

5.6 Audio oscillator, 400 c/s

The pentode section of valve V3 sustains oscillations in a resistor-capacitor phase-shift network with a fine adjustment in the capacitor C34. This network drives the grid of the pentode, the anode of which drives the triode section through C35. Positive feedback for the network is taken from the cathode of the triode.

The anode of the triode V3b drives the output transformer T1, which has two output windings. One output winding leads to three contacts on the switch S2 and then to a potentiometer VR2. The current passes through the split controlling winding L1 of the reactor L2. Tapped off this circuit is an AF OUT jack on the front panel, which can supply 400 c/s or 50 c/s, depending on the position of S2. The other output winding leads to one contact on switch S2 (above) and then to S3 and S4, to modulate the A.M. oscillator.

5.7 Crystal oscillator

The triode V2a is a Pierce-type oscillator. S3 selects the crystal inserted between the anode and grid of V2A.

5.8 A.M. oscillator

The triode V2b acts as a high-frequency Colpitts-type oscillator, the frequency of which is determined by the inductors L6, etc., in series with the capacitors C24, etc., switched through S4, all of which are preset. The exact frequency of oscillation is determined by the variable split-stator capacitor C23, which is driven by a reduction gear from the right-hand knob on the front panel, which also indicates the calibrated frequency on the appropriate A.M. scale.

5.9 Crystal verification

When a crystal is switched into circuit, V2a and V2b triodes are coupled through C16 between the cathodes. The audio beat-note is filtered from the high-frequency components in the anode circuit by C21, and fed, via C14, to the grid of V3B, which stops oscillating and forms, with the accompanying triode, an amplifier for the beat-note through the A.F. OUT jack J1. Adjustment of the right-hand knob on the front panel, indicating the frequency on the appropriate A.M. scale, determines the beat-note.

5.10 F.M. oscillator

The triode V1a acts as a Colpitts-type oscillator, the frequency being determined by the preset inductors L3, etc, and the sections "A", etc, of the reactor L2, switched by S1, and the preset capacitors C3, etc. The exact frequency of oscillation is determined by the variable capacitor C6 which is driven by a reduction gear from the left-hand knob on the front panel, which also indicates the frequency on the appropriate F.M. scale. Frequency modulation is effected by varying the inductance "A", etc, by the current (at 400 c/s) in L1 when this is switched in by S2 from V3. Thus, at constant amplitude, the frequency of oscillation is varied at 400 c/s about a steady value, which is indicated on the appropriate F.M. scale on the front panel. The preset permanent magnet N. is to linearize the performance of L2, and under no circumstances should any attempt be made to re-adjust it. The output of this oscillator is taken from the cathode resistor R13 via capacitor C41 and coaxial lead to the switch S2.