

# Accuphase

INTEGRATED STEREO AMPLIFIER

## E-308

- Preamplifier and power amplifier with MCS topology
- Parallel push-pull output stage delivers high quality 100 watts  $\times$  2 into 8 ohms
- Current feedback principle combines superb sound with total operation stability
- Logic-control relays permit straight and short signal paths
- Tone control circuits
- Strong power supply with large transformer
- Option board slots provide capability for digital signal input and analog record playback





**Sophisticated MCS topology assures outstanding S/N ratio – Enjoy crystal clear sound emerging from a background of utter silence. Current feedback amplification, wide-band power transistors in parallel push-pull configuration, and potent power supply deliver plenty of quality power: 140 watts per channel into 4 ohms or 100 watts into 8 ohms. Option boards allows digital signal input or analog record playback with impeccable quality.**

The E-300 series has always played a central role in the Accuphase integrated amplifier lineup. Drawing from a wealth of know-how and experience, the E-308 incorporates the latest advances in circuit technology and materials research. It has been designed to deliver onehundred percent of musical enjoyment. Specially noteworthy is the MCS (Multiple Circuit Summing) topology implemented in the preamplifier and power amplifier sections. It drastically improves S/N ratio, allowing utterly natural sound to emerge from a background of deep silence.

An integrated amplifier offers various advantages such as convenient operation and modest space requirements. However, because its overall gain is very high, even the slightest interference or crosstalk at the input can have a considerable effect on the sonic result. To preclude this possibility, the E-308 is designed to achieve total electrical and structural separation of the preamplifier and power amplifier sections. These two parts operate as if they were entirely separate components. An EXT PRE switch and dedicated inputs and outputs allow independent use of the preamplifier and power amplifier.

Both the preamplifier and power amplifier use the MCS principle developed by Accuphase, with multiple input circuits connected in parallel. Together with the current feedback topology, this results in a significant enhancement of all vital performance parameters. The power amplifier output stage adopts a parallel push-pull configuration of multi-emitter power transistors designed for high-power audio applications. The large power transformer in the power supply and plenty of filtering capacity sustain ample high-quality output power.

The preamplifier section comprises features such as tone controls, loudness compensator, and facilities for recorder monitoring and copying. Each circuit component has been carefully selected after extensive tests. The end result is an integrated amplifier that clearly stands out from the rest. Option boards can be used to implement digital inputs and high-quality analog record playback.

**Parallel connection MCS topology in preamplifier and power amplifier stages**

Both the preamplifier (Figure 1) and power amplifier (Figure 2) employ the MCS (Multiple Circuit Summing) topology developed by Accuphase. This design results in significantly improved performance characteristics such as higher S/N ratio and lower distortion. In the E-308, the same signal is supplied to two separate amplification circuits, which also receive the feedback signal. The output of the circuits is combined, which is equivalent to parallel operation of the overall circuit. Mathematically, when using two parallel circuits, the improvement in S/N ratio is 3 dB. The circuit



components of the line amplifier input stage and output stage are also driven in parallel, which further minimizes noise that could arise in the various amplification stages.

**Current feedback circuit topology in power amplifier and preamplifier sections prevents phase shifts and assures excellent sound quality**

In the E-308, the signal current rather than the

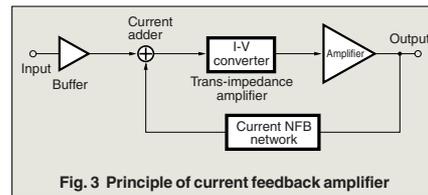


Fig. 3 Principle of current feedback amplifier

more conventionally used voltage is used for feedback. Because there is almost no phase shift, phase compensation can be kept to a minimum, resulting in excellent transient response and superb sonic transparency. Also, frequency response remains uniform over a wide gain range. This is evident from Figure 4 which shows frequency response for different gain settings of the current feedback amplifier.

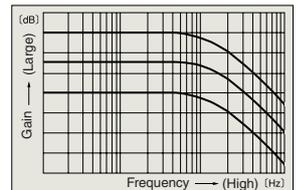
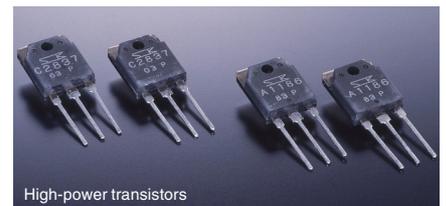


Fig. 4 Frequency response with current feedback (Response remains uniform also when gain changes)

**Parallel push-pull output stage delivers quality power: 140 watts/channel into 4 ohms, 120 watts/channel into 6 ohms or 100 watts/channel into 8 ohms**

The output devices are multi-emitter power transistors designed for high power audio applications. These devices have excellent frequency response, forward-current transfer ratio linearity, and switching performance characteristics. They are connected in a triple parallel configuration (Figure 2) for low impedance and mounted directly on a large heat sink to assure efficient dissipation of thermal energy. A generous design margin allows the E-308 to deliver ample power output.



High-power transistors

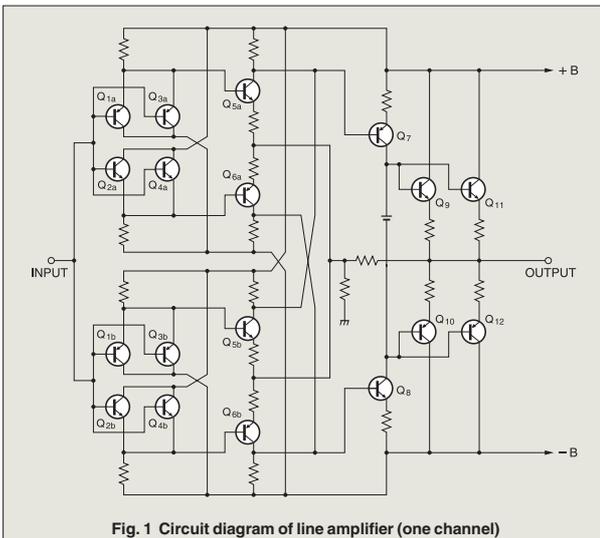


Fig. 1 Circuit diagram of line amplifier (one channel)

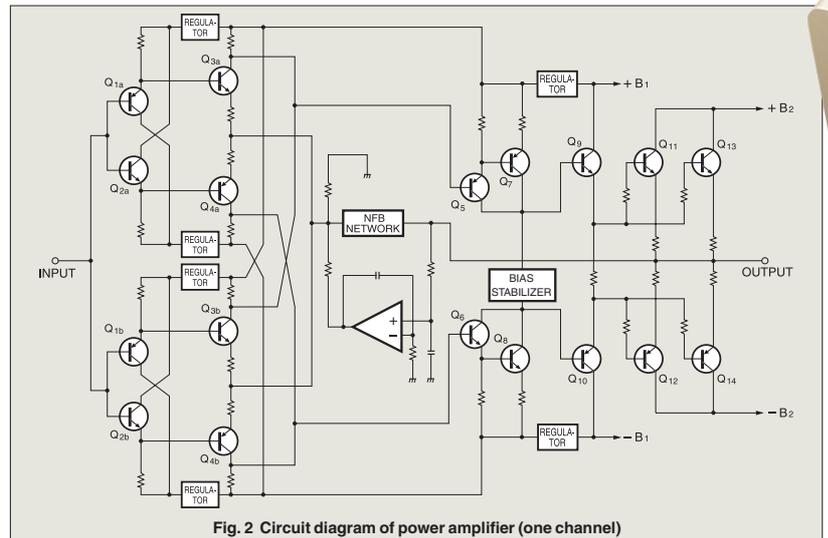


Fig. 2 Circuit diagram of power amplifier (one channel)

**Highly reliable logic-controlled relays for best sound quality**

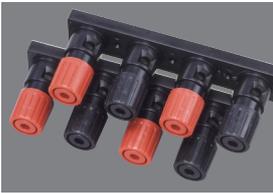
Program source switching is performed by logic-controlled relays which are arranged so as to permit straight and short signal paths for enhanced sonic purity. The hermetically sealed relays are high-quality types developed specifically for demanding communication applications. The contacts are twin crossbar types plated with gold for minimum contact resistance and outstanding long-term reliability.



Gold-plated input/output jacks with directly connected relays

**Two sets of heavy-duty speaker terminals**

Two sets of oversized speaker terminals are provided which accept also heavy-gauge speaker cable.



**Large power transformer and high filtering capacity**

The power supply section is a critical aspect of any power amplifier. The E-308 features a large power transformer with a rating of 500 VA. The transformer is mounted in an enclosure filled with damping material that has excellent heat transfer characteristics. This design prevents unwanted interaction with the rest of the amplifier. Two massive electrolytic capacitors, each rated for 22,000  $\mu$ F, are used to filter the current. This ample



performance margin of the power supply ensures dynamic sound down to very deep frequencies.

**Tone controls use summing active filters for pure sound**

The tone control circuitry in the E-308 features summing active filters. Figure 5 illustrates the operation principle of this circuit.

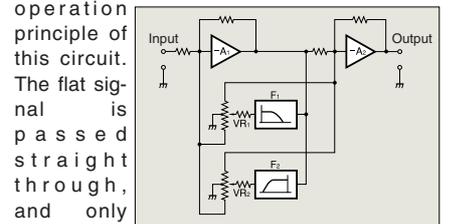


Fig. 5 Tone control circuit principle (Summing active filter type)

The flat signal is passed straight through, and only when an adjustment is required, the characteristics created at  $F_1$  and  $F_2$  are added to the signal, thereby producing the desired change. This design provides efficient control without degrading signal purity.



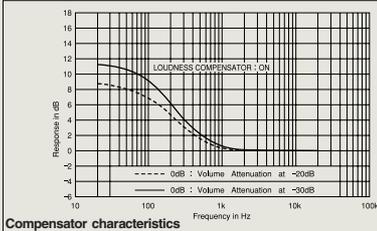
Supplied remote commander RC-20 Allows volume adjustment and input source switching

Power amplifier assembly with parallel push-pull output devices mounted to large heat sink, MCS circuit, and current feedback amplifier circuitry.



## Other Functions and Features

- Digital input and analog phono input can be implemented via option boards
- Analog peak power meters
- High-quality volume control. Supplied remote commander allows source switching and volume adjustment
- "High Carbon" cast iron insulator feet with superior damping characteristics further enhance sound quality
- EXT PRE button and dedicated inputs/outputs enable independent use of preamplifier and power amplifier sections
- Loudness compensator restores natural balance at low listening levels



## OPTION BOARDS

Three types of option boards are available for the E-308: Digital Input Board DAC-10, Analog Disc Input Board AD-10, and Line Input Board LINE-10. Choose the board according to the intended usage, and install it in one of the rear-panel slots.

- For reasons of power supply capacity, only one DAC-10 option board can be installed. Installing two AD-10 boards or a combination of DAC-10 and AD-10 is possible.
- The Analog Disc Input Board AD-9 and Line Input Board LINE-9 can also be used.



### Digital Input Board DAC-10

This board features an MDS (Multiple Delta Sigma) D/A converter and has inputs for coaxial and optical fiber connections.  
A CD player, MD or DAT recorder or other component with digital output (sampling frequency range 32 - 96 kHz, 24 bits) can be connected to the board, for high-quality music reproduction.

### Analog Disc Input Board AD-10

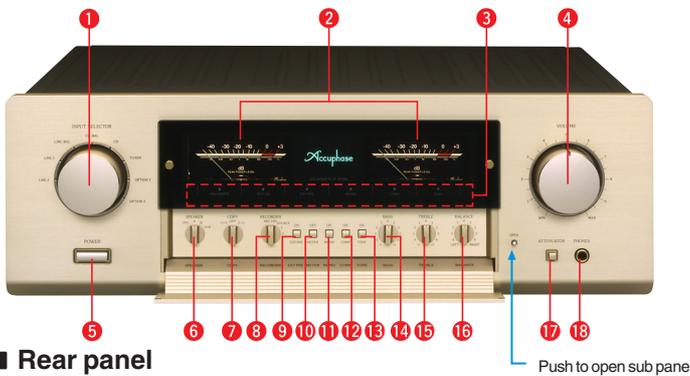
This board contains a high-performance, high-gain phono equalizer.  
● Internal DIP switches control MM/MC operation, MC input impedance, and subsonic filter on/off.

|    |                 |                            |
|----|-----------------|----------------------------|
| MM | Gain            | : 36 dB                    |
|    | Input impedance | : 47 kΩ                    |
| MC | Gain            | : 62 dB                    |
|    | Input impedance | : 10/30/100 Ω (selectable) |

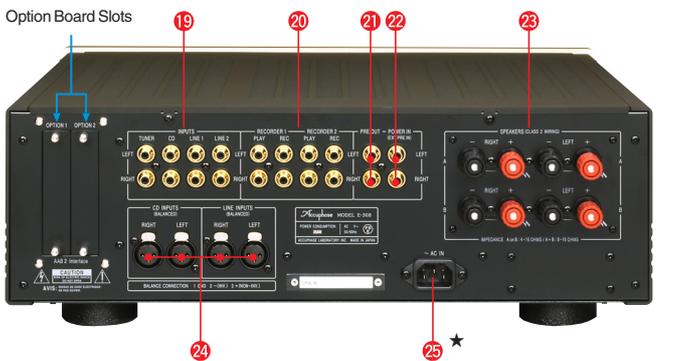
### Line Input Board LINE-10

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

## Front panel



## Rear panel



- |  |  |
|--|--|
| <p>1 Input Selector<br/>LINE 2 LINE 1 LINE-BAL CD-BAL CD<br/>TUNER OPTION 1 OPTION 2</p> <p>2 Left/Right Channel Output Meters</p> <p>3 Function LED Indicators</p> <p>4 Volume Control</p> <p>5 Power Switch</p> <p>6 Speaker Selector OFF A B A+B</p> <p>7 Copy Selector 1 → 2 OFF 2 → 1</p> <p>8 Recorder Selector REC OFF SOURCE 1 2</p> <p>9 EXT PRE (Preamplifier/Power Amplifier Separator) ON/OFF Button</p> <p>10 Meter Operation/Light Button</p> <p>11 Stereo/Mono Button</p> | <p>12 Loudness Compensator Button</p> <p>13 Tone Control ON/OFF Button</p> <p>14 Bass Control</p> <p>15 Treble Control</p> <p>16 Balance Control</p> <p>17 Attenuator Button</p> <p>18 Headphone Jack</p> <p>19 Line Input Connectors</p> <p>20 Recorder Rec/Play Connectors</p> <p>21 Preamplifier Outputs Connectors</p> <p>22 Power Amplifier Input Connectors</p> <p>23 Left/Right Speaker Output Terminals</p> <p>24 CD/LINE Balanced Input Connector</p> <p>25 AC Inlet (for supplied power cord)*</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  
• Remote Commander RC-20

## 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-ohm load  
0.02%, with 6 to 16-ohm load
- **Intermodulation Distortion** 0.01%
- **Frequency Response** HIGH LEVEL INPUT/MAIN INPUT  
20 - 20,000 Hz 0, -0.2 dB (for rated continuous average output)  
2 - 150,000 Hz 0, -3.0 dB (for 1-Watt output)
- **Damping Factor** 100 (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 | 113 mV           | 11.2 mV              | 20 kΩ           |
| BALANCED INPUT   | 113 mV           | 11.2 mV              | 40 kΩ           |
| MAIN INPUT       | 1.13 V           | 112 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: 20 dB  
MAIN INPUT → 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 (200 Hz) (Volume control setting -30 dB)
- **Attenuator** -20 dB
- **Signal-to-Noise Ratio**

| Input            | Input shorted (A weighting) S/N ratio at rated output | EIA S/N |
|------------------|---|---------|
| HIGH LEVEL INPUT | 105 dB  | 80 dB   |
| BALANCED INPUT   | 88 dB   | 80 dB   |
| MAIN INPUT       | 123 dB  | 100 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 (Voltage as indicated on rear panel) 50/60 Hz
- **Power Consumption** 46 Watts idle  
225 Watts in accordance with IEC-65
- **Maximum Dimensions** Width 475.0 mm (18-11/16")  
Height 170.6 mm (6-3/4")  
Depth 423.0 mm (16-5/8")
- **Mass** 21.6 kg (47.6 lbs) net  
26.0 kg (57.3 lbs) in shipping carton
- **Supplied Remote Commander RC-20**  
Remote control principle: Infrared pulse  
Power supply: 3 V DC (IEC R6 batteries x 2)  
Maximum dimensions: 55 mm x 194 mm x 18 mm  
Mass: 100 g (including batteries)