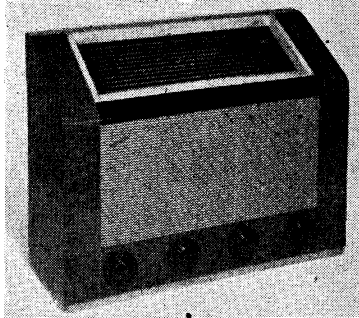


# BEETHOVEN A1188

Nine-valve, eleven-waveband superhet with RF stage with Ten SW ranges, all of which are bandspread, and with push-pull output stage. Sockets for crystal or magnetic pickup and low-impedance extension loudspeaker. Figured walnut table-type cabinet. For 100 to 250V 40-100 c/s AC. Manufactured by Beethoven Electric Equipment, Ltd., Chapel Lane, Sands, High Wycombe, Bucks.



AERIAL is fed to S2 and thence to coupling coils L1, L3, etc. The SW grid coils L2, L4, etc., are switched by S1 to g1 of RF amplifier V1. The MW coil L22 is capacitively coupled by C1, C15 to L33 in a bandpass circuit in the grid of frequency changer V2. S4 switches the tuning capacitor VC1 through series capacitors C4, C5, C6, C7 and C8 to S3, and thence to g1 of V1, except on MW band when it is switched direct to L22. In SW1 position of S4 capacitor C9 is in parallel with VC1. In all except SW1 position C3 is connected in parallel with VC1. C10 is shunted between g1 and earth. R36 is grid resistor. Cathode bias is provided by R3 decoupled by C11 with C12 to give decoupling at the highest frequencies.

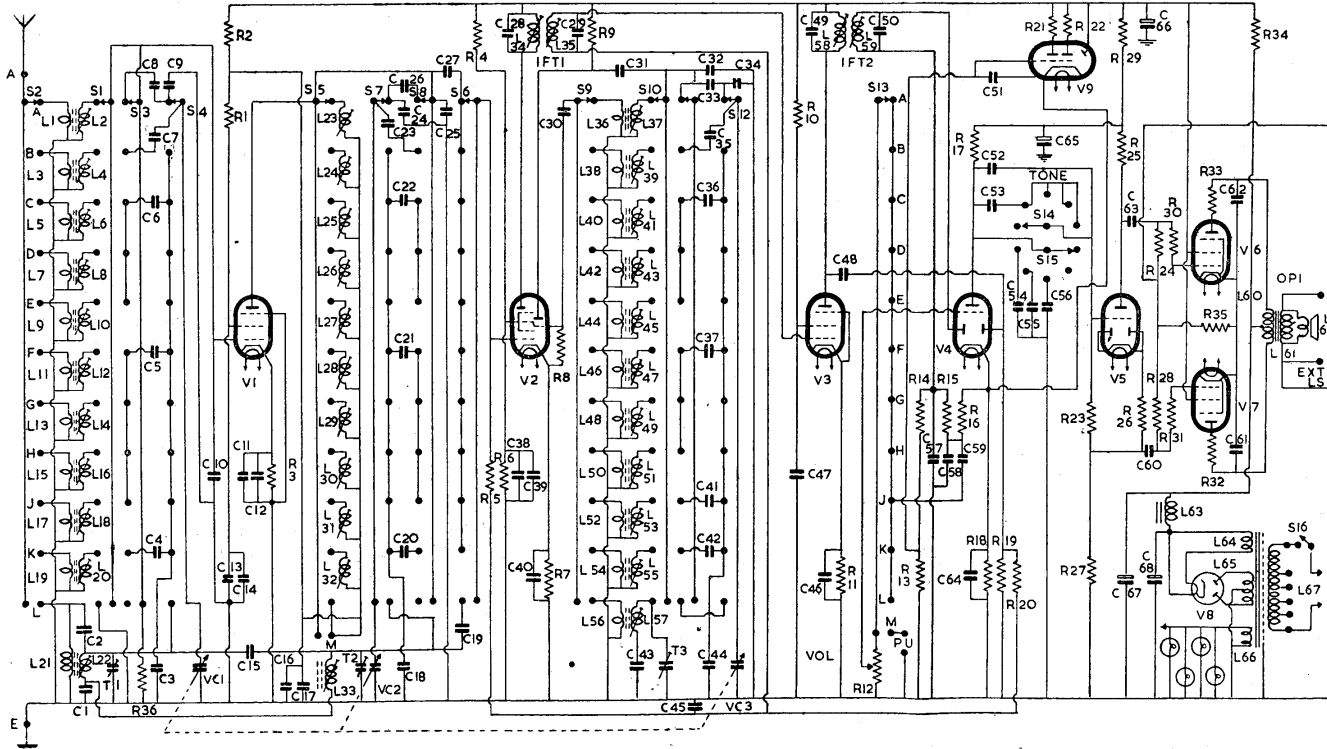
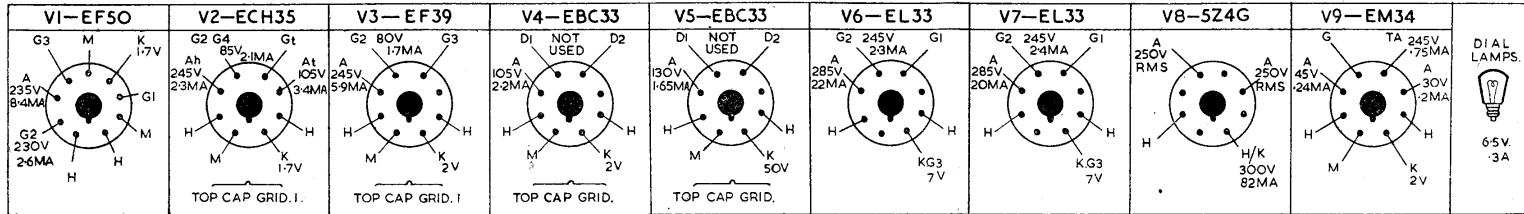
HT for V1 anode, decoupled by R2, C16, C17, is fed through tuned coils L23-L32. S5 switches the anode to the coils and S7 switches tuning capacitor VC2, through series capacitor C20, C21, C22, C23, C26 to S8, and thence to the coils. In SW1 position of S7, capacitor C24 is paralleled with VC2. C18 is connected across VC2 except on MW. C25 is coupled between anode V1 and chassis. On MW band, however, VC2 is switched direct to bandpass coil L33.

Frequency-changer. On SW bands signal from V1 anode is coupled by C27 to S6 and thence to g1 of frequency-changer V2. On MW band the signal from the aerial bandpass circuit is coupled by C19 to V2. T1,

L	Ohms
54	...
55	...
56	Very Low
57	1.0
58	2.5
59	7.5
60	800 Total
61	3
62	2.5
63	135
64	Very Low
65	130 Total
66	Very Low
67	9.5 Total

## CAPACITORS

C	Capacity	Type
1	.02 Tubular	350V
2	5pF Twisted Wire	
3	400pF Silver Mica	
4	375pF Silver Mica	
5	200pF Silver Mica	
6	110pF Silver Mica	
7	70pF Silver Mica	
8	50pF Silver Mica	
9	200pF Silver Mica	
10	10pF Tubular Ceramic	
11	.1 Tubular	350V
12	.005 Mica	
13	.1 Tubular	350V
14	100pF Mica	
15	1pF Twisted Wire	
16	.01 Tubular	350V
17	.01 Tubular	350V
18	400pF Silver Mica	
19	100pF Silver Mica	
20	375pF Silver Mica	
21	200pF Silver Mica	
22	110pF Silver Mica	
23	70pF Silver Mica	
24	200pF Silver Mica	
25	10pF Ceramic	
26	50pF Silver Mica	
27	100pF Silver Mica	
28	100pF Silver Mica	
29	100pF Silver Mica	
30	100pF Silver Mica	
31	100pF Silver Mica	
32	10pF Ceramic	
33	50pF Silver Mica	
34	200pF Silver Mica	
35	70pF Silver Mica	
36	100pF Silver Mica	
37	180pF Silver Mica	
38	.1 Tubular	350V
39	100pF Silver Mica	
40	.1 Tubular	350V
41	170pF Silver Mica	
42	300pF Silver Mica	
43	555pF Silver Mica	
44	400pF Silver Mica	
45	.1 Tubular	350V
46	.1 Tubular	350V
47	.1 Tubular	350V
48	10pF Ceramic	
49	100pF Silver Mica	
50	200pF Silver Mica	
51	.1 Tubular	350V
52	.00025 Tubular	350V
53	.01 Tubular	350V
54	.005 Tubular	350V
55	.002 Tubular	350V
56	.001 Tubular	350V
57	100pF Mica	
58	100pF Mica	
59	.01 Tubular	350V
60	.05 Tubular	350V
61	.002 Tubular	1000V
62	.002 Tubular	1000V
63	.05 Tubular	350V
64	.25 Electrolytic	25V
65	2 Electrolytic	350V
66	16 Electrolytic	350V
67	16 Electrolytic	450V
68	16 Electrolytic	450V



## RESISTORS

R	Ohms	Watts
1	1K	...
2	1K	...
3	180	...
4	33K	...
5	1M	...
6	47K	...
7	220	...
8	47K	...
9	33K	...
10	100K	...
11	270	...
12	1M Potentiometer	...
13	3M	...
14	2M	...
15	47K	...
16	470K	...
17	47K	...
18	680	...
19	1M	...
20	1M	...
21	1M	...
22	1M	...
23	1M	...
24	250K	...
25	33K	...
26	1K	...
27	33K	...
28	250K	...
29	10K	...
30	47K	...
31	47K	...
32	100	...
33	100	...
34	1.2K	...
35	140	...
36	1M	...

## INDUCTORS

L	Ohms
1	...
2-20	Very Low
21	12.5
22	3.0
23-32	Very Low
33	3.0
34	7.5
35	7.5
36-53	Very Low

# BEETHOVEN A1188—Contd.

T2 are MW bandpass trimmers. AVC, decoupled by R20, C45, is applied through R5.

**Oscillator** is connected in a shunt-fed tuned-anode circuit. The anode coils L37, L39, etc., are switched by S10, through C31, to oscillator anode, of which R9 is the load. The MW coil L57 is provided with trimmer T3 and padder C43. The oscillator tuning capacitor VC3 is switched by S12 through series capacitors C33, C35, C37, C41, C42 to S11 and thence to the coils. On SW1 band C34 is shunted across VC3, whilst C32 is placed across the tuned circuit on all ranges. For the SW bands other than SW1, C44 is placed across VC3.

The grid reaction coils L36, L38, etc., are switched by S9 through C30 to oscillator grid of V2. Automatic bias for grid is developed on C30 with R8 as leak.

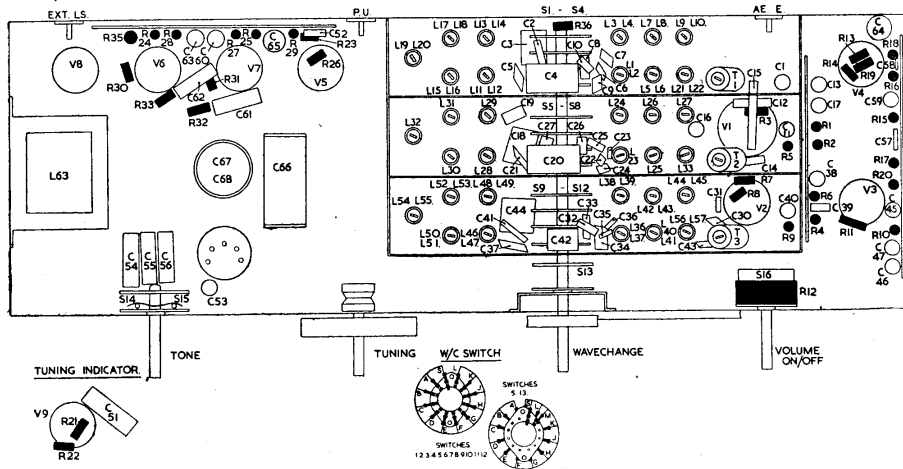
**IF amplifier** operates at 465 kc/s. Secondary L35, C29 of IFT1 feeds signal and AVC voltages, decoupled by R20, C45 to g1 of IF amplifier V3. Cathode bias is provided by R11 and decoupled by C46. Screen (g2) voltage is obtained from R10 and decoupled by C47. Suppressor grid (g3) is strapped to cathode. L58, C49, which form the primary of IFT2, are in the anode circuit.

**Signal rectifier.** Secondary L59, C50 of IFT2 feeds signal to one diode of V4. R16 is load, and R15, C57, C58 form an IF filter.

**Tuning indicator.** The DC component of the rectified signal is tapped from potential divider R13, R14 and fed to C51 and grid of tuning indicator V9. Cathode is coupled to cathode of V4. R21, R22 are anode load resistors. Target anode voltage is taken from HT line.

**AVC.** C48 feeds signal from primary of IFT2 to second diode of V4. R19 is its load. AVC voltages decoupled by R20, C45 are fed to control grids of V2 and V3. Cathode voltage of V4 provides a delay bias for the AVC diode.

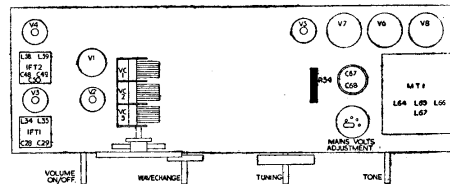
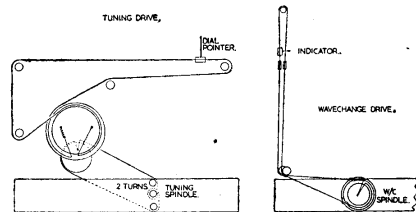
Continued at end of McCarthy MC422 on page vi



## TRIMMING INSTRUCTIONS

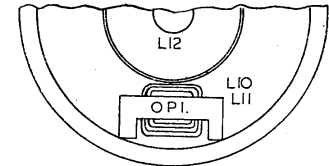
Apply Signal as Stated Below	Tune Receiver to	Trim in Order Stated for Max. Output
(1) 465 kc/s to fixed plates of VC2 via .01	MW 550 metres	Core L59, L58, L35, L34
(2) 600 kc/s to AE socket via dummy aerial	500 Metres	Core L57, L33, L22
(3) 1.4 mc/s as above	214 metres	T3, T2, T1 and repeat (2) and (3).
(4) SW Bands		

Alignment of the bandspread ranges should be effected with great care as the normal signal generator is not accurate enough for satisfactory adjustment. Alignment in the factory is effected with crystal-controlled apparatus. Should any adjustment be necessary, the receiver should be tuned to a station of known frequency and the oscillator, HF and aerial inductances adjusted in that order for max. output.



# BEETHOVEN A1188

Continued from page iv



Identifying the windings on the speaker and output transformer of the A1188

**AF amplifier.** C59 feeds rectified signal to S13, which, in its eleven radio positions, passes the signal to volume control R12 and thence to grid of triode section of V4. Twelfth position of S13 feeds pick-up signal to volume control. Cathode bias is provided by R18 decoupled by C64. HT, decoupled by R29, C65, is fed through load R17 to anode.

**Phase splitter.** C52 feeds signal from anode V4 to grid of phase splitter V5. R23 is its grid resistor, and R26 cathode bias resistor. The diodes are strapped to cathode. Opposite phased signals appearing across anode load R25 and cathode load R27 drive the push-pull output valves.

**Tone control.** S14 in position 1 gives bass attenuation, but in its other positions provides bass lift by connecting C53 across C52. S15, which is ganged to S14, gives maximum treble in position 1, and treble attenuation in three of its other positions by connecting C54, C55, C56 in turn between anode V4 and chassis.

**Output Stage.** C60, C63 feed, through grid stoppers, R30, R31, the grids of push-pull pentode output valves V6 and V7. R24, R28, are grid resistors. Cathode bias is by common resistor R35. Screens are fed from R34 and decoupled by C66. Anodes of V6, V7 are coupled through stopper resistors R32, R33 to primary L60 of output transformer OP1, the HT being fed to its centre tap. C61, C62, between anode and cathode of each valve, prevent parasitic oscillation.

Secondary L61 feeds signal to a 10-inch permanent magnet speaker L62. Sockets are fitted on L61 for a low-impedance extension speaker.

**HT** is provided by an indirectly-heated full-wave rectifier V8. HT secondary L65 of mains input transformer MT1 supplies anode voltages, and L64 the heater current. Choke capacity smoothing is by L63, C67, C68. Additional smoothing is by voltage dropping resistor R34 and capacitor C66.

**Heaters and dial lights** obtain their current from L66. Primary L67 of MT1 is tapped for 110 to 250 volts, 40-100 cycles AC mains supplies. S16, which is ganged to the volume control spindle, is the ON/OFF switch.

**Chassis removal.** Remove the four control knobs and rear panel of cabinet. Remove left-hand and top battens to which rear panel is secured. This is necessary to give clearance for top of scale assembly and transformer housing when withdrawing chassis. Remove the four chassis bolts on underside of cabinet and withdraw chassis.