

Tone Control Switch Table

Switch	FID	BRI	MI	M2
S14	—	—	—	—
S15	—	—	—	—
S16	—	—	—	—
S17	—	—	—	—
S18	—	—	—	—
S19	—	—	—	—
S20	—	—	—	—
S21	—	—	—	—

CAPACITORS		Values (μF)	Locations
C1	Aerial series	0.0005	F3
C2	Aerial shunt	0.00022	A1
C3	Earth isolator	0.01	E4
C4	Aerial L.W. trim.	0.000056	A1
C5	V1 cath. by pass	0.1	F3
C6	1st I.F. trans. tun.	0.00007	A2
C7	V1 osc. C.G.	0.00007	A2
C8	A.G.C. decoupling	0.00005	E3
C9	Osc. L.W. trim.	0.1	A1
C10	Osc. S.W. track	0.00033	E3
C11	Osc. L.W., M.W. track	0.005	E3
C12	Osc. anode coup.	0.00057	E3
C13	V2 S.G. decoupling	0.00005	E3
C14	2nd I.F. trans. tun.	0.1	E4
C15	V2 cath. by pass	0.00007	B2
C16	V2 osc. C.G.	0.1	B2
C17	I.F. by passes	0.00001	D4
C18	A.G.C. coupling	0.0001	D4
C19	A.F. coupling	0.00001	E4
C20	V3 cath. by pass	0.01	D4
C21	V3 tone corrector	25.0	D4
C22	Tone control cap.	0.001	D4
C23	Speaker isolator	0.02	D3
C24	Speaker isolator	0.02	D3
C25	Speaker isolator	0.01	D3
C26	Speaker isolator	0.01	D3
C27	H.T. Smoothing	16.0	E4
C28	capacitors	24.0	E4
C29	Mains by pass	0.1	D3
C30	Aerial S.W. trim.	0.00005	A1
C31	Aerial M.W. trim.	0.00005	A1
C32	Aerial tuning	0.000532	A1
C33	Osc. S.W. trim.	0.00005	E3
C34	Osc. M.W. trim.	0.00005	E3
C35	Osc. L.W. trim.	0.00005	E3
C36	Osc. tuning	0.000532	A1
C37	Osc. tuning	0.000532	A1

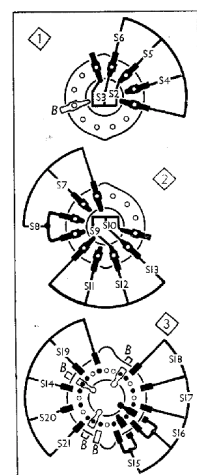
* Electrolytic. † Variable. ‡ Pre-set.
§ "Swing" value, min. to max.

RESISTORS		Values (ohms)	Locations
R1	Aerial series	500,000	F3
R2	V1 osc. C. G.	47,000	F3
R3	V1 fixed G. B.	220	F3
R4	Osc. H.T. feed	39,000	F4
R5	S.G.'s H.T. feed	33,000	E4
R6	V2 fixed G.B.	330	E4
R7	I.F. stopper	47,000	E4
R8	Sig. diode load	470,000	D4
R9	Volume Control	1,000,000	C3
R10	F.-B. coupling	4,700	D4
R11	V3 grid stopper	47,000	B2
R12	F.-B. coupling	15,000	C3
R13	V3 pent. G.B. and	220	D4
R14	A.G.C. delay	220	D4
R15	A.G.C. decoupling	1,000,000	D4
R16	A.G.C. diode load	1,000,000	D4
R17	Tone control	27,000	D3
R18	resistors	22,000	D3
R19	resistors	47,000	D3
R20	V4 surge limiter	82	C3
R21	Heater ballast	*800	B2

* Tapped at 620Ω+90Ω×90Ω from V4 heater.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial	0.5	A2
L2	Aerial coupling	very low	A1
L3	coils	57.0	A1
L4	Aerial tuning	very low	A1
L5	coils	1.1	A1
L6	Osc. S.W. reaction	14.5	E3
L7	Osc. M.W. and	21.5	E3
L8	L.W. reaction, total	2.4	E3
L9	Oscillator tuning	very low	E3
L10	coils	4.0	E3
L11	1st I.F. transformer	4.5	E3
L12	2nd I.F. transformer	9.4	A2
L13	2nd I.F. transformer	9.4	A2
L14	2nd I.F. transformer	9.4	B2
L15	Smoothing choke	9.4	B2
L16	Speech coil	490.0	B1
L17	O/p trans.	2.5	C4
L18	O/p trans.	500.0	C4
T1	Aerial switch	0.5	F4
S1	W/band switches	—	E3
S2-S13	Tone control	—	D3
S14	switches	—	D3
S21	Speaker switches	—	D4
S22	switches	—	D4
S23	switches	—	D4
S24	switches	—	D4
S25	switches	—	D4

VALVE	Anode		Screen		Cath.
	V	m/A	V	m/A	
V1 CCH35	220	2.9	80	3.6	1.7
V2 EF39	34	2.5	80	1.6	2.1
V3 CBL31	220	5.1	220	4.1	18.5
V4 CY31	—	—	—	—	250.0



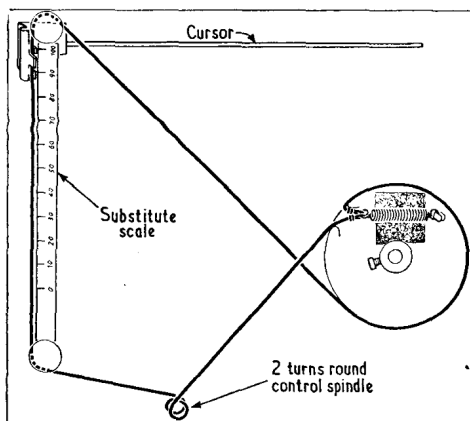
Diagrams of the waveband (upper pair, 1 and 2) and tone control (bottom unit, 3) switch units, all drawn as seen from the rear of an inverted chassis.

DRIVE CORD REPLACEMENT

About a yard of Nylon braided glass yarn is required for the drive cord, this length leaving ample for tying off.

The complete drive system is shown in the sketch below, where it is drawn as seen from the rear of the chassis, neglecting obstructions, when the gang is at maximum capacitance. The actual overall length of our sample cord was $29\frac{1}{2}$ inches, after making the loops.

When fitting the cursor carriage, which has a tongued cord grip, the receiver should be slipped into its cabinet and the cursor adjusted by the tuning knob until it registers with the black spots at the



Sketch showing the tuning drive system, as seen from the rear with the gang at maximum.

tops of the scales. A pencil mark should then be made on the cursor carriage, level with the 100 degree mark on the substitute scale. Then remove the chassis from the cabinet, turn the gang to maximum, and readjust the cursor carriage until the pencil mark is again level with 100 degrees.

PYE
48A

CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator leads, via a $0.1 \mu\text{F}$ capacitor, to control grid (top cap) of **V1** and chassis, removing the original top cap connector, but connecting a $500,000 \Omega$ resistor between the valve cap and the A.G.C. line. A convenient point to make the latter connection is the bare wire between the trimmers **C31** and **C32** (location A1).

Switch set to M.W., turn the volume control to maximum, the tone control to "Fid" and the cursor to 570 m on the scale. Feed in a 465 kc/s (645.16 m) signal, and adjust the cores of the two I.F. transformers. The primary adjustments are at the lower ends of the transformers, while the secondary adjustments are at the upper ends. After adjusting these in turn for maximum output, remove the $500,000 \Omega$ resistor and replace the top cap connector.

R.F. and Oscillator Stages.—Since the calibrated glass scale is mounted in the cabinet and alignment adjustments must be carried out with the chassis on the bench, a substitute scale is printed on the rear of the scale backing plate. This scale has 100 divisions and readings on it are taken against a pencil mark on the cord clamp on the cursor carriage.

With the gang at maximum capacitance, the reading on the substitute scale should be 100 degrees, and if any adjustment is required the cursor carriage may be slid up or down the drive cord as necessary. Transfer the "live" signal generator lead to **A** socket via a suitable dummy aerial.

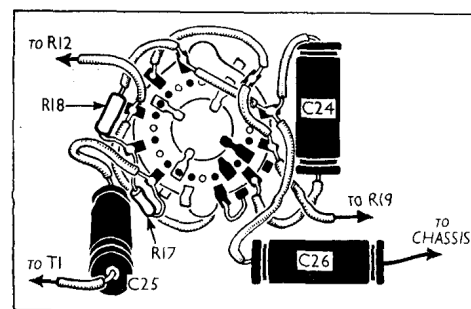
M.W.—With set still switched to M.W., tune to 8 deg on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C35** (E3) and **C32** (A1) for maximum output. Tune to 78 deg on scale, feed in a 500 m (600 kc/s) signal, and check calibration.

L.W.—Switch set to L.W., tune to 31 deg. on scale, feed in a 1,200 m (250 kc/s) signal, and adjust **C36** for maximum output. Tune to 75 deg on scale, feed in an

1,800 m (166.7 kc/s) signal, and check calibration.

S.W.—Switch set to S.W., using a 400Ω dummy aerial, tune to 6 degrees on scale, feed in a 17.5 m (17.14 Mc/s) signal, and adjust **C34** (E3) and **C31** (A1) for maximum output. Tune to 75.5 deg on scale, feed in a 43 m (6.98 Mc/s) signal, and check calibration. If any error exists, the turns spacing of **L10** (E3) should be altered to correct it. Then adjust the turns spacing of **L4** (A1) for maximum output. Repeat these adjustments until no improvement results.

Sensitivity Figures.—The following sensitivity measurements were made by the makers on a standard 48A receiver, and a reasonable tolerance would be



Sketch of the "Tonemaster" switch assembly.

about 20 per cent. Using a Pye workshop rack, type No. 940020, the input signal was applied as specified in the foregoing alignment instructions, with the aerial jack (S1) open. The output in each case was 10 mW with the speaker connected. The mains voltage was 200 V, A.C.

I.F. stages: (input to **V1** hex. C.G. with receiver tuned to 570 m on scale) $95 \mu\text{V}$.

R.F. and I.F. stages: (input to aerial circuit) as follows:

S.W.	{ 17.5 m.	17.14 Mc/s.	75 μV
	{ 43.0 m.	6.98 Mc/s	95 μV
M.W.	{ 200 m.	1,500 kc/s.	60 μV
	{ 500 m.	600 kc/s.	150 μV
L.W.	{ 1,200 m.	250 kc/s.	75 μV
	{ 1,800 m.	(No reading : noise level too high.)	