The Essential Home Theatre Resource™
Widescreen Review NEWSLETTER

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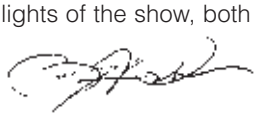
WELCOME!

December is here and winter has arrived, even in sunny Southern California. While last month's Newsletter found us running around in shorts, this month we're wearing jackets and scarves and getting ready for the Holidays.

Our archived article this month picks up where last month's left off with the interview with the Room Tuning Wizards Michael Green and Bob Hodas. Have you entered to win one of the DVDs available in our DVD Giveaway contest? Do so now while you still have time, as this contest ends on December 31, 2007. And the special Holiday subscription rates for *Widescreen Review* are still available, so be sure you start your new subscription or renew your old one before the offer expires on January 31, 2008.

Next month will find us at the Consumer Electronics Show (CES) in Las Vegas, and I'm sure we'll have lots to report on when we get back from Sin City. Everything that happens in Vegas will not stay in Vegas, and we will share with you the highlights of the show, both in the print magazine and in this online Newsletter. Until then, Happy New Year to you all.



Gary Reber
Editor-In-Chief, *Widescreen Review*

NOW AVAILABLE ON NEWSSTANDS

Issue 127, January 2008 of *Widescreen Review*:

- "Marantz VP-15S1 1080p DLP" By Greg Rogers
- "Triad Gold Series In-Wall Loudspeakers" By Gary Altunian
- "Artcoustic Spitfire Loudspeaker System" By Gary Altunian
- "Over The Rainbow: Deep Color™ And xvYCC" By Alen Koebel
- Our HDMI series of articles written by Steve Venuti, HDMI Licensing, LLC; Xiaozheng Lu, AudioQuest; Steven Barlow, DVIGear; Raymond Griffin, Kimber Kable; Noel Lee, The Head Monster; Steven Hill, Straight Wire; Joe Perfito, Tributaries; Don Bouchard, Ultralink; and Ben Jamison, VizionWare.
- "On Screen With Charles de Lauzirika: DVD Producer of Blade Runner: The Final Cut" By Danny Richelieu
- Over 40 Blu-ray Disc, HD DVD, and DVD picture and sound quality reviews
- And more...

ATTRACTIONS

Recent News

Here are some of the recent headlines that have made it to the News section of WidescreenReview.com, which is now updated daily as our Web staff finds worthy home theatre-related stories and press releases. Visit WidescreenReview.com throughout the day to find out what's going on in the world of Home Theatre.

After Holidays, CompUSA Is Done (The Orlando Sentinel)

"Consumer electronics retailer CompUSA said Friday it will close its store operations after the holidays following the sale of the company to Gordon Brothers Group LLC, a restructuring firm. Financial terms weren't disclosed..."

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Awareness Of Digital TV Transition Grows, But Substantial Education Still Needed, Research Shows

"There's growing awareness of the nation's February 2009 transition to digital television by TV broadcasters, yet the group of Americans with the lowest level of awareness about the transition includes those that are most deeply affected—households that receive television programming exclusively 'over the air'..."

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EchoStar To Officially Become Dish Network (Multichannel News)

"EchoStar Communications filed documents with the Securities and Exchange Commission Thursday to officially change its name to Dish Network Corp., a move that reflects its plans to split into two separate companies.

EchoStar announced in September its intention to split into two separate entities—one to hold its Dish Network satellite TV assets and the other, dubbed EchoStar Holding Corp., to hold its broadcast satellite receiver, antennae, and commercial satellite lines of business..."

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ATI Acquires Theta Digital

"Amplifier Technologies, Incorporated [ATI] has acquired Theta Digital of Agoura Hills, California. Theta Digital is one of the most prestigious names in high-end audio and home theatre.

This acquisition will position ATI to provide products that define the utmost audio/video experience. Long known for its innovative styling and dedication to sonic purity, Theta Digital's legacy of unswerving devotion to quality and detail will be further enhanced..."

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Dolby And SIM2 Exploit Local Dimming LED Backlight Technology (LEDs Magazine)

"SIM2 Multimedia and Dolby Laboratories, Inc are working together to develop new prototype high dynamic range (HDR)-enabled liquid crystal display (LCD) flat screens using Dolby's new LED-based local dimming technology.

In addition, SIM2 will provide Dolby with manufacturing reference designs. SIM2 Multimedia manufactures home theater products and high-end large screen systems and professional projection systems..."

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Digeo® Announces Moxi® TV For PC And Offers An Early Look

"Digeo, Inc., makers of the Emmy®-award-winning Moxi digital media recorders (DMR), today announced Moxi TV for PC, a software application enabling PC users who have a TV tuner card and Windows XP to use their personal computer as a DMR. With Moxi TV for PC, users can watch, record, and play TV content from their PC. For a limited time, those interested can sign up to for the Moxi TV for PC beta program at www.moxi.com. The beta will be available to beta testers for download at no cost..."

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I Want To Know

The Studio Scoop

Rumors, Reports, & Ramblings

Stacey Pendry

Disney/Pixar/Buena Vista/Miramax

Pixar's latest hit, *Ratatouille*, topped this year's list of Annie Award nominees, with more than a dozen nominations in 11 categories. Even the short film, *Your Friend The Rat*, which ran along with *Ratatouille* in theatres and was later included on the DVD, received a nomination.

Other nominated Disney projects include *Little Einsteins*, *Tigger & Pooh: The Turtles Need For Speed*, *Meet The Robinsons*, *Disney Princess Enchanted Tales*, and *The Emperor's New School: The Emperor's New Musical*. All were nominated in one or two categories.

Enchanted, Disney's tale of an animated princess come-to-life in New York City had the highest stateside box office receipts. With its total takings to date of $71 million in its first 12 days of release, this enchanting film could indeed prove to be a lucrative holiday favorite for the Mouse House.

The French film that had all the buzz at Cannes this year, *The Diving Bell And The Butterfly* has been picked up by Miramax for distribution in the states. Julia Schnabel's outstanding drama will be released on Friday, December 7, 2007 in New York and Los Angeles prior to a national rollout.

The film is based on true-life events of Jean Dominique Bauby, former Editor-In-Chief of the French magazine *Elle*. Bauby suffered a severe stroke that left him totally paralyzed, except for his left eye. By blinking his unaffected eye, Bauby was able to dictate a heart-tugging memoir. *Butterfly* is easily one of the best reviewed films this year, and Oscar® buzz is building even before this film's U.S. debut.

NBC/Universal

Russell Crowe will replace Brad Pitt in Universal and Working Title's project *State Of Play*, saving the delayed political thriller from shutting down completely.

Pitt pulled out of the movie in mid-November, citing concerns that the script made him feel uneasy. Universal was adamant about going forward with Matthew Michael Carnahan's script and the cast that was already in place.

Russell was already due to start filming Universal and Imagine's project *Nottingham*, the Ridley Scott-directed retelling of the Robin Hood story. He was able to shift his schedule to begin working on *State Of Play* this month and to begin production on *Nottingham* in March 2008.

Crowe has turned out to be Universal's golden boy, starring in such box-office success stories as *American Gangster*, *Cinderella Man*, and *A Beautiful Mind*

NBC/Universal has laid off 25 percent of its salaried staff at Oxygen Media, as part of the takeover of the network that was announced two months ago.

After consolidating functions and operations, NBC laid off a total of 65 of the 260 employees. The staff made redundant by the takeover will be offered jobs within NBC/Universal, where available. Others will be offered an enhanced severance package and outplacement services.

NBC/Universal paid a whopping $925 million for the network, hoping to target women viewers by linking Oxygen through cross promotion with other in-house properties such as Bravo and *The Today Show*.

Sony/Columbia Tri-Star

In order to hype their newest project with Producer Judd Apatow (*Talladega Nights*, *The Cable Guy*, *Knocked Up*, *The 40 Year Old Virgin*, and *Superbad*), Columbia has created an unconventional tie-in with the movie *Walk Hard: The Dewey Cox Story*.

The film stars John C. Reilly (*Talladega Nights*, *Chicago*, *Boogie Nights*) as Dewey Cox, a fictional rock-n-roll icon whose music influenced a nation. Reilly will unleash his inner rock star and tour the United States performing in character, as Dewey Cox, along with his band The Hard Walkers. The "Cox Across America" tour kicks off the first week of December in Cleveland at The Rock And Roll Hall Of Fame with additional performances in Chicago, Austin, Nashville, San Francisco, Los Angeles, and New York. Each concert will be preceded by a special screening of the film.

Steve Carr, director of *Daddy Day Care,* has been named to helm Columbia's *Mall Cop* in early 2008.

The comedy stars Kevin James (*I Now Pronounce You Chuck & Larry*) as a mild-mannered mall security guard, jolted into action when his mall is taken over by organized crime.

James, who co-wrote the script with Nick Bakay, will also produce the project along with Happy Madison Productions.

Paramount/DreamWorks

The writers' strike has caused a number of shake-ups in Tinsel Town's unfinished projects. The inability to get rewrites to tailor vehicles to a specific star are noted as being problematic.

This week, Martin Scorsese and Leonardo DiCaprio stepped out of Warner Bros.' project, *The Wolf Of Wall Street* and over to Paramount's upcoming film *Shutter Island*. The screenplay for *Shutter* is adapted from the Dennis Lehane novel. Paramount has signed Sir Ben Kingsley to this period thriller as well. This will be Sir Ben's first collaboration with Scorsese.

Philippe Dauman, President and CEO of Viacom—DreamWorks' parent company—this week lauded Steven Spielberg as "one of the great filmmakers of our time and all time." Hopefully, those words will have the same massive impact as the dismissive remarks made by Dauman this past summer. Dauman commented that the potential loss of Spielberg at the end of his contract in 2008 with DreamWorks would be "completely immaterial" to the bottom line of Paramount and its parent company Viacom.

Now, amid the rumors DreamWorks executives Spielberg and David Geffen are unhappy with their marriage with Paramount and are looking at Universal, Dauman is quoted as saying, "We are very pleased with where we are with DreamWorks." **WSR**

Coming Soon...
To A Retailer Near You

Danny Richelieu

New Electronics

Panasonic DMP-BD30

Panasonic recently introduced their first Profile 1.1 Final Standard Profile Blu-ray Disc player, the **DMP-BD30**. At $500, the player includes HDMI 1.3b compatibility with 1080p24 playback potential, and will upconvert standard-definition DVDs to 1080p. The player includes an SD Memory Card slot for viewing images and video through the player on your display, and can even be used to play bonus material that could potentially be downloaded from the Internet to coincide with Blu-ray Disc media. Blu-ray Disc's Profile 1.1 adds picture-in-picture compatibility with secondary video and audio decoders as well as on-board persistent memory.

Panasonic *800 405 0652* *www.panasonic.com*

UltraPower PGX-500

UltraPower, a division of Ultralink/XLO, introduced their new line of power management and conditioning components, called PowerGrid. Three models are in the line, the **PGX-500** ($500), the **PGX-400** ($400), and the **PGX-300** ($300). Each features Ultralink's patented under-/over-voltage auto shutoff circuitry with microprocessor control, high-joule surge protection, and noise filtration. The PowerGrids use a dedicated processor-based active surge processor to monitor the incoming line voltage, board-level power status, and outgoing power conditions to minimize voltage fluctuations. The devices' natural state is that of an open circuit, allowing the processor to diagnose the power conditions before closing the circuit, delivering power to the connected components. Each of the three models are available now.

UltraPower *909 947 6960* *www.ultralinkproducts.com*

New Loudspeakers

Velodyne Acoustics MicroVee

Velodyne Acoustics has introduced the **MicroVee** subwoofer, with a small, 9-inch cube footprint and three 6.5-inch drivers. Two of the drivers are passive, tuned to deliver maximum bass output, and the third driver is active, driven by an internal Energy Recovery System Class-D amplifier, which can provide 2,000 watts of dynamic power and up to 1,000 watts of continuous RMS power. The drivers are made with aluminum cone diaphragms and the active driver uses a dual-layer copper voice coil. The MicroVee is available now for $1,000.

Velodyne Acoustics *800 VELODYNE* *www.velodyne.com*

New Electronics

Nordost Magus

Nordost recently announced the newest addition to the Wyrewizard line, the **Magus** power cord. The Magus is a flexible cable that uses high-strand-count OFC ("Oxygen Free" Copper) conductors combined with Nordost's proprietary Micro Mono-Filament and extruded FEP (Fluorinated Ethylene Propylene) construction technology. The design reduces insulation contact with the conductors by more than 80 percent. The Magus is fitted with a gold-plated IEC connector, available in either a straight or right-angled configuration, as well as the option for a straight or right-angled US NEMA connector. A 1.0-meter Magus cable sells for $160; additional half-meter increments are $20 each.

Nordost *800 836 2750* *www.nordost.com*

Belkin HDMI 2-to-1 Video Switch

Belkin has introduced their newest HDMI switch, the aptly named **HDMI 2-to-1 Video Switch**. The switcher allows for the connection of two HDMI-based sources to a single HDMI input on your display device, and supports 480i/p, 720i/p, and 1080i/p resolutions. The HDMI 2-to-1 Video Switch is fully HDCP-compliant and can be controlled via IR remote, which is included with the device. The switch sells for $55.

Belkin *800 2BELKIN* *www.belkin.com*

SmX Cinema Solutions CineWeave HD

SmX Cinema Solutions has introduced a new line of audio-transparent screens that use a proprietary, patent-pending woven material. The **CineWeave™ HD** has a gain of 1.16 with a "hotspot-free" viewing angle of 160 degrees, and the woven material is said to require no equalization for loudspeakers that are placed behind the screen. SmX also guarantees that the CineWeave will be entirely free of moiré pattern artifacts, which can be a problem with micro-perforated audio-transparent projection screens.

SmX Cinema Solutions *888 810 6906* *www.smxscreen.com*

Widescreen Review™ The Essential Home Theatre Resource presents

THE ULTIMATE DVD GIVEAWAY CONTEST!

20 TITLES—OVER 100 DVDs!

Just complete the contest form below and mail it or fax it to us. We will draw names at random the first week of January 2008.


Live Free Or Die Hard


I Now Pronounce You Chuck & Larry


Shoot 'Em Up


Mr. Bean's Holiday


The Simpson's Movie


Entourage Season 3 Part 2


Transformers: The Movie


Ratatouille


Shrek The Third


Futurama: Bender's Big Score


Flight Of The Conchords


Evan Almighty


Rush Hour 3


Deep Water


Doctor Who: Third Season


Pirates Of The Caribbean: At World's End


Blade Runner: Four Disc Collector's Edition


Harry Potter Years 1-5 Gift Set

Stanley Kubrick Director's Series


Little Britain: Complete Collection

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DVD PREFERENCES

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Mail to: Widescreen Review, 27645 Commerce Center Drive, Temecula, CA 92590. Fax to: 951-693-2960. Enter online at: www.WidescreenReview.com. All DVDs are NTSC Region 1.

Entries must be received by December 31, 2007.
Titles preferred are not guaranteed to be won. One DVD winner per physical address.

Michael Green And Bob Hodas

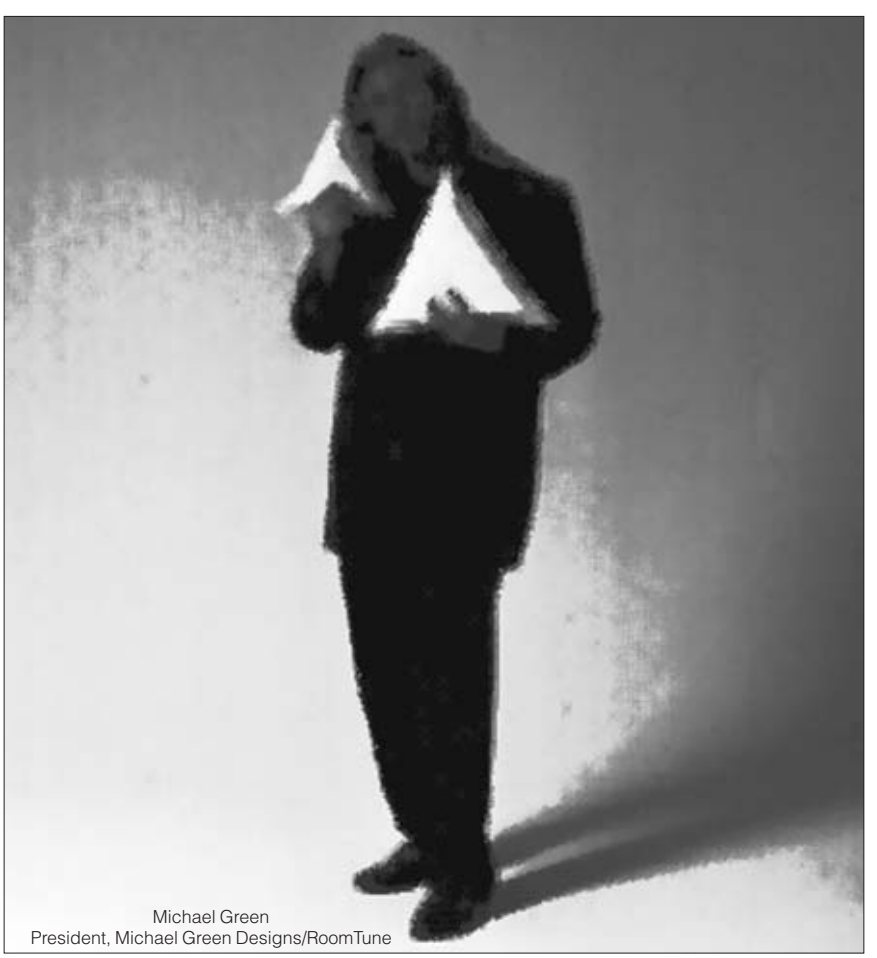
Wizards Of Room Tuning

In this edition of On Screen we explore the controlled acoustic approach to home theatre surround sound. Can the videophile and audiophile be considered separately in the context of a home theatre experience? I think not. Both the videophile's goal of realistic reproduction of the theatrical experience in the home and the audiophile's goal of the recreation of the concert or recording venue experience are mutually supportive in a home theatre music system optimally setup to maximize spaciousness and scale. The primary raison d'etre of the theatre or concert hall is not spaciousness in and of itself, but rather the ability to contain a sizeable audience. The large number of seating positions inevitable results in a whole range of better and worse seats acoustically and visually. With the typical home audience consisting of just one, two or a few people (on occasion), the optimization of the reproduction of the soundtrack for all or most of the likely seating positions is well within reach.

Michael Green and Bob Hodas, who spent time with us at our home re-setting-up our reference systems, approach surround sound set-up with the idea that when you listen to a sound system you are listening to the room as much as the system. If you accept this premise an understanding of the way a room works acoustically will provide great insight into appropriate system set-up. The result of treating your room in the way prescribed is to substantially eliminate the boundaries of the room acoustically, thus allowing for a sense of stage width, depth and height extending beyond the physical boundaries of the room.

Editor Gary Reber talks with both Michael Green and Bob Hodas during the two day period the three spent together creating a controlled acoustic environment in the living room of the home which serves as *Widescreen Review's* reference system facilities. Michael Green is the President of Michael Green Designs and RoomTune who design and manufacture acoustical and tunable audio products distributed by Ultra Systems (800 724 3305). Bob Hodas has made excellence in audio a primary goal from his early work with The Doobie Brothers, through the recent remix of *Aladdin* for Walt Disney's World On Ice, and has recorded a number of records for the Windham Hill and Hearts Of Space labels. He has consulted on the development of many successful products with manufacturers such as Dolby Laboratories and Monster Cable®. As a contributing editor for *Recording Engineer/Producer* and *Mix* magazines he has written articles sharing knowledge that contributes to the advancement of audio quality. He tunes more than 200 recording studios on a regular basis. Mr. Hodas can be reached at 510 649 9254 in Northern California.—Gary Reber, Editor ■

This continues part 2 of "Michael Green And Bob Hodas: Wizards of Room Tuning" from *Widescreen Review* Issue 15, July/August 1995. Part 1 is available in our November Newsletter #18 at http://www.widescreenreview.com/wsr_newsletter.php for free download.



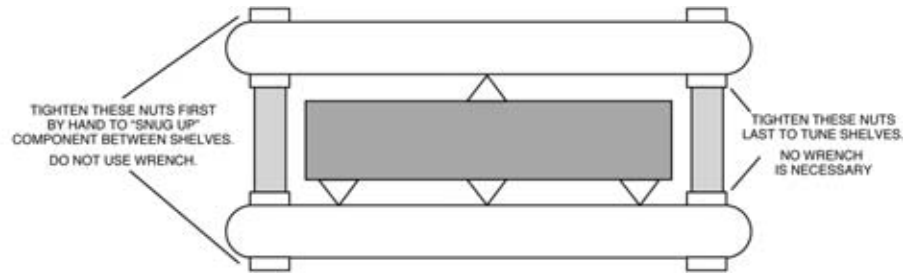
Michael Green
President, Michael Green Designs/RoomTune

Reber: Where are we now?

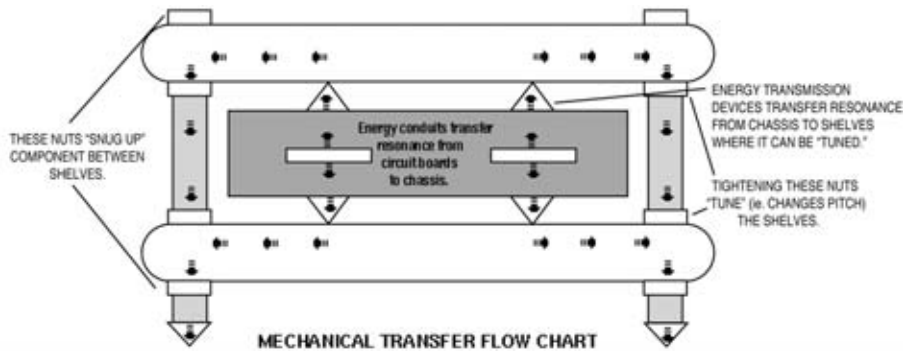
Green: I think we're up to the mechanical grounding drain.

Reber: This is the stage at which we position the AudioPoints between the bottom chassis of each component and the shelf. Explain what the purpose of AudioPoints are, what they're made of, why use only three and what's the benefit?

Green: The AudioPoint is a pure brass, geometrically designed, mechanical grounding device. Its job is to gather the vibration from a component chassis and send it at a certain rate of speed into your next surface, the shelves, which we call "tuning boards." We use three because that's the smallest number possible without leaving the component unstable. So we take the energy from the components, through the AudioPoints,



Snugging the component between AudioPoints to create energy conduits to the ClampRack TuningBorad shelves.



I have designed it so that you usually point the absorbent side away from the listener and towards the room boundaries.

Reber: I notice also that they're not large pieces of treatment, they're rather small and unobtrusive.

Green: Yes. A big misconception in the industry is that you need large sizes to work on bass response, and smaller sizes to work on higher frequencies. It's really not true, especially in this context of corner loading. With corner loading, all the frequencies gather in your upper corners and they all will load back into the room again. And so we've designed our triangular CornerTune product so that you use the minimal amount of product to get the most coverage in the room. And we have fixed major bass cancellation and phasing problems in a room by using products as small as the 16-inch x 10-inch EchoTune placed in the right place in the room. The more we think of our systems like big, tunable musical instruments the better off we are. It really is one big instrument. The only non-variable element in the equation is your ear. Everything else in the room you can change. Everything in the entire audio chain should be variable so that you can dial-in the sound that you want. The more locked-in a sound you have from any component, or speaker, or room, for instance because of damping, the further you are from the truth, and the harder it is to get back to the truth in the music. So variability and flexibility are really key to a good sounding system.

Reber: Have you had critics of your approach? Has anyone accused your approach of not being grounded in scientific principles or research?

Green: Oh, absolutely! Every time somebody makes a statement of searching, whether it's a true statement or it's a false statement, you're going to find a lot of controversy follows. A lot of people have veered from the truth. There has been a lot more attention paid to electronics and gadgetry than the mechanical physics area. They've kind of left it alone. In fact a lot of people say to me that after they hear their components put on my racks they're really surprised that they make that big of a difference. They're shocked. And they say "we didn't think that a signal could be effected that much." Acoustical music, the concert hall, and acoustical concepts are ages old, but we need to remember that audio and video are still very young industries. Combining something as delicate as electricity with sound cycles, meaning not only sound waves but actual signals traveling down a very fragile path, with all these different shapes and sizes of materials that are passing that signal, you're going to have a lot of opportunity for mistakes along the way. So to take this industry and base it on an electrical, mathematical value of a circuit, instead of including the mechanical physics behind that part, is a big mistake. What I'm trying to do is to bring the industry back to the days of the acoustical instrument, back to putting vibrations into their proper, valuable perspective, instead of saying "oh no, we can solve this problem electrically by adding more parts or more damping." I think the industry will swing back around and start building simplicity back into our systems. If we do we'll end up with better sounding systems.

Reber: So we mechanically grounded everything and intrinsically treated everything while still keeping the room relatively live. We followed by setting the loudspeakers positions according to an equal time-distance radius geometry while tuning the relative positions for the best acoustical sound dictated by the dimensions and shape of the space. And what an incredible difference your tuning, mechanical grounding and JustaRack system has made in terms of openness and three-dimensional spatially, and a natural vibrancy to the sound. Then Bob Hodas, using his SIM analyzer, simultaneously worked with us to fine tune the signal output from the electronics into the room using Audio Control one-third octave equalizers. These precision equalizers allowed us to electronically correct for the little problem areas that we couldn't address acoustically. But overall, if you look at the equalizers each channel is pretty flat based on an imaginary line drawn through the knobs to approximate the frequency response created by each channel of equalization. There's not anything really seriously out of whack there. So the combination of a relatively good room with good dimensions and high ceilings, and your acoustical treatment has laid the foundation for the last stages of electronic equalizer filtering.

Green: You want to allow the components in the system to do as much as they can and to use electronic devices like equalizers when you have a system at this level to control some of the fine tuning. You make that all work together by selectively choosing how you want your room to be controlled. You don't want to come in and just blast your room with dampening material because you're going to lose what you're trying to preserve, all that ambience that the microphones picked up during the recording process. You want your room to preserve that on playback you have a big soundstage. So yes, the two worlds really need to be working together, and that's what Bob is doing by coming along afterwards, after the room is treated and you bring the room along to a certain level, he can then measure what the room is still doing right, and what it's doing wrong, and what the components are doing right and wrong, and then you can fine tune and adjust and then… Voila! The end result is obvious: now we have this huge soundstage that is very articulate and detailed, and a very realistic sound.

Reber: That's for sure! What an astonishing openness and spatiality with very defined imaging and resolution! It simply is amaz-

ing! Frankly I was a bit skeptical about the component mechanical grounding part until I experienced the dramatic difference your solution has produced. We have two other reference systems that we will be doing as well. We've already done all the acoustical treatment and interfacing equipment so the next step is to really just fine tune it and equalize it, which we're going to be doing following this. We will report on those rooms and systems in a future issue.

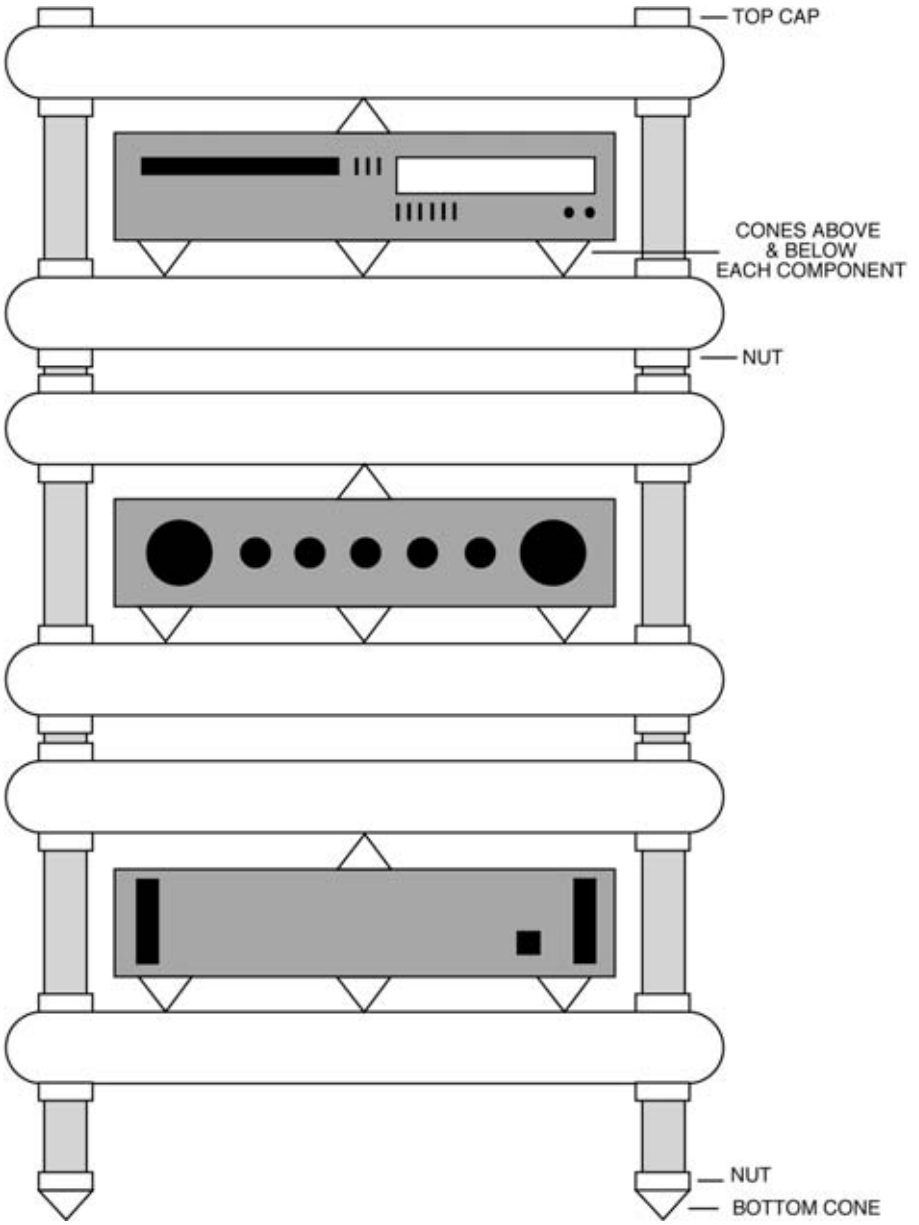
Is there anything you want to communicate to our readers in summary?

Green: Yes. I would say that we need to look at the overall picture. If I was a consumer getting involved in home theatre, I'd be looking at the basics. I'd be looking at "what is it I'm trying to achieve and how do I get there without a lot of tricks that are going to confuse me and lead me astray in the process." Consumers need to get on a path of truth. And remember, simplicity is really the key. Electronics are never going to solve the problems that you need to solve mechanically or acoustically, neither can you solve actual electronic problems with mechanics and acoustics. It's a blend. Don't put all your faith in buying the most expensive gear out there without addressing the other areas. It's much better to have a medium-priced or even a lower-priced system done right than it is to have a very expensive system done wrong. I think a lot of people buy equipment based on the prestige of a particular brand name and that isn't necessarily the right way to do it.

We also need to provide better showrooms for people to go to where they can actually see and hear surround sound home theatre systems raised to a higher level, high enough to move the potential customer to the point that they're saying, "what I'm seeing and experiencing here is really spectacular. I want to put this in my home. How much does it cost?" Once we get this all figured out and agree technically what path we are going on, then we need to start equipping the stores a little bit better. And this type of an article is very important because it starts to bridge that gap of understanding.

Reber: You have demonstrated that your techniques for room and equipment tuning for five-channel discrete really opens things up into a three-dimensional world.

Green: It's a whole new era for us and it's important that designers start thinking about how a room operates and how ears operate. We mustn't think that a huge theatre is like a small listening room, because to take that approach is going to lead you into some big problems.There are approaches out there on the market right now that are heading in the wrong direction, and just because somebody may gain a lot of ground by being, let's say, well known in a particular area, maybe even in the film industry, doesn't mean that they're going to be able to make that same scenario work in your home. It's a completely different world.



JustaRack Configured As ClampRack.

I look forward to the day when homes are actually being built with theatres in mind. Having a dedicated room where you can view movies and listen to music and get educated and play video games. Someday you are going to have a multimedia room where you will be able to combine all of these things. We need to take everything into consideration because someday you're going to walk into a Parade of Homes and they're going to have a room there that's going to be able to do everything you want it to do so that all the media input that you want to put into your brain will be there available for you. I think we need to stop heading into so many different areas and start concentrating on some of the problems and start getting them fixed. And you can do a lot of that even in the way you construct your room.

It is my goal to put together a system like this that doesn't cost a lot of money. Then you've changed the industry. It's one thing to go after the ultimate in expense and everything else. But so much the better to be able to produce something that the common person is going to be able to afford to put in their home. That's what my company is working

Bob Hodas and Michael Green tuning up.

on by developing our test facility where we can simulate any room. Not so we can do a bunch of two-million dollar homes, it's so we can get to the point where somebody purchases an average priced system and gets totally blown away by the performance. And to provide the technology in a way that will make it so simple that all you'll have to do is sit down and grab your remote and pop it on and then enjoy the movie. That's the dream. I think that the dream of every videophile is to just get past all this other stuff and just get to the enjoyment of the movie. Become engulfed in it. I think the industry is still so very young right now. We're still taking a lot of guesses. And physics are what I believe are going to put an end to all the guesses. The more I work in the technology end of it, the more I realize that a lot of these problems can be solved by good mechanical design techniques both in the home and in the equipment. And then you can hear what a five-channel system will do. Then you can hear that it's wrong to over-dampen a room. Then you can hear that it's wrong to use a narrow focused point source blasting out at your ears. Then we can learn how to set the music free. You know just like we did in your big room here. Hearing the sound really engulf you from all over the room. Then it could take you places and your mind can get really opened up. It's just like taking a walk outside in the morning with the birds singing and everything else going on, the bicycles going by, the children playing and everything else, we're used to listening to in a three-dimensional world and we need to get to that point. Once you're in that realm you'll say, "Wow! This is reality." And I think that we're one or two steps away from being able to do that for the average person in the average home. Then you're in a whole new world. I don't know what's going to happen with theatres at that point.

Reber: The home is such a more intimate experience and in many ways you can create a much more enveloping experience in your home than that in a movie theatre.

Green: I think it's much more enveloping.

Reber: Than you can experience in a large auditorium.

Green: Absolutely. For instance, the air pressure levels that you can develop in the home as opposed to a large auditorium. There are so many compromises that you have to make in a large auditorium that you can solve simply in a home. And to get that feeling, that thunderous feeling at home of being there... it's amazing too, if you've ever done a study of how quickly a person, when they sit down and view a TV, how quickly they switch over into that virtual reality portion of their mind, and in a matter of seconds they're gone. And in half a minute, they're lost, enveloped into this world of the screen. What enhances that is when the sound involves them three-dimensionally, then you're completely removed from everything else around you. They used to say that watching television was shifting your brain into neutral. It's really just the opposite. Your mind is the most active and concentrated and involved when that three-dimensional soundstage really pulls you in. That's learning. You raise the art of learning when you can get involved with all your senses. That's what we strive for. I would wipe out the idea of the living room tomorrow and change it to a multimedia room and I would say to home builders, if you really want to cash in, create a home-environment media system and watch how people respond to it because that's where we're going to do our learning in the future. It's all right there. ■

Fine Tune Electronically

Gary Reber, Widescreen Review: Bob, I invited you back this trip because you did such a fantastic job equalizing and tuning the main reference system at the early stages of designing our reference systems and publishing the magazine.

Bob Hodas: Thank you.

Reber: Tell me your impressions of the last two days during which Michael Green, you and I spent time building racks, tearing down the system, doing the geometry on the system, mechanically tuning and grounding the components and the room acoustics, and finally electronically equalizing the system within the room utilizing your SIM System II® room analyzer. But first, what is the SIM analyzer?

Hodas: The SIM analyzer is made by a California company called Meyer Sound Laboratories, which builds very high-end professional systems and studio monitor loudspeakers. The SIM System II is a state-of-the-art acoustical analyzer that looks at phase and frequency response and coherence, all in real time. It can look at the time alignment of the system and it can look at the phase placement of the subwoofers in a room compared to the main speakers so that you can move the speakers around until you get linear phase on the display. Also it looks at room reflections and the impulse response of the speakers so that you can actually analyze where reflections are coming from in the room. That's why my work with Michael is important because we can pinpoint places in the room where the reflections are and then he can treat those with his RoomTune acoustical devices.

Reber: What does SIM stand for?

Hodas: SIM stands for Source Independent Measurement. What source independent measurement means is that you can use virtually any noise source for your tuning. You could use somebody singing, or you could you use different types of noises—pink noise or impulse noise, or swept tones. This system really doesn't care what the source is. The most important thing is that the noise is broad-band. What it allows you to do is to compare what's going on at the computer with what's going on with the microphone. I can then look at what's going on at the amplifier and the input and the output of the equal-

izer as well as the microphone. And I can make a number of different transfer functions and then do some very creative work with that. So I can actually see my equalizer settings as I'm tuning a room and how it fits into the room before it's tuned and what the result is. At the same time on the screen, I can display the room in its very raw state, I can fit the equalizer into the curve of that raw room and then also watch at the same time the room as it's equalized to see how the room is being affected.

This source independent measurement the system can be used for doing tuning of live situations, live music concerts or live theater. The SIM system is used on a great number of Broadway programs. It's also used by some very, I would say, high-end opera people who are very, very concerned with how their concerts sound. Pavorati uses the SIM System. Kiri Tekanawa, Carreras, The Three Tenors concert, all these people are SIMing their concerts now. That's how much they believe in this system. The Montreaux Jazz Festival uses SIM.

So I don't have to be concerned when I walk into a home theatre and there's all this variety of equipment. I'm not as concerned with where the noise source comes from as a lot of the other tuning systems have to be because my system looks at whatever comes out of your processor as being flat.

Reber: Define for us "phase," because you use the term quite a bit in your discussion of the subject.

Hodas: Phase is reflected in the time arrival of the different components of the speaker system. System phase can also be affected by elements such as room reflections and modes that bring back audio information to the listener delayed from the direct speaker signal. In an ideal situation we would have a flat phase response system. There are very few speakers manufactured that are capable of doing that. What is important in a home theatre system is to make sure that the absolute polarities of all the speaker systems involved—left, center, right, surrounds—are all running with the same polarity. We also should address where the subwoofers actually are positioned in the room. The combination with the main speakers, depending on where the subwoofers are placed, can affect the phase of the bottom end in the crossover frequency. Without looking at phase, you could accidentally place your subwoofer so that you're canceling at the crossover frequency. So it's important that you can see the phase response, so you can find the flattest response and hence get the proper amplitude for the combination of subwoofers with main speakers. Then aside from just the phase, the coherence factor which looks at the direct to reflected sound ratio, should be very high. You want high intelligibility in the theatre system so the coherence factor gives you that intelligibility reading.

Bob Hodas dialing in Right Surround equalization on the Audio Control C-131 one-third octave equalizer using the SIM Room Analyzer.

Reber: So basically what we have to do is trace linearity up to and through the output of each loudspeaker into the room?

Hodas: Right.

Reber: The signal then is analyzed from the input to the output of the processor all the way through to the equalizers and amplifiers, and finally the loudspeakers. As you know we use the Audio Control R-131 one-third octave equalizers which are essential to doing this job.

Hodas: I would say one-third octave is actually "old school" at this point. I know that they're still very popular but if you really want to tune a room properly, what you need is a complementary-phase parametric, that's a parametric that works with minimum phase, second-order filters. The reason I prefer parametric over third octave is because the center frequencies of the third-octave equalizer are all fixed. The problems in any given room are not necessarily fixed at those center frequencies. For instance you may have a big bump at 900 cycles or you might have a big bump at, let's say, 70 cycles. The third octave has a frequency center at 60 cycles and at 80 cycles but there's no center at 70 cycles and the bump that you have or the dip may be wider or more narrow than third octave. The parametric allows you to find the exact center frequency and to shape the curve to exactly fit your problem. Whereas with third octave you're stuck. And you can only come half around that problem. In fact there are many problems that go untreated because you can't get to those proper center frequencies or you don't have the right bandwidth control. So really I would like to see the industry moving into parametrics and out of third octaves because there's just not enough control. And when you have a room in a home that has a lot of anomalies any way, a room that's not specifically designed for listening to music or movies, you run into a lot more problems that you need finer tools to produce good results.

Reber: Outside of Audio Control and Rane Corporation there's really no other companies that are building high quality equalization products. Audio Control does not build a parametric equalizer. Rane has one equalizer designed for home theatre with limited parametric capability. It's limited to two bands of frequencies, with the balance in partial one third octave. I have found the Audio Control units to perform to the highest audiophile performance standards with virtually no degradation to the signal. They employ professional Constant-Q (another word for bandwidth) adjustment for precise control within narrow bands with no or minimal effect on adjacent one-third octave bands even for small amounts of boost or cut. Because of their Constant-Q technology the bandwidth is very tight and narrow, and they are, I understand, easier to work with unlike a parametric which allows control over all parameters of equalization: amplitude, frequency and bandwidth, and requires a sophisticated analyzer such as the SIM System.

Hodas: Yes, they do perform well. I do know who makes parametric equalizers for the consumer market though. Meyer Sound Laboratories makes a complimentary phase

Bob Hodas setting up to dial in Center Back Surround equalization on the Audio Control C-131 one-third octave equalizer using the SIM Room Analyzer.

parametric equalizer that's very hi-fi in that it's built with all polypropylene capacitors and 1/2 percent metal film resistors. It even has gold connectors. They do a very nice job on it. Their unit can operate at +4 dB which is the pro level or -10 dB for consumer applications. It has a switch on the back so you can actually use it in a semi-pro or let's say a home-style situation.

Reber: It's important when you're doing the kind of sophisticated tuning that we're doing that you have individual control over every channel in a multichannel system, so we're using mono one-third octave equalizers.

Hodas: Yes it is important to have enough control. The Meyer equalizer comes as a stereo parametric. You get two channels in one chassis. If you wanted to, you could actually jumper it together to make a mono equalizer, but it's not usually necessary. If you can solve the room problems using it as a stereo parametric then you can save some money. With a parametric you can usually tune a room with less filters since those filters are adjustable.The parametric, I should say, is what I put in most of the recording studios that I tune. Recently I just tuned a studio for an Elton John session and I just finished a studio for a Lyle Lovett session, for the recording and mixing of their records.

Reber: While I agree with you that a parametic can offer even greater control, the Audio Control R-131 equalizers do an excellent job providing precise control within the designated bands and a significant level of improvement in audio performance. I haven't heard a better sounding unit. It sounds transparent and is built to audiophile quality standards. I do agree that an audiophile quality parametric with sufficient capacity to work across the full frequency bandwidth would provide more precise control and thus would be a benefit to precise room tuning to eliminate or minimize coloration caused by the listening room. Perhaps our discussion will peak the interest of Audio Control or Rane or others to introduce wide bandwidth parametric equalizers.

Hodas: Your system certainly does sound good. There's no doubt about it. But there were frequencies that I couldn't get to, things that I would have liked to have done that I just can't do with third octave. If you were going to give me my choice for the best tool to do the job, it has to be a parametric. But believe me I'm happy with the way your system turned out.

Reber: Yes, I agree, it sounds wonderful! How do you feel about using an equalizer without having a capacity to analyze the room electronically with a calibrated microphone?

Hodas: It's a dangerous thing. You could hire someone to come in with a less sophisticated analyzer but there are things that are missing. Most of the analyzers don't look at phase and so you could have a component out of phase and never know it and you could be trying to make up for the problems with the equalizer. You know I started out with less sophisticated tools. Mostly I wound up checking everything with my ears. And of course ears are always the final test of any system. But you could do an adequate job with a less sophisticated equalizer or you could create more problems. I do think part of it is going to depend on the skill of the operator. But certainly for my money, I want the best tools that I can get and that's why I use the SIM system.

Reber: There's a direction developing in the high-end audiophile market toward using a room analyzer for tuning multichannel systems. In fact, Snell Acoustics is one of the first high-end loudspeaker companies to introduce a six-channel digital room system in which the early-arrival response of each of six speakers is corrected for both magnitude and phase response. I have not had any experience with this new system which costs about $8,900.

Hodas: I am not familiar with Snell's system but I do know what other companies with similar products are doing. First off, I would have to say my SIM analyzer alone costs $30,000. The level of sophistication that I've got in my analyzer is extremely high. The SIM System won an R&D 100 award from *R&D Magazine* and was displayed in the Smithsonian as a significant advancement in acoustic measuring tools. I don't know any other company that can make that claim. Also I know that the resolution that I capture in my SIM analyzer is much greater than what the other systems can capture. If they are using digital equalizers then they may be doing digital conversions in the listening chain. This could place a restriction on the amount of reverb and air heard in the system. And as far as I'm concerned, in the audiophile world, the less digital conversions you use the better. Even without additional conversions, the type of filters that are currently being used in all of the digital equalizers are FIR filters (finite impulse response), and if you really want to produce a minimum-phase filter, which is what your room problems are, you need IIR filters (infinite impulse response), and those are extremely expensive. The technology just isn't there yet for a high performance consumer analyzer/equalizer combination. So my feeling is that at some point in the future, digital equalizers in the analyzers will be a good thing, but right now you can accomplish better dynamic range, better signal-to-noise and better resolution using analog components.

Reber: You said the SIM system has greater resolution capability than other systems. How do you define resolution and what is the importance of that?

Hodas: A lot depends on how the system gathers information and whether it takes into account the reflections, the distance between the speaker and the tuning microphone, and the propagation delay that occurs. You want to identify first order reflections and depending on how the information gathering window is set up, you can actually miss information

that you should be trying to measure. For instance there are some systems that use very fast swept tones to gather the information. The speed at which the tone sweeps through in the low end doesn't last long enough to generate enough of a wave length, and so in the low end they tend to smooth out the response. My system looks at different frequencies with different length windows and so can capture accurate information very far down the spectrum in real time. With the SIM system I'm gathering information at 48th octave resolution and displaying it at 24th octave resolution. You can imagine that's a little more sophisticated than third octave. And I can see problems that in one-third or even one-sixth octave analysis become smoothed over. Problems where you may have some combing occurring from let's say a coffee table sitting in front of the listening position. To a third-octave system that may look like a hole. But if you look at it in one-24th octave resolution it may be a series of combs that are very tight and that's an area that you would not want to equalize. What happens is, as you move around the room in your listening position, that equalization isn't valid, in fact it causes problems for other people in the listening area. The SIM system gathers very accurate information. Some of the other analysis systems tend to smooth over some of the problems because they don't see those problems.

Reber: So many systems rely on summing techniques, don't they?

Hodas: Yes. A lot of the systems coming out in the market right now which have been developed by THX® and Dolby use summing techniques. JBL, I think, also has a system. Multiple microphones are placed in different areas of a theatre, then the responses are summed together in order to make decisions about how to equalize. There's two things that I see wrong with that. You may have three microphones that are showing a pretty good frequency response, and one small area of the theatre that has a very poor response that drags down the average, so you end up making equalization decisions based on a lower general average than you should. Also you may find that because of the way that things sum together, you may be equalizing areas that really you should be leaving alone because as you go around to the different points, things may be changing radically. The other big problem with summing is that it does not allow you to see phase. None of those systems address phase whatsoever. You may have components in your system that are out of phase and never know it and they'll show up as frequency problems. Then you'll be equalizing to compensate for phase problems which is a big mistake. I've seen situations where a system was tuned by one of the major companies with their summing techniques and the people who were putting on the show, complained bitterly about the way it sounded, although it showed up as being flat on their system. They brought in SIM and looked at the system and we found that the woofers and the horns were out of phase and even some of the horns were out of phase with each other. So I think it's very important to look at individual microphones. The SIM system allows you, depending on how sophisticated you want to get, to use up to 64 separate microphones. But it doesn't sum them together, it lets you draw up memory traces on the screen and then you can compare the memory traces with live traces and do a series of overlays and let a human make a decision as to what's valid and what isn't. And the coherence factor also tells you a lot about how badly room reflections or long reverb times are affecting the frequency response, so you can make accurate decisions there as well.

The completed Reference System L acoustically, electromechanically and electronically tuned by Michael Green and Bob Hodas. (See Reference Systems page 6 for complement of components.)

Reber: We accomplished today the main room, or Reference System L, and we have yet to complete the room tuning on two other rooms, System F and System D. I am extremely impressed with the sound of the main room. The sound is so open and so huge. I mean the soundstage extends to outside the walls of the house enveloping the listener in a seemingly endless radius perspective with exceptional depth delineation in both the front and back soundstage. The speakers have disappeared completely as a source. The sound is spatially holophonic. It's simply unbelievable how, defined, spacious and natural sounding the system has become with Michael's acoustical tuning and your complementary electronic tuning.

Hodas: Yes, a lot of that had to do with the combination of acoustic treatments along with equalization. I don't think that either is completely the answer. I think that really you want to address as much of the acoustic problem as you can with treatments and then come in with equalization once you've done everything you can acoustically. Use equalization to really fine tune things and correct some of the low end room problems that would be much too expensive to do acoustically, because it would mean changing walls and things like that.

Reber: I've never heard my Mirage System sound that open and spatial before in that room or in any other environment.

Hodas: It sounds great. I'll tell you, when I played my CD reference that I take to all the studios, it just sounded wonderful. It sounds better than a lot of the studios that I tune.

Reber: The home theatre market is a wide open market for SIMing.

Hodas: Yes. I've tuned several rooms that have been featured in *Audio/Video Interiors*. Mostly people have been using me on the extreme high end but it's certainly possible to SIM tune on a cost-effective basis, and a lot of people, even with mid-range systems, could benefit from it. Certainly anyone that's got a high-end system, who's really concerned with the way it sounds, would benefit from the analysis.

Reber: Do you have any other comments that you think our readers would be interest-

ed in about today's tuning or anything about the approach we've taken to our home theatre reference systems?

Hodas: As I stated already, what's important is that when working with an equalizer and an analyzer, you go for the best resolution you possibly can. It's important to address as many issues of the room acoustically before you start turning knobs and doing things electroacoustically. I certainly believe that it's a solid marriage between acoustic treatments and equalization to get a room really tuned-in so that it's enjoyable.

Reber: Were you as impressed as I was with Michael Green, with the component mechanical grounding and tuning of the rack that resulted in subtleties and benefits to the sound?

Hodas: Absolutely. I'm a firm believer in that. And only because I can hear it myself. You know I'm in the pro business, but I have audiophile sensibilities. In fact, as you know, I have recorded a number of records for the Windham Hill and Hearts Of Space labels, as well as remixing Disney soundtracks. I'm a recording engineer myself and my ears are very important to me. As you know I've recorded some CDs that were done ten years ago that are still in use at the Stereophile shows and even the CES shows for demonstration purposes.

Reber: I know when I first met you, you were one of the first people in the pro world that recognized that cables made a difference and even embraced and used high-end cables such as Monster Cable ProLink® used for professional recording and monitoring. This system, as you know is completely wired with Monster Sigma® interconnect and loudspeaker cables, which are engineered for time correct phase, and Monster Silver Digital and Silver Video.

Hodas: Yes, I certainly do and I am always open to listening. I think analyzers are great but there are a lot of things still that we don't know how to measure yet and so we have to rely on the best analyzer possible which is the ears and the brain, and that is always something that I am going to continue to use. I'm not going to just trust what goes down on the computer screen.

Reber: So bottom line for our readers is that you'd recommend them to seriously look at their acoustics and simultaneously electronically tune to finely adjust for the best sound attainable in the room.

Hodas: I think it's a simultaneous process because the analysis can help you identify the areas that you need to treat acoustically. You can do the treatments and then play with the equalizer to tweak it all in. But I think to just sort of do acoustic treatments on a random basis you may get into more trouble. And sometimes you might spend more money than you really need to. You may over treat a room and that's just as bad as under treating a room. You should use somebody who does this professionally. I've done over 300 rooms and I've seen a lot of different types of rooms and know what to look for, and if you've got someone that just sort of does it on a part-time basis, you might get yourself into trouble.

Reber: Well, not too many people are going to invest in a $30,000 analyzer unless they're serious about their work.

Hodas: No, very few people would spend that kind of money on an analyzer. But I want the best tools that I can possibly get because quality is the most important thing for me and my reputation. ■