

Reference 503 Series

NT-503DAB


USB DAC/Network Player



Exploring Music World with Versatile Network Player at the highest standard produced by Dual-monaural USB DAC

■ **Main functions**

- Dual AK4490 D/A Converters from Asahi Kasei process 11.2MHz DSD and 32-bit/384kHz PCM
- USB DAC Supporting 11.2MHz DSD and 384kHz PCM Hi-Res Audio Streaming from PC via USB
- 5.6MHz DSD and 192kHz WAV/FLAC Hi-Res Audio Streaming via Ethernet or USB Flash Memory
- Bluetooth® aptX® High-quality Wireless Music Streaming from Smartphone and Tablet
- Subscribing On-line Music Services such as Spotify, Deezer and Internet Radio Stations
- Dual-monaural Circuit Design, and Balanced Analog Audio Output with XLR Connectors
- Up-conversion to 12.2MHz DSD and 384kHz PCM
- "TEAC-HCLD" Enhanced-current Buffer Amplifiers
- "TEAC-QVCS" High-precision Volume Control Circuits
- High-precision On-board Clocks for 44.1kHz and 48kHz-system, and 10MHz External Clock Input
- Compact Full-metal Body in A4-size Footprint
- "TEAC HR Remote" Free Remote Apps for iOS/Android
- "TEAC HR Audio Player" Free Hi-Res Audio Player Software for Windows/Mac

		
Brand	TEAC	
Series	Reference 503	
Model Name	NT-503DAB-S	NT-503DAB-B
Color	Silver	Black
Main Unit Dimensions Weight	290 x 81.3 x 247.8mm / 11.4" x 3.2" x 9.8" (W x H x D) 3.9kg / 8.6 lbs.	
Package Dimensions GW	440 x 190 x 340mm / 17.3" x 7.5" x 13.4" (W x H x D) 5.4kg / 11.9 lbs.	

■ Overview

The NT-503 employs an identical DAC section to the UD-503DAB which is a TEAC's flagship D/A converter unit. In order to reproduce Hi-Res Audio sound on both left and right channels precisely and independently, the NT-503DAB accommodates a pair of Toroidal-core power transformers and dual DAC chipsets, and symmetrically layout output stages on the dual-monaural circuit design concept, while the "TEAC-HCLD" circuit which consists of four discrete enhanced-current buffer amplifiers settled at both positive and negative phases on both left and right channels is employed in the analog line amplifier section, and it enhances transient character and precisely renders dynamism of music.

The NT-503DAB also applies up-conversion to all in-coming digital audio signals, based on a fluency algorithm that processes more natural interpolates than conventional up-conversion methods. Any in-coming digital audio signals can be transformed into 12.2MHz or 384kHz PCM at maximum. (maximum value may vary depends on the original digital audio data.), and missing audio data higher than 20kHz are produced by analogical interpolation algorithm to restore natural sound as close as the original one

■ Supports a variety of sources

● Versatile Connectivity – Wide variety of Input formats and devices

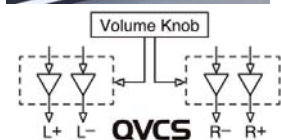
The NT-503DAB provides high-quality music playback from various types of input sources, LAN, Bluetooth® and USB. As the UD-503 does, it supports Hi-Res audio playback like 11.2MHz DSD and 384kHz/32-bit PCM from PC via USB cable, while 5.6MHz DSD and 192kHz/24-bit music streaming via LAN supporting DLNA1.5, or USB Flash Memory. Furthermore, Bluetooth® wireless connection supporting aptX® and AAC codec allows you to enjoy high-quality music streaming wirelessly, as free apps for iOS/Android "TEAC HR Remote" allow you to subscribe Internet Radio stations and premium on-line music services like Spotify and Deezer. The NT-503DAB also supports aerial digital broadcasting, DAB and DAB+.



● Pre-amplifier circuits supporting full-balanced output

Supporting three types of output level modes, Fixed (0dB), Fixed (+6dB) and Variable, on both balanced and unbalanced analog outputs, the NT-503DAB can be combined with either a conventional Stereo Integrated Amplifier, or a Power Amplifier to compose a pure hi-fi system.

Same as the UD-503, the volume section employs the "TEAC-QVCS" which is a high-precision volume control system by controlling four variable-gain amplifier circuits simultaneously. As a result, the NT-503 delivers crystal clear sound with excellent channel separation brought in by maintaining independency of both positive and negative phases on both left and right channels.

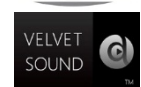


■ High-quality Audio Circuits that render texture of music

● High-performance VERITA AK4490 DACs support 11.2MHz DSD and 384kHz/32-bit PCM

As a heart of a digital audio system, the NT-503DAB employs VERITA AK4490 DACs, designed by Asahi Kasei Microdevices Corporation and have an established reputation for use in high-end audio equipment.* The VELVET SOUND architecture on the AK4490 is capable of produce fine-detailed expression of sound even outside the human audible range that is necessary for Hi-Res Audio playback. And newly developed Low Distortion Technology achieved 112dB of S/(N+D) which is the highest level in the industry for a 120dB-class DAC.

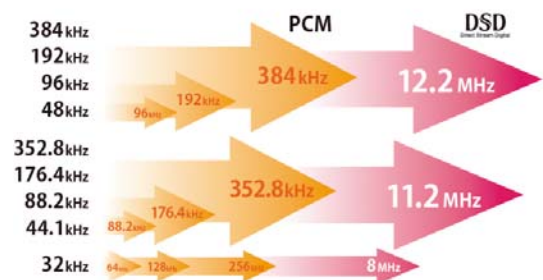
Not only 11.2MHz DSD Native playback, the NT-503DAB also supports wide variety of Hi-Res Audio sources, including 384kHz/32-bit PCM, and achieved smooth details and outstanding sense of sound placement that characterize Hi-Res Audio.



* The AK4490 is a product in the Audio4pro™ family brand developed by Asahi Kasei Microdevices Corporation for professional audio equipment and high-end digital audio applications.

● **DSD and 8x PCM Up-conversion Provide a New Horizon for your Digital Libraries including CDs**

The NT-503DAB also equips a TEAC's own design FPGA (programmable IC) that employs a fluency algorithm to smoothly augment digital audio signals, in addition to the 2x, 4x and 8x PCM up-conversion processing, DSD up-conversion is also supported as high as 12.2MHz. Thanks to this unique system, the NT-503DAB up-converts 44.1kHz/16-bit data from a conventional CD into 11.2MHz DSD which is greater than 256 times, while missing audio data higher than 20kHz are produced by analogical interpolation algorithm to restore natural sound as close as the original one. You will experience the dense sense of air that DSD format inherently have, even when listening to CD or MP3 from your huge music collection.



● **High-precision 44.1kHz and 48kHz On-board Internal Clocks, and 10MHz External Clock Input**

In the PC Streaming mode via USB cable, asynchronous transfer mode that refers high-precision and less-noise internal clock is employed, instead of referring less-precise and noisy clock generated on PC. The NT-503DAB accommodates two on-board internal clocks operated by low phase-noise type high-precision crystal oscillators for 44.1kHz and 48kHz systems. Either 44.1kHz clock or 48kHz clock is applied to in-coming digital audio signal with integral multiple sampling frequency, and eliminates jitter noise that affects to sound quality, and reproduce the original sound.



In addition, a 10MHz external clock input allows the NT-503DAB to synchronize with more precise master clock generator, and you will feel the difference of the sound quality refined by more precise clock, and enjoy a variety of the tone.

● **PCM/DSD Filters for Multifaceted Personality on a Single Unit**

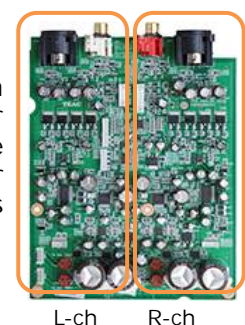
In addition to four types of PCM digital filters and an OFF mode, the unit has two types of DSD digital filters, so you can choose the best filter for the input file format and type of music. You can enjoy the subtle sound nuances of different filters without needing to connect different USB DACs.

PCM	FIR SHARP	An FIR filter with a steep roll-off sharply cuts signals outside the audio band. *
	FIR SLOW	An FIR filter with a slow roll-off gently cuts signals outside the audio band. *
	SDLY SHARP	A short delay filter with a steep roll-off sharply cuts signals outside the audio band. *
	SDLY SLOW	A short delay filter with a slow roll-off gently cuts signals outside the audio band. *
DSD	CUT OFF 50kHz	A cut-off filter at 50kHz
	CUT OFF 150kHz	A cut-off filter at 150kHz

* These filters are applicable to all PCM data except 352.8kHz and 384kHz.

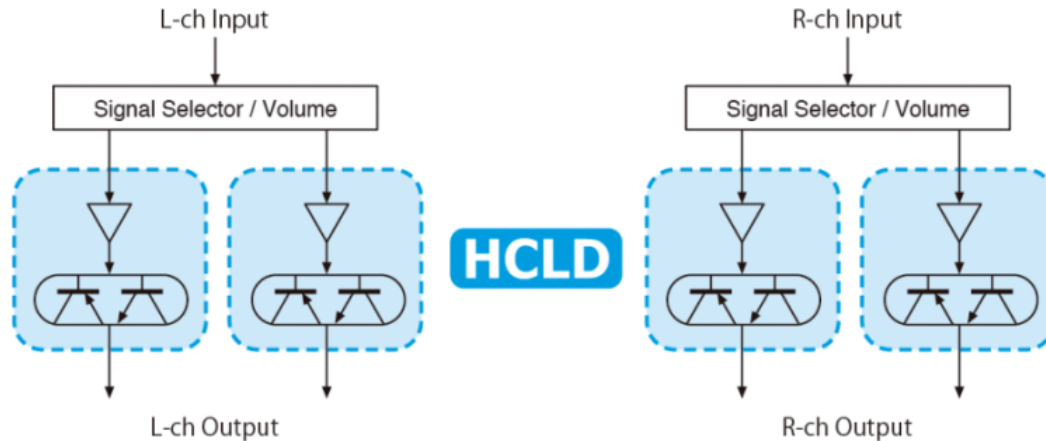
● **All-new Dual-monaural Circuit Design for Outstanding Performance**

Behind its class-over expressiveness of the NT-503DAB, an all-new lavish dual-monaural circuit design concept is employed throughout the power supply units, DAC units, and analog output stage. High-efficient Toroidal-core power transformers, and high-performance DAC chips VERITA AK4490, for example, each channel is designed as a single monaural circuit, and prevents the audio signal from interfering by another channel.



- "TEAC-HCLD" Quad enhanced-current Output Buffer Circuits for Dynamism of Music

From TEAC's decades of experiences in high-end audio design, the analog amplifier section employs a pair of discrete enhanced-current buffer amplifier "TEAC-HCLD" (High Current Line Driver) circuits on each channel. Each pair of buffer amplifier sections enhances transient character by processing a differential drive in balanced output mode, and parallel drive in unbalanced output mode. As results, the NT-503DAB delivers wide dynamic range the original Hi-Res Audio data have, without losing dynamism of music.



- Isolated Grounds for Digital and Analog Sections

Between the digital and analog sections, the NT-503DAB employs a Digital Isolator to completely isolate each power supply path and the ground. So, all digital noise coming from digital sources, particularly PC, is prevented from entering the analog section through the power supply path or the ground. An isolation circuit offers significant benefit particularly when playing back Hi-Res Audio sources that have higher sampling frequency.



- Dual Toroidal-core Power Transformers for Each Channel

The NT-503DAB accommodates a high-capacity Toroidal-core power transformer on both left and right channels, to supply clean and stable current independently, on the dual-monaural design concept. Each power unit enables the stable current supply to each channel without being influenced by the changes in current consumption due to processing of the other channel's signal. Regardless its compact unit, incorporated approach used in much larger high-end audio products is applied.



- Volume Display on OLED for Excellent Visibility

The organic electroluminescent display (OLED) with a 4-level dimmer provides high contrast and excellent visibility. A large-sized font allows you to check the volume level even from distant positions like couch.



■ Versatile Connectivity – Wide variety of Input formats and devices

- Hi-Res Audio Playback from PC via USB Cable

With a single USB Cable, Hi-Res Audio data such as 11.2MHz DSD and 384kHz/32-bit PCM can be played back without making complicated settings. TEAC offers free music apps "TEAC HR Audio Player" for Windows and Macintosh, that support create, save and recall playlists, while simplified operation allows you to just drag-and-drop music files to the playlist window.

* A separated driver is required on Windows.

● Hi-Res Audio Streaming via Network

The NT-503DAB is a versatile network player that offers network audio capability compatible with DLNA 1.5. Hi-Res Audio formats such as 5.6MHz DSD and 192kHz/24-bit WAV/FLAC can be played back from PC or NAS (Network Attached Server) with free apps for iOS/Android "TEAC HR Remote".

● High-quality Wireless Streaming via Bluetooth®

The NT-503DAB also supports Bluetooth® wireless connection with advanced codec technologies aptX® and AAC, as well as a conventional codec SBC. You will enjoy high-quality music streaming from your smartphone or tablet.



* The NT-503DAB does not support wireless audio transmission to Bluetooth® Wireless Headphones.

● Front USB port for Hi-Res Audio Playback

The NT-503DAB's USB port on front panel supports 5.6MHz DSD and 192kHz PCM stored on a USB Flash Memory, as well as conventional MP3 and WMA files. Free apps "TEAC HR Remote" for iOS/Android turns your smartphone and tablet into a touch-screen remote controller to browse and select music files on the USB Flash Memory.



● Music Streaming from your iOS/Android Devices

With free apps "TEAC HR Remote" for iOS/Android, the NT-503DAB allows you to subscribe on-line music services like Spotify, and Deezer, as well as tunein Internet radio portal that provides over 100,000 radio stations and 4 million podcasts all over the world at free of charge. Since the NT-503DAB directly receive those streaming signal from Internet, – not via your smartphone or tablet – ringtone will not be overlapped on the music. The NT-503DAB also supports aerial digital broadcasting, DAB.

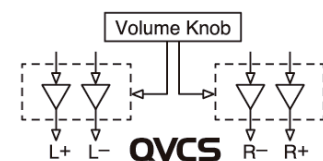
■ Pre-amplifier circuits supporting full-balanced output

● Carefully Designed Pre-amplifier Circuit Draws Finer Details of DSD

The NT-503DAB's high-quality analog output achieved by dual-monaural design and the "TEAC-HCLD" circuit, behaves as an ideal Pre-amplifier unit supporting various type of music format and input sources. The NT-503DAB delivers both balanced and unbalanced audio signal at "Fixed ($\pm 0\text{dB}$)", "Fixed (+6dB)" which is optimized for DSD source, or "Variable", allows you to connect a power amplifier unit directly to establish a pure hi-fi system. In addition to these settings, "Off" setting disables audio signal delivering from the rear connectors, to concentrate its performance to headphone output.

● Pre-amp Circuits now Use "TEAC-QVCS" High-precision Volume Control

In the pre-amp section, the NT-503DAB employs the "TEAC-QVCS" (Quad Volume Control System), which is a fully-balanced circuit design between the exits of the D/A Converters and Volume Amplifier section. Control signals transmitted from the volume knob precisely controls four independent variable-gain amplifiers simultaneously – positive and negative on both left and right channels. With this circuit design, audio signal paths are simplified, and independence of the left and right channels and positive and negative phases is preserved, and achieved clear sound quality with outstanding channel separation. (This does not apply to unbalanced analog input.)

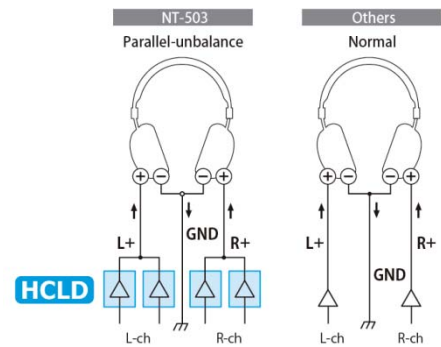


This "TEAC-QVCS" also provides 256 steps or 0.5dB steps of volume control which is precise throughout the effective range between -95dB and +24dB. And, this allows you to adjust both line output and headphone volume to the exact level you wish with a remote control, which is hard to adjust with a motorized volume control. This is quite useful and remarkable feature when you connect various types of headphones that have different impedance.

● Headphone Amplifier Shares the "TEAC-HCLD" Circuits for High-quality Headphone Listening

Same as the UD-503, the NT-503DAB also employs a high-performance headphone amplifier that delivers 500mW+500mW of output power, and the "TEAC-HCLD" circuits composed by four output transistors still used in parallel-drive mode that drives conventional single-end headphones powerfully and precisely.

In addition, a unique-designed class-AB amplifier with extended class-A operation range allows the NT-503DAB to process most part of amplification process in class-A mode, and maximizes potential of wide range of headphones, including 600 ohms high-impedance ones.



■ Features at-a-glance

- USB DAC supporting 11.2MHz DSD Native Playback and 384kHz/32-bit PCM, from PC via a USB
- 5.6MHz DSD and 192kHz/24-bit WAV/FLAC Streaming Playback via LAN (DLNA1.5 Compatible Remote Playback, and Home Media Playback)
- 5.6MHz DSD and 192kHz/24-bit WAV/FLAC Playback from USB Flash Memory
- High-quality Wireless Playback via Bluetooth® supporting aptX®, AAC and SBC Codec
- Access to the Internet Radio Stations
- Access to the aerial digital broadcasting stations on DAB and DAB+
- Free Remote App for iOS and Android
- Free Music Playback App for Windows/Mac, supporting 11.2MHz DSD
- Dual D/A Converters AK4490 from Asahi Kasei Microdevices Corporation
- DSD and PCM Filters for Multifaceted Personality on a Single Unit
- 10MHz External Clock Input for more precise clock operation (Applicable for USB Asynchronous Mode)
- High-precision On-board Clocks for 44.1k and 48kHz systems (Applicable for USB Asynchronous Mode)
- Up-convert to 12.2MHz DSD and 384kHz PCM for finer detail
- "TEAC-HCLD" Quad Buffer Amplifier Circuits for enhanced current
- "TEAC-QVCS" High-precision Volume Control Circuits
- XLR Balanced and RCA Unbalanced Line Outputs with Fixed (0dB, +6dB) or Variable Output Level
- Switchable XLR Polarity (2: HOT or 3: HOT)
- USB B Port for PC Streaming, Ethernet Port for Network Streaming
- Coaxial and Optical Digital Inputs
- Coaxial/Optical Digital Input on Front for Connection with Portable Digital Audio Player
- Discrete Headphone Amplifier with 500mW + 500mW Output Power supports Parallel Unbalanced Drive
- Large Volume Display on Multi-function OLED with Excellent Visibility (4-step Dimmer)
- Low Power Consumption with Auto Power Saving
- Robust Full-metal Body Eliminates Exogenous Noise with Elegant Appearance
- RoHS Complied

■ Specifications

Supported Formats

USB (Rear, USB B-type)	
DSD	2.8/5.6/11.2 MHz
PCM	44.1/48/88.2/96/176.4/192/358.4/384 kHz, 16/24/32-bit
Coaxial Digital	
DSD	2.8 MHz (by 176.4kHz/24-bit DoP Transmission)
PCM	32/44.1/48/88.2/96/176.4/192 kHz, 16/24-bit
Optical Digital	
DSD	2.8 MHz (by 176.4kHz/24-bit DoP Transmission)
PCM	32/44.1/48/88.2/96/176.4/192 kHz, 16/24-bit

DLNA Remote Play	
DSD	2.8/5.6 MHz
LPCM	44.1/48 kHz, 16-bit
WAV	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96/176.4/192 kHz, 8/16/24-bit
FLAC	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96/176.4/192 kHz, 8/16/24-bit
AAC	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96 kHz, 8k to 320kbps and VBR
Apple Lossless	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96 kHz, 16/24-bit
WMA Lossless	44.1/48/88.2/96 kHz, 16/24-bit
WMA DRM Lossless	44.1/48/88.2/96 kHz, 16/24-bit
WMA Standard	8/11.025/16/22.05/32/44.1/48 kHz, 5k to 320kbps and VBR
WMA DRM Standard	8/11.025/16/22.05/32/44.1/48 kHz, 5k to 320kbps and VBR
OGG Vorbis	8/11.025/16/22.05/32/44.1/48 kHz, 32k to 500kbps and VBR
MP3	8/11.025/12/16/22.05/24/32/44.1/48 kHz, 8k to 320kbps and VBR
Home Media	
DSD	2.8/5.6 MHz
WAV	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96/176.4/192 kHz, 8/16/24-bit
FLAC	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96/176.4/192 kHz, 8/16/24-bit
AAC	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96 kHz, 8k to 320kbps and VBR
Apple Lossless	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96 kHz, 16/24-bit
WMA Lossless	44.1/48/88.2/96 kHz, 16/24-bit
WMA Standard	8/11.025/16/22.05/32/44.1/48 kHz, 5k to 320kbps and VBR
OGG Vorbis	8/11.025/16/22.05/32/44.1/48 kHz, 32k to 500kbps and VBR
MP3	8/11.025/12/16/22.05/24/32/44.1/48 kHz, 8k to 320kbps and VBR
USB (Front, USB A-type)	
DSD	2.8/5.6 MHz
WAV	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96/176.4/192 kHz, 8/16/24-bit
FLAC	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96/176.4/192 kHz, 8/16/24-bit
AAC	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96 kHz, 8k to 320kbps and VBR
Apple Lossless	8/11.025/12/16/22.05/24/32/44.1/48/64/88.2/96 kHz, 16/24-bit
WMA Lossless	44.1/48/88.2/96 kHz, 16/24-bit
WMA Standard	8/11.025/16/22.05/32/44.1/48 kHz, 5k to 320kbps and VBR
OGG Vorbis	8/11.025/16/22.05/32/44.1/48 kHz, 32k to 500kbps and VBR
MP3	8/11.025/12/16/22.05/24/32/44.1/48 kHz, 8k to 320kbps and VBR
<u>DAC section</u>	
D/A Converter	Asahi Kasei Microdevices AK4490 x 2
Up-conversion	x8, x4, x2, Off (Max. 384kHz), DSD (Max. 12.2MHz)
Supported OS	
Windows	Windows 10, Windows 8.1, Windows 8, Windows7
Macintosh	OS X El Capitan (10.11.1), OS X Yosemite (10.10), OS X Mavericks (10.9), OS X Mountain Lion (10.8), OS X Lion (10.7)
<u>Network section</u>	
Connector	100Base-T
Supported Protocol	DLNA Remote Play (DLNA1.5 compatible), Home Media
On-line Music section	
Internet Radio Access	tunein Internet Radio Portal
Supported On-line Services	Deezer, Spotify
Aerial Broadcasting	DAB, DAB+
<u>Bluetooth® section</u>	
Bluetooth® Version	V2.1 +EDR
Bluetooth® Class	Class 2 (Range: approx. 10m/33ft.)
Supported Profile	A2DP, AVRCP
Supported Codec	aptX®, AAC, SBC

Audio Performance

Frequency Response	5Hz to 80kHz (+1dB, -3dB)
Signal-to-Noise Ratio	
Balanced Output	112dB (A-weighted, 1kHz)
Unbalanced Output	110dB (A-weighted, 1kHz)
Total Harmonic Distortions	00015% (1kHz, LPF: 20Hz to 20kHz)

General

Power:	AC 230V 50Hz (UK/Europe)
Power Consumption	18Watts (0.4Watts at Standby, 3Watts at Network Standby)
Overall Dimensions (W x H x D)	290 x 81.3 x 248.7 mm / 11.4" x 3.2" x 9.8"
Weight:	3.9 kg / 8.6 lbs.
Accessories:	Power Cord, Remote Control (RC-1320), AAA Batteries x 2, Owner's Manual (including Warranty Card)

Required Driver Software

Windows	TEAC Driver (complementary from TEAC, Available on TEAC Website)
Macintosh	none (no driver software required)

Optional Remote Apps

iOS	TEAC HR Remote for iOS (complementary from TEAC, Available on App Store)
Android	TEAC HR Remote for Android (complementary from TEAC, Available on Google Play)

Optional Hi-Res Audio Playback Apps

Windows	TEAC HR Audio Player for Win (complementary from TEAC, Available on TEAC Website)
Macintosh	TEAC HR Audio Player for Mac (complementary from TEAC, Available on TEAC Website)

■ Rear Panel

