

and of course capable of much greater working speed, to use electrostatic methods of tracing timebases - or electromagnetic methods as employed in the scan circuits of television equipment.

If we apply a linearly rising voltage to the pair of deflector plates of our cathode ray tube, then the luminous spot is deflected such that it moves at a steady rate to the right or left, according to the direction of the electric field (cf. Experiment No. 12). If the deflection voltage waveform is actually a repetitive sawtooth relaxation oscillation, then we obtain a linear (i.e. constant speed) periodically repetitive timebase deflection. Equal horizontal distances here represent the elapse of equal intervals of time.

The rate of voltage change is so rapid on the return flank of the sawtooth waveform, that the flyback of the luminous spot will hardly leave any visible trace in most cases.

### The Sawtooth Generator

A neon lamp circuit as shown in Fig. 8 is the simplest device for generating a sawtooth voltage waveform. A capacitor C is slowly charged via a resistor R, until it has reached the striking voltage of the neon lamp. The capacitor can then discharge rapidly through the neon lamp, until its voltage has dropped back to the value at which the neon lamp extinguishes. The charging process then recommences. This manner of producing a sawtooth voltage waveform has the following disadvantages: the amplitude is determined by the characteristics of the particular neon lamp and can not be varied at will. The rising stroke is reasonably linear only if the terminal voltage of the charging source is made rather large compared to the sawtooth amplitude.

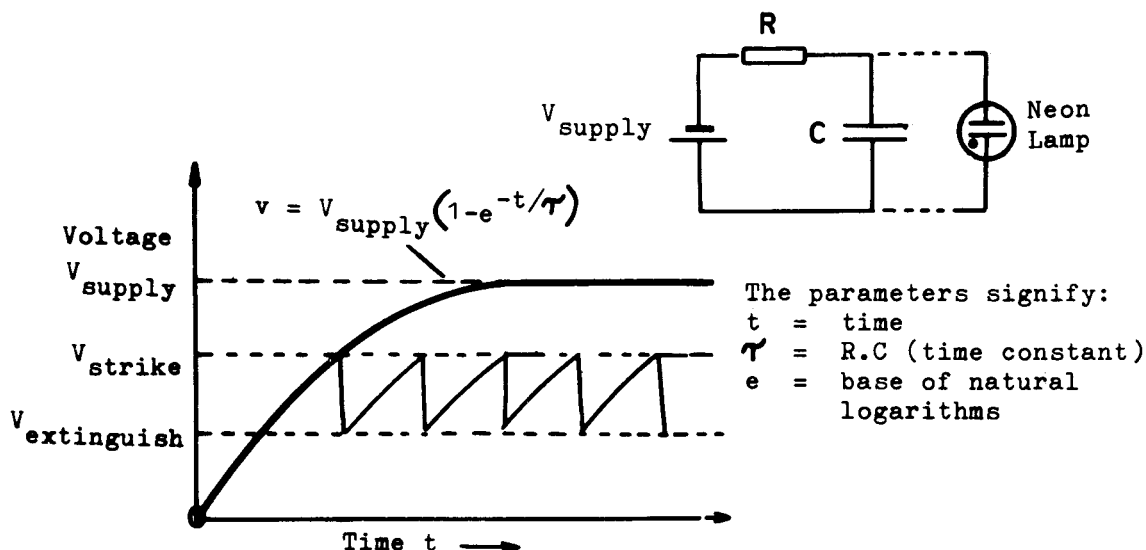


Fig. 8: Sawtooth Relaxation Circuit with a Neon Lamp

The Sawtooth Generator Module 6726 employs a modern sawtooth relaxation circuit. The voltage rise is essentially linear.

This sawtooth generator covers the frequency range from 5 Hz to 75 Hz. The sawtooth generator module is connected up simply by plugging it onto the cathode ray tube panel.