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Lissajous figures

When a particle is acted upon simultaneously by two simple harmonic motion (S.H.M) at right angle to each other, the resultant path traced out by the particles is called Lissajous figures. The shape of the resultant path that is figure depends on the time period, phase difference and the amplitude of the two S.H.Ms. The two simple harmonic motions may be mechanical (using two tuning forks) or alternating voltages (using two electrical a.c. sources) acting simultaneously at right angles to each other.

The Lissajous fig. can be defined as one of an infinite number of curves formed by combining two simple oscillations that are perpendicular to each other. This is usually viewed by an oscilloscope and is used to study the frequency, amplitude and phase relationships of harmonic variables.

The Lissajous figures oscilloscope allows to plot one sine wave along the x-axis against another sine wave along the y-axis. The resultant is a number of measurements. The Lissajous figure shows the phase difference between the two signals and the relationship between their frequencies.

Lissajous is the pattern that a ~~pattern~~ sinusoidal signal is applied to the horizontal and vertical axes on the CRT (Cathode ray ~~oscilloscope~~ oscilloscope). These patterns depend on the amplitude, frequency and phase difference of the sinusoidal applied to the horizontal and vertical baffles of the CRT (Cathode ray oscilloscope.)

Some example of Lissajous figures

- (i) Varying audio oscillator with known frequency light signal.
- (ii) Monitoring audio amplifiers and feedback networks for phase shift.
- (iii) The Lissajous figures are used to determine the unknown frequency by comparing it with the known frequency.