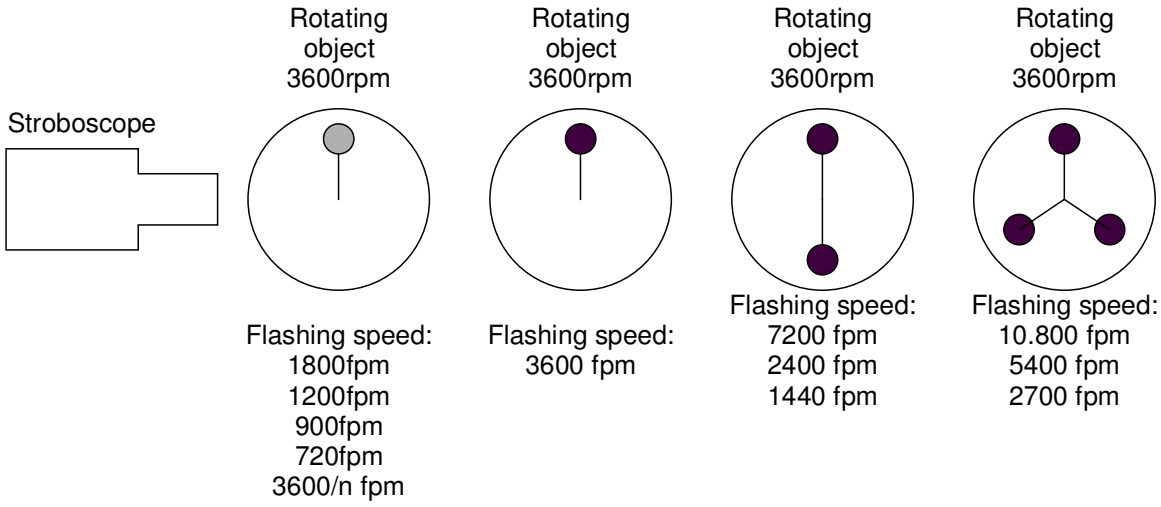
STROBOSCOPIC TACHOMETER

Principle: A stroboscopic light source provides high-intensity flashes of light, which can be caused to occur at a precise frequency. When this light source is made to fall on an object with periodic motion it appears that the motion is slowed down, or stopped when both frequencies bear a definite relationship. Stroboscopic Tachometers utilise this effect for measurement of rotational speed.

Procedure: To determine the rotational speed, a timing mark is made on the rotating object. This is illuminated with the strobe, and the strobe frequency adjusted such that the mark appears to remain motionless. The highest such synchronous speed is the actual rotational speed. At rotational speeds higher than can be tracked by the human eye, the mark would appear motionless for integer multiples of the actual rotational speed and for integral submultiples.



To distinguish the actual speed from a submultiple, the flashing rate can be decreased until another single synchronous image appears. If this flashing rate corresponds to one-half the original rate, then the original rate is the actual speed. If it does not occur at one-half the original value, hen the original value is a submultiple.

Question: Rotational speeds above the upper limit of the flash rate can be measured. How?