

## EQUIPMENT REPORT

# Classé Audio SSP-800 Multichannel Controller

An \$8000 Bargain

Robert Harley

**T**hose of us with single systems for stereo playback, multichannel music, and film-sound reproduction are presented with a dilemma. We can choose the best-sounding multichannel controller we can afford and accept its performance limitations with stereo music sources. Or we can add a separate two-channel preamplifier for CD and LP playback so that those signals never pass through the multichannel controller.<sup>1</sup>

Now there's a third option: Classé Audio's SSP-800. This is a multichannel controller that not only delivers state-of-the-art functionality, but sets a new standard in two-channel and multichannel sound quality in the controller category.

The SSP-800 is loaded with the latest high-tech features, connectivity, and upgradability, yet sound quality remains its chief virtue. Despite its immense flexibility, the SSP-800 is astonishingly easy to set up initially as well as to use on a daily basis. The SSP-800 is not only the most sophisticated controller I've had, it's also the most intuitive. The front panel contains a volume knob and just three buttons: "Standby," "Menu," and "Mute." Other

functions are accessed by the touchscreen panel. It's impossible to overstate how the SSP-800's touchscreen transforms the user interface from a frustrating collection of menus and sub-menus into a brilliantly simple control center. Moreover, the touchscreen can double as a video preview monitor. I actually spent more time with the owner's manual discovering the SSP-800's capabilities than looking to find out how to perform certain functions.

Here's the Cliff Notes overview; you can find technical details in the sidebar "Under the Hood." The SSP-800 is a ten-channel device with both balanced and unbalanced outputs on all channels. Most of the inputs are digital—four coaxial, four optical, four HDMI—but the one balanced and two unbalanced analog inputs can be configured to bypass any digital conversions. There's also a discrete eight-channel input for connecting the analog outputs from a multichannel DVD-A or SACD player. The SSP-800 will "decode" the new audio formats (Dolby Digital Plus, Dolby TrueHD, DTS-HD, DTS-HD Master Audio), provided that your Blu-ray player outputs high-resolution PCM on the HDMI interface (see sidebar).

<sup>1</sup>This is realized by running the controller's left and right outputs through one of the preamp's inputs that has been set to "Pass-Through" mode. This mode sets the gain at unity so that the individual channel calibrations remain correct—it's as though the preamp isn't even in the signal path. The preamp's outputs drive the left and right amplifiers just as they would normally. This is the ideal method, but expensive and impractical for some listeners.



**Features**

The SSP-800's feature set is staggeringly comprehensive. In addition to the usual functions such as setting up each input with a predetermined level, audio delay, audio and video connector, favorite processing, and whether the input should be bypassed, the SSP-800 sports many additional capabilities. Each channel has independent crossover-frequency and slope adjustments, and each channel has its own five-band parametric equalizer that allows you to tackle room-induced frequency-response errors. A parametric equalizer provides adjustment of center frequency, boost or cut, and Q (the filter's steepness, defined technically as the center frequency divided by the bandwidth). These filters would typically be used to notch out problem frequencies, and are best adjusted with the aid of test equipment during installation by your dealer. Unused inputs can be removed from the source-selection menu to simplify operation.

The "System Trims" feature provides direct access to controls that would otherwise be buried deep in the menu structure. A typical use would be adjustments like channel levels, audio delay, and engaging the "Dolby Late Night" mode that reduces dynamic range. Similarly, the backlit remote control includes four "Function" buttons that can be programmed to perform any function or series of functions. The "Profile" feature allows you to create shortcuts to a particular control in the menu system. Two separate Profiles can be stored with up to six commands each.

Up to six different configurations of these set-up parameters can be stored in memory and recalled from the front panel. For example, if you want to run your main speakers full-range for two-channel listening with no subwoofer, but engage the high-pass filter and drive a subwoofer for film soundtracks, you simply switch configurations.

The SSP-800 has ten discrete channels, with eight channels typically reproducing 7.1-channel sources coupled with two auxiliary channels. These auxiliary channels are extremely flexible; they can drive additional subwoofers, output a two-channel downmix of a multichannel signal, or be configured to bi-amp the main left and right audio channels. Finally, software updates are realized via a rear-panel USB connector. You go to the Classé Web site, download the software to your PC, and then upload the software to the SSP-800.

The only feature not offered is automatic speaker setup and room equalization. Classé believes that room equalization has a limited ability to correct problems and introduces a host of other issues. Moreover, Classé asserts that human involvement and judgment is essential in setting up a multichannel controller. Finally, the SSP-800 does not offer THX post-processing.

**User Interface**

A great irony of AV controllers is that the best-sounding units from high-end companies are likely to have the worst user interfaces. Software development is expensive, and high-end companies must amortize that cost over a relatively small number of units. Moreover, there's often a mindset among high-end companies that users should accept challenging operation as the price of sonic purity. Conversely, many mid-fi controllers have excellent user interfaces because customers demand it, and the manufacturer can spread out the development cost over many more units. Such controllers, however, typically have abysmal

**DECODING THE NEW AUDIO FORMATS**

Classé introduced the SSP-800 without the ability to decode the new audio formats, Dolby Digital Plus, Dolby TrueHD, DTS-HD, and DTS-HD Master Audio. But this doesn't preclude you from enjoying these new formats through the SSP-800. Rather, it simply means that the "decoding" takes place in your Blu-ray Disc player.

Here's how it works. The film soundtrack starts out as high-res PCM (Pulse Code Modulation) audio and is encoded into, for example, a Dolby TrueHD bitstream for storage on the Blu-ray disc. (I'll use TrueHD as a stand-in term for all the new audio formats.) You can think of this process as creating a Zip file on a PC.

The file must then be "unzipped" on playback; that is, the Dolby TrueHD bitstream must be decoded back into multichannel linear PCM audio for conversion to analog. This decoding can take place in the Blu-ray player or in the controller. If the decoding to PCM takes place in the player, the controller receives high-res PCM over the HDMI interface. The controller then converts the PCM to analog for listening. If the decoding of Dolby TrueHD to PCM takes place in the controller, the HDMI interface carries the TrueHD bitstream.

It really makes no difference sonically where the "decoding" takes place—in the player or in the controller, provided that the controller was designed to minimize jitter in the HDMI interface (as the SSP-800 was). HDMI can introduce audible degradation to the high-res PCM signal unless the signal is handled with the utmost care at the receiving end. Conversely, the TrueHD bitstream is relatively immune to degradation when transmitted over HDMI.

There's a small functional advantage to decoding in the player and outputting PCM on HDMI—the Blu-ray format has the capability of mixing different audio sources on the fly during playback. An example of this is a director's commentary posted on a movie studio's Web site after the Blu-ray disc has been released. There are many other examples of Blu-ray's interactivity—features that are lost if the TrueHD-to-PCM decoding doesn't take place in the Blu-ray player.

Not all Blu-ray players can perform this "unzipping" of TrueHD bitstreams to PCM, and some of those that do downrez 96kHz to 48kHz. High-res decoding requires a lot of DSP horsepower, making it an expensive feature for disc-player manufacturers. I expect, however, that all next-generation players will decode and output full-resolution PCM.

So, when you talk about whether a controller can "decode" the new audio formats, remember that there are two distinct functions—"unzipping" of the TrueHD bitstream to PCM, and the conversion of that PCM to analog.

By the time you read this, all SSP-800s will ship with an additional DSP board that performs the TrueHD-to-PCM conversion in the SSP-800. Owners of existing SSP-800s can have their units upgraded at no charge through their Classé dealers. **RH**



## A GIANT LEAP FORWARD IN SOUND QUALITY

It is impossible to overstate the significance of Dolby TrueHD and DTS-HD Master Audio formats on Blu-ray Disc. These two formats deliver perfectly lossless high-resolution multichannel digital audio with no sonic compromise. Just look at the data rate of Dolby Digital on DVD compared with TrueHD on Blu-ray: DVDs typically contained 384kbps, but TrueHD has a maximum peak data rate on Blu-ray of 24Mbps—more than 50 times that of Dolby Digital on DVD. That's not an incremental advance, but a giant leap forward.

You can vividly hear this leap forward on the Blu-ray disc *Legends of Jazz Showcase*. This great disc is a sampler of performances by various artists shot for a PBS series in HD video and recorded in high-resolution multichannel audio. The disc offers the option of Dolby Digital or TrueHD. Going back and forth between them is like throwing a light switch; the TrueHD is everything that Dolby Digital is not—warm, spacious, rich in timbre, resolved and detailed, and musically engaging. And this comparison doesn't fully reveal the extent of the difference. The Dolby Digital track on this disc runs at 640kbps rather than the typical 384kbps (the Dolby Digital format has a maximum data rate of 640kbps, but was limited by the DVD format to a maximum of 448kbps) and also benefits from a new and improved encoding algorithm.

The combination of 1920x1080 high-definition video with high-resolution multichannel audio on musical performances is extremely compelling. I just wish that the producers of *Legends of Jazz* would release on Blu-ray the entire performances of each artist—and that more concerts and musical presentations were available now that we've moved beyond the bottleneck of Dolby Digital.

RH

user manuals. The SSP-800 is a breath of fresh air, combining a highly sophisticated feature set, outstanding user interface, and the best-written owner's manual I've seen. In another irony, the SSP-800's great owner's manual is a bit of a waste; I found myself able to configure the unit with just a rare glance inside the manual.

The heart of this intuitive interface is the front-panel touchscreen. Although the menu structure isn't significantly different from that of other controllers, the directness of the touchscreen transforms those menus from complicated branches and sub-branches to a simple guide that allows one to find and change a setting instantly. I've lived with my share of controllers and AVRs with poor user interfaces and can tell you that a good GUI is a vital component of long-term satisfaction with the product.

### Listening

A multichannel controller consists of several separate elements—digital-to-analog conversion, linestage section, and surround decoding—that can be judged independently.

I evaluated the SSP-800's DAC section by comparing it to Classé's excellent CDP-502 CD/DVD player (\$8500), which I favorably reviewed in Issue 183. I fed the 502's coaxial digital output to a digital input on the SSP-800, and the 502's balanced analog outputs to the SSP-800's balanced analog inputs with all digital conversions bypassed. Going back and forth between the two was as simple as switching sources on the SSP-800.

Putting a highly sophisticated ten-channel controller up against a CD player of roughly the same price might seem a bit unfair, but my favorable impressions of the SSP-800 during daily listening invited the comparison. The SSP-800 and CDP-502 had a very similar sonic signature, with neither exhibiting significant colorations. The CDP-502 was a bit warmer in its rendering of instrumental textures, more refined overall, and sweeter in the treble. The CDP-502 was also more resolving of fine musical detail and was better at allowing me to follow very quiet instrumental lines. Additionally, the CDP-502 had a slightly more spacious soundstage, with a greater sense of air and bloom around images. Nonetheless, the difference between this outstanding \$8500 CD player and the DACs in the SSP-800 was remarkably small considering everything else the SSP-800 does. The



## SPECS & PRICING

**Type:** Ten-channel controller

**Inputs:** Two (each) S-video, composite video, component video; four (each) HDMI, coaxial digital audio, TosLink digital audio; one discrete 7.1-channel analog input; one stereo balanced analog; two stereo unbalanced analog; one (each) IR, RS232, USB, CAN Bus

**Outputs:** Two (each) component video, HDMI, trigger; one (each) CAN Bus, coaxial digital audio, TosLink digital audio, main analog audio (7.1-channel output plus auxiliary stereo output, all on both balanced and unbalanced jacks)

**Surround formats supported:** Dolby ProLogic II, PLIIx Music, PLIIx Movie, PLIIx Matrix, PLIIx Game, Dolby Digital EX, Dolby Surround EX, DTS, DTS Neo:6, DTS Neo:6 Cinema, DTS Neo:6 Music, DTS Neo:6 Cinema ES, DTS Neo:6 Music ES, discrete, mono, stereo, "party," "mono plus," "move plus"

**Dimensions:** 17.5" x 6.75" x 16.5" (excluding connectors)

**Weight:** 29 lbs.

**Price:** \$8000

### ASSOCIATED EQUIPMENT

Wilson Alexandria X-2 Series 2 loudspeakers, Wilson

WATCH center-channel, Revel Embrace surround speakers (x4), JL Audio Fathom f113 subwoofers (x2); Anthem P5 power amplifier (center and surrounds); Basis 2800 Signature turntable with Basis Vector 4 tonearm, Dynavector XV-1S and Air Tight PC-1 Supreme cartridges, Aesthetix Rhea and Rhea Signature phonostages; PC-based music server (built by Goodwin's High-End), Spectral SDR-4000 Pro CD player, Classé CDP-502 CD/DVD-A player, Sony SCD-9000ES SACD player, Meridian 808.2i CD player; Spectral DMC-30SS and Pass Labs X20 preamplifiers; Spectral DMA-360 and Pass Labs XA100.5 power amplifiers; MIT Oracle MA interconnects; MIT Oracle MA loudspeaker cables; Running Springs Audio Dmitri, Shunyata Hydra-8, Hydra-2, and V-Ray AC conditioners, Shunyata Anaconda, Python, and King Cobra CX AC cables; Shunyata Dark Field cable elevators; room custom designed and built, acoustic design and computer modeling by Norm Varney of AV Room Service, acoustic treatment and installation by Acoustic Room Systems (now part of CinemaTech)

two products sounded *quite* similar, with the difference being in that last degree of refinement rather than the SSP-800 departing from neutrality or adding sonic artifacts.

## Fully up to being the center of a high-end system

Next, I evaluated the SSP-800's intrinsic sound quality as a preamplifier with the bypass test. This involves driving power amplifiers directly from a variable-output digital source (in this case the Berkeley Alpha DAC or the Meridian 808.2i) and then inserting the SSP-800 (with its volume control set to unity gain) in the signal path. No preamplifier is sonically transparent, and the bypass test immediately reveals the preamp's colorations. The SSP-800 tended to shave off a bit of low-level detail, slightly reduce timbral liquidity by adding a touch of grain, and make the hall sound slightly smaller. No preamplifier on which I've performed the bypass test—and I've done this with some of the world's great preamps—emerges without revealing some colorations. The SSP-800 was notable for not imposing a common coloration—a bright treble, hard textures, reduced dynamics, for example—over the music. Rather, the SSP-800's departure from transparency was manifested as a slight reduction in resolution. In fact, the SSP-800 was significantly more transparent and lower in coloration than other multichannel controllers, and indeed, as neutral and free from artifacts as many \$5000 two-channel preamps. That's saying a lot for a multichannel controller. On this basis, the SSP-800 is fully up to the task of serving as the control center for two-channel sources including the output of a high-quality phonostage. I should mention that I evaluated the SSP-800's DACs and linestage with reference-quality two-channel music sources under exacting conditions through the highly resolving Wilson Alexandria X-2 Series 2 loudspeakers and applied the same standards I use to judge high-end gear.

When playing multichannel music and film sources, a controller's DACs, preamplifier stage, and surround-decoding all come together to determine the unit's overall sound quality. In

this regard, the SSP-800 is, by a significant margin, the best-sounding controller I've heard. The SSP-800's smooth and grainless reproduction of timbre, coupled with its lack of glare, created an immersive listening experience that didn't induce fatigue. Many controllers overlay the presentation with a steely hardness that doesn't encourage high playback levels, is uninviting, and quickly becomes tiresome. I've lived with the SSP-800 for many months and listened to quite a number of film soundtracks and musical performances, often at high playback level for extended periods, with no sense of fatigue. I also never thought that the SSP-800 was limiting the performance of my reference system; in fact, it was wonderful to have a controller that fully revealed the rest of the system's capabilities.

Another testament to the SSP-800's sound quality is its apparent ability to "disappear" in the signal path and reveal differences between recordings, particularly those with high-resolution soundtracks such as the Blu-ray *Legends of Jazz Showcase*. Although recorded in the same studio, each performance by a different group has its own sonic flavor—a flavor that wasn't homogenized by the SSP-800. It was on these high-res sources where the SSP-800 really revealed its prowess, with excellent dynamic contrasts, no glare, deep bass extension, and a resolution of fine detail that consistently engaged me.

### Conclusion

The Classé SSP-800 is a remarkable achievement, combining a comprehensive feature set, outstanding user interface, advanced technology, and most importantly, category-defining sonic performance. Frankly, I'm surprised that this level of build and sound quality doesn't cost more. Although it's difficult to call an \$8000 controller a bargain, that's exactly what the SSP-800 is when you consider that it is fully up to the task of serving as the centerpiece of a demanding high-end two-channel and multichannel playback system. **TAS**

## UNDER THE HOOD

The SSP-800 is an enormously sophisticated device from every standpoint—the software, user interface, audio circuitry, and physical construction. Although not inexpensive at \$8000, a five-figure price tag would not be unexpected. Starting with the casework, the SSP-800 sports Classé's wrap-around front-panel that gives the unit a distinctive and extremely elegant look. The front-panel is a full 3/4"-thick brushed-aluminum panel. The unit exudes a sense of beefy solidity, but at the same time a luxurious refinement.

The tall (6.75") chassis provides plenty of rear-panel real estate for the myriad input and output jacks of today's sophisticated electronics. As mentioned, all the analog outputs are on both balanced and unbalanced jacks, and one of the analog inputs offers balanced connection. The SSP-800's balanced output is created by the differential outputs of the Burr-Brown PCM1792 DACs; the signal is kept balanced through the analog output stage with two analog amplifiers per channel. The left, right, center, subwoofer and both auxiliary channels use the PCM1792, and the four surround channels employ the slightly lower-spec'd PCM1796 DAC.

The DSP engine is from Texas Instruments and has computing horsepower of 1800 MIPS. This is plenty of power for decoding a Dolby TrueHD or DTS-HD Master Audio bitstream into discrete PCM channels, but the chip doesn't contain the decoding software. Consequently, the SSP-800 cannot accept the TrueHD bitstream. Classé has addressed this issue in two ways. First, you can "decode" the TrueHD bitstream into eight discrete PCM signals in a Blu-ray player and feed it to the SSP-800 via HDMI. If you prefer that this decoding take place in the controller, Classé will, at no charge, replace the DSP board with a new board containing dual next-generation DSP chips that contain the decoding software and also have enough power (a whopping 5600 MIPS between them) to simultaneously perform high-res signal processing. (See sidebar "Decoding the New Audio Formats.")

Much attention was paid to minimizing noise contamination between sections as well as handling signals inside the unit. The main board is a six-layer design with careful trace-routing. Critical signals are transmitted differentially, with trace lengths optimized for the signal. I toured Classé's Montreal factory and watched engineers laying out traces by hand on computer screens. Although the boards for most electronics are laid out using an automated program, high-end audio products need skilled human judgment in routing board traces. Also during the factory tour, I was impressed by the overall dedication to product quality that was apparent at every manufacturing stage. For example, Classé maintains the highest standard of solder-joint quality, as seen through microscope photographs. You wouldn't notice these quality differences with the naked eye, but the production engineer explained to me why the solder joints are important to sound quality and long-term reliability. Everyone at the factory seemed to take great personal pride in the products produced.

How the HDMI input signal is handled requires more than "off-the-shelf" solutions to achieve good sound. Many listeners have reported that HDMI connection introduces degradation. Classé did considerable research into this problem and came up with its own way of recovering and decoding the complex HDMI signal (it is transmitted in packets and carries high-res multichannel audio, HD-video copy protection, and other housekeeping data). One of the engineers who worked on this problem (and on many other aspects of the SSP-800) is Alan Clark, the primary author of the great Linn CD12 CD player. Clark is VP of Research and Development and Chief Technical Officer of the B&W Group. Another Classé engineer who contributed greatly to the SSP-800 is Tom Calatayud, who worked at Mark Levinson on such products as the groundbreaking No.30 digital processor and No.40 Media Controller. The user interface was created and written by Classé engineer Richard Katezansky. **RH**