



mark
levinson

ML-9
POWER AMPLIFIER

ML-9 Power Amplifier

The design concept of the ML-9 power amplifier was inspired by our experience with the Mark Levinson® ML-3 and ML-2 amplifiers. After the design of the ML-3 was completed and evaluated, our beliefs and theories regarding the sonic potential of Class AB₂ amplifier design were confirmed. It was apparent that many of the superb sonic characteristics of the ML-2 Class A amplifier could be retained while efficiently offering enormous power levels. Further, there is a significant range of excellent loudspeakers available which do not require the power levels of the ML-3. The ML-9 power amplifier is designed to offer 100 watts per channel with the clarity, speed and control of the ML-3. The ML-9 will drive complex loads with complete stability and is capable of reproducing program material of wide dynamic range with relative ease and superb accuracy.

The ML-9 circuitry is completely discrete. Despite their low cost and overall convenience, no integrated circuits are used. They often possess electrical and sonic compromises which are unacceptable for the performance level upon which we insist. Discrete components of the highest quality are carefully selected to optimize each area of the circuit. This maximizes reliability while minimizing the intrinsic distortions. Large amounts of negative feedback are therefore unnecessary, eliminating potential sonic degradation due to transient distortion while maintaining superb DC stability.

A custom-made 1.2 KVA toroidal power transformer, a 30 ampere bridge rectifier and two 36,000 μ F computer-grade filter capacitors comprise the power supply of the ML-9. This power supply is capable of storing 230 joules

minimizing voltage drops while maintaining balanced ripple currents. This massive power supply greatly contributes to the ability of the ML-9 to distinctly and accurately reproduce complex and dynamic musical material at loud levels, without fatiguing distortion.

Since the output stage must be capable of delivering the power supply energy to the loudspeaker while maintaining linear and reliable operation, eight 200 watt, 15 ampere pretested and matched power transistors are employed in each channel of the ML-9. This enables the ML-9, when pulsed, to develop 58 volts peak, at peak currents up to 29 amperes (1682 watts peak) per channel. Although the impedance of most loudspeakers varies considerably with frequency, the high current capability of the ML-9 permits the accurate reproduction of the dynamics and tonal balance of the recorded material.

For an amplifier of this power, Class A operation in the output stage would be impractical due to high power consumption and heat dissipation. Therefore, for increased efficiency, the ML-9 is biased to operate in the Class AB₂ mode. 260 mA of idle current reduces crossover notch distortion and non-linearities in low-level information where these anomalies are most perceivable.

The voltage gain stages of the ML-9 consist of differential amplifiers, with cascoding techniques employed in each stage for improved linearity. To optimize linear performance, voltage gain and driver stages maintain Class A operation at all levels. Careful sorting and matching of all active components, as well as the linearizing techniques described, ensure optimal performance, reliability and unit-to-unit consistency, while requiring only minimal amounts of negative feedback. This approach to the design and manufacture of the ML-9 is difficult and expensive. These difficulties, however, are greatly outweighed by the level of performance achieved.

The ML-9 power amplifier is rated at 100 watts per channel continuous sine wave power at 8 ohms, from 20 Hz to 20 kHz, with no more than 0.2% THD (FTC) and 200 watts per channel at 4 ohms with no more than 0.4% THD. As with all our specifications, these numbers are conservative. Typically, an ML-9 driving an 8 ohm load at rated power (100 W) will produce 0.15% THD and 0.02% IMD. At rated THD (0.2%) it will typically deliver 285 watts at 8 ohms, 1 kHz. Driving a 4 ohm load at rated power (200 W), the ML-9 will produce 0.25% THD and 0.07% IMD. At rated THD (0.4%) it will typically deliver 460 watts at 4 ohms, 1 kHz. An ML-9 driving a 2 ohm load will typically produce 648 watts with 0.6% THD, 1 kHz. As illustrated, the ML-9 is capable of greater electrical performance than the rated specifications indicate. This is due to the careful design, execution and construction employed throughout.

An important design criterion to Mark Levinson Audio Systems is "preservation of investment". That is, an amplifier must be protected from external sources of damage such as other equipment and AC mains anomalies.

stages are protected by an energy limiting circuit which monitors power dissipation versus time. Independent energy limiting for positive and negative information minimizes distortion while in the overload condition. This circuit offers superb protection without affecting sonic quality. AC mains fuses have also been incorporated for additional protection and compliance with international safety regulations.

Certain loudspeaker characteristics, such as tonal balance, low frequency depth and imaging can be affected by varying the damping factor of the amplifier. The ML-9 offers switchable output damping via two toggle switches (one per channel) at the rear of the unit. The three typical damping factors available are 300, 200 and 100 at 50 Hz, with a 1 watt reference level at 8 ohms. This feature increases the flexibility of the ML-9, optimizing its match with a variety of speaker systems.

The ML-9 incorporates gold-plated Camac connectors for input connections, due to their vast superiority over conventional connectors. Five-way gold-plated binding posts are used for output connections, offering an efficient way to accommodate several types of speaker cable terminations.

Visually, the ML-9 reflects the Mark Levinson tradition of functional elegance. Efficient utilization of space permits the housing of the ML-9 circuitry within a compact steel chassis. Extruded black anodized heatsinks increase the structural integrity of the chassis while providing 1,131 square inches of cooling surface. Due to the substantial weight of the ML-9, rear handles have been provided for ease in handling. The distinctive look of the hand-brushed and black anodized front plate and handles is further enhanced by hand-engraved and filled nomenclature, making the ML-9 suitable for display in any listening environment.

The technical specifications that are included here, although representative of certain merits, are not sufficient to determine overall sonic accuracy. We suggest that your decision regarding the purchase of this product be based upon your personal evaluation and examination, and the recommendations of your Mark Levinson representative.

Relevant Data

Input Impedance: 50 kilohms

AC Mains Voltage: Factory set for 100, 120, 200, 220 or 240 VAC

Net Weight: 56 lbs.

Shipping Weight: 67 lbs.

Maximum Overall Dimensions: 8¾" H, 19" W, 13⅜" D

Detailed dimensions are available from your Mark Levinson representative.

Note: THD measured at 20 kHz and IMD measured using the SMPTE method. Pulse measurements made using one cycle of 20 Hz with a repetition rate of 0.5 seconds. All power and distortion measurements made with both channels driven, in the high damping position.