Subject: GPAF Treasure
Posted by FredT on Thu, 25 May 2006 16:00:17 GMT
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Here's a first picture of my version of the full range single driver MLTL bipole speakers I heard in Jim Griffin's room at the GPAF. I completed the enclosures just this morning, so they're still not veneered. The kit is available from Creative Sound Solutions.The forward-firing full range CR125S drivers produce the full frequency spectrum without the treble peaks and other artifacts often heard with Fostex and Lowther drivers, along with surprisingly deep bass for a 4.5" driver. The drivers are only 86dB sensitivity, and the front and rear drivers are wired in parallel resulting in a four ohm load, so they are not intended for use with low powered tube SET amplfiers. The 40W/ch Monarchy class A zero feedback solid state amp I'm using to break them appears to be a good match.
Bipole Single Driver Speakers

Subject: Re: GPAF Treasure
Posted by Manualblock on Fri, 26 May 2006 17:59:14 GMT
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Say Fred; your living room is starting to look like the Manhattan skyline. All those skyscraper speakers you got there. You should hang a little spider-man figure between them.So do these speakers play all diferent kinds of music well?

Subject: Re: GPAF Treasure
Posted by Jim Griffin on Fri, 26 May 2006 19:23:37 GMT
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Fred,I like the way those new speakers look. Let us hear how they sound after a few days of break-in. I'm glad that you built those jewels.Jim

Subject: Re: GPAF Treasure
Posted by Wayne Parham on Sat, 27 May 2006 14:32:09 GMT
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Excellent! Very attractive, you always do such fine work!

Subject: Initial Impressions
Posted by FredT on Sun, 28 May 2006 22:12:36 GMT
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Jim, I haven't responded to your request for comments about the sound of these speakers because I took them apart for veneering. The enclosures are now veneered and I plan to spray them tomorrow. I did play them for about 12 hours before disassembly, and my initial impression afer the 12 hours is this: The bass is amazingly good for a speaker with two 4.5" drivers as long as you don't over drive them. The midrange is about what I would expect from a 4.5" driver that costs $70. It's as good as the $100+ Vifa XT's in my line arrays. The treble is the only shortcoming I can hear at this point. According to the manufacturer's freq resp graph it should be flat to about 10khz, then drop to about -5dB at 15khz, then return to flat at about 20khz. I definitely hear a drop above 10khz, and it sound to me line it begins somwhere below 10khz. I miss the crispness of cymbals, etc. that I'm accustomed to hearing from speakers with a good quality tweeters. (Yes, I did verify I had installed the FR drivers in front and the WR drivers in back, and not vice-versa).I'm the ultimate cable agnostic, but I'll admit some speaker cables and internal hookup wires are brighter than others. The brightest I have heard was made from silver plated teflon coated stranded copper wire. I have some in the parts bin, and I've assembled some new harnesses to replace the stock copper internal wire than came with the kit. We'll have to see if this has any effect on the treble. The soundstage isn't quite as focused as my non-bipole speakers, but it's actually more realistic - more like the soundstage I'm accustomed to hearing at live events. I was at a blues club Friday nite and listened carefully to the live event soundstage. I couldn't identify exactly where each performer was like I can with the overhyped soundstage of the typical pair of minimonitors. The greater ambience these speakers offer is especially nice with recordings of live popular/jazz events or classical music recorded in the typical reverberant concert hall.

Subject: Spider Man Figure
Posted by FredT on Sun, 28 May 2006 22:20:39 GMT
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Are you kidding. You have no idea how much convincing I have had to do to get those 6' 2" line arrays into the family room next to the real household head's antiques. An interior designer took one look at the speakers and asked Linda "You let him have those ugly things in this beautiful house?" I have trained her to respond, with a straight face, "Size does matter".

Subject: Re: Initial Impressions
Posted by Jim Griffin on Mon, 29 May 2006 02:27:05 GMT
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Fred,Thanks for the update on your speakers. I agree that the bass is very good for these little drivers within limits but they aren't capable of pro sound output levels.My on-axis measured data

shows performance within a 5 dB (that is + 2.5/-2.5 dB) window between 1000 Hz and above 20,000 Hz. That is exceptional for an inexpensive full range driver. Off axis the treble beams a bit as you would expect. Of course you don't have quite the sparkle that a quality tweeter would convey. I can send you a copy of my measured data if you wish. On my speakers I used a single run of Canare 4S8 wire (4 16 awg copper conductors) to connect between the terminal plate and the drivers. The bipolar nature of these speakers do add a bit of ambience that will disturb the purist who wishes to have a small sweet spot. As you suggest they project much like live music versus sounding like speakers. Again thanks and I appreciate your efforts.Jim

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Subject: Re: Spider Man Figure
Posted by Jim Griffin on Mon, 29 May 2006 02:33:10 GMT
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Clearly, Fred has a very understanding wifePerhaps he tried this one: "But honey they only take up as much floor space as a mini-monitor."Jim

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Subject: "Size does matter"
Posted by Wayne Parham on Mon, 29 May 2006 04:07:59 GMT
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Subject: Re: Spider Man Figure
Posted by Manualblock on Mon, 29 May 2006 11:35:48 GMT
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I don't know but I think there would be clothing drying on them in my house. I love when they pass the stereo, " So many wires?"

Subject: Updated Impressions
Posted by FredT on Tue, 30 May 2006 18:09:03 GMT
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When I mentioned the attenuated treble and Jim commented that the 4.5" drivers might beam a bit

in the higher frequencies, I said "Doh, why do I have them pointing straight ahead and not toed in toward the listening position?" They're finally veneered and varnished (unstained red oak), rewired with silver plated teflon insulated wire, and repositioned into the system with quite a bit of toe-in. The treble is much more prominent now. I suppose I instinctively point single drivers speakers straight ahead because every other budget priced pair I have heard that didn't have a contouring network has caused earbleed when heard on-axis. Not so with these. They're the best behaved single drivers I've heard.
Completed Speakers

Subject: Re: Updated Impressions
Posted by Jim Griffin on Tue, 30 May 2006 19:38:06 GMT
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Fred,Great looking speakers! I'll glad that you like their sound.Jim

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Subject: Re: GPAF Treasure
Posted by GarMan on Tue, 30 May 2006 20:04:13 GMT
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Fred, what do you do with all your speakers?

Subject: Latest Impressions
Posted by FredT on Mon, 05 Jun 2006 13:06:08 GMT
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When I first listened to these speakers my initial impressisons were that the bass was surprisingly strong for speakers with 4.5" full range drivers and the treble was surprisingly weak. The first impression hasn't changed with time; the second impression has changed.The bass: I did a quick check of the in room response with my Radio Shack sound meter and found the bass is flat down to 40hz, rolling off to -6dB (uncorrected for sound meter errors) at 32hz. In other words the bass is essentially flat down to the fundamental frequencies of almost all musical instruments. Even the deep organ pedal notes from Jean Gillou's Mussorgski "Pictures at an Exhibition" are impressive, as are the acoustic bass notes from Brian Bromberg's "Wood" CD. This is interesting compared to some of my other speakers having 8" or even 12" drivers whose bass begins to fall off below 50hz, or to some more "conventional" single driver speakers (Fostex & Lowther), where you say it has good bass if you can hear anything below 60hz. (Bob Brines' single driver speakers are an exception with good bass into the 40's).Jim, correct me if I'm wrong, but when you combine a front facing driver with a rear facing driver wired in phase, don't you eliminate the baffle step effect that

causes the bass to sound attenduated on other speakers that don't have baffle step correction built into the crossover? If I'm correct here this would account for the amazingly strong bass I hear from these speakers.The midrange is exactly what I would expect from a $70 driver. It's comparable to the midrange I hear from the $80 Vifa PL series drivers in my Eros MKII and the $100 Vifa XT series drivers in my Selah Audio XT-8 line arrays. You couldn't ask for better. All the people whose listening experience is limited to speakers with $25 to $35 drivers (almost all under-$1K mainstream speakers) need to hear this to appreciate how much better midrange sounds from higher quality drivers.Since I posted my first impressions about the attenuated treble I made two changes: 1) I toed the speakers inward so they're almost facing the listener, and 2) I rewired and recabled them with very bright sounding Apex Jr silver-plated teflon-insulated stranded copper wire with teflon insulation.Now I'll digress a moment to explain what I'm hearing. Vandersteen speakers are often described as "laid back" and are disliked by some reviewers. Jim Vandersteen's response is that his speakers test flat to 20khz, and that the listener perceives them as laid back because of two characteristics: 1) The tweeter isn't tipped up by 2 to 6dB as on some other speakers to create a "WOW" factor which will eventually be perceived as harsh artificial brightness, and 2) the sound of his phase-aligned tweeter isn't hitting the listener's ears a bit ahead of the woofer's sound, as is the case with non time aligned speakers having high order crossovers.Jim Griffin said "My on-axis measured data shows performance within a 5 dB (that is + 2.5/-2.5 dB) window between 1000 Hz and above 20,000 Hz. That is exceptional for an inexpensive full range driver. Off axis the treble beams a bit as you would expect. Of course you don't have quite the sparkle that a quality tweeter would convey". This is consistent with my impressions, especially when you consider the perfect time alignment of single drivers. Interestingly, after listening to these speakers for a while I switched back to my Zaph Audio design two ways using high quality Seas metal dome drivers, and they sounded waaaaaay too bright at first. So my advice for anybody considering building these speakers is this: If you like a really bright in-your-face sound these aren't for you. But if you want a speaker that's flat across the full musical spectrum, having deep rich well-controlled bass, and are easy to listen to, you will like these speakers a lot.The soundstage isn't quite as precise as some mini monitor speakers I've heard, but with recordings of large scale pieces, including live rock concerts, it's more realistic sounding. I'm not implying that the soundstage is deficient - Sweet little miss Norah is still there in the room with me, whispering from dead center between the speakers, when she asks me to come away with her. Of course, being a happily married man, I decline the invitation:)The only downside I have found with these speakers is in the maximum absolute volume they will play at without sounding congested. They will play almost as loud as my Zaph Audio two ways with 7" Seas woofers and 1" tweeters, but not as loud as my Three Pi Theaters or my Selah Audio line arrays. With most music this is a non-issue, but if you want a pair of party speakers that will play all day at 100+ dB without strain get the 3 Pi's instead. Also, if you frequently listen to large scale orchestral recordings, where the dynamic range my exceed 40 dB, these will not be able to play the soft passages loud enough without congesting during that ffff crescendo.Another consideration is that the drivers are 86dB sensitivity and are wired in parallel to create a four ohm load, so they are not appropriate for flea power SET tube amps. I have been driving them with a pair of Monarchy class A sand amps, and even one of these amps rated at 40 watts into four ohms is more than adequate to drive them. I suspect any low priced solid state integrated, like the 50 watt/ch NAD 320BEE would be a good match.The bottom line is if you listen to these speakers within the parameters I have described as appropriate for their sensitivity, impedance, and maximum loudness level you will find it hard to go back to a traditional two-way. If you already have really good speakers in a first system and are considering a pair of DIY speakers for a smaller second system they would be perfect.

Subject: Re: Latest Impressions
Posted by Jim Griffin on Mon, 05 Jun 2006 19:23:05 GMT
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Fred,Thanks for the detailed posting of your observations I'm glad that you like the speakers. A few comments below:1. Bipolar Nature of Speaker. You said: "Jim, correct me if I'm wrong, but when you combine a front facing driver with a rear facing driver wired in phase, don't you eliminate the baffle step effect that causes the bass to sound attenduated on other speakers that don't have baffle step correction built into the crossover? If I'm correct here this would account for the amazingly strong bass I hear from these speakers."Essentially, a single driver firing forward will be omnidirectional (360 degrees or 2 pi radiation) at low frequencies. Hence, the total radiated energy is distributed over the 2 pi space. Around a frequency related to the baffle width, the radiation trends toward 180 degrees or pi radiation. Thus the total energy is over the pi space above the baffle step point so 6 dB more energy radiates forward versus the performance at lower frequencies. That means that to achieve flat performance across frequency you must attenuate the radiation above the baffle step point by 6 dB. This attenuation also impacts overall speaker sensitivity by 6 dB. A bipolar speaker has two drivers--one radiates forward and one radiates backward all the time. Hence, a bipolar speaker radiates into 2 pi space all the time so there is no baffle step issue. The energy injected into the 2 pi field is constant across freqeuncy.The bass increase in this speaker isn't because it is a bipolar. Actually, the fact that you have two drivers covering the bass area will double the bass produced vs. a single driver. The other reason for the excellent bass is because of the Martin King inspired MLTL enclosure which extracts optimal performance from these drivers.2. Sensitivity: You said: "Another consideration is that the drivers are 86dB sensitivity and are wired in parallel to create a four ohm load, so they are not appropriate for flea power SET tube amps. I have been driving them with a pair of Monarchy class A sand amps, and even one of these amps rated at 40 watts into four ohms is more than adequate to drive them. I suspect any low priced solid state integrated, like the 50 watt/ch NAD 320BEE would be a good match."Actually the sensitivity of these speakers would be rated at 89 dB SPL. This comes from the basic 86 dB value from a single driver plus 3 dB associated with the increase in impedance sensitivity from 8 ohms to 4 ohms. When you parallel connect two forward firing drivers you would get a 6 dB total sensitivity increase as you get an acoustical efficiency improvement of 3 dB plus the impedance sensitivity of 3 dB. But with a bipolar arrangement the acoustical fields radiated by the speakers don't overlap so you just get the impedance sensitivity improvement. 3. Overall Output Level. You said: "The only downside I have found with these speakers is in the maximum absolute volume they will play at without sounding congested. They will play almost as loud as my Zaph Audio two ways with 7" Seas woofers and 1" tweeters, but not as loud as my Three Pi Theaters or my Selah Audio line arrays. With most music this is a non-issue, but if you want a pair of party speakers that will play all day at 100+ dB without strain get the 3 Pi's instead. Also, if you frequently listen to large scale orchestral recordings, where the dynamic range my exceed 40 dB, these will not be able to play the soft passages loud enough without congesting during that ffff crescendo."Yes, these speakers do have limits on their acoustical power output as you can only get so much bass from 4.5" drivers. Given a small to medium sized room and reasonable source material (light on the heavy bass) you

should be just fine. The fact that you can go from 40 Hz upward to 20 kHz with a single driver in a relatively small box is remarkable and would be of great benefit to some users.4. Treble Brightness. You said: "Interestingly, after listening to these speakers for a while I switched back to my Zaph Audio design two ways using high quality Seas metal dome drivers, and they sounded waaaaaay too bright at first. So my advice for anybody considering building these speakers is this: If you like a really bright in-your-face sound these aren't for you. But if you want a speaker that's flat across the full musical spectrum, having deep rich well-controlled bass, and are easy to listen to, you will like these speakers a lot."Voicing a tweeter is tricky and a personal preference issue. Some folks like the brightness and think that you are hearing more detail. But the downside is the fatigue you will experience after listening for a while. If you want to have a speaker that you can enjoy for long listening sessions, then these speakers (flat treble response) will light your fire. Thanks again for the excellent review.Jim