Accuphase

MDS SA-CD PLAYER

DP-560

● High-grade SA-CD/CD drive ● MDS+ type D/A converter with four parallel devices ● Support for playback of data discs (CD-R/-RW, DVD-R/-RW/+R/+RW) ● Direct Balanced Filter with separate line and balanced signal paths ● HS-LINK and USB digital interfaces ● Transport outputs and digital inputs allow insertion of DG-58 into signal path for sound field correction ● Phase selector for balanced outputs ● Sampling frequency and quantization bit display

Featuring a newly developed high-grade SA-CD/CD drive — State-of-the-art integrated SA-CD/CD player employs latest digital technology to fully convey the allure of beautiful music.

Newly designed next-generation SA-CD/CD drive combined with exquisite disc tray and ultra-quiet disc loading mechanism for silky smooth operation. Innovative MDS+ type D/A converter using four parallel DAC circuits ensures highly accurate D/A conversion of DSD and PCM signals. Separate configuration of transport and processor sections, each equipped with a set of HS-LINK, coaxial, optical, and USB (input only) connectors. USB connector provides support up to 384 kHz/32-bit and 11.2896 MHz/1-bit DSD.

The Technology of Precision

Features and Functions of Transport Section

■ **Highly rigid and precise construction with newly developed SA-CD/CD drive and sturdy, heavyweight chassis to absorb external vibrations.**
The SA-CD/CD drive employs a high-stiffness construction that not only minimizes vibrations from internal rotation but also absorbs any external vibrations, whether large or small. The mechanical base is fully integrated with the massive and highly rigid chassis.

■ **Floating type traverse mechanism.**
Mechanical isolation between the traverse mechanism and the loading mechanism is provided by newly developed silicone type viscous dampers whose shape and material composition have been carefully optimized. Four of these are used to realize a floating design.


Viscous dampers


Floating type traverse mechanism

■ **Dramatically enhanced quietness of operation.**
Even though they may appear flat to the unaided eye, media discs often have slight eccentricities in dimensions and weight, as well as warping. When spinning at high speed, this leads to various types of vibrations and wind noise. Based on thorough research into these issues, the DP-560 features a strengthened rotation system and effective vibration frequency control, along with further improved vibration insulation. To combat wind noise, a larger bridge enabling air flow control is used, along with various other technology based measures that result in a significant improvement in quietness. Disc rotation noise is reduced to about one third as compared to earlier designs.

■ **Large bridge cover.**
The shape design of the bridge takes aspects such as air vibrations and air flow caused by the rotation of the disc into consideration, to effectively curb noise and vibrations from the media rotating at high speed. In addition, the bridge itself employs a 5-layer structure that also helps to block noise.

■ **Low center of gravity for effective control of vibrations and resonances.**

■ **High-quality disc tray extruded from an aluminum block, plus super-quiet and smooth disc loading mechanism.**

■ **Reinforced disc chucking design reduces wobble.**

Features and Functions of Digital Processor Section

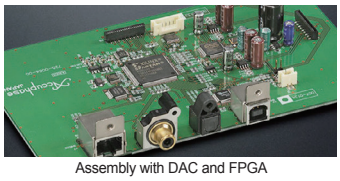
■ **High-performance Hyperstream™ DAC chip ES9018S from ESS Technology Inc.**

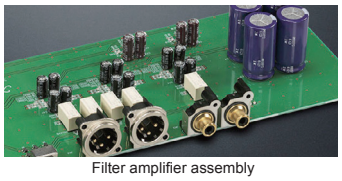

ES9018S DAC chip

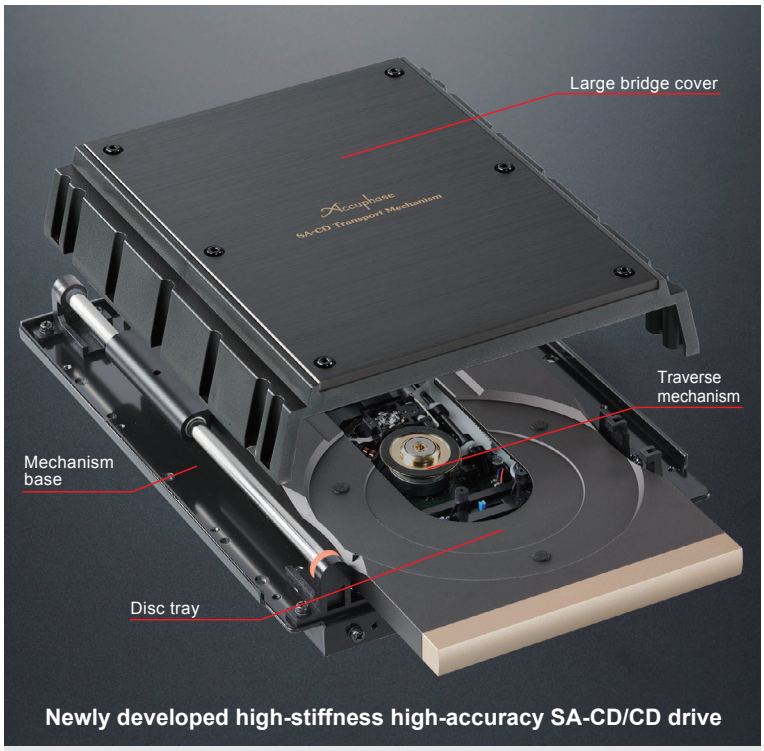
■ **MDS+ type D/A converter with four parallel circuits.**
MDS+ is a revolutionary approach that employs multiple delta-sigma type D/A converters connected in parallel for drastically improved performance. The same digital signal is supplied to each converter, and the output of the converters is summed before being sent to subsequent stages. In the DP-560, four converter circuits are used in parallel. Compared to a single converter circuit, this results in an overall performance improvement by a factor of 2 (= $\sqrt{4}$). Because the performance improvement afforded by the MDS principle is independent of signal frequency and signal level, output signal noise at very low levels is also successfully minimized, a feat that is very difficult to achieve with conventional delta-sigma converters.

■ **Direct Balanced Filter configuration for analog filter.**
The analog filter designed to remove so-called aliasing noise in the very high frequency range employs 5-pole Butterworth analog filters with extremely flat frequency response in the passband. In order to prevent unwanted interaction, completely separate low-pass filters are provided for the line and balanced signal paths.

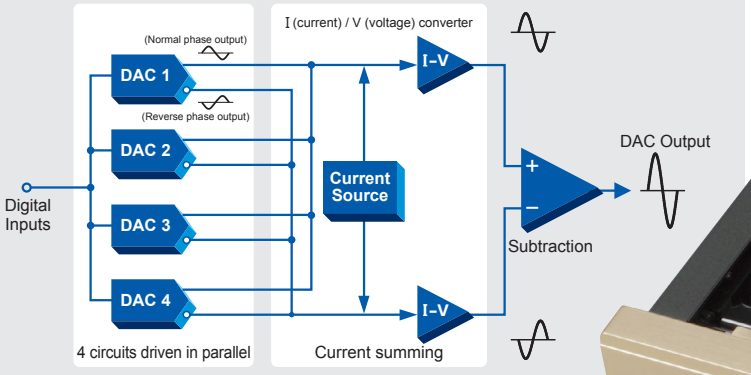
■ **High-performance audio interface chip AK4118A for drastically reduced jitter.**


Assembly with DAC and FPGA

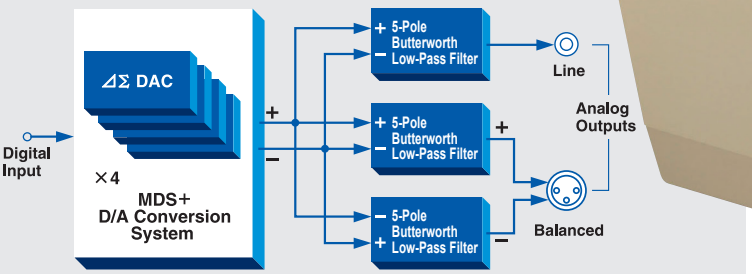

Filter amplifier assembly



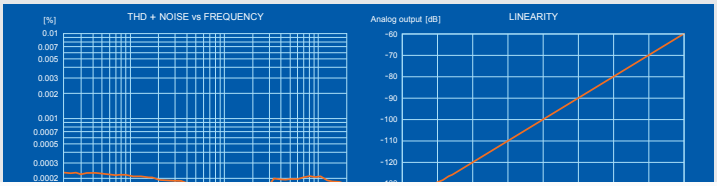
Newly developed high-stiffness high-accuracy SA-CD/CD drive



Block diagram of MDS+ converter in DP-560



Block diagram of Direct Balanced Filter circuitry



Advanced Features

■ **Power supply optimized for performance and sound quality.**
The power transformer is a newly designed type with separate windings for supplying the analog section and the digital section. The power supply circuitry for the analog section employs a discrete configuration for low noise and has been specially tuned for optimum performance and sound quality.

■ **Display can show sampling frequency and number of quantization bits.**
Besides indicating track numbers and elapsed playing time, the display can also show the sampling frequency and the number of quantization bits when using the external input and during transport operation.

■ **Digital level control allows adjustment down to –80 dB.**
The level control employs the digital principle for optimum accuracy and minimal degradation of sound quality. Integration of the level control function in the D/A converter prevents noise and provides a wide adjustment range down to –80 dB.

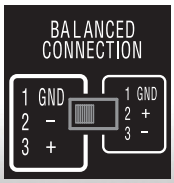
■ **Playback of data on discs such as self-recorded DVD media supported.**
CD-R/-RW, DVD-R/-RW/+R/+RW
(Supported formats: WAV, FLAC, DSF, DSDIFF)

■ **Versatile array of digital inputs and outputs including HS-LINK (Ver. 1 and Ver. 2), COAXIAL, OPTICAL, and USB (input only).**
To utilize the high performance of the built-in processing section, data from other digital equipment can be supplied to the DP-560 via the digital inputs and played back with high sound quality.

■ **Triple layer bottom plate and carbon cast iron insulator feet with superior damping characteristics absorb vibrations for further enhanced sound quality.**

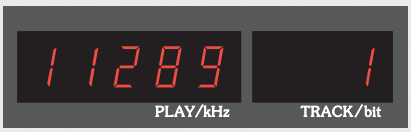
■ **Analog outputs provide a choice of line level and balanced types for shutting out external noise interference.**

■ **Phase selector for balanced output.**



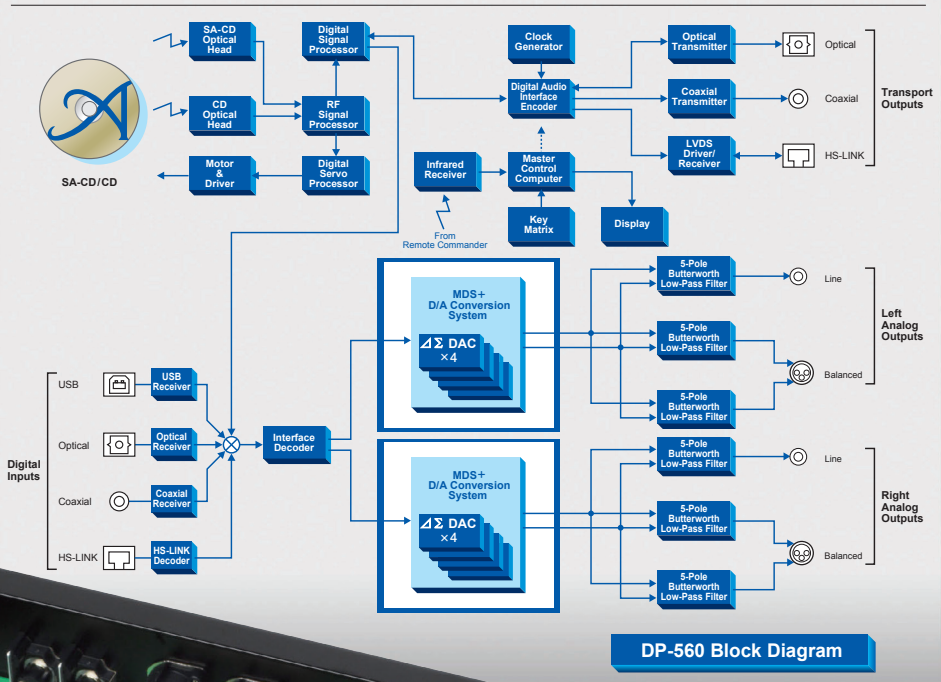
Phase selector


Power supply assembly



Display indication examples

The readout shows the sampling frequency of the source chosen by the input selector, as well as the number of quantization bits.



DP-560 Block Diagram

About HS-LINK Ver. 2

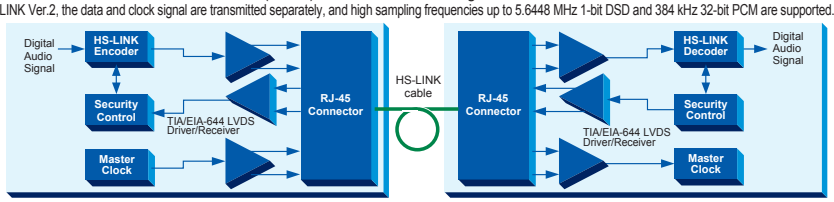
HS-LINK Version 2 is a further enhanced version of the Accuphase HS-LINK interface, providing expanded sampling frequency and quantization support.

● The Accuphase models DP-950, DC-950, DP-560, and DC-37 support both HS-LINK (Ver. 1) and HS-LINK Ver. 2.

	HS-LINK (Ver. 1)	HS-LINK Ver. 2
Sampling frequency	32.0 kHz, 44.1 kHz, 48.0 kHz, 88.2 kHz, 96.0 kHz, 176.4 kHz, 192.0 kHz / 16 to 24-bit 2-channel PCM	32.0 kHz, 44.1 kHz, 48.0 kHz, 88.2 kHz, 96.0 kHz, 176.4 kHz, 192.0 kHz, 352.8 kHz, 384.0 kHz / 16 to 32-bit 2-channel PCM
Number of bits	2.8224 MHz / 1-bit 2-channel DSD	2.8224 MHz, 5.6448 MHz / 1-bit 2-channel DSD

∗ HS-LINK cable can be used both for HS-LINK (Ver. 1) and HS-LINK Ver. 2 signal transmission.

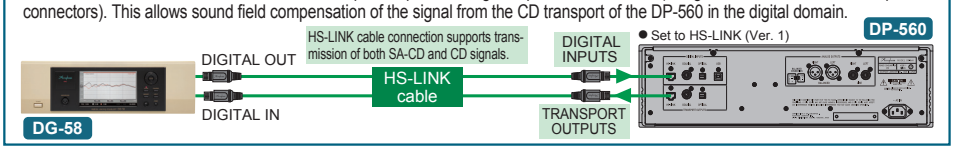
∗ With HS-LINK Ver.2, the data and clock signal are transmitted separately, and high sampling frequencies up to 5.6448 MHz 1-bit DSD and 384 kHz 32-bit PCM are supported.



HS-LINK Ver. 2 Signal Transmission Block Diagram

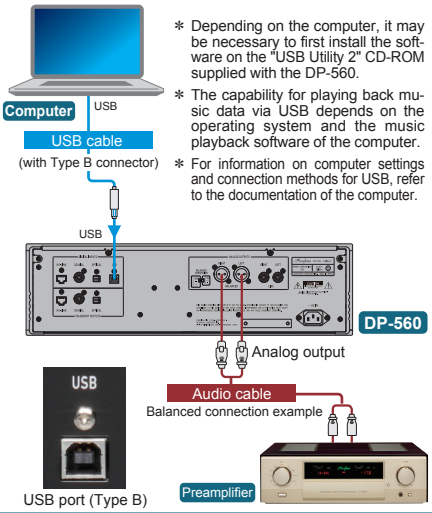
DG-58 connection example

The DG-58 can be connected between the transport outputs and digital inputs of the DP-560 (using the HS-LINK, coaxial, or optical connectors). This allows sound field compensation of the signal from the CD transport of the DP-560 in the digital domain.



Using the USB port

The USB port (Type B) of the DP-560 allows connection to a computer via USB cable (with Type B connector), for reproduction of music library data. Because sampling frequencies up to 384 kHz/32-bit and 11.2896 MHz (1-bit DSD) are supported, even very high-resolution music files can be reproduced with impeccable sound quality.

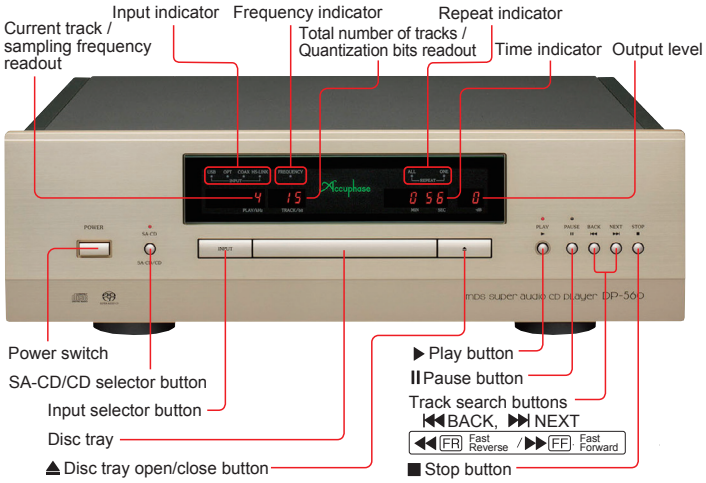


∗ Depending on the computer, it may be necessary to first install the software on the "USB Utility 2" CD-ROM supplied with the DP-560.

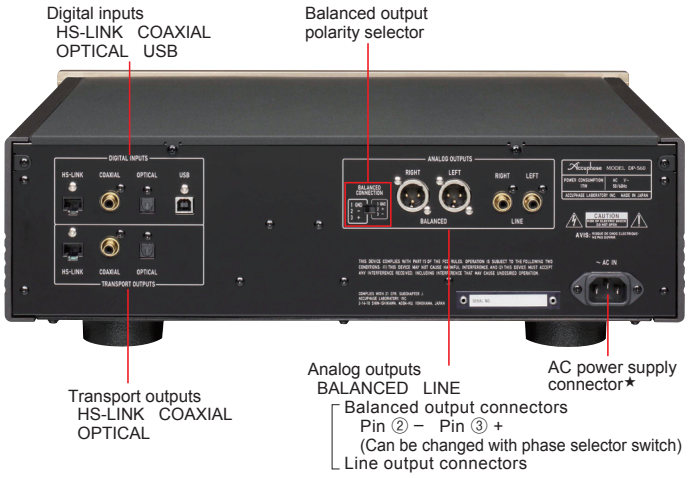
∗ The capability for playing back music data via USB depends on the operating system and the music playback software of the computer.

∗ For information on computer settings and connection methods for USB, refer to the documentation of the computer.

Front Panel



Rear Panel



DP-560 Guaranteed Specifications

∗ Guaranteed specifications measured according to JEITA standard CP-2402A ∗ Measurement disc: PHILIPS 3122-783-00632

Transport Section

Compatible Disc Formats	2-channel Super Audio CD (SA-CD) CD DSD disc DVD-R/-RW/+R/+RW (DSF file format) Data disc CD-R/-RW, DVD-R/-RW/+R/+RW (Supported formats: WAV, FLAC, DSF, DSDIFF)	
Data Read Principle	Non-contact optical pickup	
Laser Diode Wavelength	SA-CD:	655 nm
	CD:	790 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 Suitable cable: 75-ohm coaxial digital cable
	OPTICAL	Format: JEITA CP-1212 compliant Suitable cable: JEITA standard optical fiber cable
	USB	Format: USB 2.0 Hi-Speed (480 Mbps) compliant Suitable cable: USB 2.0 cable

Supplied accessories

- **Remote Commander RC-120**
- **AC power cord**
- **Audio cable with plugs AL-10**
- **USB Utility 2 CD**
- **USB Utility 2 Setup Guide**

Sampling Frequency	HS-LINK (∗: only with HS-LINK Ver. 2) 32 kHz to 192 kHz, ∗352.8 kHz, ∗384 kHz (16 to 32-bit 2-channel PCM) 2.8224 MHz, ∗5.6448 MHz (1-bit 2-channel DSD) OPTICAL 32 kHz to 96 kHz, (16 to 24-bit 2-channel PCM) USB 32 kHz to 384 kHz (16 to 32-bit 2-channel PCM) 2.8224 MHz, 5.6448 MHz, 11.2896 MHz (1-bit 2-channel DSD) (11.2896 MHz: ASIO only)
D/A Converter	4MDS+ principle
Frequency Response	0.5 to 50,000 Hz +0, –3.0 dB
Total Harmonic Distortion	0.0006% (20 to 20,000 Hz)
Signal-to-Noise Ratio	119 dB
Dynamic Range	116 dB
Channel Separation	117 dB (20 to 20,000 Hz)
Output Voltage and Impedance	BALANCED: 2.5 V 50 ohms, balanced XLR type LINE: 2.5 V 50 ohms, RCA phono jack
Output Level Control	0 dB to –80.0 dB in 1-dB steps (digital)

General

Power Requirements	AC120 V/220 V/230 V (Voltage as indicated on rear panel) 50/60 Hz
Power Consumption	18 W
Max. Dimensions	Width 465 mm (18.3 in) Height 151 mm (5.9 in) Depth 393 mm (15.5 in)
Mass	18.8 kg (41.5 lbs) net 25.0 kg (55.1 lbs) in shipping carton

Remarks

★ *This product is available in versions for 120/220/230 V AC. Make sure that the voltage shown on the rear panel matches the AC line voltage in your area.*

★ *The 230 V version has an Eco Mode that switches power off after 120 minutes of inactivity.*

★ *The shape of the AC inlet and plug of the supplied power cord depends on the voltage rating and destination country.*

Accuphase