

Accuphase

STEREO CONTROL CENTER

C-2000

- Revolutionary AAVA volume control
- Fully modular construction with individual left/right amplifier units arranged on motherboard
- Separate power transformers and filtering capacitors for left and right channels
- Logic-controlled relays for shortest signal paths
- High quality tone controls
- Option board slots allow digital signal input and analog record playback





Innovative AAVA type volume control – Adjusts listening level without deterioration in S/N ratio or distortion. Dual mono construction with two power transformers and separate modular AAVA amplifiers for left and right channels mounted on motherboard. Option board slots provide support for digital input signals and high-grade analog record playback.

The C-2000 inherits the design technology of the Accuphase C-2800 and C-2400, featuring the same AAVA type volume control. AAVA (Accuphase Analog Vari-gain Amplifier) is an innovative concept that differs radically from conventional variable-resistor type volume controls. It tackles one of the most important aspects of a preamplifier, namely how it handles listening level adjustment.

In AAVA, amplification and volume control are fully unified, eliminating all mechanical contact points. Pure analog processing ensures optimum performance and superb sound. Doing away with the variable resistor in the signal path has numerous advantages and brings the

amplifier a significant step closer to absolute purity in signal transmission. Another benefit of AAVA is that it is configured only with highly reliable semiconductor components. This assures that performance and sound quality will remain undiminished for many years to come. The large volume knob on the front panel employs a position detection method that combines superb precision with a smooth conventional feel.

The power transformer, filtering capacitors and all other parts of the power supply are duplicated for the left and right channel. What's more, all unit amplifiers such as for line input, balanced output, and AAVA are also entirely separate for

the two channels, arranged on a high-quality motherboard. This fully monophonic construction prevents unwanted interaction both on the electrical and the physical plane.

The line amplifier with integrated volume control is a major aspect of the C-2000, but there are also a host of other attractive features in this superb analog preamplifier. Tone controls and loudness compensator allow fine tuning of the sound. Tape recorder and copying facilities as well as an EXT PRE function provide connection flexibility. A range of option boards allows the amplifier to handle digital input signals and to realize high-grade playback of analog records.

AAVA (Accuphase Analog Vari-gain Amplifier) volume control

The newly developed volume control called AAVA (Accuphase Analog Vari-gain Amplifier) is totally different from conventional controls using resistors. Because the music signal does not pass through variable resistors, it is not affected by changes in impedance. This means that high signal-to-noise ratio and low distortion of the signal are maintained. The volume can be adjusted without any deterioration in sound quality.

■ Volume control resolution

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

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

With conventional volume controls, the impedance increases significantly at settings that correspond to normal listening levels, thereby leading to increased noise. Because there is no change in impedance with AAVA, there is no deterioration of S/N ratio, and frequency response also is not affected. Adjusting the volume with AAVA does not mean introducing noise. High S/N ratio is maintained, and there is no alteration of sound quality.

■ 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.

■ Simple circuit configuration

AAVA unifies the amplifier and volume control functions, resulting in a circuit that is electrically very simple. Long-term reliability is excellent, with performance and sound quality that will remain unchanged also after prolonged use.

■ AAVA means analog processing

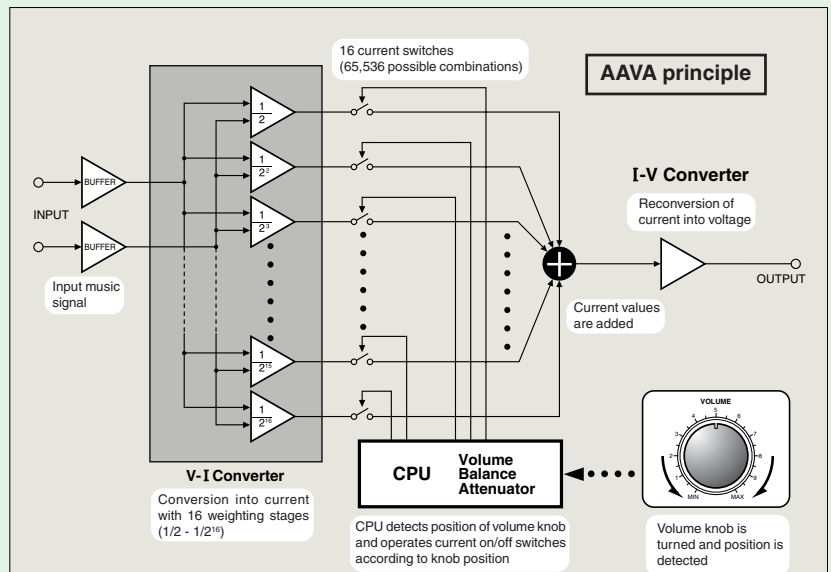
The AAVA circuit converts the music signal from a voltage into a current, switches gain by means of current switches, and then reconverts the current into a voltage. The entire process is carried out in the analog domain.

■ 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.

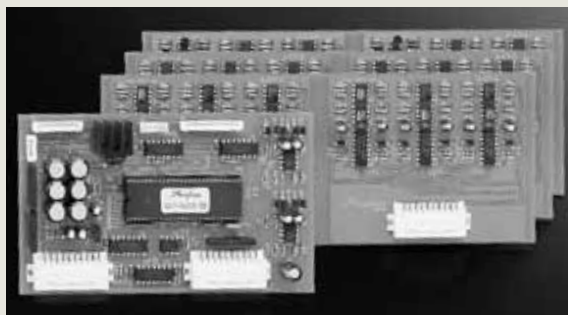
■ Attenuator and balance control also implemented by AAVA

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.



AAVA operation

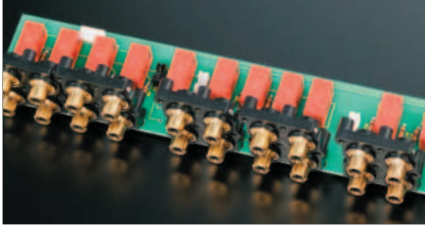
AAVA operates by feeding the music signal to a V-I (voltage - current) converting amplifier where it is weighted in 16 steps [1/2, 1/2² ... 1/2¹⁵, 1/2¹⁶]. The 16 current steps are turned on or off by 16 current switches, and the combination of switch settings determines the overall volume. The switching 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 voltage by an I-V (current - voltage) converter.



Modular AAVA unit contains input buffer, 16 V-I converter amps and current switches, current adder, I-V converter amp, and other circuitry on three boards, plus a CPU for AAVA control. Modules are installed separately for left/right channel on a motherboard.

Logic-controlled relays assure high sound quality and long-term reliability

The C-2000 offers a host of input and output connectors and functions. Strategically placed relays allow straight and short signal paths, to prevent degradation that could occur if the signal had to travel long distances for connection and function switching.



Dual mono construction with separate power transformers and separate board-mounted unit amplifiers for left/right

The input buffer, AAVA circuit, balanced output and other amplifier circuitry are configured as five separate units for each channel, arranged neatly on a motherboard. Power transformers and smoothing capacitors are also separate for the two stereo channels. This thorough dual monophonic approach assures total freedom from unwanted mutual interaction.

■ Supplied remote commander RC-20

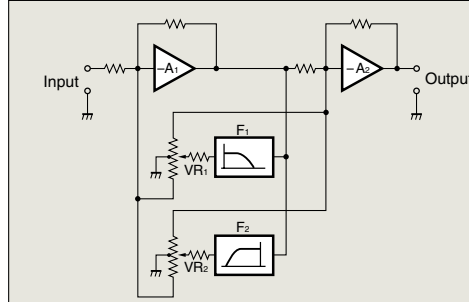
Allows volume control and input source selection.



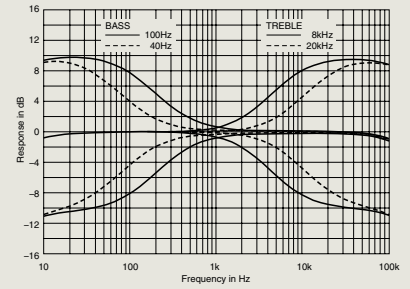
Tone controls use summing active filters for highest sound quality

The tone control circuitry in the C-2000 uses summing active filters. The illustration below shows the operation principle of this circuit. The flat signal is passed straight through, and only when an adjustment is required, the characteristics are created at F_1 and F_2 and added to the signal, thereby producing the desired change. This design

provides efficient control without degrading signal purity. The turnover frequency for the bass control (max. ± 8 dB) can be switched between 40 and 100 Hz, and that for the treble control (max. ± 8 dB) between 8 kHz and 20 kHz.



Tone control circuit principle (using summing active filters)

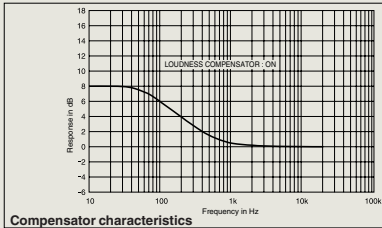


Tone control characteristics



Other features and functions

- Flexible input/output configuration
- Dedicated headphone amplifier optimized for high sound quality
- EXT PRE function allows use of external preamplifier
- Option board slots allow digital signal input and playback of analog records
- Supplied remote commander with volume control function
- Versatile features:
 - Recording/playback/monitoring facilities for 2 recorders with copy function
 - Phase selector
 - Attenuator
 - Loudness compensator for rich bass at low levels



Option Boards

Three types of option boards are available for the C-2000: Digital Input Board DAC-10, Analog Disc Input Board AD-10, and Line Input Board LINE-10. Insert the desired board in a rear-panel option board slot.

- You can also install two identical boards.
- The Analog Disc Input Board AD-9 and the Line Input Board LINE-9 can also be used.
- The DAC-10 cannot be used in the models E-407, E-406V, E-306V, E-211, and C-265.



Photograph shows an example of option board installation.

Digital Input Board DAC-10

This board features an MDS (Multiple Delta Sigma) D/A converter. It can accept the digital output signal from components such as a CD player, MD recorder, DAT recorder, etc. (sampling frequency range 32 - 96 kHz, 24 bits) for high-grade music reproduction.

- Inputs for coaxial and optical fiber connections are provided.

Analog Disc Input Board AD-10

This board contains a high-performance, high-gain phono equalizer.

- Internal DIP switches control MM/MC operation, MC input impedance, and subsonic filter on/off.

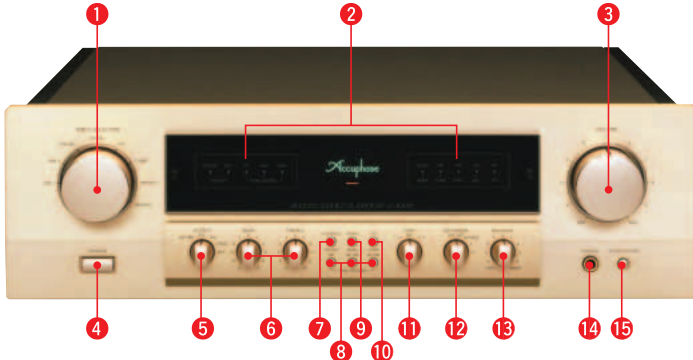
MM Gain: 36 dB
Input impedance: 47 kilohms

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

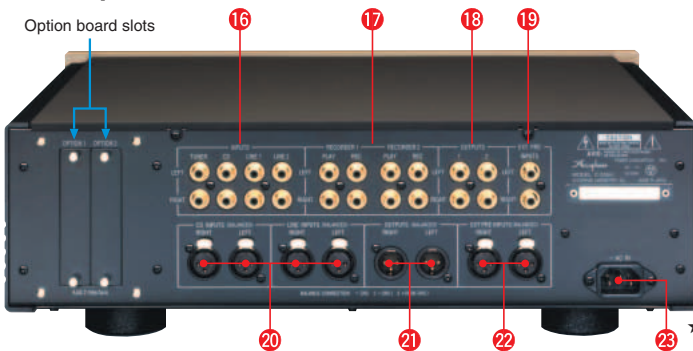
Line Input Board LINE-10

This option board provides an additional set of conventional unbalanced line inputs which can be used to connect a CD player, tuner, or other component with analog outputs.

Front panel



Rear panel



- | | |
|--|---|
| <p>1 Input selector
LINE 2 LINE 1 LINE-BAL CD-BAL CD
TUNER OPTION 1 OPTION 2</p> <p>2 Function LED indicators</p> <p>3 Volume control</p> <p>4 Power switch</p> <p>5 Output selector
EXT PRE ALL BAL UNBAL OFF</p> <p>6 BASS and TREBLE controls</p> <p>7 Phase selector button</p> <p>8 Tone control buttons
ON/OFF 40/100 Hz 8 kHz/20 kHz</p> <p>9 Stereo/mono selector button</p> <p>10 Loudness compensator button</p> <p>11 Copy selector
1→2 OFF 2→1</p> | <p>12 Recorder selector
REC OFF SOURCE 1 2</p> <p>13 Balance control</p> <p>14 Headphone jack</p> <p>15 Attenuator button</p> <p>16 Line input connectors TUNER CD LINE 1,2</p> <p>17 Recorder playback/recording connectors</p> <p>18 Unbalanced output connectors (2 sets)</p> <p>19 External preamplifier input connectors (unbalanced)</p> <p>20 CD/LINE balanced input connectors
① Ground ② Inverted (-)
③ Non-inverted (+)</p> <p>21 Balanced output connectors</p> <p>22 External preamplifier input connectors (balanced)</p> <p>23 AC power supply connector*</p> |
|--|---|

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
 - Audio cables with RCA-type plugs (1 m)
 - Remote Commander RC-20

GUARANTEED SPECIFICATIONS

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

- **Frequency Response** BALANCED/UNBALANCED INPUT
3 - 200,000 Hz +0, -3.0 dB
20 - 20,000 Hz +0, -0.2 dB

- **Total Harmonic Distortion** 0.005% (for all inputs)

- **Input Sensitivity, Input Impedance**

Input	Sensitivity		Input impedance
	For rated output	For 0.5 V output	
BALANCED	252 mV	63 mV	40 kΩ
UNBALANCED	252 mV	63 mV	20 kΩ

- **Rated Output Voltage, Output Impedance** BALANCED/UNBALANCED OUTPUT: 2 V, 50 ohms
RECORDER REC: 252 mV, 200 ohms

- **S/N Ratio**

Input	Input shorted (A weighting) S/N ratio at rated output	EIA S/N
BALANCED	108 dB	107 dB
UNBALANCED	108 dB	107 dB

- **Maximum Output Level** (0.005% THD, 20 - 20,000 Hz)

BALANCED/UNBALANCED OUTPUT: 7.0 V
RECORDER REC: 6.0 V

- **Minimum Load Impedance** BALANCED/UNBALANCED OUTPUT: 600 ohms
RECORDER REC: 10 kilohms

- **Gain**

BALANCED/UNBALANCED INPUT → BALANCED/UNBALANCED OUTPUT: 18 dB
BALANCED/UNBALANCED INPUT → REC OUTPUT: 0 dB

- **Tone Controls**

Turnover frequency and adjustment range
BASS: 40/100 Hz switchable, ±8 dB
TREBLE: 8 kHz/20 kHz switchable, ±8 dB

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

- **Attenuator** -20 dB

- **Headphone Jack**

Suitable impedance: 8 - 100 ohms

- **Power Requirements**

AC 120 V/230 V, 50/60 Hz
(Voltage as indicated on rear panel)

- **Power Consumption**

30 Watts

- **Maximum Dimensions**

Width 465 mm (18-11/16")
Height 150 mm (6-3/4")
Depth 405 mm (16-5/8")

- **Mass**

16.2 kg (35.7 lbs) net
20.0 kg (44.1 lbs) in shipping carton

- **Supplied Remote Commander RC-20**

Remote control principle: Infrared pulse
Power supply: 3 V DC (IEC R6 batteries × 2)
Maximum dimensions: 55 mm (W) × 194 mm (H) × 18 mm (D)
Mass: 100 g (including batteries)