

Technical Overview

The Spectral DMA-500SV Monaural Reference Standard

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The DMA-500SV Monaural Reference Standard amplifier is a state of the art instrumentation design created and crafted for use in the most demanding component audio systems. Its quickness, instantaneous accuracy and unrestricted maximum power are second to none in the industry. The remarkable audio components from Spectral have always evolved from much careful listening and from developing new technical designs that were auditioned during live music recording sessions and production. The best - those accurately conveying robust dynamics and transparency along with superlative detail and staging have become part of the Spectral legacy. The DMA-500SV represents our most advanced thinking and sophistication in these areas.

Evolution of the Ideal Spectral High-Speed Amplifier

Music technology continuously advances or progresses and some parts chosen to build the DMA-500AR have favorably evolved to deliver even better performance. State of the art speakers have become more demanding and now they are more dependent on amplifier control

and capability. To address these challenges the DMA-500SV has a new power transformer design that is capable of higher surge output to improve musical dynamics. Improvements to the driver circuits of the DMA-500SV come from the use of new technology parts including our unique custom TA technology array capacitors. These super precision Teflon parts allow feed-forward circuits to precisely anticipate and apply small corrections so internal amplification and perceptual listening become effortless. More cascode shield circuits and greater power isolation constructions have also been added to reduce cable dependency and noise propagations to other parts of the music system. These features create a subtle but very rewarding support to ease of listening and the ability to reach in and hear fine micro-details that enhance realism and the listening experience.

A combination of unrestricted power and instantaneous accuracy are a superlative feature of the DMA-500 architecture. To be agile, precise and fully committed, each selected output device, the largest of their kind, has its own transformer powering, a very large filter and an optically coupled analog computing safety circuit. This functional grouping is configured with field folding and noise cancelling layouts that are far more effective than mechanical shielding and massive metalwork to prevent electrical and magnetic disturbances to other parts of the amplifier. Should a loudspeaker component fail, a cable short or a power line surge, any of the computers that are monitoring and responding to device conditions can instantly place the DMA-500 into a safe protection mode. This technique allows unimpeded output device performance right up to the protection event, a much superior method compared to signal distorting current limits that gradually shut down the amplification before a protection is really needed. With computed safety, the combined outputs of all devices in the DMA-500 can be as high as 90 Amps. This power capability is unprecedented in a high-speed amplifier.

Since these parts groups operate independently, they do not interact or crosstalk or couple their activities, acting as if each output device were operating in its own individual amplifier. The result is extraordinarily low distortion and noise. Waveform tracking can be of precision acquisition quality with one-part-per-million accuracy, an assurance of absolute transparency and neutral tonality.

Driver circuits for the high-speed output section of the DMA-500 have floating power architecture. Their signal amplification parts operate as if battery energized so amplification activities are blocked from propagating from one section to another. Additional cascode shield circuits create further barriers to isolate AC power and grounding noises from circulating and creating subtle distortions. Spectral instrumentation techniques effectively use this stealth or silent support technology to reveal inner detail by preventing energy storage effects and transient distortions after a musical event. Our fully discrete custom semiconductors are used in these circuits and unlike conventional low speed and IC circuits, which switch internal state conserving power, Spectral's amplification paths up to the output devices are always operate in continuous Class A. Like vacuum tubes they are always drawing substantial power so the audio activity is not broken up by switched states but instead the action is smooth, small and effortless requiring only a very small part of the driver's full capability.

Other circuits in the DMA-500 respond to music and operating conditions. They anticipate and directly nudge corrections that would otherwise propagate through feedback paths to stress the entire amplification path. This feed-forward technique combined with high current drivers and stealth floating power reduce the need for sound damaging excess feedback, a burden placed on other amplifiers by designers opting for the lowest steady-state distortion measurements that rarely correlate with the ability to faithfully reproduce music. Without circuit stress, which cover up delicate music signals, the relaxed operation of the DMA-500 is evident by its extraordinary transparency, ability to delineate subtle detail, and its lack of technical intrusion or distraction. All are mandatory for timbral neutrality, staging precision and full dimensional realism.

The DMA-500SV monaural reference amplifier further advances the sophisticated topology and design features introduced in our limited production DMA-500 anniversary amplifier. The DMA-500SV completes the development of our "super veloce" circuit technology that will be translated throughout the Spectral line of high performance high-speed instrumentation amplifiers.

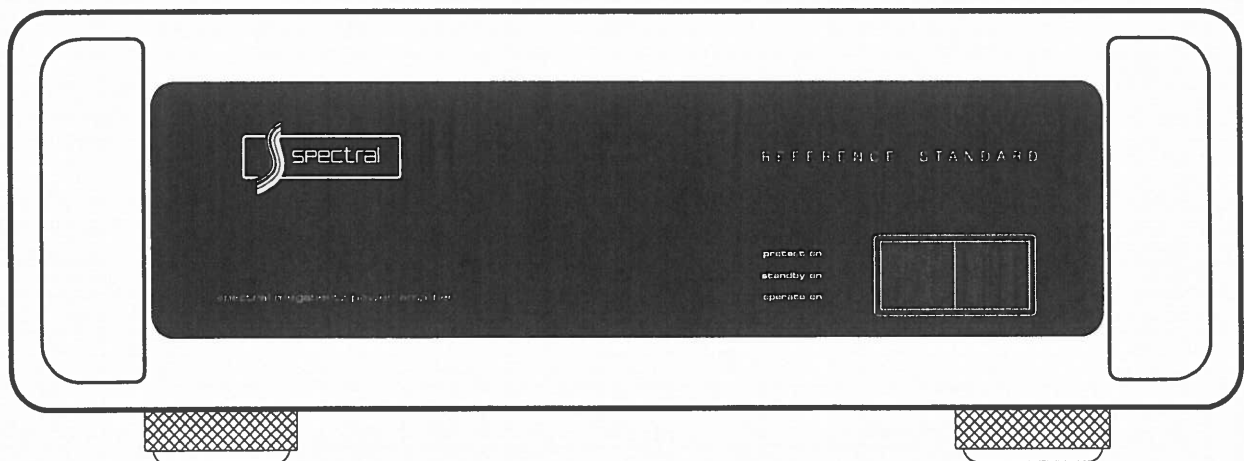
PRELIMINARY SPECIFICATIONS

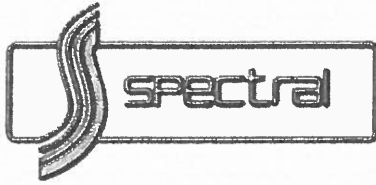


DMA-500SV HIGH RESOLUTION MONAURAL REFERENCE AMPLIFIER

SELECTED DESIGN HIGHLIGHTS:

- * State-of-the-art instrumentation amplifier.
- * Forth generation high resolution design.
- * Ultra fast settling circuit architecture.
- * Precision RF type layout and topology.
- * Focused Array high-speed aligned fet output section.
- * Generation 2 SHHA high-speed hybrid driver module features SV technology and custom semiconductor topology.
- * Power Vault magnetic field containment system.
- * New generation vertical mos-fet output transistors with innovative servo-bias tracking system.
- * Multiple power supply array with independent power supplies and bias adjustment for each output device.
- * Non-invasive optical and thermal protection circuits.
- * Fully discrete design with balanced monaural operation.
- * High current systemboard design with bulk copper technology.
- * All modular construction with instrumentation connectors.
- * Proprietary ultra-precision Teflon Array film capacitor technology.
- * Ultra-low distortion achieves one-part-per-million signal accuracy.





Q/A: The DMA-500SV Reference Standard Monaural Amplifier

1) **What is it?**

The DMA-500SV Reference Standard is a state-of-the-art monaural amplifier based on the breakthrough SV technology debuted in the acclaimed DMA-500 Anniversary Reference monaural amplifier. It features the most advanced engineering and component precision yet achieved in an audio power amplifier.

2) **Why was it created?**

The DMA-500 Anniversary Reference was a limited production specialty product built to commemorate the Spectral forty year anniversary and limited to a small number of pairs for exclusive dealers and established clients. But the high demand for the limited availability DMA-500AR was never fully satisfied during the official production period and dealer demand required a new production flagship.

The DMA-500AR was completed in time for the Spectral 40th year as one of our T40 design projects in 2017 and produced for two years. The DMA-500SV was finalized for presentation at CES 2020.

3) **What are the objectives for the DMA-500SV?**

The DMA-500 Anniversary Reference has proven the performance advantages of Spectral's SV high-speed technology. In the DMA-500AR proprietary fet devices in custom silicon were developed exclusively for our circuit application in a collaboration with Spectral engineers. The original limited device run for the DMA-500AR proved entirely successful, leading to expanded custom production for Spectral today. The first application for these ultra-high performance devices is in the production DMA-500SV monaural amplifier.

Other custom and specialized components, however, were not ready or available in time for use in the DMA-500 Anniversary. With the engineering deadline arriving for the DMA-500AR in 2017, Spectral engineers were not able to finalize all specialty component development in time. Those remaining components would have to wait until they could be finished for integration into the final DMA-500SV model. Now the DMA-500SV completes the full engineering cycle of the ultimate SV technology for our top RS amplifier.

4) **What are the breakthroughs in the DMA-500SV?**

The fundamental advantages of the original DMA-500AR are further enhanced and focused in the production DMA-500SV. Spectral engineers developed the first high-speed, wideband audio amplifier circuits for music reproduction over 40 years ago. These circuits addressed important time domain and transient distortions in amplifier design for the very first time. Today, DMA-500SV represents the pinnacle of our high-speed, high-resolution technology with the fastest signal response and the lowest time-based distortion in the audio industry. The DMA-500SV builds on the legacy of the DMA-500 Anniversary with further refinements in passive signal components and improved power supply capacity and performance.

The Teflon revolution began with the DMA-500 and continues with the DMA-500SV. Our Teflon Array Technology (TAT) introduced in the 500 driver, is further improved in the DMA-500SV. Proprietary Teflon trimmers also replace conductive plastic parts in critical output bias circuits, lowering transient settling distortion to the lowest levels yet achieved.

The DMA-500AR has proven the remarkable stability and robustness of the SV gain and output sections. With this confidence Spectral engineers have redesigned the DMA-500SV power supply and 'opened it up' for increased performance. New transformer designs deliver improved regulation and higher peak current capability to fully realize the absolute potential of the DMA-500 topology.

5) Does the DMA-500SV share components with the DMA-500?

Although the DMA-500 and DMA-500SV share common chassis designs and general layout, the DMA-500SV features various recently available new components as well as unique power supplies and support metalwork. Input, gain and output devices are individually matched by hand on advanced curve-tracing equipment before selected parts are soldered into their circuit position on the amplifier boards of the DMA-500SV.

6) Whom was the DMA-500SV created for?

These amplifiers are for the audio connoisseur, primarily established Spectral customers for use in the most sophisticated all-Spectral systems. Due to their extreme high-speed signal operation and ultra-low impedance circuitry, these amplifiers are incompatible with conventional low-speed components from other manufacturers. The DMA-500SV will be warranted for use exclusively in Spectral component systems and installed by the RS dealer.

7) What dealers will be demonstrating the DMA-500SV?

Only a select group of our most experienced RS dealers will be chosen to represent the DMA-500SV and will be demonstrating according to factory set-up and procedures. These dealers will be factory trained by Spectral and will be installing the DMA-500SV in customer systems as well as overseeing on-site system optimization and fine tuning.