

The Rocky Mountain Audio Fest

Three DIY audio fans traveled to the Centennial State for an annual audio get-together and filed this show report.

By Bob Cordell

Peter Smith, Darren Kuzma, and I are DIYers with quite a bit of experience attending DIY loudspeaker gatherings. None of us had ever been to the Rocky Mountain Audio Fest (RMAF), but we had heard good things about it. So, on a Friday late in August, while discussing how much fun it would be to present some speaker and amplifier workshops at RMAF, we decided to give it a try. We had never worked a show before, but we had given numerous demonstrations at DIY gatherings that had been fun and informative and believed we could put something interesting together.

We floated a brief description of what we wanted to do by the folks at RMAF and a few potential sponsors (there was no way we could afford the exhibit room and the cost of the trip without some help). The folks at RMAF and Ray Kimber came through, and their combined help and generosity made our workshops possible. This show report thus covers two aspects: the Rocky Mountain Audio Fest itself and the workshops we put on at the show.

OFF TO COLORADO

After six weeks of intense planning and preparation, we loaded all of our speakers, amps, and test equipment into Peter's SUV and left New Jersey for Colorado. So began our road trip. We made it to Denver in two days, arriving Wednesday night at the Marriott Tech Center to be greeted by a thin brush of snow still on the grass from a snowfall the night before. Welcome to the Rockies!

Thursday was setup day for the exhibitors. I think the experience left us with a much greater appreciation for the blood, sweat, and tears that go into the setup for a show. Having been to other shows, we were mindful of the difficulty of setting up in a strange hotel room and getting good sound. By Thursday night—and after a few tweaks—the room sounded pretty good and the test equipment was working. We were ready for the show.

THE SHOW

This was the third annual Rocky Mountain Audio Fest put on by Marjorie Baumert and Al Stiefel with the support of

the Colorado Audio Society. They put on a heck of a show, and it is easy to see why RMAF has taken off like a rocket since its birth just a couple of years ago. Attendance was up 23% from last year.

The show opened at noon on Friday, October 20. The Marriott Tech Center in Denver was a great venue, with room after room of great-sounding equipment and audiophile eye candy. It reminded me of the good old days when the Convention of the Audio Engineering Society was at the Waldorf Astoria in New York City. The intimate, friendly atmosphere was home to over 300 exhibiting companies—large and small—and over 2200 enthusiastic audiophiles for three days. We were instantly comfortable at this show.

Indeed, RMAF is a less expensive venue than many other shows and is more affordable to the smaller entrepreneur. At the same time, the exhibitors list reads like a veritable who's who: Halcro, Boulder, Kimber, Focal, Wilson were all there.

And don't forget the Glass and the Vinyl. There was plenty of vacuum tube

PHOTO 1: The real stars of the show: Marjorie Baumert and Al Stiefel.



PHOTO 2: Ray Kimber's IsoMike™ room, which included big Pass amps, was one of the highlights at the show.





PHOTO 3: Red Rock's beautiful Renaissance 50W vacuum tube monoblock employs the Svetlana 572 directly heated triode in a push-pull configuration.

electronics in evidence, complemented by many high-efficiency speaker systems. There were numerous gorgeous turntables on display and a great selection of vinyl on sale to go with them. In the room shared by Walker Audio and Red Rock Audio, I was treated to some of the best vinyl reproduction I have ever heard. The gear included the Walker Proscenium Black Diamond turntable and Al Stiefel's beautiful Red Rock Renaissance push-pull triode 50W amplifiers.

Ray Kimber's room was a sight to behold, not to mention hear. His pre-

sentation of experimental high resolution recording with the IsoMike™ technique was a highlight of the show. In that room we were surrounded by huge panel speakers fed by over a dozen Pass amps in an intriguing surround-sound setup.

There were many great-sounding rooms at the show, but the most impressive contained the Wilson Sophias. Whether due to the setup by the Wilson folks, or just blind luck in a strange hotel room, they sounded the best of all speakers I heard at the show—even better than their big Maxx siblings. Driven by Pathos amps, the Sophias enjoyed dead-on stable imaging, and seemed to do nothing wrong in producing a smooth, effortless sound.

These are not really large speakers, yet they produced extended and well-balanced bass. The Sophias I heard at the show were very good, but they didn't do anything special for me, so I was not prepared to fall in love with them when I entered the room. As a speaker designer (albeit serious DIY speaker designer), the rightness clicked, and I knew I had a new clear target to aim for.

The friendly show and intimate atmosphere was topped off by some very good live entertainment on Friday and Saturday night. Marjorie and Al did a fine job, indeed.



PHOTO 4: Peter smiles as participants struggle to decide which sound is from the vacuum tube amp in the listening comparison workshop.

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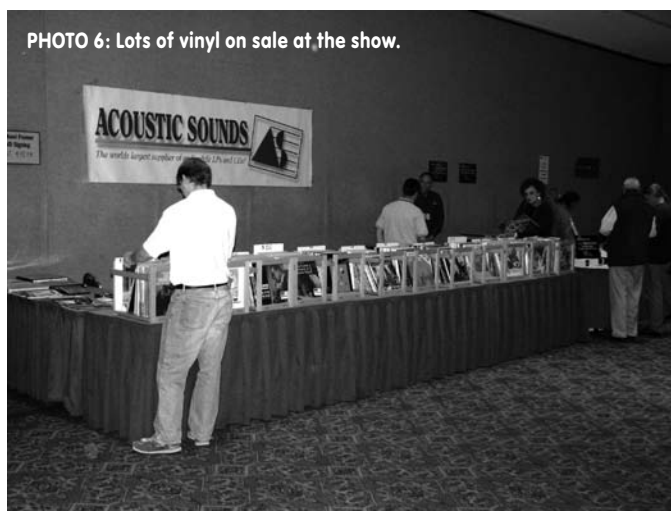
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PHOTO 5: These colorful Azzolina Audio super high efficiency horn-loaded matched full-range speakers provide high efficiency for the vacuum tube amps driving them.



PHOTO 6: Lots of vinyl on sale at the show.



OUR WORKSHOPS

We named our group of workshops “Amplifier and Loudspeaker Listening and Measurement.” In a sense, we tried to plan something for everyone. The six workshops included:

- Amplifier Measurement Clinic
- Amplifier Listening Comparison
- Loudspeaker Listening Comparison
- Loudspeaker Measurement Clinic
- The Peak Power Demands of Well-re-

cord Music
Active Loudspeakers—An Example

Quite honestly, we were thrilled with the response to the workshops. We went into this not really knowing whether our presentations would be a success or a bust. We had consistently good room traffic and all of the workshops were well-attended. The room was virtually never empty. In many cases, attendees stayed the whole hour for a workshop.

Indeed, we were humbled by the fact that some people came back to the room several times. There is a very real thirst for knowledge and healthy curiosity out there among our audiophile brethren. One thing that may have worked in our favor is that we were simply different from most of the other rooms at the show. We were also gratified that a number of attendees remarked that our room sounded very good; this is certainly a compliment for DIY equipment at a show dominated by very expensive high-end audio gear.

Following is a short summary of each of the six workshops. You’ll find more details about each workshop on my website www.cordellaudio.com.

AMPLIFIER MEASUREMENT CLINIC

How are amplifier measurements done, what do they mean, and do they have any real value? This amplifier testing clinic showed attendees how audio power amps are measured and which measurements are important. Live measurements on an actual amp were made and differences in measurements and

design were discussed. In the course of the clinic, we discussed why amp measurements are not always a good predictor of sonic differences.

The clinic began with an explanation of some of the kinds of measurements usually conducted on amplifiers. We used some *Stereophile* equipment review graphs kindly supplied by John Atkinson. This part of the clinic gave attendees a chance to become familiar with measurements and what they mean. Live measurements were then performed on a real amplifier. Equipment included a THD analyzer, a spectrum analyzer, a PC-based Digital Storage Oscilloscope, a 19+20kHz twin-tone source, a high-power 8Ω dummy load, and several other pieces of related equipment.

This workshop was well-attended and most participants stayed for the whole hour, engaging in lots of Q&A, particularly in regard to what influences the difference in sound between vacuum tube and solid-state amplifiers.

AMPLIFIER LISTENING COMPARISON

Few have ever been able to participate in a real-time, level-matched comparison of two power amps driving the same speaker system in the identical acoustic environment. The listening comparison involved a 35W per channel vacuum tube amp and a very well-built solid-state Denon amplifier rated at over 200W per channel.

The vacuum tube amp was one of “classic” late Sixties type design that was recently gutted and updated. Each channel employs a pair of KT-88s in a Class-

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PHOTO 7: Darren is in his element as he discusses loudspeaker design.

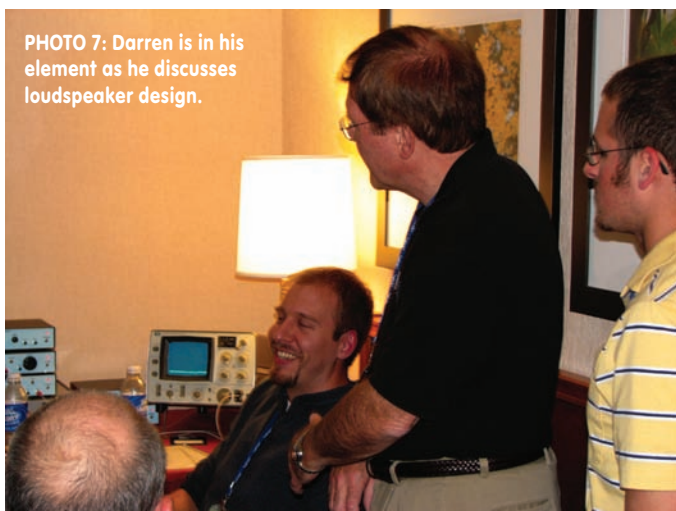
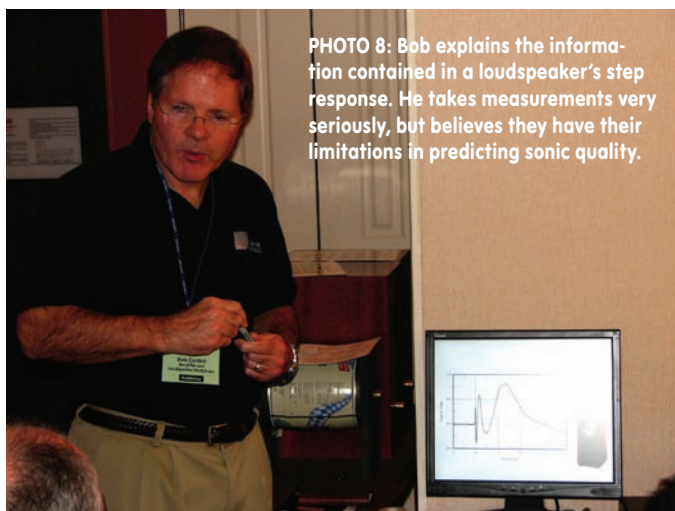


PHOTO 8: Bob explains the information contained in a loudspeaker's step response. He takes measurements very seriously, but believes they have their limitations in predicting sonic quality.



AB pentode arrangement with fixed bias. The amplifier employs a modest degree of negative feedback typical of amplifiers of the time, and achieves a damping factor of about 20.

This was an interactive workshop. One participant held a remote switch and could select either the vacuum tube or the solid-state amplifier. A green LED visible to all participants illuminated when one of the amplifiers was se-

lected. The identity of that amp was not revealed until after the show. A variety of music could be selected for the listening comparison.

Some people came away from this presentation amazed at how hard it is to hear variances in obviously different components, while others thought they could perceive subtle audible differences. Attendees were informally polled at the end of each presentation and the results

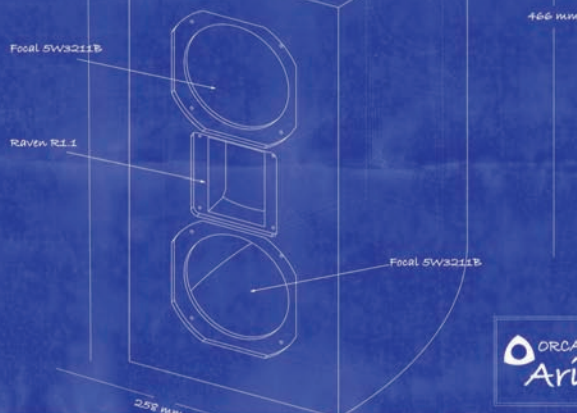
were tabulated. There were no "night and day" results. Indeed, for most attendees the differences were difficult to hear. Moreover, those who perceived a difference were just as often wrong in selecting which amplifier they thought was the tube amp. This shocked all of us.

LOUDSPEAKER LISTENING COMPARISON

This workshop focused on using au-

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dition music for loudspeaker listening tests. It included a discussion of what to listen for and what kind of music works. Peter Smith, a long-time speaker designer, presented this workshop. Peter wrote the recent article describing his “NeoNoir” loudspeaker in *audioXpress* (Sept. '06).

This workshop was well-attended, with many participants bringing their own CDs. The participants enjoyed learning the basics of critical listening. Peter demonstrated the importance of listening with a variety of selected material, and how each audition cut can reveal something different about the loudspeaker.

LOUDSPEAKER MEASUREMENT CLINIC

Darren Kuzma presented the workshop, which included a live demonstration of speaker MLS testing, a discussion of many of the challenges in speaker design, and examples of modern speaker building software and measurement techniques. As the former speaker component systems manager at Parts Express, Inc., Darren was largely responsible for their very popular Reference components. This workshop was invaluable for any attendee contemplating building his or her own speaker system.

There was considerable discussion of the implications of the loudspeaker’s measured step response in regard to driver alignment and type of crossover, and whether the loudspeaker was transient accurate (always a hot topic). A live measurement of a loudspeaker was then demonstrated using the CLIO

PC-based acoustic measurement system. Throughout the workshop there was a relaxed, open discussion of loudspeaker design issues by Darren.

THE PEAK-POWER DEMANDS OF WELL-RECORDED MUSIC

This thought-provoking demonstration made many participants think twice about how much amplifier power is needed for the reproduction of well-recorded music with good dynamic range. Participants were able to see the very high peak-to-average power ratio of music while they were listening to it. The high crest factor of well-recorded music can place very high peak-power demands on a power amp even at modest listening levels when loudspeakers of average efficiency are employed.

The presentation relied on a Peak-Average power display built specifically for the workshop. The display included two large LED displays that read power in integer watts into 8Ω. The box displayed true-RMS-derived average power on a long-term basis on the left meter, which was intended to be a rough approximation of the perceived loudness.

The LED display on the right side of the box showed the momentary average-calibrated power that occurs on musical peaks. This is the power that a conventionally-rated power amp would need to have in order to reproduce that musical peak. Note that if a continuous sinewave input is applied to the box, both meters will show identical readings. The Peak-Average power display will accurately detect and display a musical peak that lasts as little as about 20μs and will hold

it for one second before the reading begins to decay. I describe the Peak-Average power display in more detail on my website.

A variety of music was used for this demonstration, but the musical cut with the highest crest factor we have found so far is Rickie Lee Jones’ “Ghetto of My Mind” on her *Flying Cowboys* CD. Play this cut at even remotely realistic levels and monitor it with the Peak-Average power display and you may re-think how much power your amp should have. Of course, most music (unfortunately) is not this “bad” because of compression added in the recoding process for the dominant boom-box and car-CD market segments.

This demonstration was a real “Wow” for the attendees. The Rickie Lee Jones (RLJ) cut was played at realistic, but certainly not unpleasant, levels in the relatively small hotel exhibit room on speakers with an estimated sensitivity of about 89dB. The average power typically read 1-2W, while the power on peaks often topped 250W. On this cut, most peaks occurred with an aggressive “thwack” to a snare drum positioned dead center. While it is true that the RLJ track has an unusually large dynamic range, this data still suggests that many listeners may be clipping their amplifiers more often than they think.

ACTIVE LOUDSPEAKERS—AN EXAMPLE

Active loudspeakers tend to have an unfair advantage over their conventional cousins: the amplifiers, crossovers, and loudspeaker drivers are mated together

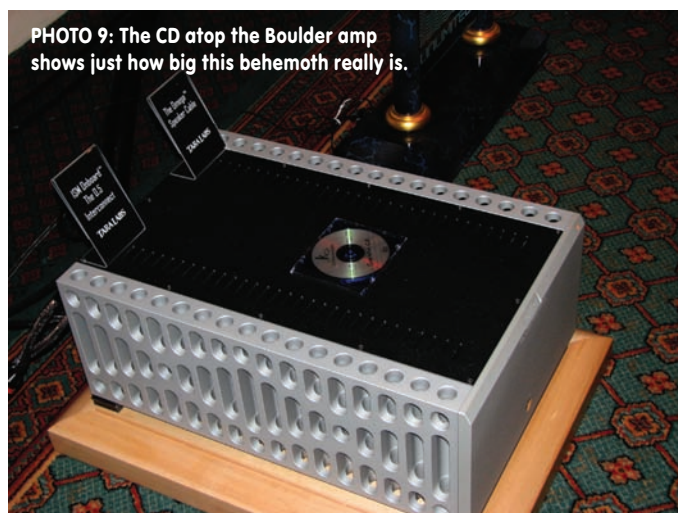


PHOTO 9: The CD atop the Boulder amp shows just how big this behemoth really is.

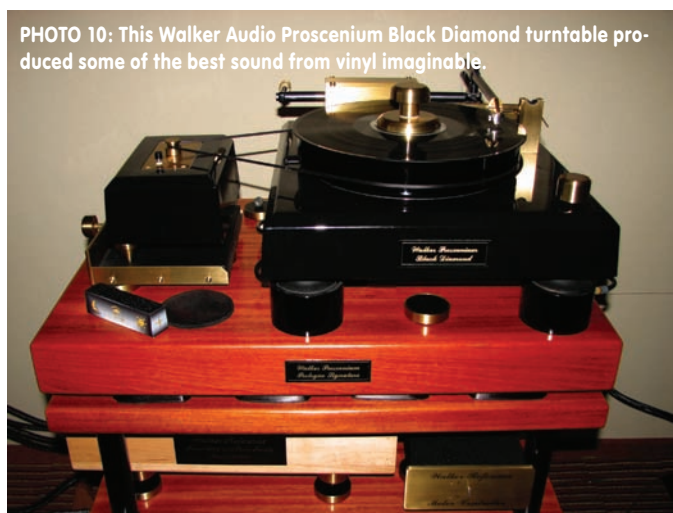


PHOTO 10: This Walker Audio Proscenium Black Diamond turntable produced some of the best sound from vinyl imaginable.

to form a complete synergistic system. Such speaker systems have been very popular in the pro-sound arena for quite some time, but have yet to significantly impact the audiophile community. This may begin to change as more compact and efficient power amp technologies capable of high sonic quality emerge.

I described and auditioned a set of DIY active loudspeakers that I built in this presentation. This speaker system integrates four conventional 125W Class-AB MOSFET power amplifiers into each cabinet, and demonstrates what can be accomplished in an audiophile active speaker system. Beyond active crossovers, the active configuration allows the loudspeaker to use a special form of vented box active equalization, called EQSS™, to achieve good bass extension and excellent low-end SPL in a small footprint. The box is tuned to 37Hz with a 3" rear port. The system achieves a -3dB response down to 35Hz with a rolloff that is approximately second-order ($Q = 0.7$) down to below 25Hz. The 3-1/2-way mini-tower is only 39" high, 9" wide, and 16" deep at its base.

The system includes a 1" silk dome tweeter, a 3" cone midrange, and four 5.25" woofers in a TMWWWW arrangement. The tweeter and midrange are each driven by a dedicated 125W amp fed from a 3-way active crossover. They are crossed at 4kHz with a first-order slope. The mid-range drivers are crossed to the woofers at 750Hz, also with a first-order slope. The top two woofers are fed by a dedicated 125W power amp, as are the bottom two woofers.

THE END ALWAYS COMES TOO SOON

The Rocky Mountain Audio Fest ended at 4:00 p.m. on Sunday. It was a splendid weekend. My only re-

gret is that I did not get to see more of the show. As an "exhibitor," I discovered how difficult it is to see all of the show. Once again, Peter and Darren and I thank Ray Kimber and RMAF for their help and generosity in making our workshops possible. Don't miss this show next year if you have a chance to go. **aX**

Bob Cordell is an Electrical Engineer who has worked in telecommunications for 36 years, having started at Bell Labs in Holmdel, NJ in 1970. He was in management for 22 of those years. His activities have included integrated circuit design, optoelectronics, and optical systems design and digital television encoding and decoding circuits. He holds 15 patents. Bob has been an audio hobbyist since his teens and has published numerous articles on power amplifier design and distortion measurement. He is a member of the Review Board of the Audio Engineering Society. His current interests include the design of MOSFET power amplifiers with error correction and the design of active loudspeakers. Bob lives in Holmdel, NJ and can be reached by e-mail at bob@cordellaudio.com.



PHOTO 11: Strange-looking eye candy abounded at the show. This is the MBL Radialstrahler omnidirectional loudspeaker.

seas Loki Speaker Kit

Madisound and Seas are pleased to offer the Loki kit. This small magnetically shielded system is the perfect choice for many applications. The Loki, with its coincidentally mounted tweeter, sounds fantastic from any position in your listening room.



The Loki uses an 18cm Seas coaxial speaker. The tweeter is mounted at the base of the woofer cone, coincidental with the woofer voice coil. This type of mounting allows you to hear the woofer and the tweeter at the same "time" and from any direction, nearly eliminating the confines of a "sweet spot". This configuration also allows you to use the speaker on its side without any change in sound.

Cabinets are available in Maple, Natural Cherry, and Black Painted Ash. The cabinet dimensions are 8" wide by 15" tall by 11" deep. The cabinets are constructed from 3/4" MDF with a 1" MDF front baffle. The cabinets are veneered with real wood on all sides. Cabinets are fully assembled.

Crossover are constructed from air coil inductors, polypropylene film capacitors and film resistors.

Frequency response is from 46Hz to 25kHz, with an average efficiency of 88db. The speaker impedance is 8 ohm.

Consider the Loki all the way around in your home theater system; as book shelf speakers; or as computer monitors.

Price Each \$225.00

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