

Tuned Circuit Scope Demo

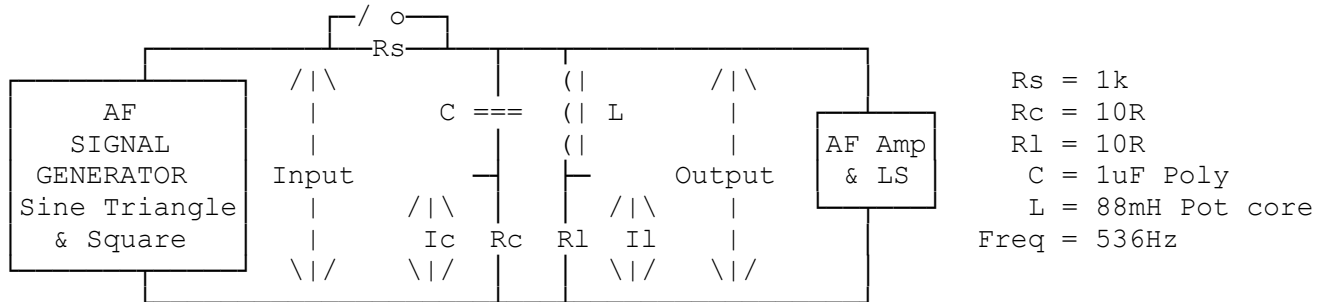
By G8MNY

(New Jan 10)

(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

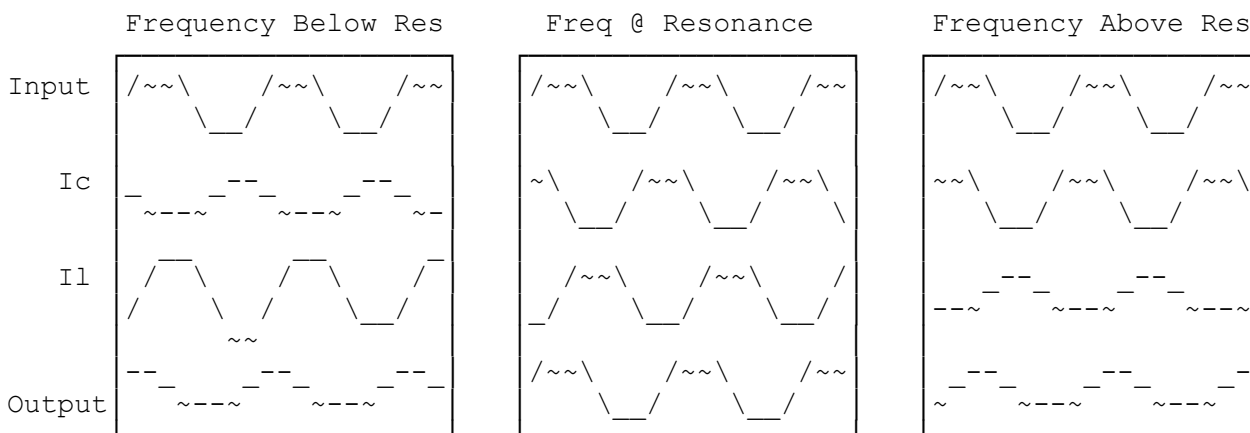
Recently I used an oscilloscope to demonstrate what is going on in a tuned circuit for an advanced Ham class.

My 100MHz scope can do 4 traces using the 2 triggers as inputs, so I looked at using all 4 traces.



I used 10:1 scope probes for the larger Input & Output signals, & 1:1 probes on the smaller current sampling voltages. The Rs short is used when you sweep the frequency so you can better see the L & C currents levels varying. With Rs in circuit the selectivity can be shown & also heard on the LS.

SCOPE DISPLAY



Points to notice:

Ic is always 90° leading the Output voltage.

Il is always 90° lagging the Output voltage.

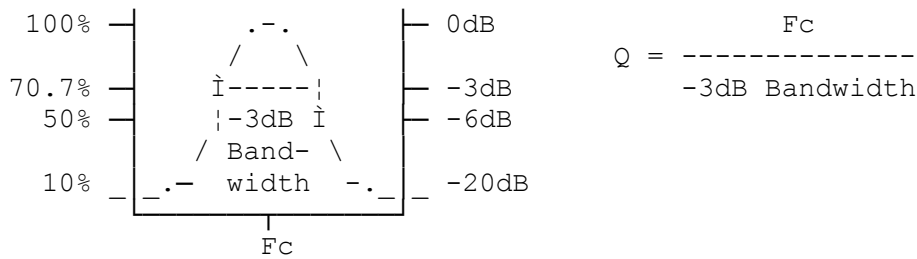
Ic is always 180° out of phase with Il.

Ic = Il at resonance, & it is why the circuit exhibit high Z at resonance.

The Output is not only largest @ resonance but also in phase with the Input.

WHAT IS Q

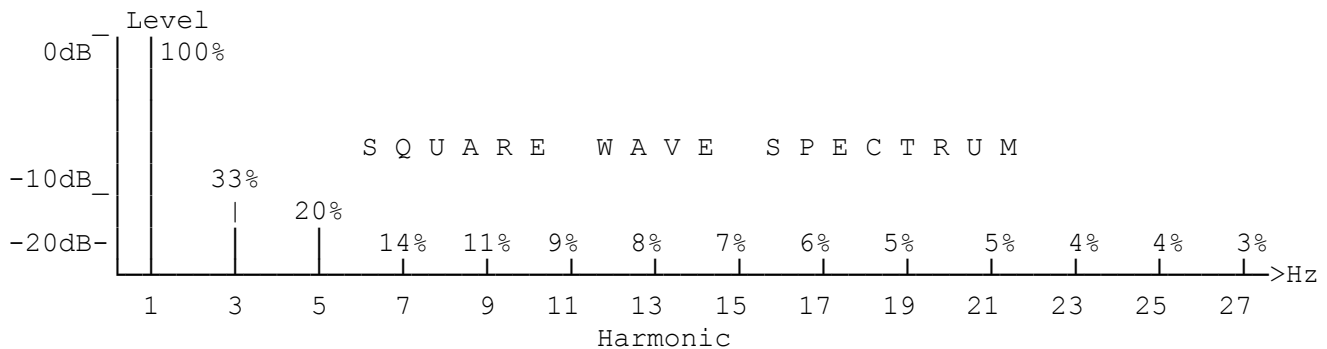
The meaning of Q can also be discussed & measured with this arrangement.



OTHER WAVEFORMS

The filtering effect on Triangle & Square waves can be shown, & notice the high pulse shaped currents in the capacitor! This means that capacitors need low inductance leads (very short) if they are to filter out harmonics!

The harmonics present in a Square wave can be demonstrated too by making the frequency 1/2, 1/3, 1/4 & 1/5 of 536Hz resonance! Sine wave harmonic Outputs @ 536Hz will be seen on the odd harmonics only.



See my Tech buls on "Scope RF Trick", "SSB Demo circuit", & "Oscilloscopes" & "Spectrum Harmonic Demo circuit".

Why Don't U send an interesting bul?

73 De John, G8MNY @ GB7CIP