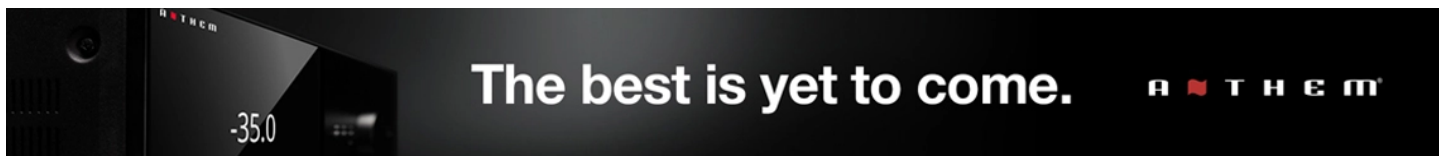


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BRYSTON SP4 16-CHANNEL SURROUND PROCESSOR REVIEW

JAY HAIDER (<https://hometheaterhifi.com/author/jay-haider/>) x OCTOBER 24, 2018 x RECEIVER AND PROCESSOR REVIEWS (<https://hometheaterhifi.com/reviews/receiver-processor/>)

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Welcome to a SECRETS exclusive: the world's first review of Bryston's SP4 16-channel surround processor with Dirac Live room correction and SphereAudio binaural immersive headphone processing!



The SP4 is Bryston's first processor for the immersive audio era. The SP4 decodes all three immersive sound formats (Auro-3D, Dolby Atmos, DTS:X) and includes their respective upmixers. The Bryston SP4 combines Dirac Live calibration with unrivaled bass management capabilities. It even natively supports multi-amped front speakers and multiple subwoofer arrays! The SP4 sounded fantastic in my system.

Highlights



Bryston SP4 16-channel Surround Processor

- 16 user-configurable balanced outputs, up to 9.1.6 discrete channels
- Extremely flexible bass management
- Supports all modern immersive codecs (Atmos, Auro-3D, DTS:X) and upmixers (Auro-Matic, Dolby Surround, DTS Neural:X,)
- Passed Dolby Vision to our TV, though Dolby Vision not officially supported
- Dirac Live room correction (all channels)
- Dirac Live works on top of manual adjustments
- Modular design
- Bryston-typical build quality
- Intuitive browser-based setup/configuration
- Interoperability with IR universal remotes needs fine tuning



Introduction

Bryston has over two decades’ experience with multichannel sound. The 16-channel SP4 is the first fruit of [Bryston’s partnership with Auro Technologies spinoff StormAudio](#) (<https://hometheaterhifi.com/press-releases/bryston-stormaudio-announce-collaboration/>). The SP4 complements but does not replace Bryston’s [7.1-channel SP3](#) (<https://hometheaterhifi.com/reviews/receiver-processor/processors/bryston-sp3-processor-review/>).

BRYSTON PROCESSOR SPECIFICATIONS

DESIGN: 16 Channel Immersive Preamp/Processor	VIDEO FORMATS: 4K UHD, HDR10, HLG
DECODING/UPMIXING CHANNELS: 16	MAXIMUM VIDEO RESOLUTION: 4K 60fps 4:4:4 8bpc
DAC: 16-channel TI ADAU1966 (109.5dB SNR)	DEEP COLOR SUPPORT: 12bpc
INPUT SAMPLING RATES: up to 192kHz	REMOTE CONTROL: Browser-based WebUI, iPad app, IP (Crestron, Control 4, Savant, RTI), IR (with external adapter).
INTERNAL SAMPLING RATE: 48kHz (analog and digital sources)	REMOTE TRIGGERS: 4x 12VDC trigger outputs, user assignable by profile and input
AUDIO FORMATS: Auro-3D, Dolby Atmos, DTS:X, legacy formats	ETHERNET: Network control
AUDIO UPMIXERS: Auro-Matic, Dolby Surround, DTS Neural:X	INCLUDED ACCESSORIES: Removable rack ears
ROOM CORRECTION: Dirac Live (all channels)	DIMENSIONS: 17” wide x 3RU (6.3”) high x 18.25” deep
MULTIWAY SPEAKER CROSSOVERS: 6, 12, 18, or 24 dB/Octave	WEIGHT: 28.8 Lbs.
BASS MANAGEMENT CROSSOVERS: 12 or 24 dB/Octave, Linkwitz-Riley	MSRP AS TESTED: \$13,995
EQUALIZATION: 10-band per channel, parametric, not overridden by Dirac Live	COMPANY: Bryston (/av-directory/bryston-audio/)
DIGITAL INPUTS: 3x HDMI 2.0/HDCP2.2; 4x HDMI 1.4/HDCP 2.2 (software configurable to 7x HDMI 2.0); 3x coaxial, 3x optical	SECRETS TAGS: Bryston, Bryston SP4, Surround Sound, Immersive Sound, Processor, Processor Reviews, Bass Management, Room Correction, Dirac Live, Processor Review 2018
ANALOG INPUTS: 8, user-assignable	
AUDIO OUTPUTS: 16, user-assignable, balanced (XLR); dedicated stereo downmix	

“Immersive” systems add speakers above the ear-level surround array to create a 3D bubble of sound. SECRETS recently covered several high-end immersive processors:

Linkbacks

- [NAD M17](#) (<https://hometheaterhifi.com/reviews/receiver-processor/processors/nad-m17-v2-surround-sound-preamp-processor-review/>).
- [Anthem AVM60](#) (<https://hometheaterhifi.com/reviews/receiver-processor/processors/anthem-avm-60-preamplifier-processor-review/>).
- [AudioControl Maestro M9](#) (<https://hometheaterhifi.com/reviews/receiver-processor/processors/audiocontrol-maestro-m9-surround-sound-processor-review/>).
- [Datasat RS20i](#) (<https://hometheaterhifi.com/reviews/receiver-processor/datasat-rs20i-surround-sound-processor-review/>).

Bryston needs no introduction. You’ve already read about the Canadian audio specialist’s [DACs](#) (<https://hometheaterhifi.com/reviews/dac/bryston-bda-3-dac-review/>), [headphone amps](#) (<https://hometheaterhifi.com/reviews/headphone-amplifier/bryston-bha-1-balanced-headphone-amplifier-review/>), and [speakers](#) (<https://hometheaterhifi.com/reviews/speaker/bookshelf/bryston-mini-a-bookshelf-speakers-review/>), as well as [odes to their heritage of reliability and performance](#) (<https://hometheaterhifi.com/blogs/bryston-bp-25-stereo-preamplifier/>). In addition to the lofty channel count, the Bryston SP4 offers the most comprehensive, flexible feature set I have seen on a processor at any price. Its bass management is category-leading.

Design



The SP4 is minimalist in front. In back there are 7 HDMI inputs and 6 legacy digital audio inputs. The 8 assignable analog (RCA) inputs are digitized (48kHz sampling). SECRETS' Technical Editor, Dr. David Rich, notes Bryston's older SP3 uses higher-performance DACs than the SP4 (3.5dB better SNR, 15dB lower THD) though the SP4's ultra-precise laser-trimmed balanced line drivers cost 12x more than typical solutions. The SP4's 16 balanced outputs are fully assignable. Two additional balanced outputs provide stereo downmix. They can drive a headphone amp and apply SphereAudio immersive binaural upmixing. Due to review time constraints I was unable to give SphereAudio a thorough audition. The SP4 is modular, so future upgrades (DAC upgrade, AES or USB inputs) are possible in addition to Bryston's current 16-channel unbalanced "Super Zone 2" upgrade.



The SP4 has no physical remote. Who would use it? There is also no on-screen display. Everything flows through Bryston's browser-based interface ("WebUI") or iPad control app. While hopefully Bryston will introduce a true iOS control app, WebUI was usable on my iPhone X.

Bryston SP4 WebUI Remote

Web Browser

iOS

Setup

A Bryston SP4 owner (or her dealer/installer) uses WebUI to set up the processor. While anyone with the SP4’s IP address can access the WebUI remote, setup/configuration is password-protected.

I had one setup hiccup. Initially, the SP4 did not pass video from our AppleTV 4K. Bryston’s Gary Dayton accurately diagnosed the issue: I plugged the TV into HDMI output 1. Only HDMI output 2 is HDMI2.0. Once I moved the cable, AppleTV worked. The “Dolby Vision” icon even popped up on our LG OLED!

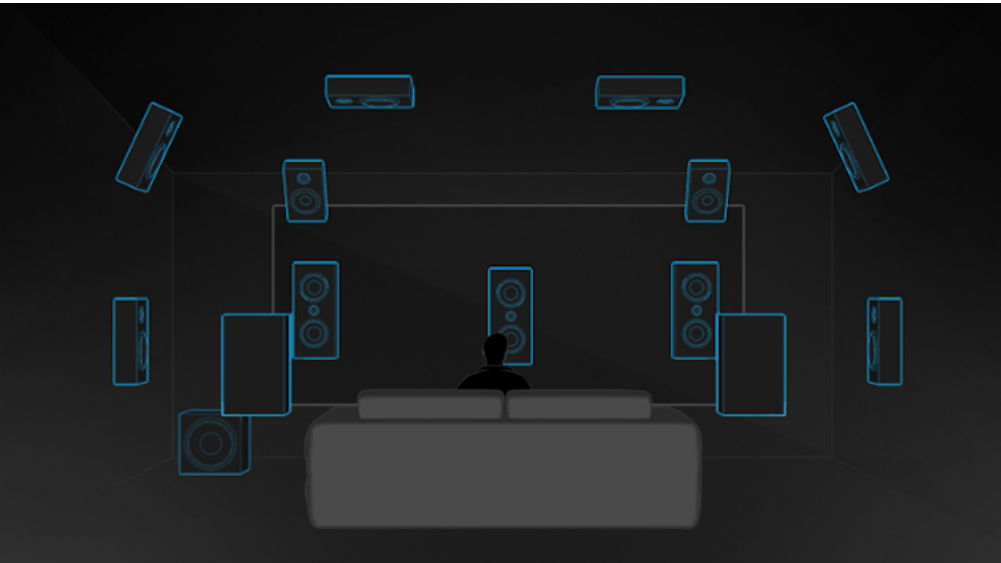


The SP4 does not officially support Dolby Vision, so my experience may not apply to other installations. That said...our Dolby Vision compatible Marantz AV7703 only passes standard HDR over the same cables. HDMI: go figure.

















The SP4 supports a staggering 73 different speaker layouts. It supports 20 different layouts with 7 ear-level speakers!

Main Theater definition		A T M O S	A U R O	D T S	FRONT								SUB				SURROUND				HEIGHT						CEILING							
					LF	CF	RF	LW	RW	SUB	LS	RS	LB	RB	LFH	CFH	RFH	LSH/LBH	RSH/RBH	LFT	RFT	LMT	RMT	LBT	RBT	TOP								
SPEAKER LAYOUT (BASE, LFE, HEIGHT, TOP)		View	Select																															
7.1.0.0	View	Select																																
7.1.0.2f	View	Select																																
7.1.0.2m	View	Select																																
7.1.0.4	View	Select																																
7.1.0.5	View	Select																																
7.1.0.6	View	Select																																
7.1.1.5	View	Select																																
7.1.1.6	View	Select																																
7.1.2.0	View	Select																																
7.1.2.2b	View	Select																																
7.1.2.4mb	View	Select																																
7.1.2s.6	View	Select																																
7.1.3.2b	View	Select																																
7.1.3.3b	View	Select																																
7.1.3.4mb	View	Select																																
7.1.4.0	View	Select																																
7.1.4.1	View	Select																																
7.1.4.2m	View	Select																																
7.1.4.4	View	Select																																
7.1.4.4mb	View	Select																																
7.1.5.0	View	Select																																
7.1.5.1	View	Select																																
7.1.5.2m	View	Select																																

The “traffic light” color-code indicates suitability for each immersive codec: “7.1.4.0-channel,” highlighted above, gets green for Auro and DTS:X, and yellow for Atmos. Click “View” for a snappy visualization of a given layout. Below, “7.1.4.2m.”



The SP4 can multi-amp front channels, with adjustable crossover, delay, and 10-band PEQ for each “way.” Surrounds, heights, and subwoofers can be clustered. Here is the SP4 configured to run 4 subwoofers.

Main Theater definition																												
SPEAKER LAYOUT (BASE, LFE, HEIGHT, TOP)		A T M O S 3 D	A U R O 3 D	D T S X	FRONT				SUB	SURROUND				HEIGHT				CEILING										
					LF	CF	RF	LW	RW	SUB	LS	RS	LB	RB	LH	CFH	RFH	LSH/LBH	RSH/RBH	LFT	RFT	LMT	RMT	LBT	RBT	TOP		
7.1.4.0	Cancel																											
Way per Speakers (LCR)						1	1	1																				
Surround Layers												1	1						1	1								
Subwoofers										4																		
Custom Channel Duplicator																												

The SP4’s bass management is the best I have seen. Bass management is a stubbornly persistent shortcoming in AVRs and processors across brands and price points. SECRETS [exposed this problem and offered commonsense solutions](https://hometheaterhifi.com/editorial/bass-management-woes-trouble-on-the-slopes/) (https://hometheaterhifi.com/editorial/bass-management-woes-trouble-on-the-slopes/) 11 years ago! More recently, SECRETS’ Technical Editor, Dr. David Rich, [discussed issues with common bass management approaches](https://hometheaterhifi.com/reviews/audio-accessory/audio-calibration/anthem-room-correction-arc-including-a-subwoofer/) (https://hometheaterhifi.com/reviews/audio-accessory/audio-calibration/anthem-room-correction-arc-including-a-subwoofer/) in a technical article. Bryston nails it. Each channel gets adjustable highpass and lowpass cutoffs and slopes, level, delay, and 10-band parametric EQ. Bass from each channel can be routed to that speaker, subwoofers, or both.

Bryston SP4 Bass Management

BASS MANAGEMENT (Expert)									
CHANNELS				BASS MANAGEMENT (Expert)					
Ch.	Status	Signal	Channel Name	Size / Filter	Frequency	Slope	With SUB	With LFE	
2	On EQ	LF	Left Front	Small	LFE 80 Hz	12 dB	None	None	
3	On EQ	CF	Center Front	Small	HPF 80 Hz	12 dB	None	None	
1	On EQ	RF	Right Front	Small	LFE 80 Hz	12 dB	None	None	
8	On EQ	SUB	Main Sub / LFE channel	Low Pass LFE OFF	100 Hz	12 dB	None	None	
5	On EQ	LS	Left Surround	Small	HPF 80 Hz	12 dB	None	None	

BASS MANAGEMENT (Expert)									
CHANNELS				BASS MANAGEMENT (Expert)					
Ch.	Status	Signal	Channel Name	Distance	Level	Limit	Enable	Value	Invert
2	On EQ	LF	Left Front	4.000 m	0.0	0.0	On	0.0	
3	On EQ	CF	Center Front	4.000 m	0.0	0.0	On	0.0	
1	On EQ	RF	Right Front	4.000 m	0.0	0.0	On	0.0	
8	On EQ	SUB	Main Sub / LFE channel	4.000 m	0.0	0.0	On	0.0	
5	On EQ	SUB	Subwoofer 2	4.000 m	0.0	0.0	On	0.0	
4	On EQ	SUB	Subwoofer 3	4.000 m	0.0	0.0	On	0.0	
7	On EQ	SUB	Subwoofer 4	4.000 m	0.0	0.0	On	0.0	
6	On EQ	LS	Left Surround	4.000 m	0.0	0.0	On	0.0	
10	On EQ	RS	Right Surround	4.000 m	0.0	0.0	On	0.0	
11	On EQ	LB	Left Back	4.000 m	0.0	0.0	On	0.0	
9	On EQ	RB	Right Back	4.000 m	0.0	0.0	On	0.0	
12	On EQ	LFH	Left Front Height	4.000 m	0.0	0.0	On	0.0	
13	On EQ	RFH	Right Front Height	4.000 m	0.0	0.0	On	0.0	
14	On EQ	LBH	Left Back Height	4.000 m	0.0	0.0	On	0.0	
15	On EQ	RBH	Right Back Height	4.000 m	0.0	0.0	On	0.0	

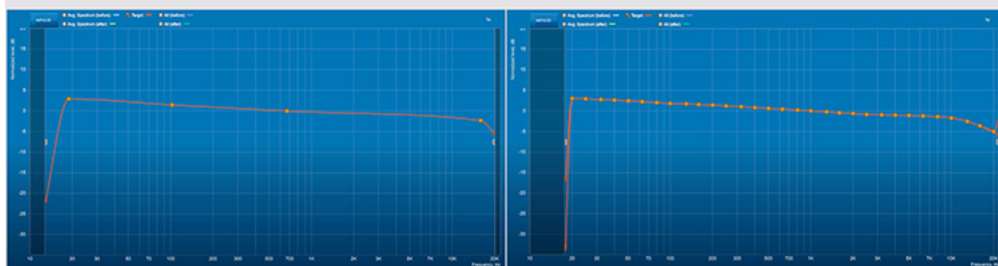
It gets even better! Usually, Dirac Live overwrites any manual level or delay settings. However, the SP4’s “Dirac group” option maintains relative settings within a group, effectively replacing a separate DSP subwoofer controller. I grouped 4 subwoofers below:

Dirac Live group setup			
CH.	SIGNAL	CHANNEL NAME	SPEAKER GROUP
2	LF	Left Front	1
3	CF	Center Front	2
1	RF	Right Front	3
8	SUB	Main Sub / LFE channel	4
5	SUB	Subwoofer 2	4
4	SUB	Subwoofer 3	4
7	SUB	Subwoofer 4	4
6	LS	Left Surround	5
10	RS	Right Surround	6
11	LB	Left Back	7
9	RB	Right Back	8
12	LFH	Left Front Height	9
13	RFH	Right Front Height	10
14	LBH	Left Back Height	11
15	RBH	Right Back Height	12

Purists will rejoice in removing a digital conversion loop. Pragmatists get reduced cable clutter.

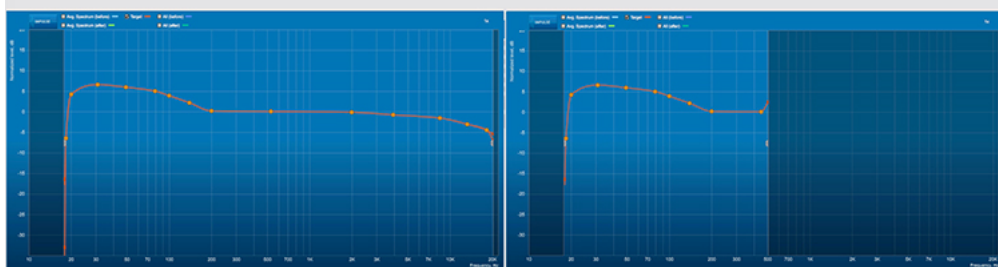
The SP4 deploys Dirac Live Calibration Tool (“DLCT”) on your Mac (or PC) for room correction and equalization. Chris Eberle covered DLCT in his [NAD T758 AVR Review](https://hometheaterhifi.com/reviews/speaker/surround-sound-speaker-systems-reviews/nad-t-758-v3-av-surround-sound-receiver-review/) (<https://hometheaterhifi.com/reviews/speaker/surround-sound-speaker-systems-reviews/nad-t-758-v3-av-surround-sound-receiver-review/>). The SP4 does not include a microphone. I used my Cross Spectrum Labs calibrated miniDSP UMIK-1. Bryston provides 4 target curves. Additionally, curves are fully customizable in DLCT: add, remove, or manipulate “break points” to change the shape; pull “curtains” to limit the affected frequency range.

Bryston SP4 Dirac Live Target Curves



SP4 Auto-Target

Alt. Curve 1



Alt. Curve 2

Alt. Curve 2 - >500Hz

Bryston's DLCT version only stores one calibration, or "Project." NAD's version stores 3, and miniDSP's 4. Multiple Projects allow the user to rapidly switch between target curves. The workaround is to build different "Profiles" and incorporate them into "Presets" that are selectable in WebUI or the iPad app. Profiles store Dirac data, and can include unique bass management and PEQ.

Also, a general DLCT criticism that's not Bryston-specific: no standalone "measurement mode." With a measurement mode, one could use Dirac's measurement engine to aid with initial setup. This feature would be especially helpful for height speakers: external measurement software cannot yet sweep heights, but DLCT can. Currently only [Anthem ARC \(https://hometheaterhifi.com/reviews/audio-accessory/audio-calibration/anthem-room-correction-arc-system-part-1/\)](https://hometheaterhifi.com/reviews/audio-accessory/audio-calibration/anthem-room-correction-arc-system-part-1/) offers this invaluable feature. Hopefully Dirac will add a measurement mode to future DLCT versions.

In Use

I installed the Bryston SP4 in a 7.1.4 channel system with on-wall height speakers and 4 subwoofers. I used 1 output from the SP4 for the 4 subs. Our subwoofer controller-amp (Crown DCI4 | 1250n) digitizes the input and routes the signal to four channels internally, negating both theoretical and practical advantages of grouping in the SP4. I set subwoofer crossovers in the SP4 to my usual 120Hz for all channels, with 4th-order rolloffs on both sides.

Before room correction, the SP4 impressed me with its low noise floor and ability to create an immersive sonic bubble. Dirac Live calibration transformed the sound from wow to WOW! All the technical details were pushed out of my consciousness as the speakers cohered into a virtuosic ensemble under the baton of a genius conductor. It went beyond "bubble of sound." The soundstage became wider, deeper, and more vivid. The Dirac-calibrated Bryston SP4 provided the most engaging immersive presentation I have heard to date, in our home or elsewhere.

I tried all 3 provided full-range target curves. I could not consistently hear differences between Auto-target and Alt. Curve 1. Alt. Curve 2 sounded marginally less open. I settled on Auto-target for most of my listening.

Unexpectedly, full-range Dirac equalization sounded much better on the SP4 than room correction (EQ only below the statistical region) alone.

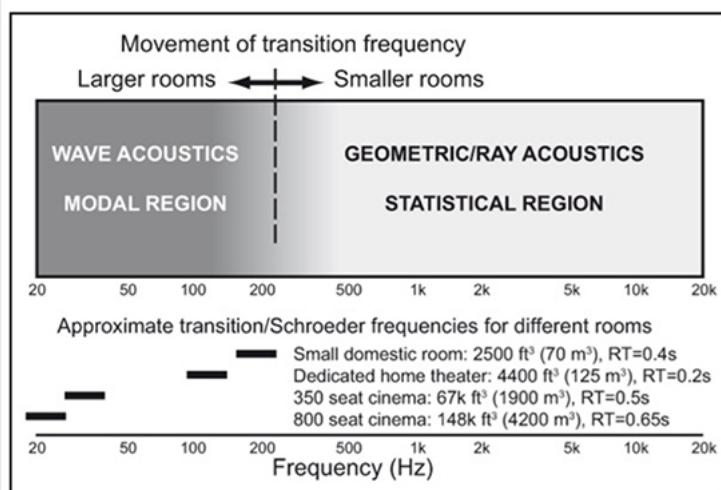


Figure 6.1 An artistic interpretation of the transition between the low-frequency region dominated by room modes and the high-frequency region dominated by reflected sounds. Also shown is the effect of room size on the position of the transition region in the frequency domain.

$f_c = 2000 \sqrt{V}$

Source: Dr. Floyd Toole, *Sound Reproduction: The Acoustics and Psychoacoustics of Loudspeakers and Rooms*, 3rd ed., pg. 149

Here, limiting Dirac to room correction dimmed sonic vividness dimmed and shrank soundstage depth. As I wrote in [this SECRETS discussion](https://hometheaterhifi.com/q-a/room-correction/) (<https://hometheaterhifi.com/q-a/room-correction/>), I don't like changing a speaker's voicing based on listening-area measurements. That still holds in stereo, including with Dirac Live, but no longer for immersive sound. Perhaps timbre mismatches that might be perceptually irrelevant in side or rear speakers matter with added front speakers. Alternately, Dirac Live may improve LCR matching.

While the SP4 offers loudness compensation, it increased boom and shrillness while hurting dialog intelligibility. I turned it off. The SP4 nonetheless maintained resolution and clarity at low levels.

The SP4 sounded so good in our system that my biggest criticism is ergonomic: lingering incompatibilities with our Harmony remote. (Bryston sent me beta firmware to activate the IR ports.) Harmony controlled the SP4 as a device reliably, but not when the SP4 was part of an "Activity" such as "Watch TV." Then it didn't consistently turn on/off or switch inputs. Dealers want to pair a processor at this price with an expensive IP-based home automation system. Datasat's RS20 omits IR control entirely; at least Bryston gave the SP4 an IR option! While I'm persuadable, I have not yet seen a compelling value-add for home automation over a great universal remote such as Harmony. Undoubtedly some troubleshooting between Bryston, Storm Audio, and Logitech will resolve these issues should a buyer want to use a Harmony remote with her SP4.

Another disappointment had nothing to do with the SP4 but was more acute. Many Auro-encoded disks don't play on American players. One example: Amazon sells the Vienna Philharmonic's 2018 Neujahrskonzert in Auro-3D – but only on Region B/2 Blu-Ray. That disappointment aside, here are a few selections (immersive and upmixed) that really shined through the SP4.

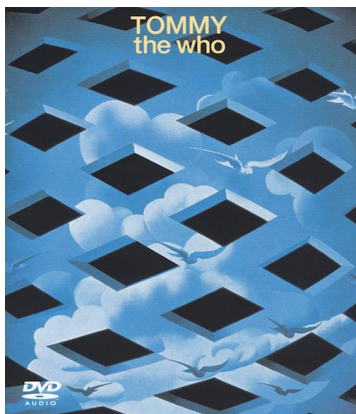


R.E.M., "Automatic for the People," 25th Anniversary Deluxe Edition (Blu Ray Audio; Dolby Atmos)

If you have an immersive system, BUY THIS SET! While expensive due to all the frills, the Atmos Blu-Ray greatly improves on the already excellent 5.1-channel DVD-A. It renders an expansive soundscape that tricks your mind into thinking you're witnessing a studio playthrough.

The Bryston SP4 rendered “Automatic for the People” with incredible detail inside that expansive soundscape. The strings in “Drive” were individually recognizable, and percussive snaps in “Star Me Kitten” jumped out from the mix. Often, Michael Stipe’s vocals projected so distinctly from standing height in the center of the soundstage that one looked for a microphone stand. The SP4 also maintained the timbre of piano notes in “Nightswimming” as they swirled through the room. I’ve heard demo systems mess that up.

Hopefully this release was a financial success for R.E.M. and Craft Recordings, leading to more immersive remixes. Thom Yorke, are you reading? “Kid A” is almost 20! “OK Computer” is nearly 25.

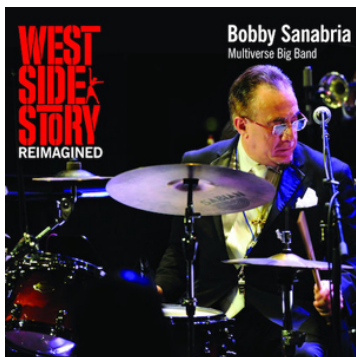


The Who “Tommy”

(5.1-channel DVD-A)

The Mobile Fidelity CD remaster and my well-worn hand-me-down LP from my mom sound as if the original engineer tried to compensate for 2-channel audio’s spatial limitations by heaping on reverb. Pete Townsend stripped much of that out of the 5.1-channel mix, instead relying on the additional channels to create scale. The result is a “Tommy” that sounds more like a stage performance than a studio creation.

This 5.1-channel mix rewards tight speaker-subwoofer integration, so no wonder it sounded so right through the SP4. From the Overture on, the SP4 rendered tactile and propulsive but squeaky-clean bass, in addition to sharp clarity and general awesomeness.



Bobby Sanabria “West Side Story Reimagined”

(Tidal HiFi, Auro-Matic immersive upmix)

“West Side Story Reimagined” is an arrangement of the Leonard Bernstein musical (except “I Feel Pretty”) for Latin jazz ensemble to celebrate the “Lentennial.” It was recorded live at Dizzy’s Club Coca-Cola in NYC’s Time Warner Center as a benefit for post-Irma/Maria Puerto Rico. The orchestration is percussion left (audience perspective) and center, brass and saxes on the right.

I tried all three immersive upmixers on “West Side Story Reimagined” and other 2-channel music. I always preferred Auro-Matic. I wonder if Auro improved Auro-Matic since I reviewed Marantz’s AV7702. I did not find the same spatial sameness from the SP4. Also, the SP4 offers adjustments to tailor Auro-Matic’s performance that I do not recall on the AV7702. I hope Dolby and DTS develop music modes for their immersive upmixers. Dolby Surround and Neural:X both steer music to the surround speakers too aggressively for me.

On “West Side Story Reimagined” Auro-Matic expanded the perceived size of our room without detracting from the performance in front or placing instruments in odd locations. The percussion bridge to “Mambo” in “Gym Scene” stayed anchored in place, rather than whizzing around the room. Auro-Matic and the SP4 also added depth and clarity to the cymbal solo intro to “Tonight,” and opened up the raucous trombones in “Cool.”



Whiskey Tango Foxtrot

(Blu-Ray, DTS:X)

Whiskey Tango Foxtrot is the only disk I own encoded in DTS:X. As Jim Milton noted in his [Blu-Ray review](https://hometheaterhifi.com/features/movie/whiskey-tango-foxtrot-blu-ray-movie-review/) (<https://hometheaterhifi.com/features/movie/whiskey-tango-foxtrot-blu-ray-movie-review/>), WTF was mis-marketed as a comedy, because Tina Fey. It is actually a drama with incisive commentary about all sides in the Afghanistan conflict, with only a few light moments.

The quality of the soundtrack, and the Bryston SP4’s ability to translate the soundtrack’s bits into goosebumps, was apparent from the first scene.

Foreign correspondents are partying in their hostel, House of Pain's "Jump Around" booming through the hostel's PA. Then a bomb explodes nearby. A concussive wave swelled through our living room. The hostel's chandelier rattled above, as the clatter of scurrying reporters surrounded me. The SP4's top notch coherence also heightened the film's emotional punch as Radiohead's "Nude" supported WTF's dramatic climax.



NFL Week 1

I think live sports are the killer app for immersive sound. I imagine an immersive mix of a football game locating you in a seat, with the action of players, fans, and stadium swirling around you and above you as you focus on the action on the field. The NFL and other leagues do not yet broadcast in immersive sound. In fact, NFL Game Pass streams in 2.0-channel. That is too bad.

I tried all three upmixers before settling on Dolby Surround. I watched every snap of Washington at Arizona.

The third sonic dimension heightened the sense of deflation in the seats at Arrowhead stadium as Cardinals fans endured "Adrian [Peterson] doing Adrian things" (to quote the color commentator) to the Arizona defense. I also watched parts of several other games. I found myself watching more of each game than I intended. Sometimes I forgot to fast-forward to the next snap as I enjoyed the coherent "bubble" rendered by the SP4. The SP4 even heightened the realism of commercials, such as one that starts with a kid talking to all the appliances before piloting a drone. The drone starts offscreen. My head whipped around and involuntarily followed the sound as the drone "buzzed" overhead from back-left to front-right. I thought a large insect was flying overhead until I saw the drone on screen.

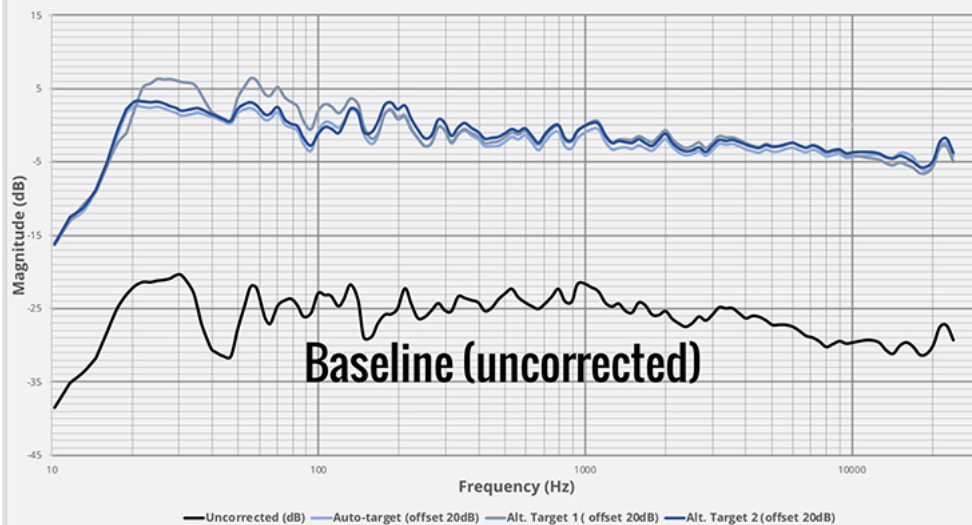
On The Bench

Generally, audible differences in AVRs and processors arise from three sources: bugs, bass management, and room correction software. Bugs are bugs, and hopefully fixable once discovered. Bass management I discussed above. Room correction systems differ markedly in target curve contours, precision of target curve fit, and customizability. Accordingly, this bench test focuses on the performance of Dirac Live as implemented on the Bryston SP4. For comparable measurements, see my reviews of the [Marantz AV7702 processor](https://hometheaterhifi.com/reviews/receiver-processor/processors/marantz-av7702-surround-sound-processor-review/) (<https://hometheaterhifi.com/reviews/receiver-processor/processors/marantz-av7702-surround-sound-processor-review/>) and [Denon X4100 AVR](https://hometheaterhifi.com/reviews/receiver-processor/receivers/denon-avr-x4100-a-v-receiver-review/) (<https://hometheaterhifi.com/reviews/receiver-processor/receivers/denon-avr-x4100-a-v-receiver-review/>). Front speakers are the same, but subwoofers are upgraded.

Unless otherwise specified, all measurements are 6-point (center of head at primary listening position and random samples from a roughly 5' bubble around it) spatial averages, smoothed 1/12-Octave. I believe random sampling tests real-world efficacy and stability better than measuring at microphone positions used for calibration.

The first figure shows the right speaker plus subs with Dirac Live off, and the three provided full-range target curves.

Dirac Live Target Curve Comparison

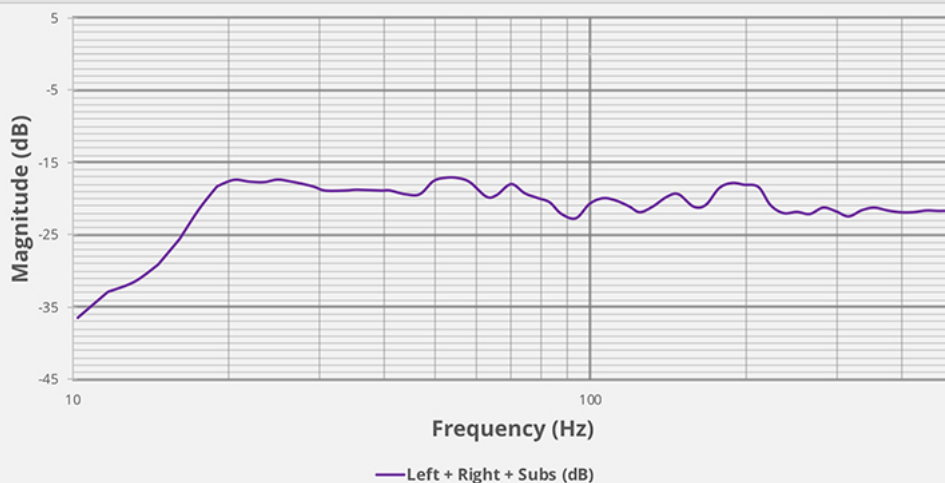


Right Channel + Subs

The target curves are clearly reflected in the measured responses. I heard no difference between the Auto-target and Alt. Curve 1; this graph shows why. Alt. Curve 2 had the worst fit: the “ski jump” starts a little lower in frequency than expected. I suspect the ~45Hz null is wider than on the other target curves because of Dirac’s boost limits.

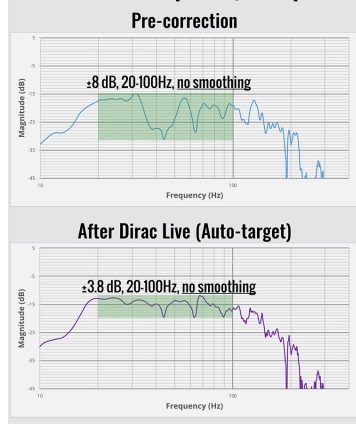
The speaker-subwoofers transition looks rougher above than I heard. Bass is generally mixed mono, so a left+right+subs measurement better reflects as-heard performance. The figure below shows the stellar results attainable thanks to the Bryston SP4’s sophisticated bass management and Dirac Live.

Mains-Subs Integration



The next figure focuses on the subwoofers alone, before and after correction. The 4 subwoofers have relative gains and delays adjusted to reduce seat-to-seat variation. The idea is: make the bass similar at every seat, so room correction on top will improve bass quality at every seat. Otherwise, room correction will improve some seats but degrade others. These measurements are unsmoothed to expose every narrow peak and null. Unsmoothed bass measurements are rarely shared: nobody wants to admit how bad their in-room bass response is!

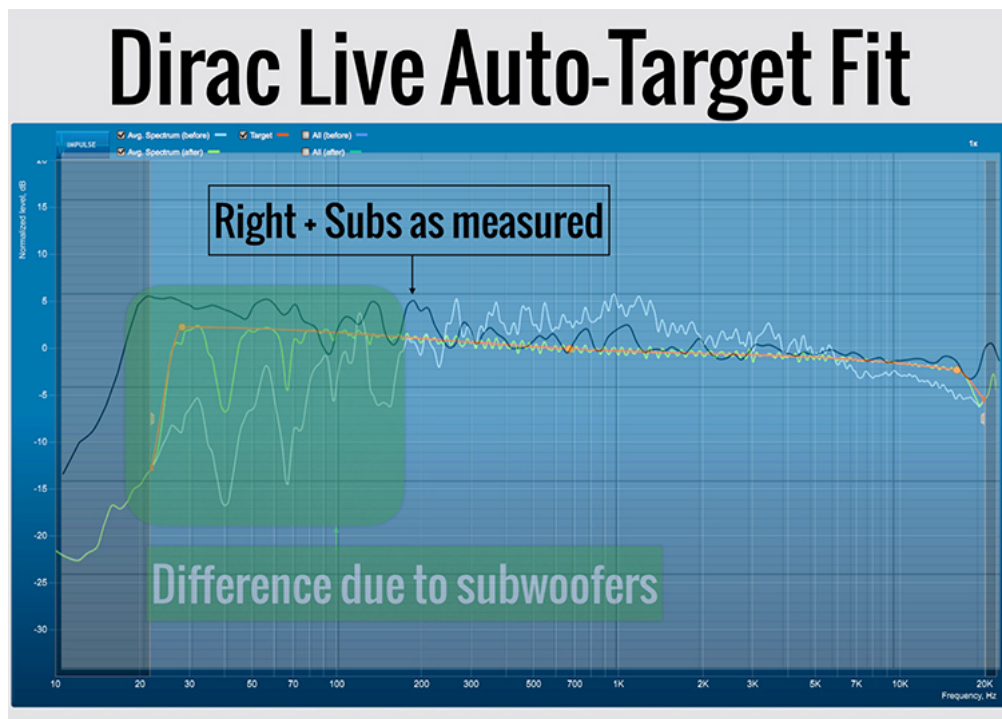
Subwoofer Frequency Response



The 16dB variance (12.5dB at 1/12-Octave smoothing) is actually quite good for an uncorrected subwoofer system in a room. The 7.6dB (3.6dB at 1/12-Octave smoothing) variance after Dirac is incredible. Better still, most of the remaining variation is 3 narrow nulls. Subjectively, that is tighter, better controlled, and more tactile bass. See why good room correction is so important?

(/wp-content/uploads/2018/10/fig-22-bryston-sp4.jpg).

The next figure examines Dirac Live's precision, or how closely measurements match the target curve. Baseline average (light blue), Auto-target (orange), and predicted average response (green) come from DLCT. Measured response is superimposed in black. Ignore everything below 120Hz: the measurement is speaker + sub but the DLCT graphs are right speaker only. According to Dirac's Flavio Fella, DLCT plots with 1/8-Octave smoothing, so the post-processing measurement is slightly higher resolution.

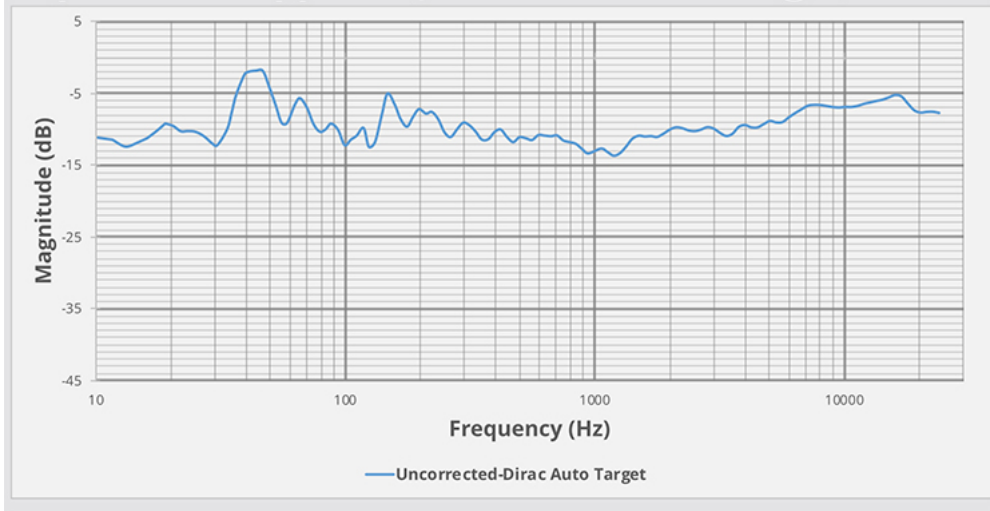


Precision is generally good, though the speaker was not equalized quite as flat as Dirac predicted. In the statistical region a light touch usually beats heavy-handed EQ.

The next figure shows the equalization Dirac applied to the right speaker. This "inverse curve" is a single-point measurement of the difference between the uncorrected response and the equalized response.

Inverse Curve

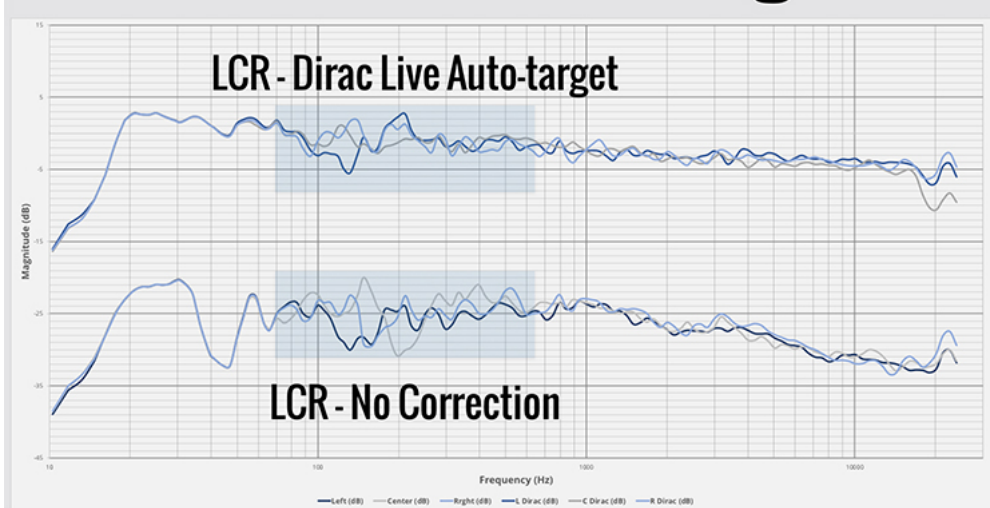
Equalization Applied by Dirac Live (Auto-Target, R+Sub)



Dirac equalized gently above ~500Hz, with no narrow, steep corrections. I consider that a good thing.

Above I wondered if the SP4's sonic coherence results from improved channel matching. I could not measure the height channels. These LCR measurements were taken at the same 6 points for each speaker.

Channel Matching



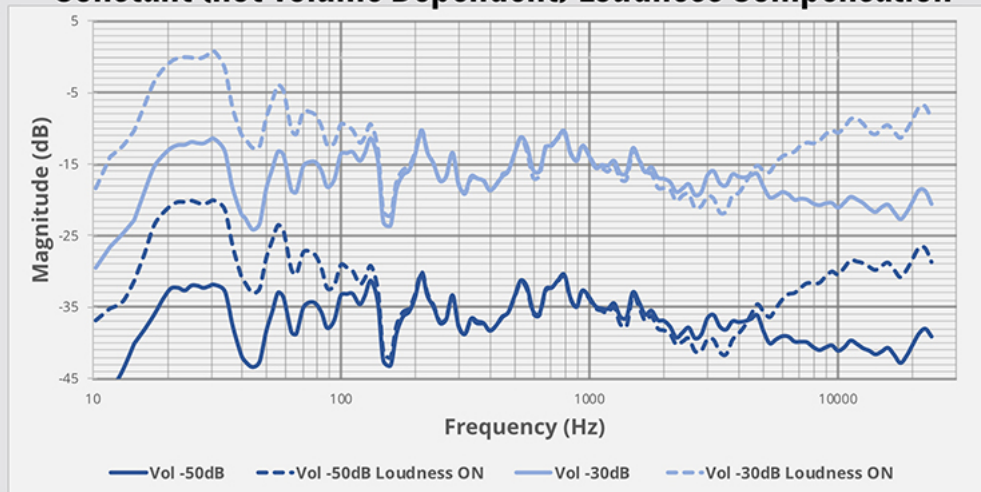
**Improved upper bass and lower midrange channel matching
(shaded region)**

Upper bass and lower midrange channel matching improves slightly. Above that, little difference. Dirac may improve channel matching considerably if the center channel differs from left/right speakers.

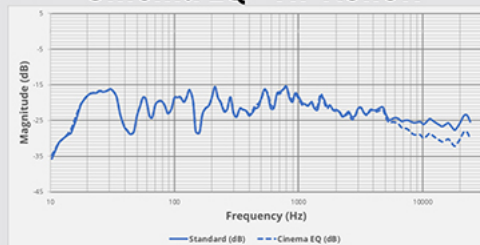
The last figure concerns ancillary features.

Loudness, CinemaEQ, LFE Dim

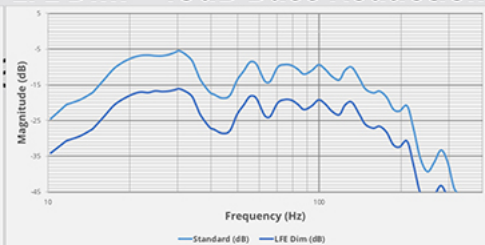
Constant (not Volume-Dependent) Loudness Compensation



Cinema EQ = HF Rolloff



LFE Dim = -10dB Bass Reduction



Cinema EQ rolls off highs. LFE Dim attenuates LFE 10dB. Loudness unfortunately does not adapt to changes in volume setting. The SP4 deserves more sophisticated loudness compensation, along the lines of Audyssey DynamicEQ or Dolby Volume.

Conclusions



The BRYSTON SP4 made my system sound truly spectacular, and made me forget the \$13,995 price tag.

LIKES

- Coherence of sound with Dirac Live
- Bass management done right (a rarity!)
- Exceptional setup flexibility

WOULD LIKE TO SEE

- More sophisticated loudness compensation
- Higher-spec DAC
- A "measurement mode" added to Dirac Live Calibration Tool

- Support for sophisticated multiple subwoofer control without an external processor
- Intuitive WebUI control app
- High build quality
- HDMI reliability equal to “mainstream” AVRs and processors
- True iOS control app that runs on iPhones
- Fine-tuned IR remote control

I’m going to miss the Bryston SP4. It is an exceptional immersive processor. On the audio side, it decodes everything, offers incredible flexibility even for systems with multi-amped speakers and multiple subwoofers, and provides exceptional sonic coherence with the help of Dirac Live. On the video side, HDMI performed better than promised (passed Dolby Vision in my setup), and was as reliable as on mass-market gear. If you’re planning a cutting-edge immersive system and can swing the price, give Bryston’s SP4 your highest consideration.

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FURY • 3 years ago • edited

I always start my comments on a review I read by saying,
"As a veteran Recording Artist" (which I am)," yada yada yada..

Why?

So, others who read my views know I'm coming from a position
of massive exposure to countless electronic equipment, in studio
and in the home.

This, I believe may give Me a slight advantage over some reviewers
who may be true "Audiophiles" but not pro engineers or musicians
which have a different approach to reaching a final opinion on any
Hi-Fi and electronic equipment.

Having said that?

I really do enjoy reading reviews.

Reviews usually save the possible buyer time and money, helping them
to make a more informed choice when equipment auditions aren't
available.

First thing I look for in any Home Theater equipment or speakers is ...
"real world playback effectiveness."

Does the product get my home theater to that Theatrical magical place? _

[see more](#)

1 ^ | ▾ • Reply • Share ›



Jay Haider ➔ FURY • 3 years ago • edited

You're not wrong about the primacy of room, speakers, and
calibration. What you're missing is that the tools provided in the
processor facilitate that calibration. Here, that means very flexible
bass management (the big thing missing on most AVRs and
processors), Dirac Live room correction/equalization, and an easy
to grasp user interface.

It is also worth noting that the other comparable processors
(similar channel count, bass management flexibility, and room
correction/EQ) are either similarly priced or more expensive.

^ | ▾ • Reply • Share ›



Madhu Kannapiran • 2 years ago

Jay - how did you get the sp4 to work with an IR remote?

^ | ▾ • Reply • Share ›



Jay Haider ➔ Madhu Kannapiran • 2 years ago • edited

Great question, Madhu! The SP4 does not have an IR sensor, so a
standard IR remote by itself will not work. The SP4 has an IR in
port (3.5mm minijack) on the back panel. I simply ran a cable from
one of the Harmony Hub's IR blaster ports to the SP4's IR in port.

The only wrinkle is Logitech insists on using 2.5mm connectors, so
I had to also use a 2.5mm-to-3.5mm minijack adapter.

^ | ▾ • Reply • Share ›



Madhu Kannapiran ➔ Jay Haider • 2 years ago

Thanks Jay. I've been trying to get the sp4 to work with my
urc 880/350 without success. Was the firmware they sent
you to activate the IR ports different than the one listed
right now?

^ | ▾ • Reply • Share ›



Jay Haider ➔ Madhu Kannapiran • 2 years ago

I'm not sure. I haven't had the SP4 for months.
Does URC have the StormAudio/Bryston codes?
That sounds like a question for your dealer/installer
though.

^ | ▾ • Reply • Share ›



David Musoke • 3 years ago

Thanks for the nice review, Jay ... just a quick note on the Bryston specs
you listed in the review. The ADAU1966 DAC is made by Analog Devices
and not TI as you indicated. It also has a 118dB SNR instead of the
109.5dB as listed.

<https://www.analog.com/en/p...>

A troubling thing is that the 16-channel ADAU1966 DAC chip used for
their analog outputs has a THD+N spec of only -98dB (@-1dB input)
which is the theoretical limit for 16-bit redbook CD audio. At 0 dB input,
THD+N performance is reduced significantly to -90dB. True 24-bit audio
will not be heard as intended, sadly. But you seemed to like its sound very
much so maybe that's ok for many.

much so maybe that's ok for many.

Thanks again for the review...

^ | v • Reply • Share ›



John M. Read • 3 years ago

Not once did I find the Watts per channel or any discussion of the power supply used. Why not?

^ | v • Reply • Share ›



Marc Alexander → John M. Read • 2 years ago

It uses a SMPS. Properly implemented, type of power supply isn't really relevant these days.

^ | v • Reply • Share ›



FURY → John M. Read • 3 years ago

Watts per channel doesn't apply as the review is only about the processor's performance, not the amp that sends the processor's signal down the chain.

That's probably why.

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[JAY HAIDER \(HTTPS://HOMETHEATERHIFI.COM/AUTHOR/JAY-HAIDER/\)](https://hometheaterhifi.com/author/jay-haider/)

Jay is an attorney by day, and a musical omnivore by night. Jay seeks out multichannel recordings, with or without video accompaniment. He also enjoys 2-channel music on digital and vinyl, as well as TV and the odd flick. Jay picked up his love of music from his mother, who was cool enough to go to Woodstock...but square enough to actually buy a ticket for it. Jay approaches audio and home theater from a music-first perspective. His main interest audio-wise is gear that pushes the boundaries of realism in the home, especially speakers and room correction systems. However, he is also very interested in products that expand the possibilities for music lovers on modest budgets, and gear designed to provide a well-balanced sound in spaces where a full-bore audio system is impracticable. Jay has a special interest in correlating subjective impressions of speakers and room correction systems with acoustic measurements. A Washington DC native and die-hard Washington football fan, Jay lives in Atlanta (ITP) with his wife, daughter, and their two ferocious mini-lions.

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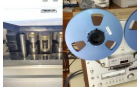
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SECRETS of Home Theater and High Fidelity was launched in 1994 as the first major publication offering serious audio/video journalism on the Internet.

Our magazine, which began with the publication of the SECRETS Primer, is available exclusively on-line and offers to our readers an extensive information resource about home theater and high-end audio.

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