Subject: Review - Studio Series one pi
Posted by RMW on Sat, 12 Feb 2005 03:59:36 GMT
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I've owned a Yamaha RX-V640 AV receiver for over a year, and for most of that time I've been running it with a pair of Tannoy PBM-8 studio monitors. I also have a vintage (?) QSC model 5.1 power amp, rated 80 watts per channel into eight ohms, and 120 watts per channel into four ohms. The line level subwoofer output on the Yamaha receiver feeds both inputs of the QSC amp, and the QSC amp feeds a pair of Rage 12" subwoofers from the subwoofers.cc division of Audio Concepts Inc. The homebuilt sub cabinets are two cubic feet gross internal volume, sealed, and loosely stuffed with medium density spun polyester fiber matting. Primary sources are the line level outputs from a Bell ExpressVu satellite receiver, and the optical output from a budget DVD/CD player. I hated to see 340 Watts of Japanese-engineered, Malaysian-built power going to waste, so I decided to look into building six identical systems to replace the two Tannoys. There

a lot about speaker system design over the years, and Wayne's knowledge of the physics and engineering aspects strike me as (pardon the pun) more than sound. His willingness to share the design details of the finished systems he sells impressed me. The greatest appeal for me was his ongoing responsiveness and encouragement, both by email and on the forum here.I am no woodworker. I am fortunate to have a neighbour who is as passionate about power tools as I am about music. My neighbour helped me build my sub boxes, in return for a large circle jig from Jasper Audio. This time around, I called him and asked if he would help me again in exchange for one of the smaller Jasper jigs. He readily agreed. His contribution this time around was cutting rebates and through holes for the drivers and the terminal cups, and through holes for the port tubes. I had my local lumber yard cut all the 5/8" MDF panels to size, and I assembled the boxes on my kitchen counter using butt joints, #8 particle board screws, and yellow carpenter's glue. The boxes are caulked with silicone sealant, and lined on three sides with 3 ½" R12 fiberglass insulation. The baffles are removable, and sealed with 3/16" X 1 ¼" heavy duty truck cap foam tape weatherstripping. Immediately after we cut the holes for the port tubes, I realized that the 2 ½" mailing tube I had purchased was 2 ½" inside diameter, reinforcing the woodworker's adage to "Measure twice, cut once." Determined to stick to the proven design, I managed to find a shop in the next county that stocked 63 mm PVC pipe. Since the internal diameter of the PVC is roughly 2 ¼", as opposed to the 2 3/8" in the original design, I sought Wayne's advice and subsequently cut the port tubes to 3" in order to maintain the specified tuning frequency.As I type this, the speakers are in their places, one in each corner of my living room, one on top of the entertainment unit, and one on a window ledge directly behind my spot on the couch. The corner speakers are on 27" stands, so the space between the LF and HF drivers is at ear level. The stands were homebuilt as well, with leftover rectangles of MDF for the bases and platforms, and sand-filled 4" PVC tubes serving as uprights. The MDF is coated with the same black chalkboard paint that I used on the cabinets, and the uprights are covered with oak grain contact paper.As I have posted in the forum here, the

knowing that there was a recommended HF upgrade from Vifa, but since my local driver source still had some of the CTS piezos in stock, I decided to go with them. "Spitty" has been used in the past to describe some of the Motorola-designed piezo tweeters, but that adjective does not apply in this case. To my ears, these speakers are very well balanced. When I'm listening to music, I often run just the front left and front right speakers. The bass response is impressive, and

depending on the program material, I often choose to leave the subwoofer amp off.I'm entirely

will enjoy them for years to come. Whether you source out the components yourself, buy the kits from Wayne, or buy the finished systems, which are very professionally done, I offer my opinion that you will have no regrets. Thank you Wayne, for sharing your wisdom and your designs!
My review on the Web site

Subject: Re: Review - Studio Series one pi
Posted by Wayne Parham on Sun, 13 Feb 2005 20:03:52 GMT
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That's a very nice review, Ross, thanks!

Subject: Re: Review - Studio Series one pi
Posted by RMW on Tue, 15 Feb 2005 22:47:10 GMT
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Thanks Wayne - I'm going to try to post pictures. I call these Studio Series one pi Stealth Edition

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Subject: Re: Review - Studio Series one pi
Posted by RMW on Tue, 15 Feb 2005 22:49:25 GMT
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Let's try that again...this is left rear.

Subject: Re: Review - Studio Series one pi
Posted by RMW on Tue, 15 Feb 2005 22:50:33 GMT
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This is right rear.

Subject: Re: Review - Studio Series one pi
Posted by RMW on Tue, 15 Feb 2005 22:51:43 GMT
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Left front closeup....

Subject: Re: Review - Studio Series one pi
Posted by RMW on Tue, 15 Feb 2005 22:52:22 GMT
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Center, closeup....

Subject: Re: Review - Studio Series one pi
Posted by RMW on Tue, 15 Feb 2005 22:53:24 GMT
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Front right, closeup....

Subject: Re: Review - Studio Series one pi
Posted by Wayne Parham on Tue, 15 Feb 2005 23:10:46 GMT
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Great job! Thanks for the photos!

Subject: Re: Review - Studio Series one pi
Posted by RMW on Wed, 16 Feb 2005 01:45:53 GMT
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Thank YOU Wayne! I wish you could hear them. They were built to be listened to. Like I said earlier, I'm no woodworker - I don't pretend to be, hence the flat black chalkboard finish and the

dark gray grill cloth. I envy those who can build loudspeakers that sound great and are also beautiful furniture. My goal was minimum attention to form and maximum attention to function - stick to the plans and run any variations past the designer for the final word. A quick glance might lead you to believe that you're looking at the backs of the boxes, because the grill cloth covers everything except the terminal cups. This is a compromise that I'm quite willing to live with. Unorthodox, yes, but also unique. It boils down to the fact that I built these suckers to please me - the look is perfectly acceptable to me, and the sound is what's important. The DIY Audio forum let me to the attached link today - I agree with much of what is said there. Food for thought....
The Ten Biggest Lies in Audio

Subject: Re: Review - Studio Series one pi
Posted by Wayne Parham on Wed, 16 Feb 2005 03:32:47 GMT
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Thanks for remining me about Audio Critic. Akhilesh has been telling me to order the back issues for months, and I keep forgetting. So I just went there and did it.
TheAudioCritic.com

Subject: Re: Review - Studio Series one pi
Posted by Manualblock on Wed, 16 Feb 2005 19:09:43 GMT
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Ironic; the ten biggest lies from one of the biggest liars ever to self-publish.

Subject: Re: Review - Studio Series one pi
Posted by Wayne Parham on Wed, 16 Feb 2005 23:04:56 GMT
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Don't mince words, John. Tell us how you really feel about Peter Aczel. Seriously, I kind of dig the articles in those magazines. I understand what you said about reviewer's hidden agendas. That kind of stuff is really bad. But to tell the truth, that's what I see from most commercial reviewers. Their business model is advertising, so they cannot avoid having some bias and a sort of built-in agenda. Unless complete anonymity is enforced and only nameless technical issues are described, all reviewers, magazines and E-Zine's are suspect, in my opinion.So basically what I'm saying, is that if an article isn't purely technical, I disregard it as being possibly tainted with hidden agendas, no matter what its source. I'd rather look at a sales brochure than a review because at least then the agenda is out front.I guess the matter is Peter Aczel got caught doing a review of something he sold. But isn't that true of most publications of this sort? If the magazine

sells advertising, isn't the whole thing essentially doing reviews of products it sells? It is a process of selling opinions, so it is inherently problematic. The business of reviewing must be exceedingly difficult to do, and ethics could easily become blurred.I don't know, but I've come to the conclusion that that it's best to focus on the issues and not the players. That's how I've come to see things.

Subject: Re: Review - Studio Series one pi
Posted by Manualblock on Thu, 17 Feb 2005 12:04:09 GMT
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Could not agree more. Sad though that people feel they have to adopt someone elses agenda in order to persue their hobby.

Subject: The 11th Lie (LONG!!)
Posted by Dave Williams on Mon, 21 Feb 2005 18:32:11 GMT
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Hi all,First posting here, so be nice 8^). I'll preface by saying that I'm far from the consumate audiophile. I haven't listened to many systems, never designed or built speakers, etc, although it is just something I'm interested in pursuing more once funds allow.Anyhow, that aside, the engineer in me really feels the need to comment on the Ten Biggest Lies article.First of all, I can't fault the author for skepticism about many claims routinely made in audio literature. There are loads of bogus claims made all the time, as there are in any industry, and I hold as much disdain as anyone for claims I see which set off my BS detector. But I think there is a major flaw in his article. Nearly all of his conclusions are based, implicitly or explicitly, on superposition, and therefore on the assumption of linearity of every analog component in the sound reproduction chain up to and including human perception of sound.Which brings me to lie number 11 (just call me Nigel Tufnel):11. The world is linear.It isn't. We often MODEL it as linear, but there's a famous saying among people who model things for a living."All models are wrong; some are useful."The 'some are useful' thing boils down to the degree of non-linearity. Some things are VERY close to linear, but many things really aren't all that linear, especially as one approaches the boundaries of their operating envelopes. For most devices, a good designer trying to use linearity in his/her modeling will be able to spec devices in such a way that nonlinearity is very weak in the operating range, but for some things this just isn't practical.To cite a specific example, speaker suspensions are stiffening springs; so at a minimum there is a cubic component to the stiffness. I haven't measured one, but I bet the non-linearity is measurable within the operating range. That's one reason why speakers exhibit significant harmonic distortion.Now everyone knows these systems aren't really linear, but many people don't fully understand the implications of that fact when they attempt to draw conclusions based upon simple concepts like superposition.So why would we model a system as linear if it really isn't all that linear? Two reasons:- It's intuitive- It allows us to invoke superpositionBut superposition isn't "right" unless the system is linear. Hence the "All models are wrong" mantra I stated earlier.Just as an example, consider the cubic non-linearity

noted earlier, where the suspension of the speaker has a stiffness like:F = k*x + a*x^3where k is what we normally think of as the stiffness (linear) and a is hopefully small.Now, suppose we feed it a signal of two sinusoids of different frequencies, w_1 and w_2. The linear MODEL, F=k*x will yield response only at w_1 and w_2 (superposition). However, with a healthy amount of algebra, you can show that for the cubic SYSTEM, the response contains information at the following frequences:w_1w_23*w_13*w_2w_1 + 2*w_2w_1 - 2*w_2w_2 + 2*w_1w_2 - 2*w_1Now, there are various coefficients that crop up which I haven't kept track of which can be quite small especially if "a" is small, so maybe the energy doesn't matter. But it's there. And if you're unlucky, it might be significant. You can see now why it might be the case that DAC artifacts above 20kHz that don't get totally filtered out (because we can't make a perfect filter) may still be important.Which brings me (in long-winded fasion) to my problem with this article.The author is falling into the VERY-EASE-TO-FALL-INTO trap of equating his model of the system with the system itself. It just isn't so. To make blanket statements about the real-world performance of a system based only on the linear performance of the model, without consideration and analysis of the non-linearities is just as irresponsible as his much-derided "audiophile" who dismisses ABX testing when it fails to show a difference between a Krell and a Pioneer.I'm not telling anyone they should swallow marketing claims hook, line, and sinker; go out and mortgage their house for a 6' length of cable; or believe someone when they tell them that they haven't heard holographic imaging until they've put their CD player on top of a matched triad of pickled cat testicles. The author is right in his skepticism about over-priced audio gimicks, but is totally misguided in his blanket invocation of superposition.As I say, I haven't measured the non-linearity of any any audio components, or the ear, or the acoustic behavior of air. They may or many not be significant in cables, or in capacitors, or in the response of the cochlea, but they're there.Linearity assumptions are very useful in that they get us a long way toward simulating and designing complex systems in simple fashion, and used appropriately they can allow the screening of BS claims. But one must always remember that the linear system is only a model, and does not capture all the phenomena that can occur in the real system.Rant over, you will now be returned to your regularly scheduled programming.BTW, cheers Wayne, for a great forum and an atmosphere that encourages rational discussion about audio in general and your products in particular rather than just the usual hype and drivel.Dave Williams

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Subject: Oops
Posted by Dave Williams on Mon, 21 Feb 2005 22:20:26 GMT
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Oops. Just realized I think I messed up the frequency analysis of the cubic system in my previous post. But the point stands that there will be frequency content at potentially many other frequencies than w_1 and w_2 in the response of the cubic system.

Subject: Re: The 11th Lie (LONG!!)
Posted by Manualblock on Wed, 23 Feb 2005 14:59:09 GMT
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Dave; the argument you just made was made a long time ago to answer this guy when he first started spouting this nonsense. But he is a consumate salesman speaking to an audience that is pre-disposed to accepting his schpiel. No rational argument will detract them from the mission of proving that people cannot tell differences in audio equipment. It took the Japanese experimentors in the early 90's to yank us out of the solid state hierarchy that was strangling audio for 15 yrs.How many people gave up on audio because of the terrible sound they would hear entering an audio store full of perfect sound forever CD and solid state gear?Now there is a new generation looking for a spokesman to return us back to the dark ages of sound reproduction. Half of all recorded music from the last 25 yrs. is unlistenable because of this type of flat earth thinking. Thanks for lighting a candle.

Subject: Re: The 11th Lie (LONG!!)
Posted by Spinjack on Mon, 07 Mar 2005 23:29:07 GMT
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Great post, Dave. As an engineer myself, I find it incredibly frustrating to read about or hear about amazing new 'enhancements' that have no basis in logic or reality. Although I have heard high dollar system that absolutely blew me away, I think there is an aweful lot of high dollar junk out there. Do you want to know if there is a difference? Then ABX it.
