

Accuphase

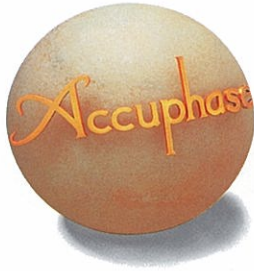
# E-207

INTEGRATED STEREO AMPLIFIER

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







**Powerful output stage consisting of parallel push-pull circuits with MOSFET drive delivers high-quality power of 100 watts/ch into 8 ohms. Outstanding low impedance drive capacity as low as 2 ohms. All direct-coupled circuitry designed with DC servo configuration for straight and pure signal transmission from MC input to speaker outputs.**

The integrated stereo amplifier E-207 is a further refined and enhanced version of the predecessor model E-206. It is based on the same sonic philosophy and design concept, but it delivers an even higher level of operational ease and performance, for perfect harmony with today's demanding program sources.

Integrated amplifiers offer considerable advantages regarding space economy, ease of setup and operation. To realize these advantages, while at the same time delivering performance on a par with separate-type amplifiers, is no easy task, since the total gain from the MC input to the speaker output can be as high as 107 dB. Interference and crosstalk between the various amplification stages must therefore be avoided by all means. The E-207 fully reflects Accuphase's long experience in circuit design technology and manufacture of truly outstanding separate amplifiers of a very high calibre. Its electronic circuit design, physical parts layout, and choice of materials all work together towards the goal of sonic perfection. In performance, the E-207 stands heads and shoulders above other amplifiers in its class. To do it full justice, it must be compared to the best performers in the category of separate components.

The success of the E-207 is based on the thorough separation of the preamplifier section and power amplifier section. Simply by setting a switch on the rear panel, these two sections can be used on their own. Every circuit unit employs the complementary differential push-pull circuit design, which is an Accuphase specialty. It is further enhanced by the DC servo approach, which allows direct coupling of all amplification stages and guarantees absolutely stable operation.

The driver stage in the power amplifier section uses MOSFETs in an original Accuphase, specially designed circuit for superior drive characteristics. The power supply features a large power transformer and amply dimensioned filter capacitors, which let the amplifier handle even low-impedance loads with ease. Thus, the E-207 can produce a rated output power of 100 watts per channel (into 8 ohms, both channels driven), and even 2-ohm loads can be driven comfortably.

The preamplifier has a phono section equipped to handle MM and MC cartridges. The

high-gain phono equalizer provided maintains superb sound quality for both MM and MC cartridges. A subsonic filter (-12 dB/oct., 17 Hz) is provided to remove any turntable rumble components for stable and clean playback.

The input selector has a total of nine positions - seven inputs (AD, CD, TUNER, LINE1 - 4) plus TAPE1 and TAPE2. The high-gain amplifier section employs a differential amplifier design with a FET input stage. Of course, DC servo control is employed in this section as well, for totally stable operation.

The four tone controls with center frequencies of 100 Hz, 500 Hz, 2 kHz, and 8 kHz allow fine and precise adjustments similar to a graphic equalizer. An on/off switch lets the user remove the entire tone control circuitry from the signal path if not needed.

The E-207 is available in two versions: with the traditional Accuphase champagne gold face or with a black faceplate. Optional persimmons wood side panels further enhance the visual appeal of this superb amplifier.

enables stable direct-coupled operation.

**Direct-Coupled Construction with DC Servo Control**

The E-207 has three major amplifier sections, namely the phono equalizer, the high-gain and the power amplifier sections. All of these have their own DC servo loop and are connected without any coupling capacitors, for optimum signal purity. With an improperly designed DC amplifier, problems such as output voltage drift due to temperature influences or output voltage offset due to component tolerances can impair operation stability. Therefore, Accuphase employs the DC servo principle which eliminates all of these problems and assures stable operation. From the phono inputs to the speaker outputs, there are no capacitors in the signal path, resulting in impressively clean and uncolored sound.

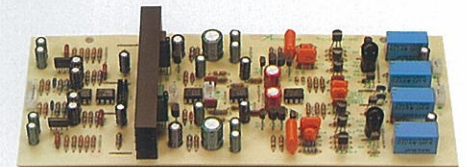
**Sophisticated Phono Section for MM and MC Cartridges**

Although digital media are becoming ever more prominent, the analog records owned by many audiophiles will be a source of musical pleasure for many years to come. The E-207 is well equipped to bring out the best in analog records. Its equalizer section shown in Fig. 2 has dedicated inputs for moving-magnet (MM) and moving-coil (MC) cartridges, optimized for their specific requirements. Since the output voltage and output impedance of MM cartridges are comparatively high, junction FETs (Q<sub>1</sub>, Q<sub>2</sub>) are used in a bootstrap differential configuration. The MC input on the other hand must handle extremely low-level signals with low impedances. This is best achieved by a pair of very low-noise bipolar transistors (Q<sub>5</sub>, Q<sub>6</sub>), also in a differential arrangement. In the output of the phono stage, a boot-

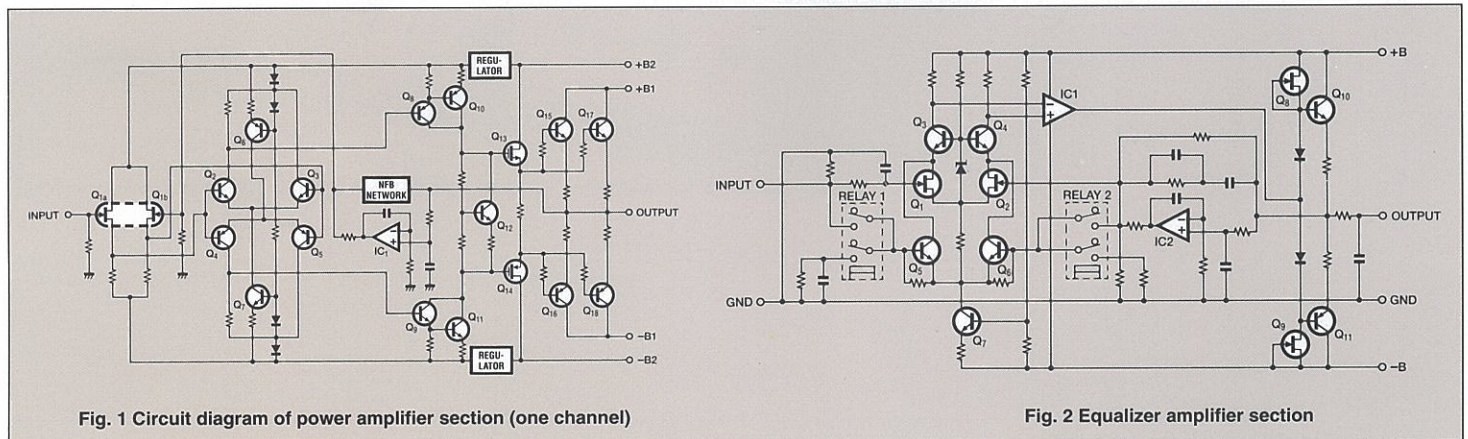
**Powerful Parallel Push-Pull Output Stage with MOSFET Drive**

Fig. 1 shows the circuit diagram of the power amplifier section. Q<sub>13</sub> and Q<sub>14</sub> form the MOSFET driver stage in a symmetrical complementary push-pull configuration. The final stage consists of the high-performance bipolar transistors Q<sub>15</sub>, Q<sub>16</sub>, Q<sub>17</sub> and Q<sub>18</sub>, each of which has superior electrical characteristics with a cutoff frequency (f<sub>T</sub>) of 70 MHz, a maximum handling current of 10A and a maximum power dissipation of 100 watts. The combination of MOSFETs with top-quality bipolar devices which works as an excellent voltage controller bringing out the best of both principles for stable thermal characteristics and efficient high-frequency handling.

The input stage uses a symmetrical arrangement of balanced differential amplifiers in a complete push-pull design. This results in a high CMRR (Common Mode Rejection Ratio) and notably improves operation stability of direct-coupled amplifier stages. The first input stage uses a junction-type FET with outstanding noise characteristics, to allow minimum input offset and



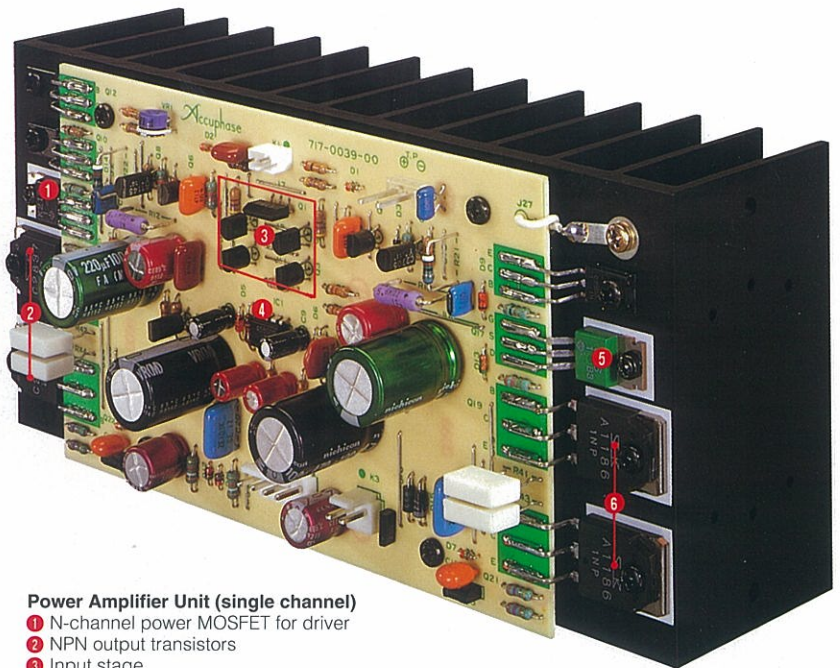
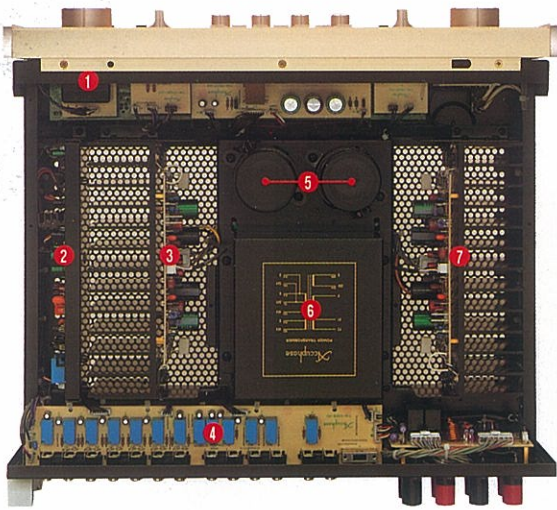
**Circuit board for preamplifier section with high-gain equalizer amplifier**



**Fig. 1 Circuit diagram of power amplifier section (one channel)**

**Fig. 2 Equalizer amplifier section**





### Internal Layout

- 1 Volume controls
- 2 Preamplifier unit
- 3 Right-channel power amplifier unit
- 4 Relay board for logic control
- 5 High-capacitance filter capacitors
- 6 Power transformer
- 7 Left-channel power amplifier unit

### Power Amplifier Unit (single channel)

- 1 N-channel power MOSFET for driver
- 2 NPN output transistors
- 3 Input stage
- 4 DC servo IC
- 5 P-channel power MOSFET for driver
- 6 PNP output transistors

strap complementary push-pull circuit lowers the NF impedance and improves the S/N ratio.

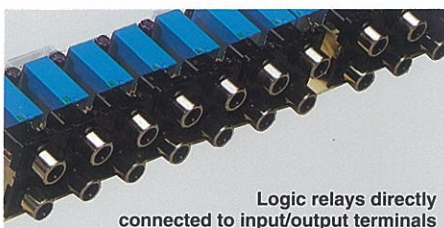
### Dedicated Power Supplies Eliminate Unwanted Interference

In an integrated amplifier, the preamplifier, which handles very low-level signals, and the power amplifier, with a large power handling capacity, are housed on the same chassis, and there is a possibility of mutual interference via the power supply. In the E-207, a number of measures are taken to effectively prevent any kind of interference:

- Separate transformer windings for preamplifier and power amplifier.
- Separate left/right channel power supply for the voltage amplification stage of the power amplifier all the way through the rectifier circuit to the voltage regulators.
- Dedicated regulated power supply for preamplifier.
- Separate power supply for logic control circuits.

### Highly Reliable Logic Relay Control

Signal switching of program sources is performed by Accuphase's original Logic Relay Control Systems that do not suffer from the problems associated with conventional rotary switches, such as contact deterioration and corrosion due to sulphur effects and oxidization. The relays used in the E-207 were developed specifically for demanding audio or communications equipment. The relays are filled with nitrogen gas and hermetically sealed. The contacts are twin crossbar types plated with gold for minimum contact resistance and outstanding long-term reliability. Arranged at strategic points to allow shortest signal paths, these relays contribute greatly to the impeccable sound quality and reliability of the E-207.



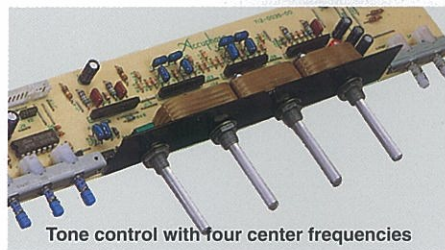
Logic relays directly connected to input/output terminals

### Pre Out/Main In Jacks Allow Separate Use of Preamplifier and Power Amplifier Sections

A switch and a pair of input/output jacks on the rear panel let the user insert for example a graphic equalizer or a sound processor into the signal path. It is also possible to use both of the high-quality segments of the E-207 in combination with another component such as a preamplifier or power amplifier.

### Four Band Tone Controls

The tone controls incorporated in the E-207 are a precision tool that makes it possible to fine-tune the sound of a program source. While graphic equalizers are helpful in making sonic adjustments, their numerous controls are often difficult and cumbersome to operate. The E-207 offers the best of both worlds with just the right choice of four center frequency points that are considered to be most important for musical expression.



Tone control with four center frequencies

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 at Accuphase 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 two other controls. The tone control circuit configuration is shown in Fig. 3. It consists of a combination of summing filters, which have virtually no adverse influence on sound quality. However, when the tone controls are not used, the entire circuitry can be removed from the signal path by setting the tone control switch to OFF.

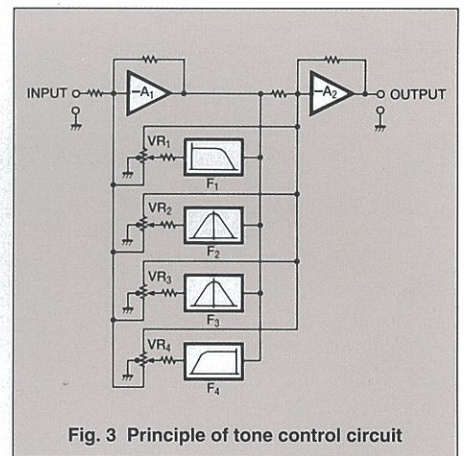


Fig. 3 Principle of tone control circuit

### Dual Outputs

Two pairs of speakers can be connected, and speaker switching is performed by large dedicated relays. An A+B position lets you use bi-wiring to connect the tweeter section and woofer section of high-quality speakers with separate cables.

### Many Other Valuable Features

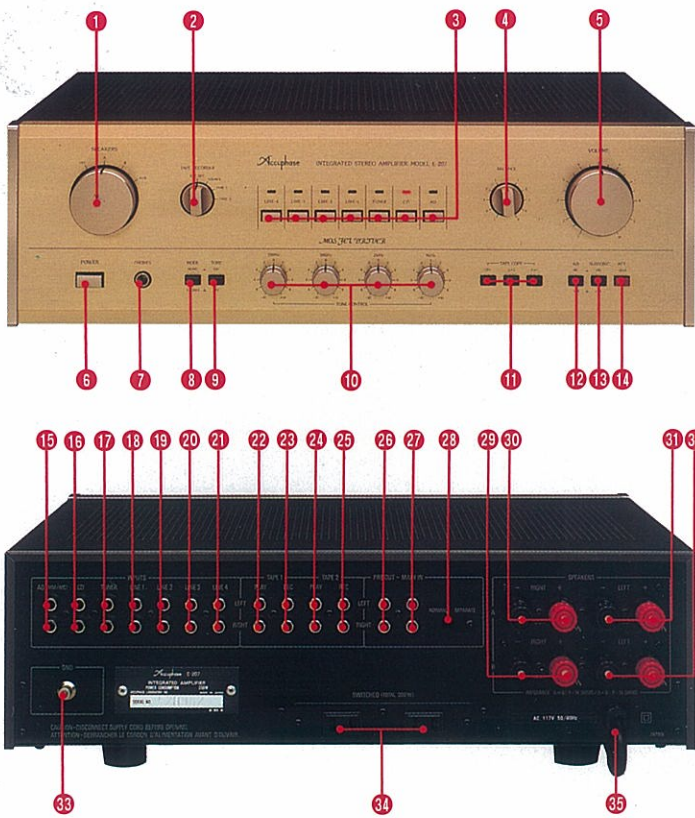
The E-207 satisfies the tape enthusiast with provisions for two tape recorders and a monitor switch that allows easy recording, playback, and dubbing. For unattended recordings, the signal from the tuner input is automatically supplied to the TAPE REC outputs while power to the amplifier is switched off.

A mode switch lets you combine the left and right channels for mono operation, and a sub-sonic filter helps to cut low-frequency rumble during playback of analog records. A headphone output allows private listening.

### Choice of Two Front Panel Colors and Optional Side Panels

The E-207 is available in champagne gold, the traditional color of Accuphase products, or in black (E-207B). The optional side panels SP-207 made of exquisite persimmons wood enhance the visual appeal of the amplifier even further, for a harmonious blend with the listening room.





**FRONT/REAR PANELS**

- 1 Speaker selector: OFF, A, B, A+B
- 2 Recording output/tape monitor switch: REC OFF, SOURCE, TAPE-1, TAPE-2
- 3 Input selector: LINE-4, LINE-3, LINE-2, LINE-1, TUNER, CD, AD
- 4 Balance control
- 5 Volume control
- 6 Power switch
- 7 Headphone jack
- 8 Stereo/monophonic selector switch
- 9 Tone control ON/OFF switch
- 10 Tone controls (100Hz, 500Hz, 2kHz, 8kHz)
- 11 Tape copy switch: OFF, 1→2, 2→1
- 12 Equalizer gain selector switch: MC, MM
- 13 Subsonic filter: 17 Hz, -12 dB/oct.
- 14 Attenuator: -20dB
- 15 AD (analog disc) input jacks
- 16 CD input jacks
- 17 Tuner input jacks
- 18 LINE-1 input jacks
- 19 LINE-2 input jacks
- 20 LINE-3 input jacks
- 21 LINE-4 input jacks

- 22 TAPE-1 tape input jacks
- 23 TAPE-1 recording output jacks
- 24 TAPE-2 tape input jacks
- 25 TAPE-2 recording output jacks
- 26 Preamplifier output jacks
- 27 Power amplifier input jacks
- 28 Preamplifier/power amplifier separation switch
- 29 Right channel output terminals for speaker B
- 30 Right channel output terminals for speaker A
- 31 Left channel output terminal for speaker A
- 32 Left channel output terminal for speaker B
- 33 Ground terminal
- 34 Switched AC outlets\*
- 35 AC power cable

\* Remarks:  
*The shape of AC outlets differs for areas with 100/117 V and 220/240 V. And the switched AC outlets may not be supplied depending on the safety standards or regulations applicable in the particular country to where the unit is destined.*



Black-type E-207B



Optional persimmons wood side panels SP-207

**GUARANTY SPECIFICATIONS**

(Guaranty 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 driven, 20 to 20,000Hz, 0.02% THD)

**Total Harmonic Distortion**

0.02% with 4 ohms load  
 0.01% with 8 ohms load  
 (Both channels driven, 0.25W to continuous average power output, 20 to 20,000Hz)

**Intermodulation Distortion**

0.01%

**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 rated output)

**Damping Factor**

90 (8 ohms load, 50Hz)

**Maximum AD Input Level (1kHz, 0.005% THD (REC OUT))**

MM INPUT: 300mVrms

MC INPUT: 8.0mVrms

**Rated Output Level and Impedance**

PRE OUTPUT: 1.1V at 25 ohms  
 TAPE REC OUTPUT: 89.8mV at 220 ohms (AD source)  
 HEADPHONES: 1.0V (Suitable load impedance: 4 to 100 ohms)

**Input Sensitivity and Input Impedance**

Input	Sensitivity		Input impedance
	For rated output	EIA (for 1W output)	
AD INPUT (MC)	0.11mV	0.01mV	100Ω
AD INPUT (MM)	3.9mV	0.39mV	47kΩ
HIGH LEVEL INPUT	113mV	11.3mV	20kΩ

**Gain**

HIGH LEVEL INPUT → OUTPUT: 48dB  
 AD INPUT (MM) → TAPE REC OUTPUT: 29dB  
 AD INPUT (MC) → TAPE REC OUTPUT: 60dB

**Tone Controls**

Four-band principle  
 Turnover frequency: 100Hz, 500Hz, 2kHz, 8kHz  
 Adjustment range: ±10dB

**Signal-to-Noise Ratio and Input-Converted Noise**

Input	Input shorted, A-weighting	IEIA S/N ratio
HIGH LEVEL INPUT	109 dB	80 dB
AD INPUT (MM)	85 dB	80 dB
AD INPUT (MC)	70 dB	78 dB

**Subsonic Filter Characteristics**

Cutoff frequency: 17Hz, -12dB/oct.

**Attenuator Characteristics**

-20dB

**Output Load Impedance**

4 to 16 ohms

**Semiconductor Complement**

61 transistors, 16 FETs, 14 ICs, 69 diodes

**Power Requirements**

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

**Power Consumption**

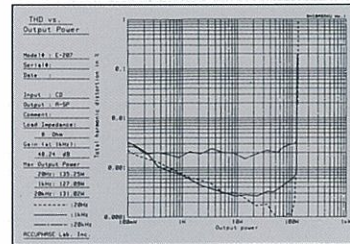
55 watts idle  
 330 watts in accordance with IEC-65

**Maximum Dimensions**

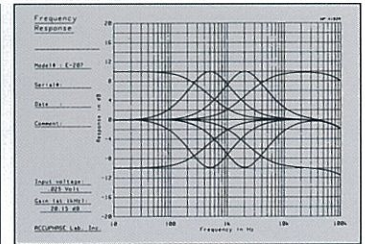
445 mm (17-11/16") width,  
 150 mm (5-15/16") height,  
 411 mm (16-3/16") depth

**Weight**

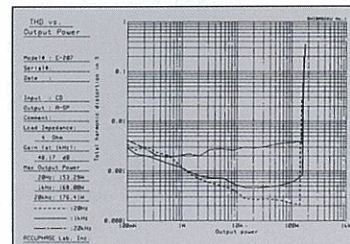
17.3 kg (38.1 lbs.) net  
 21.5 kg (47.4 lbs.) in shipping carton



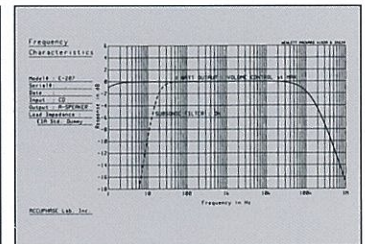
Output power vs. total harmonic distortion (at 8 ohms)



Tone control characteristics



Output power vs. total harmonic distortion (at 4 ohms)



Frequency characteristics

\* Specifications and design subject to change without notice for improvements.

