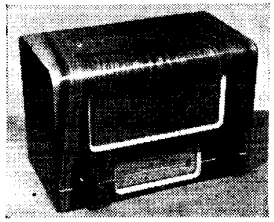
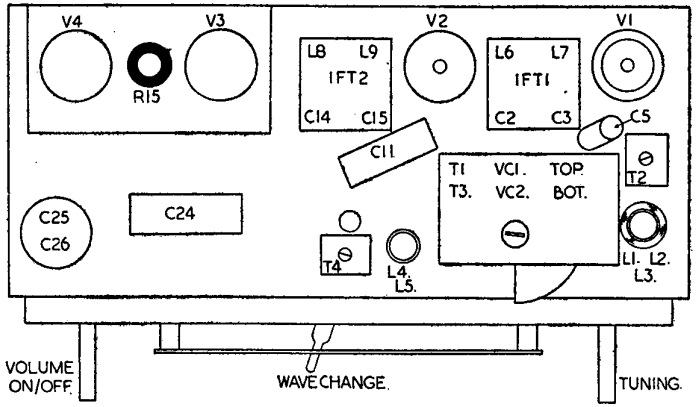
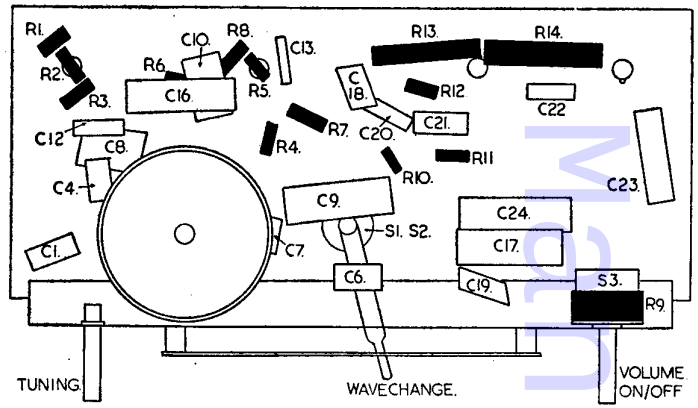
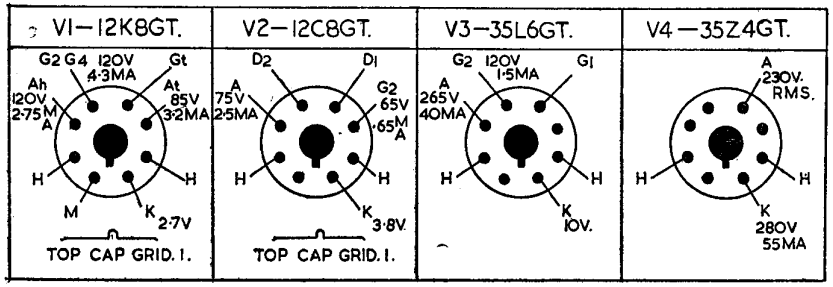
McCARTHY MC 422







Four-valve, two-waveband reflex 'superhet with permanently attached aerial lead. For 200-250V AC-DC, but can be used on 110 V if simple modification is made. Well-ventilated walnut veneered midget cabinet. Made by Felgate Radio Ltd., Studland Street, Hammersmith, W6.



CAPACITORS

C	Capacity	Type
1	.01	Tubular 500V
2	150pF	Silver Mica
3	150pF	Silver Mica
4	100pF	Silver Mica
5	.1	Tubular 350V
6	100pF	Silver Mica
7	275pF	Silver Mica
8	455pF	Silver Mica
9	.1	Tubular 350V
10	300pF	Silver Mica
11	.1	Tubular 350V
12	.00015	Tubular 500V
13	100pF	Silver Mica
14	150pF	Silver Mica
15	150pF	Silver Mica
16	.1	Tubular 350V
17	.1	Tubular 350V
18	100pF	Silver Mica
19	100pF	Silver Mica
20	.002	Tubular 500V
21	.01	Tubular 500V
22	.00015	Tubular 500V
23	.01	Tubular 1000V
24	50	Electrolytic12V
25	24	Electrolytic 350V
26	24	Electrolytic 350V

RESISTORS

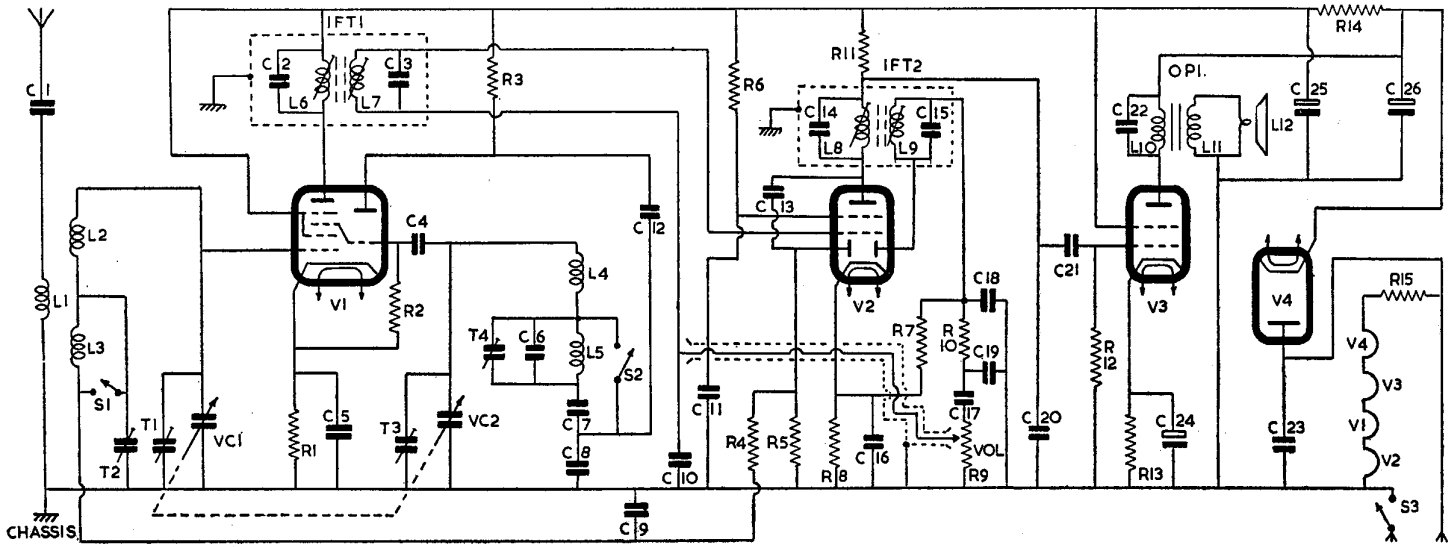
R	Ohms	Watts
1	220	¼
2	47K	¼
3	12K	¼
4	1M	¼
5	1M	¼
6	68K	¼
7	330K	¼
8	1.5K	¼
9	500K Potr. with SP. ST. Switch	
10	33K	¼
11	15K	¼
12	330K	¼
13	220	1
14	10K	2.5
15	820	20

INDUCTORS

L	Ohms
1	85
2	3.75
3	41
4	8
5	10.5
6	6.5
7	6.5
8	6.5
9	6.5
10	400
11	.5
12	3

TRIMMING INSTRUCTIONS

Apply Signal as Stated Below	Tune Receiver to	Trim in Order Stated for Max. Output
(1) 460 kc/s to g1 of V1, via .1 mF.	MW band	Core L9, L8, L7, L6
(2) Check to see that wi the dial pointer coin hand side of scale.	th gang conde cides with en	nser fully meshed d mark on left
(3) 1.5 mc/s to AE lead via dummy aerial.	200 meteres	T3, T1.
(4) 600 kc/s as above.	500 metres	Check calibration.
(5) 300 kc/s as above.	1,000 metres	T4, T2
(6) 150 kc/s as above.	2,000 metres	Check calibration.



AERIAL is fed through isolating capacitor C1 to common MW and LW coupling coil L1. The grid coils L2 (MW), L3 (LW), which are series connected and coupled direct to g1 of triode-hexode frequency changer V1, are tuned by VC1 and trimmed by T1 (MW), T2 (LW). S1 shorts out L3 when receiver is switched to MW band.

AVC, decoupled by R4, C9 is applied to g1 of V1 through the tuned coils. Cathode bias is provided by R1 decoupled by C5. L6, C2 which form the primary of IFT1 are in the hexode anode circuit.

Oscillator is connected in a tuned-grid shunt-fed circuit. The grid coils L4 (MW), L5 (LW) which are series connected and coupled by C4 to oscillator grid, are tuned by VC2, trimmed by T3 (MW), T4, C6 (LW) and padded by C7, C8. S2 shorts out L5, C7 when receiver is switched to MW band.

Automatic bias for oscillator grid is developed on C4, with R2 as leak resistor. Anode reaction voltages are developed capacitively on C8 for both wave bands and are fed by C12 to oscillator anode of which R3 is the load resistor.

IF Amplifier operates at 460 kc/s. Secondary L7, C3 of IFT1 feeds signal to g1 of double-diode pentode V2. The pentode section of this valve

Continued on page 48

REGENTONE RG99/2

AERIAL is fed through isolating capacitor C1 to SW coupling coil L1 and thence to bottom end of grid coils L3 (MW) and L4 (LW). R1 across aerial and earth sockets is a static drain. Grid coils L2 (SW), L3 (MW), L4 (LW) are trimmed by T1, T2, T3 and switched by S1 to aerial tuning capacitor VC1 and to g1 of triode-hexode frequency changer V1.

AVC and a standing bias decoupled by R6, C2, are fed through the tuned coils to g1. The Gram. position of S1 connects g1 direct to bias network R17, R18. Cathode of V1 is at chassis potential. Screen (g2, g4) voltage is obtained from R2 decoupled by C11. L9, C3, forming the primary of IFT1, are in the hexode anode circuit.

Oscillator is connected in a tuned grid shunt fed circuit. The grid coils L5 (SW), L7 (MW), L8 (LW), trimmed by T4, T5, T6 and padded by C9, C8, C7 respectively, are switched by S2 to oscillator tuning capacitor VC2, and through C6 and series limiter R4, to oscillator grid of V1. Automatic bias for grid is developed on C6 with R5 as leak. Anode reaction voltages are obtained inductively from L6 for SW, and capacitively from across padders C8, C7 in the case of MW, LW, and are switched by S3 through C5 to oscillator anode. R3 is anode load. In Gram. position of S2, S3, oscillator anode is coupled through C5, C6, R4 to its grid and becomes inoperative.

IF amplifier operates at 465 kc/s. Secondary L10, C4 of IFT1 feeds signal, AVC voltages and a standing bias decoupled by R11, C10 to g1 of IF amplifier V2. Cathode and suppressor grid (g3) are connected down to chassis. Screen (g2) voltage is obtained from R2 decoupled by C11. Primary L11, C12 of IFT2 is in the anode circuit.

Signal rectifier. Secondary L12, C16 of IFT2 feeds signal to one diode of V3. R9, the volume control, is the diode load and R7, C14, C15 form an IF filter.

Pickup sockets are fitted at rear of chassis for connection of the magnetic pickup which forms part of the gramophone unit. The pickup, shunted by R8, is coupled by S4 (closed only when wavechange switch is in gram. position) across the volume control R9.

AVC. C13 feeds signal at anode V2 to second diode of V3. R12 is its load, and R11, R6, C10, C2 decouple feed to control grids of V1, V2. Delay bias for AVC diode is obtained by connecting bottom end of load R12 to R17, R18, which are in the negative HT return lead to chassis. This delay voltage also serves as a standing bias for control grids (g1) of V1, V2.

AF amplifier. C17 feeds signal from volume control R9 to grid of triode section of V3. R10 is its grid resistor and with C17 provides automatic bias. R13 is anode load, and C18 anode RF bypass.

Output stage. C19 feeds signal through stopper R15 to g1 of pentode output valve V4. R16 is its grid resistor, and bias is obtained by connecting bottom end of R16 to bias network R17, R18.

L13, the primary of output matching transformer OP1, is in the anode circuit. Negative feedback from anode to grid of V4 is introduced by R14. Three degrees of tone control are given by S5 in conjunction with C20, C21 and R19. L14, the secondary of OP1, feeds signal to a 6½-inch PM speaker L15.

HT is provided by full-wave indirectly-heated isolated cathode rectifier V5. L16, the HT secondary of mains input transformer MT1, supplies its anode voltages. Its heater current is obtained from L17 in common with the rest of the valves. R21, R22 are surge limiters. Resistance-capacity smoothing is given by R20, C23, C24.

Heaters and dial lights obtain their current from L17. S6, which is ganged to the wavechange switch, controls the dial lights D2, D3 and gramophone turntable light D1. Primary L18 of MT1 is tapped for input voltages of 100-120, 200-220, 230-250V 50 c/s. S7, ganged to the volume control, is the on/off switch.

Gramophone unit may be a Garrard S or Collaro AC49. Both have friction rim driven turntables and have magnetic pickup and automatic stop mechanism. Motors operate on 100-120, 200-250V 50 c/s AC.

Chassis removal. Remove four push-on control knobs, rear panels, and motor cover panel underneath cabinet. Remove mains lead from voltage tapping panel on gramophone motor. Unplug pickup leads from sockets at rear of chassis.

Remove the three chassis bolts which are accessible through either back or front of gramophone compartment. Withdraw chassis so that LS leads can be unsoldered from output transformer. Chassis can be removed.

Removal of Gramophone Unit. Unclamp pickup lead from back rail of receiver shelf and pull through hole in corner of motor compartment. Remove mains lead to motor voltage tapping panel (if receiver chassis has been removed, then this lead will already have been taken off). Remove the spring washer on turntable spindle and carefully ease off turntable. With a short-bladed screwdriver undo the three bolts holding motor unit plate to bottom shelf.

TRIMMING INSTRUCTIONS

Apply Signal as Stated below.	Tune Receiver to	Trim in Order Stated for Max. Output
(1) 465 kc/s to g1 of V1 *via* .01	—	Core L12, L11, L10, L9.
(2) 18 mc/s to AE socket *via* dummy aerial	18 mc/s mark on dial	T4, T1.
(3) 6 mc/s as above	6 mc/s mark on dial	Check calibration and sensitivity.
(4) 1.4 mc/s as above	215 metres	T5, T2.
(5) 600 kc/s as above	500 metres	Check calibration and sensitivity.
(6) 300 kc/s as above	1000 metres	T6, T3.
(7) 160 kc/s as above	1875 metres	Check calibration and sensitivity.

"Service Charts" Back Numbers

A few back numbers of Service Chart supplements going back to November 1947 are available at 1s. each, post free, from the publishers, ELECTRICAL AND RADIO TRADING, 6, Catherine Street, London, WC2.

Copies of a duplicated foolscap size index of all sets reviewed since 1934 are available at 2s. 6d. from The Editor, ELECTRICAL AND RADIO TRADING, 186, High Holborn, London, WC1.

McCARTHY MC422

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functions first as an IF amplifier and later as an AF amplifier, whilst the diodes are used for signal rectification and AVC. The bottom end of L7 is returned to chassis through R9, the volume control, bypassed by C10. Cathode bias is provided by R8 decoupled by C16. Primary L8, C14 of IFT2 is in the anode circuit.

Signal rectification. Secondary L9, C15 of IFT2 feeds signal to one of diodes of V2. R7 is its load. Rectified signal is fed through filter R10, C18, C19 to volume control R9.

AVC. C13 feeds IF signal appearing at anode of V2 to its second diode. R5 is the load and R4, C9 decouple to AVC line to V1. Cathode bias developed on R8 provides delay voltage for AVC diode.

AF amplifier. From the volume control R9 the rectified signal is fed back through secondary L7 of IFT1 to g1 of V2 where it is amplified and appears across anode load R11. C20 is anode bypass capacitor for the AF circuit.

Output stage. C21 feeds signal to g1 of beam tetrode output valve V3. R12 is grid resistor, cathode bias is provided by R13 decoupled by C24.

Primary L10 of output matching transformer OP1 is in the anode circuit, the HT for which is drawn direct from reservoir smoothing capacitor C26. C22 gives fixed tone correction. Secondary L11 of OP1 feeds signal to a 5-inch PM speaker L12.

HT is provided by a half-wave indirectly-heated rectifier V4 with anode voltage obtained direct from the mains. Resistance-capacity smoothing is given by R14, C25, C26, and C23 eliminates modulation hum.

Heaters of V1 to V4 are series connected and obtain their current of .15A from the mains through dropper resistor R15 for 200-250V supplies, and direct from the mains for 110 V.

When the receiver is used on 110V it is necessary to short out resistor R15 as no tapping adjustments are fitted.

S3 which is in the mains lead to chassis and ganged to the volume control spindle is the ON/OFF switch.

Chassis Removal. Remove the two control knobs and rear panel of cabinet. Slide chassis out of cabinet as far as LS leads will permit. Unfasten nuts holding LS to baffle at front of case. Chassis together with speaker can then be completely removed from cabinet.

BEETHOVEN A1188

from page 45

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.

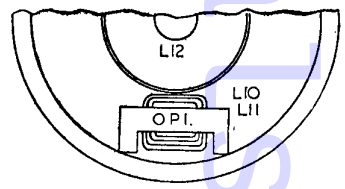
Phase splitter. C52 feeds signal from anode V4 to grid of phase splitter V5. R23 is its grid resistor, and R26 cathode bias resistor. The diodes are strapped to cathode. Opposite phased signals appearing across anode load R25 and cathode load R27 drive the push-pull output valves.

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.



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

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.

NEW-LOOK TELE-FILTER

The New-Look Tele-Filter is a sheet of tinted plastic with a frame of adhesive material, by which it can be stuck to television screens. It is claimed to eliminate "dangerous ultra-violet rays" (tube makers say no such rays are given off), to reduce glare due to the red-yellow part of the spectrum and to improve contrast during viewing by artificial lighting.

There are sound grounds for both the latter claims. During our tests a majority of viewers voted for the filter although it reduces brightness, while the blue hue, though one ceases to be conscious of it after some minutes, makes the picture rather "cold."

Retail prices range from 15s. for the 9 by 7½ in. size. Makers are New Look Products, Cranleigh, Surrey.

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