

# MDSD SA-CD PLAYER DP-720



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DP-720 is the successor of DP-700.  
It is the flag ship model of all-in-one CD/SA-CD players  
from Accuphase.

## DP-720 internal view



### Features of DP-720

#### (a) New SA-CD Drive

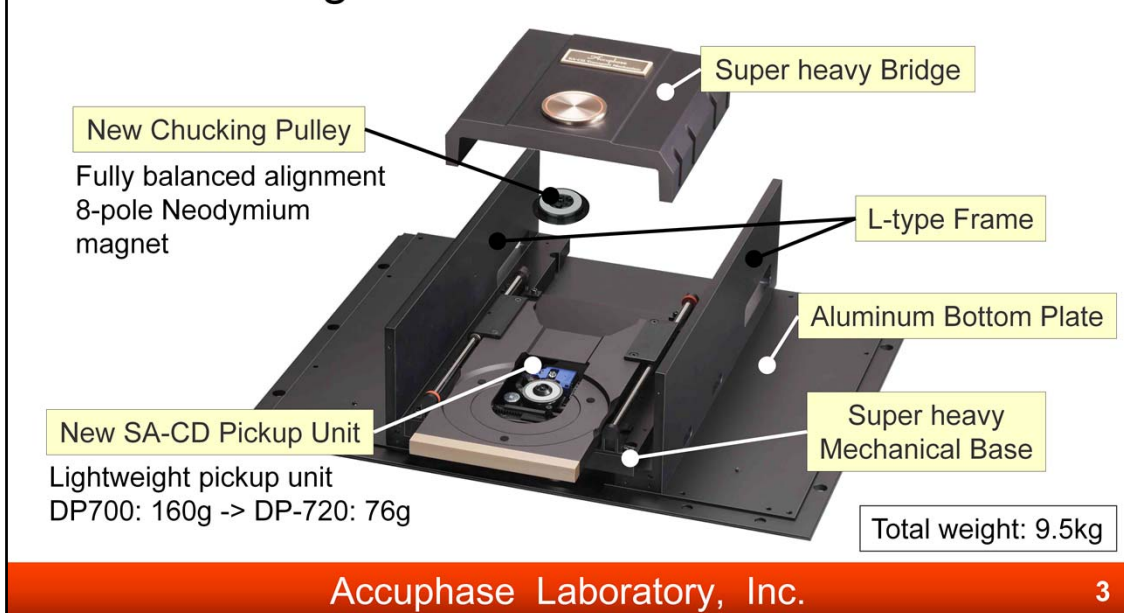
Newly developed SA-CD Drive.

#### (b) MDS++/MDS D/A Conversion System

8 DAC chips are driven in parallel on each channel.

# New SA-CD Drive

- New design SA-CD Drive for DP-720



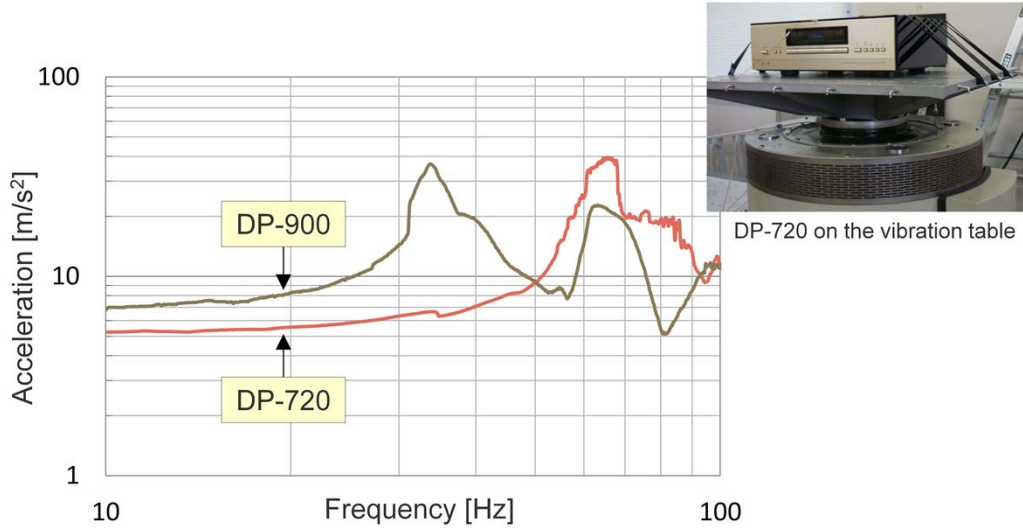
SA-CD mechanism drive was newly designed for DP-720. The mechanism drive was progressed from the DP-900's philosophy which is efficient vibration control and low center of gravity.

Light-weight laser pick up unit is employed. Light-weight pick up has the advantage on anti-vibration. We also re-design a new chucking pulley that is made of neodymium magnet.

The performance for efficient vibration and low center of gravity is improved by the dual L-shaped aluminum frames which reinforce Mechanical Base.

# Anti-Vibration Property

- Anti-Vibration property is close to DP-900



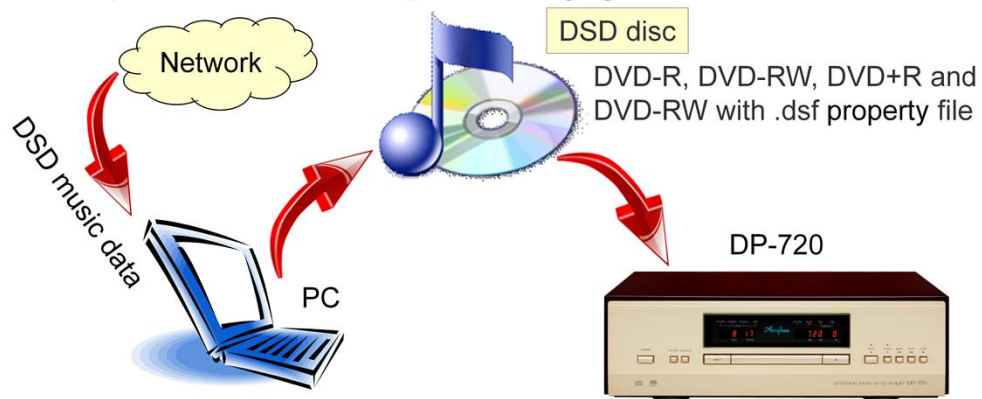
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Anti-Vibration property is close to DP-900.

## “DSD disc” Available

- New SA-CD Drive can play DSD disc made with personal computer by yourself



.dsf property file: A kind of music data with DSD format

DSD disc format: <http://www.ps3sacd.com/downloads/DSDDiscFormatSpecs.pdf>

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### DSD-disc Available

DSD-disc is a DVD which is written .dsf property music data by PC.

The new CD drive is compliance with DSD-disc.

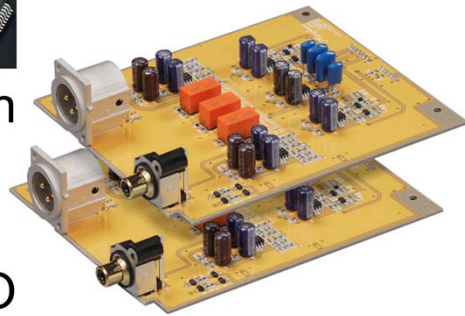
You can enjoy DSD format- music data with DP-720.

# Electrical Features

- 8 parallel D/A converters
  - Using to MDS++ for CD(PCM) signal
  - Using to MDSD for SA-CD(DSD) signal
  - ES9018S 32bit DAC, 1 chip / channel



- Glass fluorocarbon resin Printed-Circuit Board
- Direct Balanced Filter
- Many kinds of Digital I/O



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## Features

### (a) 8 parallel D/A converters

8 D/A converters are driven in parallel for DP-720.

This is as same as DP-700 but this time we changed the DAC chip.

DP-700 has AD1955 of Analog Devices.

DP-720 has ES9018 of ESS Technology.

These DACs are essential for our original circuit MDS++ for CD and also original circuit MDSD for SA-CD.

### (b) Glass fluorocarbon resin Print Circuit Board

Teflon Print Circuit Board is used for analog circuit.

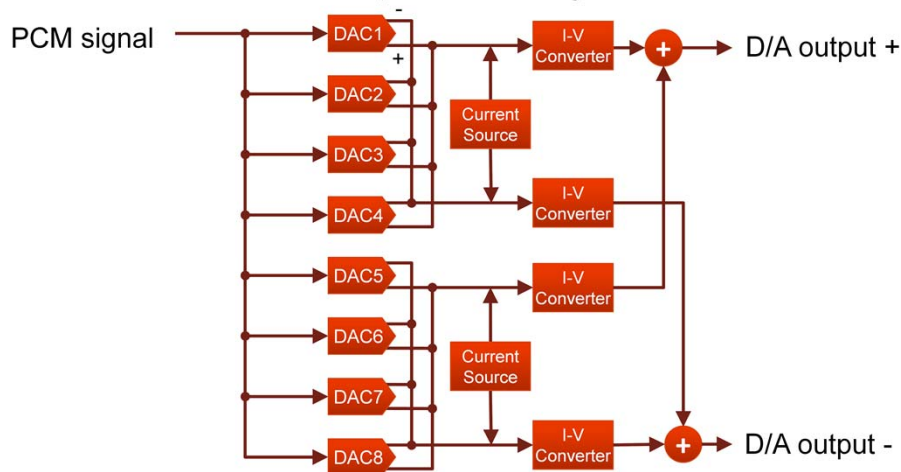
### (c) Direct Balanced Filter

DP-720 has full balanced circuit post-filter.

### (d) Many kinds of Digital I/O

# Multiple Delta-Sigma++

- Technique to make DAC parallel
- Performances improved by a factor of 2.8



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MDS++ is a technique to make DAC parallel.

The same digital signal is supplied to each converter.

The output of each DAC is combined.

The specialty of MDS++ is dividing the addition into current addition and voltage addition to reduce the load of I-V converter.

The Audio signal values are added up. But conversion error and noise cancel each other.

The ratio between the signal and conversion errors increases. So the converter performance is improved.

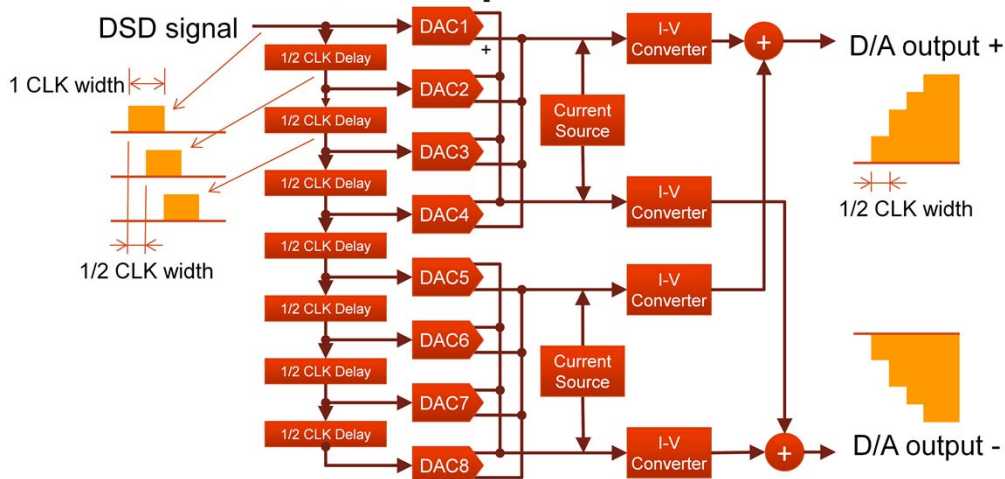
The improvement degree works by a square root of the number of DACs.

Current Source optimizes the OPERATING POINT of I-V converter.

In DP-720, overall performances are improved by a factor of 2.8.

# Multiple Double Speed DSD

- In the high freq. works as low pass filter, in the low freq. works as MDS++



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MDS+ means Multiple Double Speed DSD.

The DSD signal has big noise in the high frequency. It must be removed.

MDS+ works as low pass filter to remove a noise in the high frequency and works as MDS++ improving characteristics in the low frequency.

The point of MDS+ is delay elements.

DSD signal in DP-720 is D/A converted with half-delayed clock and the output is combined.

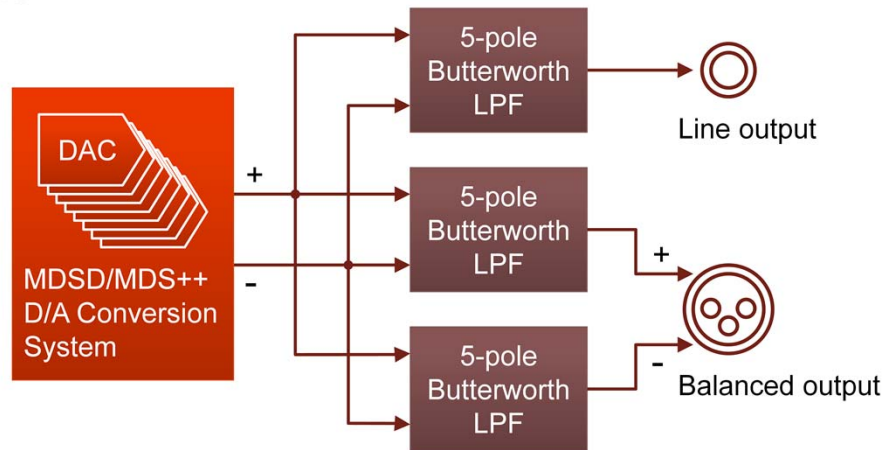
As the analog output becomes half-clock time resolution, it allows double speed operation.

This configuration is moving-average filter. It works as complete linear phase LPF and remove high frequency noise of DSD signal.



# Direct Balanced Filter

- Balanced connected independence post filter



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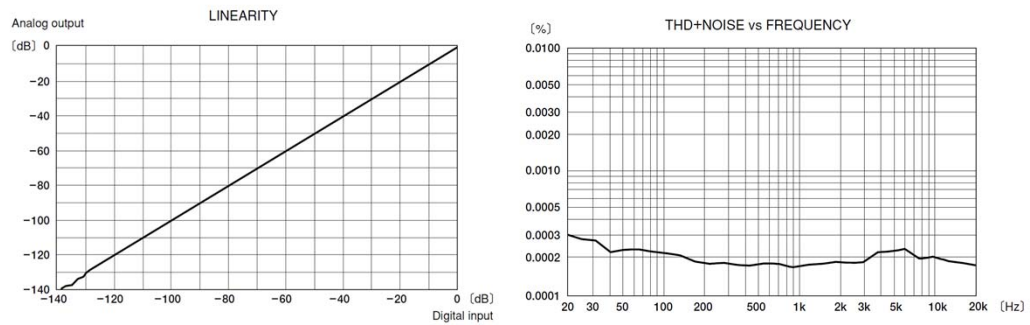
Full-balanced structure is employed after D/A converter in DP-720.

In addition, the independence low pass filter is installed for all audio outputs.

Due to this, the sound signal from all the outputs becomes high quality.

# Electrical Performance

- Electrical performances are close to the quality of DC-901



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The electrical performances of DP-720 approach the quality of DC-901.

# Digital Inter face

- Inputs

- Coaxial: 192kHz/24bit
- Optical: 96kHz/24bit
- HS-Link: 2.8224MHz/1bit, 192kHz/24bit
- USB: 192kHz/24bit



- External DSP

- Coaxial I/O: 192kHz/24bit
- HS-Link I/O: 2.8224MHz/1bit, 192kHz/24bit

DP-720 is equipped with four input and External DSP I/O. External DSP is for DG-58. USB input is up to 192kHz/24bit compliance and works with asynchronous mode.