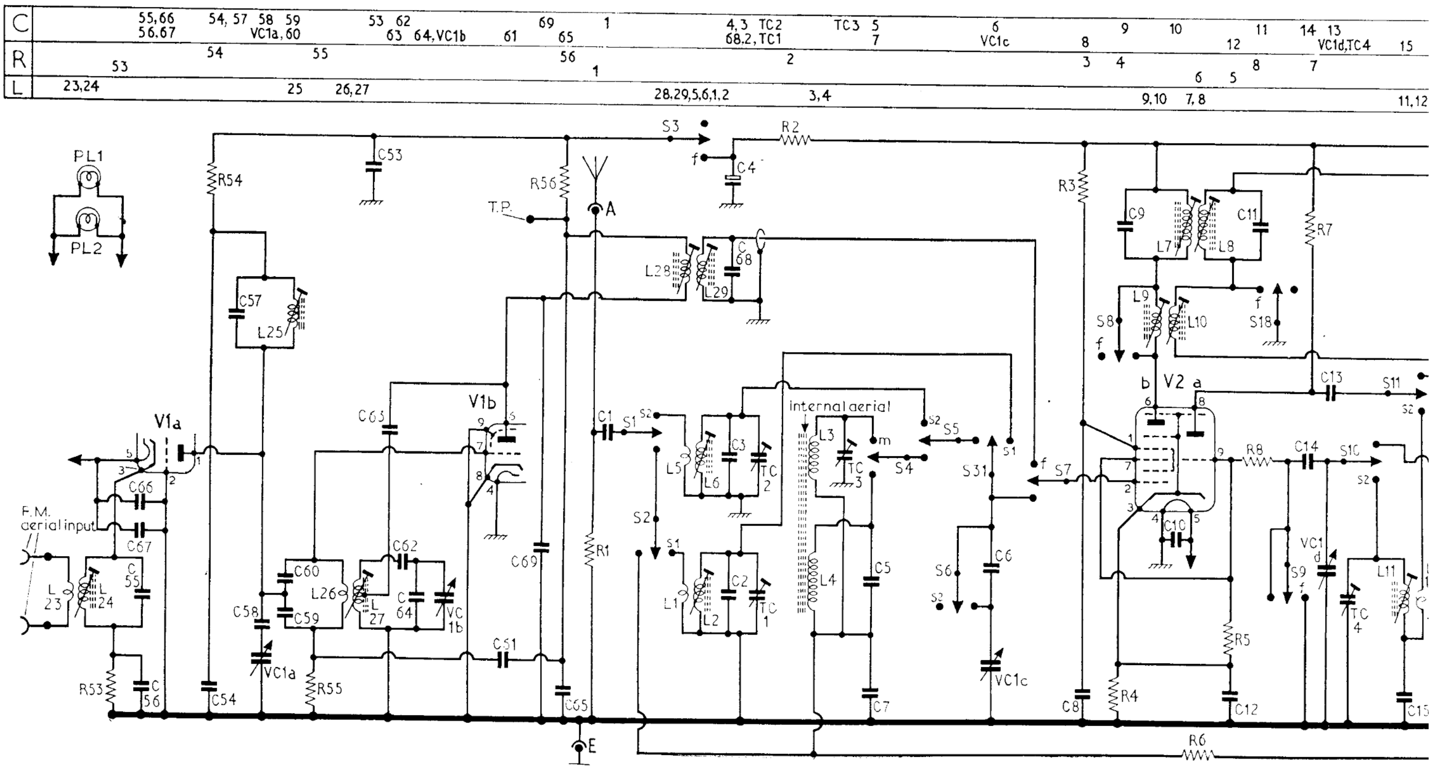

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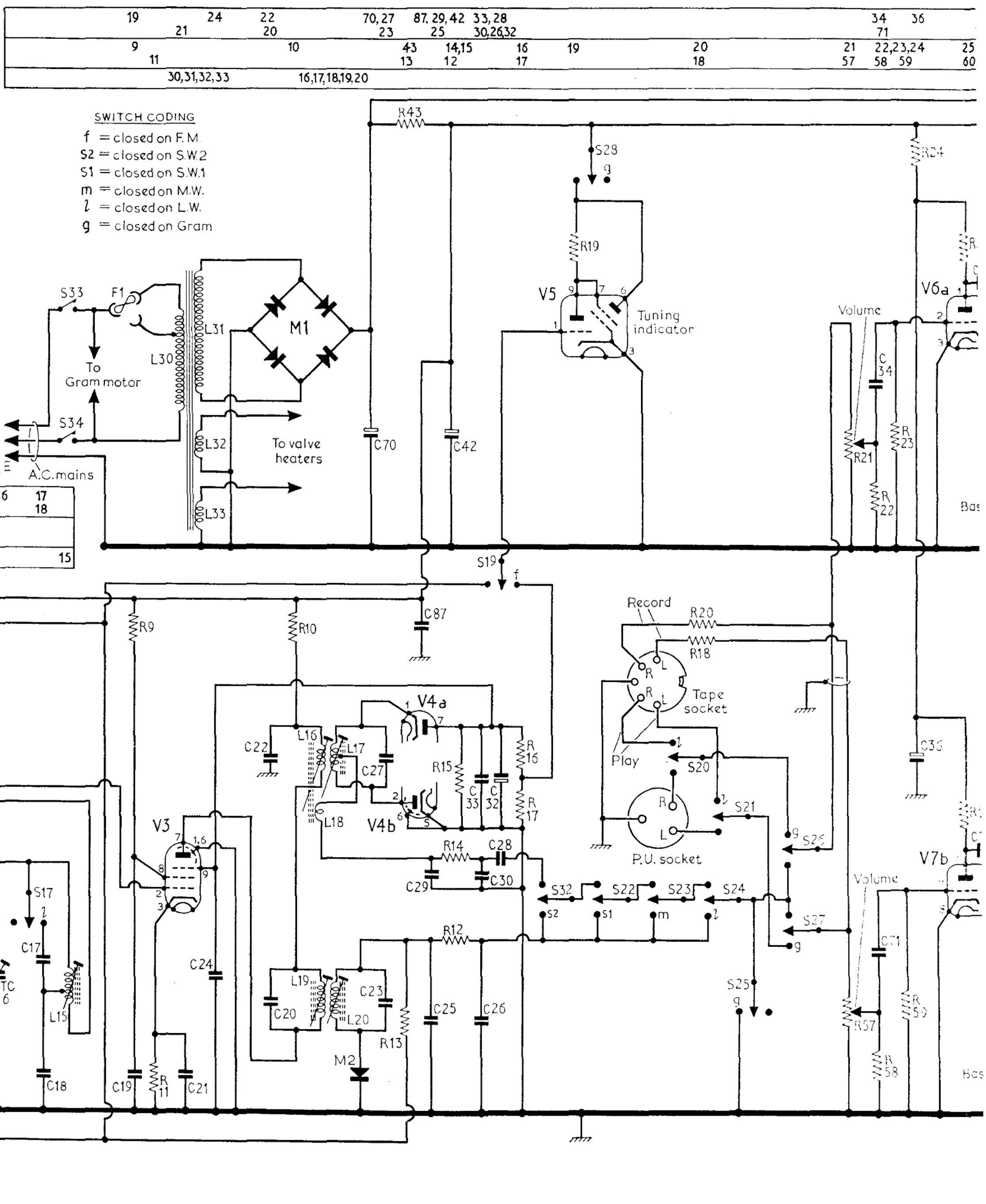
Valve Table

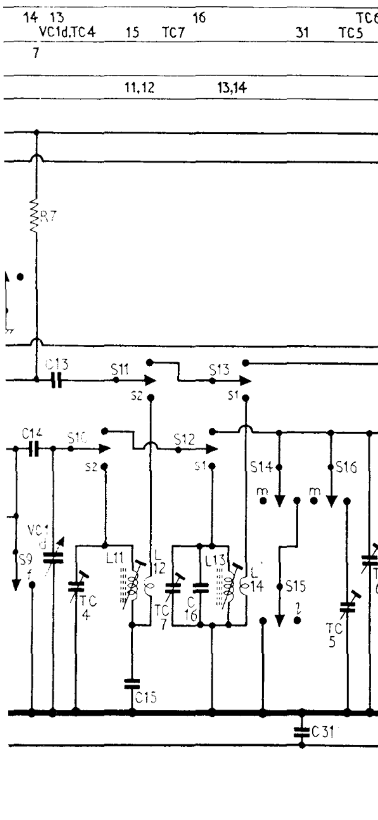
Valve			Anode (V)	Screen (V)	Cathode (V)
V1	ECC85		*F.M. Tuner unit**		
V2	ECH81	a	96	—	2·8
		b	250	103	2·8
V3	EF89		232	112	1·5
V4	EB91		—	—	—
V5	EM84		—	—	—
V6	ECC83	a	91	—	—
		b	115	—	1·1
V7	ECC83	a	115	—	1·1
		b	86	—	—
V8	ECC82	a	145	—	63·0
		b	145	—	63·0
V9	ELL80	a	252	225	9·3
		b	252	225	9·3
V10	ELL80	a	252	225	9·3
		b	252	225	9·3

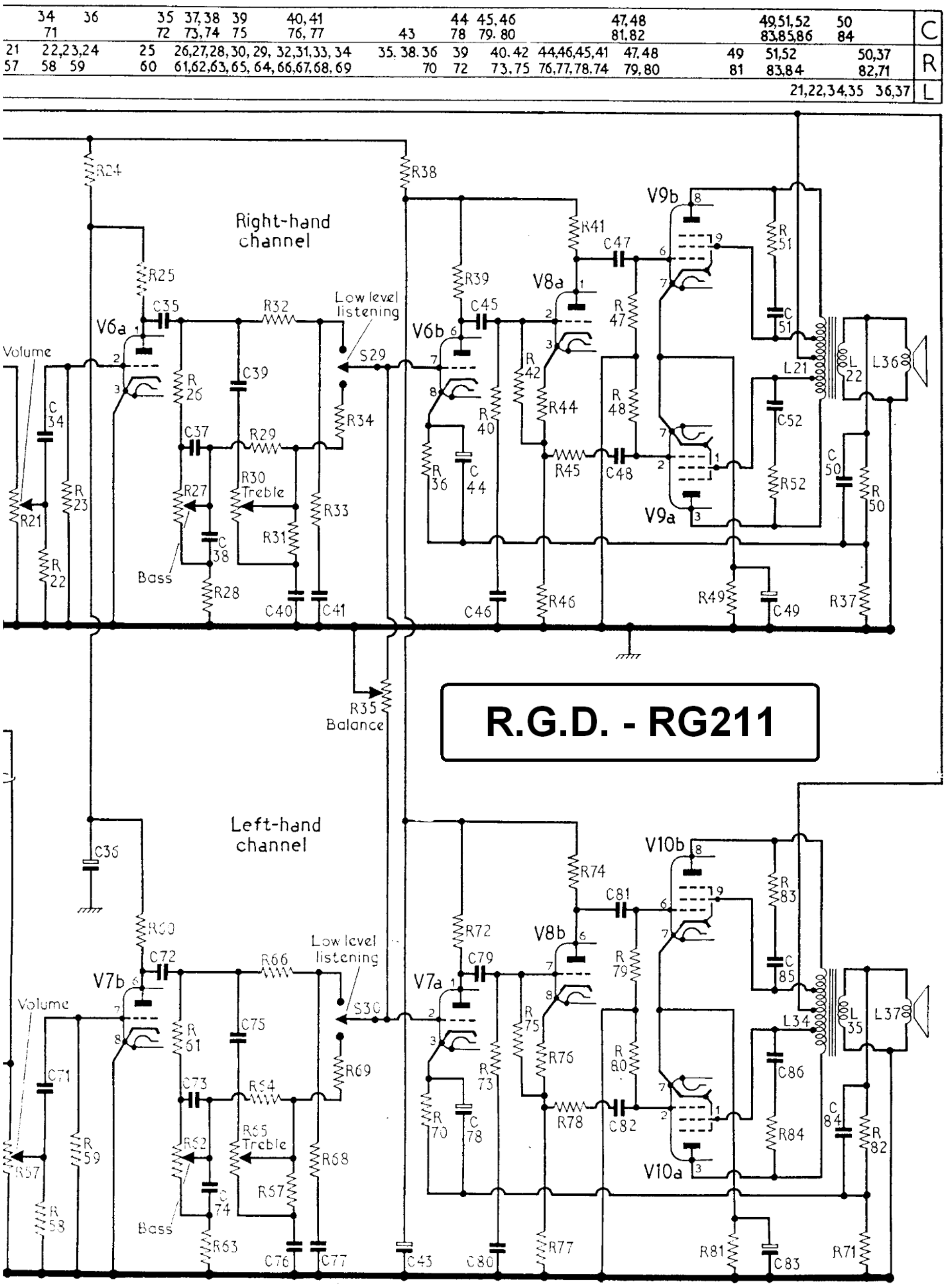
* *Voltage measured at the f.m. tuner test point (junction* **R56** *and* **C65***), 180V with receiver switched to f.m.*

SWITCH CODING

f = closed on F.M.
S2 = closed on S.W.2
S1 = closed on S.W.1
m = closed on M.W.
l = closed on L.W.
g = closed on Gram







CIRCUIT ALIGNMENT

A.m. alignment should be completed before f.m. alignment in order to allow time for the receiver to "warm-up" before adjustments are made to the h.f. circuits associated with f.m.

For alignment purposes, the scale backing plate is marked. The cursor should be set so that it is in line with datum "D3" with the tuning gang at maximum capacitance.

Equipment Required.—An a.m. signal generator covering the range 140-1,700kc/s and 5-22Mc/s; an f.m. signal generator covering ranges 10-11.5Mc/s and 85-105 Mc/s with a deviation of up to ± 150kc/s; an audio power output meter with an impedance to match 15Ω; a valve voltmeter with a 0-10V d.c. range or high impedance d.c. voltmeter e.g. model 8 Avometer; an oscilloscope if the f.m. signal generator does not incorporate display equipment; one 0.1μF capacitor and one 5,000pF capacitor, and one 400Ω resistor.

A.M. Circuits

During alignment the signal input should be progressively reduced as the circuits come into line to maintain an output of approximately 50mW for i.f. alignment and 500mW for r.f. alignment. For all adjustments the signal input should be modulated 30 per cent at 400c/s.

1.—Connect the a.m. signal generator via a 0.1μF capacitor to **V2** pin 2. Connect the audio output meter across one loudspeaker.

2.—Switch receiver to m.w. and fully open the tuning gang. Unscrew the cores of **L7, L8, L19** and **L20.**

3.—Feed in a 470kc/s signal and adjust the second a.m. i.f. transformer, upper core first, for maximum output. Adjust the first a.m. i.f. transformer, lower core first, for maximum output. (These adjustments should be made once only.)

4.—Connect the signal generator to the a.m. aerial socket via a dummy aerial. Short-circuit the primary of the first f.m. i.f. transformer **L28.** Fully close the tuning gang and check that the cursor is set as described in the second paragraph.

5.—Set the cursor $2^{11}/_{32}$in from datum mark. Feed in a 600kc/s signal and adjust **L15** and **L3** for maximum output.

6.—Set the cursor $11\frac{1}{8}$in from datum mark Feed in a 1,430kc/s signal and adjust **TC6** and **TC3** for maximum output.

7.—Repeat operations 5 and 6.

8.—Switch receiver to l.w. and set the cursor $8\frac{5}{16}$in from datum mark. Feed in a 225kc/s signal and adjust **TC5** then **L4** for maximum output.

9.—Disconnect the dummy aerial and reconnect the signal generator to the aerial socket via a 400Ω resistor. Switch receiver to s.w.1.

10.—Set the cursor $3\frac{3}{8}$in from datum mark. Feed in a 6.1Mc/s signal and adjust **L13** then **L2** for maximum output.

11.—Set the cursor $11\frac{3}{16}$in from datum mark. Feed in a 9.65Mc/s signal and adjust **TC7** then **TC1** for maximum output.

12.—Switch receiver to s.w.2. and set the cursor $2\frac{7}{16}$in from the datum mark. Feed in an 11.85Mc/s signal and adjust **L11** then **L6** for maximum output.

13.—Set the cursor $11^{21}/_{32}$in from datum mark. Feed in a 21.6Mc/s signal and adjust **TC4** then **TC2** for maximum output. Remove the short-circuit from **L28.**

Note: The ganged capacitor should be rocked for maximum output while adjustments are made to the aerial circuits.

Resistors

R1	3·3kΩ	R42	1MΩ
R2	1·8kΩ	R43	310Ω
R3	39kΩ	R44	820Ω
R4	220Ω	R45	15kΩ
R5	33kΩ	R46	22kΩ
R6	220kΩ	R47	470kΩ
R7	33kΩ	R48	470kΩ
R8	220Ω	R49	180Ω
R9	47kΩ	R50	3·3kΩ
R10	2·2kΩ	R51	3·3kΩ
R11	150Ω	R52	3·3kΩ
R12	100kΩ	R53	220Ω }
R13	2·2MΩ	R54	4·7kΩ }
R14	47kΩ	R55	470kΩ }
R15	39kΩ	R56	6·8kΩ }
R16	470kΩ	R57	2MΩ
R17	470kΩ	R58	330kΩ
R18	2·2MΩ	R59	10MΩ
R19	470kΩ	R60	220kΩ
R20	2·2MΩ	R61	68kΩ
R21	2MΩ	R62	250kΩ
R22	330kΩ	R63	6·8kΩ
R23	10MΩ	R64	39kΩ
R24	47kΩ	R65	250kΩ
R25	220kΩ	R66	1MΩ
R26	68kΩ	R67	47kΩ
R27	250kΩ	R68	10kΩ
R28	6·8kΩ	R69	82kΩ
R29	39kΩ	R70	3·3kΩ
R30	250kΩ	R71	100Ω
R31	47kΩ	R72	220kΩ
R32	1MΩ	R73	4·7kΩ
R33	10kΩ	R74	22kΩ
R34	82kΩ	R75	1MΩ
R35	500kΩ	R76	820Ω
R36	3·3kΩ	R77	22kΩ
R37	100Ω	R78	15kΩ
R38	6·8kΩ	R79	470kΩ
R39	220kΩ	R80	470kΩ
R40	4·7kΩ	R81	180Ω
R41	22kΩ	R82	3·3kΩ
		R83	3·3kΩ
		R84	3·3kΩ

Capacitors

C1	470pF	C42	80μF	C84	1,000pF
C2	120pF	C43	20μF	C85	1,000pF
C3	44pF	C44	50μF	C86	1,000pF
C4	8μF	C45	0·022μF	C87	0·1μF
C5	174pF	C46	100pF	TC1	—
C6	500pF	C47	0·047μF	TC2	—
C7	3,000pF	C48	0·047μF	TC3	—
C8	0·01μF	C49	100μF	TC4	—
C9	150pF	C50	1,000pF	TC5	—
C10	0·01μF	C51	1,000pF	TC6	—
C11	150pF	C52	1,000pF	TC7	—
C12	0·01μF	C53	0·01μF		
C13	100pF	C54	1,000pF }		
C14	100pF	C55	10pF }		
C15	500pF	C56	1,000pF }		
C16	150pF	C57	4·7pF }		
C17	410pF	C58	75pF }		
C18	390pF	C59	4·7pF }		
C19	3,000pF	C60	4·7pF }		
C20	150pF	C61	12pF }		
C21	0·047pF	C62	75pF }		
C22	0·01μF	C63	20pF }		
C23	150pF	C64	10pF }		
C24	1,000pF	C65	180pF }		
C25	330pF	C66	1,000pF }		
C26	100pF	C67	0·01μF		
C27	40pF	C68	26pF		
C28	0·022μF	C69	20pF		
C29	150pF	C70	80μF		
C30	1,000pF	C71	0·047μF		
C31	0·047μF	C72	0·022μF		
C32	2μF	C73	2,200pF		
C33	1,000pF	C74	0·022μF		
C34	0·047pF	C75	560pF		
C35	0·022μF	C76	8,200pF		
C36	8μF	C77	0·033μF		
C37	2,200pF	C78	50μF		
C38	0·022μF	C79	0·022μF		
C39	560pF	C80	100pF		
C40	8,200pF	C81	0·047μF		
C41	0·033μF	C82	0·047μF		
		C83	100μF		

Coils*

L1	—	L30	36·2
L2	—	L31	34·0
L3	3·5	L32	—
L4	15·0	L33	—
L5	—	L34	400·0
L6	—	L35	—
L7	10·3	L36	—
L8	10·3	L37	—
L9	1·3		
L10	1·3		
L11	—		
L12	—		
L13	—		
L14	—		
L15	5·0		
L16	1·0		
L17	—		
L18	—		
L19	10·3		
L20	10·3		
L21	400·0		
L22	—		
L23	—		
L24	—		
L25	— }		
L26	— }		
L27	— }		
L28	— }		
L29	— }		

Miscellaneous

F1	750mA
M1	EC3
M2	GD12
PL1 }	6·5V0·3A }
PL2 }	6·5V0·3A }
S1-S28	—
S29, S30	—
S31,S32	—
S33, S34	—

‡ *F.M. Tuner*
* *Approximate d.c. resistance in ohms.*
† *Speakers.*

F.M. Circuits

During alignment the signal input should be progressively reduced as the circuits come into line so that an output of 5V at the detector or 500mW audio output is maintained, depending on the measuring method employed at the time.

1.—Switch receiver to f.m. and connect the d.c. voltmeter between **V4** pin 7 and chassis, positive terminal to chassis. Connect the f.m. signal generator via a 5,000pF capacitor to **V3** pin 2.

2.—Unscrew the lower core of the third f.m. i.f. transformer, both cores of the second f.m. i.f. transformer and both cores of the first f.m. i.f. transformer.

3.—Feed in a 10.7Mc/s unmodulated signal and adjust the upper core of the third i.f. transformer for maximum reading on the d.c. meter.

4.—Transfer the signal generator to **V2** pin 2 and adjust the cores of the second i.f. transformer (lower core first) for maximum meter reading.

5.—Transfer the signal generator and 5,000pF capacitor to the f.m. tuner test point. (This point is at h.t. potential.) Adjust the cores of the first i.f. transformer (upper core first) for maximum meter reading. Repeat this adjustment with the signal fed in at the f.m. aerial terminals.

6.—With the signal generator connected to the f.m. aerial terminals, feed in an 87Mc/s signal and, with the tuning gang fully closed (cursor at datum mark), adjust **L27** for maximum d.c. meter reading.

7.—Feed in a 92.5Mc/s f.m. signal, deviation ± 25kc/s and tune the receiver to this signal for maximum d.c. meter reading. Then adjust the lower core of the third f.m. i.f. transformer for maximum audio output. Adjust **L25** and **L24** for maximum audio output.

8.—Adjust the signal generator to ± 150 kc/s deviation and check the linearity and symmetry of the discriminator curve on an oscilloscope. If asymmetry is apparent, the receiver should be realigned. The discriminator curve should be linear to ± 75kc/s either side of centre frequency at all inputs above that required to give 2W audio output at 25kc/s deviation.

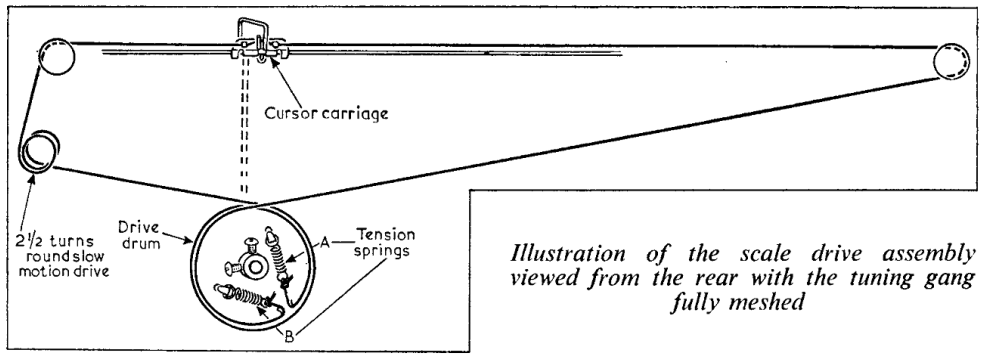


Illustration of the scale drive assembly viewed from the rear with the tuning gang fully meshed

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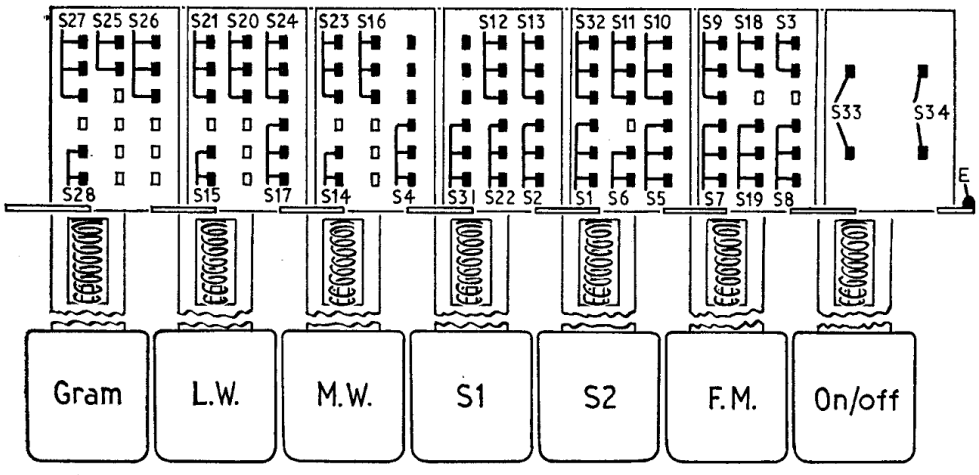

Press-button waveband switch unit illustrating the connecting tags as seen when viewed from above an upright chassis. Each single-pole switch is numbered in accordance with the circuit diagram overleaf. For tape playback, the gram and l.w. buttons should be depressed simultaneously