



fulcrum
ACOUSTIC

product specification

FH1596

Full Range Coaxial Horn

tq^{install}
SERIES



Overview

The FH1596 is a 2-way, high sensitivity, coaxial horn loudspeaker that provides a precise 90° x 60° pattern with control to below 400 Hz, low frequency extension to 54 Hz, and extremely high output using a single amplifier channel. Its 3.5 inch voice coil, 15 inch woofer combines interactively with a 4 inch diaphragm high frequency compression driver to produce precise pattern control through the crossover range. The FH1596's 35° compact trapezoidal shape allows it to be deployed with its trapezoidal profile vertically oriented (90° H x 60° V) for stand-alone use, in distributed systems, or in vertical arrays; or with its trapezoidal profile horizontally oriented (60° H x 90° V) for use in horizontal arrays.

Sound, innovative acoustical design combined with Fulcrum Acoustic's TQ™ processing leads to exceptional clarity and precise transient response, even at very high sound pressure levels. The required digital signal processing can be provided by one of many supported platforms.

The FH1596 is particularly effective in acoustically challenging spaces where broadband pattern control is necessary, and in applications requiring high acoustic output and high fidelity. Its clean aesthetic and relatively compact size complements many architectural styles, which facilitates acceptance by interior designers and architects. This makes it the perfect choice for houses of worship, sports facilities, theaters, night clubs, theme parks, and more.

Performance Specifications¹

Operating Mode

Single-amplified w/ DSP

Operating Range²

54 Hz to 20 kHz

Nominal Beamwidth

90° x 60°

Transducers

LF: 15.0" neodymium magnet cone driver, 3.5" voice coil

HF: 4.0" titanium diaphragm, neodymium magnet compression driver

Power Handling @ Nominal Impedance³

80 V / 800 W @ 8 Ω

Nominal Sensitivity @ Input Voltage⁴ (whole space)

106 dB @ 2.83 V

Nominal Maximum SPL (peak / continuous)

141 dB / 135 dB

Equalized Sensitivity @ Input Voltage⁵

103 dB @ 2.83 V

Equalized Maximum SPL⁶ (peak / continuous)

138 dB / 132 dB

Recommended Power Amplifier

800 W to 1600 W @ 8 Ω

Physical Specifications

Connections

(2) Neutrik NL4 Speakon

Pin 1+/-: Full Range

Pin 2+/-: NC

Mounting / Suspension Points

(12) M10 x 1.5 eye bolt angle points, (1) M10 x 1.5 pull back point,

(2) M12 x 1.75 yoke points

Dimensions / Weight

See page 5

Finish

Black painted enclosure w/ matte black grille, or

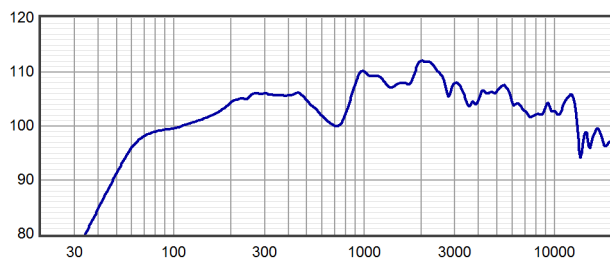
White painted enclosure w/ matte white grille

Options

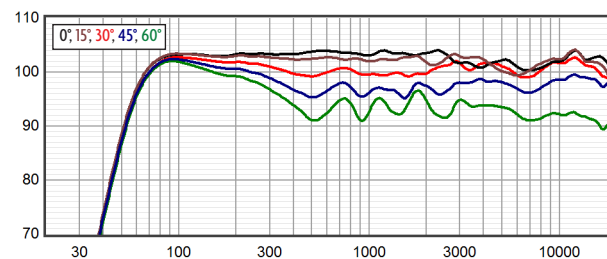
YK-FH15 Yoke Bracket, Terminal strip input, Custom color finish, Weather-resistant (WR) enclosure & hardware



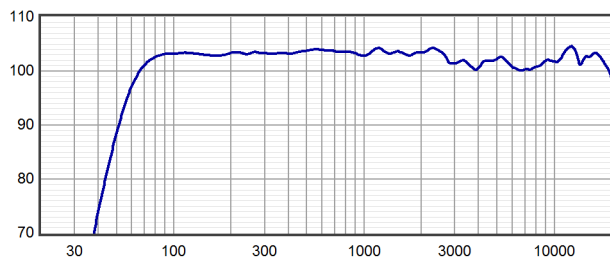
Axial Sensitivity (dB SPL, 2.83 V @ 1 m)^{7,8}



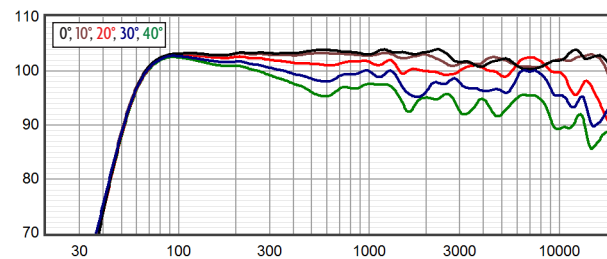
Horizontal Off Axis Response^{7,11}



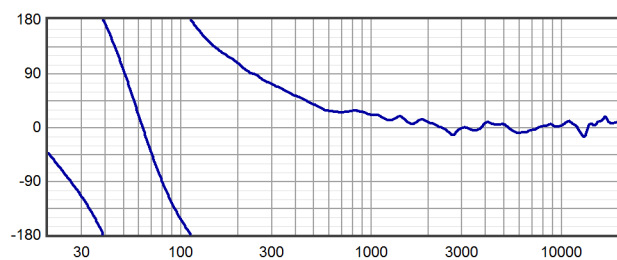
Axial Processed Response (dB)^{7,9}



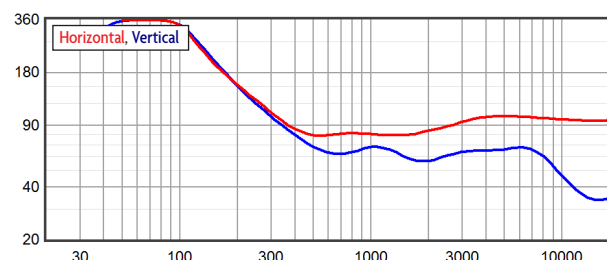
Vertical Off Axis Response^{7,11}



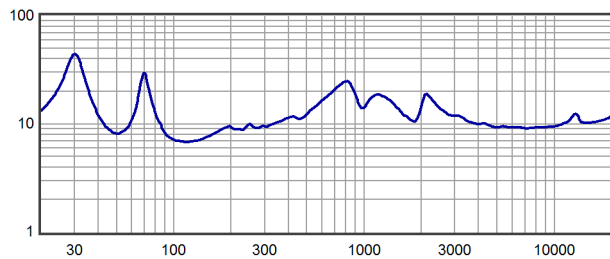
Axial Processed Phase Response (degrees)^{7,10}



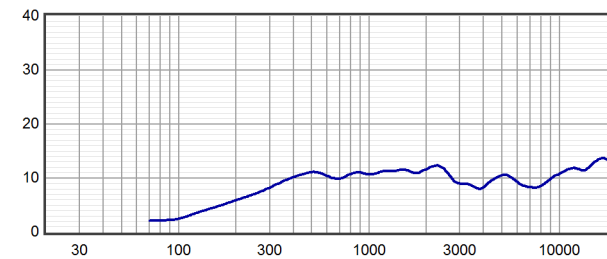
Beamwidth^{7,12}



Impedance (ohms)



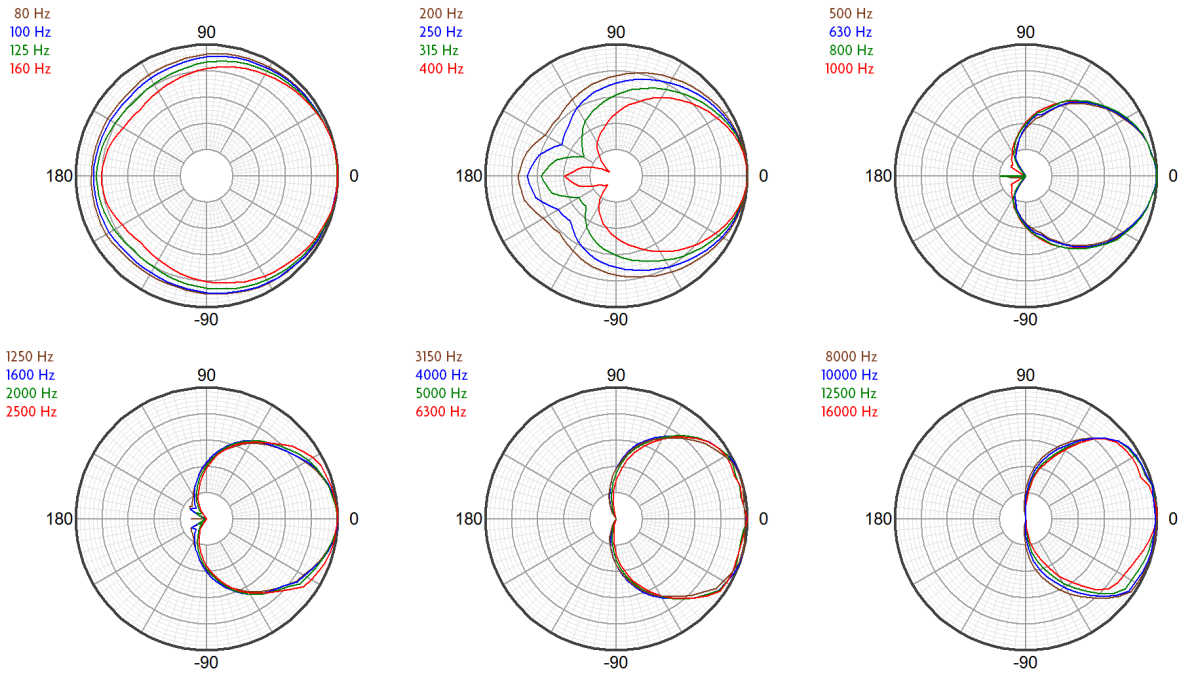
Directivity Index (dB)³



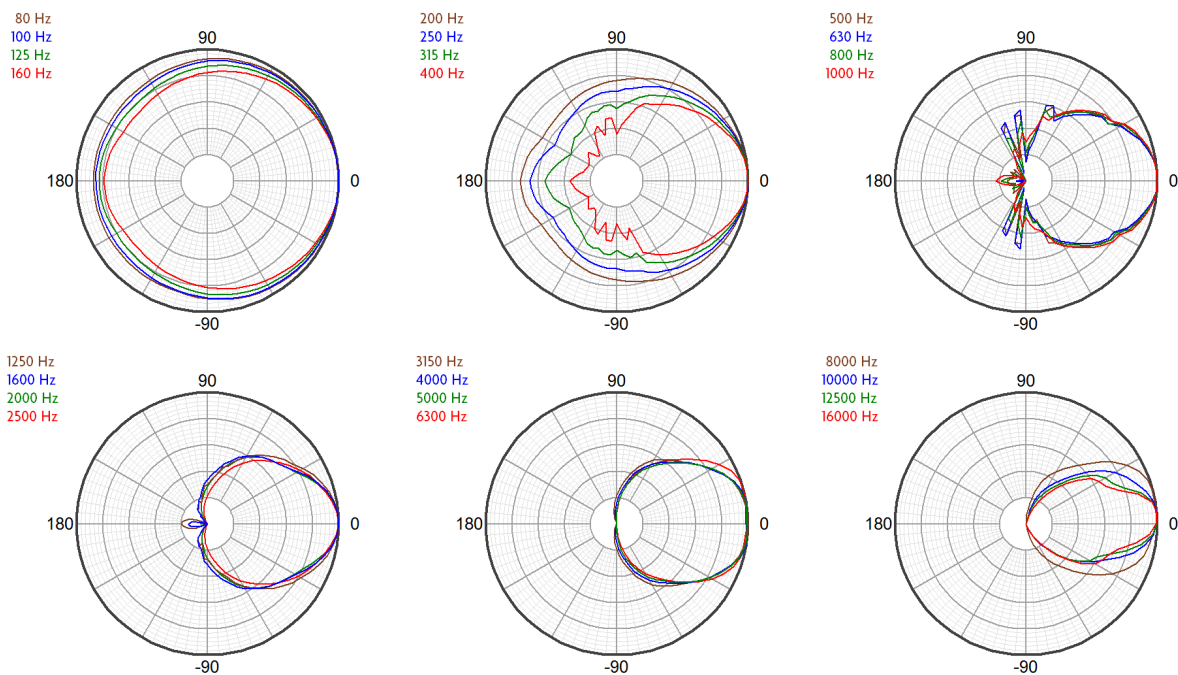


product specification

Horizontal Polar Response (30 dB Scale, 6 dB per Major Division)



Vertical Polar Response (30 dB Scale, 6 dB per Major Division)





Technologies

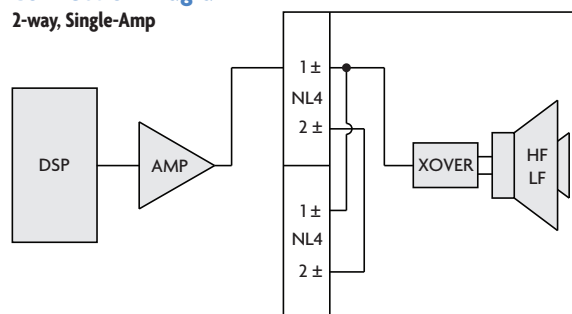
The large mouth of the FH1596's low frequency horn combined with a coaxially mounted high frequency horn extends the 90° x 60° pattern to below 400 Hz and produces a symmetrical, well behaved coverage pattern.

The proprietary horns employed in the FH Series represent a modern digital-signal-processing-aware update to the traditional horn-in-horn coaxial loudspeaker concept. Fulcrum Acoustic's Temporal Equalization™ (TQ™) digital signal processing techniques eliminate midrange colorations and high frequency harshness while producing a smooth, seamless coverage pattern through the crossover range. In fact, the horns used in the FH series were designed from the ground up to take advantage of the unique capabilities of TQ™.

The high frequency horn in the FH1596 employs a 4 inch diaphragm compression driver. The driver's large diaphragm area permits the compression driver to operate at frequencies too low for smaller compression drivers to handle. This allows the high frequency horn to smooth the polar response of the low frequency section in the frequency range where the high frequency horn would otherwise cause shadowing. It also allows the compression driver to produce extreme sound pressure levels with an effortless sonic character.

Connection Diagram

2-way, Single-Amp



Mechanical Specification Drawings

2D and 3D DXF dimensional drawings are available for download at www.fulcrum-acoustic.com/support.

Notes

¹ **Performance Specifications** All acoustic specifications rounded to nearest whole number. External DSP with Fulcrum Acoustic-provided settings is required to achieve the specified performance.

² **Operating Range** The frequency range within which the processed response is within 10 dB of the average.

³ **Power Handling** Based on the AES power handling of the transducers.

⁴ **Nominal Sensitivity** The 1-meter-referenced SPL produced by a 1 watt band limited pink noise signal, with no processing applied.

⁵ **Equalized Sensitivity** The 1-meter-referenced SPL produced when an EIA-426-B signal is applied to an equalized loudspeaker system, at a level which produces a total power of 1 watt, in sum, to the loudspeaker subsections.

⁶ **Equalized Maximum SPL** The 1-meter-referenced SPL produced when an EIA-426-B signal is applied to an equalized loudspeaker system, at a level which drives at least one subsection to its rated power.

⁷ **Resolution** All response graphs are subjected to 1/6 octave cepstral smoothing with a gaussian weighting function.

⁸ **Axial Sensitivity** The SPL plotted against frequency for a 1 watt swept sine wave, referenced to 1 m with no signal processing.

⁹ **Axial Processed Response** The axial magnitude response with recommended signal processing applied.

¹⁰ **Axial Processed Phase Response** The axial phase response with recommended signal processing applied, and latency removed.

¹¹ **Horizontal / Vertical Off Axis Responses** The magnitude response at various angles off axis, with recommended signal processing applied.

¹² **Beamwidth** The angle between the -6 dB points in a loudspeaker's polar response.

¹³ **Directivity Index (Di)** The ratio of the on-axis sound pressure squared to the spherical average of the sound pressure squared at a particular frequency expressed in dB. To convert the directivity index to directivity factor (Q) use the formula $10^{Di/10}$.