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# SOUND & VISION

**TESTED!**  
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HD 800S  
HEADPHONES  
P22

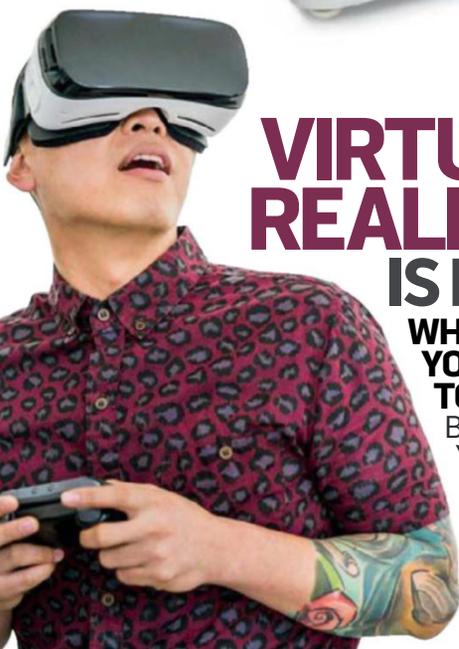


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**ATMOS-READY, WILLING, AND ABLE:** Pioneer's SC-95 Elevates Your Audio



## POCKET POWER!

**FOUR MINI PROJECTORS**  
THAT DELIVER A BIG  
PICTURE IN A PINCH!

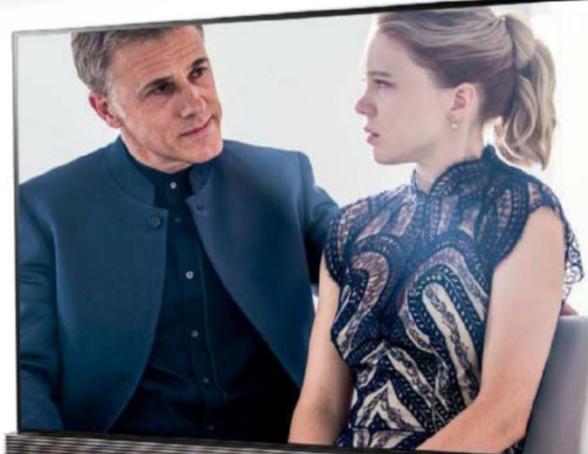


## VIRTUAL REALITY IS HERE

**WHAT YOU NEED TO KNOW**  
BEFORE YOU START GOOGLING FOR GOGGLES

## A NEW KIND OF OLED

LG'S SIGNATURE OLED65G6P TAKES THE TECHNOLOGY TO ITS PINNACLE



# EXPLORE A NEW DIMENSION OF SOUND

BP9060 HIGH-PERFORMANCE  
BIPOLAR TOWER SPEAKER

BP9020 HIGH-PERFORMANCE  
BIPOLAR TOWER SPEAKER

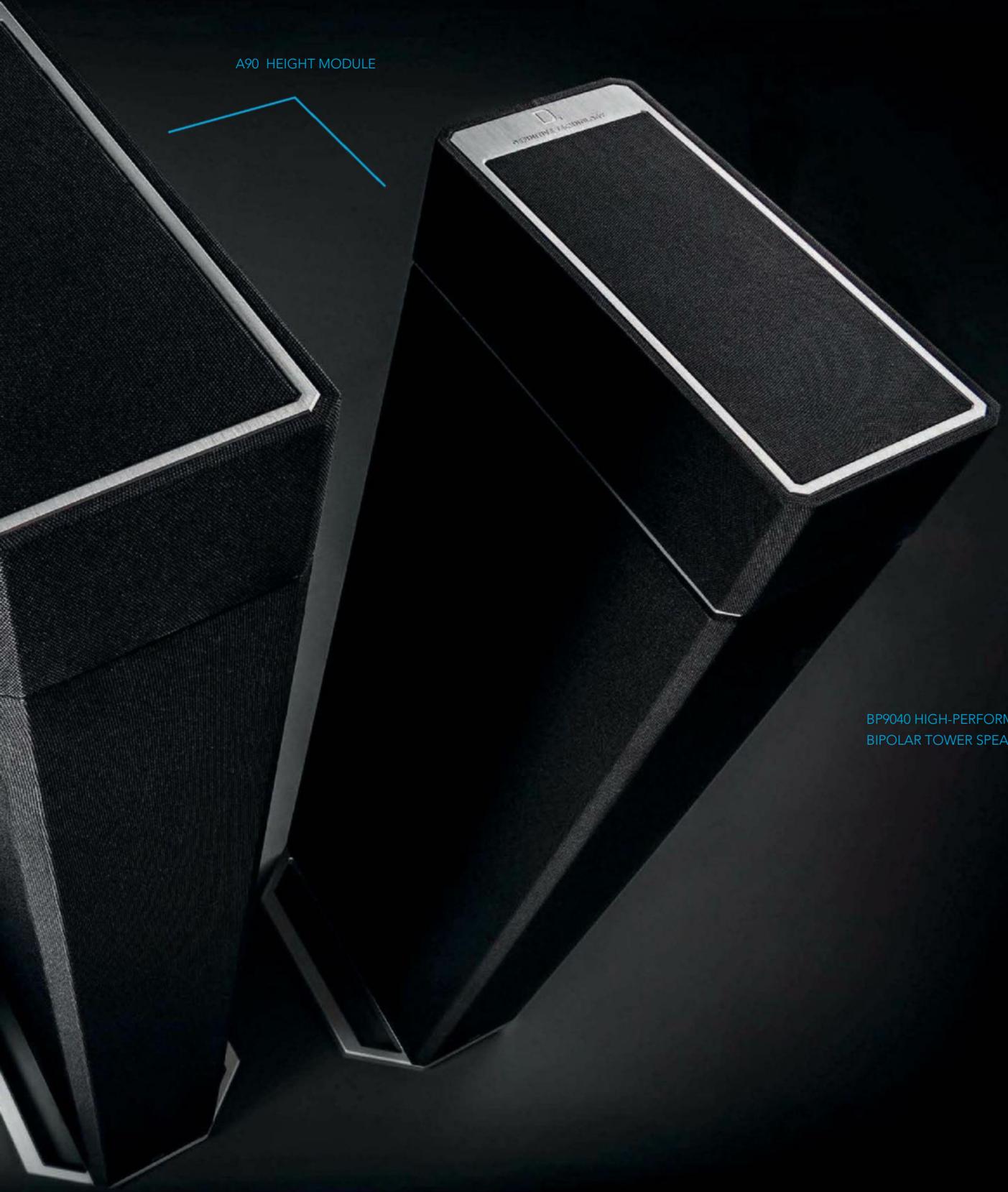
The arrival of BP9000 Series ushers true high-performance, full-range sound into a new era—totally redesigned and re-engineered with improvements that cascade across every one of our patented audio technologies.

From advances in our Forward Focused Bipolar Array, built-in powered subwoofers, new Intelligent Bass Control, and seamless Dolby Atmos / DTS:X integration, the BP9000 Series offers the big, room-filling, yet precise sound you demand with an elegant footprint that makes every single day of ownership a marvel to behold.

This is what obsession sounds like.

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A90 HEIGHT MODULE



BP9040 HIGH-PERFORMANCE  
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# Preview

**ON THE COVER** Pocket Power! Mini projectors from Magnasonic, Optoma, Sony, and Vivitek. Additional gear from LG, Pioneer, RSL, Samsung, and TiO.



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## 36 Mini Projectors: A Big Picture in a Small Pocket



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# GROUNDBREAKING BASS

We know that the best loudspeaker transforms sound into an experience you can *truly* feel. Our integrated powered subwoofers push this even further, providing you with explosive detail other speakers can only hope to achieve.

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**D.**  
DEFINITIVE TECHNOLOGY



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# GoldenEar's 3D Array Soundbar is "Absolutely Unbelievable"

— Darryl Wilkinson, *Home Theater Magazine*

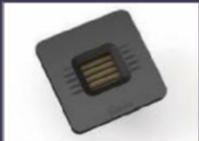


3D Array \$999

FF3 \$499

*"Most exciting soundbar demo I heard"*  
— Brent Butterworth, *Sound&Vision Magazine*

We call the SuperCinema 3D Array, quite simply, "an extra-ordinary high-end loud-speaker system disguised as a soundbar." It is designed to combine the form factor of a sleek, stylish soundbar, with the performance of a true, high quality, component system. The complete ultra-high-performance system would include a powered subwoofer and a receiver or separates; plus the 3D Array achieves superb three-dimensional surround performance with or without rear surround speakers. Its 2.7" thin cabinet is constructed of aircraft-grade aluminum and contains six of GoldenEar's signature cast spider leg basket bass/midrange drivers and three High-Velocity Folded Ribbon Tweeters along with our breakthrough 3D Technology that cancels interaural crosstalk distortion for total sonic immersion.



High-Velocity Folded  
Ribbon Tweeter (HVFR™)



High-Definition Cast-Basket  
Bass/Midrange Driver

*"Awesome just got redefined"*

— Darryl Wilkinson, *Home Theater Magazine*

The 3D Array sounds amazing and the experts certainly agree. Al Griffin of *Sound & Vision* wrote that the 3D Array System, "...delivered at least 90% of my main rig's [Triton Two Towers] performance." Chris Martens of *The Absolute Sound* raved, "...a soundbar system so good that audiophiles might buy it for music playback alone...if asked to recommend a soundbar to please finicky, hypercritical audiophiles, this would be my hands down choice." And *Home Theater's* Darryl Wilkinson summed it up perfectly when he raved that, "the width and openness of the soundstage was absolutely incredible" calling it "an instant classic" that is "a must-listen-to, top-of-the shopping list, soundbar-to-beat...when it comes to soundbars awesome just got redefined."

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July/August 2016

# TrackOne

## VIRTUALLY REAL

It's Not Quite for the Mass Market, but VR Is Here.



BY ROB SABIN,  
EDITOR

This being our annual outdoor/portable A/V-themed issue, we had fun with some categories we don't normally follow closely. Along the more conventional product lines, yours truly finally got curious enough about so-called pico projectors to call in a few for a test. Our survey, starting on page 36, includes two remarkable projectors that actually slip into your breast pocket, and two "mini-beamers" that resemble the big-boy home theater projectors we test year round, just shrunk way, way down. I didn't have particularly high expectations going in, but, as you'll read, I was pleasantly surprised.

On the audio front, along with reviews of some very high-performing headphones and a new hi-res music player, you'll find Geoff Morrison's roundup of some compact and super-affordable tube-driven headphone amps he found on Amazon. With a bit too much idle time on his hands while healing a broken leg, he did a little comparo to see what 60 bucks or so will net you on sound and build quality. That's on page 42.

But if you're looking to step outside the box and into the future, Geoff's primer story on virtual reality on page 32 will help get you grounded on a technology that we've all been hearing more about. Media coverage of VR has exploded as of late in anticipation of the upcoming release (finally) of the Oculus Rift in early 2016, not to mention the HTC Vive and PlayStation VR due out late 2016/early 2017. Adding to this excitement are the multitudinous activities to bring VR programming into the mainstream: various game developers, movie production companies, and sports broadcasters have committed to creating both highly interactive and more "sit-back" immersive experiences using VR technology. But is VR really ready for prime time?

Well...yes and no. The products mentioned above are really sophisticated computer and game console peripherals, and they're not cheap: \$600 for the Rift, \$800 for the Vive, and \$400 for the PlayStation VR. And unless you're already a serious hard-core gamer, the Rift and Vive will likely require a PC or video card upgrade to run. By virtue of their pricing and powerful platforms, these goggles are able to use the widest range of sensors to closely track head movements and even your position in space. When released, they will be by far the most sophisticated VR products to yet reach consumers and will deliver the best experience attainable today. But they're still first-generation VR.

At the opposite end of the spectrum is "VR for the rest of us" in the guise of Google Cardboard and its spin-offs: Samsung Gear VR and products like the Zeiss VR One, which I've personally been auditioning. These use your smartphone, which already has onboard motion and position sensors, to play virtual reality apps that can be viewed through goggles costing anywhere from less than \$20 for cardboard versions up to perhaps \$150 for plastic enclosures. They vary somewhat in features, comfort, and the quality of the lenses, but they all have in common one thing: They're not quite VR as it's intended to be seen. And due to the phone's more meager processing and more compromised ability to track movement, these goggles are more likely to trigger the motion sickness that early VR has become known for. As Geoff put it in his story, "Judging VR based on [Google Cardboard] would be like eating a raisin and deciding wine sucks." Let's hope we see a bridging of that gap soon as the best VR systems come down in price and the smartphones and apps get more and more sophisticated.

**Is virtual reality  
really ready for prime  
time?**

### Customer Service And Subscriptions

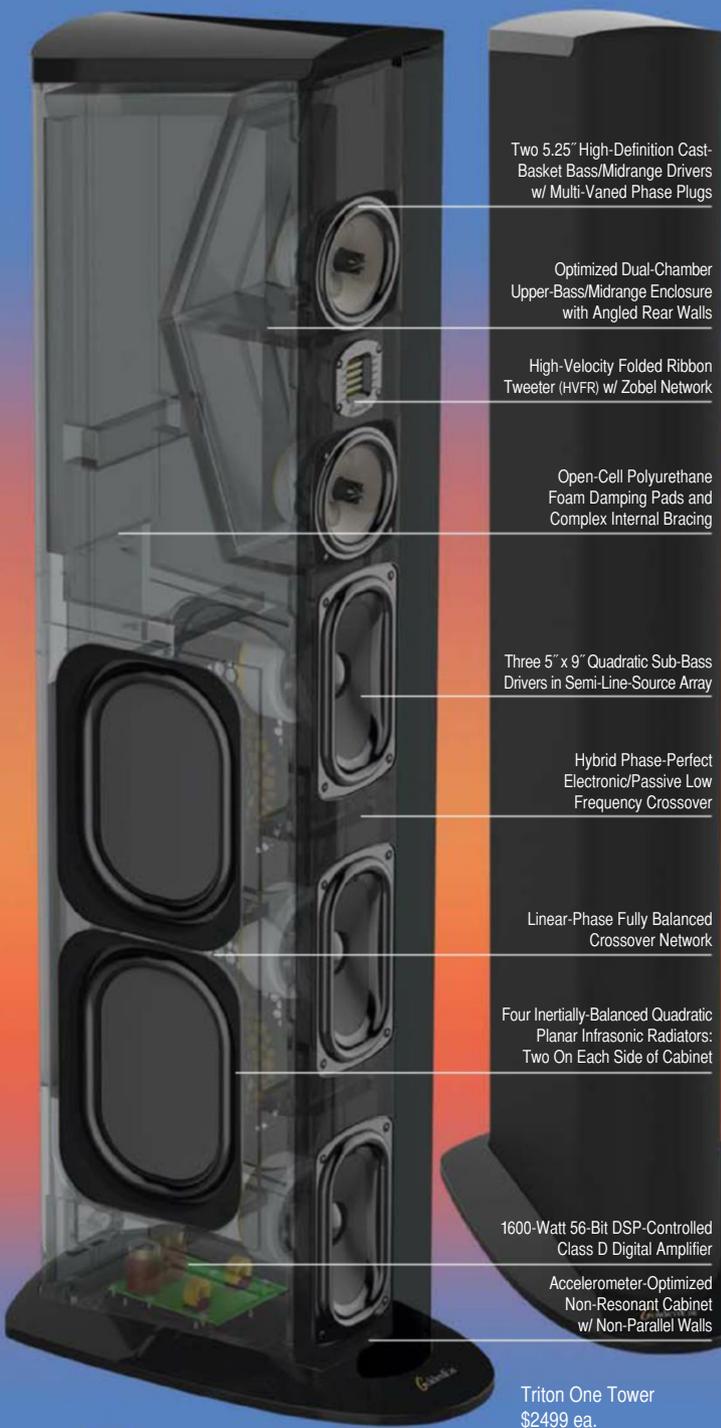
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# GoldenEar has Engineered Our New Triton One to Perform Like a \$20,000+ Super Speaker!

*“Revelatory ... cosmically orgasmic ... astounding performance-vs-price ... these speakers absolutely embalm the competition”* – Darryl Wilkinson, *Sound & Vision*



Two 5.25" High-Definition Cast-Basket Bass/Midrange Drivers w/ Multi-Vaned Phase Plugs

Optimized Dual-Chamber Upper-Bass/Midrange Enclosure with Angled Rear Walls

High-Velocity Folded Ribbon Tweeter (HVFR) w/ Zobel Network

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Three 5" x 9" Quadratic Sub-Bass Drivers in Semi-Line-Source Array

Hybrid Phase-Perfect Electronic/Passive Low Frequency Crossover

Linear-Phase Fully Balanced Crossover Network

Four Inertially-Balanced Quadratic Planar Infrasonic Radiators: Two On Each Side of Cabinet

1600-Watt 56-Bit DSP-Controlled Class D Digital Amplifier

Accelerometer-Optimized Non-Resonant Cabinet w/ Non-Parallel Walls

Triton One Tower  
\$2499 ea.

*“Triton One shames some speakers costing ten times as much ... it is an absolute marvel”*

– Caleb Denison, *Digital Trends*

*“Best High-End Value at CES 2014 ... Sandy has created a speaker that defies its price point”*

– John Sciacca, *Residential Systems*

*“Best of CES 2014 ... stunning realism ... the sound was truly grand and majestic”*

– Roger Kanno, *SoundStage*

*“Best Sound for the Money at CES 2014”*

– Jonathan Valin, Kirk Midskog and Neil Gader, *The Absolute Sound*

Introducing Triton One, an evolutionary speaker that builds upon advanced technologies that have made Tritons mega-hits around the world. Stereophile called them, *“A Giant Killer Speaker”* and Robert Deutsch further added, *“it’s not unreasonable to compare the sound of the \$4998 Triton One with speakers costing tens of thousands of dollars more”*. This new top-of-the-line flagship was engineered to deliver even better dynamics and bass than the extraordinary Triton Two, along with further refinement of all aspects of sonic performance. How well have we succeeded? In the words of HD Living’s Dennis Burger, the Triton One delivers, *“... the sort of upper-echelon performance that normally only comes from speakers whose price tags rival a good luxury automobile”*.

*Triton One “creates visceral, tangible waves of pure audio bliss”*

– Dennis Burger, *HD Living*

Great sound is what it is all about and the Triton Ones deliver, as The Absolute Sound’s Anthony Cordesman wrote *“they provide sustained musical pleasure and exceptional realism ... extraordinary sound quality and value ... one of the best buys in speakers ... highly recommended”*. The Ones were specifically engineered to excel with all types of music as well as movies. Best of all, they offer previously unheard of value, as Brent Butterworth wrote in *Sound & Vision*, *“I heard a few people saying the Triton One sounded like some \$20,000-and-up high-end towers, but I disagree: I think they sounded better than most of them”*. Hi Fi’s Chris Martens raved the Ones are, *“jaw-droppingly good ... one of the greatest high-end bargains of all time with a dazzling array of sonic characteristics”*. And Darryl Wilkinson summed them up best, *“A Masterpiece ... GoldenEar has fully ushered in the Golden Age of the Loudspeaker”*. Hear them for yourself and discover what all the excitement is about.

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# GoldenEar's ForceField Subs: "Near perfect... a tour de force"

— Andrew Robinson, *HomeTheaterReview.com*



## "Thunderous...Room-Shaking"

— Al Griffin, *Sound&Vision Magazine*

GoldenEar's ForceField subwoofers are true over-the-top super subs that are especially remarkable for their compact size and unusually affordable prices. All three incorporate the same advanced technology and components including: DSP controlled high-power digital amplifiers (1000, 1200 or 1500 watts), ultra-fast long-throw high-gauss magnet structure drivers (8", 10" or 12") and pressure-coupled downward-firing quadratic planar infrasonic radiators. In addition, their uniquely shaped cabinets are not just attractive, but are also purposefully configured for dramatic performance benefits.

## "Extraordinary bass prowess... I've never heard a sub this small go that deep"

— Steve Guttenberg, *The Audiophile*

With their high output capability, stunning impact, superbly musical bass articulation and breathtaking infrasonic low frequency capabilities, the ForceFields have received the highest praise from critics, experts and knowledgeable listeners around the world. Geoff Morrison of Residential Systems raved, "their thunder filled the room." AV Forums praised the, "monstrous output for such a small sub." Mark Fleischman of *Home Theater* wrote, "I was dumfounded" over their, "low frequency barrages with floor-shaking confidence." And to top it off, the British writer Stephen May raved, "this astonishing box can pressure-load a room like an angry Silverback" and Andrew Robinson warns, "Your walls, floorboards, and ceiling may just crap out on you." And, as Dennis Burger of *Tech Tell* observed, they are also, "shockingly musical!"

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# GoldenEar's Amazing New SuperSub™ XXL is "A Subwoofer to Die For"!

– Sound&Vision Magazine

*"What struck me most was not the sub's powerful and deep low frequency output, which I expected, but rather it's unusually high degree of tautness, transient speed and control"* – Chris Martens, *The Absolute Sound*



*"Sonic bliss ... remarkably powerful ... they kick ass, totally ... down to the infrasonic"* – Mark Henninger, *AVS*

GoldenEar's new award-winning SuperSub XXL is an elegantly styled, finely finished and surprisingly compact subwoofer. It can effortlessly generate mega-sub-bass pressure waves of extremely high amplitude, while delivering extraordinarily detailed, accurate and precise low-frequency performance that is both highly impactful and extremely musical. Simply put, it is equally adept at recreating dramatic cinematic sound effects, as well as the subtle musical excellence of Ron Carter, Sting or Yo Yo Ma. To achieve this, we have engineered a unique, patent-pending 360 degree dual-plane inertially-balanced active driver and sub-bass radiator topology, and combined it with a very advanced 56 bit DSP controlled 1600 watt Class D digital electronics package originally developed for our award winning Triton One.

*"Blew me away ... the perfect balance of power and control, impact and unobtrusiveness, fury and finesse"*

– Dennis Burger, *HD Living*

Housed within the gorgeous piano gloss black enclosure are two horizontally-opposed 12" ultra-long-throw active drivers and two vertically-opposed 12-3/4" x 14-1/2" planar infrasonic radiators. This dual-plane, patent-pending dynamic inertial-balancing preserves and focuses all the energy produced by the transducers, in order to more effectively move the air in the room, rather than wasting energy moving the box. It also enables you to hear all the fine subtle details in your recordings. The benefit is a new achievement in state-of-the-art subwoofer performance that, not only "rocks the house", as Big Picture Big Sound's Chris Boylan raved, but is also, "strong, pure and controlled" as Sound&Vision's Mark Fleischman wrote.

*"The SuperSub XXL has looks to kill and is built to rock the house when duty calls"*

– Sound&Vision

Best of all is GoldenEar's signature combination of high-end performance, superb build quality, gorgeous styling and extraordinary value. Mark Henninger raved, "The SuperSub XXL ups the ante down low". Secrets of Home Theater's Robert Kozel clearly stated, "... this is a bargain for a sub of this performance". Visit your nearest GoldenEar dealer and experience this super sub today.



SuperSub XXL  
\$1999 ea.



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Introducing the New

# Triton One

from GoldenEar Technology®



\$2499.99/ea

*“With Triton Ones, GoldenEar Technology has fully ushered in the Golden Age of the Loudspeaker”*

*– Darryl Wilkinson, Sound & Vision*

*“In every criterion that matters to me, the speaker simply punches way above its weight class ... there’s an awful lot of magic to enjoy here”*

*– Dennis Burger, HomeTheaterReview.com*

*“It provides extraordinary sound quality and value for the money. They have all—or more—of the features and technology that anyone looking for specsmanship could want, but their real merit is that they provide sustained musical pleasure with exceptional realism. Highly recommended”*

*– Anthony Cordesman, The Absolute Sound*

*“It is an absolute marvel ... Triton One shames some speakers costing ten times as much.”*

*– Caleb Denison, Digital Trends*

*“Even with your eyes open, it’s practically impossible to make yourself realize that you’re not listening to living, breathing human beings playing actual instruments in front of you.”*

*– Darryl Wilkinson, Sound & Vision*

**GoldenEar Technology®**  
A Passion for Sonic Perfection®

# Letters

We welcome questions and comments

**E-mail them to HTLetters@src.com.** Please note: Questions about the features and functions of a particular product are best directed to the manufacturer. Questions about what product you should buy are best directed to a dealer who knows all the details of your system, your preferences, and your personal habits. All submissions are considered the exclusive property of *Sound & Vision* magazine and TEN: The Enthusiast Network. We reserve the right to edit letters for brevity. Due to the volume of mail that we receive, we regret that we cannot respond to every letter.

## Take Me to the River

*The River* is, undoubtedly, a great album, but the recording of the original version was awful. I often wondered who was the... who approved the final mix/sound to be sent to the stores. No matter how you would EQ your system, there was no bass or lower midrange to be found; it had a very empty, tinny sound.

A while back, I found the double CD version and bought it, hoping for the best, but it was even worse than the original album. Now we come to *The Ties That Bind—The River Collection* reviewed by Mike Mettler (May issue, and at soundandvision.com). It retails north of \$120 at the big-box store. Is the sound quality much better than the original recordings? I would give two stars to the original 1980 LP and sub zero to the double CD. I would hate to purchase it and be disappointed again.

**Francesco Tenti**  
Huntington, NY

*Mike Mettler replies: Bruce Springsteen himself has typically been the final arbiter of how his music is approved for release in any given format, and his albums have historically tended to be more about feel, vibe, and experience than outright sound quality—unless you want to talk about the Sony Mastersound version of Born to Run, a stereo LP that always felt like it wanted to be a mono release. The Ties That Bind mix of The River is the best representation of that particular album to date, but let's not forget: Ties is a six-disc box set that includes a number of rarities and outtakes, not to mention a documentary and a full of-era concert on Blu-ray (or DVD, depending on which version you're considering), which all adds up to the justification of the hefty-for-some price tag. I gladly purchased my copy of this box set via Amazon with no regrets.*

## Is UHD BD a Bust?

I live in Ireland, and have always been an early adopter of new tech down through the years. So when 4K appeared on the horizon, I was overjoyed with the thought of high-res discs. But here we go again, with talk of some of the new Blu-ray UHD movies being upscaled and not shot in native 4K, and talk of them being not much better than standard Blu-ray 1080p discs has me already regretting buying my Sony 4K TV.

Having no release date in Europe for UHD discs or indeed players, I rely on U.S. imports. Can you clarify if these discs are worth buying? At \$30 per disc, it could be a costly purchase if all these rumors are true.

**Peter Brennan**  
Via e-mail

*Peter, by now you may have seen our June issue with its inaugural review of the Samsung UBD-K8500 player and the 15 or so discs we looked at. In essence, our finding was in line with what several of our reviewers have been saying all along: that the key benefits of UHD would not be realized until we had a disc format that could deliver high-bandwidth renderings of movies with HDR (high dynamic range) and wide color gamut, and that the extra resolution brought by 4K would be less important and less discernible at typical screen sizes and viewing distances.*

*My own experience with UHD is that there is often noticeable extra detail, even at those typical sizes/distances (say, a 65-inch screen at 8 to 10 feet), in content that's been captured digitally or scanned from film in 4K, even if it's delivered on a 1080p disc and scaled up by the 4K display. What we saw with this first batch of UHD Blu-rays would seem to bear that out somewhat—the most detail was observed in the titles that were indeed native 4K and not upsourced to 4K from a 2K master. That said, it was probably the HDR more than anything that enhanced the experience, and that was found on every title. Does this mean there weren't some dogs in the mix? Sure there were, which reminds all of us that UHD BD is no different than any audio or video medium that came before it. There are always going to be good and bad transfers no matter the format. We buy the content we like and want, and we hope we'll be blown away when we get it home and not disappointed. But you can always rely on disc reviews—ours and those of others—to help you make the most intelligent choices.—RS*

## Hi-Res on Disc

I know that the audio industry wants to motivate buyers of audio merchandise, but may I suggest that doing so by trying to launch new so-called “Hi-Res” equipment to please ex-computer geeks who loved the idea of downloading digital music files—sometimes with considerable time, trouble, and cost to the consumer with the inevitable degrada-

tion of top quality (ironically, with the use of false terms like “lossless”)—has reached the point of absurdity and is not the way to go.

The simple solution, which has been around for the longest time, is just this: Buy an SACD player and SACDs and listen!

Listen to what DSD and a sampling rate of three million bits per second can reveal in a recording, and without any fuss and bother for you to do but play the bloody SACD! SACD or universal multichannel disc players can cost very little and usually so are the discs themselves.

**Christopher Mankiewicz**  
Los Angeles, CA

I enjoyed reading Al Griffin's article about how to find hi-res music (“Finding Hi-Res Music,” May issue and soundandvision.com). Unfortunately, he left out one of the largest sources of native, 96/24 LPCM music files available today on both Blu-ray live concerts and re-issues of catalog classics released on Blu-ray Pure Audio discs. The soundtracks on Blu-ray are one-to-one copies of the original master recordings, the data is encrypted and can only be heard over HDMI with HDCP to authenticate a secure connection that can't be copied or hacked, from a real Blu-ray player with the disc in the drawer. This content is not available online from any of the sources he cites.

**Bob Rapoport**  
CEO, Essence Electrostatic

*Al's article and research were focused on surveying the variety of new hi-res download stores that have sprouted up in recent times, but both writers here are on target in reminding us that these two hi-res disc formats remain viable options. For Blu-ray concerts in particular, concertsondvd.com is a deep source, and pureaudio-bluray.com has links to the various labels participating in that format. Meanwhile, SACDs and hi-res back title Blu-ray releases can be found on acousticsounds.com, which was mentioned by Al.—RS*

## FAQ U?

Regarding the article “FAQ: Hi-Res Audio” in May: This piece looks like an ad and reads like an ad. But it's not labeled as an ad. Am I off base?

Also, the piece mentions among the acceptable master formats upscaled 44.1/16 CD-quality masters. That seems like a direct contradiction of the CTA definition.

Finally, thank you for recognizing a man who has received far too little acclaim for his achievements—Morris Kessler.

**Steve Benoff**  
Beaumont, CA

*We received a couple of e-mails about the presentation of this article, as well as concern about the accuracy (or lack thereof) of the waveform graphic used to depict differences among different digital media. This un-bylined piece was actually authored by me for the CTA-sponsored Guide to Hi-Res Audio we*



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## LETTERS

were honored to be charged with creating to help educate non-technical, mass-market consumers about this high-quality emerging medium. Thinking it would also be a service to our readers, we picked it up from the Guide, including the graphics and the somewhat promotional header (“Understanding Hi-Res and Why You Want It”). A careful read reveals that the text is informational rather than promotional, and technically accurate (if oversimplified in spots), though in retrospect, the article should have better acknowledged the still-too-high cost of the content and the potential complexity of setting up a hi-res library.

The questionable graphic, meanwhile, used

mock sine waves that get increasingly smoother and less staircase-like to graphically depict the graduated improvements in sound quality that should follow higher sampling rates and bit depth. But it lacked any sort of disclaimer clarifying that the undulations in the actual waveforms were not depicted with mathematical accuracy or comparative scale, and it showed the “Original Audio/Recording Studio” waveform as essentially equivalent to the “24-Bit High Resolution Audio/High Resolution Audio Player” waveform. That might be technically true for a native 24-bit digital recording that originates and leaves the studio as a digital file, though not necessarily for an original analog master taken

into the digital realm. We’ve made adjustments to the online version of the FAQ to address all these points.

Upsampled 44.1-kHz/16-bit was mentioned in the article not as an “acceptable” alternative to higher-resolution file types, but as one of the four Master Quality or “MQ” designations announced last year by CTA that they hope music labels and retailers will use to identify the provenance of hi-res files. There has indeed been music sold at the hi-res stores that has been upsampled from CD-quality masters but not identified as such. Perhaps there are improvements in sound quality that accrue to upsampling and possibly other enhancements made in a remastering that make these releases more worthwhile than their predecessors. But the idea with the MQ-C designation is simply that you, as a consumer, should be aware of where that recording came from and make your own call.

Finally, yes—Kessler is one of the great unsung heroes of the audio biz, and we’re lucky he’s still at work.—RS

### Equity for Vidity

John Sciacca mentioned in the May issue (“The Connected Life: Are You Ready for Video Nirvana?”) that you’ll be doing a review of the pricey Kaleidescape Strato 4K player. How about a companion review for the much less expensive Vidity player?

**John Mammino**

Via e-mail

John’s column, which primarily discussed the advantages of UHD Blu-ray against UHD streaming platforms, didn’t mention Vidity, an emerging 4K video service that supports downloads-to-own (not live streaming) of UHD movies to any Vidity-compliant storage device. Currently, Western Digital, one of the founders of the Secure Content Storage Association behind Vidity, sells a 1-terabyte My Passport hard drive (available on Amazon for less than \$100) that is said to provide storage for some compatible Samsung UHD TVs and perhaps others; once you own the downloads and have them stored, you can move them to any compatible device including tablets, phones, and laptops. FandangoNow.com, formerly M-Go, sells the movies; as of late April, there were 34 current and back catalog titles available, though I was unable to access any pricing or a Buy button without registered equipment. We’ll try it out as soon as we can.—RS

### CORRECTIONS:

In our May issue New Gear department, the price for LG’s OLED77G6P Signature Series OLED Ultra HDTV was misstated. The price for this 77-inch flagship model is \$24,999. The 65-inch version, the OLED65G6P, sells for \$7,999. Our hands-on assessment of the OLED65G6P is on page 46.

Also in May New Gear, it was stated that the Samsung UBD-K8500 Ultra HD Blu-ray player supports the Dolby Vision HDR format. In fact, it supports only HDR10, as reported in our June review.

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## Widescreen Review

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## home theater review.com

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## UDIOHOLICS Online A/V Magazine

"...beautiful, capable speakers that are also a terrific value... their performance stands toe to toe with much more expensive contenders."

# Perfect focus

NEW GEAR, TOP NEWS, HOW TO, AND MORE...

Edited by Claire Crowley

## Jam On

15 Minutes with Brad Serling, Founder of nugs.net

Nugs.net. Ever heard of 'em? I hadn't but was intrigued when I saw the press release: "Live Music Pioneers nugs.net Launch Streaming Service." Turns out the company has been making professional recordings of concert



performances available to fans of jam bands for years—something followers of Gov't Mule, Phish, and Widespread Panic probably already know. To learn more about this unique service, I reached out to founder Brad Serling.—Bob Ankosko

**S&V:** Can you tell us a bit about the history of the company—how and why you started it and the story behind the name?

**BS:** I actually launched the nugs.net site in 1997, so we're approaching 20 years. Back then, the idea was to make it easier to trade my tape collection with other tapers. I had started recording the Grateful Dead in 1990 and continued with Phish, and there wasn't enough time in the day to copy my tapes for everyone who wanted them. So, with the bands' permission, I started a website to post copies of my recordings for folks to download. The idea behind the name was a play on the word *nugget*—nugs.net is a network of nuggets. Each tape in my collection was a nugget in a musical gold mine.

By 2000, nugs.net was serving 3 million free MP3 downloads of primarily Phish and Grateful Dead from my tape collection. I received a letter from the attorney representing

both bands at the time politely asking me to cease and desist. I called him that day and he said, "We either need to shut you down or go into business with you." I e-mailed him a business plan, and the next thing I

knew I was invited to San Francisco to meet with the Grateful Dead band members, their archivist, and of course their attorney.

The nugs.net site remained a free repository of my recordings after the Grateful Dead hired me in 2000 as a consultant, and even after partnering with Phish in 2002 to launch LivePhish.com, it was important to the band that the nugs.net site remain free. So over the years, nugs.net became the name of the company, but the site nugs.net stayed free.

This year is the first time we'll actually start selling music directly on the nugs.net site as opposed to our sister sites like LiveDownloads.com and artist-branded sites like LiveMetallica.com and LiveChiliPeppers.com. With the launch of the nugs.net app last fall, we decided to consolidate our multi-artist store under the nugs.net domain.

**S&V:** Last November you launched the nugs.net streaming service. How's it doing?

**BS:** For a live music fan, having last night's show from all your favorite bands in the palm of your hand is irresistible. The reason we started the nugs.net streaming service is because of the overwhelmingly positive response we got from users of our LivePhish streaming service, launched in late 2014. With both the nugs.net and LivePhish streaming services, we've had nothing but rave reviews from our customers.

While our single biggest-selling format remains MP3 downloads, we are seeing a lot of younger, new customers adopting the streaming services as their first experience with



nugs.net as well as a large number of existing purchasers who are continuing to buy downloads and CDs, but who also want the convenience and portability of a streaming service. We just crested \$1 million in subscription revenue, serving just over 500,000 streams per month from the streaming catalog of 10,000 shows from just 15 artists, including Pearl Jam, Bruce Springsteen, Widespread Panic, Umphrey's McGee, and The Disco Biscuits.

**S&V:** In terms of download format, the standard offering appears to be MP3, FLAC, or CD, but high-resolution formats are offered for some recordings. Which format is most popular?

**BS:** The general rule since we started selling downloads is a 70/30 split between MP3 and lossless formats. That's a real eye-opener. Within that 30 percent of lossless sales, we see a breakdown among the higher-resolution formats like 192-kHz/24-bit or DSD, which we only offer for certain releases. Typically, when a Hi-Res format is offered, we will see 5 to 10 percent of total sales in that higher-quality format. When CDs are offered alongside downloads, it skews the numbers considerably, depending on the artist. For example, we sell a lot of Springsteen and Pearl Jam live CDs compared with Phish or Widespread Panic. Metallica sells more live downloads than CDs, but we sold out immediately when we did a limited run of four concerts from last year on 180g vinyl.

**S&V:** Can you tell me about pricing?

**BS:** Pricing is typically \$9.95 for a 3-hour concert in MP3 format. CD-quality FLAC or Apple Lossless is usually \$12.95, with Hi-Res formats at \$17.95 or \$19.95, depending on the resolution. When we offer DSD, it's either \$39.95 or \$49.95, depending on whether it's DSD64 or DSD128. They are huge files (10-plus GB per concert). CDs are usually \$23 for a three-CD set of a full concert, but Metallica was adamant about pricing it at \$19.81 (the year of their first concert) for a two-CD set.

**S&V:** What about live streaming?

**BS:** We have a thriving pay-per-view business with bands like Phish, where we charge \$24.95 per night for a FullHD 1080p live stream of every other show they play. The audio is 320-kbps AAC, since that's a limitation of the codecs we're using. But we're working on a way to do lossless audio or even 24-bit lossless with FullHD video.

Our biggest live event was Metallica the night before Super Bowl 50, where we had over a million views of the free stream from AT&T Park here in San Francisco.

Widespread Panic has been offering free audio simulcasts every night they play on LiveWidespreadPanic.com for over two years now. It's become very popular among fans, and we hope to do that with more of our artists.

*An extended version of this interview appears on [soundandvision.com](http://soundandvision.com).*

 nugs.net



# This Just In...

By Mark Fleischmann

**Facebook's Virtual Reality** technology uses dynamic streaming to offer multiple resolutions. It musters the highest quality in the center and lower quality in your peripheral vision...



**Tom DeVesto**, cofounder of Cambridge SoundWorks and Tivoli Audio, has launched a new Boston-based company called Como Audio. The first products, due in fall, will be different from Tivoli's, but still small and user friendly...

**Ultra HDTVs Occupied** 40 percent of U.S. retail shelf space in late 2015, according to Quixel Research—although picture-improving HDR and other technologies are still developing. Shelf share of 1080p TVs dropped to 46 percent, from 71 percent 18 months before...

**Netflix in HDR** is on the way. Check out the first season of *Marco Polo* and the second season of *Daredevil*...

**Vudu's Ultra HD** offerings have increased to 33 with *The Intern* and *In the Heart of the Sea*. The latter streams in Dolby Atmos...

**Amazon's First Non-Prime** original series is the third season of *Fashion Fund*.

Does the ad-supported show herald more free programming?...

**Verizon's FiOS Custom TV** now comes in two flavors: Custom TV—Essentials and Custom TV—Sports & More. The latter was apparently designed to mollify ESPN, which was miffed at having its expensive sports channels omitted from the money-saving skinny bundle...

**Canada Mandates Skinny TV** bundles, requiring all pay-TV providers to offer an under-\$25C package. Full à la carte service is due in December...

**ABC Is Now on Sling TV** as a Broadcast Extra add-on for \$5/month in some markets. It's the first time one of the major broadcast-TV networks has gotten slung...

**Xfinity Now Records 24/7** on home security cameras, a boon to Comcast cable subscribers who get the Home Automation package for \$9.95/month. You can review footage for up to 10 days on the Xfinity Home app or computer web browser...

**T-Mobile and YouTube** have inked a pact to bring the latter's videos to the former's Bing On mobile video service, making it immune from the data cap. Also added are such luminaries as Baeble Music, Discovery Go, ESNE TV, FilmOn.tv, Fox Business, KloudTV, and Red Bull TV...

**Sky Q, from Sky**, the U.K. pay-TV and ISP company, will launch with the Sky Q Silver 12-tuner DVR, the Sky Q Mini Wi-Fi box for secondary TVs, the Sky Q Hub, which connects to Sky boxes with Wi-Fi and power-line technology, and the Sky Q app for tablets and smartphones. The company calls it "fluid viewing," and Ultra HD support will follow...

**Internet-Connected TVs** now reach 52 percent of internet-connected homes, says the NPD Group. Most are fed through a game console or streaming player, with directly fed smart TVs accounting for less than half of the total...

**Hulu and Windows 10** now have diplomatic relations with a PC, tablet, and phone app that integrates with the operating system's live tiles and

voice-operated Cortana personal assistant. Hulu has also launched an ad-free version for \$11.99/month and another that integrates Showtime's streaming service for \$8.99/month over the basic \$7.99/month charge...

**Microsoft Axed Its Skype** for TV app from smart TVs from most major manufacturers. If you're already using it, it may go on working for a while but may eventually be removed from your set...

**Sony's PlayStation Vue** streaming platform has gone nationwide following a limited launch in March. The cord-cutter lure runs on PlayStation4 and -3, Amazon Fire TV and Fire TV Stick, and iOS devices running the Vue app...

**DTS Play-Fi** wireless multiroom audio distribution is now built into the Acer Liquid Jade 2 smartphone. Press the Play-Fi tile in your Android notification screen, and your Wi-Fi network will fling music to Play-Fi devices, which include serious audio equipment from heavy hitters like Paradigm and Polk...



**PBS Is Multicasting** kids' channels. The stream is available through local affiliates as well as pbskids.org...

**Sonos Cut Jobs** in a restructuring designed to give new emphasis to voice control and advanced streaming. The wireless speaker market, especially Amazon's Echo speaker, prompted the refocus...

**Online Radio Listening** now reaches half of listeners 12 and up, up from one-third two years ago. The medium has captured 73 percent of listeners 12 to 24...

**B&O Comes to LG Smartphones** via its B&O Play division. LG already offers 192/24 and a 32-bit DAC in some models...

**The DisplayPort 1.4 Interface** does 8K at 60 hertz. Will it leapfrog 4K, which the new standard supports at 120 Hz? No comment...



# Handson

## Cardas A8 Ear Speakers

By Steve Guttenberg

### Open Your Ears

**PRICE \$299**

**CARDAS AUDIO** IS BEST KNOWN as a manufacturer of audiophile cables, but the Bandon, Oregon-based company jumped into headphones a few years ago with its EM 5813 Ear Speakers. Their sound was big and bold, but comfort issues limited my listening times to short bursts because the earpieces were heavy and the cables unwieldy. Now Cardas is back with new in-ears, the A8 Ear Speakers. I've known George Cardas for decades, and he's normally a soft-spoken dude, but he's really

#### AT A GLANCE

**+** Plus

- Driver designed by George Cardas
- Accommodates balanced cables
- Extraordinary sound quality

**-** Minus

- Lacks mic or smartphone controls

jazzed about what's going on with headphones. They're keeping hope alive for the future of high-end audio for the next generation. Ask him about the A8, and he'll give you an earful—he's a man on a mission.

The A8 is lighter and more comfortable than the EM 5813, and the cable is thinner and more flexible. It features stranded conductors wrapped in a helix pattern around a textile core, and it's definitely one of the best cables I've ever seen on an in-ear headphone. The upper "Y" part of the cable disconnects at its base, so you can easily change cables or hook up a Cardas balanced cable for use with the balanced output jacks on the Pono or Astell & Kern portable music players. Best of all, the A8's sound quality, even with my iPod classic, is scary good for the money.

The earpieces are machined from billet brass, painted, and finished with a blue rubberized coating. The proprietary 10.85mm

dynamic driver was designed by Cardas and features the world's first Ultra Linear Contour Field Dual Magnet Driver. George Cardas claims the A8 driver's "unique magnetic formulation" and contour magnets allowed him to replace the permeable material (iron) and increase and focus the flux density in the voice coil gap, which he claims significantly lowers distortion. I'm not qualified to discuss the tech, but I can tell you the A8's sound is extraordinary in its resolution of fine detail, dynamic punch, bass power/definition, and it produces a wide-open soundstage. Cardas even invested in the factory in China that makes his headphones, to ensure maximum quality control over A8 production.

I used my Astell & Kern Jr high-resolution music player for most of my listening tests and found the A8 more neutrally balanced than the Cardas EM 5813 headphones. With a great-sounding audiophile recording—saxophonist Peter Epstein's *Staring at the Sun* CD—the stand-up bass, bass drum, and floor toms are tighter and clearer over the A8; the EM 5813 feels bloated and thick by comparison. The A8's soundstage is sharper in focus and more spacious. This recording's uncompressed dynamics really cut loose over the A8, and resolution of the quietest details of the recording venue's ambient reverberation are revealed. That's the sort of sonic information lesser in-ears gloss over. The A8 sets them free.

The deep, deep bass tremors coursing through rapper-producer Earl Sweatshirt's *I Don't Like S\*\*t* album have tremendous weight and

#### RATING

**Cardas A8 Ear Speakers**  
Performance ★★★★★  
Build Quality ★★★★★  
Comfort ★★★★★  
Value ★★★★★

#### THE VERDICT

**The Cardas A8 is big on transparency and soundstage and delivers remarkably deep yet tuneful bass.**



power but never sound overdone. The A8 is a bass lover's headphone.

Things were going so well, I brought out one of my long-term in-ear references, the Sennheiser IE800 (\$800) to pit against the A8. These two sound very different; the A8's bass goes a lot deeper, without any loss of definition or low-end clarity. Dynamics are more viscerally felt over the A8; it's a higher-energy headphone. But the IE800's midrange sounds more refined and natural, and the treble is sweeter. The IE800's sound is closer to neutral but less exciting to listen to.

The A8 Ear Speakers bode well for headphones to come from Cardas Audio, and from what George told me about his next in-ear, it's going to be a game changer! Stay tuned...



#### SPECS

**Type:** In-ear • **Driver:** 10.85mm • **Impedance:** 32 ohms

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The Core is a remarkable speaker that delivers excellent sound quality for its size, but its price is steep.

## Mass Fidelity Core Multiroom Bluetooth Speaker

By Bob Ankosko

# Getting to the Core

**PRICE \$599**

**MY WIFE** THOUGHT I WAS CRAZY as I walked into the kitchen cradling a speaker while singing along with the Boz Scaggs classic “Look What You’ve Done to Me.” It’s not uncommon for me to serenade the family, but doing so with a “live” speaker in tow, well, that’s unusual even for (the goofball in) me. But that’s one of the things I love about Mass Fidelity’s remarkable Core: It’s so easy to move around. And then there’s the sound—we’ll get to that in a minute.

Before I delve into the Core’s other endearing qualities, a word about its unique design. Four small custom-designed drivers project sound from the front and sides of a stylish cube with a black acrylic top and slotted chrome base with feet that elevate the speaker just enough to let bass radiate from its 3.5-inch downfiring woofer. Three of the four sides are covered with black grille cloth; if you saw it sitting on a shelf, you probably wouldn’t guess “speaker.”

Apart from being impeccably built, the Core is engineered to deliver

### AT A GLANCE

#### + Plus

- Stylish, sturdy design
- Compact and battery powered
- Easy setup, no apps required
- Remote control included
- Spacious, full-bodied sound
- Digital audio input

#### - Minus

- Pricy
- Not ideal for heavy pop/rock

the best possible sound quality from the smallest possible enclosure. It supports higher-quality aptX and AAC (lossless) coding and uses 24-bit digital signal processing to create a spacious stereo soundfield regardless of the listener’s position. At play is an audio rendering technique called Wave Field Synthesis (WFS), which works by “physically re-creating

sound in space—similar to a hologram.”

Around back, you’ll find auxiliary analog and (optical) digital inputs along with a subwoofer output.

Operating the Core is a piece of cake. There’s a power button around back and four “buttons”—actually inconspicuous depressions—on its top panel: one for putting Core in multiroom mode, one for source selection, and two for volume up/down. If you’re streaming from an NFC-enabled phone, simply tap it on top of the Core, and you’re off. Otherwise, just press the source button until the tiny LED turns blue and select Core in your device’s Bluetooth menu.

### A Versatile Performer

Apart from being easy to set up and use, the Core is one of the most versatile Bluetooth speakers I’ve tested. For starters, it’s battery powered, which means if you need a quick fix of music in the laundry room while performing your favorite chore, no problem: Just pick it up and move it. The battery is rated for up to 12 hours of operation, which is realistic based on my experience.

About that multiroom mode: Pushing the multiroom button sets up a dedicated 5.2-/5.8-gigahertz wireless network that shares uncompressed digital audio at “above CD quality” among up to eight speakers. Whatever you’re playing on one speaker can be streamed to seven others—all you have to do is tap the multiroom button

on the speaker(s) you want to receive the signal. If you decide you want to play another source on one of the networked speakers, simply hit the source button on that speaker to select another input. Works like a charm. You can create up to four networks, or groups, but I only had two speakers so I wasn’t able to test that feature.

I listened to a broad range of music—from country to classical to pop to alternative rock—and had fun moving the speakers around: from the living room to the dining room, from the kitchen to the foyer, from my basement office up to a second-story bedroom and, yes, even to the laundry room. The sound was shockingly good for such a small speaker—spacious, detailed, and full-bodied. The manufacturer recommends placing the Core around the middle of a wall rather than in a corner for the best imaging and pushing it close to the wall for the best bass—both good bits of advice. Moving the speaker to within an inch or so of a wall (or any boundary) delivered a sweet bass boost, although I did notice buzzing (overload) on some bass-heavy material; notching down the volume usually solved the problem.

The Core really shines on acoustic music, which seems to be par for the course with most of the smallish Bluetooth speakers I’ve tested. I was struck by how alive Antoine Dufour’s acoustic guitar sounded on “Into Your Heart” (*Existence*), especially the plucked harmonics and guitar slaps. On heavy pop/rock—like Evanescence’s “Bring Me to Life” (*Fallen*)—the



## RATING

### Mass Fidelity Core Multiroom Bluetooth Speaker

Performance ★★★★★  
Features ★★★★★  
Ergonomics ★★★★★  
Build Quality ★★★★★  
Value ★★★★★

treble could become a tad harsh with the volume cranked—again, a problem generally solved by turning down the volume.

Exploring yet another of the Core's many talents, I ran a cable from its optical input to a 50-inch LG TV and fired up *Captain America* (Comcast On Demand). While no match for a discrete surround-sound setup (duh), the sound was many cuts above what the TV can do on its own, with respectable oomph and breadth.

In the final analysis, the Core is a remarkable little speaker. It's stylish, unobtrusive, versatile, and, most important, delivers excellent sound quality for its size. My only reservation is the price, which is considerably above the \$300-to-\$400 sweet spot where you'll find a number of very good Bluetooth speakers.

## SPECS

**Drivers:** 1.5 in wide-range driver (4), 3.5 in woofer (1)  
• **Amplifier:** 120 watts • **Control Buttons:** Power on/off (back), multiroom, source, volume up/down (top) • **Features:** NFC automatic pairing, remote control, rechargeable lithium-ion battery with 12-hour (rated) life, speakerphone functionality • **Inputs:** Wireless via Bluetooth with aptX, 3.5mm analog audio, optical digital, control (for IR receiver eye) • **Outputs:** Subwoofer (3.5mm), USB (for charging) • **Dimensions (WxHxD, inches):** 6 x 4 x 6 • **Weight (Pounds):** 3.5 • **Accessories:** AC charging cable, stereo RCA-to-minijack cable

## PERFECT FOCUS

# The Connected Life

JOHN SCIACCA

## Welcoming the 21st Century Baby



As I write this, I am sitting in a hospital room waiting for my wife, Dana, to be induced sometime around 5:00 this evening. My weekend plans had been to grab some craft beer and watch *The Masters* in 4K on DirecTV, but this was a late-in-life, bonus baby (I'm 46), and the pregnancy has been fraught with "excitement" as we've dealt with high blood pressure and gestational diabetes. If you get nothing else from this column, heed my advice to have kids sooner rather than later.

Sitting in the hospital room, I reminisced about having our first daughter, Lauryn, back in 2006, and was struck by just how much has changed in the world of technology in those 9½ years.

On the medical side, I'm sure much has changed, but one thing we've noticed is that my wife's doctor can now remotely monitor and receive constant, real-time updates of her blood pressure and the baby's vitals on her smartphone. She assured us that even when she's not here, she's here.

Another change for us is I had a cell phone in 2006 but not a smartphone. (The first iPhone launched in June 2007.) Checking or sending e-mail required pulling out a computer and going to a place in the hospital—the waiting room—that offered Wi-Fi. Now I have my iPhone 6 and my wife has her Galaxy, and besides the (sucky) Wi-Fi that's in our room, we have LTE service that makes it much easier to keep in touch with the outside world. You know, so those post-delivery Tweets and Facebook posts can go off without a hitch.

When we had Lauryn, I loaded a bunch of music onto an iPod so Dana could listen during the delivery via a small speaker. Now we have Bluetooth speakers and Tidal, Rhapsody, Deezer, Pandora, and Google Music. In fact, Spotify even has a "Birthing Playlist" curated by an ob-gyn with songs designed to accompany the different stages of labor. (I read the songs to Dana and she said, "Eject." Sorry, Spotify.)

Besides the small Samsung LCD TV in our room—with a handy wired remote by the bed and built-in speaker for quasi-private listening—we have *literally* the entire world at our fingertips. Whether through my Vudu To Go library with about 200 movies, Netflix, Amazon Prime, or the Dish Anywhere app to watch live or recorded TV streamed from our home's Hopper 3, there is virtually nothing we can't watch to pass the time. I do wish Dish's new HopperGO was available. This device (demonstrated at CES) holds up to 100 hours



of content, creates its own Wi-Fi hotspot, and serves up to six simultaneous streams so everyone can be entertained. But that'll be something to look forward to for the next baby...

Beyond the tech at our disposal while in the hospital, there have been huge advances in baby care that baby Audrey Elize will enjoy that didn't exist for big sister Lauryn. In fact a whole new section at CES this year—BabyTech Summit—was devoted to "baby technology."

Now, instead of fighting with the car seat or wondering if it's correctly installed and tightened, the 4Moms Self-Installing Car Seat makes sure it's correctly latched, leveled, and tightened every time it's installed and will notify you immediately of any issues. Also cool is the Owlet Infant Monitor Sock that uses sensors to track oxygen levels and heart

## A whole new section at CES this year was devoted to "baby technology."

rates and can notify you immediately either via an app or by a flashing monitor if there are any dangerous changes.

My favorite bit of baby tech from the show—and one I'm trying to get my hands on—is Onelink's Wi-Fi Envirocam. This includes a 1080p pan/tilt/zoom IP camera with night vision and two-way audio for remotely checking in on baby. You can also set boundaries and be notified if anyone enters or leaves a defined space. The Envirocam also tracks the room's temperature, humidity, and CO levels, and tracks the baby's respiration rate. All designed to make parents sleep a bit easier.

There's no question that Audrey is entering a different and exciting new world. Fortunately, technology is around to help her (slightly older) parents make the most of it.

(Welcome Audrey Elize Sciacca, born April 10, 2016 at 11:50 am. 5 pounds, 11 ounces, 18.5 inches)

# Handson

## Sennheiser HD 800S Headphones

By Steve Guttenberg

### Sound Unbound

**PRICE \$1,699**

**THE HOOPLA** SURROUNDING the introduction of Sennheiser's original HD 800 headphone in 2009 was monumental because it was such a radical upgrade over the HD 650, the previous Sennheiser flagship. So, we're due for another flagship, but the HD 800 S is more like a reboot. What about a new flagship? As you'll read below, it's coming, too!

The most obvious difference between the HD 800 and HD 800 S is easy to spot: The new one is black, while the original is gray. That works for me; the black finish enhances the headphones' striking good looks. Sennheiser's Axel Grell responded to my query about how the two headphones differ with this: "For the HD 800 S, we are using the same RingRadiator transducer [driver] as for the standard HD 800, but we now have a Helmholtz-Absorber in its center cavity. The result of this is a flatter high-mid to high-frequency response.

#### AT A GLANCE

##### + Plus

- Rebooting a classic, making it better
- Hand-crafted in Germany
- Smoother sound than the original HD 800

##### - Minus

- Not as transparent as the very best planar headphones

And as the center of the transducer is closed now, the low-frequency range is extended as well."



Each driver is tested, measured, and given a unique identifier. So if you ever need to replace an HD 800 S driver, Sennheiser claims it will be able to provide an exact match. The HD 800 S is delivered in a beautiful storage case.

The headphone comes with two sets of 11-foot-long cables, one with a standard 6.3mm plug, the other with a 4-pin XLR plug for use with balanced headphone amplifiers. My balanced Oppo HA-1 amp has both types of connectors, so I swapped between the two cables on the HD 800 S and found that the balanced connector scheme produced more sharply defined imaging and greater overall clarity. Balanced connections don't always yield better sound, but they did with the HD 800 S.

Donning the HD 800 S, the feel is just right. The headphone is light, open, and easy to wear for hours at a time. The sound is distinctly high-res, but not so much that it makes you cringe when you play less than stellar recordings. The soundstage is so big and "roomy" that I had to check, more than once, that my speakers weren't playing. They weren't—all the sound was coming from the HD 800 S!

I don't own an original HD 800, so I visited my friend Michael Toto at Stereo Exchange in NYC to compare the store's HD 800 with the HD 800 S. Plugged into a Chord Hugo headphone amp/DAC, the HD 800 S is sweeter on top and fuller on the bottom, but both headphones share a big-as-outdoors soundstage. The HD 800 S takes a bit of the edge off overcompressed recordings, while the HD 800 lets you

#### RATING

##### Sennheiser HD 800 S Headphones

Performance ★★★★★  
Build Quality ★★★★★  
Comfort ★★★★★  
Value ★★★★★

#### THE VERDICT

**The Sennheiser HD 800 S** refines the original, hugely influential headphone, and makes it better than ever.



hear every last bit of the harshness. With pristine audiophile recordings, I preferred the HD 800.

Back at home, when I compared the HD 800 S with my Audeze LCD-X open-back headphones, the LCD-X delivered a smaller soundstage, pulling the sound inside my head. But the Audeze produced superior transparency and resolution, so it was easier to hear the quieter details of my recordings, and the LCD-X's bass was more powerful. Still, the HD 800 S was a lot lighter and more comfortable, and that counts for a lot. Sennheiser has no plans to phase out the original HD 800; it's priced at \$1,499, while the HD 800 S is \$1,699.

As for that flagship: In late 2015, Sennheiser debuted their all-new \$55,000 HE-1 electrostatic headphone and matching tube amplifier system. That package is in an altogether different league than the HD 800 S. Sennheiser is pushing the envelope to the limit, and their headphones just keep getting better and better!

#### SPECS

**Type:** Over-the ear • **Driver:** 50mm ring radiator • **Impedance:** 300 ohms • **Weight (Ounces):** 11.6



# Reference Tracks

MIKE METTLER

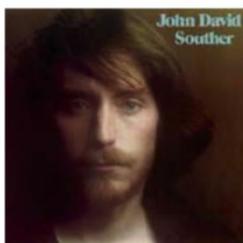
## JD Souther Hastens Down the Hi-Res Wind With New Solo Album Reissue Series



Consummate singer-songwriter JD Souther pours a lot of history into every line he writes and records. “I can’t consciously put my finger on it, but I can remember probably every piece of music I’ve ever heard,” he admits. “But it’s just at certain times, not all at once. I’m sure bits of it come out in everything I write.”

Souther also has an uncanny knack for making a melody all his own, and he has a critical ear for just how good the finished product has to sound. By now, your wheels are turning as to what you personally know of Souther’s CV. Let me help with that. Not only was Souther at the forefront of the singer-songwriter movement that emerged in the early 1970s, but if you sift through some prime album credits, you’ll find he’s co-written some of the biggest songs of the modern rock era, including the Eagles’ “Best of My Love,” “New Kid in Town,” “Victim of Love,” and “Heartache Tonight.”

On his own, he wrote “Run Like a Thief,” which Bonnie Raitt hit out of the park on *Home Plate* (1975), and he was also a chief collaborator of onetime paramour Linda Ronstadt, having produced *Don’t Cry Now* (1973), penned “Faithless Love” on *Heart Like a Wheel* (1974), and then sang with her on the title tracks for *Prisoner in Disguise* (1975) and *Hasten Down the Wind* (1976). And yes, you’re probably aware of his uber-catchy, Roy Orbisonesque Top 10 single, “You’re Only Lonely” (1979). In short, JD Souther could very well be the unsung



VIP of American music. (Oops, did I just bury the lead?)

And now, thanks to Omnivore Recordings, we get to revisit Souther’s own recorded canon with the triple-threat CD reissuing of his first three heretofore hard-to-find solo albums: *John David Souther* (1972), *Black Rose* (1976), and *Home by Dawn* (1984). They’re all loaded with a number of

bonus tracks, demos, and live takes. “We went into my massive tape vault and pulled a bunch of stuff,” Souther reports. “We wanted these three albums put out close together so they could be felt as a progression and a representation of the time.”

Souther, 70, and I got on the line to discuss the improved sonics of this reissue series and his passion for high-resolution audio and surround sound.

Some people call it music and some people call it gold, but nobody knows how to hone a mix quite like JD does.

**MM:** Are you more of an analog guy than a digital guy at this point?

**JD:** Well, I have learned to enjoy Pro Tools. You no longer end up with 12 boxes of tape on the floor that you have to sort back through and cut. But there are so many analog plug-ins you can use with Pro Tools now that you don’t really have to have boxes of tape scattered about.

There are ways to make things sound analog. You just have to be willing to accept it’s a little duskier-sounding, and it doesn’t have quite the extreme highs and the brilliance off the top. It doesn’t have the splash that digital does, but if you want to cut with analog tape, you have to prepare yourself for a lot of work if you’re going to cut things together and overdub them. But, of course, you have to be careful about that, too, because tape decays.



Vintage Photo by Linda Ronstadt

**MM:** Did you transfer these albums with high-resolution playback in mind?

**JD:** Well, everything we do that’s new, we do in the highest resolution possible, because the goal is to make a great vinyl master. All of my new records since 2008 have come out on vinyl. They’re mastered for vinyl, and they’re 180-gram. They sound wonderful. They certainly sound better than the CDs, and especially better than the downloads.

**MM:** What would you consider to be an optimal surround sound mix?

**JD:** There are two schools of thought on that. One is the ideal listening spot is in the middle of the band onstage. I never agreed with that. I like being in the audience and feeling the band coming at me from the stage. I don’t want to hear the guitar player in front of me and the drummer off to the right of me.

I think it’s a real art form to make it serve all those masters. Personally, my preference—and maybe it’s not everyone’s—is sitting on the drums in the back with the band in front, or sitting right in the middle of the audience. And not in the front row.

*An extended version of the Mettler-Souther reissues Q&A appears in The S&V Interview blog on [soundandvision.com](http://soundandvision.com).*

<b>CD</b>
<b>LABEL:</b> Omnivore Recordings
<b>AUDIO FORMAT:</b> 44.1-kHz/16-bit PCM Stereo (CD and download)
<b>NUMBER OF TRACKS:</b> 17 ( <i>John David Souther</i> ), 17 ( <i>Black Rose</i> ), 13 ( <i>Home by Dawn</i> )
<b>LENGTH:</b> 59:41 ( <i>John David Souther</i> ), 1:06:35 ( <i>Black Rose</i> ), 44:47 ( <i>Home by Dawn</i> )
<b>PRODUCERS:</b> JD Souther, Cheryl Pawelski (reissue series and bonus tracks); JD Souther, Fred Catero ( <i>John David Souther</i> ); Peter Asher ( <i>Black Rose</i> ); David Malloy ( <i>Home by Dawn</i> )
<b>ENGINEERS:</b> Fred Catero, Larry Cox, Peter Granet ( <i>John David Souther</i> ); Val Garay, Greg Ladanyi ( <i>Black Rose</i> ); Joe Bogan, Ross Martin, Keith Odle ( <i>Home by Dawn</i> )
<b>PERFORMANCE</b> ★★★★★
<b>SOUND</b> ★★★★★

By Bob Ankosko

# Monster Blaster Bluetooth Boombox

**PRICE \$400**

**AS I REMOVED THE MONSTER Blaster** from its box, I felt like I was lifting a dumbbell from the rack. Seriously, the thing weighs about 17 pounds, and it's built like a tank, ready for the rough and tumble of outdoor use.

And when I say rough and tumble, I'm not kidding. If you buy the Blaster from monsterproducts.com, it's covered by a lifetime warranty with "one time, no-fault replacement." As Monster explains on its website: "If the Blaster has any issues (your fault or ours), return the product and get a replacement." Buy it elsewhere, and you get the one-year standard warranty.

The Blaster is sleek and unassuming with its gray/black finish and rubberized endcaps. On one end, you have buttons for power, volume, and indoor/outdoor mode. On the other, a rubber flap seals (and conceals) a handful of connections: two minijack inputs (one labeled mic for when you're in the mood for a little karaoke), a USB port for charging cell phones and other portable devices, and a power cord receptacle (for charging the internal battery).

### AT A GLANCE

**+** Plus

- Killer outdoor music system
- Super sturdy design
- Battery powered
- Awesome one-time, "no-fault replacement" policy

**-** Minus

- Pricey
- Heavy!

The connection end also has an NFC sensor.

A sturdy metal-mesh grille wraps around the boombox, protecting two full-range drivers on each of its angled side panels and a down-firing woofer with an oblong bass radiator on either side. The drivers are arranged to more or less project sound 360 degrees. Rubber feet lift the svelte enclosure about a quarter of an inch off the ground—just enough for the bass to breathe.

Monster says the Blaster is splash resistant, meaning you can put it by the pool, but don't drop it *in* the pool.



When I walked in the house carrying the Blaster, my daughter said, "What's that?" OK, so it's not much to look at, but who cares when you're rocking out in your backyard, in a park, or at the beach. And, I do mean rocking out, as I'll explain in a moment.

### I Wanna Rock

When you turn on the Blaster, you're greeted with an ascending piano scale, and a female voice says, "Ready to Connect" (and "Goodbye" when you disconnect). I tried connecting my Samsung Galaxy S6 via NFC but nothing happened, so I opened its Bluetooth menu and selected it manually. A couple seconds later, the little lady inside announced: "We are connected."

My plan was to get right to the good stuff—wailing guitars, heavy grooves—so don't ask me why I selected the Diana Krall station on Amazon's Prime Music. It turned out to be a welcome side trip, though, as I was immediately captivated by Krall's slow, sultry rendition of "Superstar" from 2015's *Wallflower*. Her contralto voice sounded appropriately lush and smoky, the string accompaniment rich and full.

I worked my way through a dozen stations/genres before settling on The Eagles, which served up a

### RATING

**Monster Blaster Bluetooth Boombox**

Performance ★★★★★

Features ★★★★★

Ergonomics ★★★★★

Build Quality ★★★★★

Value ★★★★★

### THE VERDICT

**The Monster Blaster will shock you (and your neighbors) with its powerful sound.**

steady stream of mostly classic rock.

I moved the Blaster around the house—from office to foyer to kitchen to garage (hey, it's a boombox)—reveling in the '70s anthem, "Carry on Wayward Son" by Kansas. The sound

wasn't as refined as what you might expect from a good set of home speakers, but it was powerful and loud—*very loud*—when I cranked it up. Distortion encroached as I approached max volume, so I left it a few clicks from maximum, which was still plenty loud.

It was time to take the show outside and let the Blaster strut its stuff—like I said, it's a boombox—so I stepped out onto my patio, walked across to the far end, and put the Blaster on a stone wall. I was instantly impressed by how loud it could play, even when I was standing (or sitting) a good 25 feet away. I waved meekly to my neighbor as I turned down the volume—before turning it back up... and down. Over and over. I'm sure he thought I was losing it.

From Aerosmith's "Walk This Way" to ZZ Top's "Sharp Dressed Man" to Boston's "Something About You," it was a lively mix that really showcased the Blaster's party potential. Even lighter fare such as Marshall Tucker's "Can't You See" and the ethereal production of Bruce Springsteen's "Tunnel of Love" filled the open space.

Monster says the Blaster's internal battery is good for up to 15 hours of play time, depending on volume, which seems accurate based on my experience. You just have to remember that if you're continually playing it at top volume, run time will be a lot less.

I switched between the Blaster's Indoor and Outdoor modes, hard-pressed at first to detect the subtle shift in tonal balance, which pushes the midrange and treble forward a





bit in Outdoor mode. Whether I was in the house or out in the backyard, I preferred the Indoor mode's slightly more focused bass and less edgy sound.

Monster's Blaster isn't the cheapest outdoor speaker on the block, but its simplicity, rugged design, and ability to play loud and clear will delight backyard revelers for hours to come.



## SPECS

### Drivers (Estimated

**Sizes):** 2.5 in driver (4), 5 in down-firing woofer (1), bass radiator (2) • **Amplifier:** N/A • **Control Buttons:** Power on/off, volume up/down, mode (switches between Indoor and Outdoor modes) • **Features:** Integrated handle, splash-resistant, NFC automatic pairing, rechargeable lithium-ion battery with 15-hour (rated) life, LED battery-level indicator • **Inputs:** Wireless via Bluetooth, 3.5mm analog audio (2, 1 for microphone) • **Outputs:** USB (for charging) • **Dimensions (WxHxD, inches):** 18 x 8 x 8 • **Weight (Pounds):** 16.8 • **Accessories:** AC charging cable

## PERFECT FOCUS

# Q&A

AL GRIFFIN

## Atmos Advice



**It's my understanding that the overhead speakers in a Dolby Atmos system are meant to create diffused sound. I have a pair of dipole surround speakers with a front-facing woofer and side-facing drivers. Could these be used in a 5.1.2 Dolby Atmos system if I hung them from my cathedral ceiling with the woofer facing down and the side drivers firing to the front and back of the room?**

*Al Erdelyi / via e-mail*

Let's take your main point first. The function of the overhead speakers in a Dolby Atmos system is not to create diffused sound, but an enveloping soundfield with individual sonic elements at identifiable locations in space. Dipole surround speakers, which fire sound from opposing sets of drivers acoustically out of phase with each other, are designed to deliver a diffused surround presentation in channel-based home theaters—one that emulates the wash of sound from arrays of wall-mounted surround speakers in conventional, non-Atmos commercial cinemas. In this case, all the surround speakers on the left wall of the auditorium, for example, are fed the identical signal from a single channel. Since listeners will hear output from more than one of these speakers (each at relatively different distances and angles), the overall sensation is a diffused presentation of the surround effects.

Dolby Atmos, however, is an object-based format that requires a spatially specific presentation by speakers (currently up to 64 independent speaker feeds, assigned on the fly by the renderer in the Atmos commercial cinema processor) tasked with conveying the apparent physical location of individual sonic elements within Atmos soundtracks. That's why direct-radiating speakers are used exclusively in cinema installations.

The rules for home Atmos installations aren't as rigid, however. Take, for example, this passage from Dolby's Best Practices documentation for home Atmos: "Dolby Atmos is a highly flexible solution, so minor variations from these recommendations are unlikely to materially detract from the immersive Dolby Atmos experience." While Dolby may give you a pass to experiment with Atmos at home, its documentation does go on to recommend using "conventional" overhead speakers with "wide dispersion" characteristics.

Forum discussions I've read by home theater integrators have a negative take on the use of dipole speakers for object-based audio formats like Dolby Atmos. Their main argument is that the null section of dipole speakers—the part where the woofer is located on your dipole surrounds—doesn't allow for



the localization that's key for object-based audio performance. So there you have it from the folks in the field.

Other listeners with Dolby Atmos experience, however, still advocate for the use of diffuse side surrounds, even for Atmos.

The main reason is that side surrounds are so much closer to the listener than the other speakers, especially with Dolby's recommendation of placement at ear height, that the precedence effect takes over and the direct-radiating surrounds end up calling too much attention to themselves.

Now to the subject of your cathedral ceiling. Physical speakers are the only practical solution here, and direct-radiating models with wide, symmetrical dispersion aimed straight down are likely to provide the best experience for listeners in the largest number of seats throughout the room. Dolby does have a workaround to using physical speakers on the ceiling: Dolby Atmos Enabled Speakers (DES). These are

### Can I use dipole surrounds as height speakers in a Dolby Atmos system?

towers or add-on speaker modules located just above ear height with drivers aimed upward at an angle toward the ceiling. The idea is to bounce some frequencies off the ceiling and back down toward the listeners to give the impression of sound coming from above.

While Atmos Enabled Speakers would normally provide you with an alternative option, another section from the Atmos Best Practices guide referring specifically to DES speakers states: "For optimal performance, the ceiling should be flat (not angled or vaulted), with a height of 14 feet or less." This basically means that cathedral ceilings like yours aren't a great environment for Dolby Atmos-enabled speakers. Why? Because the ceiling's angled surfaces and greater reflection distances do not lend themselves to creating the desired psychoacoustic effect.

To sum up, the dipole speakers you intend to use as overhead speakers in your setup are unlikely to provide the sonic cues required to create a convincing overhead experience. Combined with the incompatibility of DES and cathedral ceilings, direct radiators are your best option to achieve the target of object-based audio systems like Dolby Atmos, which is to present an enveloping bubble-shaped audio experience that's spatially convincing and satisfying.

# Handson

## Parrot Zik 3 Headphones

By Lauren Dragan

### Norman Door

**PRICE \$400**

**SINCE THEIR FIRST VERSION,** Parrot Zik headphones have been consistently beautiful to look at and have featured technology that is a nose ahead of the competition. It's the combo of pretty and new that has made the Ziks the darlings of the tech-enthusiast set. Now in its third iteration, the new Zik 3 is packed with all sorts of bells and whistles. Some will be familiar to users of the Zik 2.0: touch-sensitive controls on a sleek-looking ear-cup, deeply customizable noise cancellation and EQ via an app, sensors that trigger a pause in the music when the headphones are removed. And some are new: wireless charging, USB audio, Apple Watch, and Android Wear compatibility.

At face value, the Zik 3s have a lot of things going for them.

To start, the active noise control (ANC) is really great. While it can verge into vacuum-feeling on the highest

**AT A GLANCE**

**+** Plus

- Excellent ANC
- Decent Bluetooth sound (with ANC off)
- Wireless charging

**-** Minus

- Inconsistent sound quality
- App mandatory for major functions

setting, the noise blocking also can be reduced and even mixed with increasing amounts of external noise to enhance situational awareness—an unusual feature.

Also, over Bluetooth (and with all the audio enhancements and the ANC turned off), the sound is pretty good—not often the case with Bluetooth 'phones. The Zik 3 is relatively neutral-sounding, although lacking some dexterity in the highs and depth to the sonic field.



#### RATING

**Parrot Zik 3 Headphones**  
**Performance** ★★★★★  
**Build Quality** ★★★★★  
**Comfort** ★★★★★  
**Value** ★★★★★

#### THE VERDICT

**While the Zik 3** has allure with fun features, it falls short on core functionality, especially against its price competition.

products. In other words, you need to turn the iPhone volume all the way up before you put it in your pocket, or else you'll never get enough loudness. The same is true with the included analog cable; there is no remote or mic.

Ergonomics aside, the Zik 3's sound quality was disappointing in most of its listening modes. Through Bluetooth, when the ANC is on, the bass was boomy and blurry and tended to thicken the lower mid-range. The Concert Hall settings, which are made to imitate room feel, added a weird metallic edge to the sound. The Equalizer settings were fun to toy with, but I never felt that any amount of tweaking really made for an improvement over the initial tuning.

Listened to passively over the analog cable, the Zik's vocal range became blaring. Powered through the USB cable, though, the headphones finally found their sweet spot: The highs had more clarity and dexterity, the mids some depth, and the bass, while forward, was well formed. However, once connected via USB, the ANC controls and all the app features are inaccessible.

Unfortunately, even at their best, the Parrots don't quite hold up sonically in a very competitive field. The Sennheiser Momentum Wireless and Definitive Technology's Symphony One come to mind. If ANC, rather than sound quality, is the priority, Bose does it better and for less.

Despite its ambitions, the Parrot Zik 3 never felt like a fully completed thought. There are so many other ways to spend \$400, and many will leave you feeling less aggravated.

#### SPECS

**Type:** Over-ear, BT • **Weight (Ouces):** 9.5 • **Driver:** 40 mm Neodymium drivers



And, the fit for the Zik 3 is lightweight and comfortable.

But then...

There is a concept in design known as the Norman Door. Named after Don Norman, author of *The Design of Everyday Things*, a Norman Door is a door that is difficult to discern whether to push or pull by simply looking at it. In his book, Norman argued that a well-designed object shouldn't cause confusion or need instruction: It should be intuitive to use.

Since becoming a popular concept among designers, the Norman Door has become the symbol of beautiful, but ultimately unsatisfying-when-used objects. Spending time with the Parrot Zik 3, for me, was a lot like encountering a Norman Door.

It starts with the controls. As in the Zik 2.0, to turn on or off the ANC, you must use the Parrot Zik app (compatible with iOS and Android, or Apple Watch/Android Wear). This is really annoying if, say, you decide to listen to music via one of the included cables. Additionally, to even access the Parrot Zik app, you must create a social media account with Parrot. While some may not object, to be *required* to create a profile or link with your existing Google/Facebook account can feel invasive to those who value their privacy. Don't have internet connection? You can't sign in. Can't sign in? You can't use a vast quantity of the Zik's controls. Including the ANC. To be fair, Parrot did make it possible to access the app controls without an internet connection provided you don't sign out before losing Wi-Fi. But if you accidentally sign out before a long flight, you're out of luck.

I found the touch controls to be wonky. I'm not new to touch-sensitive earpads, so the fact that I was constantly pausing my music when I wanted to skip tracks or adjust the volume says something. And despite the fact that the packaging states the Zik 3 are "made for iPhone," the touchpad volume control is independent from the iPhone's volume control, rather than remaining in sync as with some other



## The Rise and Fall of Stereo (Part Two)



Last issue, we discussed the ascent of glorious stereophonic sound. Stereo was a true revolution in audio playback, and it quickly condemned monaural to an eternity of lo-fi hell. Audio manufacturers' marketing departments had an easy time convincing consumers to upgrade to stereo; everyone could easily hear the improvement. Now, 50 years later, stereo is unraveling.

As an audiophile, it's difficult for me to express my dismay as I see stereo practically becoming a historical footnote. I feel like a doctor in the tropics where malaria has finally been eradicated. What a tremendous outcome. Then, incomprehensibly, people stop using insecticides and nets. The mosquitoes come back, along with malaria. What happened?

Let me try to explain. Stereo is much, much more than two speakers. It is a sophisticated technique that encodes and reproduces signals

### Stereo is practically becoming a historical footnote.

containing information on the spatial properties of a soundfield. To properly decode the information and reproduce the soundfield, the listener must be properly positioned relative to the stereo speakers. As every audiophile knows, the subtended angle should be approximately 60 degrees or more. Look around you; on an everyday basis, how often do you see people listening to speakers at an angle of 60 degrees?

Distortion can take many forms. The distortion from a blown speaker is easy to hear. In a "stereo" soundbar, with the tweeters being the only independent speakers, and placed a foot apart, the abysmal spatial response is easy to hear. Because it fails to properly decode the encoded stereo signal, the playback quality of any

"stereo" system is quite poor. And make no mistake—spatial distortion is every bit as real as any other audio distortion.

Monaural absolutely, positively cannot decode stereo. And neither can a "stereo" system with tightly spaced speakers. We all lived through the sad era of "stereo" boomboxes, but now the list of "stereo" systems is growing exponentially. "Stereo" soundbars, "stereo" Bluetooth speakers, "stereo" smartphones—these products now dominate music playback. They are stereo in name only. In terms of audio fidelity, specifically their spatial fidelity, they are an abomination. Compared with stereo, listening to tightly spaced "stereo" speakers is like listening to an instrumental-only version of an Adele album.

But what about headphones? They provide awesome stereo, right? Well, no. Headphones provide terrible stereo playback. In fact, they don't provide stereo at all; they are binaural devices. In stereo, each ear hears the other channel; this interaural crosstalk is a key part of stereo decoding. Headphones are what stereo speakers would sound like if you sat in front of them with an infinitely large piece of soundproof plywood bisecting your head. Headphones massively distort spatiality.

It's a moot point, but sadly I blame home theater systems for this debacle. They introduced listeners to a center channel. Soon, people assumed that a center-channel "stereo" soundbar worked just fine and they didn't need the other 4.1 speakers. Disaster. I also blame smartphones. Smartphones with "stereo" speakers or headphone playback are the worst thing that ever happened to audio (and video) playback.

I guarantee you that many kids have never heard actual stereo. Raised in a house with a big TV and a soundbar, smartphones, and lots of Bluetooth speakers and headphones, they have never heard one of the most beneficial audio innovations—stereo separation.

Is there hope? Can stereo make a comeback? I don't know. Sound systems in cars are a ray of light. But I can tell you that I'm pretty depressed. At this point, I'd almost prefer to live in the lo-fi hell of true monaural, rather than the distorted and duplicitous world of "stereo."

## DirecTV to Stream—Free!

AT&T-owned DirecTV is launching its own video streaming service. It will use both home and mobile broadband networks to reach smart TVs, tablets, phones, PCs, and streaming devices. Unlike DirecTV satellite service, it won't require an annual contract, set-top box, or dish installation.

Stop the presses—among three service tiers will be a free ad-supported option called DirecTV Preview. According to the press release: "This free offer for anyone with a wired or wireless internet connection will feature some of the quality programming available on DirecTV today. The tailored ad-supported service will showcase content from AT&T's Audience Network, many networks and other content sources, and millennial-focused video from Otter Media, a joint venture of AT&T and The Chernin Group."

The paid tiers will be DirecTV Now, "including much of what is available from DirecTV today," and DirecTV Mobile, "a mobile-first user experience for people wanting to watch premium video and made-for-digital content directly on a smartphone, regardless of the wireless provider." Sign up for one of the paid services, download the app, and go.

Cost for the paid tiers had not been announced at press time. Launch is scheduled for the fourth quarter of this year.

In other DirecTV news: The satellite network kicked off its 24/7 Ultra HD channel in April with a live broadcast of the Masters golf tournament. The channel is accessible via the HR54 Genie DVR, with the 4K Genie Mini set-top box for additional TVs. LG, Samsung, and Sony make DirecTV 4K Ready TVs.—MF



# DIRECTV

## GigaMonster Looms Over ISPs

Look out, cable ISPs. You've got another competitor to worry about in addition to Google Fiber.

GigaMonster is also bringing fiberoptic Internet service networks to communities that could use a little competition. The service made its debut in Denver and is also building in Atlanta, Charlotte, Dallas, Houston, Los Angeles, Memphis, Nashville, Phoenix, and San Francisco. It is concentrating on apartments and gated communities, either directly or through a partner in the community, and the service cost is built into rents. The company has peering deals with Amazon, Netflix, and YouTube, so those services would not be throttled. Pricing ranges from \$39 to \$109 a month for 30 Mbps to 1 Gbps.—MF



# Handson

## Technics EAH-T700 Headphones

By Steve Guttenberg

### Shine On Brightly

**PRICE \$1,199**

**REMEMBER TECHNICS?** THEY made turntables, right? Yes, they did, and now they're making them again. The brand's history dates back to 1965 when it debuted the Technics 1 monitor speaker. The brand went on to create a wide range of components, including a tube amplifier in 1966, and in 1970 the world's first direct-drive turntable, the SP-10. Many other products followed, but the Technics name faded from view a few years ago and then roared back to life in 2015 with a couple of stellar speakers and a new line of electronics. This year, Technics showed an all-new SL-1200 Series turntable and

#### AT A GLANCE

**+** Plus

- Two-way design with super tweeter
- High sensitivity makes it ideal for use with portable hi-res music players
- Handcrafted in Japan

**-** Minus

- No padded storage case

these remarkable headphones, the EAH-T700.

These crisply styled beauties feature finely crafted aluminum ear-cups and

deliciously thick padded ear cushions and headband; pictures fail to convey how it feels. These headphones look like they can shrug off a little rough handling with ease. The EAH-T700 were designed and made in Japan, precisely because Technics engineers want to maintain the strictest quality control standards.

Peer inside the EAH-T700's earcups, and you'll spot something unusual: In addition to a 50mm main driver, there's a 14mm aluminum *super tweeter*. The 50mm is set in an angled aluminum baffle, as is the super tweeter, to better direct ultra-high frequencies precisely to your ear. The drivers are compliantly decoupled from the earcup to reduce resonance. Technics claims the tweeter's response extends all the way up to 100 kilohertz to fully resolve the bandwidth of today's ultra-high-resolution recordings. I can hear some of you muttering that human hearing doesn't go much past 20 kHz, but even so, headphones that reach to 100 kHz might have audible benefits at the upper range of the frequencies we *do* hear.

You get two sets of oxygen-free copper headphone (4N) cables, one 4-foot one and a 10-footer. The cables are terminated with 3.5mm plugs with sleeves that screw onto the earcups. A 3.5mm-to-6.3mm adapter plug is provided, but I was surprised to note that Technics didn't include the sort of classy storage box that comes with other flagship headphones. They do provide a basic drawstring pouch for storage and travel, however.

These closed-back headphones weigh a little over a pound (16.6 ounces), but I still found them a pleasure to wear. The luscious earpads and supple headband are largely responsible for the EAH-T700s' comfort. The pads also do a great job sealing out external noise, so I took the EAH-T700s out to a local park with my Astell & Kern Jr high-resolution music player. That turned out to be a great pairing because the EAH-T700s are more sensitive than any other flagship headphones I've tried, so they played louder and were more dynamically alive than the other 'phones with portable players. Pumping up the volume to "11," the bass slam was

#### RATING

**Technics EAH-T700 Headphones**

**Performance** ★★★★★  
**Build Quality** ★★★★★  
**Comfort** ★★★★★  
**Value** ★★★★★

#### THE VERDICT

**The Technics EAH-T700**

sounds sweet at home, and its high sensitivity makes it ideal with high-resolution portable players.



truly visceral on my LCD Sound-system albums. So if you do a lot of listening on the go and crave audiophile sound quality and maximum dynamics, the EAH-T700 would be a great choice.

Back at home, I compared the EAH-T700 with another pair of two-way full-size headphones, the EnigmAcoustics Dharma D1000 (\$1,195), with my Oppo HA-1 headphone amp, and the differences between the two headphones were clear cut. The EAH-T700 had a sweeter tone and richer bass, but the D1000 is more see-through transparent, so I could hear "deeper" into the music. Fingers sliding over strings and singers' breaths were the sorts of details that the EAH-T700 glossed over. Ah, but maybe that's why the Technics managed to breeze through some of the harsher-sounding contemporary albums in my collection. Still, the EAH-T700 is very much a high-resolution device, though other headphones dredge up even more detail.

With so much happening in high-end headphones, you might think there's nothing new to offer, but even a quick listen to the Technics EAH-T700 will prove otherwise.

#### SPECS

**Type:** Closed-back, over-the-ear  
**Drivers:** 50mm dynamic driver, 14mm aluminum super-tweeter  
**Impedance:** 28 ohms • **Sensitivity:** 102 dB/1 mW • **Weight (Ounces):** 16.6



# Apptitude

MICHAEL ANTONOFF

## Your Song Here



Now that we never need to dismount from the barstool to drop quarters in the jukebox, it just seems wrong to call TouchTunes a mobile app. Pushing through a crowd to reach an illuminated cabinet required actual mobility, also called walking. But that was then. Today no one with a smartphone is budging. In the battle of the bulge, beer wins, waistline loses.

Music lovers win, too. That's because the soundtrack playable by revelers in today's bars is stored in the cloud rather than in a mechanical changer. Instead of 99 selections, you can choose from hundreds of thousands.

In an ideal world, I should be able to play the music already in my pocket directly to the bar's speakers via Bluetooth just like at home. But that would constitute a public performance, not to mention a free-for-all among patrons each packing their own portable in the quest to be dominant deejay. Besides, in a commerce-driven economy, artists should be paid.

Enter TouchTunes, a music distributor with internet-connected jukebox screens installed in 65,000 venues throughout North America. Before the app, you inserted money or a credit card into a slot to program the music. The

### The soundtrack played in today's bars is stored in the cloud.

company shares revenues with the watering hole and the music label.

Its mobile app has been out for a few years, but now it's been redesigned to be more personalized. When you install the app on your phone, it can import playlists from Spotify or iTunes. The app's personalization features also combine each user's play preferences with what TouchTunes calls "the venue's vibe" to help users discover the music they have in common with each locale. The new Android and iOS versions were expected this spring.

I was able to use a prerelease version on a borrowed iPhone at a New York bar taken



TouchTunes

over by TouchTunes in March. I easily found "Touch of Grey." Minutes later, the Grateful Dead changed the vibe of the place.

But I really wanted to try TouchTunes on my own, so on the following Saturday, I downloaded the preexisting version. I was prompted to choose a screen name. I wanted "Lucky Man" on account of Keith Emerson having died the day before. But it was taken. So I wrangled "Sir George" as in George Martin, the fifth Beatle, who died the day before that.

It was early afternoon. I was hungry and thirsty and standing in a UPS store making copies. I whipped out the app to locate nearby TouchTunes-enabled establishments. I found a Mexican restaurant just down the block where "Yellow" by Coldplay was currently playing, according to the app. I knew the joint served a hearty brunch and a decent margarita. What sealed the deal was being able to choose the music.

Using a credit card, I bought 13 credits for \$5. The new version also accepts PayPal and Apple Pay.

Between burrito bites and napkin wipes, I opted for Billy Joel's "You May Be Right." With each credit worth about 38 cents, I could pay two credits to add the song to the queue or three credits to jump the queue. I made the mistake of paying two credits, then deciding I couldn't wait and paying three. There was no way to belatedly add the one credit. Joel did come up quickly after that, but there was no second play later on.

Clearly there are kinks to work out. Still, I expect to be sharing more of my musical tastes from a fixed position in other dives. The new norm may be Norm, the immovable object of *Cheers* fame, slugging back brewskis and playing the hits.

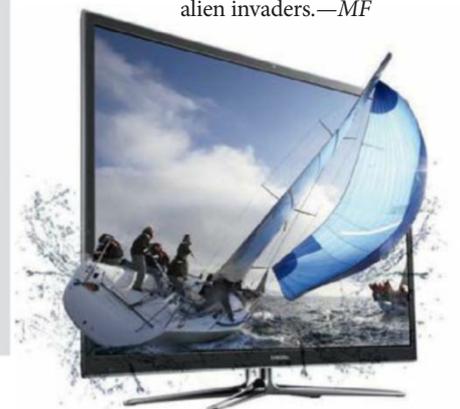
## Onkyo, Pioneer AVR's Do Tidal

Tidal music streaming and FireConnect wireless multi-room connectivity are coming to A/V receivers from Onkyo and Pioneer, both of which are now under the same management. Tidal's celebrity ownership by rapper Jay Z has overshadowed its strong reputation among audiophiles as a lossless music source. FireConnect, from Blackfire Research, allows an app to route music from computers and mobile devices on a home network to the receiver or to compatible wireless speakers, such as the ones Pioneer has on the drawing board. Software updates will be necessary. Applicable models include the Pioneer LX301 (\$700) and LX101 (\$500) and Onkyo TX-NR757 (\$799), TX-NR656 (\$699), and TX-NR555 (\$599).—MF



## Samsung Axes 3DTV

First 3D was the next big thing in television. Then it was a feature, not a category. Now it may be turning into an absent feature and a dead category. An anonymous source at Samsung told cnet that 2016 models will not support 3D. Some Samsung models carried over from 2015 will still support it, as will some sets from LG and a couple from Sony. Vizio pulled out of 3D in 2013. But who needs 3D when we have virtual reality? Samsung's Gear VR headset will enhance in-the-flesh roller-coaster rides at Six Flags amusement parks by adding heroic visuals of Superman battling the LexBots and fighter jets repelling alien invaders.—MF



# NewGear

THIS MONTH'S HOT STUFF...



## → Visual Apex Portable Projector Table Stand

Summer is a time to enjoy the great outdoors, and VA's projector table is a must-have accessory if you're a devotee of backyard movie parties. Weighing in at just under 9 pounds, the stand has a 15 x 17.5-inch platform that supports up to 44 pounds and four telescoping legs that can be locked in at any point between 18.5 and 44 inches. **Flexible, Foldable:** You can set up the stand with or without its accessory shelf and, after the final credits roll, fold it up and stow it away in the included canvas carry bag that has enough room for a projector. Of course, you can use the stand for business meetings and impromptu indoor theater setups, but that wouldn't be as much fun, now would it? **Price:** \$99

**VisualApex • (800) 883-7495 • visualapex.com**

## → GoldenEar SuperSub X Subwoofer

Ah, isn't that sweet? GoldenEar's SuperSub XXL has a little brother—a mean little brother. Like its older sibling, X is built around the company's patent-pending dual-plane topology that mates two outward-facing drivers (8-inchers, in this case) with subbass radiators that fire from the top and bottom of a heavily braced Medite cabinet. As GoldenEar puts it, "This force-cancelling inertial balancing preserves and focuses all the energy produced by the transducers in order to effectively move the air in the room." **Size (Doesn't) Matter:** The SuperSub X may not be much bigger than a 12-inch cube, but its unique driver layout combined with 1,500 watts of power (delivered from the same amp developed for GoldenEar's flagship Triton One) and sophisticated digital processing are said to produce floor-shaking output down to 12 hertz. **Price:** \$1,249

**GoldenEar • (410) 998-9134 • goldenear.com**



## → Dashbon Flicks Boombox Projector

Many of today's Bluetooth speakers have put a new face on the classic boombox, but Flicks pushes the concept to its logical conclusion: a portable movie theater! Measuring 11.7 x 5.3 x 6.5 inches, this boombox packs an LED-based, 720p DLP projector that can display a 100-inch image from just over 8 feet away, plus the requisite speakers—in this case, two full-range drivers plus a "subwoofer" and bass radiator. **Unplugged:** Flicks is offered in two versions, both equipped with a rechargeable lithium-ion battery and HDMI input. (Roku, anyone?) The 280WH (\$699) is rated for 8 hours of movie time or 56 hours of Bluetooth music streaming. Want to save a hundred bucks? Go with the 140WH—it's a little lighter (6.1 versus 7.7 pounds), but you'll have to cut those play times in half.

**Dashbon • info@dashbon.com • dashbon.com**





◆ **Origin Acoustics AS41 AcoustaScape Outdoor Speaker System**

Tired of moving audio gear out to the deck or patio for those summer soirées? Nestle Origin's all-weather AS41 speakers among the plants and shrubs in your landscaping, run wires to the Zone 2 outputs of your A/V receiver, and outdoor music is forever at your command.

**Creative Gardening:** Setup involves using supplied plastic spikes to "plant" four wide-dispersion satellite speakers around your designated listening area and literally burying an in-ground subwoofer that radiates bass from an inconspicuous "mushroom cap" that protrudes from the ground. The system is impedance-matched and rated to handle up to 200 watts. Want to expand your audio oasis to 2,500 square feet? Add a couple AS4SAT Expansion Packs, each of which includes an additional pair of satellites (\$400 per pack). New Age never sounded so good. **Price:** \$1,700

**Origin Acoustics • (844) 674-4461 • acoustascape.com**



◆ **Philips BDP7501 4K Ultra HD Blu-ray Player**

Forget streaming. The buffer-free, pristine picture possibilities of 4K Ultra HD (UHD) Blu-ray are here at last, and the BDP7501 is one of a handful of players ready to wow you with lifelike images—provided the player is hitched to a UHD TV that supports high dynamic range (HDR) and wide color gamut. (You do have one, don't you?) With said TV attached, you'll experience better-than-HD resolution, an expanded color palette (thanks to wide gamut up to BT, 2020 and 10-bit color depth), and both blacker blacks and brighter whites (courtesy of HDR10). **Spec'd to Impress:** Don't let the BDP7501's form factor fool you. The diminutive box is rich with features, including Wi-Fi connectivity, Netflix and YouTube apps, 4K upscaling, and two HDMI outputs: one 2.0a with HDCP 2.2 and one 1.4b (for non-HDMI 2.0a-compliant A/V receivers). **Price:** \$350

**Philips • (866) 310-0744 • usa.philips.com**



# Virtual Reality

Forget everything you've ever heard or experienced about VR. This time, it's for real. **By Geoffrey Morrison**

**I'M STANDING** ATOP THE Sagrada Família basilica in Barcelona. I look up, and Gaudí's organically ornate spires reach up toward the sky and sun above me. I look down, and the streets radiate out like spokes on a wheel. Suddenly, I want tapas.

*Click*

It's night. I'm at Sky100, perched 1,289 feet above Victoria Harbour. The sodium lamps and neon lights of Kowloon burn

daytime bright. The towers, peaks, and signs of Hong Kong Island reflect their own glow across the water. To the right, the dark sea beckons. Scratch the tapas, now I want dim sum.

*Click*

I'm astride Rey's speeder bike, racing across the deserts of Jakku. I look up as I pass beneath the decaying remains of a Star Destroyer. Wait, what?

*Click*

I'm balanced at the edge of an island that's floating above a cloudy sky. Beside me, a hovering humpback whale eyes me condescendingly. How does a whale look at someone condescendingly? Wait, how does a whale hover? Maybe the answers lie across this rope bridge that connects to another eerily unsupported island.

*Click*

Reality. I think. Some amount of time has passed. Lots. There is no doubt: Virtual reality is here. It is glorious.

## The Bytes and Bobbles That Led Here

If you're older than, say, 10, you've been promised VR before. Many times before. Saga VR, Virtuality, VFX1, Nintendo's Virtual Boy...this isn't our first rodeo.

Except...it is. VR is radically different from anything that came before. The VR of old had tiny, mediocre displays with low contrast and even lower resolution. The archaic head tracking was so sluggish, it made most people who tried it nauseated.

The disconnect between promise and reality has been so wide for so long, many people have been, and still are, understandably skeptical. But now it's 2016. We've reached a singularity of low-priced sensors and high-resolution screens. Cheap processing power and simple content distribution. All the pieces to make the VR future we were promised are here.

Enter Palmer Luckey.

## The VR Revolution

Palmer Luckey is 23 years old. When the history of VR is written, he'll have his own chapter. Luckey had an idea, and like so many brilliant ideas, it seems so obvious in

hindsight. He realized that the two things VR needed most—accurate motion tracking and a high-resolution screen—were literally everywhere: in smartphones. He built a prototype, got it working, and started a company. At 19. In 2014, Facebook bought this tiny company, Oculus VR, for \$2 billion. With a *b*. Like nearly everyone who has tried their only product, the Rift, Facebook realized that this was The Real Deal.

When I met Palmer, it was at Oculus' first CES. His shaggy hair, T-shirt, and exuberant demeanor could have been that of pretty much anyone but the CEO of a company. This was only a few months after a \$10 million Kickstarter campaign; Facebook's billions were unforeseen in the future.

I'm not sure if the company's entire staff was in that one suite at the hotel formerly known as the Las Vegas Hilton, but I'd be surprised if they all wouldn't have fit on a sofa. They were so unknown, and VR still such a joke, that my bosses had passed all invites down to me. "You like VR. Go check this thing out. Maybe it will be bad enough for a laugh." I'm paraphrasing. Barely. They had no idea, and neither did I.

That prototype, already named Rift, was literally a gutted cell phone taped to a pair of ski goggles. It wasn't even HD resolution. But it was a revelation.

As soon as they slid the goggles over my eyes, I started giggling. *Everyone does this when they first try it.* The tracking was so good that my brain easily accepted this virtual reality right before my eyes. It was a short demo, not even a real game, but I was sold. *This* was what we'd been waiting for. Every gamer, for sure, and anyone who thought VR would be a cool idea. And that was the prototype.

I've now tried every version, including the shipped model shown at CES this year. Each generation got better, more immersive, smoother, more realistic.

## Today, the Future

The version of the Rift you can buy today for \$600 has countless



# Is Here



● **The Oculus Rift (as well as the HTC Vive) uses two 1080 x 1200 OLED screens, one for each eye.**

advances over that first model I tried a product lifetime ago. Each one is important.

Let's start with the screen. One of the main complaints about VR in the past has been low-resolution screens that have a screen-door effect worse than that of any lo-res projector. The Rift and its closest competitor, the HTC Vive (\$800; see the accompa-



nying "Beyond Rift: Other Goggles to Oogle"), have two 1080 x 1200 OLED screens, one for each eye. At the distance the screens are from your eyes, this resolution isn't quite enough to make the individual pixels invisible, but it's close enough that you won't care.

OLED is better than LCD in nearly every way, but several factors make it an ideal choice for a VR display.

OLED's contrast ratio helps to provide the sense of immersion, with a black that seems like total darkness. And darkness is key, but for a completely different reason.

In conjunction with OLED's fast response time, the Rift and Vive screens run at a 90-hertz refresh rate. That's not even the interesting part. It's unclear whether the Vive does this, but on the Rift, for the vast majority of that time, the screen is dark. To cut down on motion blur that could make you

queasy, the Rift uses black frame insertion. This trick, also used in some OLED and LCD TVs, flashes an image at your eyes, then quickly goes black. It flashes another image, then goes black again. This is similar to how film projection works. If it didn't do this, your brain would sense the lack of motion in the screen as you slightly moved your head. With a TV, your brain expecting to see motion creates motion blur. If you were wearing a VR headset, it would manifest itself as that

and motion sickness. Making your customers sick isn't the best idea.

Make no mistake, minimizing motion sickness is paramount to every company involved in VR. If the first generation of real consumer VR makes people sick, it's game over. A fancy screen is part of that; accurate and fast tracking is the other part. The tracking is so slick, so smooth, that Gabe Newell, co-founder of Vive and co-developer Valve, claims that no one gets sick using the Vive. I'm sure some people will, but no doubt far fewer than with any earlier version of VR.

The tracking in the headset is multi-part and clever. Accelerometers, gyros, and, in the case of the Rift, *magnetometers* track the motions of your head in three axes (up/down, left/right, tilted). These motion sensors have gotten really good, thanks to the ubiquity of smartphones.



● **Rift VR games *Smashing the Battle* and *Pinball FX2 VR***

## SERIOUS HARDWARE

Your computer probably can't handle the Oculus Rift or the HTC Vive. Sorry. If you're lucky, you might only need a new video card. The issue is multifold. Essentially, your video card needs to render 2160 x 1200, which is likely 25 percent more than what it

needs to create now (presuming a 1080p TV/projector is your display). Worse, it needs to do that at 90 fps.

Actually, that's not even the nub of the issue. It has to do with stuff like "API-event-to-draw-call latency" and other things that would take an entire

article of their own to explain. It's a lot more intense than what your video card is doing now. At a minimum, you need an Nvidia GeForce GTX 970 or an AMD Radeon R9 290. Ideally, something faster. The good news is that your CPU and RAM aren't really as important; what you have will

probably be enough.

This will get better. Not that future VR headsets will get any easier to run, just that the cost of video cards that can run them will drop. A few years ago, only the top-of-the-line cards could do games at 1080p/60. Today, nearly all of them can.—GM



● **HTC's Vive ships with two laser-emitting bases that track the movement of the headset and hand controllers (also included).**

The sensors aren't nearly enough to simulate normal movement, though. The Rift and the Vive are two-part systems. A separate IR camera bundled with the Rift tracks your head's position by seeing small IR emitters arrayed on the front and back of the headset. This adds precision, and it lets you move vertically and horizontally. Peer over a virtual ledge, or peek around a doorway. The Vive goes one step further, literally, tracking you with lasers as you move around a defined space (see "Beyond Rift").

The sonics aren't as revolutionary as the visuals, only because we've had positional audio in games for nearly two decades. Suffice it to say, VR's audio will track your position and direction just like the video. The Rift has headphones built in; the Vive comes with earbuds in the box.

OK, so you can look and move around an environment. Not quite a holodeck, but *really* close (and it's not even the 24th century yet). But what about *interacting* with the environment? Yeah, you can do that, too.

The Vive and (by the time you read this) the Rift have hand controllers that are *also* tracked. Move your hands, and your VR hands move, too. I haven't used the Vive's controllers, but I have tried the Rift's Touch controllers. They're almost as mind-blowing as the visuals. They look like the top part of a joystick and strap to your hands. Not only are your hands tracked, but your individual fingers are tracked. Look down in a game and wiggle your fingers, and your virtual fingers will wiggle. Reach down and pick something up by physically reaching

down and closing your hand around the object. Sure, in the real world, you're just gripping the controller—but in the game, you're picking up a crowbar. Game on.

## World Creators

Hardware would be meaningless without software. Probably the greatest boon to the latter was when John Carmack—the legendary designer of *Doom* and *Quake*, and the closest thing the gaming industry has to royalty—signed on with Oculus. It seemed so sudden that, to outsiders, it was as if Carmack had tried the Rift and immediately said, "I want to be your CTO." Who would say no to that?

Video games are perhaps the easiest thing to get working on VR headsets like the Rift and the Vive. The computer is already rendering the entire scene in 3D, just as it would for your computer monitor. The added complexity of head tracking, locational tracking, and high frame rates is all hardware dependent (i.e., not the developer's direct problem).

Already, there are games that work brilliantly with the Rift and the Vive. First-person shooters, where you aim

## BEYOND RIFT: OTHER GOGGLES TO OOGLE

### HTC Vive (\$800)

Built by HTC but designed and "powered" by Valve, the Vive is the Rift's most direct alternative. Their specs are far more similar than they are different: same resolution OLED screens, same refresh rates, same reliance on full-motion tracking.

There are two main differences, however. The first is that the Vive already comes with the handheld controllers that let you feel like you have hands in the virtual world. The Rift's Touch controllers should be available by the time you read this, but for around \$200—which will make the Rift system price the same as the Vive price.

The other difference is in how the devices track your movements.



● **Sony's PlayStation VR headset (right) with RIGS Mechanized Combat League**

The Rift has emitters in the headset. The Vive uses two laser-emitting base stations and photoreceptors on the headset. For now, the only real difference this makes is that the Vive lets you move around more, in a space of 15 square feet. The Rift's virtual space is only 5 x 11.

Which will have more games? And how many games will be playable across both platforms? It remains to be seen. Each already has some exclusives. For now, both the Rift and the Vive are incredible, and there probably isn't a bad choice between them.

Ferrari or Porsche, take your pick.

Gizmag has a great breakdown of the pros and cons of both at [bit.ly/GizMagRiftv-Vive](http://bit.ly/GizMagRiftv-Vive).

### Sony PlayStation VR (\$400)

Due in October, the PSVR is designed to work with the PS4. Given that hardware limitation, it's not surprising that the PSVR is slightly scaled back compared with the Rift and the Vive. Resolution on the OLED screen is 960 x 1080 per eye, with a 90- or

120-Hz refresh rate. Field of view is also slightly less, at 100 degrees (Vive and Rift are 110). The PlayStation Camera will help with positional tracking.

Although not as hardcore as the Rift or the Vive, the PSVR is far more accessible and requires only a PS4 console to run; consequently, it's almost certain to be far more popular, and there are dozens of games already in the works. If you don't have a PS4, total cost of entry is \$800, compared with \$600 to \$700 for the serious gaming PC required by the other headsets—plus, of course, the cost of the headset itself.

### Samsung Gear VR (\$100)

Along with Google Cardboard (see below), the Gear VR is perhaps the best-known representative of the lower class of VR, the kind run only by your smartphone and limited by its more challenged processing power and fewer sensors. The

naturally with a look and your hands. Space sims, where you're in the cockpit, looking all around. Racing sims, where you're in the driver's seat of perfectly rendered and photorealistic cars. A *Star Wars* game, where you—I'm not kidding—*hold a lightsaber in your hands and deflect blaster bolts*. How are you still reading this and not buying one of these already?

While there certainly will be games designed specifically for use with VR, many other games will still work on a VR headset, as if it was a type of monitor. That's the key. You don't need to build a game from the ground up to work with VR (though you could); you just need to port it over so it works with the various controller inputs that VR headsets have. An open-source format has already been developed to allow a game to work on any headset.

Games, though, are but a fraction of what's possible. Filmmakers are already experimenting with VR as a storytelling medium. Artists are using it as a creative tool and to show off their work. Theme parks are tapping it to augment the excitement of roller coasters. Photographers and videographers, both amateur and professional, can show you amazing locations around the world and



● **The HTC Vive with VR shooter game *Arizona Sunshine*.**

VR already has a growing number of products and content types, but it isn't just a new category of entertainment; it's a new universe. The Oculus Rift and the HTC Vive are the first generation. The next generation will be



cheaper, have better screens, and who knows what else.

There will be more games, of course; that's probably the easiest part. But creative people will

always come up with new ways to use new technology—ways we can't even imagine.

We're truly looking at the beginning of something that only has precedent in science fiction. How cool is that?

So, do you need to run out and get a VR headset right now? At \$600 for the Rift and \$800 for the Vive, no. But if you're like me and this is something you've wanted since you were a kid, maybe. Because it's as awesome as you'd hoped. Welcome to the (virtual) future. Finally. ♦

beyond (I've lost hours to this, BTW, and have already started making my own). There are applications for education, exploration, therapy, and more. Still seems frivolous? How about a doctor being able to practice surgery in a virtual environment with a virtual body, based on scans of a patient?

Many companies, including Microsoft, are working on augmented reality. This involves a computer-generated image overlaid on reality. Imagine a mechanic tearing down an engine. Using AR, he can see the actual engine, with the bolts he needs to loosen glowing green. As he

separates the engine parts, the one he needs to change glows red. An architect could stand at a potential build site, see his creation situated in the space, and address any issues while moving around in the real world. The possibilities are endless.

**Nah, Take the Blue Pill**

Will virtual reality conquer all other entertainment, take over our lives, and make us subservient to the hive mind? No. Well, probably not. Will some people use it instead of a TV? Probably. Will some people use it to excess? Of course. But people do that with TV now, so...whatever.



● **Samsung Gear VR works only with select Samsung smartphones.**

Gear VR is built by Samsung, but it's "Powered by Oculus." For \$100, it seems like an easy buy, except it only works with certain



phones—specifically, the Galaxy S6, S6 edge, S6 edge+, Note 5, S7, and S7 edge. The Gear VR is essentially just a plastic headset with lenses and a control pad on

the side, allowing you to interact somewhat with your environment. For example, you can spin around 360 degrees in a virtual world without actually having to spin around in your chair (which also works). I'd say that the Gear VR is a

real taste of what you get with actual VR. What it does, it does well—namely, photo spheres from around the world (and created sci-fi worlds) and 360-degree videos. It doesn't do gaming very well, which probably isn't a surprise, given that you're still limited by the processing power of the phone.

Sure, it's a great peripheral—but commensurate with its price, it's not the full Monty of the Rift. You can check out my full review on the S&V website at [bit.ly/Tech2GearVR](http://bit.ly/Tech2GearVR).

**Google Cardboard (\$20 or less)**

If you've not seen a Google Cardboard headset, it's what it sounds like: a structure made from flat corrugated cardboard, containing a pair

of inexpensive lenses. It folds up into goggles that encase your smartphone as the video source. Amazon sells many versions, some with an elastic band to hold the whole thing to your head, and there are Google Cardboard experience apps for both Android and iOS in the Google and iTunes stores.

In theory, Google Cardboard gives you a tiny taste of what the more elaborate headsets offer. But you get what you pay for. The experience isn't great. Judging VR based on this would be like eating a raisin and deciding that wine sucks.—GM



● **Google Cardboard with the Dive City Rollercoaster app**



# A Peck of Picos

## Today's Mini Projectors Put a Big Picture in a Remarkably Small Pocket

By Rob Sabin

**WITH THE WARM SPRING** beckoning us Northerners to the outdoors, thoughts of week-long beach vacations or camping trips bring on a serious dilemma: How in the world are we going to watch movies? OK, maybe, maybe not. But if you happen to be a millennial or a teenager with a smartphone, you know that its screen handily doubles these days for your old pappy's big-screen TV. Except, it's really not so big, is it? You can crowd in only so close when you're trying to share your latest photos or a download of *American Horror Story* with a group of friends.

Today's projector manufacturers have heard your cries for help, as well as those of business professionals who need to cart around projectors for presentations. And even the cries from guys like me, who, on a day off in a distant land, wouldn't mind being able to watch a

reasonably large and acceptably high-quality image of a high-def movie on whatever white wall happens to be nearby. After cocktail hour, anyway.

With this in mind, and a long-nagging curiosity about what these little boxes can actually do, I called in a few for a survey. And when I say little, I mean it. The *largest* of the four projectors I evaluated is but 6.5 inches wide x 1.3 high x 4 deep, about the size of a typical mass-market paperback book (if you still remember what those look like). The smallest, I kid you not, is about half the size of the iPhone you might use to drive it.

These projectors go by any number of descriptives, including pocket, mini, pico, and—I like this one—mini-beamer. What most have in common is that their diminutive size is made possible by none other than Digital Light Projection micromirror technology. Yes, *that*

DLP—the one that helped revolutionize the home theater projector business, not to mention digital cinema.

DLP, for those unfamiliar, is based on a concept so preposterous on its face, it's a miracle it even works, much less that Texas Instruments has disrupted entire industries with it and has now made it so ubiquitous and cheap that it's available in projectors costing less than \$200 on Amazon. At the heart of any DLP system is typically one DMD, or digital micromirror device (but sometimes, there are three). The DMD is an electro-optical chip, created using something akin to a semiconductor mass-fabrication process. A finished DMD has a silicon base, above which is suspended a multitude of tiny, square mirrors that nearly adjoin, like treetops in a rainforest canopy. Each mirror is suspended by a post and able to mechanically swivel between two positions, based on application of a static electric charge from below.

Each mirror represents a single pixel on the screen, and there can be millions on one chip; a 4K-resolution DMD has 8.8 million, each measuring less than one-fifth the width of a human hair. When a mirror is tilted to its on position, it reflects a beam from the projector's light source that passes through the lens and on to the screen. Tilted to its off position, it dumps that light into an absorptive

area, and that pixel goes dark on the screen. To get shades of gray, the mirrors oscillate rapidly—many thousands of times per second—to mitigate how much light strikes the screen.

Most single-chip DLP home theater projectors add color by sending the white light source through a multicolored filter wheel, or color wheel, that rapidly cycles among the primary colors. Signal processing coordinates the red, green, and blue picture information with those moments when the wheel is in the right spot to reproduce each color. But instead of using the typical high-intensity lamp and a delicate glass color wheel, which creates both bulk and the potential for damage from rough handling, these pico projectors typically use a multicolored LED light source or occasionally a laser. This eliminates the mechanical wheel, reduces size requirements, and makes these devices durable for travel and mobility.

Based on size and cost, you'll find a wide variety of performance levels within the category. Along with their footprints, pico projectors vary greatly in their resolution and light output, not to mention the quality of their lens and optical elements, their connectivity, and their features. The smaller projectors produce less light but can be operated on battery



● The Magnasonic PP60 comes with its own foldable tripod.



● The Vivitek Qumi Q6 offers a sleek and fashionable design.

**The largest of these four projectors is about the size of a mass-market paperback.**

Projector	Price	Rated Lumens	Image Size Range (In. Diagonal)	Brightness @ Min Size Diagonal Image (ft-L)	Brightness @ Max Size Diagonal Image (ft-L)	Throw Distance for 65-In Diagonal Image (In)	Brightness @ 65-In Diagonal Image (ft-L)	Black level @ 65-In Diagonal Image (ft-L)	Contrast Ratio @ 65-In Diagonal Image (ft-L)	Color Temp @ 65 In Diagonal Image, 100% white (K)	Image Size @ 12 ft-L Brightness (In)	Black Level @ 12 ftL	Contrast Ratio @12 ft-L
<b>Magnasonic PP60</b>	\$170	25	10-60	53.7	1.58	121	1.34**	0.004	335:1	7585	21	0.025	490:1
<b>Sony MP-CL1</b>	\$350	37	40-120	5.35	0.715	72	2.17	0.002	1,085:1	9790	29	0.003	4,033:1
<b>Optoma ML750ST</b>	\$550	700	25-200*	160.9	3.76*	44	23.1	0.029	797:1	6260	90	0.016	777:1
<b>Vivitek Qumi Q6</b>	\$599	800	30-90	91.7	9.24	87	17.8	0.033	539:1	6430	82	0.028	441:1

\* Measured with 170-inch-diagonal image

\*\* Measured with image size just beyond max recommended range, see "Brightness @ Max Size" for measurement at 60 inches

power for true on-the-spot portability, while the more powerful units require a place to plug in for AC power. The four projectors under review here straddle both worlds. There are two shockingly tiny, battery-operated, breast-pocket projectors from Magnasonic and Sony, retailing for \$170 and \$350, respectively, and two somewhat larger and more fully featured models from Optoma and Vivitek, selling for \$549 and \$599. Three of the four are LED-driven DLP projectors; the Sony uses a laser light source and an alternative imaging device, as I'll describe later. The projectors vary in resolution from a somewhat meager 650 x 360 pixels to 1920 x 800 pixels—essentially, 720p high definition. Rated light output among them runs from 25 to 800 lumens. So I was prepared for, and got, an interesting range of experiences.

I should add a note about audio: Each of these projectors has a tiny built-in speaker, which worked, barely, for reproducing intelligible dialogue and sounded about as good as you'd expect from a driver the size of a fingernail, powered by a wee 1- or 2-watt flea amp. But each projector also has a 3.5mm minijack audio output, into which I plugged my home theater rig for playback. This helped create an immersive experience irrespective

of image size, though you probably won't have a theater system nearby when you use these projectors in the field. A good portable powered speaker with an analog input is a highly recommended accessory if you plan to watch movies or music videos.

### How We Tested

Given their small form factor and relatively low cost, it would be unfair to hold these products to the standards we apply to full-size home theater projectors, even the budget models we test. That said, a good picture is a good picture, and while we should expect to give up some image quality, maybe even a lot, for the convenience and wow-factor associated with whipping a credit-card-sized projector out of our jeans pocket in a social setting (my hero!), it's helpful to understand the trade-offs and know how close these picos come to hitting an enthusiast's sweet spot.

That said, I zeroed in on light output as the most critical attribute and came up with a repeatable test procedure to gauge each projector's ability. First, I mounted the projector on a traditional camera tripod, which allowed me great ease in moving the projector's distance from the screen and swiveling it up, down, right, or left to eliminate the keystone effect that results in non-parallel sides. This is a more prominent issue with temporary setups and small screen

sizes. Most of the projectors had digital vertical keystone correction that I'd have been happy to tap for a one-time portable application, even though we strongly recommend that this be avoided in a permanent home theater installation to avoid artifacts or loss of sharpness. I skipped it here as well for purpose of evaluation.

For each projector, I set up first for a 65-inch-diagonal image as my preferred image size, on the thinking that if I'm carrying around a projector, even a small one, it would be nice to know it can deliver a reasonably viewable picture at least as large as a reference flat panel at home. For projectors that offer different video modes, I selected the one that had the best default color for movies. After measuring and recording peak white light output and throw distance at that 65-inch size (in a dark room and on my reference Stewart Filmscreen StudioTek 130 1.3-gain white matte screen), I physically moved the projector (none of these has an optical zoom adjustment) to whatever throw distance delivered 12 foot-lamberts of output, then measured how large an image the projector could cast at this brightness. I selected that number of 12 ft-L as about the lowest light output that any of our reviewers have successfully used in their darkened home theaters, though usually with a much larger image. I also measured black levels at both the 65-inch and 12-ft-L sizes to calculate contrast ratio

figures. (Don't consider them absolute, but you can use them for comparison among our test subjects.) Beyond this, I looked at the range of specified image sizes the manufacturer recommends and measured peak white at both the smallest and the largest image size advised for that unit. You can find my results in the accompanying chart.

Then, I looked at a few test patterns and some content. I viewed segments of *Mission: Impossible—Rogue Nation* and *The Martian* on Blu-ray through each projector's HDMI input from my Oppo BDP-103 universal disc player. I also watched an Amazon Prime high-def download of *Ex Machina* via my iPad 2 through a 30-pin-to-HDMI adapter and checked out some live high-def and standard-def YouTube streams, on the thinking that a portable device is likely to be the source in most applications. Along those lines, I also fed those projectors that featured a USB input and an integrated media player some standard-def video clips from a thumb drive.

Although I created a level playing field to compare these projectors in a highly favorable environment, the nature of how they're used will likely put them in less ideal conditions. All front projectors do better in a pitch-black room; that might work for night-time movie viewing, but not a business presentation. And a white sheet or a white/off-white painted wall won't likely have the reflective properties of my reference screen. That said, the two brightest of these projectors did produce a surprisingly watchable image even with the room lights on, and so did the little guys if the image was small enough. Be prepared to adjust your expectations and ratchet down your screen size, maybe to a large degree. But whatever situation you find yourself in, if the goal is simply to get a decent picture up that a small group can enjoy, you can probably get by with any of these.



● The Optoma features a short-throw lens.



● Sony's MP-CL1 is about the size of an iPhone.

**The two brightest of these projectors produced a surprisingly watchable image.**

# Pocket Full of Fun

## Magnasonic PP60 DLP LED Projector

**PRICE \$170**

**MAGNASONIC CLAIMS** THAT THIS is “the world’s smallest portable DLP projector,” and I don’t doubt it. The PP60 is only a touch bigger (and thinner) than a pack of playing cards, and it barely tips the scale at 4.5 ounces; it’s hard to accept that any functional projector could fit in such a tiny, lightweight form factor. It carries a \$300 list price but is promoted on Magnasonic’s website for \$170, so I’ve evaluated it in that context.

You do sacrifice brightness and picture detail for the PP60’s size and portability, as it’s rated for only 25 lumens of light output and a somewhat meager 640 x 360 pixel resolution. But you get a fair amount for your money: It’s well thought out and reasonably well performing (considering the form factor), and it comes with a nice mix of cables and accessories. The built-in battery gives you two hours of play time before requiring a three- to five-hour charge from your computer or phone charger—perhaps a bit short for some movies or a sports event. A single HDMI input accepts signals up to 1080p and is MHL compliant for connection to compatible smartphones. Magnasonic includes a short standard HDMI cable, a micro-HDMI-to-HDMI adapter, an MHL adapter, and a 5-pin/11-

### AT A GLANCE

**+** Plus

- Incredibly small and light-weight
- Uncomplicated operation

**-** Minus

- Best with small image size
- Only two hours on a battery charge
- Mono audio output

pin converter for Samsung Galaxy phones. There’s a small carry bag for travel and a cute little fold-up plastic tripod that should come in handy for table or counter setup.

Controls here are about as straightforward as they get—no fancy picture adjustments or even a menu to navigate, which guarantees very simple setup and operation. An on/off slider and a pair of up/down volume buttons are on one side, and the HDMI input, micro-USB charging port, and 3.5mm headphone output are on the other side. (Oddly, the headphone output delivered only the left channel of a stereo HDMI signal to my hi-fi rig and a pair of headphones I plugged in; I assume it’s a mono output, though that probably won’t matter with most portable speakers.) The tiny speaker fires off the top, and there’s a mechanical thumbwheel above the lens opening to adjust focus. And...you’re done.

Recommended

image size starts at 10 inches—no bigger than the average tablet, really—and tops out at 60 inches diagonal, 5 inches smaller than my target. To be a little more fair, I evaluated mostly at 50 inches, though the picture still lacked any real punch, and it turned out that 30 to 35 inches diagonal gave me a more satisfying experience, improving both sharpness and contrast. (Achieving 12 ft-L brightness required an even smaller image of just 21 inches.) There were some odd halo-like reflections cast near the lower right corner of the image, but they were noticeable only on black transitions. I also spotted some occasional brightness pumping I couldn’t explain, but again, nothing that was particularly bothersome. And in an early scene of *Ex Machina*, when Caleb (Domhnall Gleeson) is approaching the entry to his boss’s compound, the projector struggled with some motion artifacts and moiré on the vertical slats of the gray wood fence as the camera panned across it. Again, such an inexpensive product can’t be chastised for this.

Even with a smaller, punchier image, I couldn’t help my expert eye from seeing everything that was right or wrong: pretty good, though not great, color accuracy (such as in the hyped greens of the tall grass in the opening of *Rogue Nation*) and skintones that were acceptable but ultimately too red. Focus was about what you’d expect from a lens opening smaller than the diameter of a pencil eraser—a touch soft but (with careful adjustment) sharp enough to allow me to get sucked into the program. Not surprisingly, shadow detail was hard to come by, as the image tended to crush blacks in the name of delivering more impactful contrast.

### RATING

**Magnasonic PP60 DLP LED Projector**  
 Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

Magnasonic • (855) 293-7253  
 • magnasonic.com

### SPECS

**Dimensions (WxHxD, Inches):** 3.9 x 0.5 x 3 • **Weight (Pounds):** 0.28 • **Resolution:** 640 x 360 • **Brightness:** 25 lumens • **Inputs:** HDMI Ver. 1.x with MHL, Micro USB (power/charging) • **Outputs:** 3.5mm mono analog audio • **Miscellaneous:** Recommended image size (inches), 10-60; throw distance (feet), 1.6-12.5

### THE VERDICT

**Don’t expect much more** than utilitarian image quality, but the diminutive Magnasonic PP60 is a fun product that provides ultimate portability and delivers fair value.



● The PP60’s HDMI input is MHL compliant.



Let’s put all that in perspective: This is a low-low-budget \$170 projector that’s as big as my wallet and half as thick. By A/V enthusiast standards, it’s a toy. Despite its obvious shortcomings, I

was always amazed at what it could do and never really held against it what it couldn’t. Crossing the \$500 mark gets you into a different class of product that starts to mimic what a “real” projector can do. But if your goal is to just walk around with a really cool little wafer you can pull out at any moment to put up a surprisingly viewable image, I don’t think you’ll be disappointed. The Magnasonic PP60 seems to know its target audience and serves it well for not a lot of money.

● The tiny PP60 is about the size of a pack of cards.



# Beam Dream

## RATING

**Sony MP-CL1 Laser Projector**  
 Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

Sony • (877) 865-7669 • sony.com

## Sony MP-CL1 Laser Projector

**PRICE \$350**

**INSTEAD OF** A DLP CHIP AND AN LED light source, Sony's MP-CL1 uses a laser to literally scan its 1920 x 720-resolution image. The laser diode (which is spec'd for 2,000 hours but lasts up to 10,000, Sony says—versus 20,000 to 30,000 for LED) is directed into something called a MEMS mirror. The mirror physically moves to precisely control the beam and create the image. What? You've never heard of MEMS? It stands for "micro electric mechanical system," and it describes a chip that's fabricated like a semiconductor but includes both electrical and mechanical elements to perform a specific task. Sound familiar? That's right: DLP's Digital Micromirror Device (DMD) is also a MEMS.

An interesting advantage to Sony's laser approach is the ability for each pixel to retain its sharpness on the screen with no need to mechanically focus a lens. It's an odd experience to move a projector in or out and watch the image zoom accordingly but with no need to adjust focus. The MP-CL1 will even keep the focus uniform across an image cast on an undulating wall, or if part of the picture sits atop a bump-out or other obstacle. No focus control is even provided.

The MP-CL1 is impressively solid, with a sleek black metal case about the size of a standard iPhone. It comes with a USB-to-micro-USB charging cable (the unit works two hours on a charge), an HDMI-to-mini-HDMI adapter for the

### AT A GLANCE

**+** Plus

- Compact form factor
- Auto focus
- Acts as phone charger

**-** Minus

- No way to fine-tune focus
- Some laser sparkle
- Overly warm color balance
- Only two hours on a battery charge

projector's mini-HDMI/MHL input, and a plastic kickstand that casts the image slightly upward for coffee-table placement. (The tripod insert found with the other projectors is absent here; I had to tape the Sony to my tripod. Also absent is a carry bag.) Along with HDMI, you can connect with Wi-Fi mirroring from Android sources. There's also a regular USB port that will charge your phone in a pinch from the MP-CL1's battery. The projector accepts signals up to 1080p.

Along one side of the MP-CL1 is an on/off button and a little swivel/plunger control used to access the menu, navigate up/down, and then select. The menu is surprisingly extensive and includes controls for vertical and horizontal keystone correction, contrast and brightness, and color saturation and hue. An alignment menu is used to periodically reconverge the laser's red, green, and blue primaries.

I was wowed by the Sony's technology,

and user interface, and it threw a respectable image, though not without some noticeable flaws. First, the good: Although it has only 37 lumens of light output, it's rated to cast pictures from 40 to 120 inches, so my 65-inch image target was well within its range. The 2.2 ft-L or so that I measured at that size, while still meager, was a bit brighter and had more perceived punch than the Magnasonic's image. This was thanks in part to the Sony's ability to achieve a much deeper black than any of the DLP models I tested (see the accompanying chart). It had, by far, the best measured contrast ratio of any of the four projectors at any image size, though its lack of brightness was still limiting, even at 65 inches. Ultimately, I found that pushing the projector in for a 50-inch image gave it satisfying brightness, though that shrunk to 30 inches to get to my 12 ft-L ideal target.

At any image size, I was troubled by a color balance that leaned too far red in the dark areas of the picture. This was quickly apparent in the already golden-red landscape in the opening scenes of *The Martian*, as well as in *Rogue Nation*, where it made the dark wood of a record-store listening booth and the paneled walls of a Senate hearing room take on a reddish hue instead of the natural dark brown walnut seen on a proper display. This was mitigated by reducing the color saturation a touch, but the hue control wasn't much help. And despite the projector's 720p resolution, that last bit of sharpness was always missing, even from small

images, and it made me yearn for a lens adjustment for fine-tuning. Finally, the nature of laser projection is that you get pearlescence in lighter areas of the image that becomes more

### SPECS

**Dimensions (WxHxD, inches):** 5.9 x 0.5 x 3.1 • **Weight (Pounds):** 0.46 • **Resolution:** 1920 x 720 • **Brightness:** 37 lumens • **Inputs:** HDMI Ver. 1.4b with MHL 2.2, Micro USB (power/charging) • **Outputs:** 3.5mm stereo analog audio, USB (for charging external devices) • **Miscellaneous:** Recommended image size (inches), 40-120; throw distance (feet), 3.77 at 40-inch screen size

### THE VERDICT

**Sony's super-cool laser projector** delivers an acceptable image and easy setup when compactness and portability are paramount.



#### ● The MP-CL1 accepts signals up to 1080p.

apparent with camera movement. The MP-CL1 has technology to tame this so-called laser sparkle, though I did spot it occasionally. It wasn't particularly bothersome.

Again, it's only fair to lower the expectations for a \$350 projector that is so small and so remarkably high-tech for its price, and whose intended purpose is really just to deliver mobility and a useful image when you need it. Most users will likely be amazed by the Sony and what it can do and will readily forgive its faults, if they even notice them. And while you'll find alternatives at its price that might deliver a brighter and perhaps even sharper image, they most certainly won't have the incredible portability or cool factor of the MP-CL1.



● The laser-driven MP-CL1 focuses automatically on any surface.

● An included kickstand casts the image slightly upward when needed.

# Power Play



## RATING

Vivitek Qumi Q6 DLP LED Projector

Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

## Vivitek Qumi Q6 DLP LED Projector

**PRICE \$599**

**STEPPING UP** FROM THE TINY, battery-fed Magnasonic and Sony portables to Vivitek's AC-powered, \$599 Qumi Q6 puts you into new territory. At a compact 6.5 inches wide x 1.3 high x 4 deep, it's not going to slip into your pocket, but it will fit easily in a briefcase or backpack, and it comes with a padded carry pouch that holds the projector, its small power brick, the credit-card-style remote, and the included HDMI and HDMI-to-mini-HDMI cables. It's a stylish little thing with rounded corners that comes in seven colors, including the snappy brushed gold of my review sample. There are unraised and fairly invisible touch-sensitive controls on the top for operation and menu access that proved annoying—I inadvertently excited them every time I touched the projector. So I stuck with using the remote.

The Qumi Q6 is loaded with features and connections. There are two HDMI ports (one MHL compliant) and a USB port for a flash drive loaded with video or photos; an integrated Office Viewer opens Word, Excel, PowerPoint, text, or PDF documents. You can store content in the Q6's 4 gigabytes of internal memory or tap built-in wireless connectivity from either an Android or iOS device via a third-party app for your device from EZCast. I found the app suitable for use with static content, but less so for streaming

### AT A GLANCE

**+** Plus

- Powerful big-picture brightness
- Extensive image adjustments
- Accurate color reproduction
- Exceptional flexibility

**-** Minus

- So-so blacks
- Slightly soft focus

video, where it tended to stutter and buffer on hi-res YouTube clips. There's a tiny built-in speaker and a 3.5mm analog stereo audio output. And the Q6 displays 3D video via 144-Hz DLP-Link glasses (not supplied), though only from PC sources playing 1024x768, 120-Hz signals and not from 3D Blu-ray players.

Compared with the true pocket projectors, the Q6 trades a bigger footprint and wall-power requirement for 800 LED-driven lumens of light output, while still delivering 1280 x 800 (WXGA, 720p) pixel resolution from its 0.45-inch DLP chip. The projector is spec'd for images from 30 to 90 inches, and at my target 65-inch size, peak white measured a bright 178 ft-L. Image size at 12 ft-L, my suggested minimum for dark-room movie watching, was a large 82 inches. And out of the box, the Q6's color tracked like a

more expensive projector's, with grayscale hovering close to the 6500K (D65) color temperature standard across the full brightness range in the Movie preset.

Menu options were closer to those of a more serious rig: about a half-dozen picture modes for presentations, gaming, movie-watching, or other scenarios, including a Bright mode that boosts light output even further but didn't share the accurate color of the Movie preset. Other settings included automatic or manual correction for vertical keystone; three color temps (including the preferred Warm setting for movies); gamma adjustments from 1.8 to 2.4, and the usual contrast, brightness, sharpness, color, and tint controls. A low-power mode provides a slower fan speed, but even when I used the high setting and sat within 3 feet of the projector, I never found fan noise obtrusive, and it disappeared completely when I was watching content at normal volume.



After I did some casual fiddling with the picture controls, image quality was really quite good with the Q6. That field of tall green grass that opens *Rogue Nation* now looked more natural and saturated compared with the performance of the pocket projectors. And in the excellent Blu-ray transfer of *The Martian*, fleshtones were well rendered (if perhaps leaning just a bit pink)—notably in close-ups of the crew in their space station and mothership, as well as in the face and torso of stranded astronaut Mark Watney (Matt Damon) as he strips off his space suit early in the movie to dress his body wound. The familiar red, white, and blue NASA logo rang true. The Qumi also nicely handled the dark "gray fence" scene from *Ex Machina*, where I saw less video noise in the gray slats and no distracting moiré on the vertical lines as the camera panned across.

So, what's not to love? The caveats again fall under the category of nitpicks from a spoiled enthusiast,

## SPECS

### Dimensions

**(WxHxD, inches):** 6.5 x 1.3 x 4 • **Weight (Pounds):** 1.0 • **Resolution:** 1280 x 800 • **Brightness:** 800 lumens • **Inputs:** HDMI Ver.1.4b (2, 1 with MHL); USB (Type A) with document reader • **Outputs:** 3.5mm stereo analog audio • **Miscellaneous:** Recommended image size (inches), 30-90; throw distance (feet), 3.28 to 9.84

## THE VERDICT

**For such a small** footprint, Vivitek's Qumi Q6 impresses with its big, bright picture, excellent color, and generous feature set.



and they need to be taken in the context of what is still, after all, a pretty small and inexpensive projector. That said, the Q6's worst faults were a fairly high black level compared with what a more expensive and larger projector might do (letterbox bars were closer to a light gray than black) and a lack of really fine focus, especially at 65 inches and beyond. Thanks to the bright, punchy picture, the lack of deep black was easily forgiven, even on scenes in *The Martian* that mixed bright highlights with the black background of deep space. Focus was mostly sharp, and close-ups easily revealed details in Watney's stubble, as well as in the grass-covered camouflage hat worn by Benji (Simon Pegg) in *Rogue Nation*. Still, I did find myself frequently revisiting the focus thumbwheel, yearning for that last modicum of sharpness that the Q6's small lens just couldn't muster.

Like I said, these are enthusiast nitpicks. Ultimately, I spent many hours being engrossed by the pictures from Vivitek's Qumi Q6, and I found it a surprisingly good projector that delivered impressive pictures for its size and cost.



**Optoma ML750ST DLP LED Projector**  
 Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

# Gotta Look Short

## Optoma ML750ST DLP LED Projector

**PRICE \$549**

**THE "ST"** IN THE MODEL NUMBER of the Optoma ML750ST stands for "short throw" and denotes the newest version of the previously released (and still available) ML750. A short-throw lens allows a projector to sit closer to the screen for a given image size. This can be a real convenience when you're trying to blast a large image from a tabletop, which might otherwise require the projector to be placed behind audience members (who cast shadows with every trip to the loo). But I quickly found that a short-throw lens seems to yield another, more significant benefit. I'll get to that in a moment.

Measuring 4.1 inches wide x 1.5 high x 4.2 deep, the ML750ST is rated for 700 lumens from its LED light source, and it uses a 1280 x 800 (WXGA, 720p) resolution DLP chip. The projector has a single HDMI-MHL input, a "universal I/O port" with an included adapter for a VGA computer connection, a microSD card slot that adds up to 32 GB to the onboard 1.5 GB of internal memory, and a USB port for a thumb drive. Like the Vivitek Qumi Q6, which costs \$50 more, there's an integrated document reader, but unlike the Q6, wireless mirroring from an iOS or Android device requires an optional USB dongle (model WUSB, \$30); as with the Q6, wireless connectivity requires the use of an EZCast app. Viewing 3D requires a PC-driven 1024x768, 120-Hz signal and DLP-Link glasses (not supplied). Control is via buttons on the projector's top or the included credit-card remote.

A protective carry bag is provided.

### AT A GLANCE

**+** Plus

- Convenient short-throw setup
- Bright, big, contrasty pictures
- Excellent focus and detail
- Great out-of-box color

**-** Minus

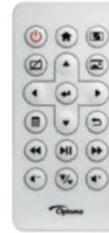
- So-so blacks
- Noticeable fan whine
- Wireless dongle not included

The Optoma's menus are fairly sophisticated and offer Cinema, Photo, Eco, Bright, and PC presets with adjustable contrast, brightness, saturation, and hue settings, along with three color temp options. The Cinema mode was essentially accurate for contrast and brightness, and grayscale tracking stayed close to the D65 standard. Manual or automatic vertical keystone correction is provided.

As for that extra benefit of a short-throw lens: Upon setting up the Optoma, I quickly realized that its proximity to the screen appears to give it more efficient use of the available light output. The projector threw its 65-inch image from just 44 inches away from the screen, much closer than any other projector I tested, and it gave me a super-bright (for an LED mini projector, anyway) 23.1 ft-L peak white output. For the sake of comparison, the Vivitek measured a still excellent 17.8 ft-L at the same image size from 87 inches away, though with 100 more rated lumens output.

The Optoma's brightness edge was quite noticeable, and with black levels comparable to the Q6's, the added brightness also brought it some additional contrast and punch. *The Martian* suddenly looked awesome in a way it hadn't before, taking on the kind of engaging brightness, contrast, and color that I've seen from this disc on my reference projector. The colors generally seemed more saturated and had more pop, and I began noticing things like the American flags on the astronauts' space suits. Meanwhile, stark whites displayed in the exteriors of the space ships or in the pristine clean-room-like interiors were appropriately neutral, and shadow details became more obvious in darker areas of the image. While watching the *Rogue Nation* opener, I noticed for the first time, in the background, the blue of the sky and the white of the clouds—and I even noticed that the woods behind the field where Benji is hiding were shot near the twilight hour and hanging onto their last bits of fall color. Focus, adjustable via the Optoma's lens ring, remained satisfyingly crisp at all times, even when I temporarily blew the image up to my full 92-inch screen.

Like the Vivitek, however, the \$550 ML750ST was not without its faults. Deep blacks remained fairly light by enthusiast standards, though again delivered no distracting penalty on most content, thanks to the high brightness. More serious to me was fan noise that, though not particularly loud, seemed higher in pitch than I'm used to and called some attention to itself within 5 feet or so of the projector. It was drowned out by movie soundtracks at normal volume but might be distracting during a slide presentation. And though the Optoma is rated for an image up to 200 inches, don't count on that. At 170 inches, the largest I could test in my room, it was way too dark to see any of what makes this projector's performance stand out.



Optoma • (888) 289-6786 • optomausa.com

### SPECS Dimensions

**(WxHxD, inches):** 4.1 x 1.5 x 4.2  
 • **Weight (Pounds):** 0.8; power supply, 0.3 • **Resolution:** 1280 x 800 • **Brightness:** 700 lumens (LED Brightness spec) • **Inputs:** HDMI 2.0, with MHL; USB (Type A) with document reader; universal I/O (VGA with supplied adapter); microSD; Wi-Fi mirroring (optional dongle required)  
 • **Outputs:** 3.5mm stereo analog audio • **Miscellaneous:** Recommended image size (inches), 25-200; throw distance (feet), 1.4 to 11.3

### THE VERDICT

**The enhanced setup and performance** from the Optoma ML750ST's high-quality, short-throw lens make this AC-powered mini projector an easy recommendation.



But at any reasonable image size up to 80 or 90 inches, the ML750ST was indeed special. At the beginning of my survey, I knew I'd have to lower my enthusiast expectations and account for the engineering trade-offs required to achieve compact size and affordability. What I didn't expect was to find even one projector among four that I could comfortably recommend for even quasi-serious movie watching. No, the Optoma won't go as bright or as black as my \$4,000 reference projector. But it practically fits into the palm of my hand, and it threw a highly satisfying image for my critical eye at about one-seventh of the price. The ML750ST just wowed me with its combination of performance, portability, and low cost. It's a great value. ♦



● **The Optoma's focus is adjustable via its lens ring.**

# TUBE AMPS for Pocket Change

There are tube headphone amps on Amazon for \$50, but are they any good?

By Geoffrey Morrison

**EVER BROWSE AMAZON LATE** at night? Like, really late at night? Maybe you're bored. Maybe you need a new pair of socks, and you go down a rabbit hole. Maybe you've

downed a fifth of Crown Royal Maple whisky because it's Tuesday in the middle of February and you've broken your leg in two places and the

Vicodin is finally kicking in, and *OMG, I need a vacuum-tube headphone amp!* Just an example. Whatever.

Some part of you realizes, OK, I don't *really* need a tube headphone amp. So, what's the cheapest one I can get that still looks cool—something I don't mind sitting on my desk while I'm trapped inside for 8 to 12 weeks? (Again, just an example.)

OK, so no more than \$50. Hey, there's one for

\$50! And that one's only \$35! Hmm, that one's \$68, but look how cool it looks! No, no, no. I won't spend more than \$50.

So, maybe it's two days later, and maybe you're zonked out on your sofa three hours into a *Real Housewives of Provo* marathon because you can't reach the remote (maybe, whatever), and Amazon delivers \$212 worth of headphone amps to your house.

Well, now what do you do? You absolutely do not e-mail Rob Sabin and pitch him on a cheap headphone amp roundup. [Oops.—RS]



## Bravo Audio V2

**PRICE \$68**

**IN THE HARSH REALITIES OF A** sober morning, I set about my task, having managed to burn in the three amps overnight. Bravo Audio's V2 is definitely the coolest looking of the bunch. The single Shuguang 12AU7 tube and big capacitor pierce a clear plastic top, while all the various bits, heatsinks, and connections

sit below. The company's logo is even great, saying Brav Audi in big letters next to an illustration of a record on a turntable.

The Brav Audi feels fairly solidly put together, or about as solid as you can expect from a \$68 tube hybrid amp. (Our tech editor Mark Peterson says that, technically, the twin triode sections in the tube act as buffer stages for both channels while the output stages are solid state.

Whatever.) It's the only one of this bunch that has a ¼-inch headphone output, the others being saddled with, oddly, ⅜-inch outputs only. The V2 even has RCA line-level inputs to go along with its ⅜-inch input. As with the other amps here, an LED embellishes the tube with a blue glow; apparently, each of the three manufacturers decided that a device that *actually glows by itself* wasn't enough, and it needed an LED

### AT A GLANCE

**+** Plus

- Cool looking
- ¼-inch jack
- Um, did I mention cool looking?

**-** Minus

- No pesky highs or lows

to help. On the V2, a bright red LED on its circuit board adds to the luminance. [As Peterson also noted, there is an explanation. Line-level vacuum tubes like those employed here have only minimally visible glow, especially if the room isn't darkened. Power rectifier, power output, and antique tubes are the ones that naturally emit that pleasant orange/blue glow. LED glow-enhancement has apparently been employed since the '80s.—RS]

My test setup was what I figured a real-world use of these amps would be: analog from my PC's headphone

### RATING

**Bravo Audio V2 Headphone Amp**

- Performance ★★★★★
- Features ★★★★★
- Ergonomics ★★★★★
- Value ★★★★★

### THE VERDICT

**If it were a knife,** it wouldn't cut hot margarine.

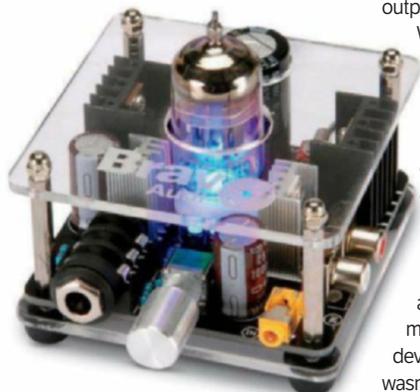
### SPECS

**Dimensions**

**(WxHxD, inches):** 3.11 x 1.73 x 3.11  
**• Weight (Ounces):** N/A • **Inputs:** Stereo analog (1), ⅜-inch stereo (1) • **Outputs:** ¼-inch stereo (1) • **Output Power:** N/A • **Output Voltage:** N/A • **Output Impedance:** N/A • **Compatible Headphone Impedances:** 20 to 600 ohms

**BRAVO AUDIO V2 HEADPHONE AMP**  
**PRICE:** \$68  
 Bravo Audio • bravoaudio.com

output, running iTunes (mostly lossless CD rips) into a variety of





headphones. Alternately, I used my iPod as the source, running the same files. I'd also had the prescience to buy a FiiO A3 solid-state headphone amp for comparisons with the tube amps; the A3 is \$9 cheaper than the V2, and it's portable.

That said, I started with the \$1,099 Oppo PM-1 planar magnetic headphones, because, why not? This is a fantastic set of 'phones, and through the V2, they sounded... boring. None of the planar's typical succinct attack and openness could be heard. Bass was subdued and sloppy, and low bass was nonexistent.

I swapped in the FiiO A3 immediately. Sure enough, the soundstage opened up, the treble appeared, and the bass got tighter. Maybe the V2 just couldn't handle the load presented by the PM-1s, or

perhaps the designers just voiced it too warm.

Next I tried the Sony MDR7506 (\$130), easily my pick for the best over-the-ear headphones under \$150. Compared with the FiiO, the V2 seemed to suck some of the air out of the music, made the remaining treble slightly harsher, and bloated the bass like an overstuffed Chipotle burrito.

The V2 sounded its best with the Beyerdynamic DT 990 open-back headphones (\$299). It rolled off a bit of the 'phone's exuberant high



end. Grimes' "Realiti" sounded far more balanced, with a great open spread and decent (though not over-the-top) bass.

Even with my favorite in-ear headphones, the B&W C5 Series 2 (\$180), the V2 took away bass definition, made the treble more brittle, and compressed the soundstage. The C5 sounded better connected directly to the PC.

Style over substance, it seems. I didn't have high hopes for the cheaper remaining contenders.

# Nobsound NS-08E

**PRICE \$50**

**THE AMAZON PAGE FOR THE Nobsound** [I checked and, surprisingly, you didn't make up that name. —RSJ] claims "exquisite appearance and outstanding hi-fi performance." And then it advises me to "Take it home, you will like it!" Apparently, I did do the former, though for the latter, don't tell me what to do, Nobsound. The front of the amp says, "NS-08E," but it's listed on Amazon as the Nobsound 6J9.

Given that name, it's probably not surprising that the two tubes rising from the middle of the small chassis are of the 6J9 variety. As with the Brav Audi, this is also a hybrid amp; the tubes here act as buffer stages while solid-state output devices do the heavy lifting of motivating the headphones. The copper-colored, machined-metal faceplate is easily the nicest single component of any of these amps. It came with a "QC PASSED" sticker on the



front that I left on as a comforting reminder, but you can remove it if you want. And the volume knob even has classy detents as you turn it.

After being aggressively unimpressed by the V2, I didn't expect much from the Nob. In my nearly 16 years of reviewing, I'm not sure I've ever been more wrong. No joke, this thing is *fantastic*. Not "fantastic for \$50" but legitimately fantastic. The soundstage is huge, and there's a lot of power to bring out the best in a pair of headphones. I sat for over an hour, trying new songs on different headphones, just because of how great the Nob made things sound.

With the Oppo headphone, Chvrches' "The Mother We Share" came alive: It was balanced and controlled, and it had full bass, with a wide soundstage. All of those things were less prominent via the PC's headphone output, or via my

## AT A GLANCE

**+** Plus

- Simple looking but attractive
- Fantastic sound
- Lovely glowing tubes

**-** Minus

- Blurrrrrp
- Dinnng

iPod playing the same file. The Oppo didn't sound bad either way, but subjectively, I liked the sound via the Nob over the PC's headphone output or the iPod directly.

Through the FiiO A3, the Oppo didn't sound as big, though it was still quite neutral and natural. Good, but the Nob gave it a bit more energy for bass, and a sharper attack.

The Nob also gave the Sony headphone more immediacy and attack. When I cued up the Grimes track, the drums and synths hit—whereas on the V2, they were more *blub blub blub*.

Julia Nunes' "Then OK" sounded wide open via the Beyerdynamic headphone, with the uke and drums taking on clarity without being harsh. Direct from the iPod, it was a touch more mellow but not quite as open.

With the same track on the FiiO A3, the Beyers sounded warmer, with less treble than on the Nob. These 'phones seems to really like the A3.

The biggest difference with the B&W in-ear headphones was that the bass was somewhat tighter and more controlled with the A3.

The only major issue I found with the Nob? When you first turn it on, it emits a

## RATING

**Nobsound NS-08E Headphone Amp**

Performance ★★★★★

Features ★★★★★

Ergonomics ★★★★★

Value ★★★★★

## THE VERDICT

**Cheap, cool looking, sounds great.** Best \$50 I've spent in ages.

## SPECS Dimensions

**(WxHxD, Inches):** 2.72 x 2.87 x 4.37 • **Weight (Ounces):** 6.53 • **Inputs:** 1/8-inch stereo (1) • **Outputs:** 1/8-inch stereo (1) • **Output Power:** ≥ 1100mW (32 ohm) • **Output Voltage:** N/A • **Output Impedance:** N/A • **Compatible Headphone Impedances:** 18 to 600 ohms

**NOBSOUND NS-08E HEADPHONE AMP**

**PRICE:** \$50

**Nobsound** • nobsound.com

fairly loud "blurrrrrp" through the signal path. Not ideal if you're already wearing your headphones. (In fact, maybe leave your 'phones unplugged when you turn the amp on.) That, and there's a small amount of background hiss, though it wasn't noticeable when music was playing. Also, if you tap it or bump it, the output rings a little (like a tiny bell), but again, it's not noticeable when playing music.

For \$50, it's easy to love the Nobsound. It looks cool and makes your headphones sound better. Hard to beat that.



# SainSonic Biggermouth A1 Headphone Amp

**PRICE \$35**

**THE SAINSONIC** WAS THE LAST amp I tested, and it had a lot going against it. First, the skinny tubes in my sample didn't sit perfectly vertical, appearing like a pair of fingers giving the peace sign (or the two-fingered salute, if you're British). Second, it has a power supply that is, no joke, larger than the amp itself. The silver chassis is about the size of a pack of cigarettes, but somehow, with the skinny tubes, it all ends up looking rather...perplexed. And third, believe it or not, there's no way to turn the amp off, so you'll just have to enjoy the music at all times, forever.

Like the Nobsound, the SainSonic has a name on the faceplate that

doesn't match the name on Amazon. The faceplate says, "Biggermouth A1." Amazon says, "SainSonic 6J5 Class A Vacuum Tube Buffer Classic 47 Headphone Amplifier Decode Audio Hifi Diy Amp with Power Supply"—or, as I like to call it, the SSCAVTBCHADAHDAWPS for short. It is also another hybrid model, using the tubes as buffers for solid-state output stages.

Oddly enough, the lack of a power switch wasn't the biggest issue with the SSCAVTBCHADAHDAWPS. When it was connected to my computer, there was a high-pitched *squeeeeeee* (a *squeeeeeee* being about 1.4 kilohertz, not to be confused with a *squeee*, which is only around 900 Hz). None of the other amps had this

## AT A GLANCE

### + Plus

- Svelte
- Fantastic sound
- \$35!!!

### - Minus

- No power switch (seriously)
- Tinnitus simulator
- Massive power brick

issue, and neither did the A1 when it was connected to my phone, laptop, or iPod, unless the latter was also connected to my PC. I tried the Biggermouth on my bigger-gaming PC, and the squeal was lower in pitch but still there. Bummer.

Which is all too bad, because sound-wise, I actually liked the A1 the best. Through the Oppos, the bass was easily the best: warm, defined, big. The bass and drums on Taylor Swift's "Shake It Off" punched but were never boomy. The sound was just that little bit more lively and open, the bass just that little bit fuller, than what I heard from the Nobsound. The A1 wasn't as clean when I turned it up, but I got plenty of volume out of all these amps (with all the headphones used), never turning them up even close to half of the volume control's range.

The multilayered guitars, bouzouki, mandolins, and pipes of Planxty's "Little Musgrave" rang true in the Beyerdynamics. The Mountain Goats' "This Year" had strong bass via the Sony. The A1 didn't sound quite as neutral as the FiiO A3, but again, it

## RATING

**SainSonic Biggermouth A1 Headphone Amp**

Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

## THE VERDICT

**How is there no power switch?** Other than that (and the squeal), a pretty great-sounding cheap amp.

## SPECS

**Dimensions (WxHxD, Inches):** 3.76 x 2.9 (est) x 3.94 • **Weight (Ounces):** 5.6 • **Inputs:** 1/8-inch stereo (1) • **Outputs:** 1/8-inch stereo (1) • **Output Power:** N/A • **Output Voltage:** N/A • **Output Impedance:** N/A • **Compatible Headphone Impedances:** 32 to 300 ohms

**SAINSONIC BIGGERMOUTH A1 HEADPHONE AMP**

**PRICE:** \$35

SainSonic • sainsonic.com

was a pleasing, more lively sound.

Did I mention you can't turn it off? Even if you unplug the power cable from the amp, the brick still glows, drawing some power. I guess if you're buying a tube headphone amp, being green isn't too high a priority, but still.

Spend the extra \$15 and get the Nobsound.



## BOTTOM LINE

What started as a joke rapidly turned into flat-out amazement. I had thought these amps would be good for a laugh and I'd be able to make all sorts of funny analogies about how bad they sounded. Nope. Well...in the case of the Bravo Audio V2: Yup. But the Nobsound NS-08E and the SainSonic Biggermouth A1 legitimately sounded great. The FiiO A3 solid-state amp, though not part

of the main point of this review, was also a reliable and inexpensive (and portable) unit.

A headphone amp can't turn bad headphones into good ones. But it can, and most of these amps do, make great headphones sound just that little bit better. And for \$50 (or less!), that's pretty cool. I'll be happy to use the Nobsound, at least, long after my

cast comes off. Uh, not that any of that was real. Just an example.





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# A New Kind of OLED

By Thomas J. Norton

## LG Signature OLED65G6P OLED Ultra HDTV

**PRICE \$8,000**

**WHILE THIS** ARTICLE IS STRUCTURED as a Test Report, in fact it's a good bit short of a full-fledged evaluation. The combination of the cost of LG's flagship OLED and the limited supply of review samples in early April prompted the company to set up a couple of displays at a venue in New York City, then shuttle in groups of A/V journalists to lay hands on the set—so to speak.

*Sound & Vision's* day was divided into two phases. In the morning, we were given a briefing on LG's Ultra HDTV lineup for 2016—plus a presentation on the technical aspects of Dolby Vision, one of the two most prevalent formats to date for delivering high dynamic range (HDR) on consumer video. Dolby reps were on hand to argue the superiority of Dolby Vision over HDR10, the other leading contender and the format that's exclusive to the initial launch of Ultra HD Blu-ray titles. (For more on the briefing itself, see the accompanying "LG and Dolby Vision.")

### AT A GLANCE

#### + Plus

- Excellent HDR in both Dolby Vision and HDR10
- Blacks to die for
- Solid off-center viewing

#### - Minus

- Expensive
- Careful setup critical for best results
- Menus tedious to navigate

Dolby Vision material is currently available only via streaming from sites such as Vudu. According to Dolby, there will be Dolby Vision Ultra HD Blu-ray releases later in the year. As I write this, however, the only UHD Blu-ray player is the Samsung UBD-K8500 (reviewed in our June issue, also available at [soundandvision.com](http://soundandvision.com)), which does not recognize or pass through Dolby Vision bitstreams. This shouldn't leave early adopters high and dry, though. All UHD Blu-rays offering Dolby Vision must also offer HDR10; no UHD Blu-rays will be

mastered in Dolby Vision alone.

All of LG's new OLED Ultra HD models (and the company's top-of-the-line LCD UHD sets as well) are designed to get the best out of both Dolby Vision and HDR10. Last year's LGs were HDR10 only. These new models are, in fact, the first sets we've seen from any manufacturer that deliver both formats. Vizio promises that their new P series LCDs will do both; the sets offered only Dolby Vision on release, but an HDR10 upgrade has been promised, though with no announced target date as of this writing in early May. Nor has there been any word on an HDR10 upgrade for Vizio's Reference series; as of April, these LCDs, such

as the RS65-B2 (February/March and our website), offered only Dolby Vision. New Panasonic, Sony, and Samsung sets announced to date offer only HDR10.

Following the briefing, we were on our own to spend time with the 65-inch OLED65G6P. Editor-in-Chief Rob Sabin, who lives in New York, had schlepped to the event some cables, his computer loaded with SpectraCal's CalMAN 5 calibration software, two calibration meters, a tripod, and Samsung's Ultra HD Blu-ray player (horrors, LG and Samsung, together at last!). Because I had traveled to the wilds of Manhattan via connecting flights from the upscale environs of northwest Florida, I had brought along a tiny DVDO 4K generator, all the UHD Blu-rays I could pack (as it turned out, we only had time to use three of them), a note pad, and a few trinkets to trade with the locals. But I



● The hinged base can be swiveled back for wall mounting.



## RATING

LG Signature OLED 65G6P Ultra HDTV  
2D Performance ★★★★★  
3D Performance ★★★★★ Not Evaluated  
Features ★★★★★  
Ergonomics ★★★★★  
Value ★★★★★



## THE VERDICT

**Our brief time with LG's flagship OLED for 2016 suggested it's not perfect (what is?), but apart from the fact that LCD sets still go brighter than OLEDs, it's unlikely that any other new HDR-equipped Ultra HDTV will be able to match or exceed the performance of this one.**

## HDTV

**LG SIGNATURE OLED65G6P OLED  
ULTRA HDTV • PRICE: \$8,000  
LG Electronics • (847) 941-8182 •  
lgusa.com**

had forgotten my flashlight, which turned out to be a pain, as neither of the remotes (the set's nor the player's) was backlit.

While LG makes both flat sets and curved ones, the G6 is flat (as will be the upcoming E6 and B6 OLEDs). And apart from a small area at the back of the panel, it's about the thinnest set we've seen. Essentially a sliver-like OLED panel applied directly to a pane of glass (LG calls it Picture-on-Glass), the unique design includes an attached base/stand that contains a soundbar and (I suspect) some of the video electronics as well. The base and display are actually hinged so the base can be rotated back for wall mounting, if desired, while still allowing the audio to function.

There are four HDMI 2.0a (with HDCP 2.2) inputs. The inputs, electronics, and panel can all accept 10-bit video when present (and it will be on Ultra HD Blu-ray). The set can also accept 12-bit video (accounted

for in the Dolby Vision standard) but will downconvert this to 10 bits internally prior to processing and display. According to LG, the set is able to display up to 99 percent of the P3 color gamut currently being targeted for new UHD content. It will also decode Ultra HD sources that use either the HEVC (H.265) or VP9 codec. HEVC will be used on most UHD sources, though some websites (notably YouTube) use VP9. The OLED65G6P does 3D, and two pair of passive glasses are provided; if you need more, LG offers a four-pack of AG-F315 glasses for \$30.

### What We Tested (and Didn't)

A review of an HDTV can be an incredibly thorough and lengthy process—or a short but limited one. When we receive a set for review, we often take days just to get familiar with all the controls and how they interact. Next comes calibration,

and then there's extended viewing using a variety of sources. I'm usually uncomfortable spending less than two weeks with a set prior to laying fingers to keyboard (though sometimes, deadline pressures demand that this be shortened).

When the set in question incorporates new technology and new procedures, the timing can stretch beyond this. As mentioned above, in the case of the LG Signature OLED65G6P, the review was done on LG's turf; the company wanted to give as many publications as possible hands-on exposure to the set as quickly as possible. Therefore, we had just a little more than four hours with the set, including setup of our test gear. That's not a lot of time.

Our tests began by viewing the set out of the box with only basic control adjustments, then performing a 1080p standard-dynamic-range Rec. 709 (also called BT. 709) calibration before viewing the same 1080p material again to check the result. (For the next few years, 95 percent of the material you'll be

watching will be optimized for 1080p in the BT. 709 color gamut.) The change from the calibration was visually inconsequential (the color was very good out of the box), though anyone spending this much money for a set should consider a professional calibration at some point. Because time was short, we limited our calibration to the set's two-point White Balance controls; we left the 10-point and Color gamut controls in their default positions. The set's Color and Tint controls looked perfect in their defaults (we checked with a color bar test pattern and the set's Blue Only picture setting). A 1080p sharpness test pattern revealed very subtle edge enhancement even with the Sharpness control full off, though this wasn't visible from more than 2 to 3 feet away.

Since the CalMAN software needed to calibrate Dolby Vision is

subject to changes (an additional update for the existing software was still being developed as of our test day), and since calibration software for HDR10 isn't available yet, we configured the picture settings for HDR material subjectively. Time limited the HDR10 discs we used to *Life of Pi*, *The Martian*, and *The Smurfs 2*. We also viewed the only Dolby Vision material made available to us that day by Dolby and LG, on a USB flash drive: short excerpts from *Jupiter Ascending* and *Pan*, plus a brief Dolby Vision promotional piece.

There wasn't time to check out the set's smart TV features (it uses LG's latest Web OS 3.0 interface), its 3D performance, or the Harman/Kardon audio system exclusive to the Signature models (there will also be a 77-inch G6). But we'll hopefully have a more thorough look at LG's new E6 or B6 OLED, each of which will be more affordable than this Signature G6. While the latter two (and also the new curved C6) will lack some of the features of the Signature G6 flagship, they will, according to LG, offer identical video performance, adjustability, and (for those to whom it matters) 3D playback capability.

### What We Saw

#### ● The LG's OLED panel is mounted on glass.

Prior to our own testing, LG had set up two G6s side by side in a separate

area. One of them showed selected scenes from *Pan* in Dolby Vision (from a USB stick). The other showed the same material, but from the standard 1080p Blu-ray. While the resolution differences were negligible (as we've come to expect from 4K on a 65-inch screen viewed from a few feet back), the Dolby Vision images were richer, with deeper colors. These images were subjectively darker overall, but they had more pop at the top end and better shadow detail at the bottom than their 1080p counterparts. In my limited time comparing HDR10 material with standard 1080p, I've found the differences, while very real, to be less extreme than what we saw here. Was this indicative of the



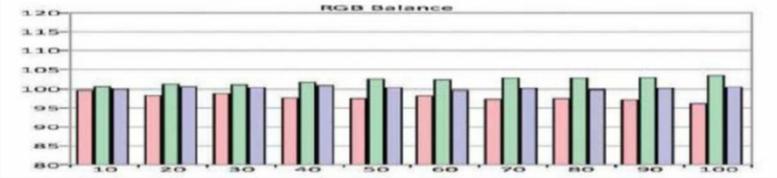
● A soundbar speaker runs the width of the bottom of the screen.

TEST REPORT

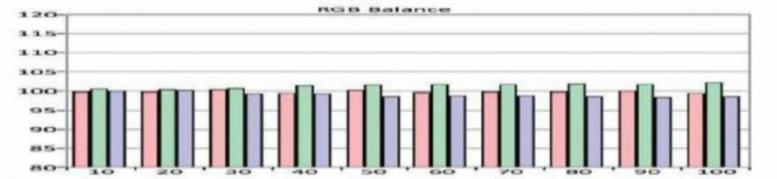
# Test Bench

## LG Signature OLED65G6P OLED Ultra HDTV

BEFORE Calibration



AFTER Calibration



**FULL-ON/FULL-OFF Contrast Ratio:**  
Unmeasurable

**THE** measurements here were made using CalMAN 5 measurement software from SpectraCal, together with an X-Rite i1Pro 2 spectroradiometer, Klein K10-A colorimeter, and AVFoundry VideoForge pattern generator.

**WITH** the G6's controls properly set, the light output from the LG's screen with a full black field displayed in our fully darkened testing space was unmeasurable. An OLED can shut off its pixels completely under these conditions. While this generously could be called an infinite full-on/full-off contrast ratio, I prefer the more conservative approach (science doesn't, or shouldn't, deal in absolutes), and refer to it as unmeasurable.

**WE** performed only one full calibration on the G6; for reasons referenced in the main text, we didn't calibrate for Dolby Vision or HDR10. Our calibration here was done on standard dynamic range (non-HDR) 1080p HD (upconverted to 2160p by the set) at a D65 white point and a Rec. 709 (BT. 709) color gamut. The LG's OLED Light was set to 40, Brightness to 57, Contrast to 80, Color to 50, and Tint to 0. The Gamma was set to BT. 1886. (When viewing HDR material later, we used the TV's default HDR settings with minor subjective tweaks.)

**PRE-CALIBRATION**, the min/max grayscale Delta E (from 20% to 100%) measured 1.48 at 20% and 3.93 at 100%. Post-calibration, using only the two-point white balance controls, it measured 1.21 at 20% and 2.31 at 100%. (Our post-calibration two-point control settings were 8 for Red High and 2 for Blue High; all the other white balance controls were left at 0.)

**WE** did not calibrate color points, but the pre/post color Delta E measured a maximum of 2.59 and 2.66 (both in blue, the worst result). This might have been improved with more time to devote, but the

default fell within an acceptable level of error. The post-calibration gamma averaged 2.38 and was generally uniform, apart from an insignificant drop to about 2.3 at 20%. The peak white output, as calibrated, measured 164.7 nits (48 ft-L). This is higher than what we've typically used for non-HDR sets (30 to 35 ft-L). But in the world where consumers are becoming accustomed to HDR, most viewers may well prefer a slightly higher peak brightness for standard dynamic range sources, as long as there are no adverse side effects.

**(DELTA E** is a figure of merit indicating how closely a display adheres to the Rec. 709 HD color standard. Experts generally agree that at levels below 3 to 4, the result is visibly indistinguishable from perfect color. We are now using the most recent mode of calculating Delta E, DE2000.)

**WE** also measured, without calibration, the HDR Effect Picture Mode, which offers a simulation of HDR with non-HDR content. The defaults in this mode—with a setting of Low, Medium, or High—employed the maximums for OLED Light and Contrast (both at 100) and a Color Temperature of Medium. In any of the three settings, the resulting peak brightness was about the same: approximately 428 nits or 125 ft-L. But the gammas were very different. In the Low setting, it averaged 1.55 and was roughly 1.6 at 50%. In Medium, the average gamma was 1.71 but approximately 1.9 at 50%. In High, it was an average of 1.89 and hit about 2.0 at 50%. The uncalibrated HDR Effect Delta E values were unimpressive, though generally remained below 9.0. That sounds terrible, but values between 3 and 10 are viewed as producing a typically visible but (depending on where the errors fall) acceptable alteration of the source's color. We didn't spend our limited time subjectively evaluating the various HDR Effect settings. The video purist will blanch at the measured results, but the feature is there if you choose to engage it.

—TJN

### SPECS

**Dimensions (WxHxD, Inches):** 57.5 x 35.1 x 2.6 (without stand); 57.5 x 34.8 x 9.6 (with stand) • **Weight (Pounds):** 69.9 (without stand); 69.9 (with stand) • **3D Glasses:** Passive, 2 pair included • **Inputs:** HDMI 2.0a (4), component video (1, shared), composite video (1, shared), analog stereo (1, shared), antenna/cable • **Other:** USB (3), Ethernet, RS-232 • **Output:** Toslink digital audio (1)

benefits of Dolby Vision, a less than optimally adjusted 1080p picture, or some combination of both? Until we get the opportunity to check out one of LG's new OLEDs on our home turf, it's difficult to say. But Rob and I were impressed by what we saw.

When we viewed the same Dolby Vision material from an identical USB source on the set we were using for our

personal evaluation, in a darker space (though without a direct A/B comparison), the LG/DV combo appeared to offer the same outstanding performance. The Dolby Vision material looked exceptional, and while it obviously had been chosen to show off the capabilities of that format, it made me eager to see Dolby Vision on UHD Blu-ray so we could compare Dolby Vision not only with 1080p but also with the same material on HDR10 (assuming the latter will be possible).

The rest of the Dolby Vision material on the USB stick was equally impressive. Our tentative conclusion, for now, must be that Dolby Vision can certainly provide the goods. But what about HDR10? For that, we moved on to those UHD

Blu-rays and the Samsung player.

At its best, the LG G6 also performed beautifully on the HDR10 UHD discs. I can't say for certain that *The Martian*, for example, looked better than what I recall from seeing it on the LG 65EF9500 OLED (visual memory being what it is, and considering that the latter set had been returned to LG three weeks prior to this evaluation). But it certainly

looked stunning, and at least as good. *The Smurfs 2*, even more so than the other discs, had the deeply saturated colors we've come to hope for in UHD sources, from Gargamel's deep-red cape to the Smurfs'... um...Smurfy blue complexions. And while not as Smurfastic, *Life of Pi* drew us in with its natural and saturated colors and punchy highlights.

Still, we didn't arrive at the best results with those HDR10 discs immediately. As with the 65EF9500, the setting of the Brightness control proved to be critical, with one or two steps making the difference between, for example, complete black when called for (on a full black screen or the black bars from a letterboxed movie) or a very deep gray.

This was reminiscent of an issue that we'd encountered in prior OLEDs (and that LG officials say has been mitigated to at least some degree in the



● **LG supplies both their full-size Magic Remote and a mini remote with the G6.**

● The connection panel offers four HDMI 2.0a inputs.



new 2016 models; see “LG and Dolby Vision”). OLED pixels can go completely dark, and the transition from black to near-black has been very tricky to manage. Even a small error there can be at least marginally visible on some material in either the crushing of shadow detail or an inability to adequately and quickly process dark, moving content—as in one torture test scene from *Life of Pi* that previous LG OLEDs have also struggled with. During the night storm at sea, with waves breaking around the floundering ship and sheets of rain randomly washing over the image, there were details in the roiling sea on the far left and right of the screen that looked unnaturally dark and pasty. This might easily be mistaken for shadows in those waves, but they didn’t look quite right. It was hardly a deal breaker and not apparent on other scenes we watched. But I mention it because this has been an OLED problem in the past, though one that LG appears to have largely succeeded in solving (this kind of rare material excepted).

At various other moments, we observed examples of what in retrospect appeared to have been odd interactions between the Samsung UHD Blu-ray player (or the

HDR10 UHD content) and the LG display. At one point, we saw noticeably grainy artifacts in the image that then went away. Then, for a while, the set seemed to be displaying noticeably dark shadows (as in a scene from *Pi* that showed excessive shadowing in the faces of Pi and his brother as they lay in bed in the ship just before the sinking) or overly dark images (as in the early scenes from *The Martian*). From experience, we guessed the issue was related to the gamma setting, but that control was locked out for HDR content, and we couldn’t cure the problem by simply readjusting the OLED Light, Contrast, or Brightness control. Switching the Picture Mode from HDR Standard to HDR Bright helped, but only a bit. Only later, after sparkles started becoming apparent in the image and the display began having trouble staying locked onto the player’s signal, did we swap out our 15-foot high-speed HDMI cable for a 7-foot cable, and ensure (per LG’s recommendation) that the set’s HDMI Deep Color control was turned on. After rebooting both the set and the player, these issues all seemed to disappear, and those exceptional HDR10 images we’d seen earlier returned.

Without multiple players, more source material, and more time to fully digest the results, it’s hard to say whether the player, the connection, or the set was responsible for the few oddities we experienced. But given that the LG G6 performed beautifully at its best (as the 65EF9500 had in my review of it, combined with the same model Samsung player), we’ll chalk them up to examples of the interface issues we should expect to see cropping up as HDR displays get mated with new, bandwidth-challenging UHD source devices and wide-gamut, HDR content.

### Conclusions

Despite a few minor issues, the LG Signature OLED65G6P comes about as close to perfect as any set we’ve seen. (When we do find the perfect set, we’ll let you know immediately!) It won’t be capable of the same peak brightness levels on HDR content that an LCD can offer, but it can go totally black in a way that an LCD cannot. And its ability to support both Dolby Vision and HDR10 is a first in the market, not to mention a

welcome feature we’d hope to see in an \$8,000 TV.

Speaking of which: Yes, the OLED65G6P is pricey, but some may recall that the Pioneer Kuro PRO-141FD plasma sold for \$7,000 when last available in 2009, and that was a 60-inch monitor with no audio or off-air tuner. A few years later, the 60-inch Sharp Elite PRO-60X5FD, the best 1080p LCD set then available and arguably the best ever made, sold for \$6,000, with its 70-inch sibling commanding significantly more. The average prices for large flat-screen sets have continued to drop since then, and we’ve become accustomed to that trend. But the state of the art is never cheap. And the LG Signature OLED65G6P is certainly state of the art. ♦



## LG AND DOLBY VISION

**IN THE BRIEFING** PRIOR TO OUR TESTING OF the sets, LG and Dolby representatives spoke on behalf of their new sets and Dolby Vision, respectively. Among other advancements, LG described the OLEDs’ Enhanced Pixel Dimming. It wasn’t clear what that means, as dimming of the actual pixels is inherent in a self-illuminating technology like OLED (it resembles plasma more than LCD in that respect). The new OLEDs were also said to cover 99 percent of the P3 color gamut, an improvement over last year’s models. For those who wonder about the even wider BT. 2020 gamut standard supposedly supported by Ultra HD Blu-rays, no current consumer set can get anywhere near it as yet. P3 is the gamut used in digital cinema, and it’s wider than the standard HD Rec. 709 gamut.

LG’s Bit Depth Enhancement (BDE) was said to improve the transition from total black to near

black. And because of OLED’s unsurpassed black-level performance, LG’s OLEDs were said to be capable of 20 f-stops of dynamic range versus 14 stops for LCD—an important argument for why LG says that OLED’s inability to hit the high peak-white values of LCD models isn’t meaningful.

There are now five lines of OLED TVs from LG, including the EG9100 carried over from 2015. The Signature G6, evaluated here, is the flagship and is flat, as are the new B6 and E6 series; the C6 series is curved. The new models are distinguished from the G6 by their physical design and features but are said to offer the same video performance. Apart from the 65-inch Signature G6 at \$7,999 and the 77-inch version at \$24,999, no prices were announced as of press time. They may be by the time you read this.

Dolby personnel then stepped on stage to discuss the merits of Dolby Vision, the HDR

format now added to all new LG sets (in addition to the existing HDR10). It was said to be an end-to-end format, with specifications and tools for content production, grading and post-production, mastering and encoding, distribution, and playback. While about 50 titles from seven studios have been mastered in Dolby Vision as of this writing, they’ve only been distributed to date either theatrically (in the new Dolby Cinema-equipped theaters) or through a limited number of streaming services, such as Vudu. Dolby did state, however, that Dolby Vision titles on UHD Blu-ray are coming, which should give us reliable Dolby Vision content for evaluating displays.

A critical difference cited is that Dolby Vision always uses dynamic metadata to optimize the picture from scene to scene. According to Dolby, the competing HDR10 uses static metadata, which results in more restricted performance.—T/JN

**The LG Signature OLED65G6P comes about as close to perfect as any set we’ve seen.**

# Emotionally Charged

By Mark Fleischmann

## HiFiMan Edition X Headphones

PRICE \$1,799

**HEAD-FI IS** SOMEHOW MORE personal than hi-fi or home theater. I may love my loudspeakers, but I don't wear them on my head. Speakers bring music into my room; headphones bring music into my head, and voices in my head are the very definition of personal. So if the sound of my fairly stable main system is aesthetically consequential, the sound of my constantly rotating head-fi system is emotionally charged. That may explain the intensity of my bond with the HiFiMan Edition X headphones. The look pushes my

### AT A GLANCE

**+** Plus

- High resolution and sensitivity
- Ultra-thin planar diaphragms
- Snazzy cosmetics

**-** Minus

- No friend to dirty amps
- Can sometimes sound over-etched

bling buttons, and the sound brings me closer to music—close to what I love, to my original motive for

getting into audiophilia in the first place.

Founded in 2007 by Dr. Fang Bian, HiFiMan makes not only headphones—including both full-size and in-ear models—but also portable hi-res music players and a hybrid tube headphone amp (EF100, \$499). The four music players range from \$199 for the affordable HM700 to \$1,499 for the top-of-the-line HM901s. The in-ears range from \$49 for the RE300h and RE300a to \$199 for the RE600 Songbird and RE600S. The Edition X (\$1,799), reviewed here, is one of five full-sized planar-magnetic headphone models—the only kind the company makes (apart from in-ear models). The others include the top-of-the-line HE1000 (\$2,999), HE560 (\$899), HE400i (\$499), and HE400S (\$299).

The Edition X is one of the most glamorous full-sized headphones I've ever seen. The blue-gray of the shiny earcup ring happens to be my favorite color. Its asymmetrical inverted-egg profile and beveled earpads are designed to fit the contours of a variety of skulls—they certainly fit mine—while the “window shade” thin-slat grille design is intended to reduce reflections from the open back. Incidentally, you probably won't want to use these headphones outdoors. Open-back headphones don't seal out noise, and the loveliness of the Edition X might attract the wrong kind of attention.

Planar headphones have flat drivers. HiFiMan went to pains to perfect the ultra-thin Mylar diaphragm, described as “near Nanotech grade” and barely visible when viewed from the side. Both sides of the diaphragm are covered with what the company calls an “advanced asymmetrical magnetic circuit” that seeks the optimum balance between efficiency and sound quality as it propels the driver into motion.

Every headphone designer has to decide between leather-like or fabric earpads; some offer both options.

HiFiMan splits the difference, ringing the comfortable velour pads with simulated leather. The headband also seeks the best of both worlds, combining a metal alloy band for strength atop a separate softer leather band, which adds comfort by directly supporting the weight of the headphones. The headband adjustment is quite stiff. That makes it hard to change but then keeps it in place more or less permanently once you've made up your mind.

The cable is something special, said to be made with single-crystal silver conductor. Its slender blue-gray fabric sheath matches the color scheme of the earcups and is somehow resistant to kinking and tangling. The 60-inch dual-mono cable is terminated in a 3.5mm plug and uses a standard 2.5mm plug at the headphone end, making it replaceable or upgradeable, though the latter is probably unnecessary. A quarter-inch plug adapter is provided.

I listened to the Edition X with headphone amp/DACs ranging from the Moon Neo 230HAD (\$1,500) to the AudioQuest DragonFly v1.2 (\$149). I also logged some time with the Astell & Kern AK Jr music player (\$499). None of them had any trouble driving the HiFiMan. The headphones are efficient enough to run off a smartphone's flea amp—though also revealing enough to make that a bad idea.

With an appropriately clean signal source, the Edition X performs well from top to bottom. Bass is firm but unexaggerated; midrange fully developed, uncolored, and open; and highs proportionate with the rest—at least through the lower treble (measurements from our sister publication innerfidelity.com did show a rolloff above that point).

Like planar headphones in general, these have a pleasing clarity that flatters voices and brings them to the fore, as well as an openness that



● The shiny horizontal slats are intended to reduce reflections from the open-back design.

## RATING

### HiFiMan Edition X Headphones

Performance ★★★★★  
 Build Quality ★★★★★  
 Comfort ★★★★★  
 Value ★★★★★



## THE VERDICT

The HiFiMan Edition X are high-resolution headphones that tell an emotionally fulfilling and balanced version of the truth about your music files.

## HEADPHONES

### HIFIMAN EDITION X HEADPHONES

PRICE: \$1,799

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captures ambience embedded in the recording and fosters a feeling of freedom from enclosure. Images are big and bold and close up, occasionally verging on being over-etched with some content and amps. But once you get used to HiFiMan's version of the planar sound, it becomes a new standard of realism.

After a few weeks of unstructured break-in and listening, I trawled through several dozen test tracks that have passed through headphones or headphone amps of recent acquaintance. With the HiFiMan, it was hard to find a loser. Even in MP3 at 192 kilobits per second, XTC's "Senses Working Overtime" had all the dynamic drama and drum punch it needed, which distracted from any loss of resolution in the top end. In MP3 at a higher-quality 320 kbps, Hank Green and the Perfect Strangers' "If---ing Love Science" lofted its rapid-fire lyrics over machine-gun guitars, and I



didn't miss a word. When I stepped up to FLAC at 96 kHz and 24 bits for Led Zeppelin's "Dancing Days," the track hurled its savage mock-Middle Eastern twang into the flat diaphragms, and it emerged as a tasty play-it-loud metal treat.

The HiFiMan brought out the best qualities in singing voices without bending them out of shape. It integrated the parts of Nick Drake's voice that tend to detach—the breathiness and the chest resonance—into a holistic human presence in "Time Has Told Me" and "River Man" (FLAC, 96/24). The string section on the latter track was lush and velvety. The headphones also juggled the wide-ranging dynamic and timbral demands of Peter Gabriel's dramatic vocal in the orchestral arrangement of "San Jacinto" (FLAC, 48/24) and accurately weighed Richard Thompson's baritone in the *Acoustic Classics* version of "When the Spell Is Broken" (ALAC, 44.1/16). Thompson's

## SPECS

Type: Over-the-ear, open back • Driver: Planar magnetic • Impedance: 25 ohms ±3 • Sensitivity: 103 dB • Weight (Ounces): 14.1

acoustic guitar on that recording can turn steely and hard, but the HiFiMan kept it under control.

I never tire of putting the first movement of Beethoven's Fifth Symphony to work. For the HiFiMan, I trotted out two very different versions. Bernard Haitink's recording with the London Symphony Orchestra (48/24) has an uneven distribution of frequencies across the stage with much of the lighter-textured instruments at far right, requiring high resolution, precise imaging, and a certain amount of treble prominence to balance out the darker-toned instruments at the left. The HiFiMan maintained the recording's idiosyncratic equilibrium. Carlos Kleiber's historic recording with the Vienna Philharmonic (FLAC, 88.2/24) is my go-to version for texture, layering, blastability, and emotional

connection. The HiFiMan painted the sections of the orchestra with a broad brush, then filled in the fine details with masterly touches and made volume peaks not just palatable but hearty. I needed an emotional catharsis; I got one.

HiFiMan's Edition X headphones are about as good as headphones get (though, admittedly, I haven't experienced the top-line HE1000 at nearly twice the price). These well-balanced performers aced any kind of music I threw at them, and they aren't too fussy about the company they keep, though a high-quality amp/DAC and high-resolution content will get the best out of them. Pretty much every moment I spent with them was golden. ♦



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# An AVR with Altitude

By Daniel Kumin

## Pioneer Elite SC-95 A/V Receiver

**PRICE \$1,600**

**IT HAS BEEN MORE THAN TWO** years since Onkyo bought—or merged with, depending on your financial-accounting philosophy—Pioneer's home-audio unit, but so far there has been no sign of their brands melding into a single entity. (Piokyo? Onkioneer?) And in all seriousness, we've no such expectation. For its part, Pioneer still retains two more or less discrete A/V receiver lines, the more quotidian VSX range and the higher-end SC models. More or less: All of the SCs reside in the brand's specialist-oriented Elite series, while most of the VSXs remain in the "regular" Pioneer lineup. Yet a few sub-\$1,000 VSXs, including two new ones, nestle in among the SCs on the Elite side of the ledger.

Confused? Yeah, me too. Happily, my task here today is not to make order out of Pioneer's model nomenclature, but to examine one of the brand's latest standard-bearers, the Elite range's third-from-the-top SC-95. This address puts the new Pioneer squarely in what I consider the sweet spot of most receiver lines: far enough down to avoid the "every-feature-that'll-stick" price penalty, but far enough up to ensure you get the important stuff at a fair price.

This means the latest in HDMI 2.0a fashion, i.e., HDCP 2.2, with Ultra HD HDR-readiness and 4K (2160p/60) passthrough plus video scaling to 4K. It also means nine channels of amplifier power assignable to 11

### AT A GLANCE

**+** Plus

- Latest-gen audio and video processing
- Fine-performing nine-channel Class D power
- Cooler-than-ever free phone/tablet apps
- Extensive proprietary auto-setup/EQ

**-** Minus

- Uninspired supplied remote
- Occasional streaming audio glitches

speaker terminals, distributable among height speakers for Dolby Atmos (and DTS:X, with a promised firmware update) plus width speakers, rear surround speakers, Speakers B extension duty, HDZone and Zone-2/3 outputs, and biamplification options in a truly bewildering array. The SC-95 manual, supplied on a CD, includes 11 full pages just of speaker-wiring diagrams, many of which themselves have several options. Pioneer claims up to 760 simultaneous watts (8 ohms, 1 kilohertz, 1 percent THD), which works out to, let's see, two from six is four, carry the one, uh, 84.444 watts per channel with all channels driven—a pretty bold claim in my experience, but one that Pioneer's

efficient Class D power amps might be able to deliver (we'll see what MJF finds in the lab). The SC-95's stereo spec is 135 watts per channel. [Ed. Note: We are only able to test seven channels simultaneously, but at 1 percent THD, the SC-95 delivered a quite hefty 108.5 into 8-ohm loads with seven channels driven.—RS]

The long, long features list begins with Pioneer's proprietary MCACC Pro auto-setup/EQ system and continues to high-end ESS Sabre 192/32 digital-to-analog conversion for all channels, both Bluetooth and Apple AirPlay wireless readiness (the receiver packs dual-band Wireless-b/g/n on board), and a full complement of network-audio streaming, including 2.8/5.6-megahertz DSD file playback. There's a lot more, of course, including "hooks" for the most popular home-control systems, such as AMX, Control4, Crestron, and Savant. Phew.

### The Setup

The SC-95 is conventionally laid out, with the drop-down door on the front that has become all but universal regardless of brand. The Pioneer's is plastic but operates smoothly, and the unit's overall finish and feel are crisp and reasonably elegant. With the receiver up on my rack, I began by bundling nine speaker-wire pairs into position: the usual five channels of LCR and surrounds plus two pair of Atmos ceiling-bounce elevation modules plopped atop my everyday fronts and surrounds. (This required moving my surrounds from their usual high shelves to stands a bit behind and astride the listening position.) Here I encountered a problem. Puzzlingly, among the receiver's literally dozens of speaker-setup options, a 5.1.4-channel Dolby Atmos layout ("5.2.4" in Pio-speak, since the SC-95 features two sub outs) was missing in action. I chose 7.2.4, which requires an external amp to power either the main fronts or the rear surrounds, involving yet two more speaker wires to a pair of small two-ways pressed into service as back surrounds, which my everyday setup does not employ.



● The Elite SC-95's look is clean and elegant.



## RATING

Pioneer Elite SC-95 A/V Receiver  
 Audio Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

## THE VERDICT

**All the good stuff—including** Dolby Atmos/DTS:X, 4K/HDR with upscaling, and HD-remote-room ability—in a nicely usable, fine-sounding, fairly priced package.

## A/V RECEIVER

### PIONEER ELITE SC-95 A/V RECEIVER

PRICE: \$1,600

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(I subsequently discovered that by setting surround rear to “None” on the SC-95’s manual setup page, I could have gotten, effectively, a sanctioned 5.1.4, but nowhere in the manual is this made explicit.)

With a grand total of 12 speaker cabinets and 34 transducers connected and at the ready, I proceeded with Pioneer’s proprietary auto-calibrations and EQ routine, MCACC Pro. This entails the usual parade of clicks and noise bursts, with the SC-95’s Pro edition taking about 15 minutes in all. MCACC is quite a deep and interesting system (though it collects data from only one physical mic location), and even a cursory discussion of its powers would fill these pages. That said, the system nailed my speakers’ sizes, distances, and level adjustments with impressive precision. For my phase test, I deliberately miswired one front main and one rear Atmos speaker to see if the system would catch them, and it did so with flying colors. (I also determined, on a second run, that MCACC discovered and calibrated my 5.1.4-channel setup just fine, setting the nonexistent surround rear pair to “None” of its own accord.) MCACC Pro dialed in a room-EQ curve that, while not entirely consistent with

those of other systems I’ve tried (and my own observations), was generally correct in its contours and mild in its equalizations. As always, however, I did all of my evaluative listening with the EQ defeated.

### The Hands-On

As usual, I began with straightforward listening to music, first in plain, two-channel, subwoofer-less (Pure Direct) stereo. My main fronts are long-discontinued Energy Veritas speakers of considerably lower than average sensitivity and impedance alike, and the Pioneer proved plenty powerful to drive them to satisfying levels, not only without complaint but with impressive dynamic conviction on track after track. On a cut like “I’m Tired of Crying Over You” from Jimmy Rogers’ *Blue Bird* (one of the very few examples of classic blues recorded to audiophile standards), the Pioneer presented the vocal impact, presence, power, and the snare-drum snap familiar to me, along with perhaps an unexpected degree of elegant soundstaging and aural spaciousness.

Multichannel music is an important factor for some of us, and the SC-95 stands ready to deliver here, too. Manually changing to a



no-subwoofer five-channel setup to place maximal demand on the receiver’s power amps, I heard a well-produced rock-surround selection like Sheryl Crow’s “My Favorite Mistake” from the SACD of *The Globe Sessions* deliver plenty of oomph in the bottom octaves coupled with a very convincing presence on the upfront, dead-room vocal. Pioneer touts the SC-95’s latest generation of its Class D power amp topology as D<sup>3</sup>, with shorter signal paths and reduced complexity for improved performance. Whatever the case, the new receiver boasts very fine amplifier performance all around. On a familiar multichannel reference disc like the Telarc SACD of Bartók’s Concerto for Orchestra, the Pioneer had no difficulty delivering all

its bells and whistles—and strings, horns, and woodwinds—with all the required realism, both tonal and spatial, at fully naturalistic levels, even with my rather low-sensitivity 5.1 speaker suite.

Moving on to film sound, I quickly determined that the SC-95 aced my rotation of torture scenes (the audio, not the actors!) from movies such as *The Fugitive* and *Master and Commander: The Far Side of the World*, with clear, intelligible dialogue, appropriately dynamic music, and well-presented effects. This allowed me to advance to the

main event: full 5.1.4-channel Atmos. I began with Dolby’s Atmos demo disc, in particular the “Leaf” trailer. This had wowed me on Atmos’ debut, and it wowed me again via the Pioneer, with its preternaturally lifelike bubble of ambience and overflying birds.

I’m not much for sword ‘n’ sorcery, but because Atmos-equipped Blu-rays of *Game of Thrones* had arrived on my doorstep, I quickly got sucked into the Westeros vortex (a little nudity doesn’t hurt, neither). HBO’s mashup of *The Tudors* and *Conan the Barbarian*, with plot lines lifted from *I, Claudius* (with a tablespoon of *Dallas*), blurs the production-value line between TV and movies. *GOT*’s Atmos soundtrack is less wow-ified than I’d expected, but there are scenes like the tower fight in episode 1 (chapter 5) that showed off Atmos’ value—more worthy in ambience re-creation than gee-whiz flyovers, in my estimation—and the SC-95 to excellent advantage. The new Dolby Atmos soundmark even more so.

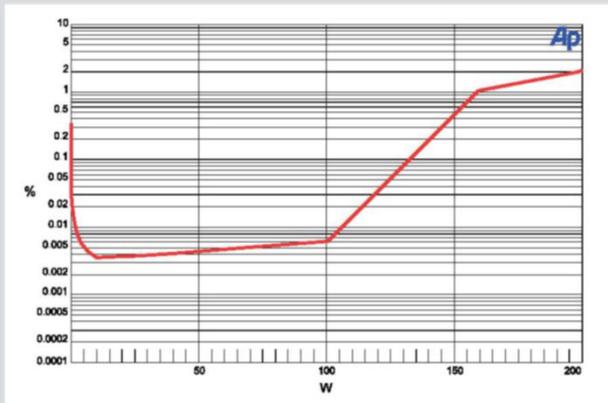
The SC-95 offers the streaming audio options we’ve come to expect on midrange-and-up receivers today. Pioneer contents itself with just two pay services, Pandora and Spotify, along with free internet radio via the vTuner interface, and media-server hookup via DLNA or Windows Play To (Win 8.1-certified). Via my Mac OSX-based TwonkyMedia software server, the new receiver cheerfully played every file format I tossed its way, including MP3, AAC, WAV, AIFF, and FLAC. The SC-95 also seamlessly played my growing collection of DSD files (DSDs have tripped up a couple of streaming receivers I’ve tried in the past year), sounding great in doing so via either wired-Ethernet or Wi-Fi



● The plastic front-panel drop-down door operates smoothly.

# Test Bench

## Pioneer Elite SC-95 A/V Receiver



**AUDIO** This graph shows the SC-95's left channel, from CD input to speaker output with two channels driving 8-ohm loads. Measurements for THD+noise, crosstalk, signal-to-noise ratio, and analog/digital frequency response were all within expected performance parameters. Full details available at [soundandvision.com](http://soundandvision.com).—MJP

	0.1% THD	1.0% THD
Two Channels Continuously Driven, 8-ohm Loads	132.4 watts	159.0 watts
Two Channels Continuously Driven, 4-ohm Loads	230.2 watts	278.4 watts
Five Channels Continuously Driven, 8-Ohm Loads	121.6 watts	140.8 watts
Seven Channels Continuously Driven, 8-Ohm Loads	96.7 watts	108.5 watts

**VIDEO** The Pioneer SC-95 passed our usual tests for video clipping, 1080i deinterlacing, chroma/luma resolution, scaling, and 3D passthrough.—RS

## SPECS

**Power Output:** 135 watts x 2 (8 ohms, 1 kHz, 0.08% THD, two channels driven); surround mode, 760 watts total (8 ohms, 1 kHz, 1% THD, all channels driven) • **Auto Setup/Room EQ:** MCACC Pro • **Video Processing:** HDR/Rec. 202 passthrough; scales to 2160p/24 • **Dimensions (WxHxD, Inches):** 17.1 x 7.3 x 17.4 • **Weight (Pounds):** 33.25 • **Video Inputs:** HDMI (8, 1 MHL), component video (1), composite video (2) • **Audio Inputs:** Stereo analog (3), coaxial digital (2), optical digital (2) • **Video Outputs:** HDMI (3), composite video (1) • **Audio Outputs:** 9-channel speaker (1), 9.2-channel pre-out (1); record-out, HDZone/Zone 2, Zone 3 stereo line-level outputs, optical digital (1), 1/4-inch headphone (front) • **Additional:** USB (1), Wi-Fi/Bluetooth antenna (2), Ethernet, USB (1), RS-232, 12-volt trigger, IR

linking to my home network. All was not beer and Skittles, however. On a couple of occasions, the Pioneer locked up during DLNA playback, requiring a cold reboot, unplugged, to recover. This seemed to occur when switching inputs from a live-playing DSD file, but the sequence of trying to re-create it deliberately was so laborious and haphazard that I eventually gave up and put it down to one of those things. Nor can I say, definitely, that my DLNA server wasn't a contributing factor.

I confirmed Bluetooth playback from my iPhone—no problem. AirPlay: ditto, and the Pioneer obligingly switched automatically to its wireless input, requiring no setup (other than a viable wireless network) to work. I also messed about with the Pioneer's video scaler, which comes with a couple of interesting options, though since I'm not as yet 4K'd on the display side, I can't speak to its ultimate scaling quality. (I did discover that, for unknown reasons, my admittedly aged Samsung LCD set would not sync to the Pioneer's 1080p-scaled signal, but it displayed its 1080i output just fine.)

The un-illuminated remote supplied with the SC-95 is familiar from several previous Pioneer models. With small, tightly spaced buttons and generally low-contrast lettering, it's not

● **Buttons are small, but the remote's layout is logical and usable.**



my favorite, but it's sensibly laid out and usable nonetheless. Happily, Pioneer also offers free control apps for both iOS and Android. The iOS version of the latest, iControlAV5, is a well-conceived and occasionally whimsical but quite powerful controller. In addition to the usual parameters of volume, input and mode selection, and so on, this incorporates quite comprehensive zone control, Pioneer's too-cool four-axis audio balance commander (which involves a rolling ball), individual channel level trims, control over the SC-95's video converter/scaler, and access to all of its many "sound enhancement" functions, such as digital-audio upconverting, Pioneer's Sound Retriever-AIR processing, and DNR. And, of course, it lights up in a dark room.

To the usual two-zone multiroom facilities Pioneer adds an HDZone option, with a dedicated HDMI output for a (stereo) HD second room (though for longer runs, you'll have to add your own HDMI extender). And there's enough packed into the iControlAV5 app, including its multiroom-control pages, that with an obsolete smartphone (and who doesn't have one?) or a modest investment in a Craigslist previous-gen tablet, an SC-95 owner with a multiroom setup could have a pretty snazzy touchscreen system for little more than pennies.

Pioneer's new SC-95 is fairly typical of upper-range A/V receivers today—which is to say, very flexible, substantially powerful, and frankly quite complicated. But beyond those bare facts, and the excellent nine-channel amplification, its many, many features seemed somehow more than usually accessible, and its especially attractive iOS control app raises its likability quotient considerably. ♦



● **The nine amp channels and 11 speaker terminals facilitate Dolby Atmos and DTS:X (with firmware update).**

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# Easy Is as Easy Does

By Darryl Wilkinson

## TiO Home Automation System

**PRICE** \$2,979 as reviewed

**THE FOLKS** AT TIO (SHORT FOR “Turn it On”) claim they’re taking “an entirely fresh approach to home automation” with a philosophy that considers the user to be the most important part of a TiO system. In other words, if a home automation system were a round hole and the user a square peg, the manufacturer should re-engineer the hardware hole into a square rather than force the user to become a round peg. Of course, making things truly and honest-to-goodness-ly easy for the user is way, way simpler to pontificate about than it is to accomplish.

Here’s a brief overview of TiO. To begin with, TiO is definitely not DIY. So if you’re allergic to paying someone to install gear, this isn’t for you. If the benefits of having a pro do the work (and the inevitable troubleshooting) are worthwhile to you, read on. Can’t decide? Stick around, because the ability the user has to simply and near-instantly customize the way the TiO system operates (on both a day-to-day basis and a scheduled one), without having to pay for a service call from a TiO dealer, could be very appealing to you. The other main bit to know is that, unlike a lot of systems that specialize in one aspect of home automation (such as lighting or security), TiO is a “jack of all automations” system that’s capable of governing your home (lights, motors, cameras, etc.) as well as your home entertainment gear, including wholehouse audio distribution. Added to everything else TiO can do, its A/V integration gives it a significant leg up on other home automation systems.

### AT A GLANCE

#### + Plus

- Easy retrofit replacement of wired volume controls
- Dedicated router creates private TiO Wi-Fi network
- Exceptional level of user customization

#### - Minus

- Limited direct IP control of third-party components
- Few streaming services supported—but more coming

### TiO’s Idiomatic Table of Elements

The folks at TiO speak in a dialect that might be slightly off-putting at first. That’s because, as part of their re-imagining of home automation, they’ve created a lingo for describing features and functions in ways that resonate with users. People familiar with custom installation systems, however, will probably recognize TiO’s terms under other names. The first bit of TiO-speak we’ll run into is *Element*, which is the company’s word for “a TiO system device for control of music, lighting, and more.”

All TiO systems are built around the MasterCoordinator 2 (MC2, \$500). The “foundation of the TiO ecosystem,” the MC2 is an Asus RT-A68U router running proprietary TiO system firmware. (It’s basically a specialized hub/router combo.) Once connected to your home network, the MC2 creates a private wireless network

(802.11b/g/n, 2.4 gigahertz, WPA2 encryption) and becomes the central communication hub for the TiO Elements (system devices, remember?)—up to 250 of them. Importantly, the MC2 controls everything locally without requiring a 24/7 Internet connection to a remote server. (Of course, you’ll need Internet access if you want to stream audio from an online service or control a Nest thermostat.) TiO says the MC2 provides a Wi-Fi signal with a 360-degree range of 450 feet or more. A TiO Network Extender (\$250) can be added to extend the wireless coverage even more.

TiO is somewhat unusual among automation systems in that it’s exclusively Wi-Fi when it comes to the wireless communication. A big reason for going Wi-Fi-only (plus Ethernet), and especially for employing a modified Wi-Fi router, is that it greatly speeds up installation and configuration of a TiO system. Whereas Z-Wave and ZigBee devices, for example, require registration with a hub/console or coordinator before they’ll operate within a system, TiO devices are

### RATING

#### TiO Home Automation System

Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

automatically (or, in TiO-speak, “automagically”) discovered by the MC2 during the configuration process.

### It’s Elemental

Surprisingly, there are only two primary Elements used to build a TiO system: the StealthStream 1 and the TouchLite 4. TiO likes to refer to them as the company’s Swiss Army knives because of the impressive list of things each one can do. I’ll agree it’s an apt description, but I’m disappointed that the lingo-slinging TiO tech talkers don’t mention the obvious connection with being on “the cutting edge.” (Hold your applause, please.)

The StealthStream 1 (AZSS1, \$500) is an amplified streaming audio player, and it’s unlike any I’ve seen so far. For starters, it’s small—small enough, in fact, to fit into a single-gang electrical box. It runs off of 24 VDC from an external power supply, connects to the TiO network via Ethernet or Wi-Fi, and packs a 50-watt x 2 Class D amplifier inside. On the back are an optical audio input and a 3.5mm analog stereo audio output.

The AZSS1 currently supports TuneIn, Rhapsody, and SiriusXM, with Spotify, Tidal, and Deezer said to be coming by the fall, along with AirPlay and Google Chromecast capabilities. According to TiO, the AZSS1 supports streaming of lossless, uncompressed audio up to 192/24—the



● **TiO’s MC2 is a specialized hub/router running TiO’s proprietary firmware.**

## THE VERDICT

With TiO's unique approach to home automation, systems are a breeze to design and install, quick to configure, and intuitively natural to use—with the bonus of being highly configurable by the user without the need for a return service call from the dealer.

supported lossless codecs include ALAC, FLAC, WAV, ALAC 96/24, FLAC HD 192/24, and WAV 192/24—and since each AZSS1 has its own internal DAC, actual playback resolution isn't affected by the number of hi-res audio streams being played simultaneously through the system (as long as you remain within the overall bandwidth limit). That's not always the case with other streaming systems, whether DIY or pro-installed. AZSS1s can stream audio from hard drives connected to the MC2, as well as from NAS drives and servers on the home network. Available Wi-Fi bandwidth limits the number of simultaneous wireless streams to six, while sanity is the primary limitation on the number of wired streams. (TiO says they've worked with up to 30 simultaneous streams in a system.) If you still can't find anything to listen to, the AZSS1 includes Bluetooth 4.0 connectivity.

The AZSS1's digital audio input is auto sensing and can be configured to automatically select the digital input when an audio signal is detected.

This means that, unlike the case with most other streaming systems, the user simply turns on the local source—be it an HDTV, a BD/DVD/CD player, or, hell, even an old MiniDisc player—in order to listen to it. That's the sort of hassle-free, confusion-eliminating "automagic" that should be the goal of every smart home/home automation system. Of course, auto sensing isn't a TiO innovation. It's the company's employment of the feature in combination with the rest of what the AZSS1 does that's so worthy of note.

The AZSS1's small size, Wi-Fi connectivity, and freestanding, enclosed-chassis design allow you to stash it just about anywhere—shelf, drawer, closet, humidior, Faraday cage (well, maybe not a Faraday cage if you expect to use Wi-Fi)—as long as you can run the power and speaker wires to it. But what's even more awesome about the AZSS1's little chassis is that it's a perfect fit for a single-gang electrical box. Why? Because it makes it stupidly easy and insanely quick to replace an old, wired, analog volume control with a new AZSS1 without

## TIO HOME AUTOMATION SYSTEM

**PRICE:** \$2,979 (MC2, \$500; AZSS1, \$500; TL4, \$180; TCWiFi, \$230; TCIP, \$200; TIR3, \$30; TTBLT, \$299)  
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## HOME AUTOMATION SYSTEM

replacing speakers or redoing any of the existing wiring; in some cases, you can even reuse the volume control's terminal connectors. What's more, if that old control was the round-knob style, you can reuse the original wall plate to cover the AZSS1. The round status LED on the AZSS1 will usually line up with the hole that remains in the wall plate after the volume control is removed. Unfortunately, TiO can't do anything about fingerprints, crayon marks, or scratches that have accumulated over the years.

On the other hand, if those fingerprints, crayon marks, or scratches are on the wall *next* to your old volume control, you can actually cover those, and bring some additional utility, with the TouchStream 7 (AZTS7, \$1,299). This unusual component (which was not yet available for us to test) combines all the functionality of an AZSS1 with a 7-inch-diagonal touchscreen in front of it that provides full automation system control via the same interface in the TiO Home App (see below)—while still fitting into a single-gang mounting box.

## It Turns Me On

TiO's other Swiss Army knife, the TouchLite 4 (TL4, \$180), handles lighting control and other automation functions. Installed in a wall with a standard Decora-style wall plate, the TL4 looks like little more than another upscale light dimmer—but dimming is only part of the story. The Wi-Fi-enabled (802.11b/g/n) TL4 is a UL-approved "load-agnostic touchpad controller" that, according to TiO, "will control virtually any kind of lighting load—incandescent, tungsten, LED, CFL, MLV, ELV, cold-cathode, etc.—even controlling multiple types on the same circuit at the same time. The TL4 will also control motors, fans, and other load types."

Rather than having individual physical pushbuttons, the TL4 has a full-length rectangular capacitance touchpanel that's configurable to operate as one, two, or four "button" sections. Customized labels with words, graphics, or any other images can be inkjet- or laser-printed on special vellum paper and inserted behind the TL4's clear acrylic cover (but in front of the adjustable

backlight), where they won't get dirty or worn off over time, and they can be easily swapped out, too. TiO's Action Group feature makes it possible to assign up to 12 remotely located TL4s to a single button and have them operate in unison, all turning off/on or dimming simultaneously. But the TL4's buttons don't have to be assigned to lighting control at all. They can be programmed to initiate any activity, ranging from a single action (like muting the audio from

an AZSS1) to, well, anything else the system can do. In other words, you could think of the TL4 as a touchpad system controller that, by the way, also happens to control lighting.



● Left to right: The TouchLite 4, StealthStream 1, and TouchStream 7.

● The TouchStream 7 installs into a standard single-gang wall box.



### Elementary Bits and Pieces

Other Elements are used to integrate home A/V gear and other automation devices into a TiO system. The TiO Connect Wi-Fi Module (TCWiFi, \$230) and the TiO Connect Wired Module (TCIP, \$200) are both used to convert IP communication from the MC2 into whichever protocol that's required, including infrared (IR), serial, and contact closure. TiO also offers a Security System Keypad Emulator Adapter in order to integrate a home security system into the TiO system. The only thermostat that TiO supports at the moment is the Nest, although the company is working on adding other thermostats soon. IP-based security cameras need to be ONVIF Profile S compliant, which eliminates most of the common DIY brands, but dealers will be familiar with the ones that are, such as several from FLIR and TRENDDnet.

The system that TiO provided for review included two AZSS1s audio



● The StealthStream 1 (AZSS1) is a streaming audio player with a DAC and 50-watt x 2 Class D amp.

streamers, four TL4 dimmer/wall controllers, one each of the TCIP wired and TCWiFi wireless IR connectors, and, of course, an MC2 MasterCoordinator, along with an Android tablet (TTBLT, \$299) running an authorized Pro version of the TiO Home App. With the exception of some added configuration

options, the Android-only Pro version is identical to the standard Android and iOS releases of the TiO Home App—which, by the way, can be downloaded and used in demo mode if you'd like to get a feel for how the TiO user interface looks and operates.

Thanks to the private network created by the preconfigured MC2, the process of discovering the TiO Elements was quick and nearly brainless. (If only replacing and wiring light switches could be that easy.) Aside from the physical install, the part that took the most time was giving each Element and, er, Space (see below) a unique, friendly name. That's when I found myself struggling to come to terms with—and tiresomely translate—TiO-talk's user-friendly (rather than installer-centric) lingo. Once I decided to forget what I "knew" about custom installation (well, that was easy) and look at the TiO system the way a typical homeowner would see it, configuring and programming the system was as easy as—if not easier than—any other system I've dealt with.

### TiO's Mode of Moods

After understanding Elements, the next important TiO concept is a Space, which is any area in the home that's controlled by a TiO Element. (If you say, "Oh, you mean a zone!" I'm going to slap you.) A home can have lots of Spaces of varying sizes, including part of a room, a whole room, multiple rooms, the entire house, and an outside landscaped area. Spaces with AZSS1 streamers

## SPECS

**MC2:** 8.2.11b/g/n, 2.4GHz, WPA2 encryption, External antennas (3), WAN port (1), LAN ports (4), 8.6 x 6.3 x 3.3 in (WxHxD), 1.4 lb • **AZSS1:** 50 watts x 2, Inputs: Bluetooth 4.0, optical digital, Wi-Fi 802.11b/g/n 2.4GHz, Ethernet, Streaming services: Tuneln, Sirius XM, Rhapsody, Spotify, Outputs: 3.5 mm analog audio, 2.75 x 1.88 x 3.9 in (WxHxD), 0.55 lb • **TL4:** 802.11b/g/n, 2.4GHz, Selectable dimming/switch modes, programmable capacitance touch buttons (1, 2, or 4), Dimming loads: Incandescent/Tungsten (600W, expandable to 2,000W), LED (250W), Dimmable CFL (250W), Motors/Fans (1/8 Hp), Replaceable custom labels, 2.51 x 4.12 x 1.5 in (WxHxD), 3.8 oz

can be cloned, so they always operate in unison, or shadowed, so the audio source is the same but the volume can be adjusted independently. After the hardware has been installed, named, and assigned to its Space during configuration using the Pro TiO Home App, the installer—or, more importantly, the homeowner—can then begin to create *Moods*.

In essence, a Mood is a snapshot of the status of every device or gadget that TiO controls in a particular Space, including lighting, audio source, volume, and third-party A/V gear, as well as thermostat settings. Much like taking a picture, all the status settings are captured by pressing the TiO Capture Mood button icon that appears on every screen of the TiO Home App (Pro or standard version). Then you name the Mood, select which Elements are to be included, and (if desired) schedule it for specific times or events, such as sunrise and sunset. Moods can be created, recalled, or edited at any time by the installer—or, more interestingly, by the homeowner after the installer is long gone—and they can be assigned to buttons on TL4s. Conveniently, each time a Space is created in the TiO system during setup, the system automatically generates a "Space Off" Mood for shutting off everything in that Space.

A TiO Experience is a selection of Moods in different Spaces that are activated simultaneously. As with Moods, Experiences can be created, recalled, or edited at any time—again, by the installer or homeowner. Creating an Experience is done by pressing the (surprise!) Create Experience icon that's also on every screen in the TiO Home App. Then you simply drag and drop existing Moods into the Experience's list. Party and Goodnight are two obvious examples of useful Experiences that would provide easy control over most, or all, of your home. Vacation

Experience might include Moods with scheduled lighting or audio activities to make it seem like someone is at home.

### It Ain't Easy Being Easy

The TiO Home App was simple to navigate without being too simplistic, and it offered a high degree of customization without being overly confusing. That's not an easy thing to accomplish in an app, either. Once you've chosen the Space you want to control from the home screen, a scrolling arc of circles becomes available. The circles contain icons for the different Elements and Moods that are already part of the system. The Elements and Moods appropriate for that Space are colored in, while the unavailable ones are grayed out. It's not quite a warm and fuzzy user interface, but it's much friendlier and more approachable for a lot of folks than a higher-tech, more *Star Trek-ish/Star Wars-ian* layout would be.

I really liked the TiO Home App overall, but that doesn't mean it was perfect. For instance, although the app will recognize existing playlists on connected drives, NAS devices, and network servers, you can't create playlists on the fly from within the app. [Ed. Note: TiO said at press time that playlist functionality will be released by the fall.—RS] And to put it mildly, I'm not a fan of the app's text-based, folder/subfolder style of selecting music (which, for example, requires you to take a path like Synology BC214se/Music/By Album Artist/Adele/21/Rolling in the Deep). It's a far more natural experience to choose music from an array of cover art icons, the way Mirage and Plex, for example, allow you to do. TiO is hardly alone in using this method, but it's the very first thing I'd change about the app. It would also be helpful if the app would present the available music as a single library, rather than make you

I can't say enough about how awesome the two AZSS1s were.



● The AZPS1 remote Power Supply supports the StealthStream 1.

choose the individual server that a song is on. Strangely, there was no obvious way in my system to fast-forward or rewind a song in the app, either. (TiO's documentation for the app under "Audio Controls" says, "Depending on your music source, you may have access to these control options: Rewind, Pause, Fast Forward, Repeat, and Shuffle.")

### Balls in Your Walls

Hardware-wise, I can't say enough about how awesome the two AZSS1s were in this system. That streamer/integrated amp is a marvelous device (um, Element), packing so many features and so much power into one small chassis that it's hard to believe it works. But it does work—and very well, too. The auto sensing digital audio input worked like magic, switching to that input and back to the streaming section each time I power-cycled the Oppo BDP-105 player connected to it. StreamSharing is TiO-talk for streaming audio from one AZSS1 to others in the system while maintaining the audio in perfect sync across Spaces, and it worked precisely as promised. Interestingly, the AZSS1 also let me share audio

from the Oppo, but there was a delay in the second AZSS1's audio.

I have to admit that I really didn't expect much from the AZSS1's built-in 50-watt x 2 Class D amp. After all, it's designed to fit into a single-gang electrical box. How good could it be? Well, it turns out that if you do get a couple of these AZSS1s installed, you'll have some real balls hidden behind your walls. The amp not only plays powerfully and cleanly but also sounds open without any edginess in the high end. While I was working on this review, I had Paradigm's excellent Play-Fi-enabled streamer, the PW Amp, along with the company's phenomenal Prestige 75F towers, so I was able to spend time comparing the two amps playing the same speakers. The PW Amp is a damn impressive amp in its own right, but I must say that I was floored to hear the AZSS1 give it a close run for its money (in Canadian dollars, of course). The differences were small, and some variables were difficult to account for, but overall I thought the AZSS1 had a bit more punch in the bass region, while the PW Amp provided slightly more depth in the imaging.

From a lighting-control standpoint, the TL4s were rock-solid and responsive—

consistently faster to react, I have to say, than a lot of Z-Wave- and ZigBee-based lighting systems I've worked with. The fact that the TL4 can handle so many different types of loads and do so simultaneously on the same circuit is something for installers to admire, but I fell in love with the design of the TL4's capacitance

touchpanel. It's sleek without calling attention to itself, and, well, it just worked—even when I was wearing gloves, which is especially important for TL4s used at front or back doors or in garages. It was incredibly easy to reconfigure the TL4, too, including the backlighting, number of buttons, button function assignments, and even the ramp rate and min/max levels for TL4s used as dimmers. Unless your home is a museum, the way you live in it is going to change over time, and there's no way to predict those changes when a home automation system is first installed. Providing an easy way for the homeowner to adapt the system's operation to those changes is by far one of a TiO system's most compelling features.

Although neither is a fatal flaw, by any means, there are two potential issues that might crop up as a result of the TL4 being TiO's only in-wall lighting control Element. (TiO also makes a \$180 touchscreen-less, plug-in, load-agnostic lamp dimmer, the LMPNA.) The first issue is the TL4's 600-watt maximum incandescent load. While that's likely not going to pose a problem for most people, especially with the prevalence of LED lighting today, it still might not be stout enough for some fixtures, such as large chandeliers or extremely vain vanity-mirror lighting. Fortunately, TiO says the TL4 supports a booster that can control loads up to 2,000 watts if needed.

The other possible negative is that, at \$180, the TL4 is a bit expensive to use as a wireless light switch for, say, a basement or garage light where all you need is remote on/off control. (TiO recently announced plans for a "low-cost, three-way" switch as part of a future update.)

Last, TiO's Elements for A/V and other home device control worked very well. In my case, the TCWiFi and its IR output adapter (TIR3, \$30) consistently functioned as programmed with a basic AVR, BD, and HDTV system. TiO's IR driver library didn't seem as extensive to me as some of its competitors, though that can be overcome in time; the company currently uses the Global

Cache IR library that has more than 150,000 codes in it. Also, direct IP control of some select IP-enabled devices (Nest, cameras, garage door openers) was only added after my review period, though the list of controlled devices is said to be expanding. That's good, because IP control is more reliable than IR for automation. So TiO is on the right track.

### Conclusion

Recommending a home automation system isn't as simple as giving a thumbs-up to an AVR or an HDTV, because home automation isn't something you can easily return to the store or trade up for something better. Home automation gear becomes part of your home, and you can't transfer the programming from one company's system to a competitor's. Unless you're buying a \$50 smarthome hub and you have lots of free nights and weekends to tinker, you should definitely take your time deciding on the best system for you.

So here's the thing: I think TiO has hit a towering home run (pardon the install-related pun) with the company's new home automation ecosystem. It's perfect for small- and medium-sized homes—especially those in which music (streaming or local) and A/V control are of high importance. TiO has absolutely succeeded in making the system both easy to operate and easy to customize. The AZSS1 and the TL4 are unique and cleverly designed, with a bundle of functions that, hard to believe, are all in one product. In case you can't tell, I really like what TiO has done. Of course, there are some things I would change, mostly dealing with the app, but nothing egregious. Other automation systems, such as those from Control4, will provide more extensive options for many homeowners. On the other hand, there are quite a few situations in which a modest TiO system will do more and do it for less money—both up front and in the future. Without any doubt in my mind, TiO's approach to home automation and its impressive ecosystem make this a system highly worthy of consideration. ♦



● The TouchLite 4 installs with an attractive Decora-type wall plate.

**TiO has hit a towering home run.**

# Great Bass in a Small Package

By David Vaughn

## RSL Speakers Speedwoofer 10S Subwoofer

PRICE \$399

**THERE ARE TWO THINGS THAT I** really love in life. The first is the entrepreneurial spirit that grows within someone and inspires them to take a chance with an idea, create a company, and do their best to make it succeed. The second is great bass. As longtime readers know, I'm a bass-oholic—and if my wife would let me, I'd have four (or more) subwoofers in my media room, because there's no such thing as too much bass!

My reference subs are a 15-inch Hsu Research VTF-15H MK2 (\$899), located closest to the listening position along my right wall, and a 12-inch SVS PC-Ultra (\$1,199 in 2004), sitting in my front left corner. This is quite a combination, and it's rare that any sub can match the price/performance ratio that these offer by themselves, let alone together.

When editor-in-chief Rob Sabin asked if I was interested in reviewing a budget entry from RSL Speakers, I begrudgingly agreed, thinking I'd go a month with tepid bass in order to give this wannabe a chance at the subwoofer title. Although we planned to listen to and evaluate a single 10-inch sub on its own, we realized that it might be challenged filling my nearly 5,000-cubic-foot room. RSL obliged and sent two Speedwoofer 10S subs, to see if they could gang up and best one of the big boys in my room. At \$798 total, the pair still

### AT A GLANCE

**+** Plus

- Exemplary value
- Clean, punchy bass
- Optional wireless transmitter works like a charm

**-** Minus

- Doesn't go quite as deep as the big boys

comes in cheaper than either of my reference subs alone.

### A Blast from the Past

RSL's founder, Howard Rodgers, has quite an audio résumé. He started building speakers when I was still in diapers in 1970 and sold factory-direct from his store in North Hollywood, California. When a producer from Warner Bros. Records came in for a demo, he was so impressed by what he heard that he bought a pair of speakers—and the next thing you know, word of mouth spread like the flu in a nursery school, and RSL Speakers (under their original brand name of Rogersound Labs) could be found in record companies throughout Southern California.

By 1979, RSL had three locations, had ventured into car audio, and had bought a building in Canoga Park for their headquarters; times were really good. Unfortunately, the recession of the early '80s hit, but Rodgers persevered by expanding his wares to include

an outdoor speaker, which helped him survive a dark time in the American economy. By 1984, the Reagan economy was on fire and RSL was adding video components, as a new industry debuted in America: home theater.

Rodgers continued to develop speakers during this time and came up with a patented Compression Guide speaker box design, an innovative way to solve some of the detrimental issues associated with speaker cabinets. RSL eventually grew to eight stores and had become one of the most popular A/V specialty chains in Southern California when Rodgers decided to sell the company and retire in 1989. Unfortunately, within three years, RSL had gone belly-up under the new ownership, and Rodgers ultimately bought back the company name because, well, you never know what can happen.



### RATING

RSL Speakers Speedwoofer 10S Subwoofer

Performance ★★★★★

Features ★★★★★

Build Quality ★★★★★

Value ★★★★★

Fast-forward a few years, and Rodgers was back in the game with the new RSL Speakers after his oldest son convinced him to relaunch the company. In 2011, the company released the first Speedwoofer 10 subwoofer, which used a 375-watt Class A/B amp. The finish was piano gloss black to match the company's bookshelf/satellite speakers, and it had a remote box that could control the crossover and volume of the sub, all of which resulted in a \$750 price tag—pretty expensive for a modestly sized sub.

### Under the Hood

Here we are in 2016, and a new generation of Speedwoofer is on the market, dubbed the 10S. The Class A/B amplifier has been replaced with a Class D, still providing 375 watts. Inside the 15 x 16 x 16.75-inch cabinet is a forward-firing, 10-inch cast-aluminum-frame high-excursion woofer, along with the company's Compression Guide tuning technology. This technology seeks to mitigate the distortion caused by cabinet resonance—that's found to a greater or lesser degree in all box speakers—by guiding rear sound waves through calculated areas of expansion and compression. The internal baffles required for this also serve to brace the cabinet, which can further reduce cabinet resonance. Less cabinet resonance



● RSL's high-excursion woofer is housed in a cast-aluminum frame.



## THE VERDICT

When I heard I was going to review a budget \$399 subwoofer, I dreaded the month I'd miss my reference subs. I couldn't have been more wrong!



bright, lighting up the wall behind the sub; I like my room completely black on movie night.

This is a vented sub, but in lieu of a traditional round port, there's a slot vent along the bottom front.

### In Use

My room is prewired for subs in multiple placements, so setting up the Speedwoofer 10S

is supposed to mean better sound. But does RSL's method work as advertised? We'll see.

When the subs arrived, I decided to test them in three different ways. First, I would use one by itself to see how well it could handle a large room. Next, I'd use both subs, positioning them close together. Last, I'd put one sub each in my designated subwoofer locations in my room.

The back of the Speedwoofer 10S includes three knobs—volume, internal crossover, and phase—along with a crossover bypass switch, stereo RCA in/out jacks (allowing you to daisy-chain another subwoofer with ease), stereo speaker-level inputs, a power switch, a detachable power cord, and a wireless pairing button. There's also an LED that signifies the power status (red off/blue on), but I found it much too

was a breeze. It performed best in my closest-to-the-listener position along the right wall, which surprised me given the sub's size. Most small subs crave a corner placement to maximize room gain, but that definitely wasn't the case here. After calibrating with my sound meter, I fired up some tunes to see what this little guy could bring to the table.

First up was "Brass Monkey" from the Beastie Boys' *Licensed to Ill*—yes, I really wanted to hear how well this sub could thump. I set my Marantz pre/pro to reference 0 and was shocked by how pronounced the bass was. In fact, I had to double-check that I had disabled my SVS sub—I was amazed that such a small sub could produce so much room-shaking bass. I've had other small subs in my room that could play loud, but I haven't had one that could actually shake my subfloor till now; usually, only the big boys can do that! If one Speedwoofer could produce this much bass, what could two adjoining subs do?

Out came the second sub, and I connected the two with an RCA cable from sub 1 to sub 2. I placed the second sub on top of the first and then side by side with it, to see if that made a difference—it didn't, at least in my room. After recalibration, I resumed testing, and I found that the two subs together were even more impressive, with everything I threw at them.

## SUBWOOFER

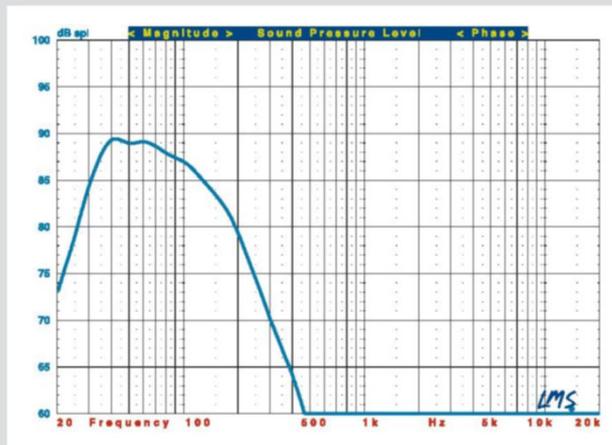
### RSL SPEAKERS SPEEDWOOFER 10S SUBWOOFER

PRICE: \$399 (\$449 with optional wireless transmitter)

RSL Speakers • (800) 905-5485 • rslspeakers.com

## Test Bench

### RSL Speakers Speedwoofer 10S Subwoofer



**10S (blue)** Close-miked response, normalized to level @ 80 Hz: lower -3 dB @ 30 Hz, -6 dB @ 27 Hz, upper -3 dB @ 127 Hz using LFE input.—MJP

**SPECS** 10 in aluminum-frame high-excursion woofer; 375 watts RMS; 15 x 16 x 16.75 in (WxHxD), 40 lb; optional wireless transmitter; line-level RCA input (2), line-level RCA output (2), speaker input (2)

Knowing how two performed together, I then moved the second sub to my front left corner and ran a third calibration—and I really liked what I heard. This definitely evened out the bass response throughout the room on hard-hitting bass sequences from the Extended Edition Blu-ray of *The Lord of the Rings: The Fellowship of the Ring*, such as the appearance of the Balrog and the thunderous footfalls of the Nazgûls' horses as they pursue the Hobbits through the forest. The trade-off was less overall output, since the subs were separated. Frankly, I'd love to have four of these in my room, two in each sweet spot—now that would be fun!

Ultimately, though, the majority of my testing was done with one sub in the closest position, and I never found the bass lacking at modest

listening levels—which is how I do the majority of my viewing and listening. It was only during some thunderous, bass-intensive scenes played at reference level that I felt the sub couldn't keep up with my reference subs. Frankly, for a \$399 sub to even be in the conversation is the highest compliment I can give it.

I also tried the Speedwoofer 10S's wireless option, a \$50 premium. It adds a wireless transmitter, allowing you to place the sub anywhere in the room, as long as you have a power outlet nearby. For most people, this opens up new options for hiding the sub or getting the best sound from it, as you don't have to worry about running wires through walls or under



● A narrow slot vent at the bottom of the faceplate takes the place of a traditional port.

## TEST REPORT

- The Speedwoofer 10S features a pair of RCA outputs for daisy-chaining another woofer.



baseboards once you've found the perfect spot.

Pairing the sub to the transmitter was a breeze, and once connected, they never lost sync during any of my tests. Some listeners worry about the audio delay that a wireless system might introduce to the signal, but I noticed none at all. When I put the two subs next to each other—one hard-wired, the other wireless—and played the same signal to both, the

bass seemed to play perfectly in sync.

### Conclusion

In all my tests, as expected, placing the subs together produced the purest output. In fact, the pair of these damn near matched the audible and tactile impact of either the Hsu or the SVS when used alone. Were there limitations to what they could

do? Sure—the Speedwoofer pair couldn't go quite as deep as the big boys, especially when playing some organ samples that dip below 20 hertz. But, truthfully, it's rare to find bass this deep, and given the difference in cost and size between the Speedwoofer and my reference subs, that's a pretty reasonable trade-off.

I should also note that, early on, one of my two subs developed an



- The \$50 optional wireless transmitter kit lets you place the sub anywhere in your room.

odd, high-pitched whine that was only audible following extended use and after I'd turned off the rest of my system. RSL responded immediately with a replacement, and traced the issue in my sample to an out-of-spec component in the feedback circuit that was causing some oscillations. Damn them gremlins! In any event, RSL stood behind the product, and as an online company, they offer a 30-day in-home trial for all their speakers, along with free shipping (both ways, if you aren't satisfied).

Of course, in the end, it's the sound that counts—and in this regard, the Speedwoofer 10S is a surefire winner. On music, the bass is

tight, with no overhang to speak of. Not once did I feel the sound was sloppy or inarticulate. In a room as large as mine, I would ideally want four Speedwoofer 10S subs—two in each sweet spot—to satisfy me. But in many smaller rooms, one sub would be more than adequate. And two would be even better to even out the bass response; that's one hell of a bargain for \$800. Until I hear something better, when someone asks me to recommend a budget sub under \$500, this will be the first I'll mention. And a sub under \$1,000? I'll recommend two of them. ♦

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**WORLD'S LARGEST SELECTION  
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# Restraint and Refinement

By Mark Fleischmann

## Questyle QP1R Music Player

PRICE \$899

**IF YOU** HAD CHUCKED ME INTO A time machine a decade ago, freed me today, then handed me the Questyle QP1R, naturally I'd mistake it for an iPod on steroids. With that clickwheel, it's got to be an iPod, right? You'd have to explain to me that what Questyle calls the steering wheel isn't identical to Apple's clickwheel; here, the functions are divided differently among the wheel, its big central button, and the four vibrating touch-sensitive buttons around it.

My second reaction would be: Wow, this is heavier than an iPod. You'd have to explain that this high-end music player stuffs its rigid machined-aluminum chassis with lots of audio circuitry; the analog output section even utilizes discrete components. That requires some real estate, but it enables the player to audibly outperform a smartphone.

Then I'd say: What's a smartphone? You'd realize that you had chucked me into the time machine just before the iPhone's debut and that this is going to take some real splainin'. But instead, you'd plug a great pair of headphones into the Questyle and say, just listen.

### From Foxconn with Love

Questyle has divisions in both China and the U.S., and markets audio gear in 20 countries across Europe and Asia. The company's products—along with some of Apple's—roll off the assembly line at Foxconn, their OEM in China.



AT A GLANCE

+
Plus

- Three gain settings
- Heavy build and discrete components
- Clickwheel nostalgia

-
Minus

- No touchscreen or apps
- No input for DAC use
- No Bluetooth

Questyle is well versed in current mode amplification and brings that expertise to products that include a stereo power amp, a preamp, two headphone amps, a wireless media player, a digital-to-analog converter, and two hefty pocket-sized music players. The main benefits of the QP1R (\$899) over the QP1 (\$599) include internal capacity doubled to 32 gigabytes, more hand-picked components, lower output impedance to drive more demanding headphones, and lower distortion. It's also said to actually sell better.

The QP1R's space-gray or champagne-gold aluminum case is covered on the front with Gorilla Glass. Surrounding the wheel and its center button are four touch controls for home screen, folder navigation, back, and forward. They can be set to vibrate, adding a helpful tactile response. On top are a headphone minijack and a second minijack offering a choice of analog line or digital optical output (the latter with supplied adapter). The knurled volume knob—or “mechanical helm volume control,” in Questyle-speak—is protected by jutting structures sculpted as part of the chassis, leaving it accessible by thumb in front or forefinger in back. On the right side

is a power button that also flips the display on and off. On the bottom are a USB Micro-B port, for charging and file loading, and two microSD card slots, augmenting the 32-GB internal storage with up to 200 GB times two (the published specs say 128 GB, but Questyle says that's wrong). There's no Bluetooth capability, nor a digital input that would allow the QP1R's internal DAC (based on the Cirrus Logic CS4398 chip) to be used with other sources.

Simplicity is this player's merciful watchword. This is a music player, not a media player, and its 1.75 x 1.5-inch display is not a touchscreen. While this reduces functionality—no apps here—it also flattens the learning curve. There's only so much to learn. No special software is required to load music. Just drag and drop from your computer. The unit charges in four hours with a standard phone charger or in eight hours via computer. A charge provides eight to 10 hours of playing time.

Questyle says that their unusual, patented, and patiently refined current mode amplification—used throughout their product line—allows wider bandwidth and lower distortion, while employing less negative feedback than the more traditional voltage mode amplification. This take on pure Class A circuitry results in higher performance. Discrete transistors and other components are part of the recipe.

The player provides three gain modes to accommodate

## RATING

Questyle QP1R Music Player  
 Performance ★★★★★  
 Features ★★★★★  
 Ergonomics ★★★★★  
 Value ★★★★★

a variety of headphone loads. I used the high mode, which ran all the headphones I tried at less than half of the available volume range. I didn't need to resort to lower modes for fine-tuning because there were more than enough increments in the volume control, with gentle click-stops in the knob and hairline graphics in the display. Questyle offers suggestions for the gain control setting for some popular headphones in the Download section of the company's website.

I reviewed the QP1R with a trio of headphones: HiFiMan Edition X (\$1,799, reviewed in this issue), Sennheiser HD 600 (\$400), and Sony MDR-V6 (\$110). The lousy tracks were classical guitarist Narciso Yepes, Sonata K. 34—Larghetto, *Scarlatti Sonatas* (iTunes AAC); Steve Winwood, “Horizon,” *About Time* (MP3, 192 kilobits per second), and Jefferson Airplane, “White Rabbit,”



● An optional leather case is available in black, gray, or tan.

● The steering wheel is visually similar to the old Apple clickwheel.

## THE VERDICT

Although short on some bells and whistles, the Questyle QP1R is a dedicated music player that offers four-figure sound and build quality at a three-figure price.



*Live at the Fillmore East* (MP3, 192 kbps). The CD-quality tracks, all ripped in Apple Lossless, were Richard Thompson, “She Never Could Resist a Winding Road,” *Still*; Steely Dan, “Deacon Blues,” *Aja*, and the second movement of Brahms’ *Ein Deutsches Requiem* with Mariss Jansons leading the Royal Concertgebouw Orchestra and Netherlands Radio Choir. The high-resolution tracks were pianist Arthur Rubinstein, Scherzo No. 1 in B minor, *Chopin: Ballades & Scherzos* (FLAC, 176.4/24); Herbie Hancock, “Watermelon Man,” *Head Hunters* (DSD), and Billie Holiday, “You’ve Changed,” *Lady in Satin* (DSD). It was comforting to know that this is a true DSD player—one that handles DSD natively, with no conversion to PCM.

I had reservations about ergonomics, aggravated by my own clumsiness. Occasionally, when accessing the volume control from the front, I managed to activate the glass-topped touch-sensitive controls with the palm of my hand. Or my thumb would slip off the steering wheel and press one of them. I was warned that the wheel can be slippery; the designers need to give it a grippier texture. [Ed. Note: Questyle says they now have a transparent skin for this that ships with new units and can be supplied to existing owners free of charge.—RS] There was also a slight lag in the action of the volume control, which made me overshoot and vacillate until I learned to be patient with it.

### Discretion Advised

Restraint and refinement are what define this player. That means a top end that’s neither laid-back nor splashy, but clean and uncolored, methodically mining detail in hi-res

content. The midrange has a close-up perspective that images voices brilliantly without inducing fatigue (at least, with two of the three headphones I tried). The bottom end is tight and doesn’t add any kick to the bass in the bits. That would help if your headphones have an emphatic or under-controlled bass response, but not if they need bass reinforcement.

The Questyle seemed most at home with the Sennheiser HD 600 headphones, stressing their solid imaging and fulfilling their potential for high listening comfort. I’ve heard the Chopin piano selection through a variety of gear and have sometimes found its loud opening chord jarring and the rest glassy and hard. The Questyle/Sennheiser combo made the opening dynamically potent but not fatiguing, and it imaged the rest crisply but without undue edge enhancement. In the Brahms movement, the orchestra and chorus were sweet and colorfully textured. Even the Yepes guitar transcription of the Scarlatti sonata—a 1985 recording in iTunes AAC lossy format—was realistically defined. Given the lossy format and early digital recording, I expected less and tried to pick it apart, but the worst I could come up with was a shortage of woody resonance and a slightly foreshortened decay (the latter proving to be headphone dependent).

The Questyle/Sennheiser combo was vocally coherent in exactly the ways that artists likely have intended. In the Winwood track, the vocal was luminously realistic, with a slight echo that was discernible but firmly attached to the voice. The echoes in the Thompson and Holiday tracks were thicker and looser but still

## QUESTYLE QP1R MUSIC PLAYER

PRICE: \$899

Questyle North America • (702) 751-9978 • questyleaudio.com

## SPECS

**Storage:** 32 GB internal + 2 x 200 GB microSD  
• **Compatible Playback Formats:** AAC, ADPCM, AIFF, ALAC, APE, DSD64, DSD128, FLAC, LPCM, MP3, OGG, WAV, WMA Lossless • **Maximum Resolution:** 192/24 • **DAC:** Cirrus Logic CS4398 • **Maximum Output Level:** 1.95 V RMS • **Audio Inputs:** USB Micro-B (1), microSD card (2) • **Audio Outputs:** 1/8-inch analog minijack (1), 1/8-inch analog line/digital optical combo minijack (1) • **Dimensions (WxHxD, Inches):** 12.6 x 5.3 x 0.6 • **Weight (Ounces):** 8

tethered to the voice. No one would mistake the Jefferson Airplane live track for audiophile material, but the mix does preserve the dynamic arc of Grace Slick as she builds up to the declamatory finale, and the Questyle/Sennheiser team made sure that rising volume didn’t mean rising discomfort. The only thing the Sennheiser and its small diaphragms failed to get from the Questyle was a meaty rhythm section (in the Steely Dan track, among others).

The Questyle was sometimes challenged by the Sony headphones. Their treble emphasis has been cruel to many otherwise excellent signal sources, but I learn a lot from it. The Chopin piano piece reverted to being glassy and hard. The Winwood vocal, so involvingly imaged by the Sennheiser, became off-puttingly peaky. Most tracks thinned out; that’s just how the Sony rolls, unless connected to a dark-toned source, and that’s not how the Questyle rolls. Yet the Questyle/Sony combo did have its share of great moments. The Scarlatti track’s acoustic guitar remained coherent; it was crisp but not frazzled. And the Hancock-on-DSD track came through with the kind of ingratiating warmth and smoothness I associate with good analog reproduction. “Play it loud!,” I told my notebook.

While the Sennheiser was the Questyle’s ideal mate in this group, the shiny player also harnessed some of the HiFiMan’s best qualities. The Chopin piano track flipped back from hard glaze to high resolution through these planar phones. The Scarlatti guitar track acquired a noticeably longer decay than the other two headphones supported. In the Jefferson Airplane track, the HiFiMan’s bass extension brought out both the bottom-end rumble and the top-end twang in Jack Casady’s bass. Steely Dan’s horn charts glowed, and certain elements leaped boldly out of the mix to tickle my pleasure centers. “Cymbals!,” I wrote in my notebook. “Guitar solo!” In the Holiday DSD track, the Questyle/HiFiMan combo knitted together all of the sometimes warring elements—searing voice, canned orchestra, both slathered in echo—to produce a wholeness that made me write, “It’s music again.” Hancock in DSD brought me to a place that was beyond analysis. I put down the pen and just grooved.

If you don’t want to listen to music on a smartphone—but don’t want to spend more than three figures for a hi-res-friendly music player—then the Questyle QP1R hits the sweet spot just below \$1,000. It’s well built, thoughtfully engineered, and easy to use. And its clean, smooth, just-the-facts voicing favors headphones with a relatively neutral balance of frequencies, regardless of their electrical demands. If your iPod just died and you’re looking to step up to something better, this music player makes hi-res easy. ♦



● The QP1R is finished in space gray or champagne aluminum.

# Entertainment Reviews in High Definition



BLU-RAY  
Spectre



## The Ghosts of Bonds Past



After an acclaimed reboot that successfully shed the sillier trappings of the long-running *James Bond* franchise, the creators of the recent *Spectre* have now curiously chosen to embrace the clunky clichés and cartoon villains not

only of the 007 canon but seemingly every thriller of the past decade. Big Brother has arrived! It's the death of privacy! "We must stop this doomful technology before it goes online, or it will be too late!" (Not an actual quote, but you get the idea.)

A final message from an old colleague sets Bond (Daniel Craig) on a particularly risky course of action, to neutralize a paid killer and stop a terrorist bombing in Mexico City, but much grander schemes are afoot. The vast evil network known as Spectre might finally be exposed, but this cabal of bad intent is headed by a slippery fellow with deep personal ties to a certain MI6 agent. It leads to a confrontation that has been destined since 2006's *Casino Royale* and will come as little surprise to fans of the classic entries of the 23-film series. The drama



**BLU-RAY**  
STUDIO: MGM/Fox, 2015  
ASPECT RATIO: 2.40:1  
AUDIO FORMAT: DTS-HD Master Audio 7.1  
LENGTH: 148 mins.  
MPAA RATING: PG-13  
DIRECTOR: Sam Mendes  
STARRING: Daniel Craig, Christoph Waltz, Léa Seydoux

PICTURE ★★★★★  
SOUND ★★★★★  
EXTRAS ★★★★★

never quite gels, unfortunately, as today's beer-swilling/beer-shilling Bond displays none of the charm that helped make this superspy so popular. The glamor is there, and the movie has remarkably high production values, notably the complex single opening shot, plus a record-breaking explosion. But the disappointing action set pieces don't thrill, and the mopey characters fail to engage. At close to two-and-a-half hours, this is the longest Bond outing ever, and it sure feels like it.

The Blu-ray looks and sounds damned fine, though. Director of photography Hoyte Van Hoytema's distinctive lighting and camerawork impart a sleek appeal to the proceedings within his 2.4:1 canvas. The image was captured using a combination of film and

### RATINGS

	Poor	Fair	Good	Excellent	Reference
PICTURE	★	★	★	★	★
3D-NESS	★	★	★	★	★
SOUND	★	★	★	★	★
EXTRAS	★	★	★	★	★

digital video, and the resulting seamless whole is compromised by neither excessive grain nor any serious digital harshness. The colors of the Day of the Dead sequence are vibrant and inviting, the individual revelers are precisely defined in the long shots, and the wide cityscapes here and elsewhere surrender ample nuance in their distant geometry and specks of light. Outstanding detail is maintained even amid heavy shadows, while mist and smoke are naturally rendered as they add requisite ambiance. Some fine lines break up here and there, but never more than should be tolerated.

The DTS-HD Master Audio 7.1 soundtrack flaunts booming bass, supplementing the gravity lacking in the story. When something blows up, we feel it, but even Thomas Newman's symphonic score shows a pleasing fullness and enticing depth. It's an aggressive mix that convincingly establishes crowds and environments, and when cars—or a recklessly flown airplane—zip by or various weapons are fired, we can practically visualize their sharp trajectory across the soundstage. The surround channels are also utilized in subtler ways, however, as events take us to realistic offices with their mundane hustle and bustle as well.

MGM/Fox has included a Digital HD Copy code redeemable for your choice of format along with six short, repurposed behind-the-scenes video blogs, a brief still photo gallery, and a 20-minute analysis of the sprawling pre-title extravaganza. It reveals the tremendous effort expended by the cast and crew, but like *Spectre* itself, it's just not all that interesting. ● Chris Chiarella

soundandvision.com

Me. It was all me, James.”



## THE GOOD DINOSAUR

### THE ICE AGE COMETH...AGAIN

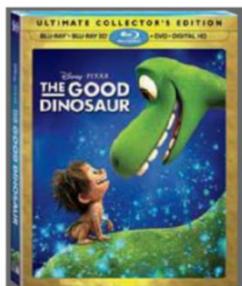
Disney

Ever wonder what would happen if the meteorite that killed the dinosaurs missed Earth instead, enabling our prehistoric pals to evolve into the dominant animals on the planet, rather than man? Regardless of your answer, here's *The Good Dinosaur*, a rare misfire from the esteemed Pixar gang. While we on the sofa are still wrestling with the ramifications of this bizarre setup, we're introduced to a family of dino farmers: no, seriously, a pack of apatosauruses that harvests corn and plows the field with their blunt heads. But then a violent storm separates young Arlo from his brood, stranding him in the wilderness, and suddenly the basic premise is rendered utterly immaterial. Arlo has some growing up to do, and his grudging role of protector for a feral human child might just provide the life lessons he needs. Yes, similarities to a rival studio's *Ice Age* are undeniable, as are the banalities from many another family film past.

The animation, however, is breathtaking, led by exquisite nature-scapes that could easily be mistaken for magnificent live-action photography, as leaves, blades of grass, and far-off mountain ranges are all immaculately rendered. The stereoscopic effect on this Blu-ray 3D has many triumphant moments, too. Rain and snow spray out realistically across the 2.39:1 frame, fireflies and birds dance and swirl in all three dimensions, while the deliberate foreground placement of bushes, trees, a layer of clouds, and even a homemade fence are further accentuated by understated focus pulls.

The DTS-HD Master Audio 7.1 soundtrack is an artfully composed accompaniment to the rich visuals, with smooth echoes wafting through the surrounds as well as swooping pterodactyls and ample discrete cues from beginning to end. Low-end power is evident in a raging river, a clap of thunder, or the roar of an imagined beast. The 360-degree longhorn stampede shook the entire room, recalling a similar scenario from *The Lion King*.

The sole 3D extra is the colorful Oscar-nominated short, *Sanjay's Super Team*. It's also on the 2D Blu-ray, alongside a handful of short featurettes. There are three crudely realized deleted scenes with introductions, plus an audio commentary by the director and others. A DVD is the third and final disc in this bundle, and the Disney Movies Anywhere Digital Copy is now viewable on no fewer than five different platforms. ● **Chris Chiarella**



**BLU-RAY 3D**  
**STUDIO:** Disney, 2015  
**ASPECT RATIO:** 2.39:1  
**AUDIO FORMAT:** DTS-HD Master Audio 7.1  
**LENGTH:** 94 mins.  
**MPAA RATING:** PG  
**DIRECTOR:** Peter Sohn  
**STARRING:** Raymond Ochoa, Jeffrey Wright, Frances McDormand

**PICTURE** ★★★★★  
**3D-MESS** ★★★★★  
**SOUND** ★★★★★  
**EXTRAS** ★★★★★



## CREED

### THE THRILL OF THE FIGHT

Warner Bros.

With *Creed*, director Ryan Coogler (*Fruitvale Station*) reboots the long-running *Rocky* franchise for a new generation of fans. Like *The Force Awakens*, *Creed*, from a screenplay by Aaron Covington and Coogler, plays it safe, never deviating far from the fundamentals that made the original film such a success.

Adonis Johnson (Michael P. Jordan) grew up never knowing his famous father, world heavyweight champion Apollo Creed. Apollo died before Adonis was born, and as a juvenile, Adonis spent much of his time in detention centers. One thing he always knew was that boxing was in his blood. Even though he was afforded every opportunity at a better life, being raised by Apollo's widow (Phylicia Rashad), he leaves his corporate job to move to Philadelphia and become a boxer. Once there, Adonis hunts down Rocky (Sylvester Stallone) and asks him to be his trainer. Despite Rocky's initial insistence that he no longer wants anything to do with boxing, he is drawn to Adonis. The two form a tight bond, and Adonis becomes like a son to Rocky, who soon finds he's fighting a great battle of his own as he prepares Adonis for the first true match of his still-young boxing career.

*Creed* was shot in HD on ARRI Alexa XT M and XT Plus cameras and arrives on Blu-ray in a 1080p AVC transfer. This is an excellent-looking film, appropriately gritty and desaturated at times, and it comes across wonderfully on disc. One can see every cut bicep and drop of sweat on the chiseled fighters, as well as every wrinkle on Stallone's face.

Warner has opted to stay old-school (relatively) with the audio track on *Creed*, giving the film a DTS-HD Master Audio 7.1 track in lieu of DTS:X or Atmos. That doesn't mean the track is compromised, however. While much of the film is quiet, it comes alive when the snippets of the hip-hop-inspired variation on the *Rocky* theme are brought to the fore and during the culminating fight sequence where we are placed in the center of the ring. Crowds cheer, and punches thwack us in the face and gut with heavy-fisted thuds.

There aren't many extras on *Creed*. The main event is a 15-minute featurette, in which Stallone, Jordan, and writer-producer Irwin Winkler discuss bringing the *Rocky* story to a new generation. Also included are 19 minutes of deleted scenes, a featurette on Jordan's training for the film, a DVD, and Digital HD UltraViolet.

● **Brandon A. DuHamel**



**BLU-RAY**  
**STUDIO:** Warner Bros., 2015  
**ASPECT RATIO:** 2.40:1  
**AUDIO FORMAT:** DTS-HD Master Audio 7.1  
**LENGTH:** 133 mins.  
**MPAA RATING:** PG-13  
**DIRECTOR:** Ryan Coogler  
**STARRING:** Michael B. Jordan, Sylvester Stallone, Tessa Thompson

**PICTURE** ★★★★★  
**SOUND** ★★★★★  
**EXTRAS** ★★★★★





### IN THE HEART OF THE SEA

## TRAGEDY ON THE HIGH SEAS

Warner Bros.



*Moby Dick* is considered one of the great American novels. Most don't know—I sure didn't—that the book was based on the true events that took place in the winter of 1820 when the whaling ship *Essex* left the port of Nantucket, Massachusetts, and sailed around the tip of South America looking for prey. While in a South American port, they hear a tale of a mammoth whale that can be found in the Pacific, so they venture dangerously far from land and get a lot more than they bargained for when they find that said whale has a vengeance against humanity. While the book deals with the fictional tale of the whale, this movie shows the aftermath of the true-life encounter and how the surviving crew are pushed to their limits trying to survive in three whaling boats in the middle of the Pacific thousands of miles from land.

As with most Blu-rays, the picture quality is exceptional, bordering on stunning on several occasions. Unfortunately, a few underwater sequences and dark interiors suffer from some banding, although the brightly lit exterior shots are outstanding and teem with detail. Fleshtones are accurate, and close-ups are particularly revealing, but the faint of heart may be grossed out by the sun-dried skin of the shipwreck victims in the third act.

The Dolby Atmos track has its moments but is mostly underwhelming, even during the action sequences. Directional queues are adequate, but the underwater sequences don't have the effect of placing you into the scene like top-rated Atmos tracks tend to do. On the plus side, dialogue is always intelligible, and the score presents an engrossing soundstage.

Supplements include a couple of behind-the-scenes featurettes and a very interesting 30-minute documentary about the real-life captain of the *Essex* who bravely went back out to sea with no better results than his first command. Rounding things out are some deleted and extended scenes, a featurette on Ron Howard, a DVD, and UV Digital Copy.

I'm generally a fan of Howard's work; even his misses are more entertaining than the average director's, and that's certainly the case here. The story has its merits, but it doesn't capture the imagination like *Apollo 13*. He failed to make an emotional link between the main characters and the audience, and frankly, I felt sorrier for the hunted whales than I did for the human survivors. Ultimately, this has rental written all over it given the middling Atmos track and screenplay. ● **David Vaughn**



**BLU-RAY**  
**STUDIO:** Warner Bros., 2016  
**ASPECT RATIO:** 1.85:1  
**AUDIO FORMAT:** Dolby Atmos/TrueHD 7.1 core  
**LENGTH:** 122 mins.  
**MPAA RATING:** PG-13  
**DIRECTOR:** Ron Howard  
**STARRING:** Chris Hemsworth, Benjamin Walker, Gillian Murphy



### SPOTLIGHT

## ALL THE CARDINAL'S MEN

Universal



A team of four *Boston Globe* journalists headed by Walter Robinson (Michael Keaton) is searching for their next exposé when their editor-in-chief (Liev Schreiber) suggests they investigate pedophile priest John Geoghan: a controversial assignment for a newspaper with a 53 percent Catholic subscriber base. Six-hundred articles later, Boston's Cardinal Law had resigned, and the church was forced to confront an international pedophilia crisis. Clearly the best newspaper movie since *All the President's Men*, *Spotlight's* brilliant ensemble cast and perfectly paced screenplay surpass Pakula's 1976 classic, justifying its Best Picture Oscar. To its credit, the movie manages to evoke ethos for the victims and outrage at the perpetrators without condemning or indicting the Catholic Church itself. In this, *Spotlight* honors the remarkable journalistic achievement it documents.

Although the subject matter of *Spotlight* limits the opportunities for showoff audio and video, the film's production values are, for a small-scale film, impressive. Since many scenes take place under fluorescent office lights, fleshtones often assume a pallor while fine textures and details are occasionally washed out. Stunningly rich black levels with gobs of shadow detail suggest a high degree of care and craftsmanship. Great color dynamics yield a palette that is both natural and neutral, as evidenced by the gorgeous greens of the golf course sequence. Resolution of fine details is variable, sometimes pinpoint and precise, sometimes drowned by those merciless fluorescents.

Audio achieves a higher level of consistency. Howard Shore's foundational score is reproduced with lovely tonality and unimpeachable clarity. Though there are few opportunities for noteworthy hard surround effects, the rear channels are always working. Whether it's the subtle but pervasive hubbub of the *Globe* offices or the murmur of the crowd at Fenway Park, the listener is always treated to an immersive and atmospheric performance, bolstered by canny use of Foley effects. Mostly, however, this dialogue-intensive audio track renders each actor's voice as uniquely as a thumbprint.

Extras include an insightful interview with the actual *Globe* editors and journalists who broke the story, but a film of such significance cries out for a substantial making-of documentary, sadly absent. *Spotlight* is poignant proof that inspired acting and intimate direction—rather than sci-fi and special effects—still define a movie's greatness. ● **Anthony Chiarella**



**BLU-RAY**  
**STUDIO:** Universal, 2015  
**ASPECT RATIO:** 1.85:1  
**AUDIO FORMAT:** DTS-HD Master Audio 5.1  
**LENGTH:** 129 mins.  
**MPAA RATING:** R  
**DIRECTOR:** Tom McCarthy  
**STARRING:** Michael Keaton, Mark Ruffalo, Rachel McAdams





## BLACK MASS

### LIVES LOST THROUGH CONTACT

Warner Bros.



In this *Goodfellas*-wannabe drama, in order to go after and finally bring down the Mafia in the North End of Boston, the FBI are willing to make an “alliance” with South Side—controlling Irish-American gangster Jimmy “Whitey” Bulger. The Feds, in exchange for information about the Italians, are willing to look the other way on the activities of Whitey’s gang. This free pass, and having his rivals federally eliminated, allows this scary, unblinking, psychopathic monster to go on a murderous crime spree, muscling in on Mafia territory to grow into the biggest kingpin in Boston. But this is a deal with the devil, for Whitey is also highly skilled at manipulating and criminally involving his Fed handler who’s ambitious for the Bureau’s praise, promotions, and raises. As Whitey sees it, “It’s not ratting, it’s business.”

Occasional scenes in FBI headquarters or Whitey’s senator brother’s offices are as light and airy as the underworld is dark and dank. Colors are cold, desaturated in a moody, dimly lit 1970s style with very narrowly focused shots that cry out for grain to complete the illusion. Nonetheless, black-and-white surveillance photographs have deep blacks and bright whites, as do the FBI suits and shirts. Skintones are natural. Plentiful detail reveals distinct patterns in Whitey’s dear old mother’s cardigans, texture in agents’ attire, and lines in lived-in faces.

Different parts of Bulger’s story are told by rats spilling their guts to the Feds, and all the dialogue in this acting-centered drama is clear and full. For much of the film, the tension-building, somber music plays quietly in the background, mainly in the surrounds, even more restrained in the front channels, but gradually builds so that by the last act you are engulfed in a sea of full orchestral instruments booming out bassily. There’s also much thump in an immersive disco scene and in rock songs (cool in 5.1) and sonic snap to gunshots.

Two featurettes of interviews with cast and crew are illustrated with clips and talking heads. One, focusing on Johnny Depp becoming Whitey, is interesting because it shows Depp getting makeup and prosthetics applied, transforming him before your eyes. A revealing hour-long documentary on the 16½-year manhunt for Bulger consists of on-camera interviews and photographs. It tells of the continual struggle with FBI higher-ups’ resistance to move against and later search for Bulger because the whole unholy affair was such an embarrassment to their corrupted and compromised organization. ● **Josef Krebs**



#### BLU-RAY

**STUDIO:** Warner Bros., 2015  
**ASPECT RATIO:** 2.40:1  
**AUDIO:** DTS-HD Master Audio 5.1  
**LENGTH:** 123 mins.  
**MPAA RATING:** R  
**DIRECTOR:** Scott Cooper  
**STARRING:** Johnny Depp, Joel Edgerton, Benedict Cumberbatch



## CRIMSON PEAK

### MASK OF THE (VERY, VERY) RED DEATH

Universal

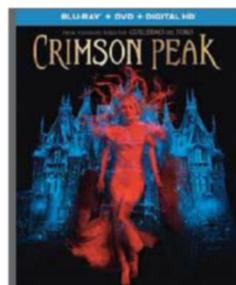


Set in the late 19th century, *Crimson Peak* is a Gothic romance, a mystery mixture of *Wuthering Heights* and *Jane Eyre*, with a dollop of *Young Frankenstein*. After the death of her mother from cholera when Edith is 12, the hideously deformed ghost comes back to warn of Crimson Peak. Fourteen years later in bustling, modern Buffalo, New York, the child, daughter of a self-made American building magnate, has become a beautiful aspiring author. She’s swept off her feet by a mysterious, darkly handsome English aristocrat who’s come to America seeking financing for his steam-powered digger of the clay his house is built upon. After the shockingly brutal murder of her father, the heiress moves to the Old World cathedral-like Allendale Hall situated atop Crimson Peak on a desolate, windswept heath to live with her new husband and his sinister sister who drifts around endless corridors like Mrs. Danvers in *Rebecca*. In an atmosphere steeped in dread, Edith must unearth the house’s secrets while it creakingly sinks into oozing blood-red clay that penetrates its floors.

Gas light and candles create warm, low-lit, painterly images, creating powerful set pieces. Contrast is excellent, with deep black jackets, bright white shirts, and natural skintones. Visually similar to Roger Corman’s adaptations of Poe, *Crimson Peak*’s striking, formal, deep-focus, and dimensional compositions are filled with saturated tones of sets and costumes. Plentiful detail in all but the dimmest scenes reveals every intricate ruffle, pattern, and piece of lacework and adds texture to tweeds and velvets. All combine to lend volume and roundness to figures and faces.

Once the movie relocates to the mansion, the mix kicks into all channels. Atmospheric and effect pans are convincing. Fernando Velázquez’s sweepingly romantic orchestral score—augmented by nerve-jangling electronica sounds that add thump to jump-out-of-your-seat moments—is full and bassy, as are slams of heavy sliding doors and the relentless heartbeat of the digging machine.

In the commentary, writer-director Guillermo del Toro draws from his knowledge of literature and art to establish an involving world of themes. Featurettes include an informative primer on Gothic romance and how the four main sets serve to evoke different moods. All offer plentiful behind-the-scenes footage, analysis, and thought-provoking background to a visually dazzling film. ● **Josef Krebs**



#### BLU-RAY

**STUDIO:** Universal, 2015  
**ASPECT RATIO:** 1.85:1  
**AUDIO:** DTS-HD Master Audio 7.1, DTS:X  
**LENGTH:** 119 mins.  
**MPAA RATING:** R  
**DIRECTOR:** Guillermo del Toro  
**STARRING:** Mia Wasikowska, Tom Hiddleston, Jessica Chastain





**THE BIG SHORT**

**MONEY MONEY MONEY**

Paramount



Based on Michael Lewis' non-fiction book, *The Big Short* brings together the ensemble cast of Steve Carell (who plays Mark Baum, a character based on the real-life Steve Eisman), Christian Bale, Brad Pitt, and Ryan Gosling as a number of Wall Street moneymen who discover the fraud underpinning the mortgage lending practices of the big banks and independently make moves to profit from the impending collapse of the system. Additionally, the film makes comical use of celebrities, playing themselves, to explain some of the technical financial jargon in layman's terms. Margot Robbie in a bubble bath explaining subprime mortgage-backed securities is my personal favorite.

Given his résumé directing comedic fare like *Anchorman 2*, it's not surprising that director Adam McKay could take the greatest economic disaster in recent history, the financial meltdown of 2008 that led to The Great Recession, and create a funny and sardonic, Oscar-nominated movie featuring several standout performances and which exposes the avarice and hubris that led to this global crisis.

*The Big Short* was shot in the Super 35 film format with some scenes shot in 4K. Paramount brings it to Blu-ray in a strong AVC 1080p transfer that is filmic, has crisp detail, vibrant color reproduction, and natural fleshtones. This isn't a film with a lot of eye-catching nuance, but the natural look of the end of the first decade of the second millennium is captured wonderfully.

*The Big Short* may seem like an odd choice to get a DTS:X mix on Blu-ray, but once you hear the mix, you'll be converted. You hear open-space atmospherics and the creak of a chair floating off to the side as Carell is in his therapy group. Additionally, there are lots of solid sound effects throughout the room; the clickity-clack of keyboards surrounding you is a common effect, and music often fills the front and surround channels. The dynamics really make this an outstanding mix. Dialogue is also full and clear. For those who have DTS:X-capable equipment, this one will be a go-to showpiece.

Several featurettes and deleted scenes in 1080p are included, but the standouts are the 14-minute "House of Cards: The Rise of the Fall," which documents in further detail some of the real events that led to the 2008 financial crash; and "Unlikely Heroes: The Characters of *The Big Short*," which examines the real-life figures portrayed in the film. A DVD plus UltraViolet and iTunes Digital Copies are also included.

● **Brandon A. DuHamel**



**BLU-RAY**  
**STUDIO:** Paramount, 2015  
**ASPECT RATIO:** 2.35:1  
**AUDIO FORMAT:** DTS:X  
**LENGTH:** 130 mins.  
**MPAA RATING:** R  
**DIRECTOR:** Adam McKay  
**STARRING:** Christian Bale, Steve Carell, Ryan Gosling



**STEVE JOBS**

**A TALE OF THREE PRODUCT LAUNCHES**

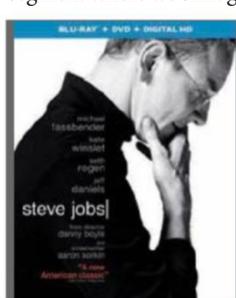
Universal



It's been said that true genius is never appreciated in its own time. Some of the most brilliant minds in human history have challenged the status quo, pioneered their field, and changed the world with their groundbreaking ideas and their seemingly limitless creativity. But the flip side of that coin almost always meant that their personal eccentricities left a gaping void in their capacity for being likable human beings. The film *Steve Jobs* explores that theme at great length and begs the question: Just how much leeway should geniuses be allowed before we dismiss them as the douchebags they are?

Not to be confused with that other Steve Jobs biopic, *Jobs* (the one with Ashton Kutcher), *Steve Jobs* deliberately and wisely abandons the traditional biography formula in favor of a literal three-act structure. We see him in those crucial hours before a mega media launch of a new product that he has personally pioneered. It's the image that we associate most with Jobs: standing in front of a packed auditorium unveiling the next big tech hardware miracle that will revolutionize the industry and change the world as we know it. And whether it's the Macintosh, the iPod, the iPhone, or the iPhart, its unparalleled success meant more to him than any of the people in his life who helped him get there.

Director Danny Boyle brilliantly approaches Aaron Sorkin's powerful screenplay with three different cinematic formats, giving each act its own distinct look and feel that work thematically in tandem with the story. Segment one was shot on 16mm film, and the grain and image blur give this sequence an appropriate low-budget quality. Imagery takes a considerable jump in sharpness and clarity during the second segment where we shift gears to the graceful nuances of 35mm film.



**BLU-RAY**  
**STUDIO:** Universal, 2015  
**ASPECT RATIO:** 2.40:1  
**AUDIO FORMAT:** DTS-HD Master Audio 5.1  
**LENGTH:** 122 mins.  
**MPAA RATING:** R  
**DIRECTOR:** Danny Boyle  
**STARRING:** Michael Fassbender, Kate Winslet, Seth Rogen



Colors and textures are more vibrant here as the story evolves to its next level. By the time we reach the final act, we've transcended to stunning high-grade digital video, and it's as if the film itself has matured along with its protagonist.

The 5.1 DTS-HD Master Audio supports the visuals superbly for a biographical drama in which the dialogue and performances are the primary focus. Sporadically, the audio struts its stuff with auditoriums pulsating with chanting, musical interludes, and subtle background ambience.

Extras include an in-depth three-part documentary on the making of the film and two separate audio commentaries with Boyle and Sorkin. DVD and Digital Copy included. Highly recommended.

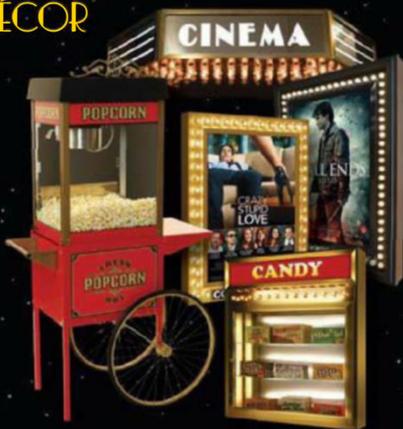
● **Corey Gunnestad**



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TAKE A LOOK AT ME NOW — RETROSPECTIVE REISSUE SERIES

PHIL COLLINS



Photo by Patrick Balls

Phil Collins required rehabilitation, and *stat*. Not only did the noted drummer/vocalist have to deal with a bout of sudden deafness, a lingering hand injury, and recover from back surgery, he also needed to tend to the state of his image. No one could fault the man's acuity behind the drum kit—a reputation initially forged by his creative deployment of odd time signatures with progressive rock giants Genesis and the fusion improv collective Brand X—but his level of ubiquity on the charts as a solo artist in the '80s and beyond ultimately served to tip his musical-reputation scales in a not-so-favorable direction.

Luckily, time—in addition to top-drawer remastering and choice bonus material—heals all music-related wounds. Witness Collins' *Take a Look at Me Now* reissue campaign, which saw double-disc presentations of his eight solo albums released two at a time over the first six months of 2016. In addition to offering (yes) 95 demos, B-sides, and live tracks (many of them previously unreleased), each album saw its cover art undergo clever reimagining. The updated covers consist of shots of the here-and-now Collins replacing the originals, which mainly consisted of differing angles of the man's visage, all having stemmed from the head-on B&W photo gracing the front of his stark 1981 solo debut, *Face Value*.

Many buyers are likely to lean more toward obtaining the four core '80s releases—*Face Value* (1981), *Hello, I Must Be Going* (1982), *No Jacket Required* (1985), and ...*But Seriously* (1989). But rest assured, Collins' four subsequent albums—*Both Sides* (1993), *Dance Into the Light* (1996), *Testify* (2002), and *The Essential Going Back* (2010)—are all also worth the investment, as many overlooked gems are waiting to be discovered within each of those sets.



All eight albums have been remastered by longtime Genesis audio guru Nick Davis, who oversaw the five-star remastering and surround sound mixes for Genesis' full-catalog DVD-Audio and SACD "cube" box sets from the previous decade. There's also 180-gram vinyl to be had here, but only for the main albums themselves and none of the bonus material. Unfortunately, surround mixes are not planned for any of these entries. I asked Collins, and while he agreed, "it's *staggering* what a difference it makes with the early '70s stuff," he's not interested in presenting his solo material in 5.1.

All that said, the very first track on the first album of Collins' solo career must be the one discussed here first, and at the most length—namely, the monster beast-mode track containing one of the most infamous drum breaks in recorded history, "In the Air Tonight." The remaster brings out all the nuances of this track: Collins' deliberately ominous Vocoder-ized vocals wafting over processed guitar, keyboard burlbles, and drum machine patterns blended from a Sequential Circuits Prophet-5 and a Roland CR-78 Disco-2. The song builds like so much swamp heat right up to the initial impactful 4-second burst of abject percussive thunder that commences at 3:41. It's as satisfying as any sonic sequence you'll experience. If Phil ever reconsiders his solo 5.1 ban, "Air" would unquestionably be the one to earmark for the first full-channel assault. (Paging Nick Davis: I can feel it coming...)

After "Air," there are many subsequent catalog highlights, which can only be summarized here as follows in the lightning round: The demo take of *Value's* almost tepid "The Roof Is Leaking," featuring Eric Clapton's much gnarlier dobro lines. The foreboding keys, marimba, and drum-kit crashes pulsing "Thru These Walls" on *Hello*. The layered background vocal buildup of Peter Gabriel, Sting, and Helen Terry on *Jacket's* uplifting "Take Me Home." The scat-blues lead vocals and backing choir mixed with soul-searing Clapton lead guitar and Pino Pallodino's tasteful bass on *Seriously's* "I Wish It Would Rain Down." The propulsive bass-and-tambourine kick fueling the lament of "Survivors" on *Sides*.

The funk'n' A horn stabs chronicling the ups and downs of "Just Another Story" on *Dance*. The pure, a cappella harmonic vocal mesh during the "True Colors" soundcheck on the *Testify* bonus disc. The Motown magic captured on the live version of "Papa Was a Rolling Stone" on the bonus disc of *Going Back*, culled from an elegiac 2010 performance at Roseland in New York.

Let's take a look at him now: After many hours (and days!) of repeat listening, it's clear Collins' solo catalog takes up much more than an empty space, reminding you of the memory of how his prog prowess with Genesis couples nicely with the smart sound design behind some of the best confessional pop songwriting you'll ever sink your ears into. But seriously: Take a long listen to *Look* and join in on another satisfying day in audio paradise.

● Mike Mettler

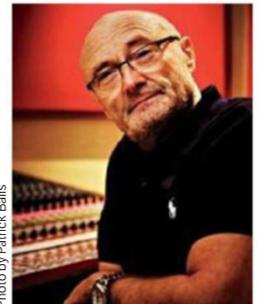


Photo by Patrick Balls

**CD**  
**LABEL:** Atlantic  
**AUDIO FORMATS:** 96-kHz/24-bit PCM Stereo (Face Value and Hello, I Must Be Going downloads); 44.1-kHz/16-bit PCM Stereo (CDs and No Jacket Required, But Seriously, Both Sides, Dance Into the Light, Testify, and The Essential Going Back downloads)  
**NUMBER OF TRACKS:** 189 on 16 CDs  
**LENGTH:** 13:47:19  
**PRODUCERS:** Phil Collins (original albums and all reissue material); Nick Davis, Miles Showell (reissues, demos, B-sides, and live material); Hugh Padgham (Face, Hello, Jacket, Seriously, Dance); Rob Cavallo (Testify)  
**ENGINEERS:** Hugh Padgham (Face, Hello, Jacket, Seriously, Dance); Nick Launay, Karen Segal (Face); Howard Gray (Hello); Steve Chase, John Jacobs (Jacket); Ed Goodreau, Simon Osbourne (Seriously); Paul Gomersall (Both Sides); Allan Sides (Testify); Yvan Bing, Thoraya Binzagar, Thierry Chaunay (Going Back)





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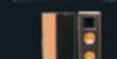
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# Private Speaker

Akoustic Arts A Directional Speaker

Akoustic Arts • akoustic-arts.com



The Akoustic Arts “A” is one of the more unusual-looking speakers you will encounter, with its honeycomb of mini transducers (200 in all). But looks aren’t the only thing unusual about this speaker. Rather than spray sound in every direction like a conventional speaker, the A projects sound in a focused beam. As the Paris-based company likes to say, it’s “the speaker that only *you* can hear.” And it appears to be off and running. By mid-April, Akoustic Arts had raised more than \$200,000, exceeding its Indiegogo funding goal by 662 percent in less than a month. We spoke with founder and CEO Ilan Kaddouch to learn more.

**S&V:** How did the concept for the A directional speaker come about?

**IK:** We wanted to revolutionize the traditional listening experience, so we created a technology to redefine personal audio. The A is a directional speaker that creates a highly targeted beam of sound, the same way a laser creates a beam of light. You hear sound only when you’re inside the beam. Outside of the beam, there is no sound whatsoever.

The A makes it possible to have multiple speakers playing different audio content in the same space. You can listen to what you want without disturbing people around you. It’s like listening to headphones without the headphones.

**S&V:** The description online says the A is based on ultrasonic technology. Can you explain how it works in simple terms?

**IK:** The A uses integrated electronics and software to create a highly directional beam of sound that can be focused on a target area, the same way a laser creates a beam of light. The technology is based on a physical phenomenon that transforms ultrasonic sounds (that are naturally directional) into audible sounds. [A more detailed description can be found on [indiegogo.com](http://indiegogo.com).]

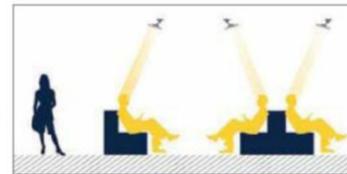
**S&V:** Akoustic Arts has two models: the A Original and A Junior. How are they different, and what is the U.S. pricing?

**IK:** The main difference between them is size and the width of the sound beam they project. The A Original costs \$1,000 and is about 8 x 8 x 1 inches (with 200 transducers); its beam is up to 48 inches wide, and it plays up to 90 decibels SPL. The A Junior costs \$600 and is about 3.5 x 3.5 x 1 inches (with 37 transducers); its beam is up to 25.5 inches wide, and it plays up to 70 dB SPL.

On the back of each speaker is a yellow A Core module with a jack for power and a minijack audio input. The module also has an updatable pilot card inside. So if you buy an A this year and want to upgrade to Wi-Fi in 2017, you just change the Core.

**S&V:** So a wireless version is in the works?

**IK:** Indeed, a wireless Wi-Fi-based version is in process but the details have to remain secret for the time being.—*Bob Ankosko*



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