Technical Briefing

Element 12

Introduction

The Stratton Acoustics Element 12 is a passive loudspeaker with an integral stand, designed and developed to deliver a specific style of musical presentation... one that's dynamic, rhythmic, tuneful, engaging and addictive.

As with its Stratton Acoustics Elypsis 1512 sibling, the Element 12 employs advanced driver technologies, crossover techniques and enclosure construction, and marries them with bespoke, artisanal design and manufacture.

And again, like the Elypsis 1512, some very specific design decisions have been taken in order to recast the traditional compromises of passive stand-mount loudspeakers and to achieve the Element 12's ultimate musical goals.

System Concept

The Element 12 employs a 300mm bass/midrange driver and a decoupled, waveguide-loaded 29mm soft dome tweeter. The two drivers are integrated at 1.7kHz via a 3rd order, ten element crossover network.

The Element 12 enclosure is manufactured in braced bamboo ply and its 57 litre internal volume is reflex loaded by two ports, tuned to 38Hz. The reflex ports incorporate generous entrance and exit flaring in order to maximise linear airflow and minimise port turbulence and compression. The enclosure's internal surfaces are acoustic foam-lined with complementary localised in-fill.

The Element 12 electro-acoustic design achieves performance levels almost unheard of among stand-mount passive hi-fi speakers: sensitivity of 94dB for 2.83V @ 1m, low frequency bandwidth to 37Hz, and group delay above 50Hz of less than 10mS. This is all combined with a 6 Ohm minimum impedance, odd-order distortion levels, typically below 0.3%, and insignificant thermal compression.

Drivers

Bass/Mid Driver

The Element 12 bass/mid driver is a very high high-sensitivity, twin voice-coil design with a neodymium-iron-boron magnet motor system, a curvilinear, part-coated paper diaphragm and rubber-roll surround. The twin voice-coil system, in which two 88mm diameter coils, serially wound on a shared former, move through twin front and rear gaps in the magnetic circuit, brings very significant benefits in terms of reduced distortion and compression. The use of a twin voice-coil in the Element 12's bass/mid driver is virtually unheard of in domestic hi-fi speakers.

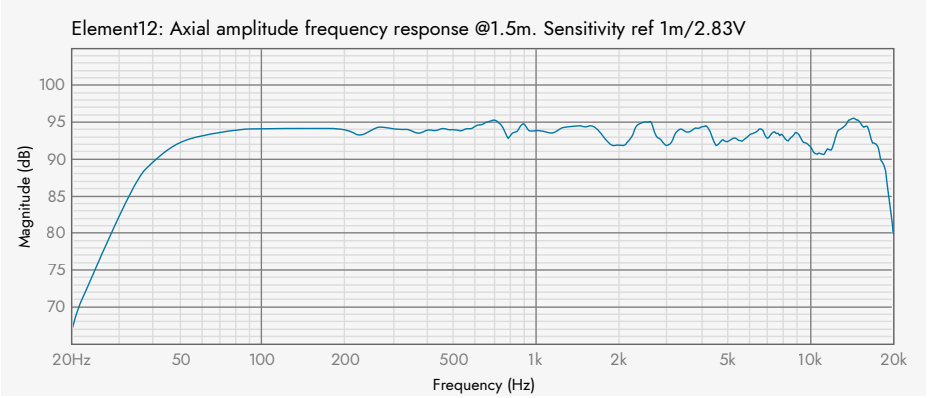
Tweeter

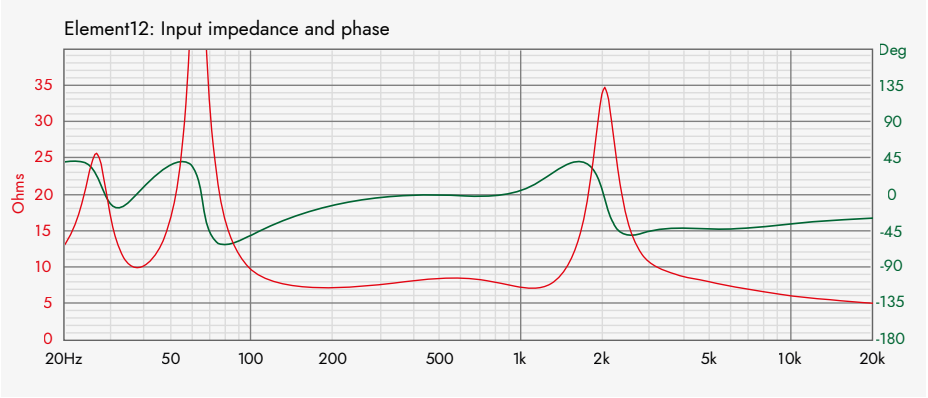
The Element 12 shares its tweeter with the Elypsis 1512. It is a 29mm diameter soft-dome device, fitted with a CNC-machined aluminium waveguide that both defines its dispersion characteristic and provides increased radiation efficiency through acoustic impedance matching. The tweeter is mounted within the Element 12 enclosure via a Stratton Acoustics patented decoupling arrangement that ensures its isolation from mechanical vibration. It also features a neodymium-iron-boron magnetic system with a double copper-capped, T–shaped pole piece and a flow-optimised rear enclosure.

Crossover and System Characteristics

The Element 12 passive crossover integrates the drivers at 1.7kHz via damped 3rd order filter slopes. Crossover components are all high-end audiophile grade and comprise plastic film capacitors and air-cored inductors. No cored inductors or electrolytic capacitors are used.

The system impedance that results from the combination of drivers and crossover remains above 6Ω between 100Hz and 10kHz. Electrical phase remains within ±45° over the same frequency range. The Element12 can be partnered successfully with almost any amplifier – from the least to the most powerful.





Enclosure

The Element 12 enclosure is manufactured from a combination of 20mm and 32mm precision CNC routed bamboo ply panels. The front baffle is capped with CNC machined, anodised aluminium trim panels to create a composite front panel thickness of 42mm. A complex and extensive internal bracing system ensures that the enclosure is effectively inert.

Stand

The integrated stand of the Element 12 incorporates folded Voronoi geometry structural panels that combine light weight, and immense rigidity with a minimal potential acoustic radiating area. The Voronoi geometry additionally results in a 'floating' aesthetic that significantly reduces the visual bulk of the Element 12.

Element 12 Specification

System Type	Twin reflex-loaded, two-way, high-sensitivity passive loudspeaker
Enclosure	Fully braced bamboo ply with CNC machined aluminium trims
Integrated Stand	Folded Voronoi geometry structural panels with a bamboo ply base
Bass/Mid Driver	300mm (12 inch) with NeFeB motor, paper diaphragm and twin voice-coils
Tweeter	29mm (1.2 inch) waveguide loaded NeFeB motor soft dome
Crossover	Two-way with third order slopes
Crossover Frequency	1.7kHz
Frequency Response	50Hz to 18kHz ±2dB
Low Frequency Cut-off	-6dB @ 37Hz
Midband Sensitivity	94dB for 2.83V @ 1m
Nominal Impedance	8Ω (6Ω minimum between 100Hz and 10kHz)
Electrical Phase	< ±45° between 100Hz and 10kHz
Group Delay	<10mS above 50Hz
Amplifier Compatibility	Any
Connections	Bi-wire custom binding posts
Dimensions (H x W D)	1214mm (48 in) x 500mm (19.7 in) x 596mm (23.5 in)
Weight (inc stand)	47.6kg (105 lbs)

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