CD Player 2 / CD Player 3 / CD Player 4

MusicBank™ System

Nakamichi

Destined to become classics, Nakamich

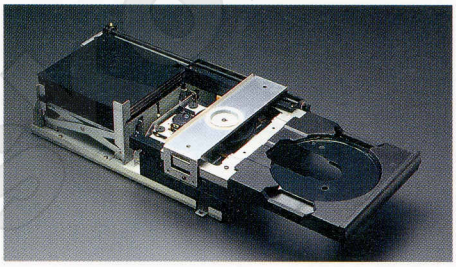
State-of-the-art CD reproduction plus the unique advantages of the Nakamichi *MusicBank System*

CD Player 2

MusicBank System

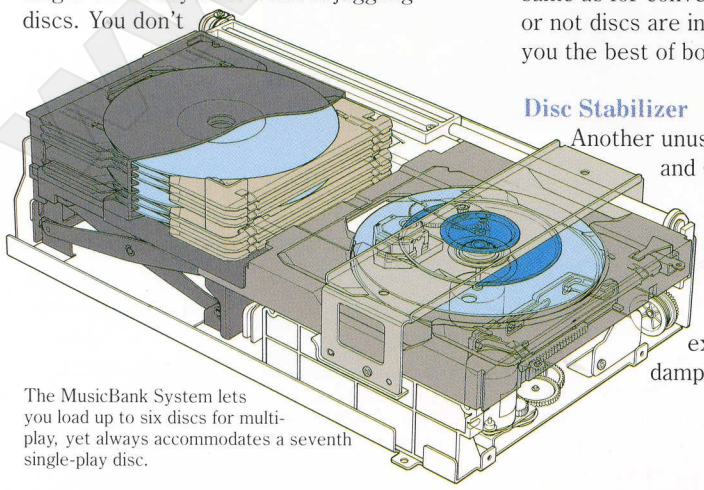
Their distinctive, clean styling aside, Nakamichi CD players may outwardly appear quite conventional. Look inside, however, and you'll find unique digital audio and transport mechanism technologies that set them apart from other players. Particularly noteworthy in CDPlayer2 and CDPlayer3 is Nakamichi's extraordinary MusicBank System.

Operationally, playing a single CD with the MusicBank System is no different than with ordinary single-disc players. The twist is an ingenious "1+6" stocker mechanism that lets you internally store up to six discs for fast access at any time. You load, inspect, or unload CDs via the same single-disc tray. And even with six discs in the stocker mechanism, you can play a single CD at any time without juggling discs. You don't even have to remove the single disc to play any of the stored discs.



The MusicBank System, designed and manufactured by Nakamichi, is unlike any other single- or multi-disc mechanism.

The MusicBank System is significantly quieter and faster than conventional changer mechanisms. It requires no external cartridge for multi-disc operation. And because single-disc operation is the same as for conventional players whether or not discs are internally stored, it offers you the best of both worlds.

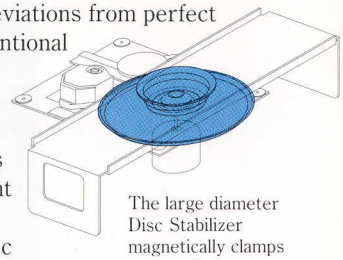


The MusicBank System lets you load up to six discs for multi-play, yet always accommodates a seventh single-play disc.

Disc Stabilizer

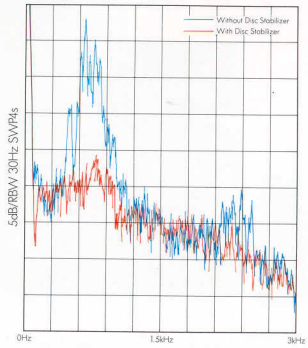
Another unusual feature in CDPlayer2 and CDPlayer3 is a large-diameter Disc Stabilizer that is magnetically clamped into place atop the CD before playing. It suppresses the effects of external vibrations and dampens disc resonances.

In CD players, focus servo circuitry is used to continually compensate for the disc's minute deviations from perfect flatness. Conventional CD player mechanisms must rely heavily on focus servo to prevent mistracking. Nakamichi's Disc Stabilizer attacks the problem at its source.



The large diameter Disc Stabilizer magnetically clamps onto each disc to suppress vibrations during play.

Painstaking research was required to optimize the shape and materials used in the Disc Stabilizer. The result is a significant reduction in focus servo activity. And this, in turn, yields more transparent sound reproduction, with improved musical definition and imaging.



Measurements of focus servo error with and without the Disc Stabilizer reveal a dramatic improvement.

i CD Players redefine Compact Disc enter

A surprisingly affordable high-performance CD player
featuring the exclusive *MusicBank System*

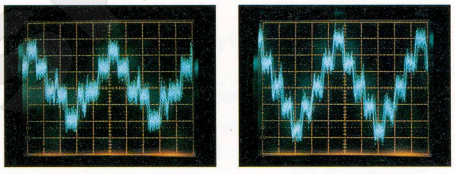
CD Player 3

Enhanced Linearity 20-bit D/A Converters

Nakamichi has shown in the past that the intrinsic precision of a digital-to-analog (D/A) converter is far more important than the simple number of bits used. Yet, if a 20-bit design can, in fact, provide the required precision, the improvements in resolution, linearity, and dynamic range are well worthwhile. Nakamichi engineers have succeeded in doing just that with the new Enhanced Linearity (EL) 20-bit D/A Converter system, featured in CDPlayer2.

Prior to conversion, the 20-bit signal from the digital filter is recalculated into two sets of 16-bit data for each channel. These are handled separately by two D/A converters per channel: one for signals above and another for signals below a −24dB threshold. Signals below −24dB are digitally "boosted" by a factor of 16 before being processed by the second D/A converter. The output of that converter is then attenuated by the same amount in the analog domain before being summed with the output of the first converter. This design provides true 20-bit precision for the most critical low-level signals because the smallest incremental change is represented with 16 times (equivalent to 4 additional bits) the accuracy of conventional uncompensated converters.

The Nakamichi EL D/A converter sonically outperforms other designs regardless of the number of bits. You'll hear musical detail, soundstage precision, and ambience you never knew existed on your CDs.



Oscilloscope traces of a 1kHz triangular waveform (16-bit data) at −86.05dB reveal the true resolution capability of D/A converters.
Competitive 20-bit design (left) is unable to reproduce the finest steps of the waveform. Nakamichi EL 20-bit converter (right) resolves the most minute signal detail.

Advanced Digital and Analog Circuitry

CDPlayer2 also features a newly developed high-stability servo system that ensures superior disc tracking. In CDPlayer2 and CDPlayer3, tracking ability is also improved by locating the RF amplifier right at the optical transport. In conventional players, the RF amplifier is on the main circuit board, necessitating an excessively long signal path between the optical pickup and the processing circuitry.

CDPlayer2 and CDPlayer3 also feature digital de-emphasis. When required, de-emphasis is performed entirely in the digital domain to avoid phase shifts and distortion.

All three Nakamichi CD players employ 8-times oversampling digital filters to improve dynamic range and permit the use of less radical analog filtering. And the analog low-pass filters are linear-phase active 3rd-order Bessel-type circuits that ensure a high degree of phase accuracy.

Other Features

Nakamichi CD players incorporate multi-regulated power supplies and Nakamichi's Isolated Ground topology to prevent noise interference between the analog and digital circuit sections. They also provide a full complement of disc and track search, access, and programming features to let you more fully enjoy your CD collection. And you can access virtually all operating functions via the infrared wireless remote control included with each Nakamichi CD player.

CDPlayer2

- MusicBank System
- Disc Stabilizer
- Dual EL 20-bit D/A converters
- 8-times oversampling digital filter
- GIC (generalized impedance converter) structure linear-phase 3rd-order Bessel-type active low-pass filtering
- New high-stability servo system
- Digital de-emphasis
- Multi-regulated power supply
- Isolated Ground topology
- Delete Play
- 3-way Random Play
- 3-way Repeat

tainment.

An economical CD player engineered to
Nakamichi's exacting standards

CD Player 4

Play • 50-program memory • Synchro Recording for automated CD dubbing with most Nakamichi cassette decks • 3-inch disc compatible in single-disc mode • Digital output • Remote-controllable, motor-driven variable output level/ headphone level • Full-function wireless remote control

CDPlayer3

• MusicBank System • Disc Stabilizer • Dual 18-bit linear glitch-free D/A converters • 8-times oversampling digital filter • Linear-phase 3rd-order Bessel-type active low-pass filtering • Digital de-emphasis • Multi-regulated power supply • Isolated Ground topology • Delete Play • 3-way Random Play • 3-way Repeat Play • 50-program memory • 3-inch disc compatible in single-disc mode • Headphone output with level control • Full-function wireless remote control

CDPlayer4

For an affordable high-performance single-disc player that delivers uncompromising musical accuracy, you need look no further than Nakamichi's CDPlayer4. Featuring advanced Nakamichi digital and analog technologies, CDPlayer4 provides highly satisfying musical reproduction with exceptionally wide dynamic range and precise sonic detail.

CDPlayer4 provides a digital output terminal for direct connection to other digital audio components.

• Dual 18-bit linear glitch-free D/A converters • 8-times oversampling digital filter • Linear-phase 3rd-order Bessel-type active analog low-pass filtering • Advanced disc-drive mechanism with floating construction • Multi-regulated power supply • Isolated Ground topology • Memory Play • Repeat Play • 3-inch disc compatible • Digital output • Headphone output with level control • Full- function wireless remote control

Nakamichi Systems

Nakamichi CD players are part of a complete line of exceptional home audio components, including receivers and cassette decks. By combining these components, you can easily build extraordinary, visually stunning systems that are unrivaled in sonic performance, quality, ease-of-use, versatility, and value.

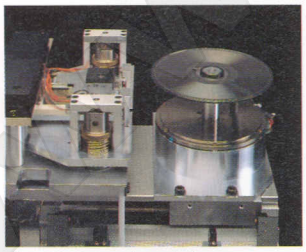
With Nakamichi systems, you can also take advantage of sophisticated features, such as System Remote and multi-room control capabilities.

Nakamichi

Better CD Players Don't Happen By Accident.

The Nakamichi OMS-2000 represents the state-of-the-art in optical disk analysis systems.

The first time you audition a Nakamichi CD player, you'll be amazed. The finest musical detail will be revealed to you with effortless clarity. Soundstage and ambience information will be presented with uncanny accuracy. And you'll wonder why other CD players fail to do the same.



The OMS-2000's optical transport mechanism provides absolute positioning with unrivaled precision.

The fact is CD player technology of Nakamichi's caliber is not developed overnight. Nor is it "stumbled on" by accident. It is years of fundamental research that has put Nakamichi at the forefront of optical disk and digital signal processing technologies. And combined with a unique product design philosophy, this research has put Nakamichi CD players in a class of their own.

Witness the Nakamichi OMS-2000 optical disk analysis system (pictured above). Incorporating unerringly precise transport and drive mechanisms built by Nakamichi, this remarkable read/write instrument permits sophisticated measurements on virtually every type of optical disk that has been or will be developed. In use today at nearly all well-known data industry companies on the globe, the OMS-2000 has become the *de facto* standard.

The Nakamichi Concert Hall: the ultimate reference standard.

Using an OMS-2000 to play CDs would be overkill. Yet, the technical expertise that has allowed Nakamichi to claim a 95 per cent share worldwide in optical disk analysis equipment of this type also yields unmistakable benefits for the owner of a Nakamichi CD player.

And because Nakamichi knows that musical accuracy is not only about numbers, the research extends beyond the laboratory. Part of every product development cycle are extensive "live vs. reproduced" tests, made possible by a specially designed concert hall and listening room at Nakamichi's headquarters R&D facility.

The Nakamichi Listening Room: a highly essential piece of "test equipment."

What may be an extravagance for others is a basic necessity for Nakamichi. But that's what it takes to make a better CD player.

Feature Comparison

	CDPlayer2	CDPlayer3	CDPlayer4		CDPlayer2	CDPlayer3	CDPlayer4
MusicBank System	●	●		Delete Play	●	●	
Disc Stabilizer	●	●		Random Play	●	●	
3-inch disc compatible	●	●	●	Synchro Recording	●		
8-times oversampling digital filter	●	●	●	Disc Scan	●	●	
Dual Enhanced Linearity 20-bit D/A converters	●			Time Data Memory	●	●	
Dual 18-bit linear glitch-free D/A converters		●	●	Repeat Play	●	●	●
Linear-phase 3rd-order Bessel-type active filtering	●	●	●	System Remote terminal	●	●	●
Digital de-emphasis	●	●		Digital output terminal	●		●
Multi-regulated power supply	●	●	●	Large FL display	●	●	●
Isolated Ground topology	●	●	●	Disc Calendar	●	●	
Floating disc drive mechanism	●	●	●	Motor-driven variable output level	●		
High-precision silent mechanism	●	●		Headphone output with level control	●	●	●
New high-stability servo system	●			Wireless remote control	●	●	●
Memory Play	●	●	●				

Specifications

	CDPlayer2	CDPlayer3	CDPlayer4
Main Unit			
System	Compact Disc digital audio	Compact Disc digital audio	Compact Disc digital audio
Signal Detection	Optical (semiconductor laser)	Optical (semiconductor laser)	Optical (semiconductor laser)
Error Correction	CIRC system	CIRC system	CIRC system
Number of Channels	2-channel stereo	2-channel stereo	2-channel stereo
Sampling Frequency	44.1kHz	44.1kHz	44.1kHz
Disc Rotational Velocity	Approx. 200 to 500 rpm (constant linear velocity)	Approx. 200 to 500 rpm (constant linear velocity)	Approx. 200 to 500 rpm (constant linear velocity)
D/A Converter Type	20-bit dual converters	18-bit dual converters	18-bit dual converters
Digital Filter	8fs oversampling	8fs oversampling	8fs oversampling
Wow & Flutter	Below limits of measurement	Below limits of measurement	Below limits of measurement
Frequency Response	5–20,000Hz ±0.5dB	5–20,000Hz ±0.5dB	5–20,000Hz ±0.5dB
Signal-to-Noise Ratio (IHF A-wtd)	Better than 105dB	Better than 105dB	Better than 105dB
Dynamic Range	Better than 100dB	Better than 98dB	Better than 97dB
Total Harmonic Distortion (1kHz)	0.0035%	0.0035%	0.0035%
Total Harmonic Distortion + Noise (1kHz)	0.004%	0.004%	0.004%
Channel Separation	Better than 100dB	Better than 95dB	Better than 95dB
Output (1kHz, 0dB) Line:	2.0V/600 ohms (fixed) 2.0V/600 ohms (variable, output level at max.)	2.0V/600 ohms	2.0V/600 ohms
Headphones:	60mW into 40 ohms (output level at max.)	60mW into 40 ohms (phones level at max.)	60mW into 40 ohms (phones level at max.)
Power Requirement	120, 230, 240 or 110/127/220/240V AC, 50/60Hz (according to country of sale)	120, 230, 240 or 110/127/220/240V AC, 50/60Hz (according to country of sale)	120, 230, 240 or 110/127/220/240V AC, 50/60Hz (according to country of sale)
Power Consumption	27W max.	27W max.	20W max.
Dimensions (W×H×D)	430×100×375 mm 16-15/16×3-15/16×14-3/4 inches	430×100×375 mm 16-15/16×3-15/16×14-3/4 inches	430×100×320 mm 16-15/16×3-15/16×12-5/8 inches
Approximate Weight	8.0kg; 17 lb. 10 oz.	7.8kg; 17 lb. 3 oz.	5.0kg; 11 lb.
Remote Control Unit			
Principle	Infrared pulse system	Infrared pulse system	Infrared pulse system
Power Requirement	3V DC (1.5V×2)	3V DC (1.5V×2)	3V DC (1.5V×2)
Dimensions (W×H×D)	60×18×180 mm 2-3/8×11/16×7-1/16 inches	60×18×165 mm 2-3/8×11/16×6-1/2 inches	63×18×135 mm 2-1/2×11/16×5-5/16 inches
Approximate Weight (incl. batteries)	130g; 5 oz.	120g; 4 oz.	100g; 3-1/2 oz.

● Dimensions do not include protruding parts. Height is the panel height. ● Specifications and features are subject to change without notice. ● All non-metric weights and measures are approximate.
● MusicBank is a trademark of Nakamichi Corporation. ● The photograph on the front cover is a visualization of multi-disc capability and is not intended to suggest actual mode of operation. Discs cannot be stacked onto loading tray.

Nakamichi

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