A 100 MHz filter with the schematic shown below has the measured response shown at the right. Redesign the filter for the same center frequency but 10 MHz bandwidth by changing the values of the capacitors only. Use standard 5% series capacitor values if you know them, and integer picofarad values if you don’t. The inductors are adjustable and will be varied to tune the filter after it is built.

Step 1. Should C1 and C7 be larger or smaller, and by how much? What is an approximate value for C1, C7?

Step 2. Should C3 and C5 be larger or smaller, and by how much? What is an approximate value for C3, C5?

Step 3. Based on your choices for C1, C3, C5 and C7, select a value for C2 and C6 and a value for C4.

Step 4. Your measured response looks like the figure to the right. Which inductor should you adjust for a symmetrical response?
The microstrip hairpin filters shown at the right are printed on 0.0625” FR-4 glass-epoxy circuit board. Assume the drawing is to scale. The filter on the left has a center frequency of 780 MHz and a 3 dB bandwidth of 100 MHz. Estimate the center frequency and bandwidth of the filter on the right.