

function was also avoided. Based on the solid red curve, the high pass crossover frequency for the full range driver can be set higher than the 200 Hz frequency used for the low pass crossover.

So far, the low frequency portion of the design has been optimized for the Eminence Alpha 15A woofer. But two other woofer choices were also listed in Table 2 with lower Qts values. Figure 7 shows the low frequency responses of all three woofers with the same baffle and crossover design. Reviewing the three plots it is seen that as the Qts decreases the low frequency response also decreases. The only way to regain low frequency output is to increase the baffle size which effectively shifts the dashed blue line in Figure 6 to the left. Then to regain control of the rounded hump originally between 100 and 200 Hz, a lower crossover frequency is required. The more expensive woofer drivers like the Beta 15A and Gamma 15A with lower Qts values require larger baffles, a lower crossover point, and will probably still not extend as low as the less expensive Alpha 15A.

One objection heard often with respect to higher Qts drivers in OB designs is that the bass transient response will ring and produce a bloated one note bottom end. Figure 8 shows the impulse responses for the three Eminence drivers in the OB design from Figure 7. Again there is not much difference in the shape of the three curves. The only significant difference is the increasing length of the transient response with increasing Qts, but since the Alpha 15A woofer extends lower in the frequency domain it should also have a slightly longer transient response in the time domain. There is no evidence of excessive ringing bass response from any of these three drivers. Once again, the better OB low frequency performance is achieved with the higher Qts Eminence Alpha 15A woofer.