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## Bulletin 9602

### Development Overview

# Spectral DMA-150 High Resolution Power Amplifier

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Spectral audio components share creative uncompromising use of edge-of-the-art technology, dedicated precision manufacture, and experience with live sound at recording sessions. From much listening and design experimentation, Spectral has consistently pioneered component systems having fast settling, high-speed circuit architecture. These have invariably outperformed 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-150 High Resolution Amplifier for this demanding criterion and resulting sonic resolution are unmatched among contemporary high-end amplifier designs.

The DMA-150 amplifier is a system designed to achieve full capability from all components in the

sound reproduction chain. Its dual monaural arrangement is carefully structured to provide quick, precise non-interactive loudspeaker drive and tight control from almost unlimited power reserves. These features create an unyielding constant impedance that preserves critical tuning of loudspeaker drivers and crossover response independent of signal conditions. Loudspeaker performance becomes more timbrelly correct yet has tough and full weight with effortless dynamics.

To help accomplish these ends, magnetic and electrical fields from this powerful activity are carefully and strategically isolated and then shielded within the DMA-150. Such stealth design prevents load related waveform error as well as propagation of unwanted interferences through cables, power cords and interconnect cables. Without such contamination, each component in the sound system operates to its best unimpeded design capability thereby providing overall enhanced listenability.

### **Beyond Conventional Design Solutions**

Like the innovative DMA-180 Reference Amplifier, the DMA-150 utilizes Spectral's unique "Focused Array" output section design with powerful ultra-fast Mega Fet devices. 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 are used to calibrate each output device separately. Groups of these individual output device / power supply circuits utilize field folding construction and electronic shielding to further impede propagation of stray interference. The resulting "Focused Array" of individual isolated output sections performs as one with virtually no cross-coupling and energy storage artifacts reflecting between output devices. During

extreme program dynamics, this arrangement can launch an instantaneous high current drive of over 60 amps per channel to the most sophisticated loudspeakers with assured precision waveform tracing. Gone are performance damaging magnetic and electrical field propagation problems of conventional multiple device heavy construction. Without stray radiation, critical small signal paths within the DMA-150 and other sound system components can perform with lowest distortion and settle to signal extinction in micro-seconds. Hence, the DMA-150 works with power and speed yet behaves inert to other electronic parts of the system. Reproduction is highly articulate and resolving yet has all the powerful unlimited character of the best very high power amplifier designs, giving little suggestion of its actual 150 watt-per-channel output specification.

#### **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, similar to circuitry in the DMC-20 Reference Preamplifier, is applied to the DMA-150 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 FET's 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-150 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-150 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.

#### **Power and Precision in a Unique Marriage**

Improvements in high-current fet technology, high-speed amplifier topologies and new protection systems are combined in the DMA-150 dual monaural amplifier to successfully advance the art of amplifier design. Until now, amplifiers could not offer both powerful speaker control capability and the sonic transparency and life possible only with high-speed, fast-settling circuitry. Breakthrough circuits backed by Spectral experience have now brought together the necessary combination of speed, accuracy, control and stealth. The DMA-150 High Resolution Amplifier advances the Spectral tradition for musical resolution and sonic holography. Although of moderate size, the DMA-150 offers remarkable sonic sophistication and drive precision for the most demanding system applications.