



Circuit diagram of the Ultra Model 25 A.C. superhet. Note that V1 is a triode-pentode frequency changer. L5 is an image suppression coil. The first I.F. transformer is iron-cored, and the second air-cored in our chassis. R12 is a semi-fixed resistor feeding the neon tuning indicator. The pick-up is fed to the grid of V3 via a transformer, to give the requisite step-up.

## COMPONENTS AND VALUES

| Condensers | Values (μF)                    |
|------------|--------------------------------|
| C1         | V1 pent. cont. grid decoupling |
| C2         | V1 pent. anode decoupling      |
| C3         | V1 pent. S.G. by-pass          |
| C4         | V1 triode grid condenser       |
| C5         | V1 cathode by-pass             |
| C6         | V1 triode anode decoupling     |
| C7         | Oscillator L.W. tracker        |
| C8         | V2 anode decoupling            |
| C9         | V2 cont. grid decoupling       |
| C10        | V2 cathode by-pass             |
| C11        | V2 S.G. by-pass                |
| C12        | I.F. by-pass                   |
| C13        | L.F. coupling to V3 pentode    |
| C14        | Tone control condenser         |
| C15        | Fixed tone compensator         |
| C16        | Part of tone comp. filter      |
| C17        | Coupling to V3 A.V.C. diode    |
| C18        | V3 cathode by-pass             |
| C19        | H.T. smoothing                 |
| C20        | Mains interference suppressors |
| C21        | Band-pass primary tuning       |
| C22        | Band-pass primary trimmer      |
| C23        | Band-pass secondary tuning     |
| C24        | Band-pass secondary trimmer    |
| C25        | Oscillator L.W. trimmer        |
| C26        | Oscillator tuning              |
| C27        | Oscillator trimmer             |
| C28        | 1st I.F. trans. pri. tuning    |
| C29        | 1st I.F. trans. sec. tuning    |
| C30        | 2nd I.F. trans. pri. tuning    |
| C31        | 2nd I.F. trans. sec. tuning    |

\* Electrolytic. \* Pre-set.

| Resistances | Values (ohms)                  |
|-------------|--------------------------------|
| R1          | V1 pent. cont. grid decoupling |
| R2          | V1 pent. S.G. H.T. feed        |
| R3          | V1 harmonic suppressor         |
| R4          | V1 triode grid resistance      |
| R5          | V1 fixed G.B. resistance       |
| R6          | L.W. tracker by-pass           |
| R7          | V1 triode anode decoupling     |
| R8          | V2 S.G. H.T. feed              |
| R9          | V2 anode decoupling            |
| R10         | V2 cont. grid decoupling       |
| R11         | V2 fixed G.B. resistance       |
| R12         | Neon T.I. feed resistance      |
| R13         | Neon T.I. exciter resistance   |
| R14         | V3 signal diode load           |
| R15         | Manual volume control          |
| R16         | V3 cont. grid I.F. stopper     |
| R17         | Part of tone comp. filter      |
| R18         | V3 anode circuit stabiliser    |
| R19         | V3 G.B. and A.V.C. delay       |
| R20         | voltage resistances            |
| R21         | V3 A.V.C. diode load           |
| R22         |                                |

| Other Components | Values (ohms)                    |
|------------------|----------------------------------|
| L1               | Aerial coupling coils            |
| L2               |                                  |
| L3               | Band-pass primary coils          |
| L4               |                                  |
| L5               | Image suppression coil           |
| L6               |                                  |
| L7               | Band-pass secondary coils        |
| L8               |                                  |
| L9               | Oscillator coupling coils, total |
| L10              |                                  |
| L11              | Oscillator tuning coils          |
| L12              |                                  |
| L13              | 1st I.F. transformer Pri.        |
| L14              | 1st I.F. transformer Sec.        |
| L15              | 2nd I.F. transformer Pri.        |
| L16              | 2nd I.F. transformer Sec.        |
| L17              | V1 pent. anode choke             |
| L18              | I.F. choke                       |
| L19              | Speaker speech coil              |
| L20              | Hum neutralising coil            |

| Other Components (Cont'd.) | Values (ohms)                   |
|----------------------------|---------------------------------|
| T1                         | Pick-up transformer Pri.        |
| T2                         | Pick-up transformer Sec.        |
| T3                         | Output transformer Pri.         |
|                            | Output transformer Sec.         |
|                            | Pri. total                      |
|                            | Heater sec.                     |
|                            | Lamp sec.                       |
|                            | Rect. heat sec.                 |
|                            | H.T. sec.                       |
| S1-S5                      | Waveband switches               |
| S6, S7                     | Radio-gram. changeover switches |
| S8                         | Tone control switch             |
| S9                         | Mains switch, ganged R15        |

## VALVE ANALYSIS

Valve voltages and currents given in the table below were measured with the receiver operating on 225 V mains, with no signal input and with the volume control at maximum. Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

| Valve         | Anode Volts | Anode Current (mA) | Screen Volts | Screen Current (mA) |
|---------------|-------------|--------------------|--------------|---------------------|
| V1 AC/TP*     | 255         | 7.7                | 185          | 2.45                |
| V2 AC/VP†     | 135         | 8.8                | 180          | 1.95                |
| V3 AC/2Pen/DD | 240         | 31.0               | 250          | 6.75                |
| V4 UU3        | 315†        | —                  | —            | —                   |

\* Osc. anode (G2) 75 V, 1.65 mA.  
† Each anode, A.C.

## GENERAL NOTES

**Switches.**—S1-S7 are the wavechange and radio-gram. switches, mounted in a single unit beneath the chassis. They, and the signal frequency coils, are covered by a rectangular metal screening box, held to the chassis by four self-tapping screws. This screen has been removed in our under-chassis view to show the switches and coils. The switches are clearly indicated, and the following table gives their settings for the M.W., L.W. and Gram. positions. O indicates open, and C closed.

| Position | S1 | S2 | S3 | S4 | S5 | S6 | S7 |
|----------|----|----|----|----|----|----|----|
| M.W.     | C  | C  | C  | O  | C  | O  | C  |
| L.W.     | O  | O  | O  | C  | O  | O  | C  |
| Gram.    | O  | O  | O  | O  | C  | C  | O  |

S8 is the Q.M.B. tone switch at the rear of the chassis which is closed when depressed. S9 is the Q.M.B. mains switch, ganged with the volume control R15.