

## ■ Spectral DMA-360 Series 2 monaural reference amplifier



The DMA-360 Series 2 limited production Monaural Reference Amplifier is the new version of the original DMA-360 monaural amplifier from Spectral Audio. The DMA-360 Series 2 is also the most powerful high-speed amplifier ever developed for high-end music applications. An impressive array of engineering "firsts" in the DMA-360 Series 2 culminate over twenty-five years of high-speed FET design to produce the "ultimate" Spectral amplifier.

Spectral engineers pioneered the invention of high-speed FET audio amplifiers in the early 1980s with the wideband DMA-100 Class A instrumentation amplifier. From these innovative beginnings, Spectral has evolved increasingly powerful and sophisticated megahertz amplification for applications in the Spectral component system. Today these high-resolution amplifiers feature greater speed and settling capability combined with higher voltage and current than previously possible. The DMA-360 Series 2 Monaural Reference is now the ultimate realization of this quest to achieve uncompromising amplification true to the live musical experience.

From much listening and design experimentation, Spectral has consistently pursued component systems having ultra-fast settling, high-speed circuit architecture. These have invariably out-performed more traditional often cumbersome high-end design methods to achieve superlative detail, staging and listener involvement. Indeed, test methodology simulating music waveforms and hearing acuity confirm that quickness of response and rapid signal extinction when reproducing complex dynamics are mandatory for accurate music reproduction. Only then can one preserve instantaneous waveform accuracy to prevent cover-up of delicate musical signals by previous events. Construction and performance of the Spectral DMA-360 Series 2 Monaural Reference Amplifier for this demanding criterion and resulting sonic resolution are unmatched among contemporary high-end amplifier designs.

### **UNPARALLELED RESOLUTION, UNPRECEDENTED POWER**

The very high-speed launch and enormous current reserves of the DMA-360 Series 2 are made possible with the use of Spectral's proprietary "Focused Array" construction. This breakthrough topology aligns high-current vertical FET output devices for rapid, piston-like signal launch. The output section is comprised of eight individual V-FET amplifier modules paralleled to achieve a minimum 350 watt RMS output with 90 amp capability, and full rated power is delivered with absolute load stability at an unprecedented 1 MHz. Except for the original DMA-360, output current is approximately double that of any previous high-speed amplifier design. The "Focused Array" output section design of the DMA-360 Series 2 makes possible the practical use of ultra-fast vertical FET devices for the first time in a high-powered audio application. Each device, having vacuum tube-like operating character, is energized from its own dedicated high energy storage capacitor, rectifier, and individually powered from an isolated ultra-low coupled transformer winding. Individual teflon bias trimmers calibrate each V-FET output device separately for maximum linearity and precise alignment. Groups of these individually powered output sections utilize field folded RF type construction and electronic shielding to banish noise and eliminate low level propagation of stray interference. The resulting "Focused Array" of eight individually powered output sections performs as one with virtually no cross-coupling or energy storage artifacts reflecting between output devices. During extreme program dynamics, this arrangement can launch an instantaneous high-current drive of over 90 amps to the most sophisticated loudspeakers with unprecedented waveform tracing precision. Gone are performance-damaging magnetic and electrical field propagation problems of conventional high-powered amplifier construction. Without stray radiation, critical small signal paths within the DMA-360 Series 2 can perform with lowest possible distortion and settle to signal extinction in millionths of a second. Hence, the DMA-360 Series 2 works with high power and great speed yet behaves inert to other system components. Reproduction is extremely articulate and naturally resolving yet has all the powerful unlimited sonic character of the most brutal high power amplifier designs.

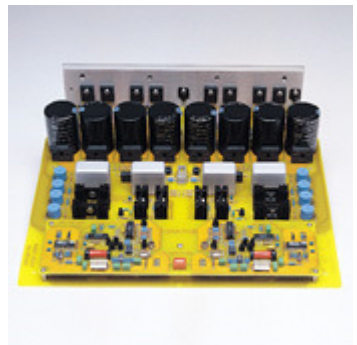
## THE POWER VAULT

The Focused Power output section of the DMA-360 Series 2 is only one of the many Spectral innovations designed to create the ultimate in amplifier control and resolution. A unique transformer architecture supports the critical requirements for lowest noise and high power capability of the powered output section array. In traditional high-end power amplifiers, output transformers are located away from active amplifier circuitry for purposes of noise isolation and construction ease. This virtually universal method extracts a significant sonic price, however, because of the speed and regulation losses which are imposed by the long power supply wiring harness. In addition, the EMI and noise which radiate from the supply harness invariably contaminate sensitive low level circuitry by noise modulating the musical signal. Spectral engineers have long recognized the problems associated with power supply noise contamination and have proposed a unique solution in the DMA-360 Series 2 Monaural Reference Amplifier. The Power Vault electromagnetic field containment system virtually eliminates EMI radiation to the amplifier signal path circuitry as well as power and regulation losses through the traditional power supply harness. The architecture starts with Spectral's elaborate high performance custom power supply transformers. These unique designs are the result of years of research and development to maximize isolation and regulation. Each transformer features individual isolated windings to support each individual output transistor in the amplifier output section. The twin power transformers are mounted between massive machined mounting plates for damping and resonance control. The combined 38 lb. Transformer structure is then mounted on a constrained rubber floating suspension system similar to a fine turntable suspension. The finished transformer assembly is then suspended inside an EMI, RFI tight welded aluminum containment box located directly beneath the DMA-360 Series 2 output section. The resulting transformer Power Vault containment system results in an uncompromising solution to the universal power supply noise problem. The high-current power transformers are now intimately sited next to their own high-current output devices with extraordinary noise isolation. The high-speed driver circuitry of the DMA-360 Series 2 operates in a pristine environment free of the noise radiation and phantom signals which plague other power amplifiers. Dynamic range limitations are removed with a sonic clarity and quietude which are palpable.



## ULTRA PREMIUM DISCRETE CIRCUITRY

Small signal circuitry is based on Spectral's proven discrete circuit multiple cascode double push-pull FET technology. Premium silicon array construction is applied to the DMA-360 Series 2 to achieve enormous internal dynamic range capability. This reserve is linear class A with many times greater dynamic capability than program demands. It allows high current drive for quick controlled response from the very large output V-FETs as well as isolation from their internal electronic activity. Unhindered by interferences and slow cumbersome response of conventional practice, these parts operate with unyielding control and exacting precision. Reproduction is clean, effortless and highly holographic. Audio amplification paths through the DMA-360 Series 2 are direct, inherently linear and simple. These minimalist configurations have always sounded and measured best but normally become ponderous and overburdened when protection and support functions are added. The DMA-360 Series 2 takes a different route to solve the sonic problems of amplifier protection circuitry. To maintain the pristine signal path, a sophisticated analog computing ancillary system is thermal and opto-coupled within the amplifier. This "hands off" operational management system observes device loading and power dissipation as well as speaker damaging out of range signals. It takes control without circuitous cross interfering connections to electronics in the signal path, leaving the musical signal pure and totally untouched.



## A REMARKABLE TOPOLOGY

The DMA-360 Series 2 utilizes custom FETs and high speed bipolar transistors in a dense, fully balanced topology to achieve high-current launch and ultra-fast settling capability. RF (radio frequency) design techniques are employed to achieve a DC coupled power band with intrinsic bandwidth to almost 5 MHz!

**Input Stage.** The shielded input stage utilizes a balanced, double cascode design using matched differential pairs of J-FETs. The cascode design derives its own ground reference and produces extremely high levels of isolation from the preamplifier and between the stages of the DMA-360 Series 2 itself.

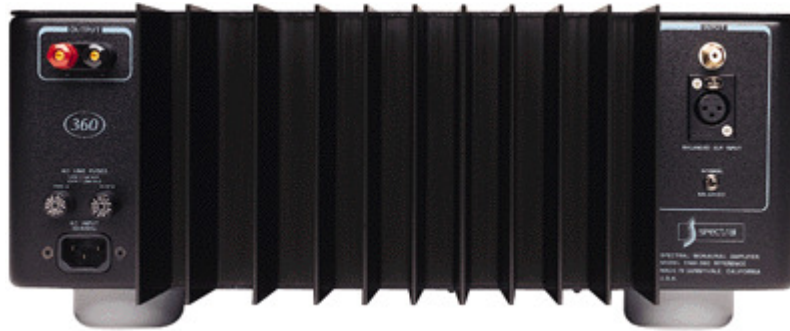
**Gain Stage.** The gain stage utilizes super high frequency (RF) bipolar transistors matched in a cascode configuration to bring the circuit gain into the power device realm.

**Output Stage.** The output stage consists of eight individually powered VMOS-FET output amplifiers. This precision amplifier array features individual push-pull drivers, high-speed power supplies and individual biasing to function as a single ultra-fast, high current output section. The result of these techniques is unprecedented fast settling and remarkable intertransient silence.



## ULTIMATE AMPLIFICATION

Radical improvements in high-current FET topologies, power supply design, and innovative new protection systems are combined in the DMA-360 Series 2 to advance the art of amplifier design. Until now, amplifiers could not offer both powerful speaker control, and the life-like sonic transparency possible only with high-speed, fast settling discrete circuitry. The DMA-360 Series 2 defies the status quo, achieving extreme high-power with the fastest most delicately detailed signal reproduction yet attained. This ultra-fast response and high-current capability allow the DMA-360 Series 2 to demonstrate tremendous performance advantage over other large high-end amplifiers, especially in terms of overall transparency and aliveness. Now that the traditional trade-off between sonic refinement and power is transcended, music enthusiasts need not compromise. The DMA-360 Series 2 Monaural Reference is the ultimate Spectral amplifier revealing new levels of accuracy and realism from all of today's finest loudspeakers.



## Specifications

### DMA-360 Series 2 Monaural Power Amplifier

Power Output (continuous):	@ 8 ohms – 350 Watts RMS @ 4 ohms – 552 Watts RMS @ 2 ohms – 680 Watts RMS
Output Compliment:	90 Amps peak
Frequency Response:	+/- 0.1 dB, DC – 150 KHz +/- 1 dB, DC – 1 MHz +/- 3 dB, DC – 1.8 MHz

### Distortion

Static:	less than 0.015% from DC to 100 KHz, typically 0.009% @ 350 WRMS/8 ohms
Dynamic:	8 Tone Cluster Test 20 KHz @ 500 Hz separation 0.01% @ 8 ohms 0.015% @ 4 ohms

### Speed:

Risetime:	less than 300 nanoseconds
Settling:	1.5 microseconds to -40 dB
Slew Rate:	600 volts/microsecond

### Noise:

Signal to Noise:	97 dB unweighted, 107 dB ASA A
Crosstalk:	98 dB @ full power 8 ohms

### Input:

Impedance:	10k ohms
Sensitivity:	1.5 volts / nominal output

### Power Supply:

Line Voltage:	120 volts
AC Voltage Range:	+/-10%
Maximum Consumption:	2000 Watts
Quiescent Consumption:	250 Watts

Operating Temperature: 0 deg. to +50 deg. Celsius range,  
32 deg. to +122 deg. Fahrenheit

**Protection Features:**

DC Protection Servo: 0.5 volt range

Current Limit Onset: 90 Amps

Thermal Threshold: Protects at 85 deg. Celsius,  
185 deg. Fahrenheit

AC Main Fuses: 120v 5A/3AG slo-blo

**Size and Weight:**

Dimensions: 20" (50.8 cm) W,  
7.23" (18.4 cm) H,  
19.6" (49.9 cm) D,

Weight: 69 lbs, 31.2 KG Net