

# Accuphase

## INTEGRATED STEREO AMPLIFIER

# E-206

- Parallel push-pull output stage: 100W × 2 (8Ω)
- Low impedance speaker can be fully driven
- DC servo-controlled throughout
- Signal path controlled by logic circuit



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# All direct-coupled circuitry designed with DC servo configuration for straight and pure signal transmission from MC input to speaker outputs. Outstanding Low impedance drive capability as low as 2 ohms.

Program sources are getting better all the time. Compact Discs have become an extremely popular music medium, and Digital Audio Tape as well as digital DBS (Direct Broadcasting Satellite) broadcasts are quickly catching up. Of course, the playback equipment has to keep pace with these developments, to let the listener enjoy the full potential of such advanced sources. The E-206 reflects Accuphase's long experience in building separate type amplifiers of world renown. It uses only carefully selected parts and provides performance and quality which are on a par with stand-alone preamplifiers and power amplifiers.

The output stage uses wide frequency range output transistors which can handle large currents and are arranged in a push-pull configuration. The complementary MOS-FET driver circuit developed by Accuphase ensures stable operation under a wide variety of load conditions. The amplifier delivers 100 watts per channel into 8 ohms (20-20,000 Hz, 0.01% THD), and 140 watts per channel into 4 ohms.

The impedance of a normal loudspeaker varies considerably depending on the frequency. In order to provide uniform energy to the speaker over the entire audio frequency range, an amplifier must be capable of delivering stable power also into very low impedances. The low-impedance drive capability of the E-206 is outstanding, with a comfortable performance margin. A large power transformer with separate windings for the preamplifier, driver stage and power amplifier stage ensures that even loads as low as 2 ohms can be driven without problems.

A very attractive feature of the preamplifier section is the Presence Equalizer which allows precise control of frequency response at four points: 100 Hz, 500 Hz, 2 kHz, and 8 kHz. This makes it possible to introduce just the right amount of tonal compensation whenever desired.

A total of seven inputs accommodate a variety of program sources. These are switched using logic relay control for optimum performance and long-term reliability.

Preamplifier output and main amplifier input jacks are provided, for additional flexibility. The two sections of the amplifier can be linked or separated at the simple flick of a switch, permitting use of the E-206 as separate preamplifier or power amplifier. A phono equalizer section which rivals the best of high-end preamplifiers, a separate recording selector, as well as many other features make the E-206 an excellent choice for the discerning music lover.

## 1 Parallel push-pull output stage and MOS-FET driver circuit. Large power supply and output stage effortlessly drive even every low impedance loads.

Fig. 1 shows the circuit diagram of the power amplifier section. The output stage employs a parallel push-pull configuration to provide an ample power output of 100 watts per channel into 8 ohms. The driver stage is another example of innovative Accuphase engineering. It uses MOS-FETs, which are ideal for the driver stage, where low output impedance and high driving voltage are essential.

This driver stage, together with the low emitter resistance in the output stage, provides extremely high-quality output which is totally free of notching distortion.

The output stage has to deliver the required energy to the loudspeakers. The impedance of a speaker varies considerably depending on the frequency. For example, the actual impedance of a speaker system having a nominal impedance of 4 ohms may drop to values as low as 2 ohms or less at some frequencies. Therefore, the power amplifier must be capable of delivering stable power also into very low impedances. However, the current flow in a solid-state amplifier is reversely proportional to the load impedance. If this current exceeds the limits of the output devices, the transistors may be destroyed. This is a factor which has severely restricted the output level at low impedances. However, the increasing use of digital program sources has led to a growing demand for amplifiers which can supply sufficient power into low-impedance loads.

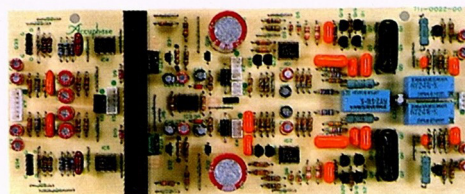
The E-206 has a  $P_c$  (maximum power dissipation) rating of about 400 watts, sustained by a large power transformer. This guarantees performance levels not attained by other amplifiers in this class. The rated output into 4 ohms is 140 watts per channel, and even 2-ohm loads can be driven comfortably.

## 2 Completely direct-coupled DC servo design from phono input all the way to the outputs

All amplifier blocks, from the phono input for analog discs up to the output stage, are linked directly, without any coupling capacitors in the signal path. This ensures excellent amplification performance and clean, uncolored sound. Any possibility of DC drift is effectively precluded by separate DC servo loops for each unit, resulting in highly stable operation.

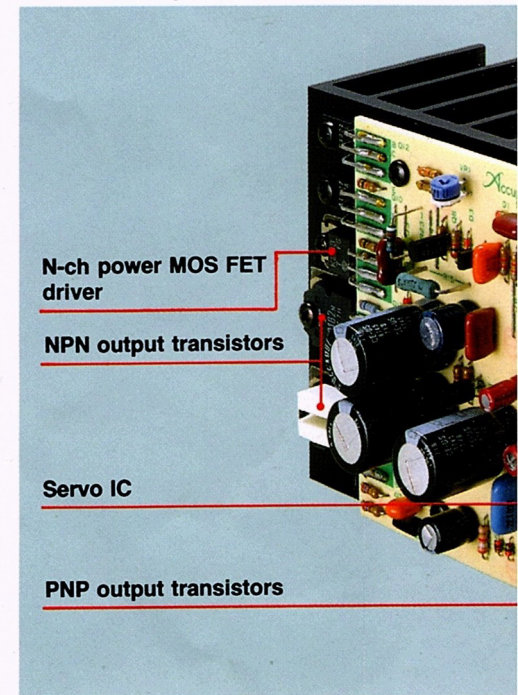
## 3 Power transformer with three separate windings for preamplifier, power amplifier driver stage, and output stage. Separate regulator circuitry for left and right channel.

The power supply of the E-206 rivals that of separate components in capability and quality. In order to preclude mutual interference between the preamplifier section, which handles very low-level signals, and the power amplifier, the power supply must be kept separate. In the E-206, this is achieved by using a large power transformer which has three separate windings, one each for the preamplifier, the power amplifier driver stage, and the power amplifier output stage. For further improved performance, the rectifiers and the regulation and filtering circuitry are kept separate for the left and right channel, thereby totally preventing interchannel crosstalk. Absolutely stable operation is achieved by separate regulator circuitry for the preamplifier and power amplifier stage.



High-Gain Equalizer Amplifier Circuit Board

## • Power Amplifier Unit (Single Channel)



## 4 High-performance phono stage accommodates all MC and MM cartridges.

Although digital program sources are becoming ever more popular, the analog record collection of a true audiophile and music lover is a treasure he will not easily abandon. The E-206 is designed to provide high-quality reproduction of analog records as well.

As shown in Fig. 2, the gain of the phono stage is switchable to match either moving-coil (MC) or moving-magnet (MM) cartridges. In the MC position, gain is 60 dB, and in the MM position 30 dB.

The input employs low-noise, high-Gm FET devices in a 3-parallel differential circuit with cascode bootstrap. The circuit is direct-coupled for superior signal-to-noise ratio and stability. The triple parallel design is perfectly suited to the low output levels of moving-coil cartridges, as it keeps residual noise to a minimum.

## 5 Straight and short signal paths with logic relay control

Long signal paths for input switching and tape monitoring can degrade high-frequency response and impair imaging. In the E-206, all switching is performed by relays which are arranged to permit the shortest possible signal paths.

Advanced logic circuits are used to control the relays and to assure accurate and precise operation.

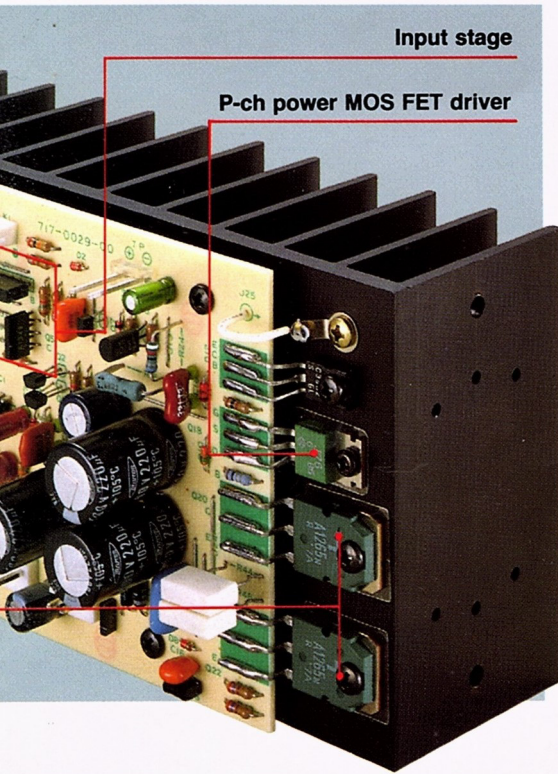
The relays have twin crossbar contacts plated with silver palladium alloy for minimum contact resistance and outstanding long-term reliability.

## 6 "Presence Equalizer" offers versatile four-point control

Even with high-quality program sources, tone controls which permit subtle adjustments of the reproduced sound can prove very useful. Graphic equalizers are originally intended for this purpose, but their great number of controls

# Accuphase E-206

INTEGRATED STEREO AMPLIFIER



Input stage

P-ch power MOS FET driver

## 8 Separate REC selector and TAPE COPY switch

Many hobby recordists desire sophisticated recording and playback capabilities for tape decks. The E-206 is equipped to easily cope with such needs as well. A separate REC selector lets you for example record an FM broadcast while listening to a CD. Dubbing between two tape recorders in any direction is also as easy as flicking a switch, thanks to the TAPE COPY selector.

## 9 Input/output terminals permit separate use of preamplifier and power amplifier

A set of preamplifier output and power amplifier input terminals on the rear panel permits separating the E-206 into two sections in their own right. These terminals can be used to hook up external signal processors such as graphic equalizers, or to combine for example the E-206's power amplifier section with another preamplifier of your choice.

## 10 Other valuable functions

The E-206 offers many more useful features. A **subsonic filter** eliminates very low-frequency noise generated by record warps. An **attenuator** allows lowering the volume level without disturbing the setting of the volume control. A **speaker switch** lets you select either of two speaker systems or use both at once. A **stereo/mono mode switch** permits switching to monophonic reproduction to check for correct phase response of the left and right speaker systems. These and other controls make the E-206 perfectly suited to handle any need.

## 11 Choice of two front panel colors: champagne gold or black

The color of the front panel is champagne gold, the traditional color of Accuphase products. In addition, a version with a black front panel is available as model E-206B.

often make them difficult to use. The newly developed Presence Equalizer of the E-206 is specially designed for program source equalization, to achieve the most pleasing aural impression during music reproduction. Adjustment is possible with four controls (refer to the frequency response chart at the end of this catalog.) In the midrange, the 500-Hz control affects for example the timbre of rhythm instruments and the 2-kHz control can be used to emphasize vocals or reduce traces of stringency. Extensive listening tests were carried out to determine the Q factor for these controls, i.e., the steepness of the tone control curve. A value of 0.707 was finally chosen, because it provides the most natural sounding results with a wide variety of program sources. The overall tonal energy balance can be adjusted with the Bass and Treble controls.

The circuit configuration of the Presence Equalizer is shown in Fig. 3. It consists of a combination of summing filters such as used in high-performance graphic equalizers. All parts were strictly selected on the basis of their sonic performance, so that signal quality is not degraded in any way. When the Presence Equalizer is not used, it can be entirely removed from the signal path by setting the Presence Equalizer switch to OFF.

## 7 Input facilities for up to seven program sources

The E-206 possesses input jacks for a total of seven source: one for analog discs (MM or MC), a tuner, a CD, two other line inputs, and two tape inputs. This provides unlimited versatility and lets you easily expand your system for example with a digital tape recorder, video disc player, or other components. The desired program source can be selected at the simple touch of a button.

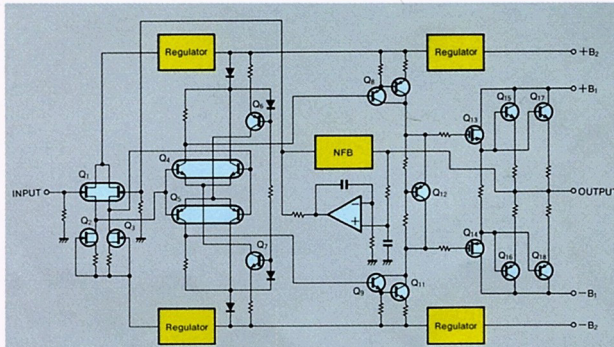


Fig. 1 Power Amplifier Section

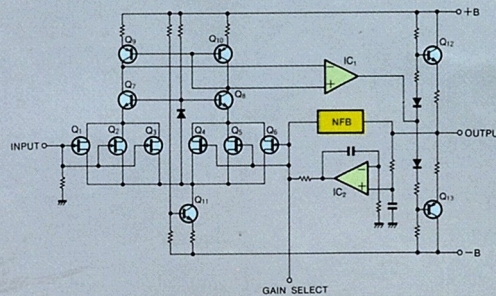


Fig. 2 Equalizer Amplifier Section

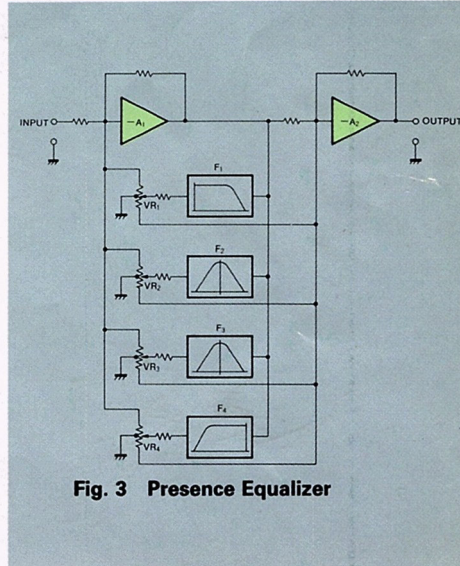
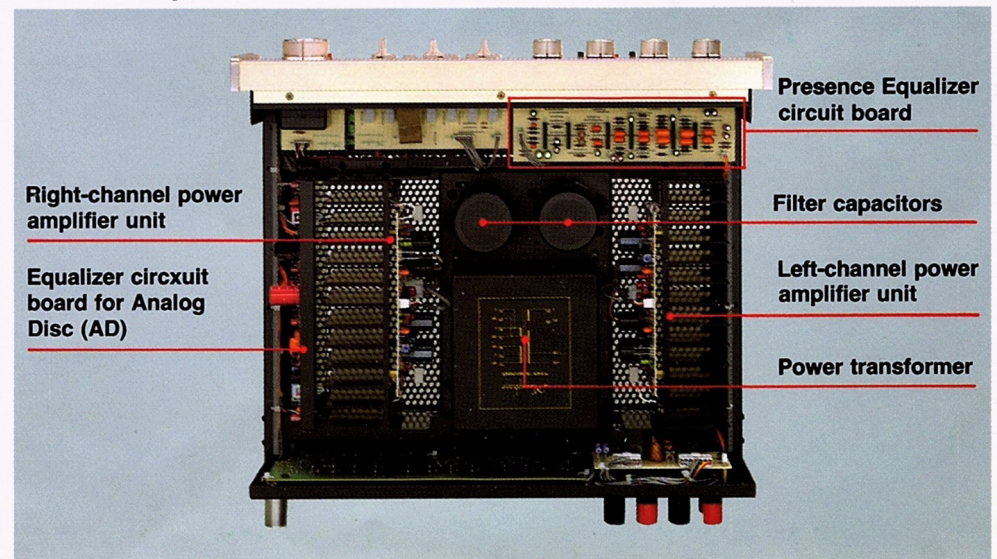


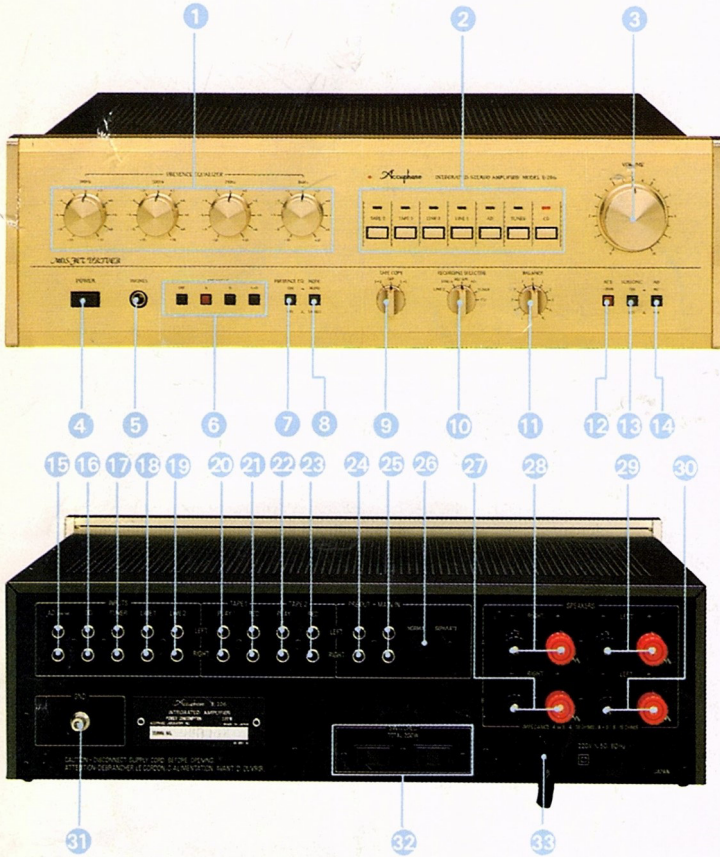
Fig. 3 Presence Equalizer

## • Internal Layout



# Accuphase E-206

INTEGRATED STEREO AMPLIFIER



- 1 PRESENCE EQUALIZER controls
- 2 Input Selectors
- 3 VOLUME control
- 4 POWER switch
- 5 Headphone jack (PHONES)
- 6 SPEAKERS selector
- 7 PRESENCE Equalizer ON/OFF switch
- 8 MODE switch STEREO/MONO
- 9 TAPE COPY selector
- 10 RECORDING SELECTOR
- 11 BALANCE control
- 12 ATTenuator
- 13 SUBSONIC filter ON/OFF switch
- 14 AD (Analog Disc equalizer gain control)
- 15 AD input jack
- 16 CD input jack
- 17 TUNER input jack
- 18 LINE-1 input jack
- 19 LINE-2 input jack

- 20 TAPE-1 input jack
- 21 TAPE-1 recording output jack
- 22 TAPE-2 input jack
- 23 TAPE-3 recording output jack
- 24 Preamplifier output jack
- 25 Power amplifier input jack
- 26 Preamplifier/Power amplifier separator switch
- 27 Speaker B right channel output terminals
- 28 Speaker A right channel output terminals
- 29 Speaker A left channel output terminals
- 30 Speaker B left channel output terminals
- 31 Ground (GND) terminal
- 32 SWITCHED AC outlets\*
- 33 AC power cord

\* These SWITCHED outlets may not be supplied depending on the safety standards or regulations applicable in the particular country to where the unit is destined.

## GUARANTY SPECIFICATIONS

(guaranteed specifications are measured according to EIA standard RS-490/AD denotes Analog Disc input)

- **PERFORMANCE GUARANTY:**  
All Accuphase product specifications are guaranteed as stated.
- **CONTINUOUS AVERAGE POWER OUTPUT**  
140 watts per channel into 4 ohms  
100 watts per channel into 8 ohms  
(Both channels drive, 20 to 20,000Hz, THD 0.02%)
- **TOTAL HARMONIC DISTORTION**  
0.02% max., at 4 ohms  
0.01% max., at 8 ohms  
(Both channels drive, from 0.25W to rated continuous average output, 20 to 20,000Hz)
- **INTERMODULATION DISTORTION**  
Will not exceed 0.01% at rated power output
- **FREQUENCY RESPONSE**  
High Level Input: 20 TO 20,000Hz; +0, -0.2dB (for rated output)  
0.5 to 120,000Hz; +0, -3.0dB (for 1 watt output)  
Low Level Input: 20 to 20,000Hz; +0.2, -0.5dB (for tated output)
- **DAMPING FACTOR**  
90, 8-ohm load at 50Hz
- **INPUT SENSITIVITY AND IMPEDANCE**

Input terminal	Sensitivity		Impedance
	At rated output	EIA at 1W output	
AD INPUT (MC)	0.11mV	0.01mV	100 ohms
AD INPUT (MM)	3.9mV	0.39mV	47 kohms
HIGH-LEVEL INPUT	113mV	11.3mV	20 kohms

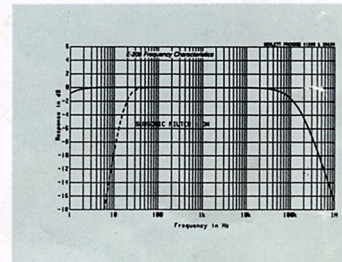
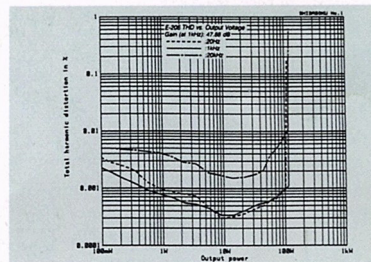
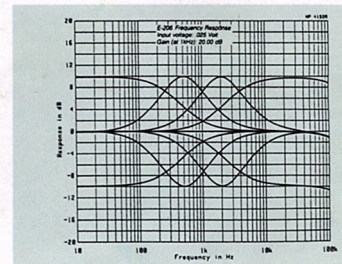
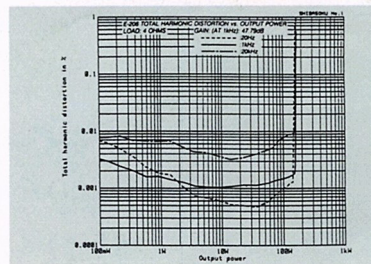
- **MAXIMUM AD INPUT LEVEL**  
MM: 300mVrms, 1kHz, THD 0.005% (REC OUT)  
MC: 8.0mVrms, 1kHz, THD 0.005% (REC OUT)
- **OUTPUT LEVEL AND IMPEDANCE**  
TAPE REC OUTPUT: 89.8mV, 220 ohms (from AD)  
HEADPHONES: 0.2V with low impedance (4 to 100ohms)
- **GAIN**  
HIGH LEVEL INPUT → OUTPUT: 48dB  
AD INPUT (MM) → TAPE REC OUTPUT: 29dB  
AD INPUT (MC) → TAPE REC OUTPUT: 60dB
- **SIGNAL-TO-NOISE RATIO**

Input terminal	Input shorted, A-weighted	EIA
HIGH-LEVEL INPUT	106dB	80dB
AD INPUT (MM)	85dB	79dB
AD INPUT (MC)	66dB	74dB

- **PRESENCE EQUALIZER**  
4-band principle  
Frequencies: 100Hz, 500Hz, 2kHz and 8kHz  
Variable Range: ± 10dB
- **SUBSONIC FILTER**  
17Hz, -12dB/oct
- **ATTENUATOR**  
-20dB
- **OUTPUT LOAD IMPEDANCE**  
4 to 16ohms
- **SEMICONDUCTOR COMPLEMENT**  
63 Tr's 17 IC's 24 FET's 80 DI's

- **POWER REQUIREMENT**  
100, 117, 220, 240V 50/60Hz AC
- **CONSUMPTION**  
55 watts at zero signal output  
330 watts in accordance with IEC-65
- **DIMENSIONS**  
445mm (17-1/2 inches) width, 145mm (5-12/

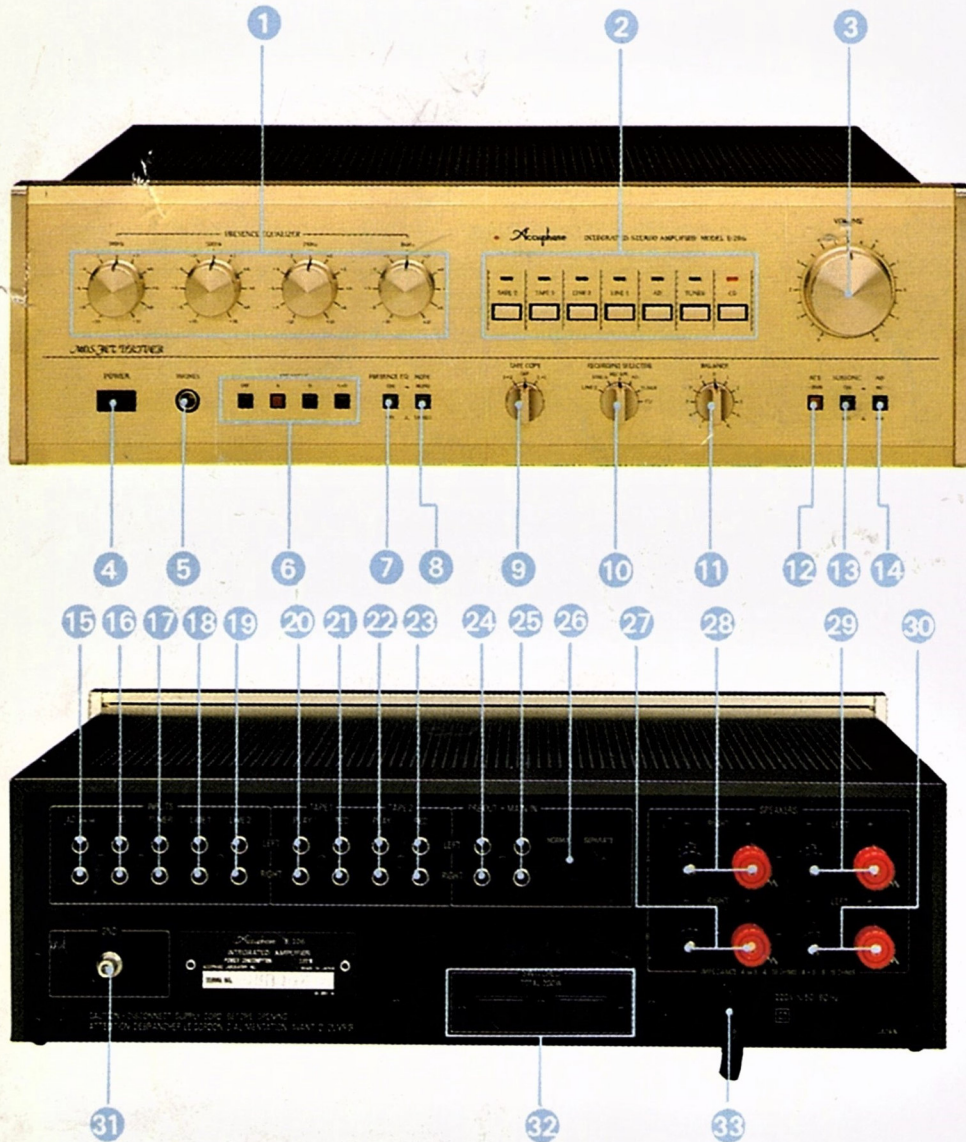
- 16 inches) max. height
- 370mm (14-9/16 inches) depth
- **WEIGHT**  
17.1kg (37.6 lb) net, 21.2kg (46.6 lb) in shipping carton



**Accuphase**  
ACCUPHASE LABORATORY INC.

# Accuphase E-206

INTEGRATED STEREO AMPLIFIER



- 1 PRESENCE EQUALIZER controls
- 2 Input Selectors
- 3 VOLUME control
- 4 POWER switch
- 5 Headphone jack (PHONES)
- 6 SPEAKERS selector
- 7 PRESENCE EQUALIZER ON/OFF switch
- 8 MODE switch  
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(Both channels drive, 20 to 20,000Hz, THD 0.02%)

● **TOTAL HARMONIC DISTORTION**

0.02% max., at 4 ohms  
0.01% max., at 8 ohms  
(Both channels drive, from 0.25W to rated continuous average output, 20 to 20,000Hz)

● **INTERMODULATION DISTORTION**

Will not exceed 0.01% at rated power output

● **FREQUENCY RESPONSE**

High Level Input: 20 TO 20,000Hz; +0, -0.2dB (for rated output)  
0.5 to 120,000Hz; +0, -3.0dB (for 1 watt output)  
  
Low Level Input: 20 to 20,000Hz; +0.2, -0.5dB (for tated output)

● **DAMPING FACTOR**

90, 8-ohm load at 50Hz

● **INPUT SENSITIVITY AND IMPEDANCE**

Input terminal	Sensitivity		Impedance
	At rated output	EIA at 1W output	
AD INPUT (MC)	0.11mV	0.01mV	100 ohms
AD INPUT (MM)	3.9mV	0.39mV	47 kohms
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● **OUTPUT LEVEL AND IMPEDANCE**

TAPE REC OUTPUT: 89.8mV, 220 ohms (from AD)  
HEADPHONES: 0.2V with low impedance (4 to 100ohms)

● **GAIN**

HIGH LEVEL INPUT → OUTPUT: 48dB  
AD INPUT (MM) → TAPE REC OUTPUT: 29dB  
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4-band principle  
Frequencies: 100Hz, 500Hz, 2kHz and 8kHz  
Variable Range: ± 10dB

● **SUBSONIC FILTER**

17Hz, -12dB/oct

● **ATTENUATOR**

-20dB

● **OUTPUT LOAD IMPEDANCE**

4 to 16ohms

● **SEMICONDUCTOR COMPLEMENT**

63 Tr's 17 IC's 24 FET's 80 Di's

● **POWER REQUIREMENT**

100, 117, 220. 240V 50/60Hz AC

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55 watts at zero signal output  
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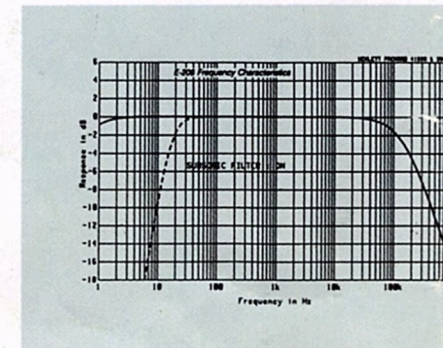
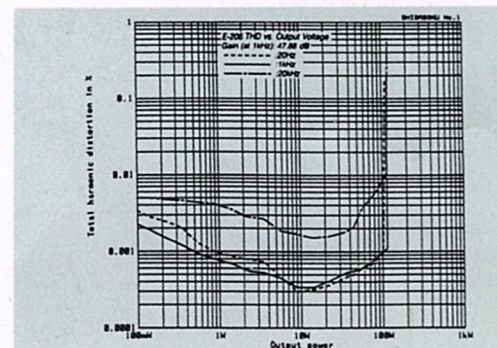
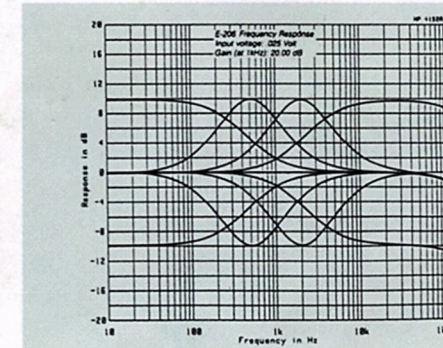
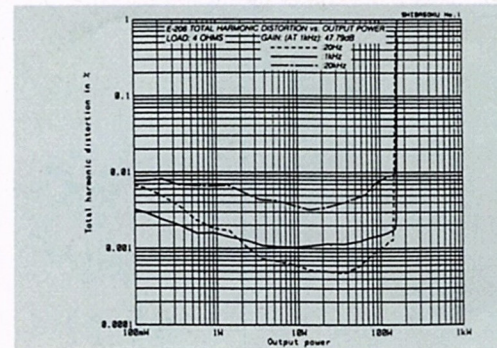
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16 inches) max. height

370mm (14-9/16 inches) depth

● **WEIGHT**

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