# Focal CMS65

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The CMS65 from French manufacturer Focal is a two-way active speaker consisting of a 165mm (6.5 inch) woofer with a Polyglass cone, which is apparently a paper/glass composite, and an aluminium/magnesium inverted dome tweeter that radiates through a shallow horn. Both drivers have magnetic shielding. The cabinet is constructed of die cast aluminium with chamfered edges and a slot-shaped port below the woofer. The power amplifiers, crossover and equalisation electronics are built-in behind an integral heatsink with vertical fins, suggesting that these speakers are designed to be used in the vertical, portrait, orientation.

The rear panel has controls for switching sensitivity from +4dBu through 0 to -10dBV, a level control variable from -66dB to 0dB, and a high-pass filter with turnover frequencies of 45, 60 and 90Hz plus an Off position. There's LF and HF shelving with 0, -4, -2 and +2dB options and a 160Hz 'desktop' notch filter switchable between 0, -2, -4 and -6dB that is designed to equalise a hump in response due to reflection from a desktop when the speakers are mounted on one. The measurements presented in this review were conducted with all equalisation controls set to 0dB and the high pass filter switched off.

Focal specifies amplifier power outputs of 100W RMS for the woofer and 60W RMS for the tweeter endowing each speaker with a claimed maximum sound output of 108dB SPL peak at 1m distance. Signal input is via an XLR socket for balanced and phono for unbalanced connection. Each speaker weighs 10.5kg and has exterior dimensions of 360mm high by 240mm wide by 230mm deep.

Figure 1 shows the on-axis frequency response and harmonic distortion measured at an output level of 90dB SPL at 1m distance. The frequency response is maintained within ±3dB from 45Hz to 17kHz with a slightly raised response from 200Hz to 4kHz which is considered by some to be a desirable response target for nearfield monitors, particularly when mounted on a meter bridge. The low-frequency

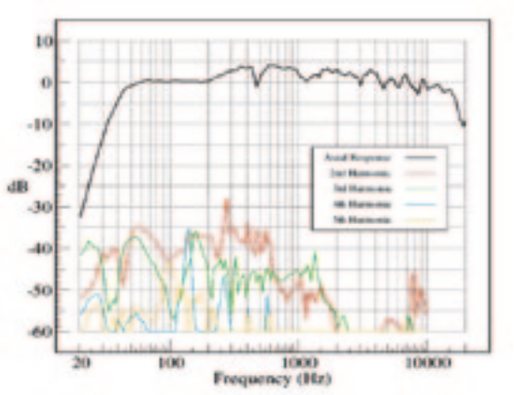


**Fig. 1. On-axis frequency response and harmonic distortion.**

roll-off is 5th order with -10dB occurring at a very respectable 35Hz. The harmonic distortion produced by the CMS65 is somewhat unusual in that it is pretty much even over much of the low-frequency range, and that there are significant amounts of 4th and 5th harmonic distortion present. Most loudspeakers have harmonic distortion in this frequency range that rises as frequency is lowered and this distortion is usually only 2nd and 3rd harmonic. However, the level distortion is kept below -35dB from 40Hz upwards except for a 'spike' at 300Hz. The off-axis frequency response for the CMS65 is shown in Figure 2 for the horizontal plane and Figure 3 for the vertical plane. Apart from some slight mid-range narrowing between 1kHz and 4kHz, the directivity in the horizontal plane is excellent with near-constant-directivity performance. The vertical directivity shows the interference notches at the crossover frequency at 30 degrees up and down which are characteristic of

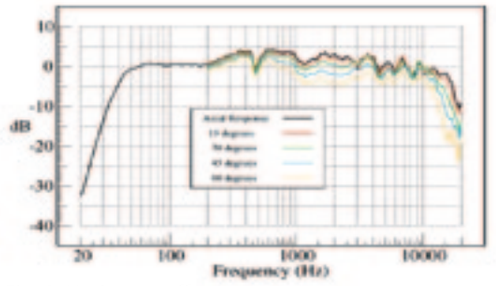


**Fig. 2. Horizontal off-axis response.**

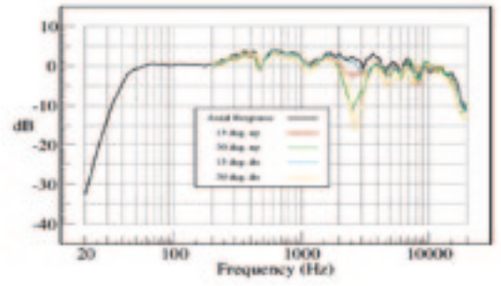


**Fig. 3. Vertical off-axis response.**

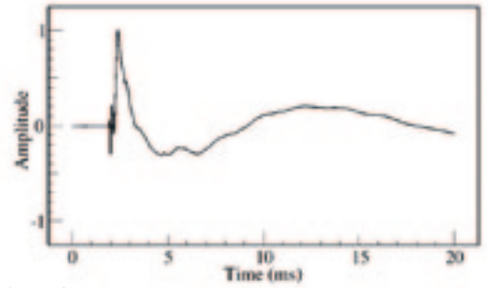


**Fig. 4. Step response.**

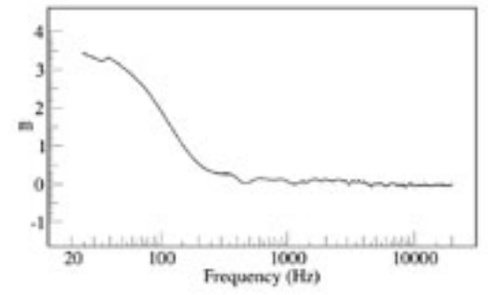


**Fig. 5. Acoustic source position.**

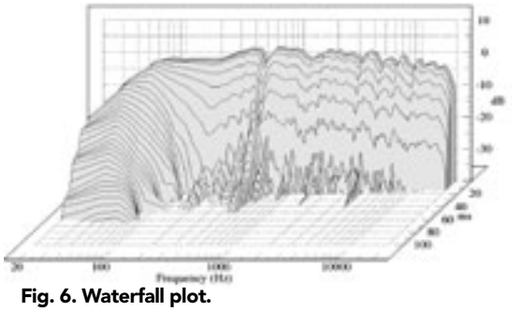

**Fig. 6. Waterfall plot.**

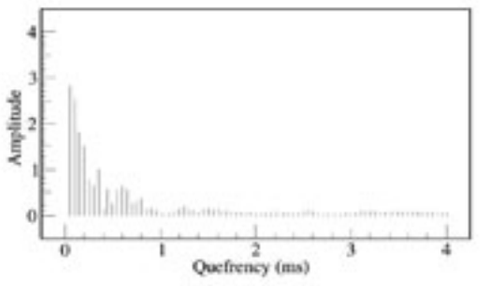


**Fig. 7. Power cepstrum.**

most loudspeakers with non-concentric drivers, but otherwise all is well.

The step response (Figure 4) shows that the drivers and crossover exhibit better time alignment than many speakers of this type with little evidence of a delay in the mid-range relative to the output of the tweeter. Figures 5 and 6 show the acoustic source position and waterfall plot respectively. The acoustic source position is seen to move to greater than 3m behind the speaker at low frequencies which is a characteristic of speakers with high-order low-frequency roll-offs, but that the decay of the low frequencies in the waterfall is considerably faster than many other ported speakers, reaching -40dB in about 65 milliseconds.

The Focal CMS65 is a very good small monitor loudspeaker. Of particular note is the excellent performance at low frequencies with commendable extension for the size of woofer and cabinet, without too much compromise in low-frequency transient response. Also good are the mid/top time alignment and the off-axis response. The harmonic distortion figures are unusual although the levels of distortion at low frequencies are about average for a speaker of this size.

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