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Bulletin 0220

Design Overview

The DMC-30SV S2 "Super Veloce" Reference Preamplifier

After years of painstaking research and development and exhaustive listening trials the Spectral DMC-30SV "Super Veloce" Reference Preamplifier was introduced utilizing Spectral's new benchmark SV technology. As the premiere example of Spectral's custom SV semiconductor technology, the DMC-30SV has been an unqualified success, joined in recent years by the similarly advanced SV reference standard amplifiers. Taken together, the Spectral SV component series has taken Spectral music systems to a new level of realism and accuracy which redefine the state-of-the-art. Now the evergreen DMC-30 preamplifier is once again reimagined with the most advanced refinements from our cutting edge research. The new DMC-30SV Series 2 continues the relentless refinement of our classic DMC-30 series and represents the most advanced reference preamplifier we have offered in our long history.

Since the establishment of our company in the 1970s and the introduction of our very first audio component, high performance preamplifier design has occupied the highest engineering priority at Spectral. Our special focus on high-end preamplifier development over the years is based on the major design challenges which low-level amplifier and control circuitry represent. At these critical signal levels, minute amplifier distor-

tions and signal control colorations are passed on and magnified by power amplifiers to dominate the sonic signature of the best audio systems. Spectral engineers have spent the last four decades pursuing ideal performance and signal transparency in audio preamplifiers to realize ultimate fidelity in high-end music systems.

Relentless Refinement: The DMC-30SV Series 2

The DMC-30SV reference preamplifier is widely considered to be the most accurate and transparent preamp in the industry. But recent advances in high performance topologies and custom components have moved the art forward at Spectral. We knew as we developed the new circuits and components for the DMA-500 anniversary amplifier that the advances in our SV technology would have application back in the DMC-30SV preamplifier. These ultra-low impedance circuits are defined by our custom built semiconductors and high precision passive components. In the DMA-500 drivers, our SV fet technology is supported by the most advanced family of passive components ever made for a Spectral amplifier. With the proven reliability and superior transparency that has been achieved in the DMA-500, our engineers applied the new techniques and components to the DMC-30SV to transfer these benefits and further advance circuit speed and lower complex distortions.

The Remarkable "Teflon Array" Technology

The DMC-30SV is one of Spectral's most successfully realized components as the first of our Super Veloce generation, but our ideal SV preamp topology can be further perfected with the extreme precision values, elements and dielectric films created for the DMA-500. Key to the performance of the DMA-500 is the remarkable Teflon Array technology created for the SV driver which lowers capacitance and inductance to improve stability at very high frequencies. Our new balanced 301C output module for the DMC-30SV S2 utilizes

Spectral's 'Teflon Array' film capacitor technology to replace all previous film capacitors in the signal path. New construction bulk metal lithographic resistors join the TA capacitors to eliminate the previous trimming elements. Improvements in compensation, stability, feedback and gain setting are the result and optimize the revised SHHA output modules on a higher plane. To support the revised line level output section of the DMC-30SV S2, a new power supply transformer with improved regulation and headroom are also employed. The result is improved dynamics and low-level clarity.

The SHHA Generation 3 Analog Line Section

The foundational core of the DMC-30SV preamplifier rests on the Spectral High-speed Hybrid SHHA Gen 3 line modules. Our highly evolved, high performance SHHA modules are now ideally powered and precisely compensated in the new 301C balanced output section of the DMC-30SV Series 2.

Just as the preamplifier is the essential heart of the finest music systems, the SHHA high-speed module is the essential heart of our high resolution preamplifiers. For this reason, the modular architecture of Spectral preamps has been developed to accommodate design evolution of our SHHA technology with convenience and ease. Now the 301C SHHA G3 line section of the DMC-30 incorporates the 'Teflon Array' technology as well as other advances which optimize all operating parameters of the DMC-30 line output section. These and other advances in the SHHA G3 module assure uncompromising sonics and extended reliability. Musical results include higher resolution, greater dynamics and improved harmonic structure. Vastly improved imaging and focus result from the elimination of transistor thermal-tail distortions and dielectric film non-linearities.

Seeking The Missing Link

With the widespread use of integrated circuit op-amp topologies in current high-end digital processors and digital source components, the role of the preamplifier to optimize the component interface has never been more critical to final system performance. Today's digital converters have a challenging task delivering precision conversions of music files and downloads while also driving complex cables and low-impedance input loads utilizing rudimentary analog circuits and basic power supplies. Without the benefits of discrete, high-bias analog amplifiers, digital processors struggle to provide optimal drive and load isolation when faced with the full dynamics of high-resolution recordings. In addition to these output drive limitations, IC based digital processors require balanced output operation to avoid higher distortion levels which occur when used single-ended. It is also important to recognize that digital audio processors are not equipped to perform the role of preamplifier in high-end audio component systems. Power amplifiers require robust drive capabilities from the best discrete class A preamplifier line sections to avoid impedance mismatching, current limiting and cable reflection problems associated with low bias IC op-amp output sections.

The Model 304 Balanced Input Amplifier

To address the shortcomings inherent in the output sections of today's high-end digital processors, Spectral engineers developed the model 304 balanced input amplifier. The model 304 is a discrete, high-speed class A unity gain buffer operating on unusually high voltage rails. This fully push-pull topology is derived from our innovative SDR-4000 I/V balanced amplifier and features superior performance to any IC buffer. The model 304 is design optimized as a discrete buffer amplifier unlike conventional IC input buffers. Custom discrete buffers are a rarity in audio today but still are found in the best ultra-premium recording consoles. Although difficult to design and hugely

expensive compared to op-amps, the optimized discrete input buffer is the only uncompromised solution for interfacing digital audio components and amplifiers.

Spectral engineers take the discrete input buffer to the next level in the 304 balanced input amplifier. Custom matched J-fet transistors are employed in the cascode front-end. Built to Spectral specifications for low gain applications, the handbuilt devices lower crossover distortion, noise and improve common mode rejection. Bandwidth, slew rate and distortion are all vastly superior to conventional buffers. The speed and resolution of the 304 balanced input buffer are exemplary and perfectly compliment the superlative performance of the 301C line section of the DMC-30SV S2.

Instantaneous Accuracy: The Final Frontier

In the DMC-30SV S2 reference preamplifier, Spectral brings together some of the most accurate and sophisticated circuits yet developed for music reproduction. Through painstaking research and development, new line-level output stages employ next generation instrumentation technology, which address historic distortion problems in solid-state semiconductor design, with heroic results. Amplifier topologies in the DMC-30SV are the fastest and deepest settling that we have developed. Premium passive component technologies used in critical locations are of unsurpassed quality. Today, no other preamplifiers have the ultra-fast signal response and the instantaneous signal extinction achieved in the DMC-30SV. This “instantaneous accuracy” sets the stage for remarkably transparent, articulate and vividly immersive sonics.

The DMC-30SV S2 Reference Preamplifier: At the Leading Edge

We are pleased to see more and more music enthusiasts are coming to understand that no music system can be any better than the performance of its preamplifier. There is growing sophistication in regards to absolute performance and price. At a time when ultra high price preamplifiers are routinely introduced at several times the cost of Spectral, the thoughtful music enthusiast is left to wonder exactly what benefits these lofty prices buy? We believe the sophisticated customer will find

the answer in the uncompromising DMC-30SV. Few preamplifiers at any price can boast the designer credentials and unrivaled component quality of the DMC-30SV. Edge-of-the-art amplifier technology and advanced custom component design are utilized throughout the DMC-30SV to a degree rarely seen in stratospheric components. This is because Spectral engineers have identified those key components that most determine instrument stability and sonic transparency and have invested aggressively. When careful investment in superior circuit performance and signal path components becomes the design priority over elaborate metalwork sculpture, state-of-the-art clarity and signal resolution can be achieved with excellent value.

The DMC-30SV Series 2 builds on the excellent fundamentals of the DMC-30SV reference preamplifier to achieve altogether superior transparency and resolution. Utilizing the new 301C line section output module featuring our exclusive “Teflon Array” technology and other topology refinements, the new DMC-30SV S2 performs with immersive sonics and dazzling realism. Now our goal of achieving 2C3D and true spatial coherence has been fully realised.

Compare our new DMC-30SV series 2 reference preamplifier against the most costly and ambitious high-end preamps in the industry. We are confident you will discover the important musical difference superior engineering experience and design innovation make.