

First, a 60 Hz sinusoidal ac voltage is converted to a 60 Hz pulse waveform and divided down to a 1 Hz pulse waveform by a divide-by-60 counter formed by a divide-by-10 counter followed by a divide-by-6 counter. These counters count from 0 to 59 and then recycle to 0; synchronous decade counters are used. The divide-by-6 portion is formed with a decade counter with a truncated sequence achieved by using the decoder count 6 to asynchronously clear the counter. Both the seconds and minutes counts are also produced by divide-by-60 counters. The terminal count, 59, is also decoded to enable the next counter in the chain