

Accuphase

INTEGRATED STEREO AMPLIFIER

E-350

- Revolutionary AAVA-II volume control
- Parallel push-pull output stage with high-power transistors delivers plenty of quality power
- Instrumentation amplifier principle in power amplifier section allows fully balanced signal transmission
- Current feedback topology
- Logic-control relays for straight and short signal paths
- Robust power supply with large transformer and high filtering capacity





Integrated amplifier with innovative AAVA-II volume control — Instrumentation amplifier configuration in power amplifier section allows balanced signal transmission. Current feedback design ensures optimal high-range characteristics. High-power transistors in parallel push-pull arrangement are supported by ample power supply with massive transformer and large filtering capacitors. The result is an abundance of quality power: 100 watts per channel into 8 ohms.

The acclaimed E-300 series has a strong following among discerning music lovers and plays a central role in the Accuphase integrated amplifier lineup. Technological excellence is a common theme, and know-how is inherited and further enhanced throughout the series. The E-350 represents a full model change from the model E-308. Featuring the revolutionary AAVA-II (Accuphase Analog Vari-gain Amplifier) volume control, the E-350 combines latest technological sophistication with high-grade parts and materials, resulting in an integrated amplifier capable of bringing out the finest nuances in any music source.

The AAVA principle was introduced to high acclaim in the model E-550, adding another highlight to the roster of Accuphase audio innovations. The E-350 now features a further refined version of this revolutionary circuit. While AAVA in its initial form required a considerable amount of physical space, AAVA-II delivers the same peerless performance in a more compact form factor. This was made possible by implementing highly sophisticated surface mount technology while increasing component density and integration as well as optimizing the layout. The power amplifier section is configured as an

advanced instrumentation amplifier, which enables fully balanced signal transmission throughout. In conjunction with the current feedback principle, this makes for even better electrical characteristics. The output stage uses high-power transistors designed for audio applications arranged in a parallel push-pull configuration, greatly improving the capability of the amplifier to drive low impedance loads. Speaker operation is sustained by a large power transformer and amply dimensioned filtering capacitors, allowing the amplifier to deliver plenty of quality power: 2 x 140 watts into 4 ohms or 2 x 100 watts into 8 ohms.

AAVA-II (Accuphase Analog Vari-gain Amplifier) type volume control

AAVA-II (Accuphase Analog Vari-gain Amplifier) is a novel volume control concept that completely does away with variable resistors in the signal path. Because the music signal does not have to pass through such devices, there is no adverse influence from changes in impedance. This means that the outstanding S/N ratio and low distortion of the amplifier are not compromised in any way, and the same superb sound quality will be obtained at any volume setting.

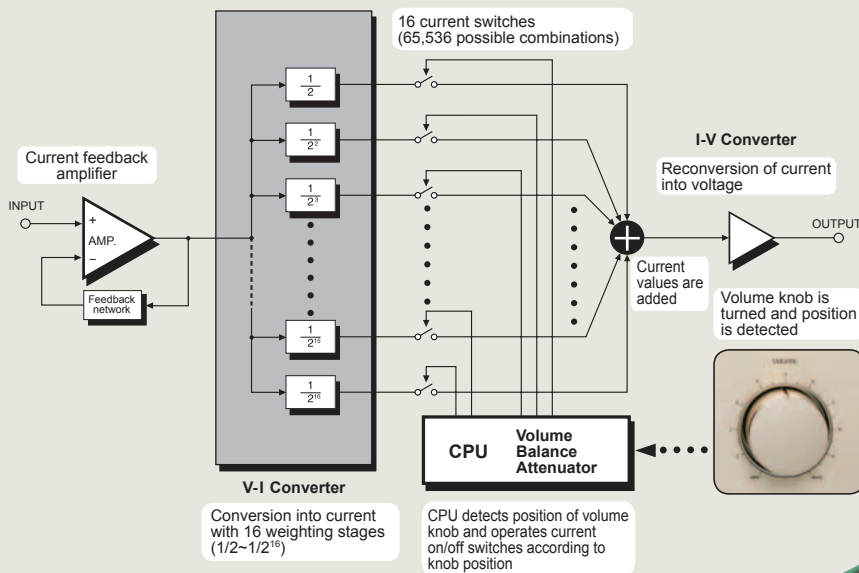
- **AAVA-II input stage employs current feedback principle that ensures high-speed, low-noise operation and assures excellent characteristics at high output voltages.**
- **Volume control resolution**
The listening volume is adjusted by a combination of 16 V-I converters. The number of possible volume steps is 2 to the power of 16 = 65,536, as determined by current switches.
- **AAVA-II circuitry is deceptively simple**
Because AAVA-II employs circuitry that is electrically very simple, long-term reliability is excellent, with

performance and sound quality that will remain unchanged also after prolonged use.

- **AAVA-II means analog processing**
The AAVA-II circuit converts the music signal from a voltage into a current, to allow control by current switches, and then back into a voltage. The entire process is carried out in the analog domain.
- **No more left/right tracking differences or crosstalk**
Because AAVA-II is an electronic circuit employing only fixed-value resistors, there is virtually no left/right tracking error also at low volume levels, and crosstalk also does not present a problem.

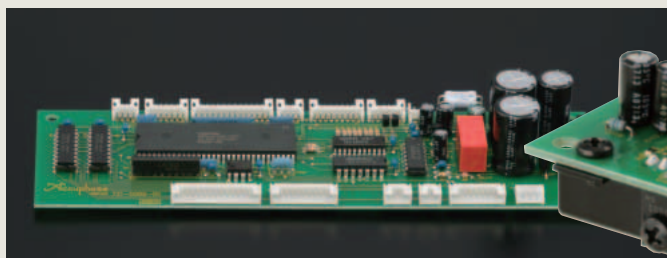
- **AAVA-II maintains high S/N ratio and uniform frequency response**
Because AAVA-II does not introduce any change in impedance, there is no deterioration of S/N ratio or alteration of frequency response. Changing the volume with AAVA does not mean introducing noise or otherwise degrading the sound quality of the amplifier.
- **Control knob gives same operation feel as with a conventional high-quality volume control.**
- **Attenuator and balance control also implemented by AAVA-II**

AAVA-II operation principle

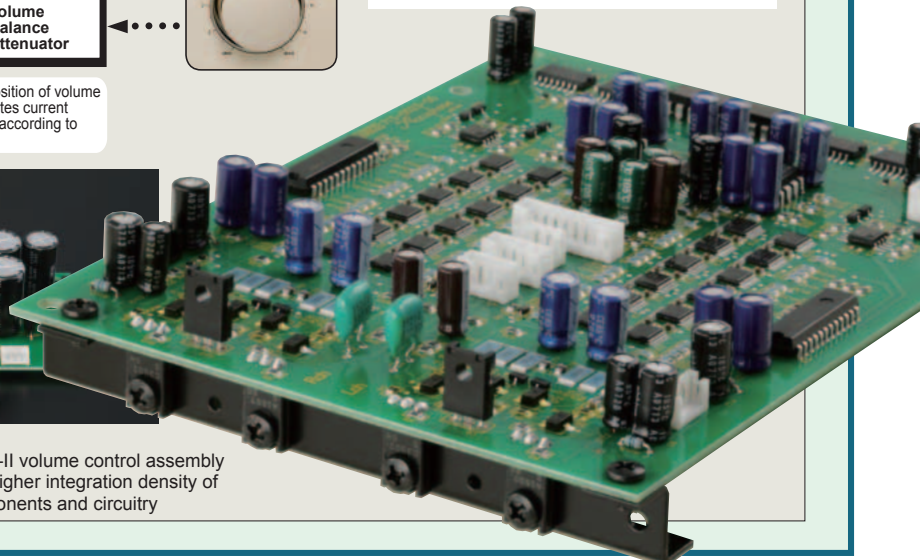


How AAVA-II works

AAVA-II operates by feeding the music signal to a V-I (voltage - current) converting amplifier where it is weighted in 16 steps [1/2, 1/4, ..., 1/32, 768, 1/65,536]. The 16 current steps 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 music signal voltage by an I-V (current-voltage) converter.



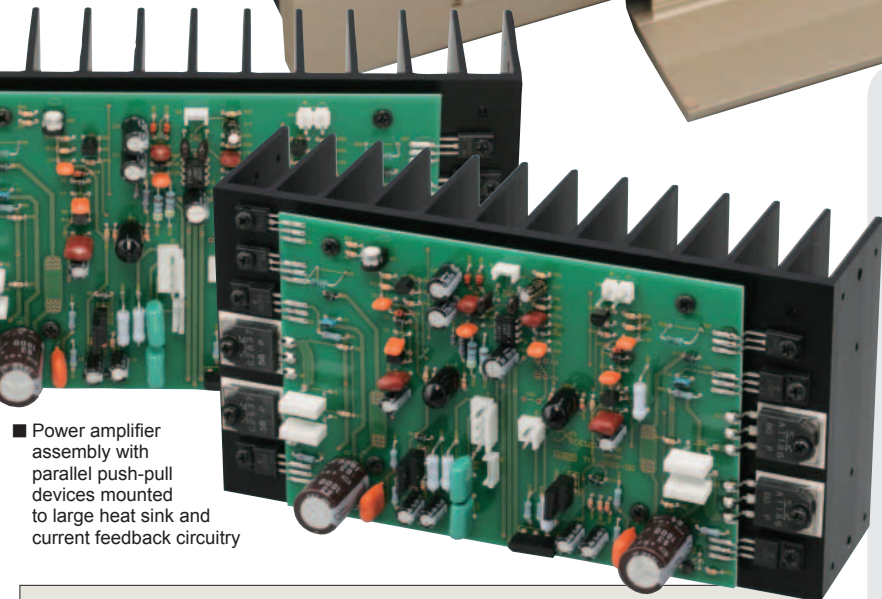
■ CPU assembly for control of AAVA-II and various functions



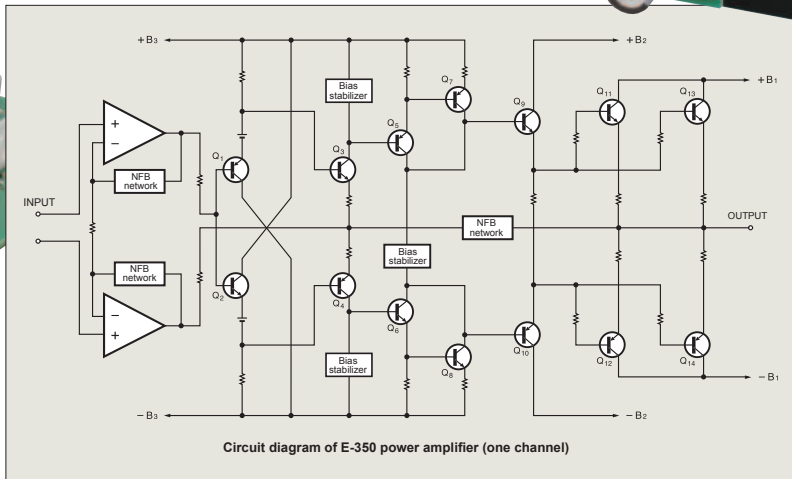
■ AAVA-II volume control assembly with higher integration density of components and circuitry



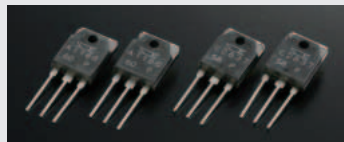
■ **Supplied remote commander RC-200**
Allows volume adjustment and input source switching.



■ **Power amplifier assembly with parallel push-pull devices mounted to large heat sink and current feedback circuitry**



■ **Output stage is configured with high-power transistors in parallel push-pull configuration, delivering high-quality power: 140 W/4 ohms or 100 W/8 ohms per channel.**



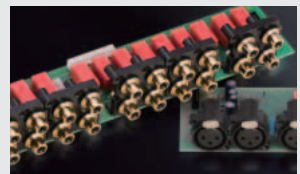
High-power transistors

■ **Instrumentation amplifier principle in power amplifier section works in tandem with current feedback design, for outstanding high-range phase characteristics.**

■ **Logic-controlled relays for signal switching ensure high sound quality and long-term reliability.**

■ **Balanced input connectors shut out external noise interference.**

■ **“High Carbon” cast iron insulator feet further enhance sonic purity.**



Input/output connectors directly linked to relays

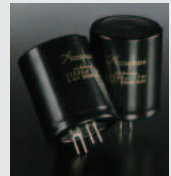
■ **Power supply features massive high-efficiency 550 VA transformer and two large filtering capacitors (22,000 $\mu\text{F} \times 2$)**

■ **Analog peak power meters.**

■ **Option board installation slots.**



Large power transformer



Filtering capacitors

■ **Two sets of large-size speaker terminals suitable for Y lugs.**

■ **E-350 front panel switching enables MC/MM selection for optional Analog Disc Input Board AD-20.**

■ **EXT PRE button and preamplifier output/power amplifier input connectors allow independent use of preamplifier and power amplifier sections.**

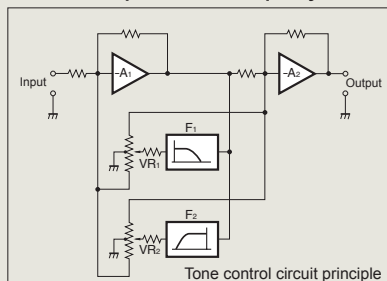


“MC/MM” button
“EXT PRE” button

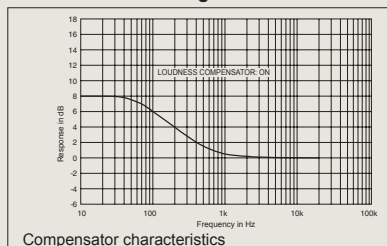


Large-size speaker terminals

■ Tone controls using summing active filters for optimum sound quality



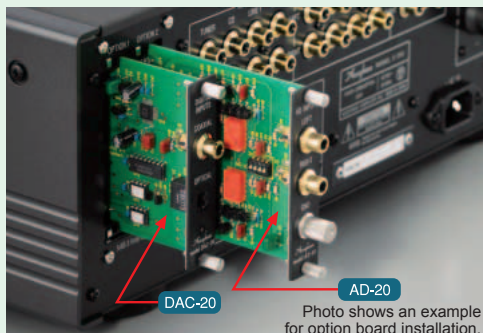
■ Loudness compensator for enhanced bass at low listening levels



Option Boards

Three types of option boards can be used in the E-350: 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-350 has no effect. MC/MM switching must be performed on the board.



Digital Input Board DAC-20

The board features an MDS (Multiple Delta Sigma) ++ type D/A converter and allows direct digital connection of a CD player, MD or DAT recorder 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.

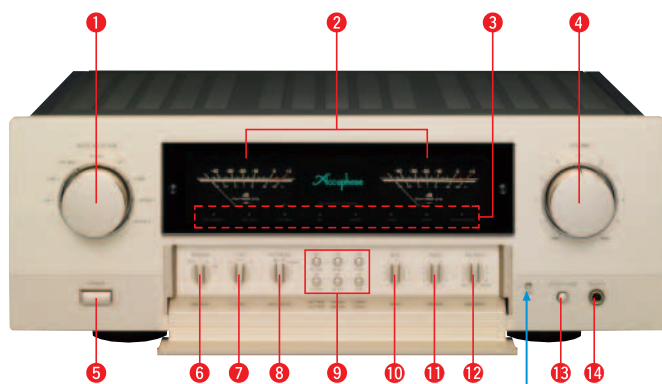
- MC/MM switching is possible on the front panel of the E-350.
- Internal DIP switches control MC input impedance and subsonic filter on/off.

MC	Gain	: 62 dB
	Input impedance:	10/30/100 ohms (selectable)
MM	Gain	: 36 dB
	Input impedance:	47 kilohms

Line Input Board LINE-10

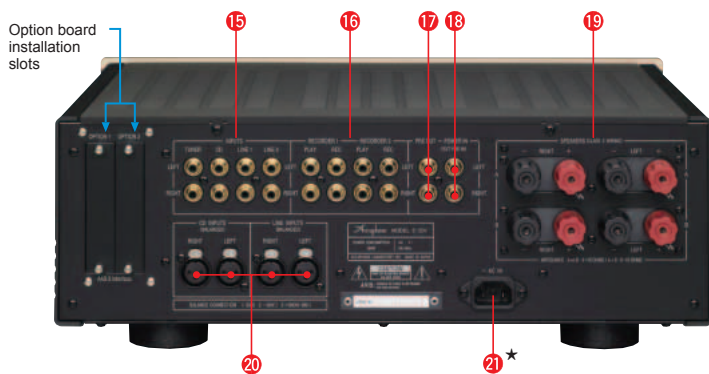
This option board provides a set of unbalanced line level inputs.

■ Front Panel



Pressing this button opens the sub panel.

■ Rear Panel



- | | |
|--|--|
| 1 Input selector
LINE 2 LINE 1 LINE-BAL CD-BAL CD
TUNER OPTION 1 OPTION 2 | 10 Bass control |
| 2 Left/right channel output meters | 11 Treble control |
| 3 Copy selector 1→2 OFF 2→1 | 12 Balance control |
| 4 Volume control | 13 Attenuator button |
| 5 Power switch | 14 Headphone jack |
| 6 Speaker selector OFF A B A+B | 15 Line inputs (unbalanced) |
| 7 Recording output selector REC OFF, SOURCE 1, 2 | 16 Recorder inputs and outputs |
| 8 Function buttons
MC/MM, EXT PRE, MONO/STEREO, Meter ON/OFF
Compensator ON/OFF, Tone Control ON/OFF | 17 Preamplifier outputs |
| | 18 Power amplifier inputs |
| | 19 Left/right speaker output terminals A/B |
| | 20 CD/LINE inputs (balanced) |
| | 21 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.

- Supplied accessories:
 - AC power cord
 - Remote Commander RC-200

Guaranteed Specifications

[Guaranteed specifications are measured according to EIA standard RS-490.]

- **Continuous Average Output Power** (both channels driven, 20–20,000 Hz)
 - 140 watts per channel into 4 ohms
 - 120 watts per channel into 6 ohms
 - 100 watts per channel into 8 ohms
- **Total Harmonic Distortion** (both channels driven, 20–20,000 Hz)
 - 0.03% with 4 to 16-ohm load
- **Intermodulation Distortion** 0.01%
- **Frequency Response** 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** 120 (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	142 mV	14.2 mV	20 kΩ
BALANCED INPUT	142 mV	14.2 mV	40 kΩ
POWER IN	1.13 V	113 mV	20 kΩ

- **Output Voltage, Output Impedance**
 - PRE OUTPUT: 1.13 V, 50 ohms (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-converted noise)**

Input	Input shorted (A weighting)		EIA S/N
	S/N ratio at rated output		
HIGH LEVEL INPUT	106 dB		92 dB
BALANCED INPUT	91 dB		92 dB
POWER IN	121 dB		98 dB

- **Power Level Meters** Logarithmic compression, peak reading meters
Output dB/% scale
- **Load Impedance** 4–16 ohms
- **Stereo Headphones** Suitable impedance: 8–100 ohms
- **Power Requirements** AC 120 V/230 V 50/60 Hz (Voltage as indicated on rear panel)
- **Power Consumption** 49 watts idle
280 watts in accordance with IEC 60065
- **Maximum Dimensions**
 - Width 465 mm (18-5/16")
 - Height 171 mm (6-3/4")
 - Depth 422 mm (16-5/8")
- **Mass** 21.7 kg (47.6 lbs) net
26.0 kg (57.3 lbs) in shipping carton
- **Supplied Remote Commander RC-200**
 - Remote control principle: Infrared pulse
 - Power supply: 3 V DC (IEC R03 batteries × 2)
 - Maximum dimensions: 56 mm × 175 mm × 26 mm
 - Mass: 153 g (including batteries)



ACCUPHASE LABORATORY, INC.