

**Quad Astable Mode Operation (Free Running Oscillator)****Description**

This circuit is configured in quad astable mode of operation, which consists of 4 separate basic oscillator circuits using a 555 type of timers. Each of the circuit is also referred to as a free-running oscillator, with the oscillation frequency given by $f = 1.46 / ((R_A + 2R_B) \times C)$. The quad oscillator produces 4 separate frequencies as determined by their respective R_A , R_B and C values. The single chip quad timer offer excellent timing and temperature tracking between the 4 separate timers. Capacitor C charges towards $2/3 V_+$ and when its voltage reaches that threshold level, the output driver on pin3 is turned on to the low output state. Now the capacitor C is discharging towards ground. When voltage on C is discharged to $1/3 V_+$, it triggers the comparator inside pin2 and starts the C charging cycle again. Hence an oscillator circuit is implemented. The output high time period is determined by $T_H = .693(R_A + R_B) \times C$. The output low time period is determined by $T_L = 0.693 R_B \times C$. Using CMOS version of quad 555 timer circuit, a very wide frequency range at very low level of voltage spikes and power dissipation can be achieved. Selection of the values of R_A and R_B is limited by the input leakage specifications of the timer at pin2 and pin6 (pins 5 through pin 9 respectively for the other timers) and the internal leakage current at the capacitor C . The value of C has a range from $10,000\mu F$ down to 0. At $C=0$, the timer will oscillate without an external C , and depends entirely on the internal parasitic capacitor inside the 555 timer for timing.

For full schematic diagram and notes, please register and login at aldinc.com