



Super Audio CD/CD Player X-01 D2

X-01 D2 Main Specifications

General

System: Super Audio CD and CD

Power supply

Europe model: AC 230 V, 50 Hz

U.S.A./Canada model: AC 120 V, 60 Hz

Korea model: AC 220 V, 60 Hz

Power consumption: 39 W

Weight: 25 kg (55 lb)

External dimensions (W x H x D): 442 x 153 x 353 mm (17-3/8" x 6" x 13-7/8")

Audio output (Analog Audio)

Jacks: XLR jacks (2 channels) x 1

RCA jacks (5.1 channels) x 1

Maximum output level (1 kHz, full scale): 2.2 Vrms (RCA, XLR)

Frequency response: 5 Hz to 50 kHz (-3 dB)

Signal-to-Noise Ratio (S/N): 116 dB

Total harmonic distortion: 0.0015% (1 kHz)

Audio output (Digital Audio)

OPTICAL: Optical digital jack x 1

COAXIAL: RCA jack x 1

i.LINK: i.LINK (AUDIO) terminal x 1

Word Synchronization input format

Jack: BNC

Input level: 4.5 Vp-p / 75 Ω

The X-01 D2 can accept and synchronize to the following frequencies received from external devices: 44.1 kHz, 88.2 kHz, and 176.4 kHz

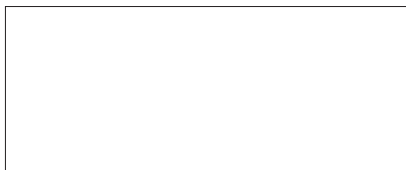
- Design and specifications are subject to change without notice.
- Weight and dimensions are approximate.
- The X-01 D2 is compliant with copyright protection system DTCP (Digital Transmission Content Protection). Both the player and signal receiver unit should correspond to DTCP to play back Super Audio CD by using i.LINK.



ESOTERIC

TEAC ESOTERIC COMPANY

www.teac.co.jp/av/



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TEAC

English version

ESOTERIC

Without compromise, the X-01D2 is an evolution

in technology from the X-01 and X-01 Limited

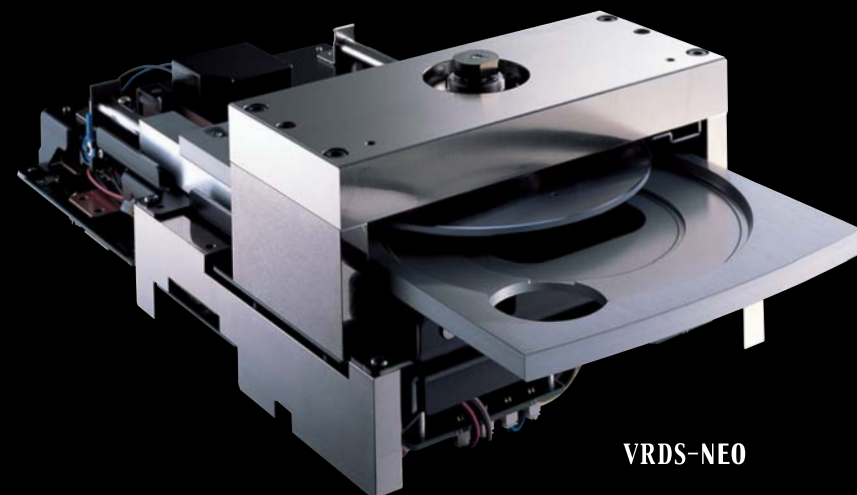
The X-01 D2, the flagship of ESOTERIC's "X" series integrated Super Audio CD/CD players opens a new realm of audio reproduction.

The X-01D2 incorporates ESOTERIC's P-03 series VRDS-NEO mechanism and the world's first user selectable dual D/A converter system. (*) This new audio system includes a proprietary DSD/PCM and PCM/DSD interactive signal conversion function.

(*) Available 2007 Aug.

Super Audio CD/CD Player

X-01 D2



VRDS-NEO



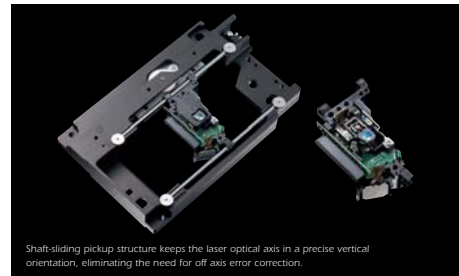
VRDS-NEO

ESOTERIC's uncompromising technologies include the proprietary VRDS-NEO (Vibration Free Rigid Disc-Clamping System), used as a core mechanical design helping to re-define sound quality.



20 mm thick steel bridge holds turntable and spindle providing ultra-low vibration and extremely accurate data retrieval

The P-03 VRDS-NEO mechanism, enhanced from the original X-01 mechanism, is an integration of ESOTERIC's highest grade "mechatronics," technologies, providing the ultimate experience in sound reproduction.



Shaft-sliding pickup structure keeps the laser optical axis in a precise vertical orientation, eliminating the need for off axis error correction.



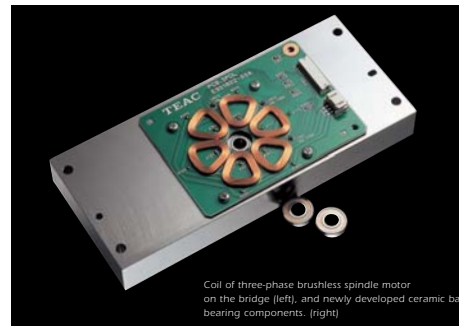
TEAC proprietary hall element sensing-type three-phase brushless motor. Speed feedback-controlled sled transport with superior response and minimal extraneous pickup lens movement.

Ultra-high-precision turntable system

When a Super Audio CD is played, the higher-speed rotational requirement causes increased and unwanted vibration. The VRDE-NEO turntable precisely supports disc rotation so adverse effects generated during high-speed rotation can be minimized. High-speed rotation also necessitates that the spindle shaft be more rigid than in the past. The turntable, which may be considered the heart of the VRDS-NEO mechanism, is supported by high-precision, highly rigid mechanical components.

[Coreless motor with no rotational irregularities]

ESOTERIC has developed a long-life three-phase brushless spindle motor for high-speed rotation. Development of the magnetic circuit, consisting of a neodymium magnet, was completed through numerous tests and scientific validations including magnetic field analysis. The optimized magnetic circuit minimizes rotational irregularities in the motor and makes it possible to reduce fluctuations in the motor drive current, thereby lessening any adverse effects on audio circuits and other areas.



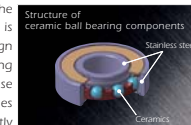
Coil of three-phase brushless spindle motor on the bridge (left), and newly developed ceramic ball bearing components. (right)

[Duralumin turntable]

During Super Audio CD playback, the maximum rotational speed is 4.5 times greater than the rotational speed during conventional CD playback. In order to ensure that the turntable can handle this high-speed rotation, ESOTERIC selected duralumin as the turntable material. This material is best known as a body material used in high speed aircraft. ESOTERIC developed new technology for processing this material into lower mass with higher dimensional precision. As a result, the P-03 enables ultra smooth turntable response and stable data acquisition by preventing disc vibration. The turntable is dyed black to absorb any diffused reflection of the laser from the pickup device.

[Rigidity and precision are significantly improved by the use of highly precise ball bearings in the spindle shaft bearing assembly]

A pair of precise ball bearings is used in the spindle shaft bearing unit and a pre-load is applied to the bearing inner rings. This design significantly reduces any potential for rattling and shaft shaking during use. The use of these specialized ball bearings dramatically increases the precision of the bearing unit, and greatly improves rotation and positioning accuracy. The ceramic ball bearings support smooth and precisely controlled turntable rotation from low speed to high speed.



[Massive bridge unit to support the turntable and the spindle unit]

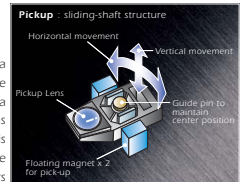
The X-01 D2 features a 20 mm-thick ultra high mass bridge (1.7 kg or 3.75 lbs), precisely processed from S5400 steel. This bridge rigidly supports the turntable and spindle unit. Any vibrations originating from the spindle during rotation are subsequently attenuated by the mass of the bridge.

Advanced pick up technology — thread servo section

ESOTERIC developed an ingenious component structure for driving the pickup lens using a horizontal sled structure. This design moves the pickup unit with an extremely high level of accuracy. This system ensures that the laser optical axis is always positioned at the very center of the pit track for optimal reading, making it possible to minimize the adverse effects of disc surface shaking and offset tracking often present with higher speed rotation.

[Pickup structure designed to prevent laser optical axis tilting during lens movement]

The pickup used in the X-01 D2 has a shaft-sliding structure that prevents the laser optical axis from tilting away from a vertical orientation even when the lens is moved. This stability in the optical axis pickup and vibration-free VRDS turntable combination, are the primary factors defining the outstanding mechanical performance of the X-01 D2.



[Speed feedback-controlled sled transport with superior response and minimal extraneous pickup lens movement]

To provide a very high-performance pickup capable of smooth, continuous movement, a proprietary hall element sensing-type, three-phase brushless motor is used in the sled transport. Powerful electronic speed feedback circuits control this sled mechanism. This is another design implementation that improves the precision and accuracy of the data acquisition process.

[Vibration isolation for spindle motor and moving sled systems]

The spindle system, which may generate fine vibrations during rotation, is isolated from the moving sled system. Since the sled mechanism requires very delicate electronic control, this isolation from high-frequency vibrations ensures superior data reading performance.

[High-precision mechanism and new software controlled servo control for superior playability]

The precision-machined proprietary mechanism combines with new system software to provide optimal servo control for each type of optical disc. This equates to superior playback capability regardless of the type of disc used.

[Disc tray shutter mechanism – Vibration seal]

When the disc tray is closed, the shutter seals the front tray opening. As a result, the shutter shields the internal mechanism, reducing any mechanical or sound pressure vibration induced by external noises (such as those created by loudspeakers). The vibration seal also stops airborne particles from entering the system.



1. Tray starts to slide back. 2. Tray stops. 3. Shutter starts to close. 4. Shutter closed and securely locked.

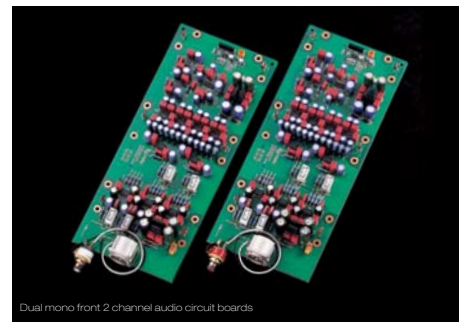
High-end Digital Technology

The X-01D2 has high quality, dual D/A converter devices on board: the Analog Devices "AD1955" DSD and PCM compatible device and the Burr Brown "PCM1704" multi-bit device.

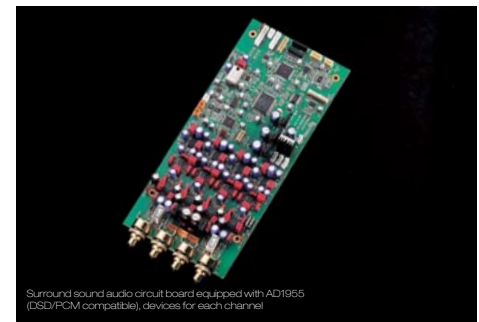
ESOTERIC's exclusive "D2," technology applies interactive format conversion functions between PCM and DSD, delivering maximum capability and flexibility for digital audio formats



A perpetual quest for source quality — The X-01D2 applies the essence of the D-03 D/A converter technology: dual mono front 2 channel audio circuit boards.



Dual mono front 2 channel audio circuit boards



Surround sound audio circuit board equipped with AD1955 (DSD/PCM compatible) device for each channel



"PCM1704" multi-bit DAC device x4 "AD1955" DSD/PCM compatible DAC device x1



Burr Brown operational amplifiers/German made WIMA film capacitors



WBT "nextgen" RCA terminals/High quality Rhodium plated AC power inlet

Dedicated high quality 2 channel audio output

The X-01D2 incorporates two different DAC devices; Analog devices AD1955 (PCM/DSD compatible DAC), and Burr Brown PCM1704 (multi-bit DAC). These two DAC devices offer three different DAC mode selections (multi-bit, 1-bit, and DSD mode), to meet wide variations of audio disc sources and to allow for a wide range of consumer choice. The AD1955 is used for DSD signal processing (Super Audio CD), and PCM/DSD interactive conversion function. The AD1955 contributes to reproduce the musical source, with full ambience throughout the entire audio range, while also providing a very smooth sound quality. The PCM1704 is used for PCM signal processing (CD). Following the established design of the X-01 series, four pieces of PCM1704 are used per channel to work in a differential mode. This design improves S/N ratio and provides high linearity of the source. The listener can enjoy etched sound imaging and low level signal linearity that only the multi-bit DAC can deliver. In addition to these 2 modes, the AD1955's built-in 1-bit DAC is selectable. In this 1-bit mode, the DSD signal is converted to a PCM signal, and then converted through the 1-bit DAC.

Mode Selection

REFERENCE mode

Signal source	DAC mode	
PCM(CD)	REFERENCE	PCM > [Multi-bit DAC]
DSD(SACD)	REFERENCE	DSD > [DSD DAC]

Multi-bit mode / 1 bit mode / DSD mode

Source	DAC mode	Front 2 channel	Surround Channel
PCM (CD)	Multi-bit	[Multi-bit DAC]	(None)
	1bit	[1bit DAC]	
	DSD	[DSD convert] > [DSD DAC]	
DSD (SACD)	Multi-bit	[PCM convert] > [Multi-bit DAC]	[PCM convert] > [1bit DAC]
	1bit	[PCM convert] > [1bit DAC]	
	DSD	[DSD DAC]	[DSD DAC]

High quality analog audio output for multi-channel support equipped with AD1955 DAC devices

The X-01D2 features the same Analog Devices AD1955 implementation for multi-channel audio output (The X-01D2 includes 6 pieces of AD1955 for 2 channel and multi-channel circuits). The 2 channel analog audio circuit and multi-channel analog audio circuits are identical in their components and layout. This implementation helps to reduce quality differences between 2 channel and multi-channel, achieving more natural and seamless multi-channel surround sound playback.

i.LINK (IEEE1394), interface with flow-rate-control

Audio grade i.LINK (IEEE1394), circuit designed by ESOTERIC, with flow-rate-control technology provides jitter free signal transmission. High grade digital signals read from Super Audio CD sources can be transmitted to other i.LINK devices equipped with flow-rate-control. These devices may include a multi-channel D/A converter, AV surround sound processor or AV receiver equipped with the i.LINK connection.

Word synchronization

The X-01D2 features a WORD SYNC input terminal to accept an incoming external WORD clock signal. The input can operate with 44.1 / 88.2 / 100 / 176.4 kHz clock signals. The unit can operate using an ESOTERIC original 100 kHz Universal Clock signal. The incoming ultra-stable clock signal produced by external components, such as a master clock generator effectively upgrade the unit, delivering higher performance with better defined and more natural sound. Because master clocks generate a signal to re-time the DAC and transport; transparency, staging, imaging and detail often improve.

Selected high-grade parts and internal wiring

- The X-01D2 uses two separate power supplies for digital and analog components. Each power supply uses an R-core transformer. This proprietary design implementation is highly efficient, reducing adverse effects on playback such as magnetic flux leakage, vibration or system noise. Furthermore, the power supply circuit is completely separated from the audio circuit board to minimize other adverse effects.
- High purity 6N (99.9999%), copper wire strands are used for main internal wiring. This wiring contributes to very high acoustic detail and finely textured sound expression from the X-01D2.
- The X-01D2 includes WBT "nextgen," RCA terminals with a conductive core made of pure material (gold plated pure copper), for analog audio output (L/R: front 2 channel) and digital audio outputs.

- High quality AC power inlet features Rhodium plated pure copper terminal with ultra low temperature treatment. This reduces noise associated with power line input.
- High grade audio components such as German made WIMA film capacitors, and Burr Brown operational amplifiers, contribute to a more dynamic three-dimensional sound stage reproduction from the X-01D2.

Highly rigid, center mounted chassis construction for VRDS stability

The X-01D2 chassis design is a perfect integration of ESOTERIC's state-of-the-art "mechanronics," technologies, allowing precise mechanism mounting and highly-rigid, resonance-free system construction. The internal sub chassis is divided into 3 sections to achieve high rigidity and optimal circuit layout, reducing interference between each circuit component.

The high mass VRDS-NEO mechanism is securely mounted on the center division of the sub chassis to achieve optimal rigidity. The chassis is supported by three pinpoint isolation feet made of quenched steel, allowing the unit to be mechanically isolated from its environment. The front panel is made of thick extruded aluminum, the top panel (with exquisitely engraved "ESOTERIC" logo), and side panels are also made of thick aluminum. This heavy construction, combined with the Disc Tray Shutter mechanism, isolate the unit from external adverse effects such as sound pressure from loudspeakers or other external vibrations. Internal vibrations are also damped by the use of this hardened "chassis in chassis" system design.