

Experiment No. 13 Depiction of Voice Oscillations

Turn the horizontally orientated solenoid coil through 180° such that it rests between the mounting ring and the neck of the cathode ray tube. Connect the coil, a 4 volt battery and a post office type carbon granule microphone in series to constitute a closed circuit. Switch the sawtooth generator to "100" and speak into the microphone, e.g. the vowels a, e, i, o, u.

Result : The characteristic oscillograms of the vowel sounds are seen clearly. The fundamental frequency of the bright vowels i and e is considerably higher than that of the dark vowels o and u.

Experiment No. 14 Rotating Magnetic Field

If a three-phase transformer is available with secondary voltages of about 10 V, connect these respectively to three solenoid coils spaced at intervals of 120° around the mounting ring, to produce a rotating magnetic field. Connect the coils in star circuit and the secondary voltages of the transformer in delta circuit.

Result : In the rotating magnetic field, the cathode ray also rotates and thus sweeps out the surface of a cone, whereby the luminous spot describes a circle on the screen.

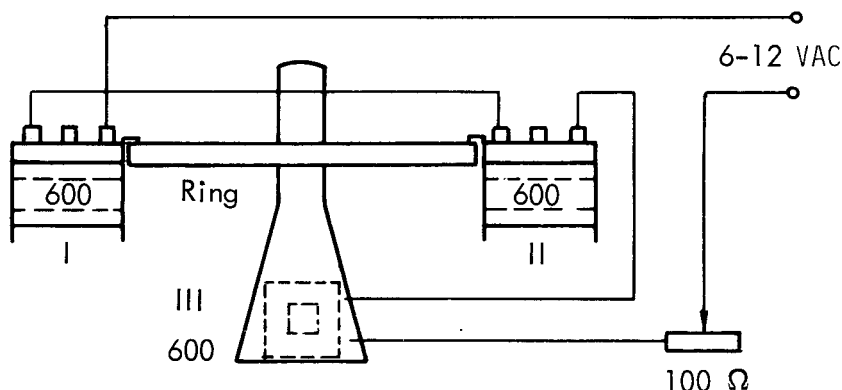
Experiment No. 15 Hysteresis Loops

Fig. 9 Circuit producing hysteresis curves

a) As shown in Fig. 9, coils I and II are secured to the edge of the metal ring, while coil III is positioned under the tube in proximity to the screen, with its magnetic field flowing in a vertical direction. The magnetic fields of coils I and II must cancel each other out; this is achieved by short-circuiting coil III and if necessary, reversing the polarity of one of the coils I or II and displacing it up or down until the image point on the screen is no longer modified. The free coil III is moved in such a way that the image point is drawn out to become a 2-3 cm long, straight line (if necessary, also reverse the polarity of this coil).

Iron or nickel is now introduced into coil II, e.g. sheet iron (from a preserving tin, non-annealed or annealed), steel knitting needle, tripod leg, screwdriver, a bundle of 3-4 pieces of wire, 2-3 superimposed pieces of nickel plate, I-core etc.