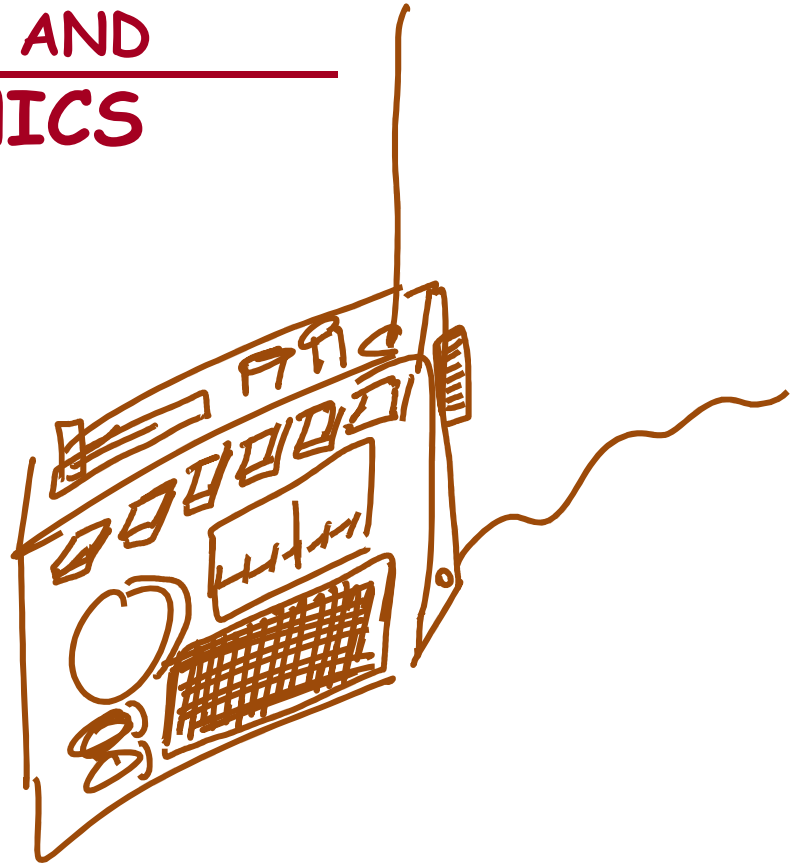
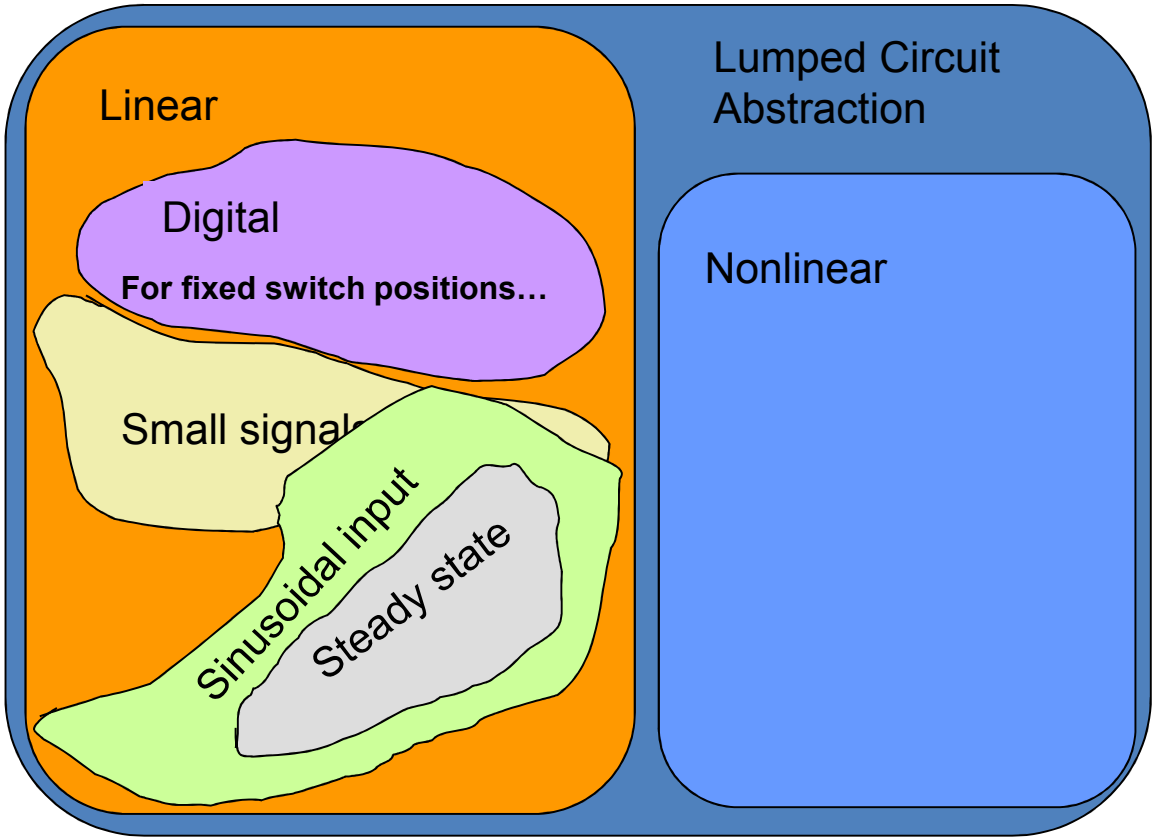
6.002x CIRCUITS AND ELECTRONICS

Filters



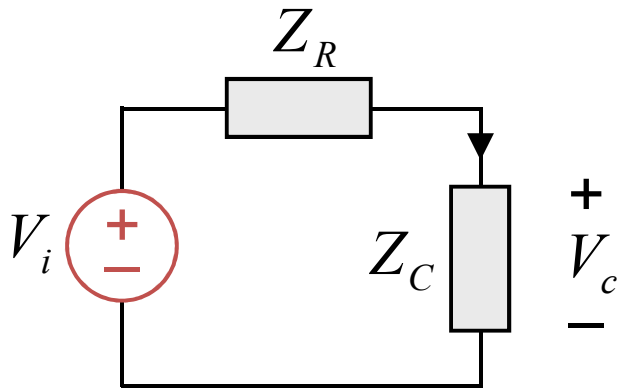
Reading: Section 13.5, 13.6, 14.3 from A & L.

Review


Lumped Circuit Abstraction
Linear
Digital
For fixed switch positions…
Small signal
Sinusoidal input
Steady state
Nonlinear

Review

Review A Filter



Review Impedances analyze like resistances

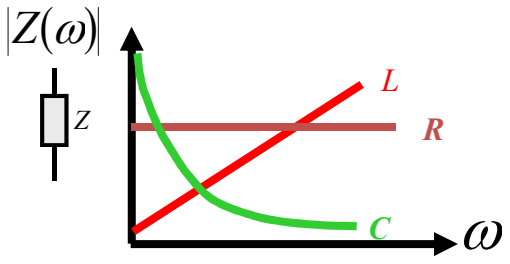
Quick Review of Impedances

Similarly

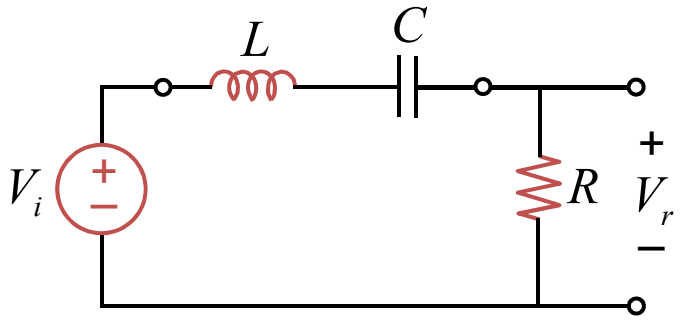
We can build other filters by combining impedances

Insight

We can build other filters by combining impedances

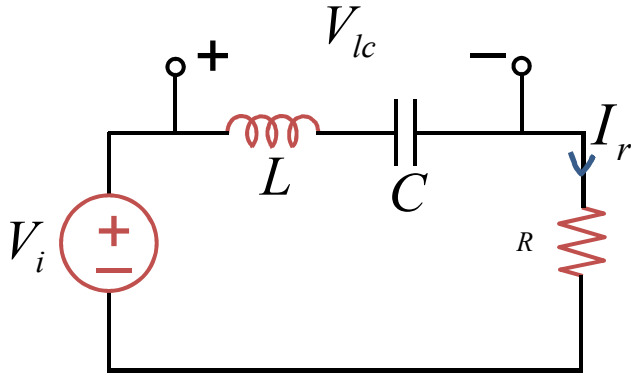


Check out:



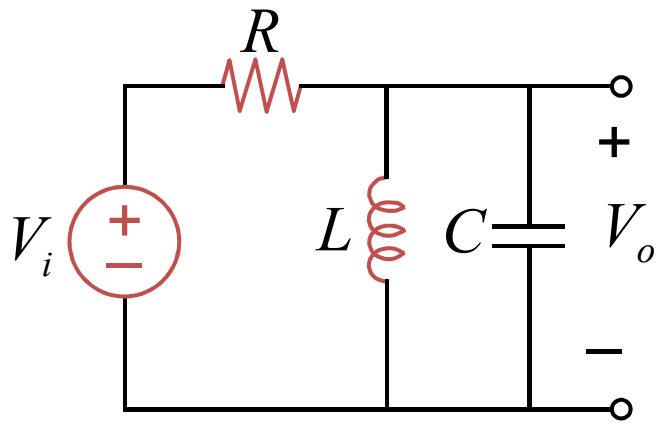
Intuitively:

What about:

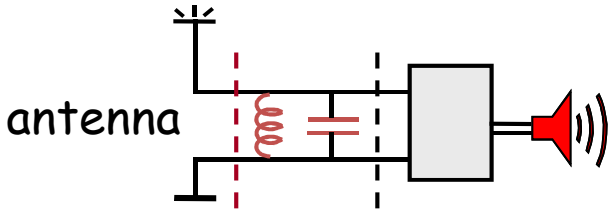


Another example:

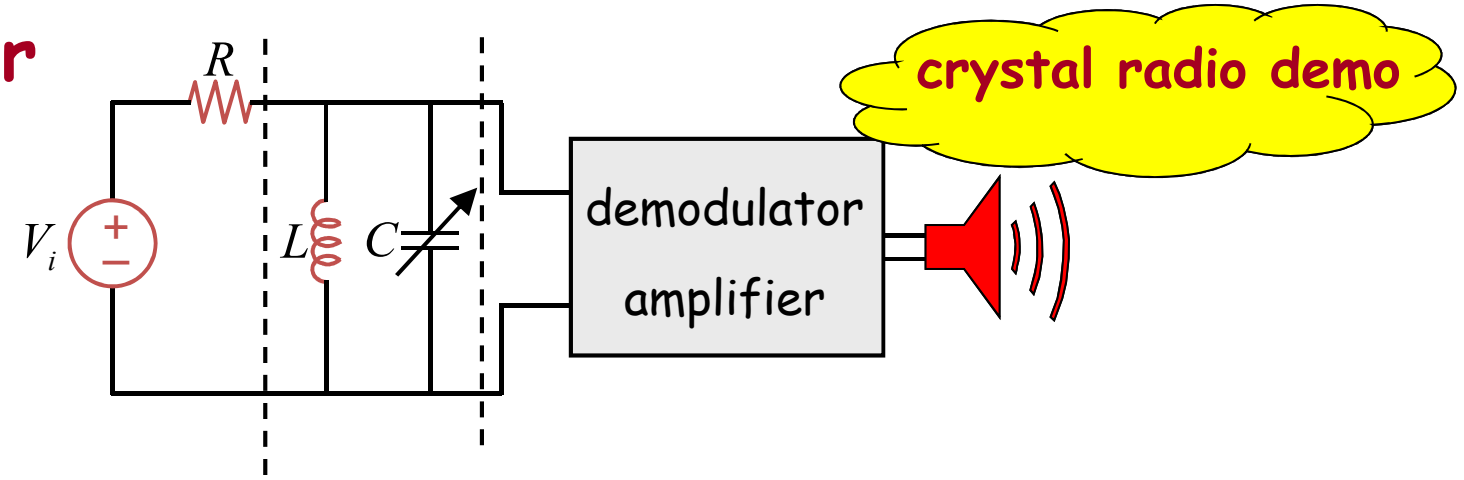
Example:



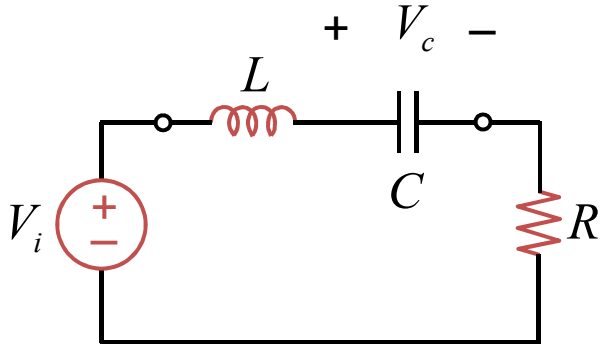
AM Radio Receiver



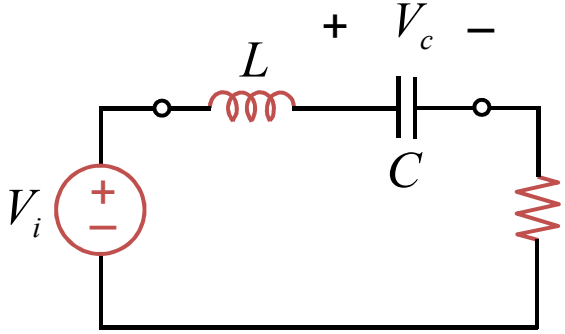
AM Receiver



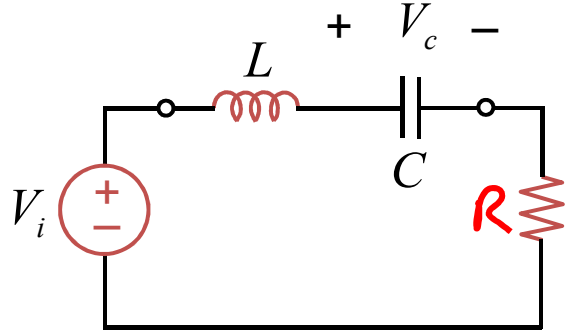
Next check out:



Check out:

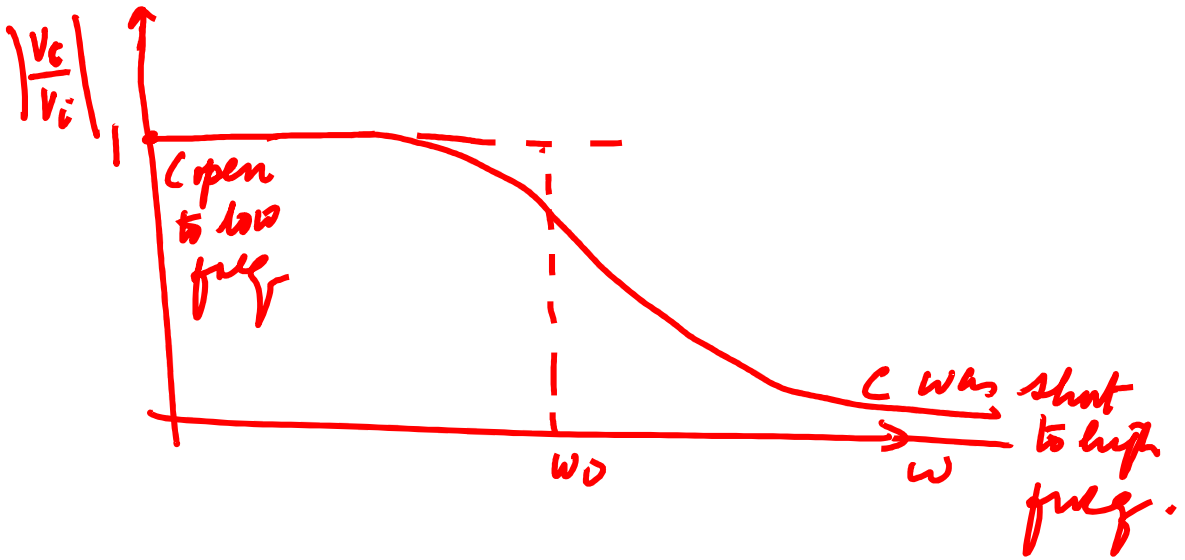


Check out:



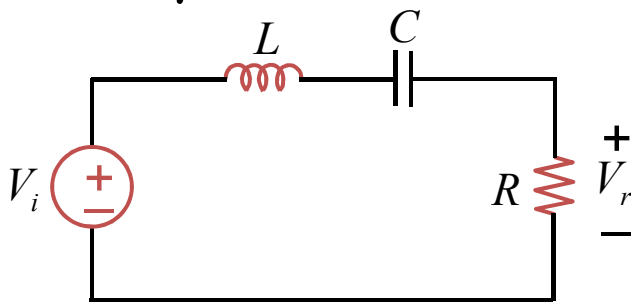
$$\omega_0 = \frac{1}{\sqrt{LC}}$$

$$2\alpha = \frac{R}{L}$$



Selectivity: Look at series RLC in more detail

Show you some fun stuff regarding Q!



Selectivity

Selectivity

$$selectivity = \frac{\omega_o}{\Delta\omega}$$

Quality Factor Q makes an a grand reappearance!

Quality Factor Q