1st Order Butterworth
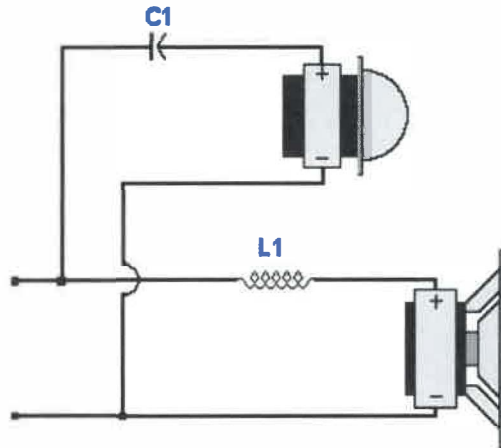
800 Hertz

8 Ohm Tweeter / 8 Ohm Woofer

Parts List

Capacitors
C1 = 24.84 uF
Inductors
L1 = 1.59 mH

S.P. 14-E

Derive the transfer functions for the the low pass and high pass crossover networks and show that the capacitor and inductor values given make them 3rd order Butterworth filters.

Hint: A simple variable transformation will turn the low pass filter into the high pass filter!

3rd Order Butterworth
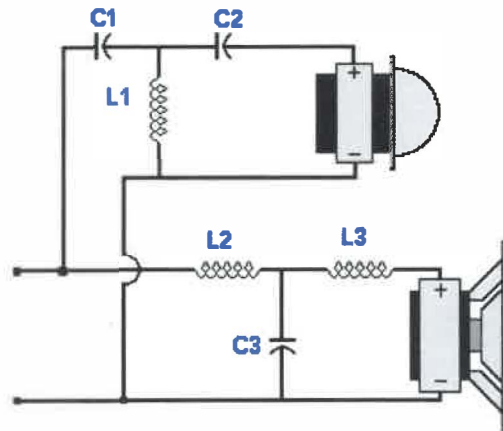
3000 Hertz

8 Ohm Tweeter / 8 Ohm Woofer

Parts List

Capacitors
C1 = 4.42 uF
C2 = 13.26 uF
C3 = 8.84 uF
Inductors
L1 = 0.32 mH
L2 = 0.64 mH
L3 = 0.21 mH

Now, these two diagrams must be combined into a 3-way diagram. When working with 3 or more speakers, at least one speaker must be bandpass. Bandpass means that the speaker has a high pass filter (HPF) that filters out low frequencies and lets high frequencies pass through, and a low pass filter (LPF) that filters out high frequencies and lets low frequencies pass through. In this system, only the mid will be bandpass. When wiring multiple speakers,