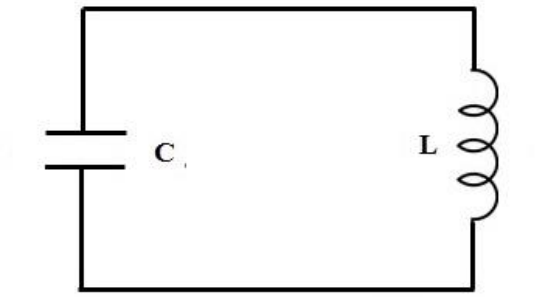
Tank Circuits

Introduction:

A parallel combination of a capacitor and inductor forms a tank circuit. It is the most common "resonant" circuit. When operating at the resonant frequency, an LC tank circuit absorbs maximum power.

Working:



When electrical charge flows from the capacitor to the coil then the capacitor drops electromagnetic energy so the inductor turns into electromagnetically charged. When the inductor gets more charge than the capacitor, but, the electromagnetic cloud in the region of the coil starts to dissolve &energy supplies back to the capacitor using wires. After that method starts once more to replicate over & over until the energy has vanished to resistance within the circuit.

This tool is designed using simple C++ algorithms to calculate the resonant frequency of a tank circuit if the capacitance and inductance values are known. Using the formula: $\mathbf{f_r = \frac{1}{2\pi\sqrt{LC}}}$,

where:

f_r = resonant frequency (Hz)

L = circuit inductance (H)

C = circuit capacitance (F)

Applications:

Without tank circuits, there would be no radio transmitters or receivers. The simplest radio transmitter involves the use of an amplifier with a tank circuit at its load side. When this circuit is powered, the tank circuit generates enough energy to couple the signal from the amplifier to the antenna, and thus the signal radiates to space. Similarly, a radio receiver employs a tank circuit when receiving a signal, by tuning it to the frequency of that signal.

Using this tool, it becomes simpler to calculate the desired values of the inductors and capacitors required for a desired frequency.