G5) for maximum D.C. on meter.

20.—Connect the 1kΩ resistor across **L17** and adjust the core of **L18** (B2) for maximum D.C. on meter.

21.—Readjust the core of **L25** (C2) for maximum D.C. on meter.

22.—Connect the 0-50μA meter between the junction of the two 47kΩ resistors (from point A to chassis) and point B (F4). Adjust the core of **L26** (F5) (starting with the core $\frac{3}{8}$in inside the former) for a zero reading on the microammeter. This will occur midway between a positive-going and a negative-going peak. Make this adjustment carefully, then disconnect the microammeter.

23.—Transfer live signal generator lead to the F.M. aerial socket and adjust the core of **L8** (A2) for maximum D.C. on meter.

F.M. R.F. Stages

24.—Tune receiver to 88Mc/s on scale and feed in an 88Mc/s signal and adjust the cores of **L3, L4** by slackening the lock-nut on the pivoted adjusting arm (on the gang spindle) and positioning the adjusting arm to give maximum D.C. on meter. Secure lock-nut.

25.—Tune receiver to 95Mc/s and feed in a 95Mc/s signal then adjust the core of **L2** (J6) for maximum D.C. on meter.

C7 and **C9** are accurately aligned at the factory for minimum oscillator voltage at the F.M. aerial socket, and for optimum F.M. calibration respectively. As these adjustments are made using special alignment equipment, and as the trimmers should not normally need readjustment, no alignment instructions are given for them.