Accuphase

PRECISION SA-CD TRANSPORT

DP-800

PRECISION MDSD DIGITAL PROCESSOR

DC-801

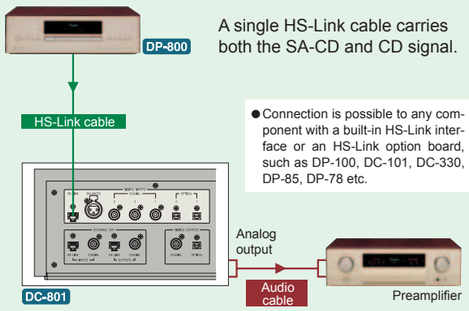
● Digital-only SA-CD/CD transport ● High-rigidity, high-precision SA-CD/CD drive ● Digital processor with revolutionary SA-CD reproduction technology MDSD ● Accuphase original digital interface: HS-Link ● MDS++ D/A converter with eight DACs driven in parallel ● "Ultra Jitter-Free +" PLL circuit ● "Direct Balanced Filter" with totally separate balanced and unbalanced signal paths

Pure Audio Enters a New Realm · · ·

Separate Type SA-CD/CD Player Combo
DP-800/DC-801 Redefines the Genre

The DP-800/DC-801 SA-CD/CD player enters the field as the designated successor to the DP-100/DC-101 model pair. The DP-800 is the transport, featuring a newly developed, ultra-massive SA-CD/CD drive designed for high rigidity and utmost precision. The DC-801 processor boasts a totally new approach to digital signal handling called MDSD, which enables straight D/A conversion of the DSD signal. Revolutionary Accuphase technology paired with our famous dedication to sonic excellence finally brings out everything the SA-CD format has to offer. The two components are connected via HS-Link cable, using Accuphase's exclusive high-quality digital interface HS-Link. Connecting a DG-38 for sound field processing in the digital domain is also possible.

DP-800/DC-801 connection

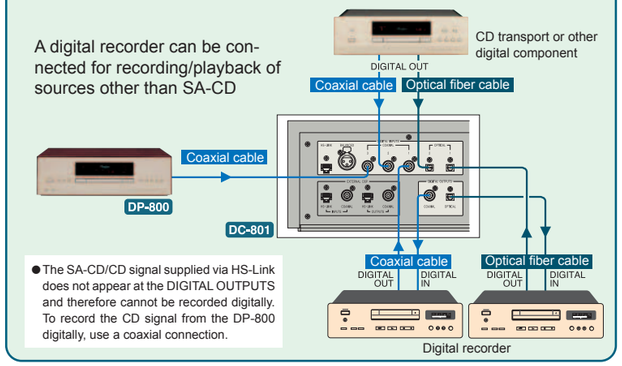


A single HS-Link cable carries both the SA-CD and CD signal.

● Connection is possible to any component with a built-in HS-Link interface or an HS-Link option board, such as DP-100, DC-101, DC-330, DP-85, DP-78 etc.

Digital recording/playback with DC-801

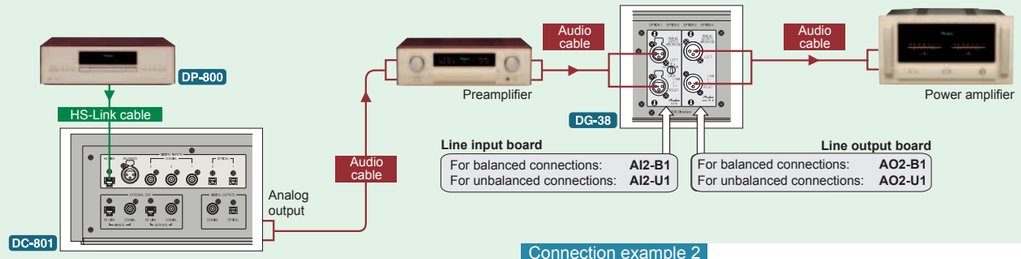
A digital recorder can be connected for recording/playback of sources other than SA-CD



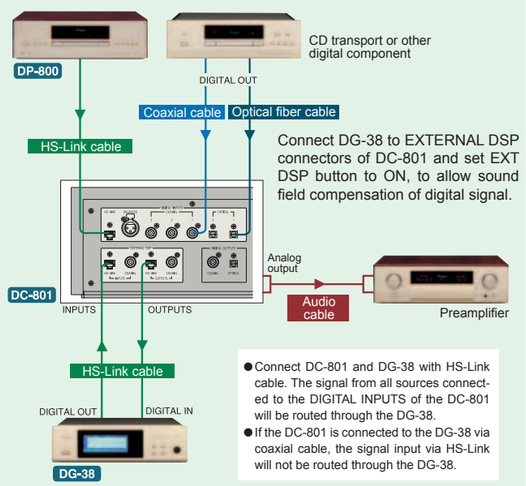
● The SA-CD/CD signal supplied via HS-Link does not appear at the DIGITAL OUTPUTS and therefore cannot be recorded digitally. To record the CD signal from the DP-800 digitally, use a coaxial connection.

Sound field compensation with DG-38: analog connection examples

Connection example 1 DG-38 inserted in analog connection between preamplifier and power amplifier



Sound field compensation with DG-38 in digital domain

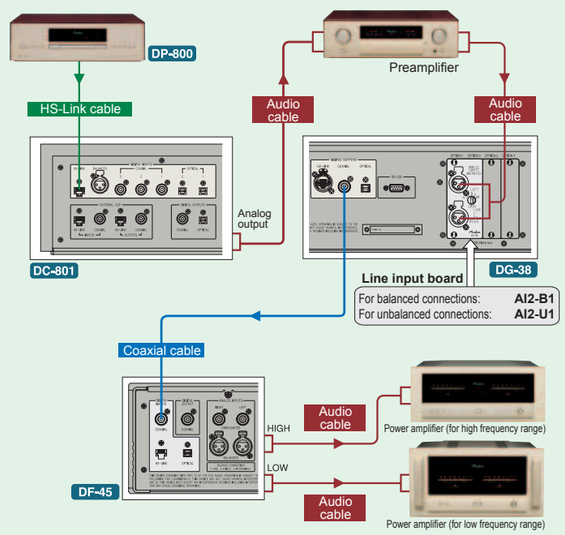


Connect DG-38 to EXTERNAL DSP connectors of DC-801 and set EXT DSP button to ON, to allow sound field compensation of digital signal.

● Connect DC-801 and DG-38 with HS-Link cable. The signal from all sources connected to the DIGITAL INPUTS of the DC-801 will be routed through the DG-38.
● If the DC-801 is connected to the DG-38 via coaxial cable, the signal input via HS-Link will not be routed through the DG-38.

Connection example 2

Multi-channel system including DF-45



Accuphase Exclusive Digital Interface
HS-Link: High Speed Link

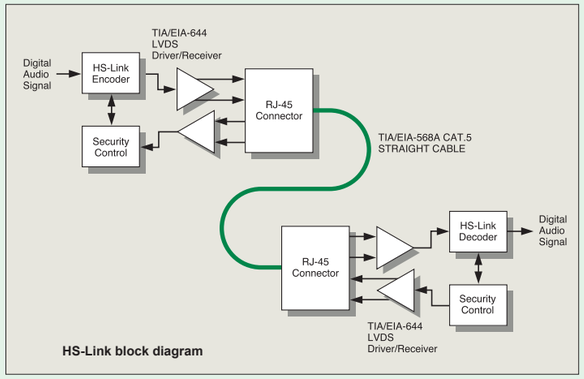
HS-Link is an ultra high-quality digital audio interface developed by Accuphase using latest digital signal transmission technology. It supports send/receive verification for copyright protection. The LVDS (Low Voltage Differential Signaling) principle allows a single dedicated HS-Link cable to transmit all audio data with utmost fidelity.

- **Capability to carry the SA-CD signal as well as conventional digital audio formats such as CD, MD, CD-R, etc.**
- **Transfer rate: 1923 Mbps (logical limit)**
- **Transfer signal format: Low Voltage Differential Signaling (LVDS) TIA/EIA-644**
- **Send/receive clock fully synchronized**
- **Full bidirectional capability with simultaneous send/receive**
- **Full security capability with send/receive verification**
- **Cable type: Shielded twisted pair 8-conductor OFC cable (equivalent to TIA/EIA-568A CAT.5)**

Sampling frequencies
32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz (16 to 24 bit, 2-channel PCM)
176.4 kHz, 192 kHz (24 bit, 2-channel PCM)
2.8224 MHz (1 bit 2-channel DSD)

HS-Link cable (supplied with DP-800)

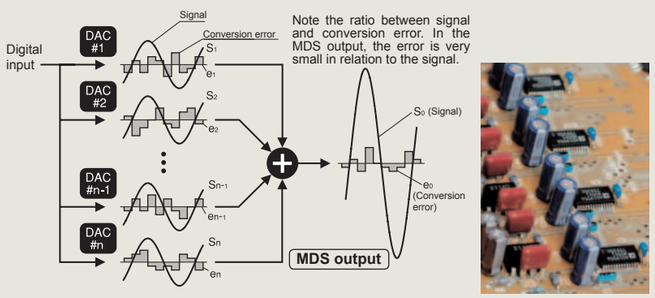
■ **DP-800 and DC-801 connected with HS-Link cable**



HS-Link block diagram

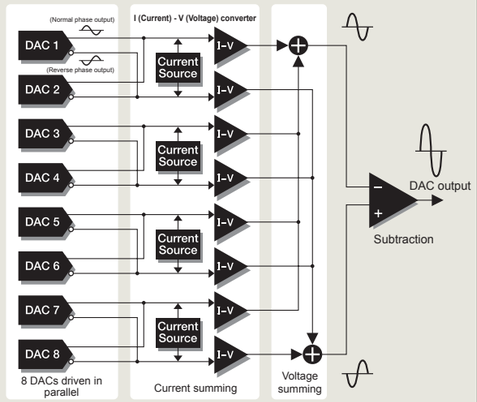
MDS++ D/A Converter with eight circuits operating in parallel

The D/A converter that forms part of the MDSD type moving-average filter circuit is an MDS++ D/A converter with an amazing eight circuits operating in parallel, ensuring the utmost in accuracy and sound quality.
MDS (Multiple Delta Sigma) is an innovative approach that employs several delta sigma type converters in a parallel configuration for greatly improved accuracy. Combining the output signal from individual converters causes mutual cancellation of conversion errors, resulting in a notable improvement in all relevant aspects of conversion performance: accuracy, S/N ratio, dynamic range, linearity, and THD.



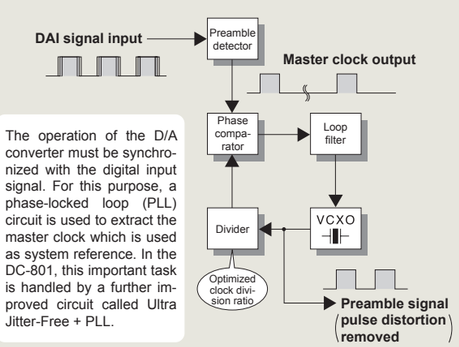
■ **MDS type D/A converter principle**

■ **Eight delta sigma converters**



■ **Block diagram of MDS++ principle**

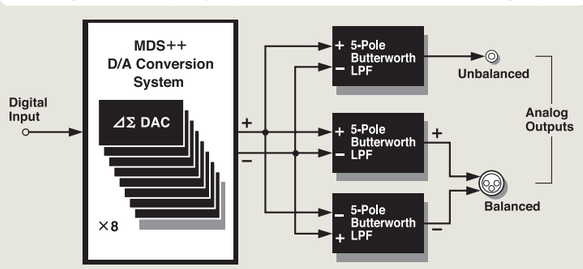
Ultra Jitter-Free + PLL circuit



The operation of the D/A converter must be synchronized with the digital input signal. For this purpose, a phase-locked loop (PLL) circuit is used to extract the master clock which is used as system reference. In the DC-801, this important task is handled by a further improved circuit called Ultra Jitter-Free + PLL.

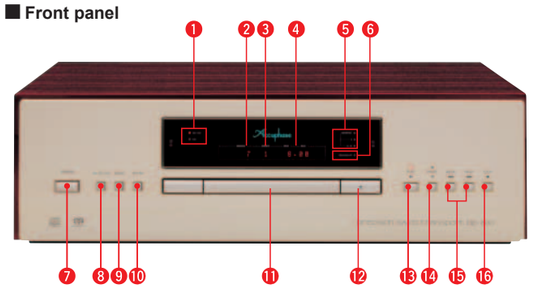
"Direct Balanced Filter" circuit

The output of any D/A converter contains so-called aliasing noise in the very high frequency range. An analog filter designed to remove that noise is therefore always required. The filter circuitry in the DC-801 uses 5-pole Butterworth analog filters with extremely flat frequency response in the passband. In order to prevent unwanted interaction, the low-pass filter configuration is completely separate for the balanced and unbalanced signal paths.



DP-800

■ **Front panel**

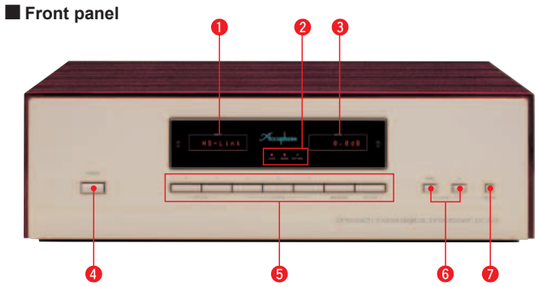


■ **Rear panel**

❶ SA-CD/CD indicator
❷ Track display
❸ Index display
❹ Time display
❺ Repeat indicator REPEAT / 1 / A-B
❻ Program indicator
❼ Power switch
❽ SA-CD/CD button
❾ MODE button
❿ ENTER button
⓫ Disc tray
⓬ Disc tray open/close button
⓭ Play button
⓮ Pause button
⓯ Track search buttons BACK, NEXT
⓰ Stop button
⓱ Digital output connectors HS-LINK (SA-CD/CD signal) COAXIAL (CD signal only)
⓲ AC power connector★

DC-801

■ **Front panel**



■ **Rear panel**

❶ Alphanumeric input display
❷ Function indicators LOCK, MDSD, EXT DSP
❸ Output level display
❹ Power switch
❺ Input selector buttons OPTICAL 1, 2, COAXIAL 1, 2, 3 BALANCED, HS-LINK
❻ Output level control buttons DOWN, UP
❼ EXT DSP button
❽ Digital input connectors HS-LINK, BALANCED COAXIAL 1, 2, 3, OPTICAL 1, 2
❾ Analog output connectors UNBALANCED, BALANCED
❿ EXTERNAL DSP connectors INPUTS (HS-LINK, COAXIAL) OUTPUTS (HS-LINK, COAXIAL)
⓫ DIGITAL output connectors COAXIAL, OPTICAL
⓬ AC power connector★

Remarks
★ *This product is available in versions for 120/230 V AC. Make sure that the voltage shown on the rear panel matches the AC line voltage in your area.*
★ *The shape of the AC inlet and plug of the supplied power cord depends on the voltage rating and destination country.*

DP-800 Guaranteed Specifications

- **Compatible disc formats** 2-channel SA-CD, CD
- **Data read principle** Non-contact optical pickup
- **Laser diode wavelength** SA-CD: 650 nm, CD: 780 nm
- **Digital outputs**
  HS-Link — Connector type: RJ-45; Suitable cable: Dedicated HS-Link cable
  COAXIAL — Format: IEC 60958
- **Power requirements** AC120 V/230 V (Voltage as indicated on rear panel) 50/60 Hz
- **Power consumption** 18 W
- **Maximum Dimensions** Width 477 mm (18-5/16") Height 156 mm (5-7/8") Depth 394 mm (15-5/8")
- **Mass** 26.6 kg (58.6 lbs) net, 32.0 kg (70.5 lbs) in shipping carton

DC-801 Guaranteed Specifications [Guaranteed specifications are measured according to JEITA standard CP-2402A)

- **Digital inputs**
  HS-Link — Connector type: RJ-45; Suitable cable: Dedicated HS-Link cable
  COAXIAL — Format: IEC 60958
  OPTICAL — Format: JEITA CP-1212
  BALANCED — Digital balanced cable: characteristic impedance 110 ohms
  Sampling frequencies: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz (16 to 24 bit, 2-channel PCM)
  HS-Link only: 176.4 kHz, 192 kHz (16 to 24 bit, 2-channel PCM) 2.8224 MHz (1 bit 2-channel DSD)
- **Digital outputs**
  COAXIAL — Format: IEC 60958
  OPTICAL — Format: JEITA CP-1212
- **D/A converter** MDSD principle (DSD signal) MDS++ principle (PCM signal)
- **Frequency response** 0.5–50,000 Hz +0, –3 dB
- **Total harmonic distortion** 0.0006% (20 to 20,000 Hz)
- **Signal-to-noise ratio** 117 dB
- **Dynamic range** 117 dB (24-bit input, low-pass filter off)
- **Channel separation** 113 dB (20 to 20,000 Hz)
- **Output voltage and impedance**
  BALANCED 2.5 V 50 ohms, balanced XLR type
  UNBALANCED 2.5 V 50 ohms, RCA phono jack
- **Output level control** 0 dB to –80 dB (digital)
- **Power requirements** AC120 V/230 V (Voltage as indicated on rear panel) 50/60 Hz
- **Power consumption** 22 W
- **Maximum Dimensions** Width 477 mm (18-5/16") Height 156 mm (5-7/8") Depth 393 mm (15-1/2")
- **Mass** 22.3 kg (49.2 lbs) net, 28.0 kg (61.7 lbs) in shipping carton

Supplied with DP-800
- AC power cord
- HS-Link cable (HDL-15)
- Remote Commander RC-100
- Cleaning cloth

Supplied with DC-801
- AC power cord
- Audio cable with plugs (1 meter)
- Cleaning cloth

Optional cables
- **HS-Link cable** **HDL-15 (1.5 m)**
  ✻ 3 m, 5 m, 7.5 m, 10 m also available

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• Specifications and design subject to change without notice for improvements. http://www.accuphase.com L0605Y PRINTED IN JAPAN 851-0162-00 (AD1)

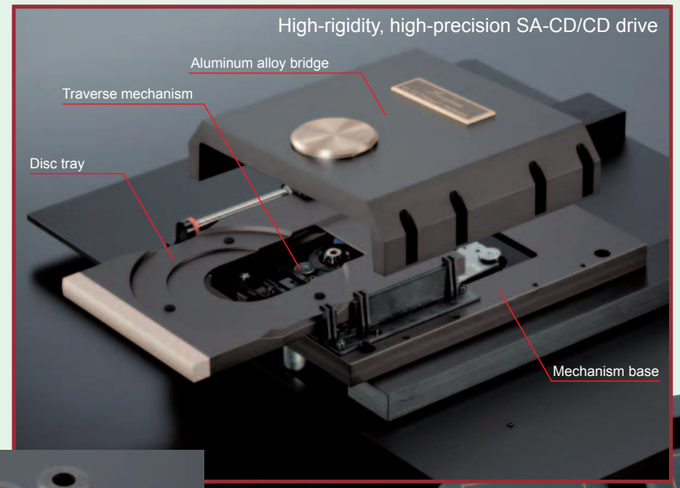
PRECISION SA-CD TRANSPORT

DP-800

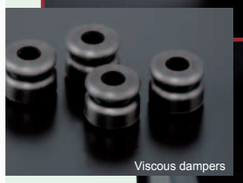
Dedicated digital-output SA-CD/CD transport – Totally new ultra-massive SA-CD/CD drive. Highly rigid, high-precision construction with low center of gravity absorbs vibrations. Finely machined and utterly smooth disc loading mechanism with exquisite tray. High-performance digital audio interface HS-Link.

Newly developed high-rigidity, high-precision SA-CD/CD drive

In order to extract the minute bits of information from the rapidly spinning disc and decode these accurately into a digital signal of high purity, vibrations emanating from the rotating medium as well as any external mechanical vibrations must be minimized. At the same time, the prevention of resonances is also highly important.
In the DP-800, the SA-CD/CD drive is mounted firmly to a strong aluminum frame, and the drive loading mechanism and mechanical base form a massive and highly rigid chassis constructed with utmost precision. Conversely, the traverse mechanism, an integrated structure consisting of the optical assembly including laser pickup and rotating parts, is designed for extremely light weight, and isolated from the mechanism base by a floating suspension arrangement. Specially selected material is used for viscous damping, supporting the traverse mechanism at four points.
A large, heavy bridge machined from a single block of aluminum is joined to the mechanism base for integrated reinforcement. The entire SA-CD/CD drive assembly is directly mounted to the bottom chassis. The resulting unit has a very low center of gravity and affords excellent protection against all kinds of adverse influences from vibrations. Perfectly stable and quiet operation produces a signal of utmost accuracy.



- **Sturdy, heavyweight chassis absorbs external vibrations**
- **Highly rigid and precise construction**
- **“Traverse Mechanism” with floating design and viscous damping**
- **Integrated construction with oversize heavyweight aluminum alloy bridge mounted to mechanism base**
- **Low center of gravity further reduces vibrations**
- **High-quality disc tray extruded from an aluminum block, plus super-quiet smooth disc loading mechanism**
- **“Advanced High Carbon” cast iron insulators with excellent absorption characteristics control vibrations to ensure high sound quality**

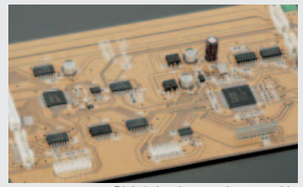

Viscous dampers

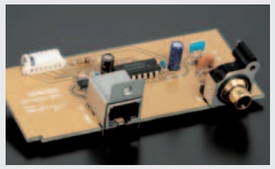

“Advanced High Carbon” cast iron insulators for best sound quality

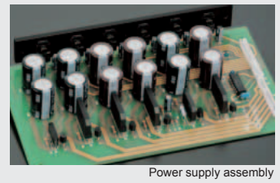
For some time now, Accuphase engineers have been engaged in an ambitious in-house development project: to create the ultimate SA-CD drive. With the introduction of the DP-800, this project has now come to fruition, culminating in the SA-CD transport mechanism incorporated in this model.
Compared to a CD drive, an SA-CD drive has a higher revolution rate, and pickup positioning accuracy as well as suppression of vibrations must be of a higher order, to allow full access to the enormous amount of information stored on the disc. This in turn places formidable requirements on the mechanical construction of the drive.
The transport in the DP-800 meets these challenges in impressive fashion, being designed to extract the information on the SA-CD one-hundred percent. The product demonstrates ultimate mechanical precision matched with ingenuity and the famous Accuphase dedication to sonic excellence. The ultra-massive SA-CD drive combines superior rigidity with rock-stable accuracy. Truly a monumental event in the world of high-end audio.
In the transport, a digital servo with a dedicated DSP assures accurate readout of the signal recorded on the SA-CD using the DSD (Direct Stream Digital) principle. This is sustained by a single-lens/twin laser diode pickup mounted to a high-speed access mechanism.
The transport not only realizes optimal reproduction of SA-CDs, it also is capable of extracting a super-accurate signal from conventional CDs. The output for both SA-CD and CD is provided via the Accuphase exclusive high-performance digital interface HS-Link (RJ-45 connector), while the CD output is also available via a coaxial connector. The HS-Link cable supplied with the DP-800 can be used for connection to the DC-801 or to other components.

DP-800 Features and Functions

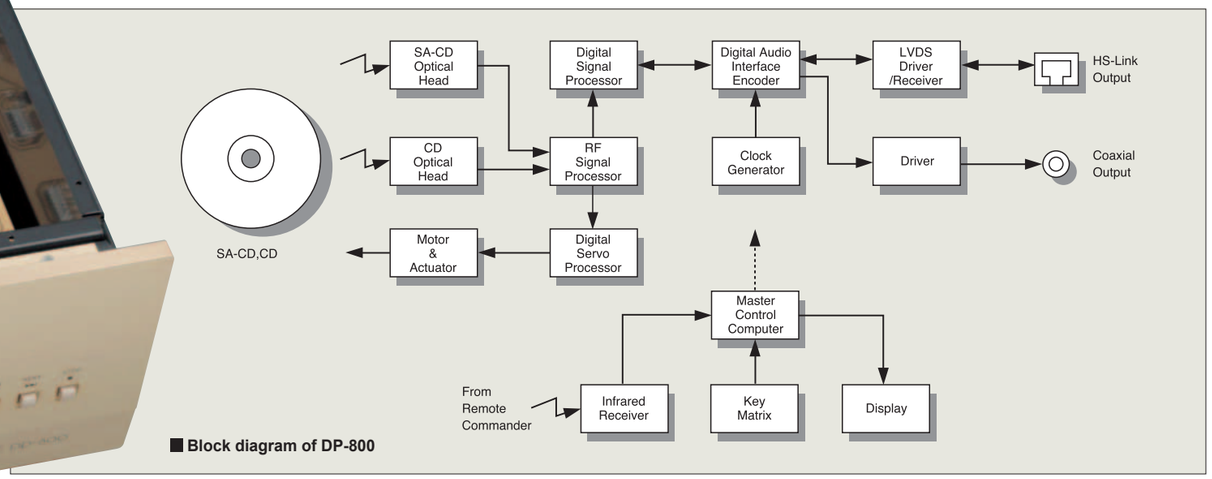
- **Newly developed high-rigidity, high-precision SA-CD/CD drive**
- **SA-CD transport supplies remarkably pure digital signal**
- **Excellent signal quality also from conventional CD media**
- **Single-lens/twin pickup high-speed access mechanism**
- **Support for text data display**
- **Accuphase’s proprietary digital audio interface HS-Link (carries both SA-CD and CD signal)**
- **Dedicated coaxial output for CD signal**
- **Power-on play feature allows automatic playback**
- **Remote commander RC-100 (supplied with DP-800)**
  - Controls DP-800 functions such as direct play, program play, repeat, etc.
  - Controls DC-801 functions such as input switching and output level adjustment
- **Both DP-800 and DC-801 feature massive cabinets made of persimmons wood**


Digital signal processing assembly


HS-Link connector and coaxial output assembly


Power supply assembly


RC-100



Block diagram of DP-800

PRECISION MDSD DIGITAL PROCESSOR

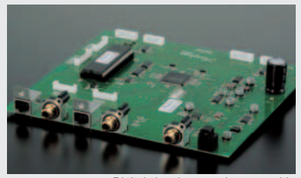
DC-801

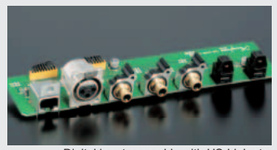
Digital processor designed for ultimate SA-CD quality – Innovative digital signal processing technology MDSD (Multiple Double Speed DSD). Moving-average filter circuit configured with delay and eight parallel converters achieves straight D/A conversion of DSD signal. Seven digital inputs for enhanced versatility.

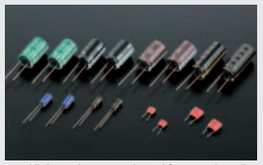
The DC-801 showcases Accuphase's mastery of sophisticated digital technology and creative circuit topology. It is a digital processor designed to realize the ultimate in SA-CD reproduction.
A new technique called MDSD (Multiple Double Speed DSD) allows straight D/A conversion of the DSD signal. MDSD employs eight MDS++ type D/A converters operating in parallel to reduce conversion errors to an absolute minimum while at the same acting as a high-cut filter that removes noise in the high-frequency range. The Direct Balanced Filter is configured with entirely separate balanced and unbalanced signal paths, and a further refined "Ultra Jitter-Free +" PLL circuit extracts the master clock for the D/A converter with absolute precision. The overall result is music reproduction that finally brings out the full sonic potential of the SA-CD format.
For connectivity to various sources, the DC-801 offers a full complement of digital inputs: HS-Link, balanced, coaxial (3 streams), and optical (2 streams). This allows the music data to be supplied to the processor without any degradation in quality. Two sets of digital outputs (coaxial and optical) let the user easily connect a digital recorder, for recording of sources other than SA-CD. And there's even a set of EXTERNAL DSP input/output connectors that allows using the Digital Voicing Equalizer DG-38 for sound field processing in the digital domain.

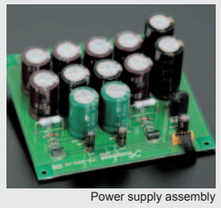
DC-801 Features and Functions

- **MDSD (Multiple Double Speed DSD) implements innovative digital signal processing**
- **MDS++ D/A converter with eight DACs driven in parallel**
- **Ultra Jitter-Free + PLL circuit**
- **"Direct Balanced Filter" provides totally separate analog low-pass filtering for balanced and unbalanced signal paths**
- **Digital level control allows adjustment down to –80 dB**
- **D/A converter printed circuit boards made from Teflon (glass fluorocarbon resin) with low dielectric constant and low loss**
  ✻ Teflon is a registered trademark of DuPont USA.
- **EXTERNAL DSP input/output connectors allow insertion of DG-38 in signal path**
- **Seven digital inputs: HS-Link, coaxial (3 streams), optical (2 streams), balanced**
- **Coaxial and optical digital outputs**
- **Balanced and unbalanced analog outputs (1 each)**

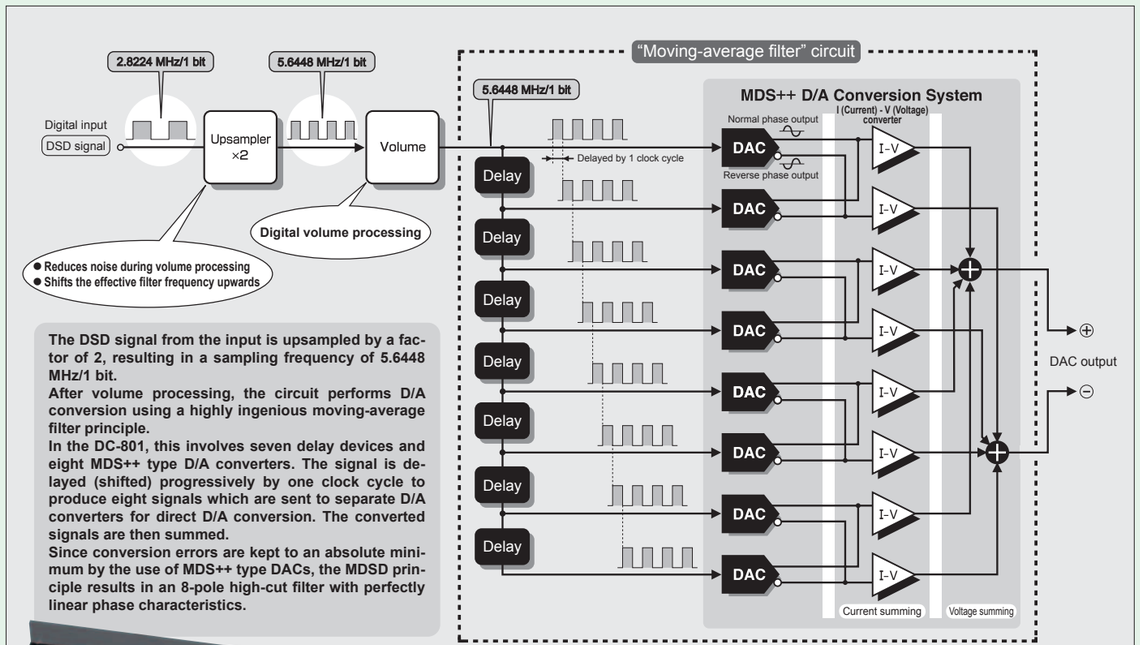

Digital signal processing assembly


Digital input assembly with HS-Link etc.


High-grade parts selected for sound quality

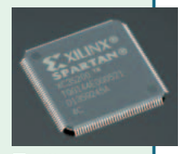

Power supply assembly

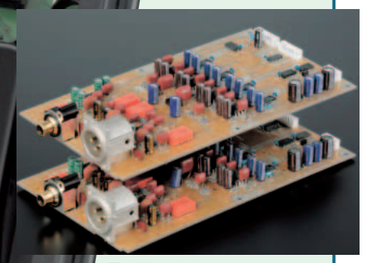
MDSD (Multiple Double Speed DSD)



The DSD signal from the input is upsampled by a factor of 2, resulting in a sampling frequency of 5.6448 MHz/1 bit.
After volume processing, the circuit performs D/A conversion using a highly ingenious moving-average filter principle.
In the DC-801, this involves seven delay devices and eight MDS++ type D/A converters. The signal is delayed (shifted) progressively by one clock cycle to produce eight signals which are sent to separate D/A converters for direct D/A conversion. The converted signals are then summed.
Since conversion errors are kept to an absolute minimum by the use of MDS++ type DACs, the MDSD principle results in an 8-pole high-cut filter with perfectly linear phase characteristics.


Delta sigma type D/A converters


■ FPGA: High-speed logic device implementing upsampler, moving-average filter circuit, and other digital signal processing tasks


■ MDS++ D/A converters and analog output circuitry on Teflon boards with low dielectric constant and low loss

■ Block diagram of DC-801