



Building a Better COAX



Herman J. Fanger invented the coaxial speaker in 1928. Eighty years later, Fulcrum Acoustic reinvented coaxial system design. Fulcrum's revolutionary pattern control coaxial driver/horn assemblies overcome the shortcomings associated with traditional coaxial speakers to provide unique performance and system cost benefits.

Fulcrum Coax Advancements

- Reduced shadowing of the woofer by the high frequency (HF) horn
- Improved high/low frequency (HF/LF) alignment through a unique motor structure pioneered by B&C Speakers
- Smooth beamwidth performance with very wide-coverage horns
- The only comprehensive line of coaxial solutions incorporating multiple driver sizes and horn patterns

Fulcrum Coax Benefits

- Co-located HF/LF drivers minimize crossover interactions within the coverage pattern
- Smooth bandwidth performance extends outside the nominal coverage pattern
- Compact coaxial products are dramatically smaller than those with offset drivers and horns
- Neodymium drivers reduce weight
- Fulcrum's carefully integrated coaxial solution provides improved intelligibility, higher gain before feedback, and enhanced sonic accuracy

Like the legendary Altec 604 (Fig. 1), Fulcrum's coaxial driver (Fig. 2) uses an integrated compression driver and woofer assembly. The similarity ends there.



Figure 1 – Classic Altec 604 coax



Figure 2 – Fulcrum coax assembly

In typical systems with offset drivers, the crossover (active or passive) attempts to orchestrate a hand-off between the HF and LF devices. An unavoidable consequence is uneven beamwidth performance. Fulcrum TQ Install CX/DX products are a completely integrated solution. The crossover seamlessly blends the horn and woofer into a single acoustical source, thereby improving directional consistency and fidelity (Figs. 3 – 8).

Fulcrum CX1265 12" Coaxial Loudspeaker, 60° x 45°

Figure 3 – Horizontal On- and Off-Axis Response

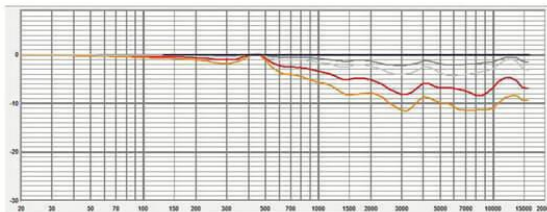
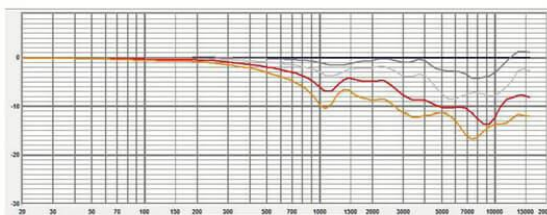


Figure 5 – Vertical On- and Off-Axis Response



Conventional 12" Loudspeaker, 60° x 45°

Figure 4 – Horizontal Off-Axis Response

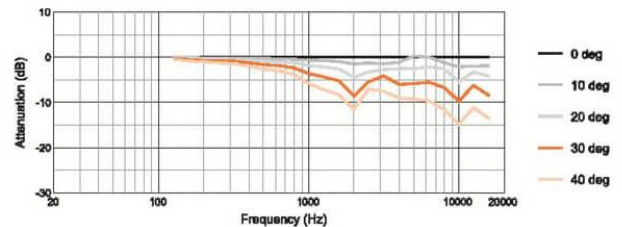


Figure 6 – Vertical Up Off-Axis Response

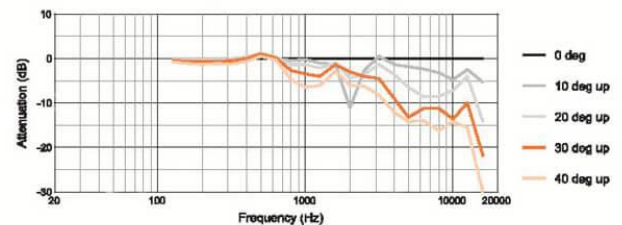
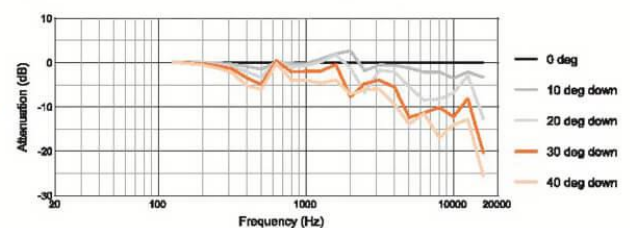


Figure 6A – Vertical Down Off-Axis Response

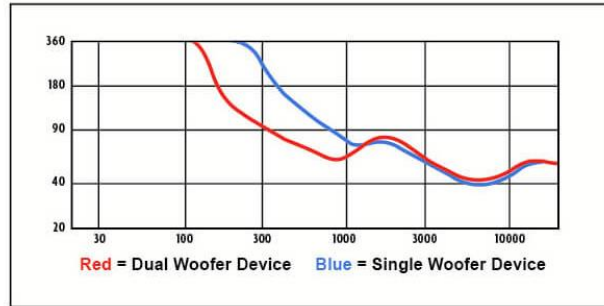


Fulcrum DX1265 12" Coaxial Loudspeaker, 60° x 45°

Figure 7 – DX Woofer Alignment



Figure 8 – DX Vertical Beamwidth



Due to the unique alignment technique, Fulcrum DX products are not conventional 3-way systems (HF/MF/LF). Rather, the woofer in the coaxial driver is shelved down 10 db with the additional woofer operating at -4 db (Fig. 7). Consequently, the composite LF output adds to 0 db or “flat,” enabling the DX to deliver 4 db more LF output than a conventional 3-way system using the same transducers. The second spaced woofer also provides the benefit of extending usable LF pattern control by over an octave for more natural voice and LF reproduction (Fig. 8).