Accuphase

MDSD SA-CD PLAYER

DP-600

● High-grade SA-CD/CD drive ● Innovative MDSD digital signal processing ● MDS++ type D/A converter using six parallel devices ● "Direct Balanced Filter" with totally separate balanced and unbalanced signal paths ● HS-Link digital interface ● Transport outputs and digital inputs allow insertion of DG-48 into signal path for sound field correction ● Balanced and unbalanced analog outputs

High-end integrated SA-CD/CD player — High-grade SA-CD/CD drive combined with exquisite disc tray and ultra-quiet disc loading mechanism ensures smooth operation. Innovative MDSD (Multiple Double Speed DSD) digital signal processing circuitry is configured as moving average filter for straight D/A conversion. Completely separate configuration of transport and processor sections, each equipped with a set of HS-Link, coaxial, and optical connectors.

The reference-level separate-type combo DP-800/DC-801 and the integrated DP-700 with their exclusive mechanism developed in-house by Accuphase have garnered high praise and acclaim the world over. The new DP-600 is positioned as a companion model to the DP-700, benefiting from its sophisticated know-how, but it is also a high-end integrated SA-CD player in its own right. Extensive listening tests were conducted to ensure optimum reproduction quality. As with all Accuphase players so far, a conscious decision was made not to support multi-channel formats but rather focus on obtaining the ultimate in musical fidelity from two-channel SA-CD music sources.

The high-grade SA-CD drive mechanism in the DP-600 is the ultimate tool for extracting the information on SA-CD discs one hundred percent. It not only keeps internal vibrations of rotating parts to a minimum, but is also highly impervious to external vibrations. This ensures that the digital signal remains in a highly pure and accurate state. A dedicated DSP chip controls the digital servo, allowing the digital signal encoded on the SA-CD in DSD (Direct Stream Digital) format to be processed with utmost accuracy. The high-speed access mechanism with its single-lens/twin laser diode combines optimum precision with lightning-swift operation.

In the digital processor section, ground-breaking MDSD (Multiple Double Speed DSD) technology is used, with an ultra-high-speed FPGA (Field Programmable Gate Array) and multiple DACs driven in parallel to handle the delayed DSD signal. After D/A conversion, summation of the multiple data results in an ingenious moving-average filter circuit that implements straight D/A conversion of the DSD signal. An important characteristic of MDSD is the use of MDS++ D/A converters which keep conversion errors to an absolute minimum. The MDSD circuit acts as a high-cut filter that virtually eliminates high-frequency quantization noise.

Features and Functions of Transport Section

■High-grade SA-CD/CD drive

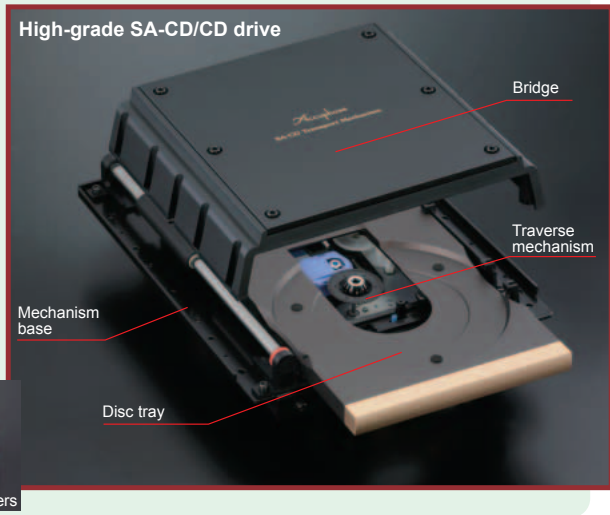
① Highly rigid and precise construction with sturdy, heavyweight chassis to absorb external vibrations
② "Traverse Mechanism" with floating design
③ Massive bridge cover
④ Non-resonant design and low center of gravity further reduce vibrations
⑤ High-quality disc tray extruded from an aluminum block, plus super-quiet smooth disc loading mechanism

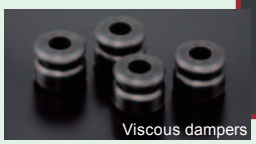
■SA-CD/CD transport outputs ultra pure digital signal

■Single-lens/twin pickup high-speed access mechanism

■Support for text data display

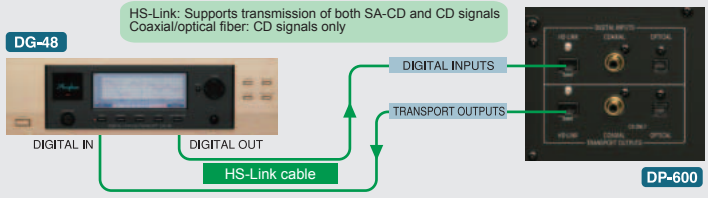
■Accuphase's proprietary digital audio interface HS-Link (carries both SA-CD and CD signal)

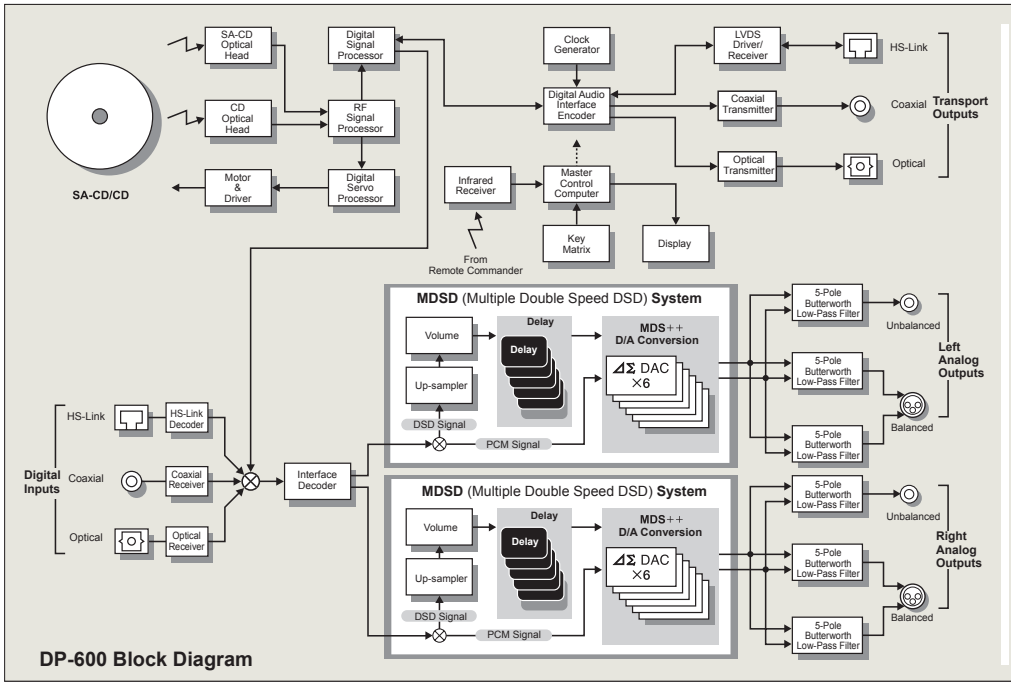




DG-48 connection example

The DG-48 can be connected between the transport outputs and digital inputs of the DP-600 (using HS-Link, coaxial, or optical connection). This allows sound field compensation of the signal from the CD transport in the digital domain.

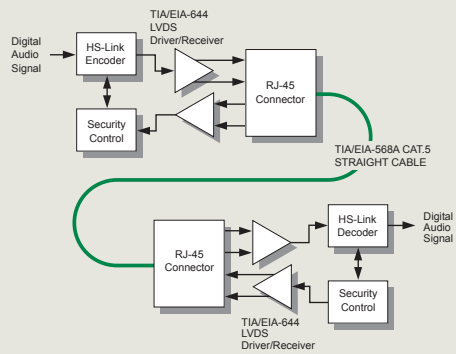




DP-600 Block Diagram

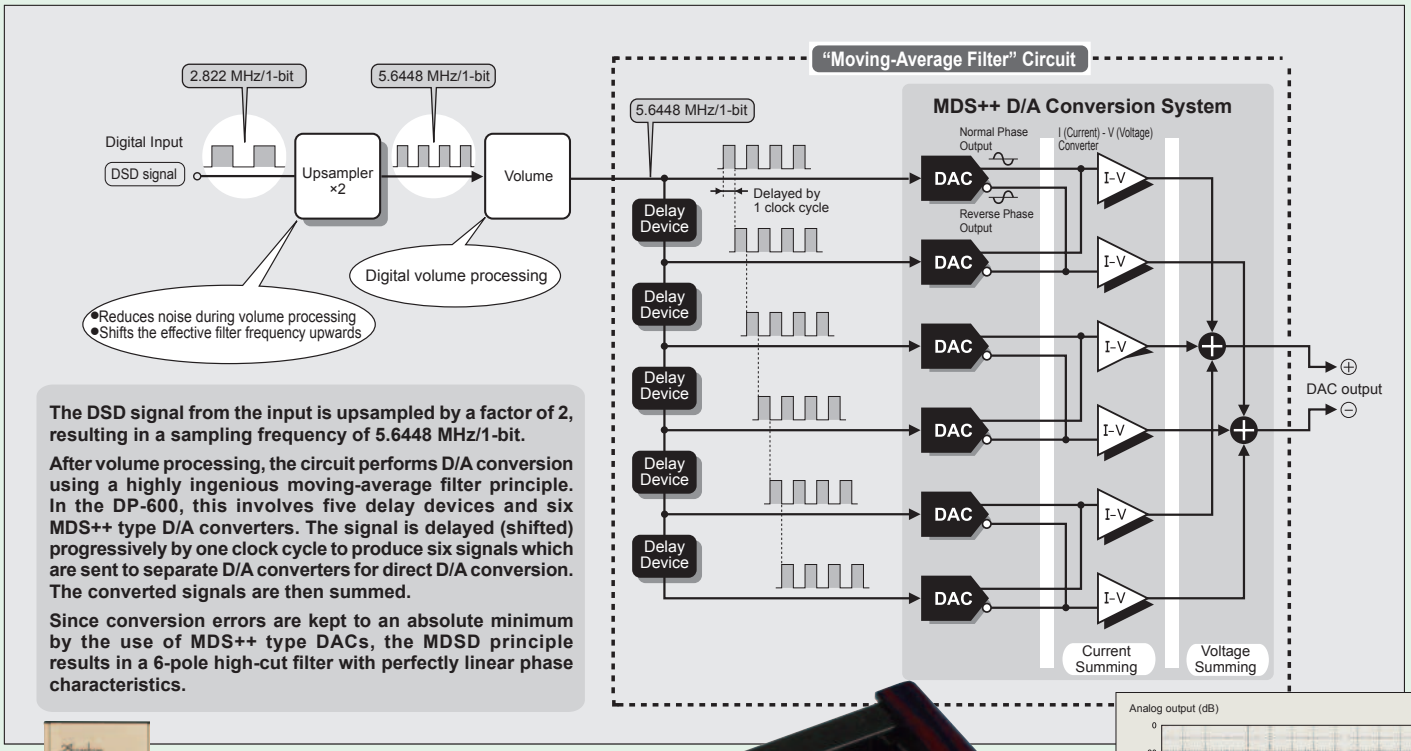
Accuphase Exclusive Digital Interface HS-Link: High Speed Link

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, including 2.8224 MHz/1-bit and 192 kHz/24-bit signals.



HS-Link Block Diagram

Innovative Digital Signal Processing: MDSD (Multiple Double Speed DSD)

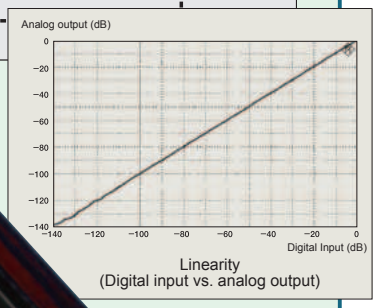


The DSD signal from the input is upsampled by a factor of 2, resulting in a sampling frequency of 5.6448 MHz/1-bit.

After volume processing, the circuit performs D/A conversion using a highly ingenious moving-average filter principle. In the DP-600, this involves five delay devices and six MDS++ type D/A converters. The signal is delayed (shifted) progressively by one clock cycle to produce six 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 a 6-pole high-cut filter with perfectly linear phase characteristics.

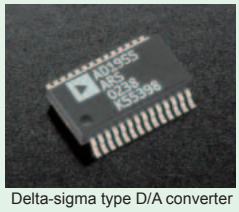
■ **Supplied remote commander**
RC-100
Gives access to various functions including direct play, repeat, program play, input switching, and level control.

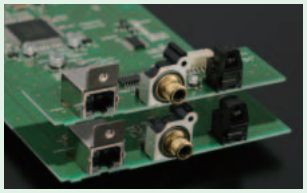


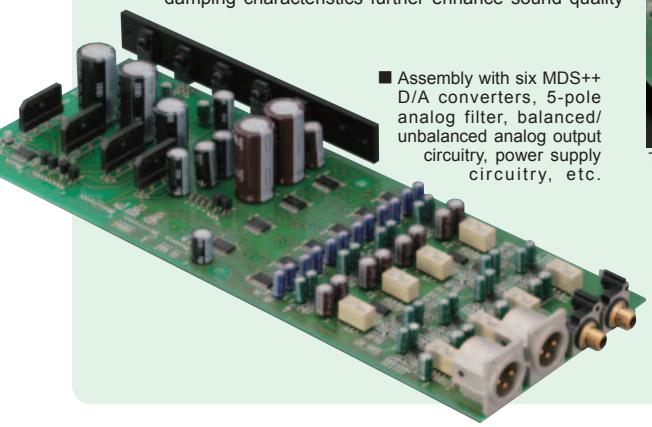
Linearity
(Digital input vs. analog output)

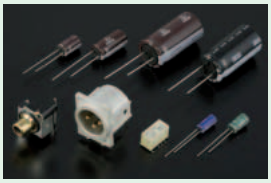
Features and Functions of Digital Processor Section

- MDSD (Multiple Double Speed DSD) implements innovative digital signal processing.
- MDS++ D/A converter with six DACs driven in parallel
- Digital level control allows adjustment down to –80 dB.
- Separate transport and processor sections, with digital input and output connectors for HS-Link, coaxial, and optical connections.
- Power-on play feature allows automatic playback.
- Balanced and unbalanced analog outputs (1 set each)
- Side panels with elegant persimmons wood finish
- "High Carbon" cast iron insulator feet with superior damping characteristics further enhance sound quality


Delta-sigma type D/A converter

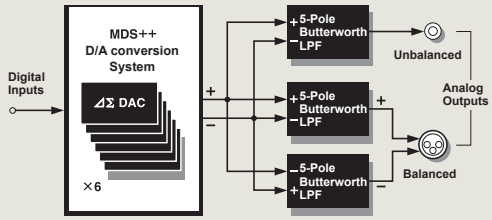

Transport outputs/digital inputs assembly


■ Assembly with six MDS++ D/A converters, 5-pole analog filter, balanced/ unbalanced analog output circuitry, power supply circuitry, etc.

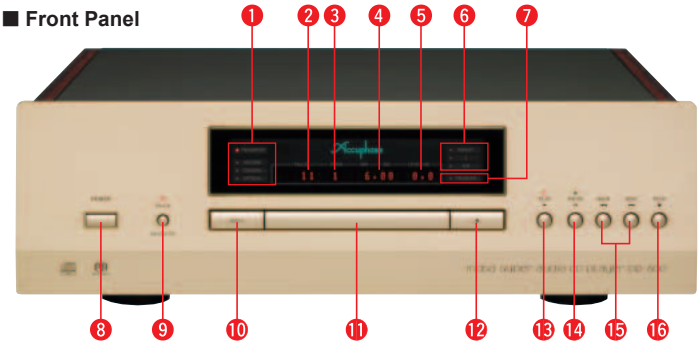

High-quality parts

Direct Balanced Filter With Separate Balanced/Unbalanced Circuitry

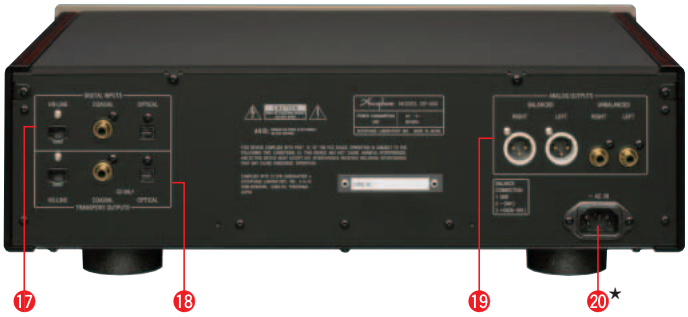
The output of any D/A converter contains so-called aliasing noise in the very high frequency range. During CD playback, an analog filter designed to remove that noise is therefore always required. The filter circuitry in the DP-600 uses 5-pole Butterworth analog filters with extremely flat frequency response in the passband. In order to prevent unwanted interaction, completely separate filters are provided for the balanced and unbalanced signal paths. A direct connection from the balancing circuit at the output of the D/A converter to the filter circuitry and symmetrical +/- configuration ensures that the +/- output impedance is also identical. This provides ideal transmission conditions for the high-quality MDS++ output.



■ Front Panel



■ Rear Panel



1. Input indicator: TRANSPORT/ HS-LINK/COAXIAL/OPTICAL
2. Track number indicator
3. Index indicator
4. Time indicator
5. Output level indicator
6. Repeat indicator
7. Program indicator
8. Power switch
9. SA-CD/CD selector button
10. Input selector button
11. Disc tray
12. ⏏ Disc tray open/close button
13. ▶ Play button
14. ⏸ Pause button
15. ⏮/⏭ BACK, NEXT track search buttons
16. ■ STOP button
17. Digital inputs (HS-LINK, COAXIAL, OPTICAL)
18. Transport outputs (HS-LINK, COAXIAL, OPTICAL)
19. Analog outputs
    - Balanced output connectors
      ① Ground ② Inverted (–) ③ Non-inverted (+)
    - Unbalanced output connectors
20. AC power connector★

■ **Supplied accessories:**
- **AC power cord**
- **Audio cable with plugs (1 meter)**
- **Remote Commander RC-100**
- **Cleaning cloth**

DP-600 Guaranteed Specifications

* Guaranteed specifications are measured according to the JEITA standard CP-2402A.
* Measurement disc: PHILIPS 3122-783-00632

Transport section

Compatible disc formats	2-channel Super Audio CD CD	
Data read principle	Non-contact optical pickup	
Laser diode wavelength	SA-CD:	650 nm
	CD:	780 nm
Transport section outputs	HS-LINK	Connector type: RJ-45 Suitable cable: Dedicated HS-Link cable
	COAXIAL	Format: IEC 60958 compliant
	OPTICAL	Format: JEITA CP-1212 compliant

Digital processor section

Digital inputs	HS-LINK	Connector type: RJ-45 Suitable cable: Dedicated HS-Link cable
	COAXIAL	Format: IEC 60958 compliant
	OPTICAL	Format: JEITA CP-1212 compliant
	Sampling frequency	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz (16 to 24 bits, 2-channel PCM) Only via HS-Link 176.4 kHz, 192 kHz (24 bits, 2-channel PCM) 2.8224 MHz (1 bit, 2-channel DSD)
D/A converter	MDSD principle (DSD signal) MDS++ principle (PCM signal)	
Frequency response	0.7 - 50,000 Hz +0, −3.0 dB	
Total harmonic distortion + noise	0.0008% (20 to 20,000 Hz)	
Signal-to-noise ratio	114 dB	
Dynamic range	110 dB (24-bit input, low-pass filter off)	
Channel separation	108 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 jacks	
Output level control	0.0 dB to −80.0 dB (digital)	

General

Power requirements	AC120 V/230 V (Voltage as indicated on rear panel) 50/60 Hz	
Power consumption	30 W	
Max. dimensions	Width	465 mm (18-5/16")
	Height	150 mm (5-7/8")
	Depth	393 mm (15-1/2")
Mass	18.5 kg (40.8 lbs) net 25.0 kg (55.1 lbs) in shipping carton	
Supplied Remote Commander RC-100	Remote control principle:	Infrared pulse
	Power supply:	Two IEC R03 (size AAA) batteries
	Max. dimensions:	56 mm x 175 mm x 26 mm
	Mass:	155 g (including batteries)

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.*

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