

Accuphase

Class-A
INTEGRATED STEREO AMPLIFIER

E-560

- Revolutionary AAVA volume control
- Output stage with triple parallel push-pull power MOS-FETs
- Instrumentation amplifier principle for power amplifier input stage allows fully balanced signal transmission and enhances current feedback and MCS+ topology
- Logic-control relays for straight and short signal paths
- Robust power supply with large high-efficiency toroidal transformer and high filtering capacity
- EXT PRE button allows separation of preamplifier and power amplifier stage





The Ultimate Pure Class A Integrated Amplifier – Innovative AAVA volume control and triple parallel push-pull power MOS-FET arrangement in output stage. Power amplifier stage features latest instrumentation amplifier configuration for balanced signal transmission. Current feedback design combined with further improved MCS+ topology results in excellent high-range phase characteristics. Massive power supply delivers as much as 150 watts per channel (music signal) into loads as low as 1 ohm.

The integrated amplifiers from Accuphase operating in full class A enjoy an excellent reputation both in Japan and overseas for their outstanding musical qualities. The E-560 represents a model change from the popular E-550. While incorporating the sophisticated technological know-how gained by Accuphase over the years, it features a further refined AAVA volume control and uses the latest circuit topology and strictly selected parts of the utmost quality. The E-560 is destined to become the new reference model for high-class integrated amplifiers.

AAVA is a revolutionary principle designed for

high performance and ultimate sound. It integrates the amplification and volume control tasks in a single electronic entity that uses analog processing and eliminates all variable resistors from the signal path. Its performance and sonic purity do not deteriorate over the years, providing excellent reliability. The AAVA version in the E-560 takes the principle to the next level, delivering the same peerless performance in a more compact form factor.

The power amplifier section is built as an advanced instrumentation amplifier, which enables fully balanced signal transmission throughout. Together with the further improved MCS+ cir-

cuit topology and the highly acclaimed current feedback principle, this makes for even better electrical characteristics. In the output stage, high-power MOS-FET devices renowned for their great sound and utter reliability are arranged in a triple parallel push-pull configuration per channel. MOS-FETs have excellent frequency response and high input impedance which reduces the load on the preceding driver stage. They also have perfect thermal stability. By driving these devices in class A, the amplifier becomes capable of reproducing even the most delicate details in the music source with intriguing suppleness and utmost fidelity.

AAVA (Accuphase Analog Vari-gain Amplifier) Volume Control

AAVA is a radically different volume control principle that eliminates all variable resistors from the signal path and provides top-notch performance and sound quality. Because the music signal is not affected by changes in impedance, high signal-to-noise ratio and low distortion are maintained at any volume control setting.

■ Volume control resolution

AAVA adjusts the listening volume by means of 16 weighted V-I converter amplifiers which are controlled by current switches. The number of possible volume steps set by the combination of these converter amplifiers is 2 to the power of 16 = 65,536.

■ Input buffer amps use 5-MCS topology

One of the factors that have a bearing on possible noise in an AAVA arrangement is the input buffer design. By connecting five high-performance amps in parallel, excellent S/N ratio is assured.

■ AAVA maintains high S/N ratio and uniform frequency response

Unlike with conventional volume controls, AAVA does not introduce a change in impedance at any volume setting. Consequently, there is no deterioration of S/N ratio, and frequency response remains totally uniform. The benefits are especially apparent at settings that correspond to normal listening levels, because the tonal quality is not altered in any way.

■ No more left/right tracking differences or crosstalk

Because AAVA is an electronic circuit employing fixed-value resistors, there is virtually no left/right tracking error also at low volume levels. Since channels can be kept separate, crosstalk also does not present a problem.

■ AAVA means analog processing

The AAVA circuit converts the music signal from a voltage into a current, switches gain by means of current switches, and then reconverts the current into a voltage. The entire process is carried out in the analog domain.

■ Same operation feel as a conventional high-quality volume control

The volume control knob position is detected by a dedicated CPU which in turn selects the current switches for AAVA operation. Operating the knob therefore feels exactly the same as with a conventional control, and as before, operation via the remote commander is also possible.

■ Attenuator and balance control also implemented by AAVA

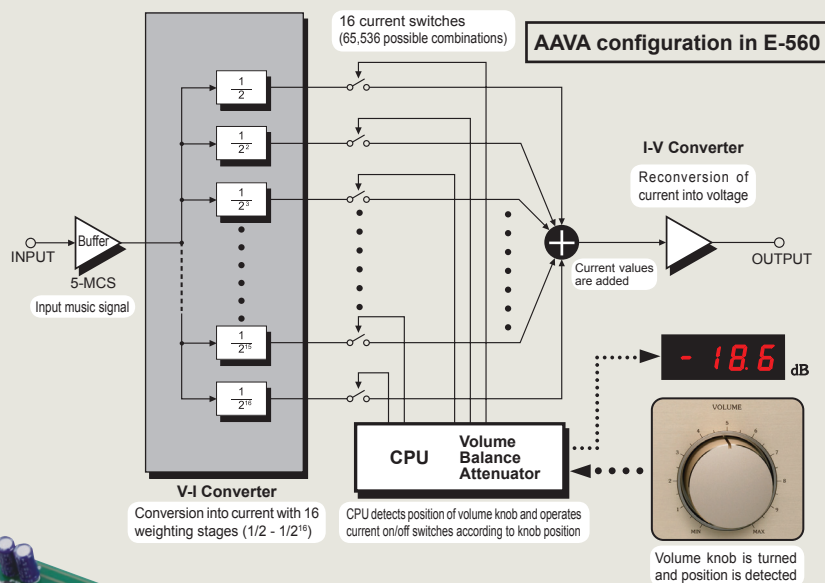
The functions of the attenuator and the left/right balance control are covered by the AAVA circuit as well, eliminating the need for additional circuit stages. Keeping the configuration simple helps to maintain high performance and sonic purity.

■ Display shows volume level as numeric value

The volume level (degree of attenuation) as set with AAVA is shown as a numeric indication in the center of the front panel. The indication ranges from MAX (0 dB) to MIN (lowest setting).

AAVA operation principle

The music signal is converted into 16 types of weighted current by V-I (voltage - current) converting amplifiers [$1/2, 1/2^2, \dots, 1/2^{15}, 1/2^{16}$]. The 16 currents are turned on or off by 16 current switches, and the combination of switch settings determines the overall volume. The switching operation is controlled by a CPU according to the position of the volume control knob. The combined signal current forms a variable gain circuit that adjusts the volume. Finally, the combined current is converted back into a voltage by an I-V (current - voltage) converter.

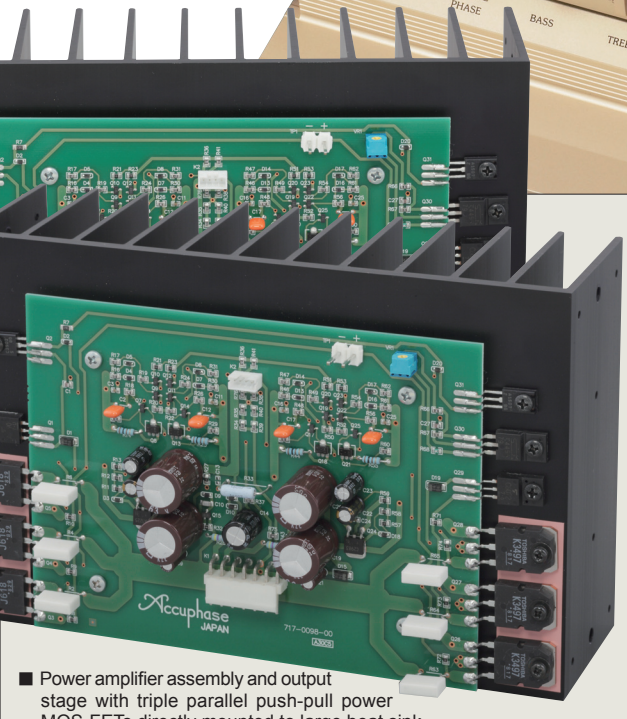


■ AAVA volume control assembly with higher integration density of components and circuitry.

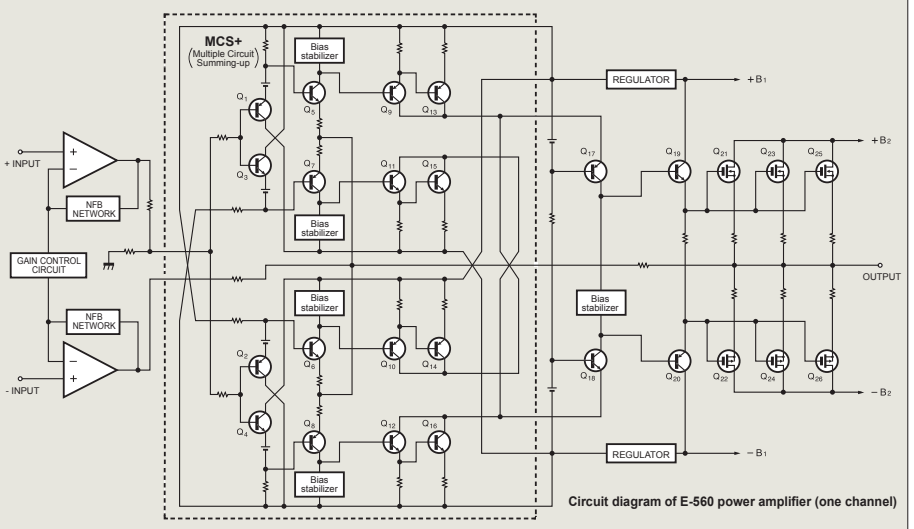
■ CPU assembly which controls AAVA and various other functions.



■ Supplied remote commander RC-200 Allows volume adjustment and input source switching.

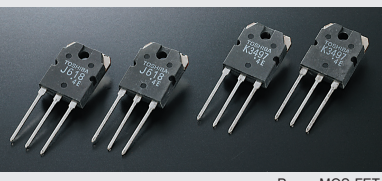


■ Power amplifier assembly and output stage with triple parallel push-pull power MOS-FETs directly mounted to large heat sink.



Circuit diagram of E-560 power amplifier (one channel)

■ Power MOS FETs in triple parallel configuration operating in pure class A deliver guaranteed linear power: 120 watts/channel into 2 ohms, 60 watts/channel into 4 ohms or 30 watts/channel into 8 ohms.



Power MOS-FETs

- Instrumentation amplifier principle in power amplifier section allows fully balanced signal paths. Current feedback design ensures outstanding high-range phase characteristics, together with further improved MCS+ topology.
- Tone controls using active filters for optimum sound quality.
- Dedicated headphone amplifier optimized for sound quality.
- Loudness compensator for enhanced bass at low listening levels.
- Versatile array of inputs with two balanced inputs to shut out external noise interference.
- Logic-controlled relays assure high sound quality and long-term reliability.



Gold-plated input/output jacks connected directly to relays

■ Power supply with massive high-efficiency toroidal transformer and large filtering capacitors provides ample reserves.



Toroidal power transformer

Filtering capacitors

- Individual phase setting supported for each input position.
- Analog peak power meters for monitoring output levels.
- Two sets of large-size speaker terminals accept also Y lugs.
- Two option board installation slots provide further versatility. With AD-20 board, MC/MM switching on E-560 front panel is possible.
- EXT PRE switch and power amplifier input connectors allow independent use of power amplifier section.



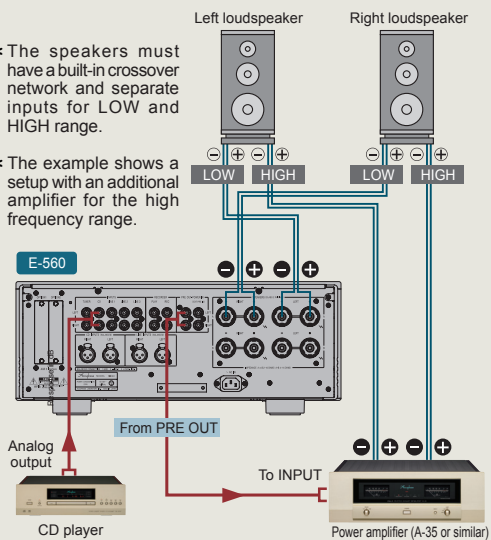
Large speaker terminals

Connection Example For Bi-amping Setup

In a bi-amped setup, the speaker units for the LOW frequency range and HIGH frequency range are driven by separate amplifiers of equal gain, for even better sound quality.

* The speakers must have a built-in crossover network and separate inputs for LOW and HIGH range.

* The example shows a setup with an additional amplifier for the high frequency range.



Option Boards

Three types of option boards can be used in the E-560: the Digital Input Board DAC-20, Analog Disc Input Board AD-20, and Line Input Board LINE-10. These boards can be installed in the rear-panel slots as required.

- It is possible to install two identical boards.
- The Analog Disc Input Board AD-9/AD-10 and the Line Input Board LINE-9 can also be used.
- When using the AD-9/AD-10, the MC/MM button of the E-560 has no effect. MC/MM switching must be performed on the board.



Photo shows an example for option board installation.

Digital Input Board

DAC-20

This board features an MDS (Multiple Delta Sigma) ++ type D/A converter and allows direct digital connection of a CD player, MD or other component with digital output (sampling frequency up to 96 kHz, 24 bits), for high-quality music reproduction.

- Inputs for coaxial and optical fiber connections are provided.

Analog Disc Input Board

AD-20

This board serves for playback of analog records. It contains a high-performance, high-gain phono equalizer.

- MC/MM switching is possible on the front panel of the E-560.
- Internal DIP switches control MC input impedance and subsonic filter on/off.

MC Gain : 62 dB
Input impedance: 10/30/100 ohms (selectable)

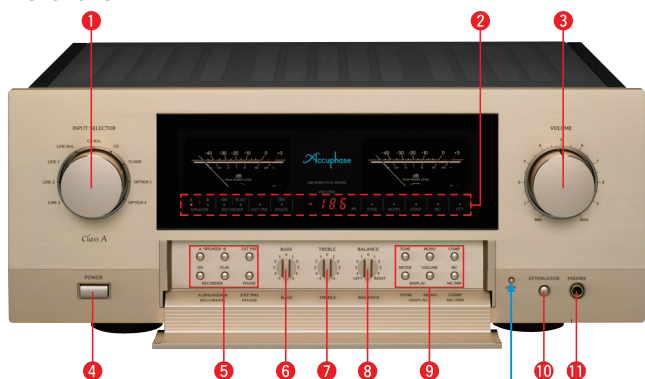
MM Gain : 36 dB
Input impedance: 47 kilohms

Line Input Board

LINE-10

This option board provides an additional set of unbalanced line inputs.

Front Panel



Rear Panel



Pressing this button opens the sub panel.

- | | |
|--|---|
| 1 Input selector | 10 Attenuator button |
| 2 Function indicator LEDs | 11 Headphone jack |
| 3 Volume control | 12 Line inputs (unbalanced)
TUNER CD LINE 1, 2, 3 |
| 4 Power switch | 13 Recorder inputs and outputs |
| 5 Function buttons (A)
Speaker selector (A/B/OFF), Phase selector,
Recording selector (ON/PLAY),
Preamplifier/power amplifier separator (EXT PRE) | 14 Preamplifier outputs |
| 6 Bass control | 15 Power amplifier inputs |
| 7 Treble control | 16 Left/right speaker output terminals A/B |
| 8 Balance control | 17 CD/LINE inputs (balanced)
① Ground ② Inverted (-)
③ Non-inverted (+) |
| 9 Function buttons (B)
Tone control (ON/OFF), Meter operation (ON/OFF),
MONO/STEREO selector, Volume level display (ON/OFF),
Loudness compensator, MC/MM selector | 18 AC power connector* |

Guaranteed Specifications

[based on the EIA RS-490 test standard]

- **Rated Continuous Average Output Power** (both channels operating simultaneously at 20 - 20,000 Hz)
150 W/ch 1-ohm load (*)
120 W/ch 2-ohm load
60 W/ch 4-ohm load
30 W/ch 8-ohm load
(*): These loads are for music signals only.

- **Total Harmonic Distortion** (both channels operating simultaneously at 20 - 20,000 Hz)
0.05% 2-ohm load
0.03% 4 to 16 ohm load

- **IM Distortion** 0.01% or less

- **Frequency Characteristics** HIGH LEVEL INPUT/POWER IN
20 - 20,000 Hz +0, -0.2 dB (for rated continuous average output)
3 - 150,000 Hz +0, -3.0 dB (for 1 watt output)

- **Damping Factor** 200 (with 8-ohm load, 50 Hz)

- **Input Sensitivity, Input Impedance**

Input	Sensitivity		Input impedance
	For rated output	For 1 W output (EIA)	
HIGH LEVEL INPUT	77.7 mV	14.2 mV	20 kΩ
BALANCED INPUT	77.7 mV	14.2 mV	40 kΩ
POWER IN	0.617 V	113 mV	20 kΩ

- **Output Voltage, Output Impedance**

PRE OUTPUT: 0.617 V, 50-ohm
(at rated continuous average output)

- **Gain** HIGH LEVEL INPUT → PRE OUTPUT: 18 dB
POWER IN → OUTPUT: 28 dB

- **Tone Controls** Turnover frequency and adjustment range
BASS: 300 Hz ±10 dB (50 Hz)
TREBLE: 3 kHz ±10 dB (20 kHz)

- **Loudness Compensation** +6 dB (100 Hz)

- **Attenuator** -20 dB

- **Signal-to-Noise Ratio**

Input	Input shorted (A weighting)	EIA S/N
	S/N ratio at rated output	
HIGH LEVEL INPUT	98 dB	93 dB
BALANCED INPUT	93 dB	93 dB
POWER IN	116 dB	98 dB

- **Power Level Meters** Logarithmic compression, peak reading meters
Output dB/% scale

- **Load Impedance** 2 - 16 ohms

- **Stereo Headphones** Suitable impedance: 8 - 100 ohms

- **Power Source** AC 120 V/230 V 50/60 Hz
(Voltage as indicated on rear panel)

- **Power Consumption** 170 watts idle
270 watts in accordance with IEC 60065

- **Maximum Dimensions** Width 465 mm (18-5/16")
Height 191 mm (7-1/2")
Depth 426 mm (16-3/4")

- **Mass** 24.0 kg (52.9 lbs) net
30.0 kg (66.1 lbs) in shipping carton

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.

Supplied accessories:

- AC power cord
- Remote Commander RC-200

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