



CAPACITORS		Values	Locations
C1	I.F. filter tune ...	30pF	F4
C2	L.W. frame trim. ...	100pF	—
C3	L.W. aerial trim. ...	75pF	F4
C4	V1 C.G. ...	200pF	G4
C5	1st I.F. trans. tuning	100pF	B2
C6		100pF	B2
C7	V1 osc. C.G. ...	50pF	A2
C8	A.G.C. decoupling	0.1μF	E4
C9	L.W. osc. trim. ...	150pF	F3
C10	S.W. osc. tracker ...	0.004μF	F3
C11	M.W. osc. tracker ...	520pF	G3
C12	L.W. osc. tracker ...	200pF	G3
C13	H.T. by-pass ...	0.1μF	E4
C14	Osc. anode coup. ...	200pF	F4
C15	S.G. decoupling ...	0.1μF	E4
C16	2nd I.F. trans. tuning	100pF	B2
C17		300pF	B2
C18	I.F. by-passes	100pF	E4
C19		100pF	E4
C20	A.G.C. coupling ...	50pF	E4
C21	A.F. coupling	0.01μF	E3
C22		0.01μF	E4
C23	I.F. by-pass ...	15pF	E3
C24	A.F. coupling ...	0.005μF	D4
C25	Part tone control	0.002μF	D3
C26		200pF	D3
C27*	H.T. smoothing	24μF	B1
C28*		24μF	B1
C29*	S.W. aerial trim. ...	50pF	B2
C30†		50pF	B2
C31†	M.W. aerial trim. ...	50pF	G4
C32†	L.W. aerial trim. ...	50pF	F4
C33†	M.W. frame trim. ...	50pF	G4
C34†	Aerial tuning ...	—	A1
C35†	Oscillator tuning ...	—	A1
C36†	S.W. osc. trim. ...	50pF	B1
C37†	M.W. osc. trim. ...	50pF	B1
C38†	L.W. osc. trim. ...	50pF	B1
C39	P.U. tone correctors	400pF§	—
C40		0.005μF	—
C41*	V4 cath. by-pass ...	50μF	—
C42	Neg. feed-back ...	0.1μF	—

RESISTORS		Values	Locations
R1	Aerial shunts	33kΩ	F4
R2		150kΩ	—
R3	V1 C.G. ...	1MΩ	F4
R4	V1 osc. C.G. ...	47kΩ	F4
R5	Osc. anode load ...	22kΩ	F4
R6	V2 C.G. stopper ...	3.3kΩ	F4
R7	S.G. H.T. pot. divider	22kΩ	F4
R8		27kΩ	F3
R9	I.F. stopper	100kΩ	E4
R10	I.F. trans. shunt ...	47kΩ	E4
R11	Signal diode load ...	470kΩ	E4
R12	Volume control ...	1MΩ	E3
R13	V3 C.G. ...	22MΩ	D3
R14	V3 anode load ...	220kΩ	D3
R15	A.G.C. decoupling	1MΩ	E4
R16	A.G.C. diode load	1MΩ	E4
R17	Tone control ...	500kΩ	D3
R18	Common G.B. ...	33Ω	E3
R19	Part tone control	200kΩ	D3
R20	V4 C.G. stopper ...	100kΩ	D4
R21	V4 G.B. ...	120Ω	D3
R22	Neg. feed-back	10kΩ	E4
R23		1kΩ	E3
R24	H.T. smoothing	470Ω	B1
R25		1.5kΩ	D3
R26	P.U. tone	220kΩ	—
R27	correctors ...	33kΩ	—
R28	Neg. feed-back	33kΩ	—
R29		10kΩ	—

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	M.W. frame aerial	—	—
L2	M.W. loading coil	1.0	—
L3	L.W. frame aerial	15.0	—
L4	I.F. filter ...	18.0	A2
L5	Aerial coupling coils	—	A1
L6		30.0	G4
L7	Aerial tuning coils	48.0	A2
L8		—	A1
L9	Oscillator tuning coils	2.5	G4
L10		15.0	A2
L11	Oscillator reaction coils	—	A1
L12		4.0	A1
L13	1st I.F. trans.	10.0	A1
L14		—	A1
L15	2nd I.F. trans.	1.0	A1
L16		6.5	B2
L17	Speech coil	6.5	B2
L18		7.0	B2
L19	O.P. trans.	3.5	B2
L20		2.6	—
L21	Mains trans.	450.0	B1
T1		37.0	—
T2	415LP P.U. trans.	180.0	C1
T3		—	—
S1-S20	Waveband switches	2.0	—
S21-S24		2,100.0	G3
S25	Aerial switches ...	—	A2
S26	Speaker switch ...	—	E4
S27	Mains sw., g'd R17	—	—
S27§	Part of wave-band sw. on gram. ...	—	—

\* Electrolytic. † Variable. ‡ Pre-set  
§ Model 415 only; 0.002μF in 415LP.

## DRIVE CORD REPLACEMENT

There are two separate drive cords for the tuning and cursor drives, although for part of their run they travel over the same pulleys and lie side by side on the gang drum. The course they take is shown in the accompanying sketch, where the system is drawn as seen when viewed from the front right-hand corner of the chassis. The gang drive is shown in broken line, and the cursor drive in solid line.

About four feet of nylon braided glass yarn is required for the gang drive, and about six feet is required for the cursor drive, these lengths leaving an ample margin for tying off. The cursor can be slipped on afterwards, and it should then be adjusted to coincide with the high wavelength ends of the scales when the gang is at maximum and the chassis is fitted in the cabinet.

## CIRCUIT ALIGNMENT

Remove chassis from cabinet and stand it on its mains transformer end on the bench.

**I.F. Stages.**—Switch receiver to L.W., turn gang to maximum and connect output of signal generator, via an 0.1μF capacitor, to control grid (pin 6) of V1 and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of L20, L19, L18 and L17 (location references B2, E4, F4) for maximum output. Repeat these adjustments until no further improvement results. It should be noted that two peaks are obtainable when adjusting the cores, the correct one being with the core set further out from the coil.

**R.F. and Oscillator Stages.**—As the tuning scale remains fixed in the cabinet when the chassis is withdrawn, reference must be made during alignment to the substitute scale printed on the side

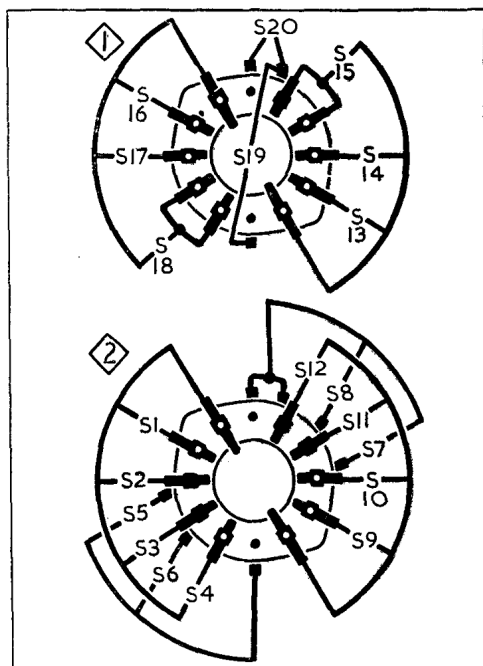
of the tuning drum. The calibration frequencies on this scale are read off against the wire cursor which is bolted to the chassis. Check that with the gang at maximum capacitance, the wire cursor coincides with the vertical line marked LMS on the substitute scale. Transfer signal generator leads, via a suitable dummy aerial, to A and E sockets. Set aerial switch to "External."

**M.W.**—Switch receiver to M.W., tune to 600 kc/s on the substitute scale, feed in a 600 kc/s (500 m) signal and adjust the cores of L12 (A1) and L9 (A2) for maximum output. Tune receiver to 1,500 kc/s, feed in a 1,500 kc/s (200 m) signal and adjust C37 (B2) and C31 (G4) for maximum output. Repeat these adjustments. Tune receiver to high wavelength end of scale, feed in a 470 kc/s (638.3 m) signal and adjust the core of L4 (A2) for minimum output.

**L.W.**—Switch receiver to L.W., tune to 166.6 kc/s, feed in a 166.6 kc/s (1,800 m) signal and adjust the cores of L13 (A1) and L10 (G4) for maximum output. Tune receiver to 266 kc/s, feed in a 266 kc/s (1,128 m) signal and adjust C38 (B1) and C32 (F4) for maximum output. Repeat these adjustments.

**S.W.**—Switch receiver to S.W., tune to 6.6 Mc/s mark on substitute scale, feed in a 6.67 Mc/s (45 m) signal and adjust the cores of L11 (A1) and L8 (A1) for maximum output. If two peaks are found with L11, adjust to the peak with the core further out. Tune receiver to 15 Mc/s, feed in a 15 Mc/s (20 m) signal and adjust C36 (B1) and C30 (B2) for maximum output. If two peaks are found when adjusting C36, it should be set to that involving the lower capacitance. Repeat these adjustments.

**M.W. Frame Aerial.**—Before commencing these adjustments, replace the chassis in its cabinet. Switch receiver to M.W. and aerial switch to "Internal." Connect output of signal generator to a loop of heavy-gauge copper wire consisting of three turns of 10 inches diameter, placed parallel to the M.W. frame aerial and about one foot from it. Feed in a 500 m (600 kc/s) signal, tune it in, and adjust the core of L2 (located in cabinet) for maximum output. Feed in a 200 m (1,500 kc/s) signal, tune it in, and adjust C33 (G4) for maximum output. Repeat these adjustments.



Waveband Switch Diagrams

Switches	S.W.	M.W.	L.W.	Gram.
S1 ...	o	—	—	—
S2 ...	—	o	—	—
S3 ...	—	—	o	—
S4 ...	—	—	—	o
S5 ...	o	—	—	—
S6 ...	o	—	—	—
S7 ...	o	—	—	—
S8 ...	o	—	—	—
S9 ...	o	—	—	—
S10 ...	—	o	—	—
S11 ...	—	—	o	—
S12 ...	—	—	—	o
S13 ...	o	—	—	—
S14 ...	—	o	—	—
S15 ...	—	—	o	—
S16 ...	—	—	—	o
S17 ...	o	—	—	—
S18 ...	—	o	—	—
S19 ...	—	—	o	—
S20 ...	—	—	—	o
S27§	o	o	o	—

§ Gram models only.

**FERRANTI**  
215, 415