

## ACE - CRESCENDO

Ace "Balmoral" is a radiogram version which uses an identical type chassis and employs a four-speed automatic record player.

### CIRCUIT ALIGNMENT

Alignment of the F.M./I.F. circuits should be carried out with the use of a wobulator for preference. If a wobulator is not available, an A.M. signal generator may be used. Both methods are described. During alignment the input should be as low as possible to prevent A.G.C. action.

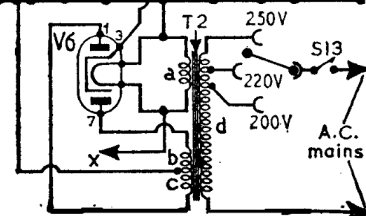
**Equipment Required.**—A wobulator; an A.M. signal generator modulated 30 per cent; an output meter with an impedance of 3 ohms, or an A.C. voltmeter; a high resistance D.C. voltmeter; an oscilloscope; a  $0.1\mu\text{F}$  capacitor and insulated screwdriver-type trimming tool.

**A.M./I.F. Circuits.**—Switch to M.W. and rotate tuning capacitor to maximum capacitance. Connect the output meter in place of the speech coil or, if an A.C. voltmeter is used as an output indicator, connect it across the speech coil. Connect the signal generator to V2b control grid (pin 2), via the  $0.1\mu\text{F}$  capacitor.

1.—Feed in a 462 kc/s signal and adjust the cores of L19 (location reference B2), L18 (G3), L14 (B2) and L13 (F3) for maximum output.

**F.M./I.F. Wobulator Method.**—Switch to F.M. and disconnect C47 (G4). Unscrew the core of L16 (G3) until it protrudes from the base of the former. Connect the oscilloscope between the top end of the volume control R23 (D1) and chassis. Connect the wobulator to point X on the underside of the tuner unit printed panel (E4).

Note: point X is at H.T. potential and an isolating capacitor should be included in the wobulator "live" output lead.



### Resistors

R1	150Ω	D2
R2	470kΩ	D2
R3	10kΩ	D2
R4	4.7kΩ	C2
R5	2.2kΩ	F4
R6	1MΩ	F3
R7	15kΩ	F4
R8	220Ω	F3
R9	47kΩ	F3
R10	22kΩ	F3
R11	1kΩ	F4
R12	100kΩ	F3
R13	220Ω	G3
R14	1kΩ	F4
R15	100kΩ	G3
R16	47Ω	G4
R17	47kΩ	G4
R18	100kΩ	G4
R19	1MΩ	G4
R20	4.7MΩ	F4
R21	33kΩ	G4
R22	2.2MΩ	E4
R23	1MΩ	D1
R24	10MΩ	G3
R25	220kΩ	G3
R26	500kΩ	A1
R27	22kΩ	A1
R28	2.2kΩ	G4
R29	47kΩ	G4
R30	150Ω	G4
R31	4.7kΩ	F4
R32	2.2kΩ	F4
R33	220Ω	D1
R34	1kΩ	H3

### Capacitors

C1	0.001μF	D2
C2	0.01μF	D2
C3	100pF	D2
C4	—	D2
C5	—	C2
C6	0.01μF	D2
C7	0.01μF	D2
C8	20pF	D2

C9	10pF	D2
C10	20pF	D2
C11	—	D2
C12	—	D2
C13	5pF	D2
C14	0.001μF	D2
C15	0.001μF	C2
C16	65pF	D2
C17	0.001μF	F3
C17a	0.003μF	E3
C18	140pF	F3
C19	30pF	E3
C20	30pF	E3
C21	528pF	C2
C22	100pF	D1
C23	0.002μF	F3
C24	0.01μF	F4
C25	0.01μF	F3
C26	528pF	D2
C27	30pF	E3
C28	490pF	F3
C29	0.01μF	F3
C30	100pF	F4
C31	500pF	F4
C32	15pF	C1
C33	15pF	C1
C34	250pF	C2
C35	250pF	C2
C36	0.002μF	G3
C37	0.01μF	G3
C38	0.01μF	F3
C39	0.02μF	F4
C40	36pF	B1
C41	200pF	G4
C42	250pF	B2
C43	500pF	B2
C44	100pF	G3
C45	4,700pF	F4
C46	200pF	G4
C47	5μF	G4
C48	0.001μF	F4
C49	100pF	F4
C50	65pF	E4
C51	140pF	D1
C52	3,300pF	G4
C53	0.01μF	G3

C54	0.01μF
C55	8μF
C56	220pF
C57	50μF
C58	0.22μF
C59	32μF
C60	32μF

### Coils\*

L1	—
L2	—
L3	—
L4	—
L5	—
L6	—
L7	—
L8	—
L9	11.0
L10	—
L11	—
L12	—
L13	5.0
L14	5.0
L15	—
L16	—
L17	—
L18	7.5
L19	3.5
L20	3.0

### Miscellaneous\*

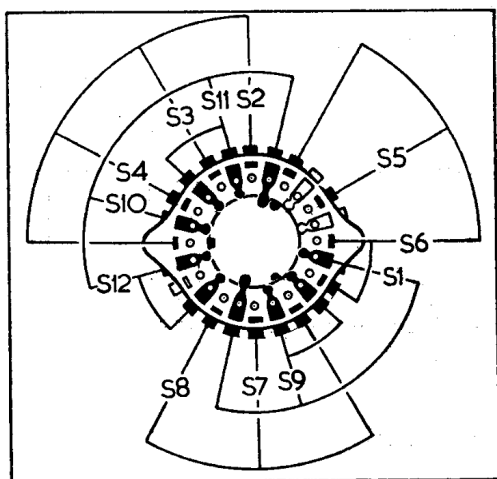
T1	{ a 500.0 }
	{ b — }
	{ c 180.0 }
T2	{ a 180.0 }
	{ b 180.0 }
	{ c 40.0 }
S1-S12	—
S13	—

\*Approximate D.C. resistance in ohms.

†Printed on panel.

- 2.—Feed in a 10.7 Mc/s wobbulator signal and adjust **L15** (B1), **L12** (B1), **L11** (F3), **L7** (D2) and **L6** (E4) for maximum amplitude with a symmetrically shaped trace on the oscilloscope.
- 3.—Reconnect **C47** and screw in the core of **L16** (G3) for the normal discriminator "S" curve with a straight centre line.
- F.M./I.F. Signal Generator Method.**—Connect the high resistance D.C. voltmeter across **C47** (G4), observing correct polarity. Connect the A.M. signal generator to point **X** (E4) via an isolating capacitor as in the "Wobbulator Method."
- 4.—Feed in a 10.7 Mc/s modulated signal and adjust **L15** (B1), **L12** (B1), **L11** (F3), **L7** (D2) and **L6** (E4) for maximum reading on the D.C. voltmeter, adjusting the input to maintain the meter reading at about 4V.
- 5.—Move the signal generator frequency to each side of 10.7 Mc/s to ensure there is no double-humping, then adjust the signal generator tuning for maximum output on the meter. This may be slightly off 10.7 Mc/s.

Adjust **L16** (G3) for minimum modulation output on the output meter across the speaker terminals. This should be a sharp null point. **L16** may require



The waveband switch wafer as seen from the rear of an upright chassis

**Drive Cord Replacement.**—About 44 ins of cord is required. The diagram below shows the tuning drive fully assembled as it appears when viewed from the rear of the chassis.

Turn the tuning gang to maximum capacitance (fully meshed) and observe that the drive drum takes up the position shown in the diagram. Tie one end of the cord to the tension spring and anchor the other end of the spring to the lug in the drum stamping.

Take the cord out of the drum through the upper opening in its perimeter and passing it behind the upper right-hand small pulley continue across the scale backing plate and over the left-hand small pulley. Make  $2\frac{1}{4}$  turns anti-clock-

wise round the tuning knob spindle and return the free end of the cord to the right-hand lower small pulley.

**F.M./R.F. Circuits.**—Rotate the tuning gang to maximum capacitance and check that the cursor lines up with the end of the scale, then tune the receiver to 95 Mc/s.

6.—Connect the signal generator to the F.M. aerial sockets, feed in a 95 Mc/s signal and adjust **C11** (D2), **C5** (C2) and **L1** (C2) for maximum output on the D.C. voltmeter.

**A.M./R.F. Circuits.**—Switch to M.W. and tune to 500 m. Connect the signal generator to the A.M. aerial and earth sockets via a standard dummy aerial.

7.—Feed in a 600 kc/s signal and adjust **L10** (F3) and **L8** (D1) for maximum output.

8.—Tune to 200 m, feed in a 1,500 kc/s signal and adjust **C27** and **C20** (E3) for maximum output.

9.—Repeat operations 7 and 8 until no further improvement can be obtained.

10.—Switch to L.W. and feed in a 167 kc/s signal. Tune in this signal on the receiver (about 1,800 m). Then adjust **L9** (C1) for maximum output.

11.—Feed in a 230 kc/s signal and tune receiver to this signal (about 1,300 m). Then adjust **C19** (E3) for maximum output.

12.—Repeat operations 10 and 11 until no further improvement can be obtained.

wise round the tuning knob spindle and return the free end of the cord to the right-hand lower small pulley.

Pass the cord over the small pulley and clockwise round the drive drum perimeter and complete by tying the end to the tension spring. Attach the cursor to line up with the edge of the scale at the L.F. end.

