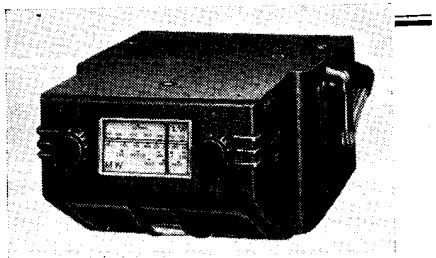
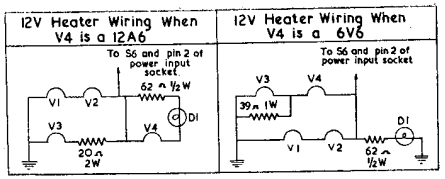
# MASTERADIO 700, 701



*Four-valve two-waveband miniaturised light-weight car radio with separate self-contained vibrator power unit. Manual tuning system incorporates a patented snap position station locating device. Model 700 is fitted with internal speaker. Model 701 has an external speaker mounted in a circular cabinet for placing in any position in the car. Both models are housed in dark grey cellulose finished metal cabinets fitted with lugs for attachment to underside of dashboard. Models available for 6 or 12 volt batteries. Manufactured by Masteradio Ltd., Fitzroy Place, London, NW1*



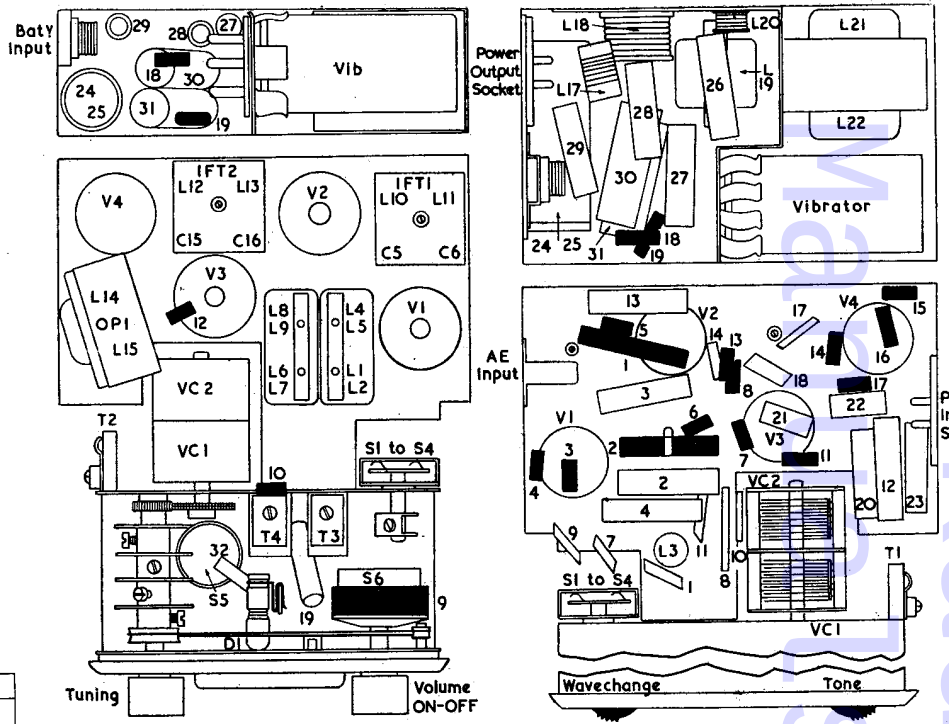

## CAPACITORS

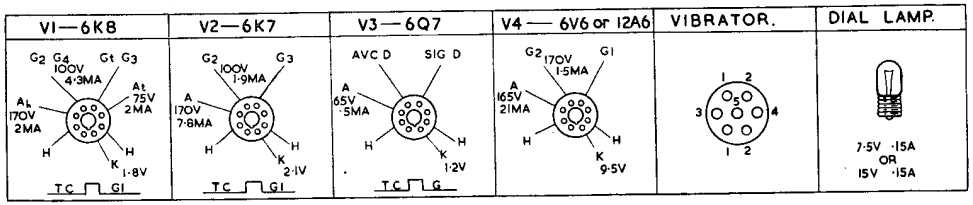
| C | Capacity | Type |
|---|---|---|
| 1 | 100pF | Silver Mica |
| 2 | .1 | Tubular 350V |
| 3 | .1 | Tubular 350V |
| 4 | .1 | Tubular 350V |
| 5 | 82pF | Tubular Ceramic |
| 6 | 82pF | Tubular Ceramic |
| 7 | 100pF | Silver Mica |
| 8 | 450pF | Silver Mica |
| 9 | 100pF | Silver Mica |
| 10 | 120pF | Silver Mica |
| 11 | 100pF | Silver Mica |
| 12 | .1 | Tubular 350V |
| 13 | .1 | Tubular 350V |
| 14 | 20pF | Tubular Ceramic |
| 15 | 82pF | Tubular Ceramic |
| 16 | 82pF | Tubular Ceramic |
| 17 | 100pF | Silver Mica |
| 18 | 100pF | Silver Mica |
| 19 | .05 | Tubular 350V |
| 20 | Electrolytic | 12V |
| 21 | .01 | Tubular 500V |
| 22 | .01 | Tubular 500V |
| 23 | 20 | Electrolytic 12V |
| 24 | 16 | Electrolytic 250V |
| 25 | 16 | Electrolytic 250V |
| 26 | 16 | Electrolytic 250V |
| 27 | .1 | Tubular 350V |
| 28 | 30 | Electrolytic 15V |
| 29 | 30 | Electrolytic 15V |
| 30 | Tubular | 600V AC |
| 31 | .05 | Tubular 600V AC |
| 32 | .002 | Tubular 500V |

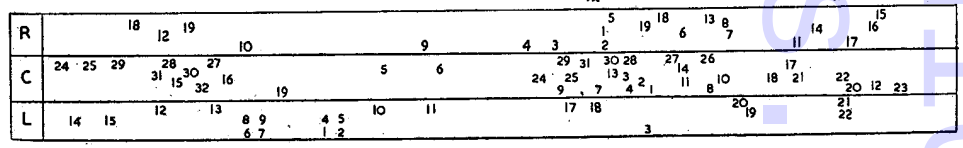
## RESISTORS

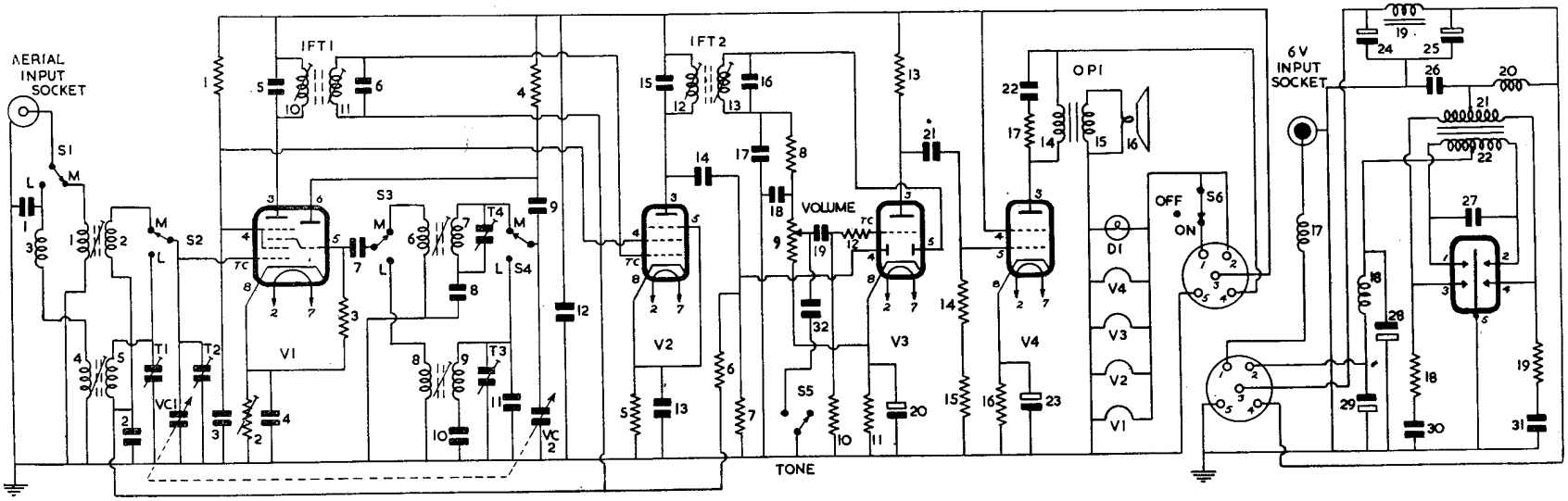
| R | Ohms | Watts |
|---|---|---|
| 1 | 10K | 1 |
| 2 | 500 Preset | |
| 3 | 47K | ¼ |
| 4 | 47K | ¼ |
| 5 | 220 | ¼ |
| 6 | 1M | ¼ |
| 7 | 1M | ¼ |
| 8 | 47K | ¼ |
| 9 | 500K Potentiometer (with SP switch) | |
| 10 | 1M | ¼ |
| 11 | 4.7K | ¼ |
| 12 | 220K | ¼ |
| 13 | 220K | ¼ |
| 14 | 220K | ¼ |

*Continued in end column*




## RESISTORS

| R | Ohms | Watts |
|---|---|---|
| 15 | 470K | ¼ |
| 16 | 400 | ½ |
| 17 | 4.7K | ½ |
| 18 | 68 | ½ |
| 19 | 68 | ½ |

## INDUCTORS

| L | Ohms |
|---|---|
| 1 | 1 |
| 2 | 5 |
| 3 | 25 |
| 4 | 3.5 |
| 5 | 21 |
| 6 | .75 |
| 7 | 1.5 |
| 8 | 1.5 |
| 9 | 6.5 |
| 10 | 12 |
| 11 | 12 |
| 12 | 12 |
| 13 | 12 |
| 14 | 450 |
| 15 | .5 |
| 16 | 2.5 |
| 17 | Very low |
| 18 | Very low |
| 19 | 225 |
| 20 | 36 |
| 21 | 300 |
| 22 | Very low |

## MASTERADIO 700, 701

**AERIAL input.** Screened aerial lead is plugged into socket at side of receiver chassis. Aerial is switched by S1 direct to MW coupling coil L1 and through filter L3 C1 to LW coupling coil L4. Screening of aerial lead is connected by outer sheath of socket to chassis which is earthed to car body.

Grid coils L2 (MW), L5 (LW) are switched by S2 to aerial tuning capacitor VC1 and to triode-hexode frequency-changer V1. LW coil is trimmed by T1 and MW coil by T2 shunted across VC1.

AVC, decoupled by R6 C2 is fed through the tuned coils to control grid of V1. Cathode bias is provided by factory preset control R2 decoupled by C4. Screen (g2, g4) voltage is obtained from R1 decoupled by C3. Primary L10 C5 of IFT1 is in the hexode anode circuit.

**Oscillator** is triode section V1 connected in a tuned-anode shunt-fed circuit. Anode coils L7 (MW) L9 (LW), trimmed by T4, T3, C11 and padded by C8, C10 respectively, are switched by S4 to oscillator tuning capacitor VC2, and coupled by C9 to oscillator anode of V1, of which R4 is the load resistor.

Reaction voltages are obtained inductively from L6 (MW), L8 (LW) and are switched by S3 through C7 to oscillator grid. Automatic bias is developed on C7 with R3 as leak.

**IF amplifier.** Secondary L11 C6 of IFT1 feeds signal, and AVC voltages decoupled by R6 C2, to IF amplifier V2. Cathode bias is by R5 decoupled by C13. Screen voltage is obtained from R1 in common with screen of V1, and decoupled by C3. Suppressor grid (g3) is strapped to cathode. Primary L12 C15 of IFT2 is in the anode circuit.

**Signal rectifier.** Secondary L13 C16 of IFT2 feeds signal to one diode of V3. R9, the volume control, is the diode load and R8 C17 C18 form an RF filter. Tone control is provided by S5, which in one of its two positions, connects C32 from slider of volume control R9 down to chassis.

**AVC.** C14 feeds signal at anode V2 to second diode V3 of which R7 is the load. AVC voltages are decoupled by R6 C2 and fed to grids of V1 V2. Cathode bias across R11 C20 provides delay voltage.

**AF amplifier.** Rectified voltage across volume control R9 is fed by C19 through stopper R12 to triode grid of V3, of which R10 is load. Cathode bias is by R11 decoupled by C20. Anode load is R13.

**Output stage.** Signal is fed by C21 to grid of beam-tetrode output amplifier V4, of which R14 R15 form grid load. Cathode bias is by R16 decoupled by C23. Screen voltage is obtained direct from HT line to V1—V3, decoupling being provided by C24, in the power unit.

Primary L14 of output matching transformer OP1 is in the anode circuit, the HT for which is obtained direct from reservoir smoothing capacitor C25. Tone correction is by R17 C22 shunted across primary L14. Secondary L15 feeds signal to a 5in. PM speaker L16.

**HT** is provided by a synchronous self-rectifying vibrator used in conjunction with a vibrator transformer L21 L22. Rectified voltage is choke-capacity smoothed by L19 C24 C25 and fed via interconnecting lead to receiver chassis. Receiver HT line is RF decoupled by C12.

LT feed to vibrator transformer is smoothed by L18 C28 C29. R18 C30 R19 C31 and C27 form an arc quench filter circuit.

Reservoir smoothing capacitor C25 should be rated to handle 75 mA ripple. Vibrator socket is wired to enable power unit to be quickly adapted for either positive or negative earthed systems by rotating vibrator 180 degrees in its sockets and reversing connecting leads C28 C29. Normally the power unit is supplied wired for use with positive earthed batteries.

**Heaters.** On 6V models, heaters of V1 to V4 and dial lamp are parallel connected and obtain their current from car battery through RF choke L17. On 12V receivers using type 6V6 or 12A6 type output valves then a series-parallel arrangement is used, as shown in the wiring diagram page vii. S6, ganged to volume control spindle, is ON/OFF switch.

DC input of 6 or 12V is fed to receiver through a 10A fused lead and through earth bonding of receiver chassis.

### TRIMMING INSTRUCTIONS

| Apply signal as stated below. | Tune Receiver to | Trim in order stated for maximum output |
|---|---|---|
| (1) 465 kc/s to g1 of V1 | MW band with R9 at maximum | Cores L13, L12, L11, L10 |
| (2) 520 kc/s as above | Gang at max. capacity | Core L6/7 |
| (3) 1.55 mc/s as above | Gang at min. capacity | T4. Repeat (2) and (3) |
| (4) 150 kc/s as above | LW Band Gang at max. capacity | Core L8/9 |
| (5) 350 kc/s as above | Gang at min. capacity | T3. Repeat (4) and (5) |
| (6) 600 kc/s to aerial socket via 110pF capacitor | MW Band 600 Kc/s | Core L1/2 |
| (7) 1.3 mc/s as above | 1.3 mc/s | T2. Repeat (6) and (7) |
| (8) 180 kc/s as above | LW band 180 kc/s | Core L4/5 |
| (9) 220 kc/s as above | 220 kc/s | T1. Repeat (8) and (9) |

### DOUBLE DECCA

A DOUBLE-DECCA was brought in with the complaint that the LT battery had to be replaced frequently, although the receiver was operated on mains most of the time.

The receiver was tested on mains and battery reception and results were normal. The LT battery was disconnected while the receiver was operating on mains and signals faded out.

A check of the voltages across the series heater chain showed a reading of 5V instead of 7.5V, and explained the short life of the LT battery as this, not being switched out, had been supplementing the heater supply during mains operation.

The cause of the low voltage was traced to the 5W dropper resistor in series with the heater chain. On getting warm the value of this would rise by about 20 per cent.

A new resistor effected a complete cure, ensuring that there was no current drain on the LT battery. To be on the safe side, the resistor was mounted on a tag in a better-ventilated position, as it seemed rather "cramped" in its original place and the nearby wiring had perished with the heat.—J. C. HALL.

# MY SERVICE BENCH

*Several readers were stimulated, by the G.R.W. contribution described last month, to send details of their benches. This is one of the most original designs*

THE basis for this bench was a kitchen table measuring 3ft. by 4ft. 6ins. The sketch should be self-explanatory except for one or two points.

Soldering irons are not tolerated on top of the bench as screwdriver handles and ebonite trimmergers always seem to get burnt. Both irons are modified as their only fault seems to lie in the fracture of the leads: so half the handle at the end is cut away and the male section of a flex-connector permanently fixed to it. The lead is then terminated with the female section.

The modified multiplug is of the type that accommodates all size plugs from 2A 2-pin up to 15A 3-pin and on the top of this have been mounted two crocodile clips separated by a thin piece of insulation and each provided with an insulated terminal top. Sets with no plug are readily connected by this means.

A further socket is provided for two home-made multiplugs converting standard 15A 3-pin to (a) D & S 13A fused plug and (b) the new 13A flat-pin plug.

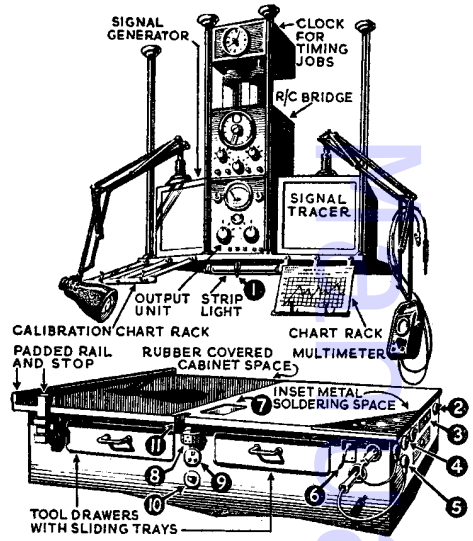
As removal of chassis is most conveniently carried out from the further side of the bench a padded stop is provided for the cabinet on this side. The cabinet is rested on its side, knobs and bolts being put in a drawer on the far side of the bench.

The instrument shelf (of somewhat unusual shape) is fixed to the ceiling to allow free access to all sides of the bench. If all instruments had been placed in line the shelf would have been too long and, if one above the other, the top ones would have been too high. Space was saved by a triangular plan. The back corners of the generator and tracer are all but touching. The output unit contains a choke for field substitution and a tapped output transformer. The first switch gives (1) low impedance (2) triode (3) battery pentode and (4) mains pentode. The second switch: (1) speaker only (2) output meter only (3) both. The output meter is connected to the primary of the transformer so that a step-up is available when connecting to allow resistance output. The speaker is also provided with a volume control.

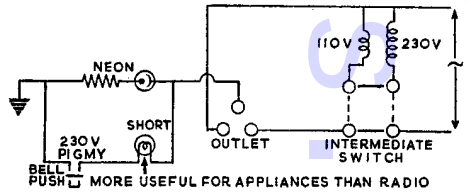
Also on this panel is a neon which is connected to a short section of spring type aerial in a paxalin tube and provided with an insulated prod and used, as G. R. W. suggested, for checking the "live-ness" of AC/DC chassis. If the chassis of an AC/DC set is thus found to be live, it is necessary to have a means of reversing the mains input—not so easy if fitted with a 3-pin plug. Change-over is by means of an octal holder with extra slot but a QMB DP switch could be used or the type used for mains reverse with fluo lighting on DC. Bench supplies are fused by wire in a made-up plug but an overload cut-out would be better.

The speaker is mounted on a triangular baffle behind the instruments and blows down and forwards, being nearer to the ear than one under the bench and better for the detection of excess hum.

Aerial and earth sockets from a anti-interference type aerial are also fixed on the underside of the instrument shelf. Also the termination of a deliberately inefficient indoor aerial.




**(1) Spring-loaded neon prod. (2 & 3) Eliminator switch and sockets. (4 & 5) Switches for light and heavy irons. (6) Cored-solder feed. (7) Glass panel over neon. (8) Modified multiplug in 15A socket. (9) Spare socket. (10) Live-neutral changeover switch. (11) Notch to prevent leads catching in drawer. Below: How 110V supply is obtained and live-chassis test made**




Addenda: by means of an auto transformer and an "intermediate" type switch, 110V is available from the usual output sockets. In districts where this voltage is encountered this may be a worthwhile addition. It is useful in any case where AC/DC sets are suspected of having too high a filament voltage as a safe low voltage check can be made to see if more than half the correct voltage is present.—E. D. MEADOWS, Alton.

### TEST BENCH TIPS

WHAT with test aerial and earth, multirange meter, signal generator, etc., the test bench can become quite cluttered. This has been remedied in the following manner.

All test gear and batteries for testing are mounted on a low shelf at the back of the bench. In all cases test leads have been suitably lengthened and these fall down behind the bench to come back up through labelled panels on the bench itself.

In the bight of each lead I have fitted a small pulley and weight which draws the leads down, their terminals preventing them slipping through, when finished with.—P. GALE, Port Erin, I.O.M.