

TIME DOMAIN AUDIO SYSTEM

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# TD712z







# The ultimate Hi-Fi sound in pursuit of true artistry

## From stereo to multi-channel; the joy of listening to music enters a new era

The artistry of music is formed from the thoughts and feelings of composers; the translation of their compositions into performances by artists; the distinctive sounds of each instrument and the exquisite harmonies woven together from numerous musical notes.

By adopting Time Domain theory, which recognises that all phonic signatures must be preserved in the time axis and thus seeks to realise a faithful reproduction of the waveform, the ECLIPSE TD series reproduces the music in its original form and preserves the artistry in its entirety. We can now bring to you the full joy of music appreciation; the joy that you felt in the concert hall.

### Accurate air compression with highest possible impulse response

#### Reproduction of the details and the natural character of instruments

Conventional speakers emphasise flat amplitude-frequency response; wide frequency bandwidth and high output power, whereas the ECLIPSE TD series incorporates Time Domain theory and so has a design which is focused upon the time characteristic waveforms of sounds. In doing so the ECLIPSE TD series realises the ultimate in Hi-Fi sound by creating an accurate and truthful reproduction of these waveforms. The Impulse Response is a measure of the degree of waveform accuracy and is measured by comparing the output of a speaker to the original impulse signals that are applied at the input. Such a comparison measures and demonstrates the uniqueness of the speaker characteristics that primarily affect sound reproduction. The closer the output impulse response is to the impulse at the input; the more closely the speaker reproduces every input signal with accurate frequency characteristics as well as precise phase characteristics that are approaching theoretically ideal values. Such an ideal performance is far from easy to create. Not only is it necessary for the drive-unit to follow and reproduce the input signal at extremely rapid speed without any deviation, but to do so without adding anything new to the sound; additions that would colour and distort the sound.

Once these colourations have been eliminated, the finest recorded sounds are reproduced in minute detail and it becomes possible to hear the composer's message in its entirety. It is almost as though an image seen through a camera lens suddenly

comes into tight focus. This clarity of sound also accelerates the accents and articulation of the musical notes, thereby allowing the subtle techniques of the artist to be reproduced in full. For example, the speed of finger work and the expression of inflections in the sound are audible for the first time. It is said that the voices and musical sounds of skilled artists are able to travel the furthest. This is because these sounds are the result of accurate and spontaneous air compression and it takes longer for a highly compressed air mass to dissipate within the surrounding lower air pressure.

Often when people wish to test the solidity and composition of materials they tap them hard and then listen to the resulting sound. The sound heard when tapping materials is the sound of highly compressed air, and this sound allows the quality of the material to be recognised. With a piano, the sound produced by the impact of the hammers on the strings is said to be the sound that describes the quality of the piano in terms of articulation and tone. In order to accurately reproduce all the sounds created by a musical instrument, it is first necessary to eliminate any sounds and errors created by the speaker drive-unit which can compete with and change the speed of a highly skilled artist's finger movements. Therefore we know that if a speaker has good impulse response, it can accurately compress the air mass with nothing added or removed, so allowing the listener to hear the unaltered natural sound of instruments as played by the artist.

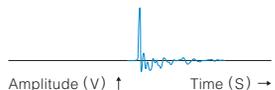
#### ■ Impulse

The term Impulse refers to signals of all frequencies of the same level and the same phase. In theory, the amplitude is infinitely great and the time difference is infinitely small. (This is expressed by a single line on the diagram for convenience.)

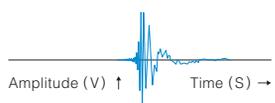


#### ■ Impulse Response Comparison

##### ● TD712z



##### ● Conventional multi-way speakers



Compared to the TD712z, the original impulse response waveform in multi-way speakers decays poorly showing unwanted sounds heard long after the original signal has ended. Since this waveform is a representation of all reproduced sounds, it is obvious that this speaker cannot reproduce the authentic sound of the instruments if the impulse response waveform decays in such an unnatural way.

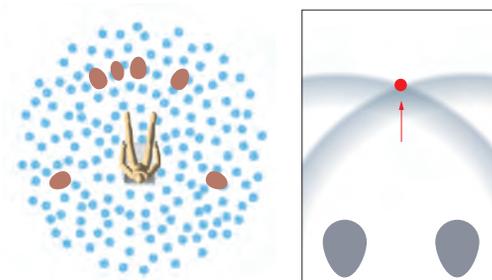
### The speaker vanish... leaving pure sound

#### Recreating 360° seamless spherical and omni-dimensional wave terrain

Recorded sound contains not only primary sound information, such as an instrument's tone and harmonics, but also the reverberations created by the positional relationship of players in a concert hall, as well as spatial information such as, the sound effects created in movies. This is often called the ambient sound.

In general, the inaccurate characteristics of conventional speakers smudge and blur this vital spatial information. The ECLIPSE TD series, with its excellent impulse response, provides a remarkably convincing reproduction of these ambient sounds. In the uncompromising search for 'pure audio' and the development of stereo sources such as SACD and DVD-Audio, together with multi-channel surround sound; the arrival of the TD712z offers a new sound revolution.

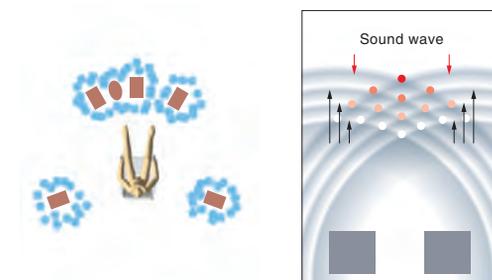
#### ■ Sound Image of the ECLIPSE TD series



Exceptionally sharp and real because the sound image focus is only on the sound wave.

With the superior impulse response of the ECLIPSE TD series, and its uncanny ability to connect coherent sound images and precisely reproduced spatial information, the listener can forget the speakers are there and can feel as though they are transported to the time and place of the original recording.

#### ■ Sound Image of conventional speakers with inferior impulse response



Enclosure vibration and incidental sounds pile up to make the sound image fuzzy.

When the impulse response deteriorates in an uncontrolled manner and the sound images become blurred; the speakers start to dominate the music. In this situation the listener becomes far too aware of the existence of the speakers and this awareness becomes a distraction from the pure enjoyment of the music.

\*Diagram showing when each impulse is input



## A new 12 cm diameter cone

Structural design and materials provide functional beauty which are indispensable when faithfully reproducing waveforms

With its unique form of the TD712z, we have considered every aspect, from the choice of materials to the use of precision manufacturing so as to ensure that the TD712z provides the ultimate in high definition sound. We have created a new generation speaker system that represents the optimum balance between sound quality, aesthetics and affordability.

### ● Fibreglass Cone

From the beginning with the ECLIPSE TD 512 series, we have sought to achieve totally accurate waveform reproduction by using a small full range drive-unit, incorporating a fibreglass cone.

This cone is extremely light and has a high modulus of elasticity whilst still possessing a high radial rigidity. This rigidity relative to a high internal energy loss might seem to be a contradictory property; however, the fibreglass cone possesses a desirable internal damping and so achieves the minimum of audible cone colouration making it ideal for speakers.

With the fibreglass cone the TD712z has achieved very low rise and fall-times and hence an excellent transient response making it possible to listen to musical sounds in their purest form.



### ● Magnetic Circuit System

The Magnetic Circuit around the voice coil of the drive-unit creates a powerful motor system with the degree of 'shove' necessary to move the cone at high speeds. By increasing the flux level of the magnetic circuit and by minimising the gap between the voice coil and the poles of the magnetic assembly, the TD712z has succeeded in achieving a magnetic flux density approximately 1.2 times greater than other equivalent systems.

### ● Air Tightness

In order for the ECLIPSE TD series floating enclosure design to perform as required, it is necessary to overcome the apparent conflict between achieving an air-tight bond where the drive-unit is fixed to the enclosure whilst eliminating the vibrations of the drive-unit being transmitted to the enclosure. This requires a solid bonding and a flexible joint. For the ECLIPSE TD series, the need for this air tightness and vibration elimination have been achieved by using the advanced technology developed by FUJITSU TEN in the manufacture of their automotive devices; by adopting the special material 'PORON' as the seal between the enclosure and the drive-unit frame and by using 'Toraypef' in the joint between the front and rear parts of the enclosure.

N.B. PORON is a registered trademark of INOAC CORPORATION.  
N.B. Toraypef is a registered trademark of Toray Industries, Inc.



### ● Diffusion Stay

Although the drive-unit can be driven at extremely high speed there will be, for as long as the unit is mounted to the enclosure, some transmission of the vibrations of the speaker cone to the enclosure and the original sound will be tainted by the colouration of its enclosure; which will 'sing along' with the original sound by adding a distorted and delayed set of vibrations from the enclosure walls. The ECLIPSE TD series has adopted an original diffusion stay to circumvent this problem. By mounting the enclosure and drive-unit in a floating configuration, the vibrations of the speaker cone are no longer transmitted. This diffusion stay is die-cast in zinc, a material which has approximately three times the specific gravity of aluminium and hence much higher internal losses which suppress any remaining resonances of the structure.



### ● Solid Foundation

The TD712z and its stand have an all-point-contact design achieved by using three spikes mounted with specially constructed fixed screws. This design eliminates many undesirable vibrations and ensures a tighter low frequency performance. In addition this arrangement allows for angle adjustment, which is an unusual option for high-end speakers. Angular adjustment up to 10° in the upward direction gives a wide degree of flexibility in the installation to suit the listening environment.



### ● High Mass Anchor

Whilst the undesirable transmission of cone vibrations can be prevented by adopting a floating structure where the drive-unit and enclosure are mechanically separated, this does mean that the drive-unit is no longer held in a stable and rigid location that is necessary for the accurate reproduction of audio waveforms. The ECLIPSE TD series resolves this limitation of the piston movement of the cone by attaching a high mass conical anchor weight to the rear of the drive-unit magnet which prevents loss of driver piston movement energy. This structure acts as a mass sink which 'grounds' the drive-unit to ensure that the only air movement is that caused by the cone tracking the original air movements of the original musical performance.



### ● Well Damped Stand

The streamlined form of the TD712z, designed in the image of aircraft wings is required in order to restrain the reflection of spherical waves from the speakers. It is made from a hybrid aluminium die-casting which possesses high rigidity and extensive internal dispersion to ensure that it is effective in preventing any residual undesirable vibrations being added to the sound you hear. Additionally, this structure ensures a stable and precise reproduction of low frequency waveforms.



### ● Eggshell Construction

The design of the enclosure continues the strategy of total suppression of unwanted vibrations. In the ECLIPSE TD series the internal standing and diffraction waves generated at the front baffle angle are largely eliminated by adopting a rigid egg-shaped form in which no two radial surfaces are in the same plane. For the highest performance models, a bulk mould compound (BMC) material is used; a material which has equivalent strength and similar density to artificial marble. By using an injection-moulding machine with a forming pressure as high as 650 tons, and by using a wall thickness of 10 mm, the vibrations caused by rear pressure of the driver are no longer a consideration. Additionally the surface is enhanced by the application of three top-coats to give a finish worthy of such top-of-the-range products.



### ● Stand Filling

The TD712z stand is filled with 4 kg of high-density sand sourced from the Min River in Fujian, China. Combined with the characteristics of the hybrid aluminium die-casting, it ensures that the whole structure is effectively damped.

### ● Spike-on-Insulator

The TD712z base adopts an unusual integrated spike and insulator foot arrangement (patent applied for) to support its unique waveform reproduction capabilities. The mounting to the stand is by all-point-contact and so the minuscule residual vibrations of the drive-unit movements are further isolated from the floor. The speakers can be moved without scratching the floor and adjustments can easily be made manually and without the use of special tools.



## TD712z

### TD712z Speaker

Maximum Dimensions: W347 x H988 x D384  
Mass (per speaker): 32kg

## TD712z-S

### TD712z-S Speaker (Short)

Maximum Dimensions: W347 x H600 x D384  
Mass (per speaker): 21.5kg

### Speaker

Unit: Ø12cm Full Range  
Input Resistance( Rating / Max.): 35W / 70W  
Impedance: 6  
Efficiency / Sensitivity: 83.5dB / W-m  
Reproducible Frequency Band: 40Hz-20kHz (-10dB)

Testimonials from renowned artists and engineers, technical data,  
where to hear & where to buy and further information on ECLIPSE TD can be found at

<<http://www.eclipse-td.com>>

- Standards and images in this catalogue may be subject to revision without prior notice.
- Product colours may differ from those published.
- The sensation of presence at original recording can only be achieved so long as the music software reflects the recorded conditions; including microphone settings, mixing, editing and mastering.

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