

5. DESCRIPTION OF CIRCUIT

5.1 Block diagram

Because the units of the instrument are used in several different ways, they will be more easily understood from the block diagram, Fig. 2, than from the main circuit, Fig. 10, which is detailed later. The way in which the units are switched to co-operate will be made clear from the applications of the instrument. The functional parts are:

- (a) *Mains Supply*, which provides the voltages for all the units, including low-voltage at mains frequency for the X-deflection voltage.
- (b) *Audio-frequency oscillator* at 400 c/s for amplitude-modulating or frequency-modulating the appropriate radio-frequency oscillator.
- (c) *Frequency-modulation section* in which a reactance is varied at 400 c/s or mains frequency, and so controls the frequency-modulation of a radio frequency oscillator.
- (d) *Radio-frequency oscillator*, the frequency of which is determined by preset tuned circuits and the reactance circuit of (c) above.
- (e) *Radio-frequency oscillator*, the frequency of which is determined by preset tuned circuits, with available amplitude-modulation at 400 c/s.
- (f) *Crystal oscillator*, which verifies the frequencies of the oscillator above by heterodyning, the beat-note being amplified by the valves which normally oscillate at 400 c/s.
- (g) *Attenuator*, which is in two parts, one continuously variable over a decade of amplitude, the other in decade steps, the output being a known loss on an adjusted level set by reference to a meter.

5.2 Mains supply

Single-phase 40-60 c/s mains supply is brought in from a three-core cable. In the live leads are chokes L14 and L15 and capacitors C49 and C50 to earth, which form a filter to reject high-frequency currents from the mains. The live lead most remote from earth has the mains fuse F1 and the mains switch S7; the other live lead passes through a mains voltage selector switch S8 to tappings on the mains transformer T2, which has an earthed screen between the windings. Across the primary winding is an indicating neon lamp.

5.3 High-tension supply

This is taken from a secondary winding through a bridge-rectifier RT4 and a resistor-capacitor filter C46 - R36 - C45.

5.4 Low-tension supply

This is taken from a centre-tapped secondary, half the voltage A going to V2 and V3, half the voltage B going to V1, both returning to the centre tap, which picks up the earth from the mains and extends it throughout the circuit and chassis.

5.5 Phasing circuit

This is a resistor-capacitor network to alter the phase of the mains supply when used as a time-base. The low voltage is taken from the AB secondary of the mains transformer. Phasing is controlled by one variable resistor VR6 at the base of the instrument, and extended to X OUT jack J2. The output impedance of this mains time-base voltage is high.