Subject: New: First Watt amplifiers by Nelson Pass
Posted by Norris Wilson on Wed, 04 Aug 2004 19:36:54 GMT
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Hello everyone, this is my first post here and I thought that I would share an amplifier concept that I found interesting by Nelson Pass. This information is for those that have not seen it yet. Article is on www.6moons.com web site.EnjoyNorris Wilson
http://www.6moons.com/audioreviews/firstwatt/firstwatt.html

Subject: Nice Link on why SS may not work well with single driver
Posted by akhilesh on Wed, 04 Aug 2004 20:40:59 GMT
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Thanx Norris! Talks about why SS ampls may not work with solid state. Perhaps Martin can comment on this link?-akhilesh

Subject: Re: Nice Link on why SS may not work well with single driver
Posted by Martin on Thu, 05 Aug 2004 01:18:34 GMT
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akhilesh,Two quotes from the article, I hope they don't mind my lifting the text directly.Quote 1 :"His whole optimization scheme for the single-driver speaker/amp interface hinges on external compensation networks which are specific to each loudspeaker. Indeed, what speaker would I be using? Terry Cain of Cain & Cain and Louis Chochos of Omega Loudspeakers to the rescue. To enable Nelson to include optimized networks with the review amp, Terry Cain personally delivered a pair of Abbys to Nelson's California digs while Louis shipped his pair instead. Using on-site acoustical measurements of either speaker's frequency response allowed Nelson to tailor the compensation networks in conjunction with his F-1 amplifier and the actual speakers."Sounds just like what I have been doing for several years. Maybe Mr. Pass's circuit is implemented differently, probably a lot more elegantly then mine, but I bet the concept and results are very similar.Quote 2 :"Tube amplifiers seem to bring out the best from such drivers. They have more bottom end, a warmer mellower mid- and upper mid-range and often more top octave. By comparison, the 'best' solid-state amplifiers make them sound more like transistor radios - less bottom end and an occasionally strident upper midrange. If you are a solid-state kind of guy like me, you start wondering how that could be. If you are a tube aficionado, you smirk and say, "I told you so." The solid-state guy probably starts fixing the response with a parametric equalizer and the tube guy enjoys his music with a nice glass of wine."This is the damping factor impact that I have also been talking about for a couple of years. A low damping factor tube amp will work with a low Qts Fostex or Lowther drivers without much compensation beyond the cable and connection resistances. The Abby is a good example. The tube amp can have several ohms of internal

series resistance.The high damping factor SS amp will probably sound terrible with the an uncompensated Fostex or Lowther driver (I know this for a fact). The Abby will not sound its best with a SS amp. Add a compensation circuit to the Fostex or Lowther driver and the SS amp will sound great and the tube amp will sound booming and underdamped. No magic here.I personally believe tha damping factor issue is the major source of the differences reported in the tube and SS amps. The odd or even distortion stuff is much less of an impact. The warmth and bass output generally associated with a tube amp is due to the internal series resistance not present in SS amps. Low Qts big magnet full range drivers will sound better with a tube amp if no compensation circuit is used.Conclusion : You need to design the speakers for the type of amp being used. I think both a tube amp and a SS amp can work well with Fostex or Lowther drivers. But you cannot design a single speaker that works well with both without some form of compensation or adjustment. Does that make any sense?Martin

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Subject: Re: Nice Link on why SS may not work well with single driver
Posted by akhilesh on Thu, 05 Aug 2004 03:34:07 GMT
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Nice post Martin! Makes total sense to me. When i took your advice and played with a compensation network in my homebrewed speaker, using the zen amp as the driver, i think i was doing the same thing. So my conclusion is it doesn;t seem like this new amp is anything radical at all, just an application of well known theory (i mean damping factor on loads) with a marketing twist!(not that i'm decrying it or anything). It seems that 6moons is marketing (reviewing) it with a vengeance. I'm not sure about the relative impacts of damping factr sensitivty versus the even order distortion on perceived euphonia. That would require some research...it seems you have more empirical data here than i do. However, i will offer that in order to understand why tube amps sound different from ss, we may need to start with a list of factors, two of which would undoubtedly be DF & Distortion. there may be other factors too, such as pshoacoustical factors, and then the other factors that may not have been quantified yet (the elusive "tone"). Anyways, nice post. thanx-akhilesh

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Subject: Re: Nice Link on why SS may not work well with single driver
Posted by Martin on Thu, 05 Aug 2004 10:29:05 GMT
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akhilesh,A couple of more thoughts tossed out in no particular order.1) Ever heard somebody say "All amps sound the same." Obvious;y this is not true but the differences in solid state amps can be subtle. However, the differences in tube amps are reported to be significant and obviously the differemce in tube and solid state are large. If I adjust my variable BSC resistor by 1 ohm the sound of the Lowthers can change very audibly. Swapping SS amps in a system probably does not change the damping factor very much and the differences in the system performance are small. Changing tube amps in a system can change the damping factor, meaning the series

resistance, significantly and thus the sound of the system is dramatically changed.2) I doubt that many tube amp designers want audible distortion. I bet that the design goal is to minimize distortion and all audible artifacts in any amp. Obviously nothing is perfect and maybe a tube amp has more of some audible artifact then a SS (or the other way around) but I have to believe that this is not an intentional design goal. 3) If you design your speakers, keeping in mind the amp to be used, I think either type of amp can be made to work very well with a full range driver. In general I believe that speakers designed for SS will not perform well with a lot of tube amps, the opposite is also true in my opinion. 4) The reason I stay with SS is that having essentually unlimited power (>100 watts vs. 2-3 watts) allows me to do anything with a filter or box and still have a working speaker design. Power is not a limitation driving decisions in the design of my speaker system. The amp for all practical purposes is removed from the design. Taking my speakers to somebody else's house (assuming SS amp) produces an expected almost consistent result. 5) If you keep in mind what I have said, you don't have to believe it at all, and go over to AA and read through the High Efficiency and SET forums where people are describing their speaker's performance I think that you will begin to see a trend. The strengths and weaknesses they describe seem to support my observations. How else can changing a tube amp in the system have such a dramatic impact?Food for thought,Martin

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Subject: Ane i wonder where the gainclone fits in?
Posted by roncla on Thu, 05 Aug 2004 16:10:05 GMT
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Having been a tube head and a SS type for many years (dual personalities) i find the gainclone (GC) to be a sort of middle between the two.It has the greater control of the SS but a more gentle but more defined sound of tubes.After running my 206e horns with 3 different amps PP6Bq5,marantz 2230 and the GC i still find the best sound from the chip amp.Not to say that if i ran the horns on a 10K$ SET that it may not sound better but i dont have that kind of money.Ane with the efficency of the horns a 200 watt SS is just at idle for normal listening.ron

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Subject: Re: Nice Link on why SS may not work well with single driver
Posted by akhilesh on Thu, 05 Aug 2004 18:07:37 GMT
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Good thoughts, Martin! i do agree with all of them. I think your observation that the low damping factor is what makes tube amps more sensitive to change is insightful, as opposed to euphonic distortion. Also, having more power is probably a good thing, all else being equal of course. Here is one extension:1. Given that tube amps will work well with some speakers and SS with other speakers, maybe it's the SPeaker/amp COMBO that makes the difference. In other words, the interaction effects between tube amps' low damping and the highish sensitivities and flat impedances of the speakers that work with them as a COMBINATION may produce better (meaning more realistic) sound than the SS amps / high Q speakers combo. In general that is.

What do you think?-akhilesh

Subject: Re: Nice Link on why SS may not work well with single driver
Posted by Martin on Thu, 05 Aug 2004 18:47:57 GMT
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akhilesh,"Given that tube amps will work well with some speakers and SS with other speakers, maybe it's the SPeaker/amp COMBO that makes the difference. In other words, the interaction effects between tube amps' low damping and the highish sensitivities and flat impedances of the speakers that work with them as a COMBINATION may produce better (meaning more realistic) sound than the SS amps / high Q speakers combo. In general that is. What do you think?"I agree that the COMBO is the key. Lets look at three speaker/amp combination examples.1) A SS friendly speaker with an efficiency of 88dB, Re = 8 ohms, and a Qtc (~ Qec) of about 0.7. The SS amp adds essentially no series resistance so the result is a maximally flat 88 dB response. But if a SET amp with an output impedance of 3 or 4 ohms is used, then the system Qtc rises to approximately (0.7 x 12 / 8) 1.05 which is an underdamped response. The efficiency also drops so the amp runs out of steam on loud passages. Not a good combination.2) A tube friendly speaker with an efficiency of 100 dB, Re = 8 ohms, and a Qtc (~ Qec) of about 0.3. The SS amp adds essentially no series resistance so the result is a very rolled off overdamped low end, screaming and shouty mid range, and an efficiency of 100 dB. But if a SET amp with an output impedance of 3 or 4 ohms is used, then the system Qtc rises to approximately (0.3 x 12 / 8) 0.45 which is almost a critically damped response. Add some cable resistance and it only get better. The efficiency also drops a little but probably is still near 95 dB so the low power amp is not such a concern. The tube amp is a good combination.3) A tube friendly speaker with an efficiency of 100 dB, Re = 8 ohms, and a Qtc (~ Qec) of about 0.3. The SS amp adds essentially no series resistance so a correction circuit is used in sereis with the driver. Much better result. The efficiency drops, but this is not a concern. The circuit allows adjustability, this is a nice advantage. I think that this is also a good combination and the path I have followed.After reading Nelson Pass's write up on his F1 amp, I think he is doing something similar to system 3, but if I understand correctly his current amp requires the correction circuit to be in parallel with the driver. So his individual circuit components play the opposite roll of the components used in my series correction circuit approach. This means that while in my series circuit the signal passes throught the inductor at low frequencies, in the F1 configuration the inductor passes the high frequencies. I would not want to rely on an inductor at high frequencies. When I measure the impedance of inductors using LAUD I find that at high frequencies they become their own resonant LCR circuit due to capacitance build up between the turns. Maybe he has already though of this and addressed it, or maybe his smaller inductors are not prone to this at audio frequencies. But I like his approach and do find it interesting and amusing that suddenly the AA HE forum seems to like this better then the circuits I have been proposing for a few years. Even Terry Cain seems to be excited!Martin

Subject: Tube amps and SS amps may be indistinguishable!

Posted by akhilesh on Thu, 05 Aug 2004 19:51:56 GMT
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Compelling argument, Martin. Essentially, you are saying that provided the Q of the system is kept reasonable, the difference between a tube amp and an SS amp is negligible. Given that even a cheap SS amp produces essentially perfect waveforms, and if euphonic distortion is not the answer, then you are most likely right. Maybe the whole tube amp hoop-la is to do with its interaction effects, (which can be negated with properly designed passive circuits in a highly efficient speaker), plus of course the usual HYPE of the audio vendors/reviewers. Hmmm...makes me think. What do i do with my 4 tube amps? :-) I'm going to keep them, but i will no longer accept as Gospel that they sound better than SS. Great points! One last question, have you ever done a listen-off between a SET and an SS on any of your speakers? If they sound essentially indistinguishable (with proper compoensations applied in each case) then you are totally right. It would be interesting to do such a listen-off. You know, take a pair of speakers, and put the relevant amp/network combos in fornt of them. Also, the whole 1 watt amp thing...to me it's just the usual audio hype. The fact that some vendors are "excited" about this and call it a "breakthrough"...well... i can tell you what i think they are excited about, and it begins with a D----- and is colored green. -akhilesh

Subject: Re: Nice Link on why SS may not work well with single driver
Posted by TC on Fri, 06 Aug 2004 00:43:35 GMT
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>>. But I like his approach and do find it interesting and amusing that suddenly the AA HE forum seems to like this better then the circuits I have been proposing for a few years. ==Amusing no doubt. Totally different approach AND results. They could not be more dissimilar.Notice in NP's design, ANY of his designs he never uses a passive element in the final output circuit (in series). The whole reason for his current source amp is to eliminate the negative electrical effects of these (passive) devices on the sound. Even his 4-way spkr uses 4 amps to deliver direct amp loop circuits with the voice coil, never to be damaged by extraneous compensation. He can hear the detrimental effects these have. You cannot push clarity through a resistor, although you can push a flat signal.That's also why he builds one of the worlds most elaborate and expensive active crossovers, because you cannot mess with an output circuit of a conventional amp and maintain ultimate clarity.In his circuits the compensation affects the output yes, but only in the frequency current domain entirely without affecting back electromotive force (emf) into the amp circuit as do other circuits. And without any kind of the signal clouding effects of the ceramic resistor media needed to balance a hi Q driver as in example #3 which NP and myself agree would be detrimental to clarityOnce an output signal sees the ceramic matrix, it is split into smithreans never to be assembled correctly again. Far far better to adjust the circuit ANYWHERE buut the final output circuit like before the amp (actively).So yes it's the same game of adding RLC to tailor response. Only he has changed the rules to maintain absolute clarity. Something passive circuits with conventional amps both tube and SS cannot do.>>Even Terry Cain seems to be excited!>> I get excited when I hear good sound. Especially sound so good that it *IS* exciting.Will I dump my SET collection? Not a chance. They are exciting

too.TC----------

Subject: Re: Tube amps and SS amps may be indistinguishable!
Posted by Martin on Fri, 06 Aug 2004 00:53:15 GMT
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Hi akhilesh,"Essentially, you are saying that provided the Q of the system is kept reasonable, the difference between a tube amp and an SS amp is negligible."I am not sure I would draw that strong of a conclusion. What I am trying to say is that when the damping factor differences between tube and SS amps is removed they become much closer sonically. I would not state that one is always better the the other, I think that there will be trade-offs in every situation and even between different SS or tube amps.For example, I had a guy over at my house to show me some very expensive speaker cables he want to demo (and then sell me). We hooked them up between my 200 watt SS amp and my Fostex FE-208 Sigma ML TL speakers. I had alway found these speakers to be lacking at the very top end and was considering adding a super-tweeter. His cables made a huge difference and the highs sounded great. Much better then my own cables. Then we swapped the speakers to my Focal two way with the inverted metallic dome tweeter. His cables produced a painful high end, absolutely terrible drove us from the room. Changing cables back to mine, my cables sounded great! So who's cables are better? Depends on the rest of the system.If you buy into the arguement that a tube amp or a SS amp (with correction circuit) can be used with a Fostex or Lowther full range driver, then I have made my point. The significant advantage I see in SS is the degree of adjustability that the circuit allows to get the response just right for the speaker system, the amp, the interconnects, the room, and the listener's personal taste.One more example, my audio buddy Pete was over last night to listen and offer opinions on the Lowther ML TL. When he arrived I had the PM2A drivers installed and playing. I demomstrated the variable BSC I am using now and first shorted the BSC out of the system. No bass, Lowther shout big time, really bad sound. Then I dialed the resistance up to balance the SPL and things were much better. He liked the mid range and top end of the PM2A but felt that the mid bass was a little recessed in the ML TL. I tend to agree with him. So 15 minutes later, I swapped to the PM6A drivers and again dialed the correct series resistance and the bass and mid bass were excellent. But the very top end, the air, was not as good as the PM2A. We listened for a while and I asked him which he liked better, he liked the PM2A better because he is a sax lover and it really shined on the horns. He is not a bass lover and really listens to the mids. But the PM6A was not hard to take. A great evening! "One last question, have you ever done a listen-off between a SET and an SS on any of your speakers? If they sound essentially indistinguishable (with proper compoensations applied in each case) then you are totally right. It would be interesting to do such a listen-off. You know, take a pair of speakers, and put the relevant amp/network combos in fornt of them."I have never done this, I don't know anybody locally into tubes. It would be a great experiment and would really go a long way towards resolving the question in my own mind or maybe even raising more questions. I have been to the one or two "high end" stores locally and they don't sell tube amps. With my adjustable BSC this would be a very easy thing to do, I'll keep looking for an opportunity to run this test and report the results if I can find an tube amp. "Also, the whole 1 watt amp thing...to me it's just the usual audio hype. The fact that some vendors are "excited" about this and call it a "breakthrough"...well... i can tell you what i think they are excited about, and it begins with a D----- and is colored green."Obviously

Nelson Pass is a very talented audio designer, his contributions over many years are amazing. There is hype everywhere in audio and it is interesting to see the positive response in the 6moons article and on the AA HE forum. When I have propose SS with correction circuits several times over the past few years, I usually got flamed. One of the big reasons I totally stopped participating in several audio forums and only occasionally in others. I am definitely not one of the sheep at AA, well maybe a black sheep.Good discussion,Martin

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Subject: Re: Tube amps and SS amps may be indistinguishable!
Posted by TC on Fri, 06 Aug 2004 01:01:24 GMT
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>>Maybe the whole tube amp hoop-la is to do with its interaction effects, (which can be negated with properly designed passive circuits in a highly efficient speaker), plus of course the usual HYPE of the audio vendors/reviewers. Hmmm...makes me think==I want your prescription. >>What do i do with my 4 tube amps? ==Sell on a-Gon to get more prescription.>>Also, the whole 1 watt amp thing...to me it's just the usual audio hype.==Well it is really a NO watt amp except the minute impedance he adds to the output creates miniscule voltage swings. Study power supply design to find the virtues of low power. What the engineers cannot measure is musics dynamic contrasts. NP knows this and does not try to point to grahs and explain this. His music is his guide.I thought you liked the sound of 45's. 45's have some of the highest leverage against a voice coil resulting in excellent clarity. 45's are about the closest you will come to a no-watt amp. >>The fact that some vendors are "excited" about this and call it a "breakthrough"...well... i can tell you what i think they are excited about, and it begins with a D----- and is colored green. == Spliff? ah, prescription filled.----------

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Subject: Terry, could not really understand most of your post...maybe you can clarify?
Posted by akhilesh on Fri, 06 Aug 2004 03:05:44 GMT
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Hi Terry,Thanx for joining in on this interesting discussion. I could not understand most of your post, so i will simply pose a few clarification questions & hope you can elaborate. -------Questions below----TC WROTE: "Notice in NP's design, ANY of his designs he never uses a passive element in the final output circuit (in series). The whole reason for his current source amp is to eliminate the negative electrical effects of these (passive) devices on the sound. Even his 4-way spkr uses 4 amps to deliver direct amp loop circuits with the voice coil, never to be damaged by extraneous compensation. He can hear the detrimental effects these have. "MY RESPONSE TO ABOVE:Not sure what you are trying to say. Are you saying active crossovers before the amp are better than passive crossovers after the amp? In some cases that is a well known and well accepted concept. Many people biamp or even triamp. I fail to see what is new here. TC WROTE: "You cannot push clarity through a resistor, although you can push a flat signal. "MY RESPONSE

TO ABOVE: Coould you please elaborate what aspect of the signal is harmed by the resistor, in terms of signal propoerties. For example, is it the phase? TC WROTE: "That's also why he builds one of the worlds most elaborate and expensive active crossovers, because you cannot mess with an output circuit of a conventional amp and maintain ultimate clarity. "MY RESPONSE TO ABOVE: Is the active crossover that he builds expensive in sense of the retail price he charges or in the cost price to him? Could you please elaborate how you know it is one of the world's most expensive?How does it compare to, say, Marchand crossovers? What parts does he use? What kind of circuit is it?TC WROTE:"In his circuits the compensation affects the output yes, but only in the frequency current domain entirely without affecting back electromotive force (emf) into the amp circuit as do other circuits. And without any kind of the signal clouding effects of the ceramic resistor media needed to balance a hi Q driver as in example #3 which NP and myself agree would be detrimental to clarity "MY RESPONSE TO ABOVE: "What do you mean only in the current domain? As oppposed to what? Voltage? What voltage and current are we talking about here, since we have active corssovers...the source or the amplifier? Finally, what back EMF force are you talking about? The speaker, to the best of my knowledge becuase of conservation of energy, CANNOT generate any back EMF force on the amplifier. Maybe I am wrong. Please elaborate. TC WROTE:"Once an output signal sees the ceramic matrix, it is split into smithreans never to be assembled correctly again. Far far better to adjust the circuit ANYWHERE but the final output circuit like before the amp (actively). "MY RESPONSE TO ABOVE:" What matrix are you talking about? Is this the same concept that the "resistor" hurts the signal? Splitting into smithereens along what aspect of the signal? Frequency? Phase? PLease elaborate. TC WROTE:"So yes it's the same game of adding RLC to tailor response. Only he has changed the rules to maintain absolute clarity. Something passive circuits with conventional amps both tube and SS cannot do. "MY RESPONSE TO ABOVE: Can you please define clarity, and why you think an after amplifier network will hurt it more than a before amplifier one? Again, please keep in mind, many people have been using biamping & triamping for decades. I cannot see anything new in here, but maybe i am missing it, and would really appreciate your elaboration.thanx-akhilesh

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Subject: Re: Tube amps and SS amps may be indistinguishable!
Posted by akhilesh on Fri, 06 Aug 2004 03:15:58 GMT
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Hi Terry,Thanx for your post! I do love my 45 amplifier! I cannot anayze why i like it, but i do! BTW, tube amps, to the best of my knowledge, are VOLTAGE amplification devices. SO the 45 amp is a voltage amplification device, as opposed to a SS amp. I am sure you knew this, but somehow from the post, which again mostly went over my head, it seemed maybe you were comparing a 45 SET to the new Nelson Pass Solid State design, and calling them equivalent. thanx !BTW, is ther anyone in the OK area you know who has a pair of your abbys? I would LOVE to hear them!-akhilesh

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Subject: Re: Tube amps and SS amps may be indistinguishable!
Posted by akhilesh on Fri, 06 Aug 2004 03:22:45 GMT

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Martin,OK. Maybe i am a bit cynical about the industry. My apologies if i appeared too cynical about the motivations of some vendors in promoting new technologies. I am very interested in the SET v/s SS experiment. We need to get you a SET. Let's talk offline, based on your time constraints. We can corodinate via email commncn. -akhilesh

Subject: Cool toys
Posted by Wayne Parham on Fri, 06 Aug 2004 03:40:35 GMT
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You know, I love my cool toys. I love my big block Olds. I loved my hotrod Mazda too. Two different things, worlds apart. I really enjoy them both.Like the big block Olds, I have some really powerful and clean solid state amps and big multi-way horn speakers. It's the same gear that's used when I attend fine musical presentations. I was always impressed with that kind of gear, so I bought it myself. The power is awesome, and this kind of system simply would not have been possible in the WWII era and before.And speaking of the WWII era and before, I have several nice tube amps that I really enjoy. Lots of old tube radios too. The radios are so nastalgic, I find myself listening to them almost every day for a little while. And the tube amps I have are really nice to listen to, especially with vocals and intimate music.To me, my hifi tube amps are kind of like Mazda's rotary engines. They're different than the big iron, and they'll really surprise the uninitiated. They are simple and they have finesse. I just love 'em. The booklet called "A Taste of Tubes" does a good job of describing the feeling I get when the tubes are glowing.So my point is that I usually find good things in more than one approach. Each has its strengths and its weaknesses.I certainly feel this way about loudspeakers. I enjoy some single driver designs. I enjoy some large multi-way horns. There are many speakers of different design types and price points that impress me. Naturally, I'm biased towards my own design choices. I've spent a lot of time developing them. I made choices I thought sounded best and performed best. But I do realize also that there are many design choices that have merit.The amplifier and loudspeaker form a filter circuit. There's no way around it. One can minimize it or embrace it. Either way, it's a fact. For that matter, the loudspeaker itself is a filter, even if the amplifier is a perfect current source. The loudspeaker is highly reactive and nonlinear over a great deal of its range.So to me, the real issue is not whether passive components are good or bad. In a sense, I don't have any choice in the matter. The speaker itself is a reactive passive component, acting like a fairly complex LRC network. I can manipulate the loudspeaker's virtual LRC network values with my cabinet and the driver's electro-mechanical properties. I can also manipulate the LRC values by including electrical components. Both are reasonable design choices, in my opinion.I can sure understand the choice to use only raw drivers in the output circuit, avoiding additional passive components like Terry describes. This means the only reactive component is the driver itself. That's cool.I can also understand Martin's choice to use passive components in the design. After all, the amplifier/loudspeaker circuit is a complex filter even if there are no extra passive components. So it makes some sense to tailor that filter. Adding a 1 ohm resistor, for example, is like having a voice coil wound with a smaller conductor. It's an easy way of having your OEM build a whole new driver without having to do that. So that's cool too.

Subject: Re: Terry, could not really understand most of your post...maybe you can clarify?
Posted by TC on Fri, 06 Aug 2004 13:27:23 GMT
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>The speaker, to the best of my knowledge becuase of conservation of energy, CANNOT generate any back EMF force on the amplifier. Maybe I am wrong. Please elaborate==The speaker(load and circuit) does generate it's own electrical (inductance, resistance) signals that are introduced to the output loop of any amplifiers circuit. In low power ANY back EMF significantly affects the pprimary signal. This is usually ignored, but exists nonetheless. Since we are talking high efficiency, we are talking low power regardless of amplifier power.The reason people biamp triamp whatever is to maintain direct connection to an output circuit to avoid the problems of passive components in a circuit (yes this has been done since amps and spkrs were invented). It always maintains ultimate possible clarity and provides for better control of the spkr. Most of the time this is an effort to increase dyanmic range and power output capability. You can always go passive but it's not -better-.TC

Subject: Re: Cool toys
Posted by TC on Fri, 06 Aug 2004 13:36:09 GMT
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Good analogies Wayne.>>So to me, the real issue is not whether passive components are good or bad. ==ANther thing that has to be accounted for is efficiency. Most of your designs probably hover well over 100db in the high freqs. Over 100db passive attenuation has dynamic "headroom" for lack of a better word, working on it's side. Passives have a far more benign negative effect on *really* high efficiency systems. Still they all sound clearer and more dynamic actively crossed (nothing new). But passive components CAN work better as efficiency rises. The ratio of "power available" to "needed power" needs to be vast NP thought that with a passive system 300 watts is a good place to start, to minimize spkr x-over effects on an amp.TC

Subject: Re: Cool toys
Posted by GarMan on Fri, 06 Aug 2004 17:28:25 GMT
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So Wayne, does this mean you drive an RX-7/8 too?

Subject: Re: Cool toys
Posted by Wayne Parham on Fri, 06 Aug 2004 18:54:10 GMT

No, I've never owned an RX-7, but I'm thinking about making a project car out of one. It would be nice to have a daily driver that got mileage better than single digits.I had several RX-2's in the seventies and eighties. My first car was a stock RX-2, and I liked it so much that I bought several more through the years. I put a different intake manifold and carburetor on them, headers and ported some of them. I must have rebuilt four or five Wankle engines and made hotrods out of every one. My favorite RX-2 was really clean, had Koni shocks and repositioned front shock towers. The stock RX-2 understeered pretty badly but if you pulled the shock tower top mounts back about 2", they were perfect. That plus a high-performance engine and clutch made a pretty slick little car.

Subject: Re: Tube amps and SS amps may be indistinguishable!
Posted by TC on Sat, 07 Aug 2004 15:30:05 GMT

>>! BTW, tube amps, to the best of my knowledge, are VOLTAGE amplification devices. ==No, they are what is being refferred to as "non-optimal" current sources.KYW writes(@diyhifi.com) about this now ressurected technology (below):>. Funny that this is how they made high sensitivity speakers in the 1930's, 40's and 50's, which they buiild with suitable damping in the driver and the enclosure and then drove with SE Class A Pentodes (current sources). If you need good examples look into many an old radio (untill they started throwing tons of feedack in and separating the speakers from the amplifiers).Interesting that Nelson Pass's approach is basically the same thing again 50 or 60 years later. I guess what goes around comes around....>>SO the 45 amp is a voltage amplification device, as opposed to a SS amp. I am sure you knew this, but somehow from the post, which again mostly went over my head, it seemed maybe you were comparing a 45 SET to the new Nelson Pass Solid State design, and calling them equivalent. ==No. The 45 in class A is only 2 watts with large *current* swings. And why it is probably the only tube I firmly reccomend for the larger fullrangers like 208, 206. 45 operates as a near current source, and why it sounds so dynamic and well balanced. A 45 SET has it'sown liitations. I do compare a 45 to the new firstwatt amp directly, because the big reason is *Class* -A- operatiopn, NO feedback used, as in most SS amps. SET and Nelsons amps share class A operation and like little else. There is only 1 gain stage in Nelsons amp, 2 in most well designed SET's. In a solid state amp there are inumersous gainstages iserting phase adjustments to the source at each stage. The cost for all this Class A operation? Heat and energy consumption. They are not efficient amps. They are the "funny car" euivalent to a "commuter car". The F-1 is definately clocking 5 second 1/4 milers. 45's are waaayy cheaper to build and implement than a solid state device running class A, and low power high impedance output. Cool thing about 45 too is you can keep beefing the power supply making it perform MORE as a current source makig it even more dynamic and beautiful. By beefing the PS you enable the impedances at the extremes to be supported in the frequency domain giving wider bandwidth which translates to balanced "fast" sound with more detail. Your ears are not lying. Only 45's are 45's. They will run out of gas. But what a great ride.TC

Subject: voltage amps, current sources
Posted by rohit on Sat, 07 Aug 2004 16:13:39 GMT
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The amplifier acts like a constant current source because it has high output impedance. It is actually somewhere in between constant voltage and constant current. It acts more and more like a constant current source as output impedance rises though. The tube itself is a voltage amp, since that is what swings the most. A transistor is sensitive to current but a tube is sensitive to voltage. Hence the name "voltage amp." Hope this helps.Rohit

Subject: Thanks, Rohit. NT
Posted by akhilesh on Sat, 07 Aug 2004 17:57:26 GMT
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NT

Subject: Re: Terry, could not really understand most of your post...maybe you can clarify?
Posted by Manualblock on Sun, 08 Aug 2004 02:55:50 GMT
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Lynn Olsen has been doing research on this internal resistance/ damping factor/back EMF and their respective effects on amp/speaker interface for 20 yrs. The reason for transformer coupling he claims is to attenuate the impact of back EMF from reaching the plate of the output tube. There are reams of empirical data to support his claims so I won't pretend to offer a grasp of his work it's easily found on the net. This is old stuff dealt with over many design choices and explains much of what you all are discussing.

Subject: Re: Tube amps and SS amps may be indistinguishable!
Posted by Manualblock on Mon, 09 Aug 2004 19:59:43 GMT
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Hi AK Let me know when you put all that tube stuff up for sale. I got some nice SS things here open for trade! The Q argument is old hat. Like the engineers say, Don't re-invent the wheel.

Subject: Re: New: First Watt amplifiers by Nelson Pass
Posted by Ed Schilling on Sun, 29 Aug 2004 14:13:45 GMT
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I first spoke with Kent about the First Watt amps back in Nov/Dec. last year. I sent Kent a pair of my favorite speakers for testing. I don't think Nelson ever heard them! I also sent a driver back to them a month or so ago for more "testing". A couple weeks ago I called to check on progress and had the privilege of speaking to Nelson again. What a great fellow he is. He said that soon I would get an amp to play with. This I am very much looking forward to…..I have been using (I bought it) a Pass X 150 for a year now. I am not sure why so many believe that high efficiency single driver speakers do not "like" SS. My X150 sounds excellent…..so does my Audio Note 300B or Fi X 2A3. I hear no "solid state" problems at all. I would be willing to bet that most people could not tell which amp is actually playing…..this I have demonstrated more than once. It seems in my case my room is more of a problem than the type of amplifier used. It will be very interesting to hear (if possible) the difference between the First Watt amps and the X150. I do not think the power difference will be much of a factor as (at least in my case) my favorite speakers are more limited in output by "doppler distortion" than anything else. The mighty X150 is only good for a couple more DB than the 2A3 for this reason. It does not sound "more powerful" even though it is, a lot more. It simply sounds musical, the same as the tube stuff. I love tubes, and yes I think it is easier to get "music" out of tubes than SS but that does not HAVE to be the case. There are plenty of expensive bad sounding amps of both types…..and I have heard examples of both (no names, please). I'll post impressions when it comes. Glad to see people are interested in them. Ed Schilling

Subject: Re: New: First Watt amplifiers by Nelson Pass
Posted by nelsonpass on Tue, 31 Aug 2004 16:28:46 GMT
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I did hear them, but not under the room conditions they deserved.

Subject: Re: New: First Watt amplifiers by Nelson Pass
Posted by Ed Schilling on Tue, 31 Aug 2004 16:58:44 GMT
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10-4. Thanks for the reply, Nelson! they deserve a better room than I have as well! I Bet those hundred amps do not hang around very long! As I said...I love the X 150.....there is no doubt in my mind about the First Watt...I can hardly wait.Ed

Subject: Re: New: First Watt amplifiers by Nelson Pass
Posted by Ed Schilling on Tue, 31 Aug 2004 17:02:34 GMT
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Not that your room is "bad", mine is. Rather, I understand what you meant. I re-read my post and it did not seem to convey what I meant to say! There,I feel better now.Ed