

"TAD: The Artistic Intent, Intact"



History of TAD



TAD = Technical Audio Devices

SPEAKER

ELECTRONICS

1970	1975	1980	1985	1990	1995	2000
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75 Project started



77 EXCLUSIVE model 2301
EXCLUSIVE model 3301

79 TD-4001 released

TAD drivers were used for the Eagles' Japan tour, shocking the Japanese market.

83 Exclusive model 2401twin
Exclusive model 2402



88 Low Frequency Driver
for studio monitors
TL-1601b



93 Exclusive model 2251



Used as professional speaker drivers in studios around the world.

73 The EXCLUSIVE brand was born
Preamp: C3/power: M3



74 Power amp.
EXCLUSIVE M4

78 turntable
EXCLUSIVE P3



91 Pre-amp.
EXCLUSIVE C7



92 Power amp
EXCLUSIVE M7



79 Pre-amp. EXCLUSIVE C3a
Power amp. EXCLUSIVE M4a

Developed and marketed as
Pioneer's premier audio component

82 Power amp.
EXCLUSIVE M5



95 Power amp
EXCLUSIVE M8

88 Power amp.
EXCLUSIVE M5a

The end of 25 years of
EXCLUSIVE history

History of TADL



TAD = Technical Audio Devices

SPEAKER

ELECTRONICS

07 TADL, Inc. established
TAD Reference One

02 TAD's first consumer model
TAD-M1



09 TAD-CR1



16 TAD-ME1

12 TAD-R1MK2
TAD-CR1MK2



14 TAD-CE1



19 TAD-R1TX



18 TAD-E1TX



20 TAD-CR1TX



21 TAD-E2



22 TAD-CE1TX



Deployed in more than 40 countries around the world for consumer use

09 TAD's first consumer model
TAD-M600



19 TAD-M700
TAD-M700S



10 TAD-D600
TAD-M2500
TAD-M4300



22

11 TAD-C600
TAD-C2000



Top-grade audio components that
sublimate the technologies
cultivated by Exclusive

15 TAD-D1000MK2
TAD-M2500MK2

18 TAD-M1000



21 TAD-D1000TX
TAD-DA1000TX



Reference Series

Mastering traditional technology
Pursuit of supreme sound



- Sublimated from conventional coaxial driver to CST with PVD beryllium diaphragm by the latest technology
- Aerodynamic port system inheriting the technical concept of TAD horn
- Pursuit of Class AB amplifier

Evolution Series

Proposing a new high-end audio system
with newly developed technologies



- Unique and original bass-reflex system "Bidirectional Aero-Dynamic"
- Original USB engine
- Class D amplifier
- S-TAD insulator

Speaker System
TAD Compact Evolution One
TAD-CE1TX



TAD Sound Philosophy for Speaker System



Accurate reproduction of both sound image and sound field at the highest level, representing the intention of all people involved in the creation process



Intention and passion of the artist



Intention of recording engineer and producer



Recorded Music



Add no artificial coloration to the recorded music and reproduce all detailed nuances

The Audio Equipment should reproduce music as it was originally performed to be true to the intentions of musicians and producers.

“Real technology should stick to basics, without being technology-oriented, and always placing the highest value on sound quality.”

~ Bart N. Locanthi (1919-1994)~

< Ex-Vice President of JBL, Ex-Pioneer Engineering Adviser >



Cornerstone of Thinking

“Engineering approach backed by elaborate theoretic study and precise testing”



Reflected in the name “TAD”

TECHNICAL AUDIO DEVICES

Design of TAD-CE1TX to realize the sound concept



Sound Concept

Accurate
Reproduction of Both
Sound Image and Sound Field

Core Technologies

14cm CST driver

Single point sound radiation and wide frequency range
with smooth phase and dispersion

Beryllium Diaphragm

Ideal lightweight and high rigid diaphragm material
Manufactured by vapor disposition -- world exclusive

Magnesium diaphragm

Lightweight, high-loss diaphragm material
Further deepened by surface treatment changes

Key Technologies

18cm woofer

Lower distortion and higher linearity
Rigid with quick transient

SILENT enclosure

Reinforced, highly rigid enclosure for accurate reproduction
of tonality and sound stage without coloration

Coherent cross-over filter

Optimize acoustic output characteristic, energetics, an impedance
characteristic. and slope characteristics

Bidirectional ADS port

Slot-shaped flared port inherited from the professional TAD horn design,
eliminating port noise.



TAD-CE1TX Main feature



The TAD-CE1TX is a speaker system created with TAD's long-cultivated acoustic technologies and the latest technologies, aiming for an impressive sound.

1. Equipped with a coaxial speaker unit "CST*1".

This model is equipped with a coaxial speaker unit "CST" that reproduces controlled directivity over a wide bandwidth from a phase-matched point, reproducing stable localization and a natural sound field space. The cone shape of the midrange is designed to control the directivity characteristics of the coaxially placed tweeter, and by matching the phase and directivity characteristics at the crossover between the tweeter and midrange, a natural attenuation characteristic and directional radiation pattern are achieved over the entire bandwidth. The CST alone is capable of ultra-wideband reproduction from 250 Hz to 100 kHz

2. beryllium for tweeter and magnesium diaphragm for midrange

The tweeter diaphragm is made of beryllium, which is lightweight and has excellent rigidity. By using a proprietary vapor deposition method and increasing the internal loss, excellent high frequency resonance damping characteristics are achieved. The midrange uses a magnesium diaphragm with a new surface treatment to eliminate the effects of material-specific resonance noise and reproduce sound with minimal distortion.

3. adoption of MACS II*2 diaphragm in the woofer

The woofer adopts a MACS diaphragm laminated with multiple layers of lightweight and highly rigid aramid fiber, and the center cap and cone are integrated into a shell shape to achieve rich bass sound reproduction and clear mid-low frequency reproduction. The skin material of the original diaphragm of CE1 has been changed to have more suitable properties as a woofer diaphragm.

4. SILENT*3 enclosure to reduce unwanted cabinet resonance

The SILENT enclosure uses highly rigid birch plywood for the framework and combines it with high internal loss MDF material to achieve high strength and low resonance. In addition, the cabinet is sandwiched from both sides by 10 mm thick rigid aluminum panels to reduce unwanted resonance.

5. "Bidirectional ADS" *4

A port for bass reflex operation is placed on the side of the enclosure. The openings are horn-shaped slits on the front, rear, left, and right sides of the enclosure to reproduce natural and rich low frequencies despite the bookshelf design. By eliminating the effects of unwanted sound from the ports and internal standing waves in the enclosure, clear bass with good response is reproduced.

*1 CST : Coherent Source Transducer

*2 MACS II : Multi-layered Aramid Composite Shell (2nd generation)

*3 SILENT : Structurally Inert Laminated Enclosure Technology

*4 Bidirectional ADS : Bidirectional Aero-Dynamic Slot

TAD-CE1TX and TAD-ST2TX

TAD Evolution series speaker system

TAD



Model No.	TAD-CE1TX -WN
Type	3way Bass-reflex Bookshelf type
Base driver	18cm cone type
Midrange/Tweeter	Concentric 14cm magnesium come (midrange) 3.5cm beryllium dome (tweeter)
Frequency range	34Hz to 100kHz
Crossover frequency	250Hz/1.8kHz
Maximum input power	200W
Sensitivity	85dB at 2.83V/m
Rated impedance	4 ohms
Polarity	LF (+), MF (+), HF(+)
Weight	29 kg
Dimensions	287 (W) x 510 (H) x 447(D)mm
SRP in Japan	JPY 1,350,000 (1pc) (Tax incl. JPY 1,485,000)
Model No.	TAD-ST2TX -K
Weight	18.5 kg (1unit)
Dimensions	399 (W) x 591 (H) x 485(D)mm
SRP in Japan	JPY 280,000 (only sold in pair) (Tax incl. JPY 308,000円)

TAD-CE1TX

Technical note

<System Configuration>

- Coaxial construction 35mm beryllium tweeter/14cm magnesium midrange CST refined
Combines the benefits of a point source with wide-range reproduction covering 250Hz to 100kHz
- Brushed up 18cm MACS diaphragm woofer

<Major Specifications>

Output sound pressure level: 85dB (2.83V/1m)

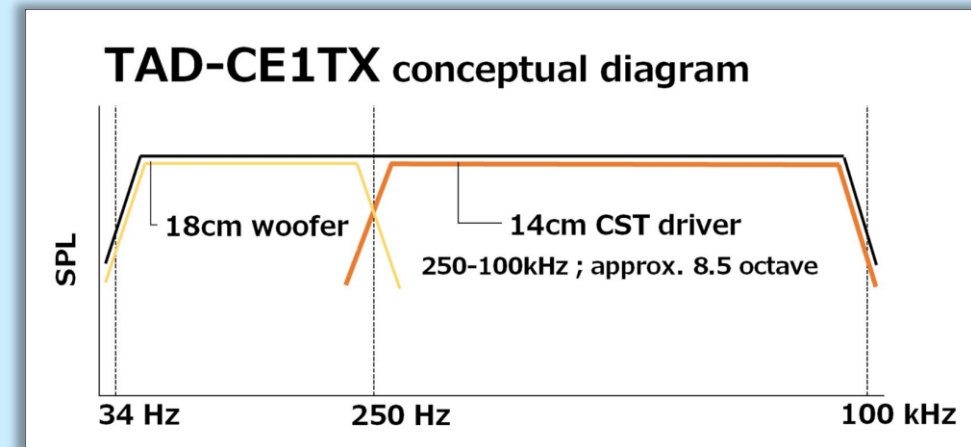
Rated impedance : 4 ohms

Maximum input : 200W

Playback frequency range: 34Hz-100kHz

Crossover frequency : 250Hz, 1.8kHz

Dimensions : W287*H510*D447



<Product Features>

- New design that deepens the TAD-CE1 introduced to the market in 2014
- Sound quality design inherits the concept of TAD's Reference TX series
- Bidirectional ADS* port reproduces natural and rich bass sound

*Bidirectional ADS : Bidirectional Aero-Dynamic Slot

14 cm CST (Coherent Source Transducer)



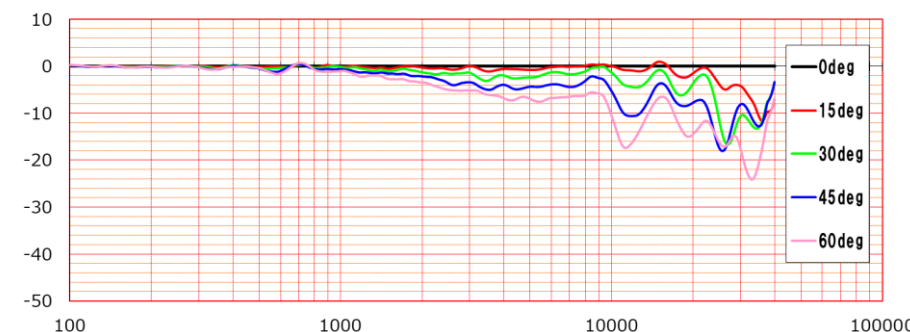
It is easy to flatten the characteristics of a typical multi-way speaker system at one point on the speaker system axis. However, off-axis, the distance to each speaker unit changes, resulting in roughness in the frequency response. Co-axial speakers have less roughness in their characteristics even off-axis because each unit is coaxially arranged.

The TAD Compact Evolution One uses the proven 14cm Coherent Source Transducer (CST) from the original Evolution One, which is designed to align the sound source position of the midrange and tweeter and make the cone of the midrange work as part of the tweeter's waveguide. The CST is designed so that the sound source position of the midrange and tweeter are aligned and the cone of the midrange works as part of the tweeter's waveguide, so the directivity of the two units is matched and there is a smooth connection in all directions near the crossover, with no frequency response dropout.

It is truly an ideal point source unit.

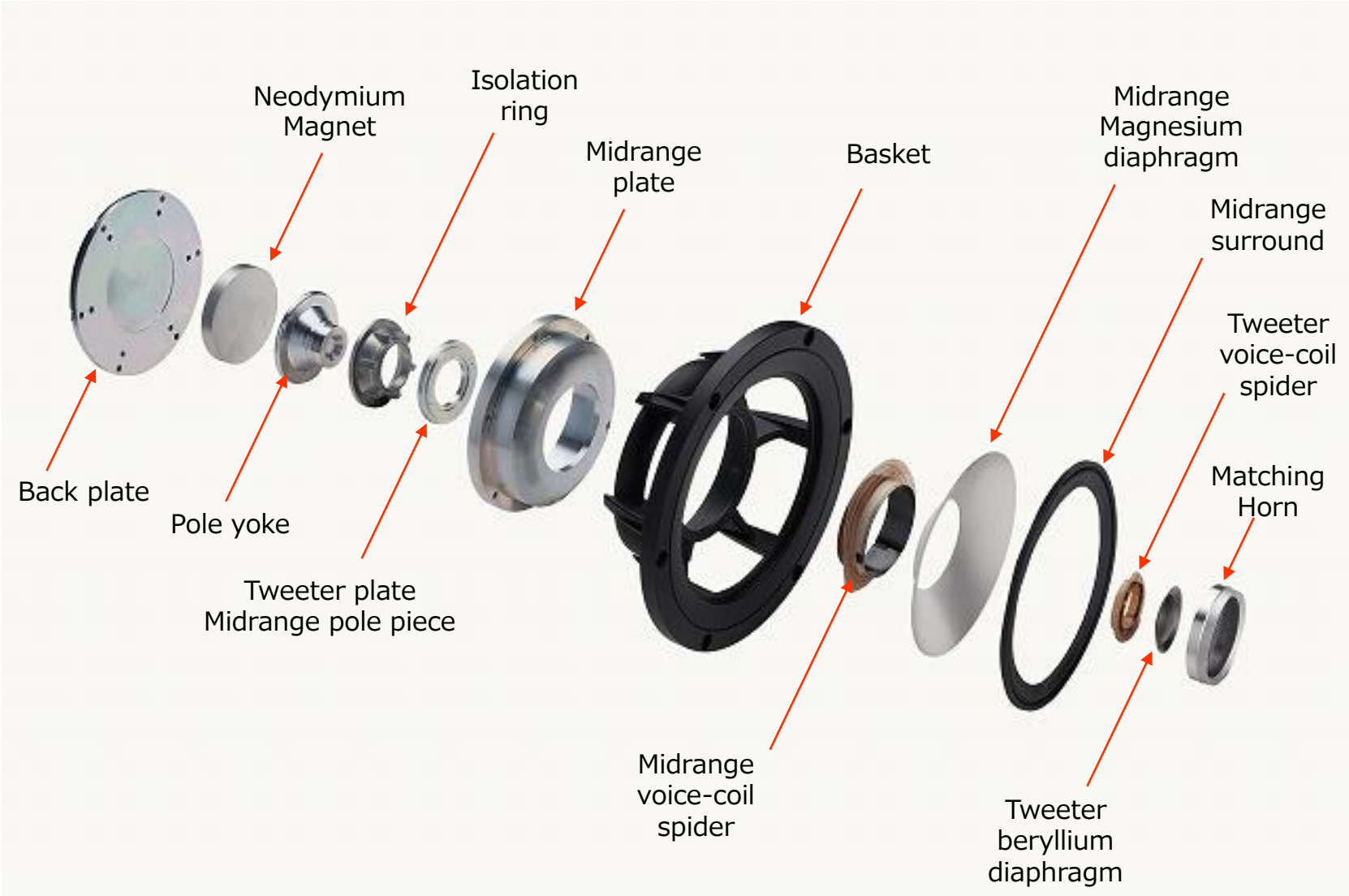
The crossover setting of the driver is also important for natural sound reproduction, and in the TAD Compact Evolution One, the crossover with the woofer is set at 250 Hz to avoid the bandwidth that determines the timbre of the human voice.

The CST is designed to radiate sound not only on the driver axis but also off-axis, with a directional radiation pattern and clean attenuation characteristics over a wide frequency bandwidth. The natural sound field and good sound image localization enable the presentation of a three-dimensional sound image.



Normalized Directivity Response of CST,
0-degree reference on infinite baffle

14 cm CST (Coherent Source Transducer)



14 cm CST (Coherent Source Transducer)



Beryllium diaphragm used for tweeters

Beryllium, the lightest and most rigid metal available for diaphragms, is used as the diaphragm material for coaxial tweeters. Beryllium material is both lightweight and highly rigid, the most necessary properties for a mid-to-high frequency diaphragm.

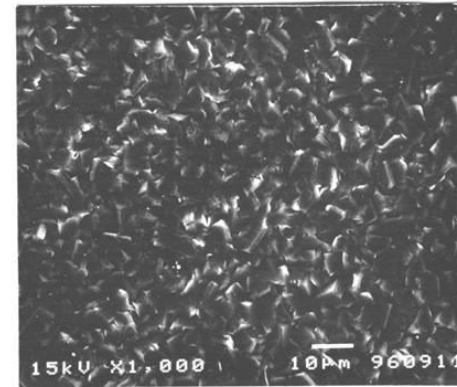
The TAD-CE1TX beryllium diaphragm is manufactured by vapor deposition. We own the vapor deposition equipment and outsource the production of the diaphragm to NGK Insulators, Ltd. using our own proprietary process.

The superiority of the vapor deposition method is that it has an internal loss that is unthinkable with metals. The internal loss, which is the factor that suppresses resonance, is created from the bonding of particles by the vapor deposition process. The vapor-deposited beryllium diaphragm has a smooth frequency response and reproduces a very straight and clear sound compared to other high-frequency diaphragm materials.

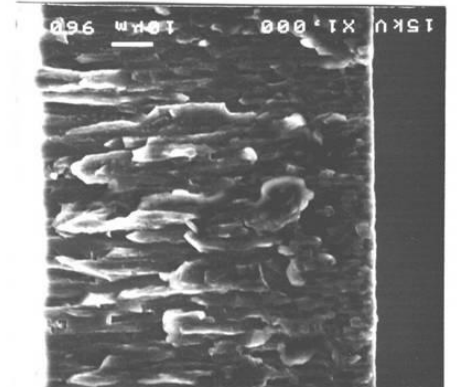
The TAD-CE1TX tweeter uses the exact same diaphragm used in the TAD-R1TX. HSDOM* technology, which uses computer analysis of the diaphragm shape to find the most appropriate shape, enables reproduction up to 100 kHz.

*HSDOM : Harmonized Synthetic Diaphragm Optimum Method

Vapour Deposit Surface



Fracture Surface



Beryllium Diaphragm Surface Closeup

Beryllium Diaphragm Cross Section Closeup

Material	Density (g/m ³)	Young modulus (*E10N/m ²)	Velocity (m/s)	Inner loss (-)
Aluminum	2.7	7	5092	0.003
Titanium	4.4	11.9	5201	0.003
Beryllium	1.85	28	12302	0.005
Magnesium	1.78	4.5	5028	0.006
Boron Alloy	4.5	23	7149	0.005
Paper	0.2-0.8	0.03-0.6	1200-3750	0.02-0.1
Ceramic Carbon	1.4	3.5	5000	0.005
Ceramic Graphite	1.8	18	10000	0.01
Crystalized Diamond	3.4	90	16270	0.014

Diaphragm material properties table

Magnesium diaphragm is used for the midrange

Magnesium is the lightest of all practical metals and has high internal loss.

For the same weight, magnesium can be 1.5 times thicker than aluminum, thereby more than tripling the rigidity of the cone body. In addition, the high internal loss reduces coloration inherent in the material, resulting in a clear midrange sound with little distortion.

In the TAD-CE1TX, the application of hybrid chemical conversion coating and painting to the surface gives it additional hardness and a yet greater internal loss.

In addition, resonance in the mid-to-high frequencies generated by interactions between the suspension and diaphragm is effectively controlled to achieve an even lower distortion and a greater transient response.

Neodymium internal magnetic circuit

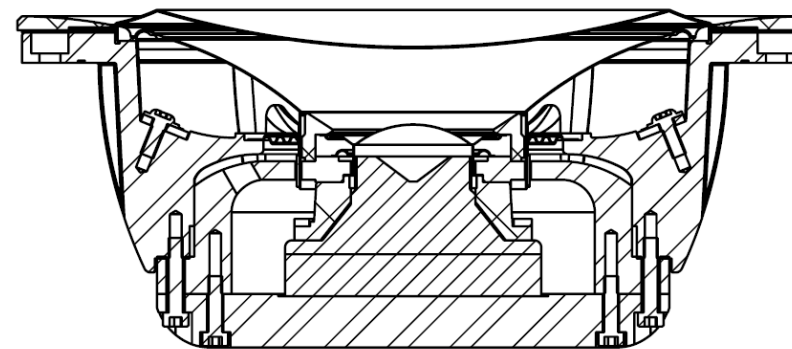
A neodymium magnet, which has about 10 times more energy than a ferrite magnet, is used. The ultra-strong magnetic circuit drives the lightweight diaphragm with great strength.

The magnetic circuit uses a streamlined yoke machined from a block of steel. This optimizes the magnetic flow in the magnetic circuit and ensures sufficient airflow behind the diaphragm to eliminate unwanted reflections.

In addition, the CE1TX has a revised neutral point for the driving force to reduce mid-range distortion and improve linearity at minute displacements.



Magnesium diaphragm



CST cross-section construction drawing

MACS II * Diaphragm

The diaphragm is further improved by laminating five layers of woven and non-woven aramid fabrics to obtain the ideal physical properties for a woofer diaphragm. By optimizing the shape of the one-piece shell-shaped diaphragm, which integrates the center cap and cone, rich and clear bass is reproduced while at the same time achieving straightforward reproduction of low midrange frequencies without coloration.

*MACS II : Multi-layered Aramid Composite Shell (2nd generation)

Cradle shape supporting powerful magnetic circuit

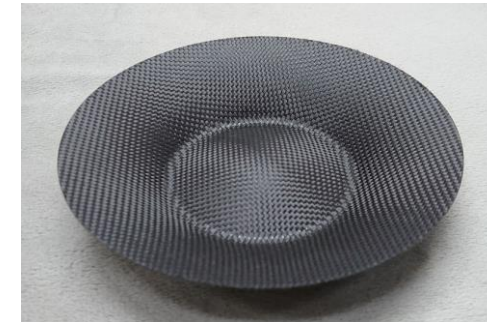
Large neodymium magnets are used for powerful driving force to reproduce rich bass. The frame and magnetic circuit are shaped like a cradle on the back of the unit to transmit this powerful driving force to the diaphragm.

Pursuit of aerodynamics on the back of the unit

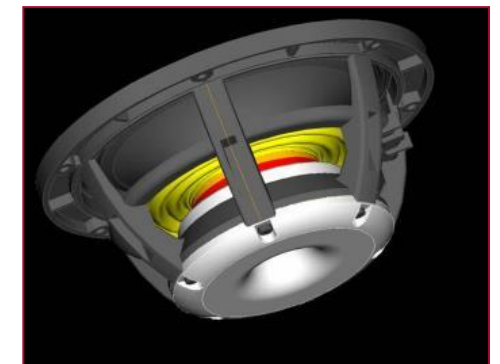
Despite the use of a large-diameter 65mm voice coil and a large neodymium magnet, a compact magnetic circuit is configured to minimize resistance at the back of the diaphragm. Furthermore, the aerodynamic design of the frame and magnetic circuit, which focuses on the shape of the back side of the diaphragm, suppresses air turbulence, which is a source of noise, to achieve bass sound reproduction with overwhelmingly high S/N ratio.

Improved Linearity

The know-how of the dumping agent-applied corrugated edge used in the TAD Pro unit is directly transplanted. The optimized T-pole type magnetic circuit with revised short ring settings and brushed-up suspension system have greatly improved linearity, resulting in clear, distortion-free sound quality.

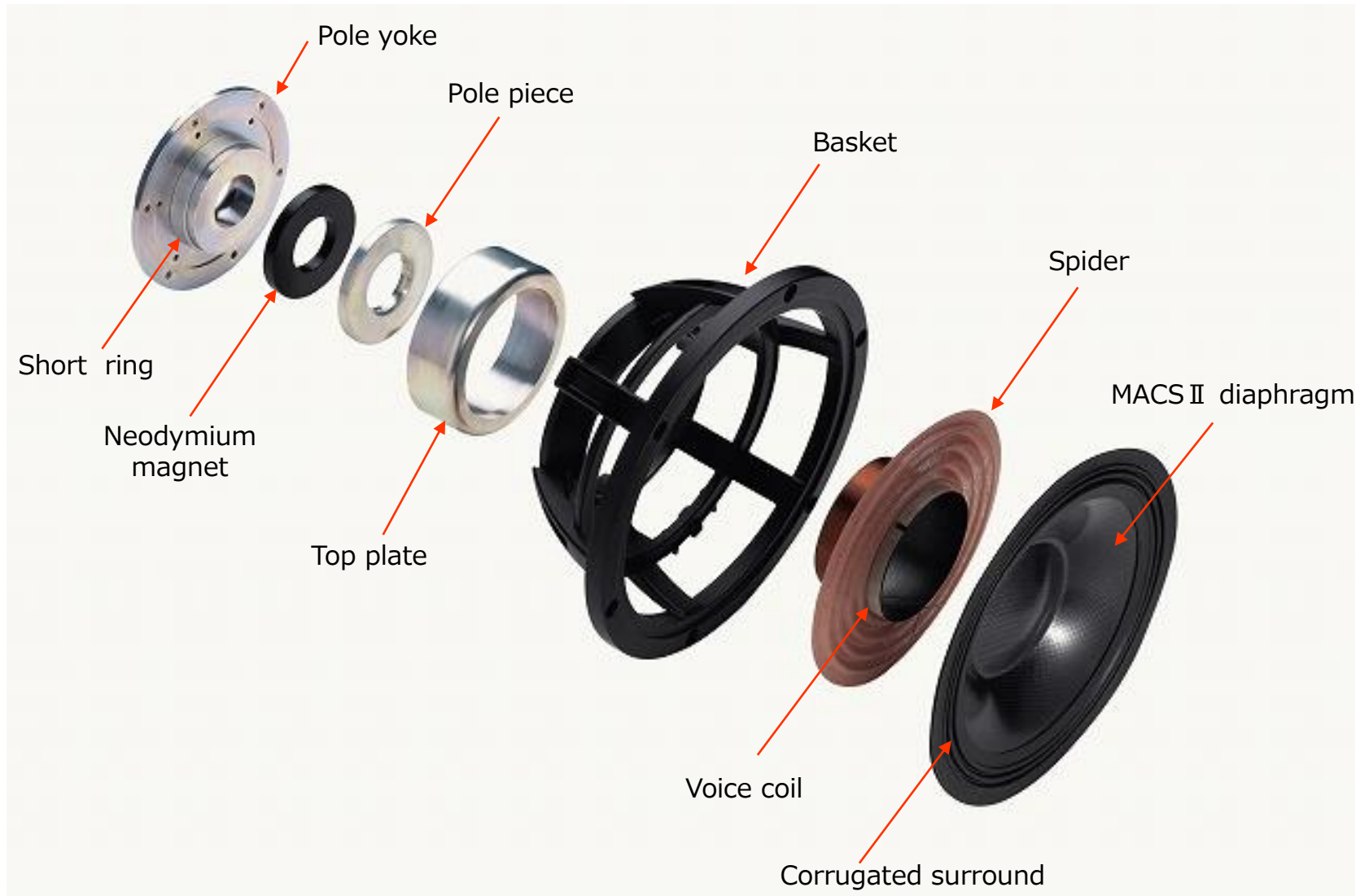


MACS II diaphragm



Backside view

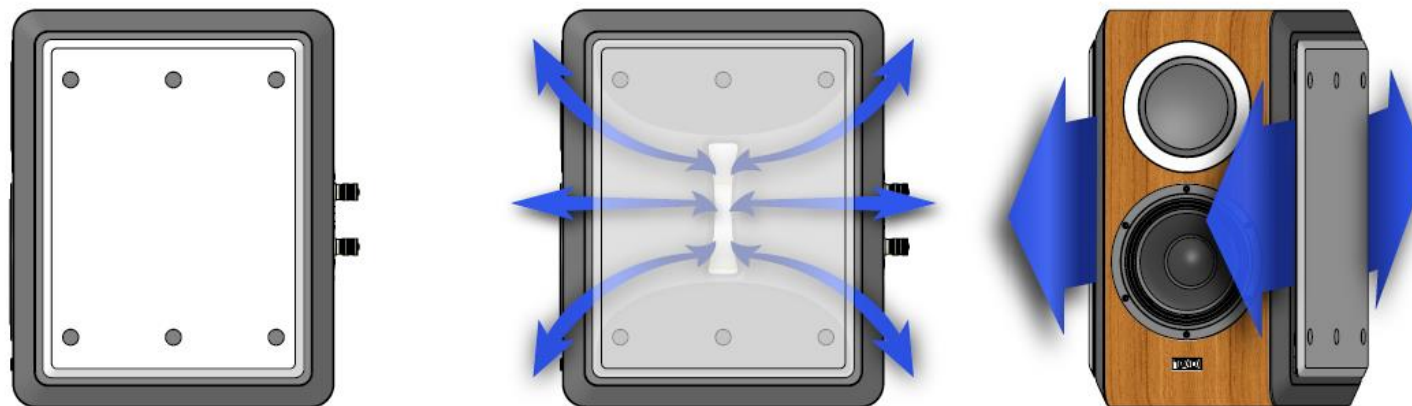
18 cm woofer



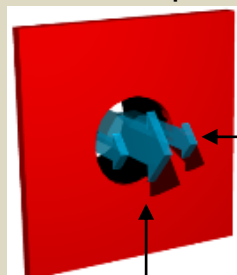
Bidirectional ADS* Ports" for natural and rich low-frequency reproduction

Slit-shaped ports are placed at the front and rear of both side panels of the enclosure. The ports are driven smoothly and efficiently by a horn shape at the introduction to the aperture. In addition to reducing port noise at large amplitudes, the ports suppress the leakage of low-order internal standing waves that strongly affect the woofer's reproduction bandwidth, resulting in a clear and responsive mid-low range. The symmetrical layout of the ports, both front-to-back and left-to-right, counteracts the forces that cause the enclosure to vibrate, resulting in rich, powerful low-frequency reproduction.

*Bidirectional ADS : Bidirectional Aero-Dynamic Slot



Typical bass reflex port



Peripheral area:
low flow velocity

Center: high velocity

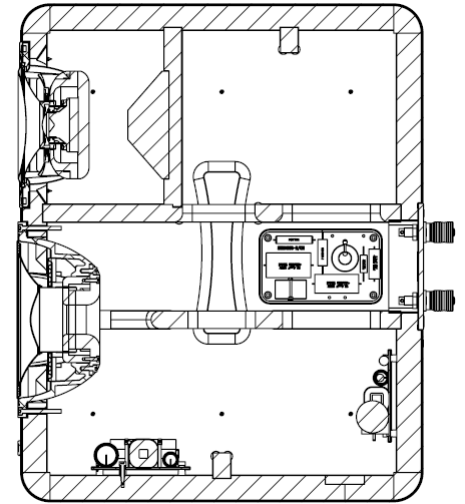
The velocity of air flow differs between the center of the port tube and the area around the sidewalls. This difference in flow velocity increases as the reproduced sound pressure increases, and above a certain level, the flow in the center is separated from the flow in the periphery, resulting in turbulence. This causes air noise at the port aperture, which is not originally part of the music source and is not what the producer is aiming for.

The SILENT* enclosure that reduces unwanted resonance

The SILENT* enclosure is constructed with a rigid birch plywood brace as the internal framework and high internal loss MDF material as the exterior panel, resulting in high strength and low resonance. Furthermore, the enclosure's unwanted resonance is reduced by sandwiching it between 10mm-thick rigid aluminum panels from both sides.

Moreover, we conducted the standing-wave analysis inside an enclosure, and optimal sound-absorbing materials are selected and effectively placed to eliminate internal standing waves that have a negative impact on the sound image and sound field.

*SILENT: Structurally Inert Laminated Enclosure Technology



Mirror finish highlights the beauty of the wood grain

Inheriting the popular wood grain pattern of the original CE1, we have further enhanced the beauty of the wood grain with a wet texture mirror finish on all surfaces.

A small-area baffle minimizes sound refraction, and a new wood-grain veneer surrounds the baffle, top, bottom, and back panels.

The highly transparent and dignified coating is applied, and the process of spraying the paint, polishing the base coating, and final polishing is carefully and time-consumingly finished by skilled craftsmen.



Cross-over Filter

Three independent board assemblies for tweeter, midrange, and woofer are mounted three-dimensionally inside the enclosure to minimize interference between them.

The filter for the CST uses carefully selected PP film capacitors, low-ESR electrolytic capacitors, non-inductive wire-wound resistors, and air-core coils.

On the other hand, for the 18cm woofer, a coil using a low-loss core with excellent magnetic characteristics is used to reduce the amount of resistance inserted in series as much as possible. In addition, low-ESR electrolytic capacitors, non-inductive wire-wound resistors, and air-core coils are used.

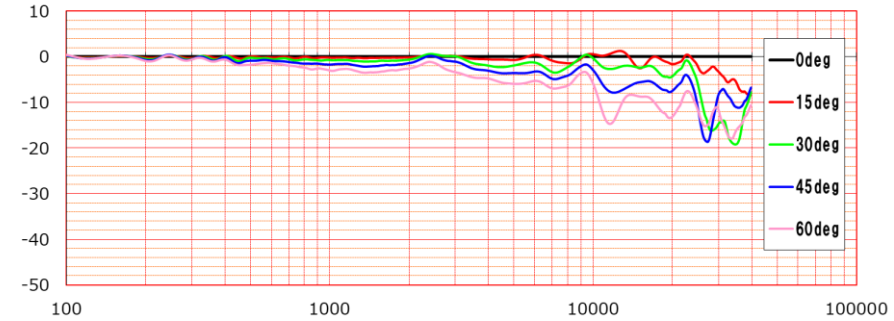
The value of each component are considered to optimize the sound output characteristics, energy characteristics, impedance characteristics, etc., to achieve a filter cutoff slope that optimizes the system's sound pressure response, phase characteristics, and directivity characteristics.

The phase characteristic and the amplitude characteristic have been reviewed and optimized according to the new shape enclosure and drivers. As a result, the three-dimensional reproducibility of the sound field and sound images are improved.

Input Terminal

The input terminals inherit the specifications that were well received by the CE1. To allow bi-wiring, there are input terminals for separate connection of the CST and woofer cross-over filters. This way, the loss in the cable is minimized, while cabling options are expanded to allow custom tuning.

The simple, large terminals are exclusively made of machined brass, and installed on a 5 mm thick aluminum plate. The terminals can securely hold even the thickest cables.



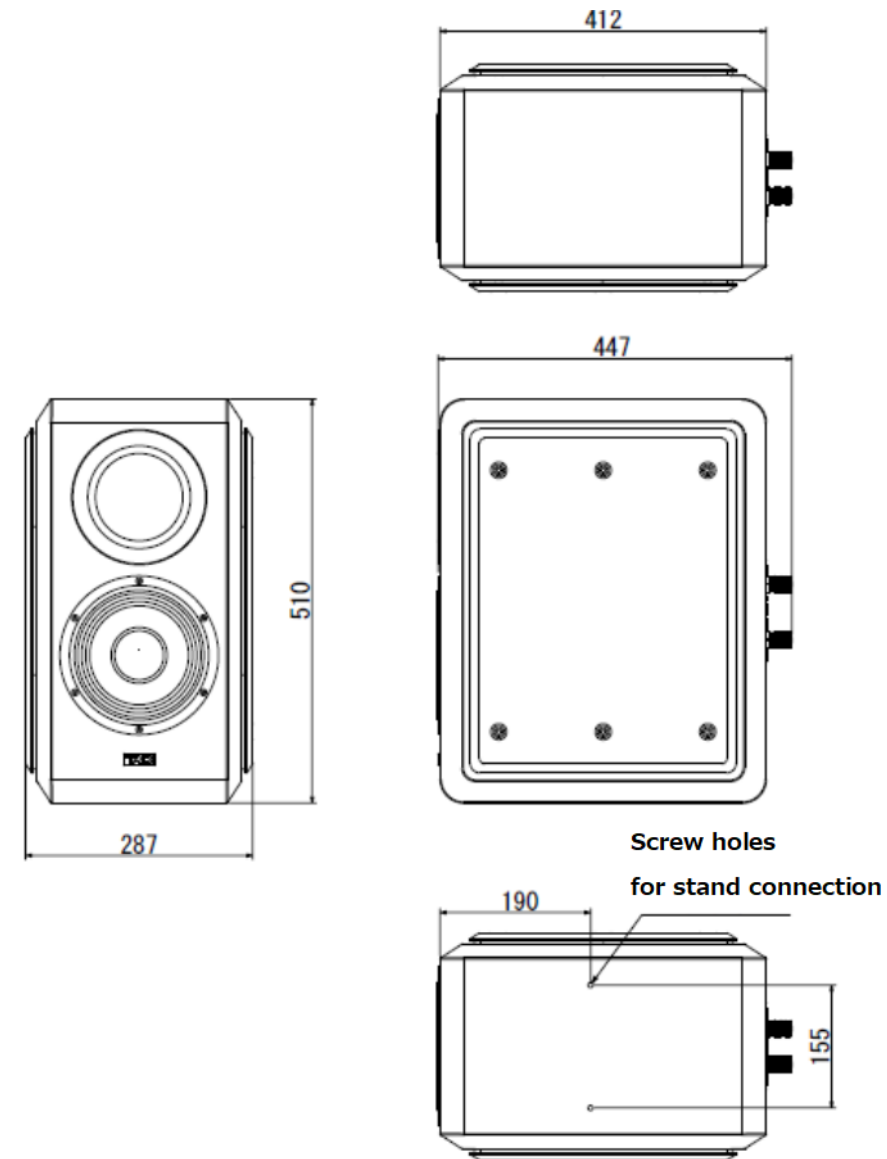
Normalized Directivity Response,
0-degree reference of TAD-CE1TX



SPECIFICATION

TAD

type :	3-way bass-reflex, bookshelf type
drivers :	woofer: 18 cm cone CST : 14 cm magnesium cone 3.5 cm beryllium dome
Frequency range :	34 Hz ~ 100 kHz (10dB, free and far-field)
cross over frequency :	250 Hz, 1.8 kHz
Maximum input :	200 W
Sound pressure level :	85 dB (2.83v, 1m @free-field)
Rated impedance :	4 Ω (minimum impedance 3.6 Ω)
Drive unit polarity:	LF(+), MF(+), HF(+), all positive
weight :	29 Kg / pc
size :	width : 287 mm height : 510 mm depth : 447 mm
combination with TAD-ST2TX	width : 399 mm height : 1101 mm (with spikes : 1129 mm) depth : 485 mm



TAD speaker stand for TAD-CE1TX TAD-ST2TX-K

TAD

Design specification

To obtain a holographic sound image, it is important to reduce reflections and diffraction around the speaker baffle. On the other hand, strong support is necessary for solid bass reproduction, so a strong stand and a stable installation with a low center of gravity are important.

To satisfy these requirements and maximize the performance of the TAD-CE1, a stylish, high-strength, low center of gravity speaker stand was specially designed.

A 5mm-thick steel base plate is used to ensure a low center of gravity and rigidity. In addition, three spikes provide basic setting, and two adjustable auxiliary legs allow for more stable installation.

<Finish and Materials>

Base:	Hybrid structure of black satin finish 5mm steel plate and black matte coated MDF laminated together
Column:	Black matte coated laminated solid MDF
Top plate:	Black matte anodized 10mm thick aluminum

Weight : 18.5 kg (1 unit)

Dimensions after assembly : 399(W) x 591(H) x 485(D) (1 unit)

* TAD-ST2TX-K is sold only in pairs



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