

Shopping for Home Audio

This essay will present the most important aspects of home audio reproduction as they specifically apply to somebody who listens to classical music. Many of the audio reviewers out there do not regularly use classical music as a basis for evaluation, and some that do use token selections of classical music do not use the most representative recordings, nor have they sat in any number of the world's great concert halls to actually know what the real thing sounds like.

I'll be sharing some tips on how to go about the daunting, and oftentimes frustrating, task of auditioning equipment, or even finding dealers that have equipment worth auditioning. I've also developed some unique formulas for assessing speaker performance which may give an indication of a speaker's performance before you ever take the time and effort to go hear it. As far as I know, in following the audio scene since the mid-70's nobody else has shared this correlation of design and performance. Of course, the biggest problem of all is just getting music lovers interested in fine audio reproduction. As I explore most thoroughly in my essay, **Listener Psychology: How We Perceive Music**, many musicians don't actually listen to the sound of music, not even at a live concert, or not even when they are making the music themselves. This is a fundamental fault of the music-training system that will be addressed in yet another essay to come.

I trust I needn't give a full accounting of all the reasons why realistic sound reproduction is important. Just consider: concert pianists make a conscious decision to play on a Steinway, Bechstein or Fazioli, and this has nothing to do with notes, compositional form or 'interpretation.' Yes, many pianists, even highly-acclaimed concert pianists, are responding simply to the tactile response of various pianos rather than to the balance of sound and harmonic character. But some make the decision of choice of piano to also include the concept of tonal modulation and layered dimensionality. Concert halls or music venues of any kind all have their distinctive sound, and millions of dollars are spent to improve the acoustics of concert halls. Composers have very specific ideas about sound, too, so Beethoven may choose to orchestrate a part for clarinet instead of oboe. Sound does matter.

Sound is the medium in which music expresses itself. The nature of that sound, the so-called "tone quality," is an important part of this expression. Listeners who haven't given any thought to the sound equation, those who just randomly picked up some equipment on sale at Best Buy, are basically saying that music isn't really that important to them.

Now, as we also learned in the essay on Listener Psychology there are some listeners who are not very attuned to the sensual and coloristic aspects of music—Ansel Adams types, as I call them—who may otherwise be very serious or astute

listeners. There is one noted British music critic who boasts about listening over an inexpensive boom box and derides all discussion of sound quality as esoteric drivel best left to the “hi-fi nuts.” Then there are the vast majority of people who are not really ‘listeners’ at all, they only see the external elements of performance and hear the vaguest outlines of the music’s ‘mood.’ In some ways they are honestly more captivated hearing an 8-year old student play on a Casio keyboard (“look how fast she moves her fingers!”) than they would be to have to sit through a concert pianist’s program at Carnegie Hall.

I’m assuming that anybody reading this article does not fit either of these above profiles. Statistically, among serious listeners, that is people who attentively listen to music rather than merely ‘hear’ music, a solid 80% can differentiate between poor sound and good sound, and they don’t need to have it explained what is meant by good or bad. I’m not just talking about the obvious things such as muddled bass, screeching treble, or obvious flaws and imbalances. I’m talking about more subtle aspects of music reproduction that many listeners have probably never put to words in their minds, yet realize on an unconscious level. Good is what is natural and communicative. If something sounds good but not quite natural, something is less than ideal. If something sounds natural but remains uncommunicative, something is off. Good audio reproduction should sound both natural and engaging to the listener. And the ear shouldn’t be fatigued after a half hour and make you want to turn the music off.

For the perceptive listener, a good audio system is vital in order to hear the full emotional power and expressive nuance of music. That holds true no matter what kind of music you like to listen to. Just listening indiscriminately as background music while you are doing something else is to never get beyond the crudest outline of the music’s depth. Even if you crank up the music and sit down to actually listen, if your system is poor or mediocre, all you are hearing is a generic wall of sound.

Therefore, this article presents some ideas on how to go about procuring a good audio system which will go a long ways toward enriching your musical experience.

As for myself, I hardly fit the profile of an avid audiophile who obsesses over having the latest and greatest equipment. My forays into the world of audio shopping are strictly to find the most realistic sound reproduction I can afford, not to have cool-looking equipment, the latest technological gimmicks, or prestigious brands to boast about. But neither am I a contrarian who disdains buying brand names. Simply put, I need to have a good sound system, just like I need a good piano; music is an extremely important part of my life, so I’ll do whatever it takes to make the magic happen.

Back in the 80s and 90s shopping for audio was easy. Within a one-hour radius of where I lived I could find virtually every interesting audio product that was recommended in the specialty magazines (Stereophile, The Absolute Sound, and

others). Now, things are vastly different, and when I recently made a short list of five speakers I wanted to audition (all highly recommended in the review magazines) I had to increase my previous driving radius of one hour to four hours north and three hours south.

The whole home theater craze has really screwed things up for the shopper who is primarily interested in getting the best possible sound. I tried the whole 5.1 and even 7.1 game for many years because in theory it makes sense to have a surround system that can simulate the true, immersive concert experience. But the only system that sounded even close to achieving this goal cost a million dollars (the Yamaha Artists Studio in NYC). Anything else I've heard has just too many compromises to the realism of the sound, the fault lying in too many layers of grainy processing, increased signal noise, and diminished transparency of the original music signal. Someday I may revisit the concept, modifying some of the ideas Audio Research attempted (keeping the front two channels completely pure and unprocessed), but the cost would be very high, and with probably less than a 10% increase in realism over a good two-channel system.

If your needs dictate an all-in-one system to handle both music and video, I suggest sticking with two channels. I'm not that much of a video aficionado so I really don't miss the center channel if the two mains have good clarity. Three-channel in theory can be very good in stabilizing the center image, a concept proven by Mercury's three microphone technique and playback system. But to recreate such a three-channel system would be very complex and costly. Audio receivers and surround-sound processors are just gimmicks that put lipstick on a plastic mannequin. All that extra processing puts artificial layers between you and the music, when what the real music lover desires is the most transparent window of realism into the recorded performance. This is best achieved with a simple but high-quality two-channel system.

Because of this massive change in the market, the traditional audio specialty stores went out of business as the big box stores sold home theater systems by the truckload. Best Buy has all but wrapped up the low-end and mid-level shoppers, but most shoppers buy by brand, and right off the shelf without any serious auditioning process. On recent visits to two different Best Buys I didn't see any speakers for under \$2,000 that were set up for serious evaluation in a closed room. Another independent audio-video store I went to didn't even have any closed rooms for quiet evaluation. Their \$6,000 speakers were set up with the big screen TV in the middle of the store, a pair of quality monitor speakers were not even hooked up to anything, and a Stereophile recommended speaker was set up by the cashier so the checkout guys could enjoy some tunes. Come on! I was almost tempted to make them play the final scene of *Salome* to see how quickly the store cleared out.

Meanwhile, those few specialty dealers that still remain seem to cater to well-heeled audiophiles, and I was hard pressed to find any speakers under \$5,000 to audition.

This apparent sharp division in the market place was amply demonstrated when I talked extensively with one specialty audio business owner who said that in times past the \$4,000 – \$6,000 category for speakers represented his biggest portion of sales. Now he stocks only one speaker in that price range and moves only about one unit per year. While I was at another shop that carries ‘prestige brands’ evaluating their only speaker under \$6k, in walks a first-time customer, a lawyer, who was looking for something with killer sound and visual appeal to wow his guests at parties. A half hour later with not more than four or five minutes of listening he buys a \$22,000 pair of speakers just like that. Those are the kinds of customers that keep these guys in business, and it must be a good business based on the \$100,000 Mercedes AMG the manager had parked out in front, which is chump change compared to the top-of-the-line Aston Martin another dealer was driving. Quite frankly, customers like me, the real music lovers who have to agonize over budget restriction, are probably their biggest nightmare. But I am compelled to push on because my needs for a good music system far outweigh my being perceived as a pain in the ass.

Many frustrated shoppers go to regional audio shows in an attempt to hear some of the products the magazines rave about. But any of these shows I’ve ever been to are really worthless for trying to make a reasoned assessment of products: throngs of people, unfamiliar music, unfamiliar rooms, too much bleed-thru of sounds from demonstrations in adjacent rooms.

The purpose of my latest foray into audio shopping was to look for a new pair of dynamic speakers and suitable amp to complement my planar and tube amp system. I like choral and symphonic music through the planars, but prefer the punch and immediacy of dynamic speakers for piano and chamber music. Both of these music-only systems are separate from my audio-video system. As I made my short list of speakers to audition I set my target goal at \$5,500, but also included one highly recommended speaker selling for \$3,500 (just in case I found something I liked that could save me some money), and also one highly regarded speaker normally selling for \$8,600 that a local dealer had on demo for \$6,990 (just in case stepping up to that next level proved to be a quantum leap in sound quality).

Finding all the speakers on my list proved to be an exhausting gauntlet, and as I drove great distances here and there to hear something, I took the time to listen to other speakers the dealers had on display. All told I gave serious evaluation to 38 speakers, ranging from \$1,200 to \$22,000, and that doesn’t count the one encounter with a \$95,000 mega system.

Just as I can’t imagine ordering a car online because it got a good review, I can’t imagine ordering speakers without having heard them. There are certain things

that you can get away with ordering from the many online suppliers, things such as cables, surge protectors, record cleaners, and accessories in general. But speakers are something you really have to hear. I know, there are some buyers who just order a pair of speakers online, and if after three months they discover they don't like them they offer them at a loss on any of the used audio sites. But, the bigger and heavier your speakers and amps are, the more unfeasible the option of shipping becomes, and one is therefore limited to selling for 'local pick up only.'

I also knew one retired sound engineer who spent his entire and considerable retirement investments on buying new audio components every few months. He had a closet full of amps (the \$10,000-40,000 kind!) and swapped out his speakers at least once a year. One time I would visit him and he had MBL Radialstrahlers, the next time he had these big suspended tuba things by Avantgarde that cost \$75,000. He also tried plasma speakers, quasi line-source systems, and every other type of configuration you've ever seen. Needless to say, his progress toward audio nirvana was not linear, but seemed to be one step forward, then two steps backward. But he didn't care because his overriding motivation in all this was his curiosity about the engineering of products. For me, once I buy a product, I usually stick with it for at least a decade. In between these forays I'm spending my time writing, listening, or at the piano trying to keep my *Hammerklavier* fugue from getting too rusty. So you see my priorities.

Everybody would love to have a dream system, but one's budget and the configuration of one's home may dictate certain compromises. I've had to downsize my own system when we moved to our current house and it is all the more painful to have once had a state-of-the art system that had to be scaled back substantially. The trick is to make the right compromises that you will be able to live with and not end up regretting later on.

Before I share some tips derived from my own experiences shopping for audio, I suppose we should take a minute to define what the object of the search is all about. First off, let's define what "ideal" might mean to the piano enthusiast, and then talk about strategies to get as close as possible in a variety of room sizes and budgets. If your ideas differ significantly from the four ideals I list below, then you may have to allow for differences in the conclusions that I derive. In any case, it would probably be well worth your time to ponder for a moment and prioritize just exactly what the most important performance criterion might be for you.

Ideal sound for classical music

Numero Uno. First on my list is that the speakers must disappear. I don't want to be listening to and focused on two boxes or panels sitting in front of me. They must create an illusion of music extending all around them and never letting on that they are actually there. Nothing breaks the illusion of being in the studio with Volodos playing twelve feet away than for a tweeter to suddenly reveal its location, or for a buzz to develop around the mid-bass driver. I can't believe how often I

encountered this problem. The corollary issue with this is how confined the sweet spot is for the speaker to be in focus. I listened to one pair of expensive mini-monitors where if you move your head but a few inches either way the illusion is gone and suddenly you hear exactly where two speakers are sitting in the room.

Numero Dos. I want to be able to tell what kind of piano the performer is playing on: Bechstein, Bösendorfer, Steinway or Yamaha. Each of these pianos have such different harmonic colors and resonant characteristics that each will have a significant influence on the very manner of the pianist's playing in terms of tempo, dynamics and articulation. Most of the generic speakers sold at the big box stores fail to differentiate these characteristics. This characteristic to hear subtle nuance in harmonics and internal resonance is closely related to what the audio people call "resolution." The best electrostatics, like the large SoundLabs I used to have, are superior at this, but well-designed dynamic systems can also convey these distinctions.

Numero Tres. I don't want to hear an undefined blob of sound that has all ranges of the piano blended together and spread over 8 to 12 feet (or whatever distance between your two main speakers). I want to hear the treble coming from the front of the piano, and the bass emerging from the back of the piano case. This is called image specificity or imaging focus, and it is even more crucial with vocal music. As I wrapped up my evaluation of one speaker, I made the mistake of asking the salesperson if he had any favorite demo track that he thought best showed off the capabilities of the speaker. So he put on a pop number with a male vocalist and was going on about how realistic vocals were. While the harmonics and balance did seem accurate (I have never heard this singer before) his voice was five feet wide, as in extreme close up of his mouth on a five foot screen. I've been in small rehearsal rooms with opera singers singing full out such that my body vibrated and I could hardly hear myself pounding on the piano, even so, with a blindfold on I could pinpoint where they were standing to within an inch or so. In an actual opera house, sitting back at a distance, this specificity becomes more diffuse, but with this pop recording the singer was probably less than a foot away from the microphone so the image should have been fairly precise. No vocal chord can produce an image that wide. So the dealer fiddled with toe-in and toe-out of the speakers and grumbled that nobody had made such a complaint before.

Quattro e Finito. The last on my list of make-or-break criterion is that the system must be truly full range. Response that is -3db at 16hz is still three decibels less than what one would experience in concert. I have been to many pipe organ concerts and to some symphony concerts with the concert hall pipe organ being used, and I have yet to hear an audio system that can shake my entire body to that degree. Most of this effect stems from the wooden flooring carrying resonant vibrations to the body. The only way to replicate that would be to have your listening chair situated on a wooden riser with the subwoofer systems bolted directly to riser. Even so, this would probably be more accurate than those "butt-

kicker” systems they used to advocate with theater surround systems. But there are also instances of strictly air-borne vibrations from the infrasonic region which can make the eardrum pulsate. I recall the large bass drum used by the Chicago Symphony Orchestra making my eardrums undulate three or four times after a powerful whack.

The only audio system I’ve ever heard that came close to replicating these kinds of visceral experiences was the big 18” Velodyne subwoofer. Mostly what subwoofers do is just rattle the walls, usually because one is trying to compensate for lack of any infrasonic perception, and this just overexcites room resonances and weakens any structure in the house that is affixed with nails instead of wood screws. With the 18” Velodyne I found I could actually turn the bass down because the lowest frequencies were actually being reproduced.

Without reproduction of the lowest octave, music is eviscerated of much of its emotional power. The final minutes of Mahler’s Resurrection Symphony sound anemic and even a bit contrived without the underlying emotional power that comes from a solid bass foundation. When Mahler specifically indicates he wants a giant bass drum to be struck by a massive bed post, it’s rather disrespectful of his wishes to just shrug one’s shoulders and say we don’t really need the bottom octave of the music, that a speaker that is -3db or even -6db at 40hz is plenty low enough. Music is not just notes, intervals and structure; it’s sound. Tiny, tinkly treble notes from a glockenspiel or triangle have their place, raspy reeds convey their own unique color, shimmering strings offer their own texture and subliminal *frisson*, and low body-shaking notes have their purpose in the type of mood and experience the composer desired to convey. Budget restrictions may dictate that one has to settle for “as good as possible” as a temporary compromise, but the long-term goal should always be for full-range reproduction, top to bottom.

The need for deep bass response is not just limited to pipe organs and big bass drums. With piano music I want to hear the low undulating resonance of a full-concert grand, and on powerful mid-bass chords I want to feel the physicality of the piano’s bass actually vibrating my body. I vividly recall three occasions at different piano recitals when I felt my entire body vibrating during climactic moments. Especially memorable was Lazar Berman’s Wagner-Liszt *Liebestod* in Herkulesaal in Munich, where the bass notes crawled up from the concert hall floor through my legs and settling into my abdomen, and this from sitting some fifty feet back. It amazes me to think about the amount of energy that this lone Steinway grand must have put out into this huge hall to cause vibrations to travel along the floor and up my chair, and doubtless to many other seats in this resonance zone. Home audio just isn’t set up to re-create such an effect, but at least with a full-range system you get more of what was captured by the microphone.

Without devolving into a long tangential discussion of neurological responses, let me just say that the more the varied senses are involved in an experience the more

potent will be the reaction. Seeing Lazar Berman on stage, feeling the expectant energy of the audience, smelling the wood of the hall, knowing the storied history of great performers having played in this very space, hearing the layers of tone and feeling the bass waves vibrate my body at the climactic moment, this all increased the immediacy and vitality of the experience. The more of these sensory and psychological clues that we omit in the process of reproducing music, the more remote and detached the experience becomes. Therefore, I want a sense of a performer sitting in front of me, not just sound coming out of some inarticulate void, and I insist on feeling the full power of the Steinway grand, and feeling that bass drum that Mahler intended to be a vital part of the experience.

But the need for full-range response isn't limited just to the passages with obvious deep bass material. Just the other day I put on a recording of Anna Vinnitskaya playing Ravel's *Miroirs* for some background music as I sorted through some papers. The recording was relatively new to me, and I haven't yet conducted one of my massive comparative surveys, but my initial reaction to the opening of *Noctuelles* was that the rendition was too dry and pointillistic. It bothered me so much I was going to take it off and put on another version that I knew I liked, but at the last minute I turned up the volume from the softer background level it had been at, and then the articulation didn't sound so bad. It was still more spiky and 'pianistic' than I like, but now I had more perception of some ambience surrounding the individual notes. Next, I fired up my main system with subwoofer, and now everything made sense—the individual notes in the treble were set off against the deeper internal resonance of soundboard. Bass tones caught by half pedaling lingered in the ambience of the room long enough to provide a foundation for the more ephemeral figurations in the treble. The first speaker has a rated bass response of -3db at 32hz which most people consider to be perfectly adequate. But as soon as I listened through the system with the subwoofer (rated at - 2db at 18hz) the whole soundfield and infrasonic ambience of the room made the upper treble articulations sound appropriate. As I said, full-range response is not just for deep bass music.

Among speakers in the current market that don't require a subwoofer, only one speaker under \$12,000 gave any hint of the palpable presence and visceral impact of a concert grand, and that was the Legacy Focus SE. Among speakers that one might find on the used market I recently saw a pair of Thiel CS5 for about \$5,500 and they could certainly do it with their heavily equalized woofers (requiring some serious amplification). In most cases, you either have to have two very substantial main speakers, or else employ the use of one or two subwoofers.

Another acoustic phenomenon that is very rarely reproduced in audio systems is the sense of 'acoustic bloom' where a piano notes seems to expand in size and volume. There are two types of acoustic bloom: one usually occurs at softer dynamic levels in the bass when a note is struck and then the pedal is engaged, thereby creating a slight surge, an actual increase in fundamental tone as well as

overtones—and undertones!—owing to sympathetic resonance from the strings when the dampers are lifted. Michelangeli was a master of this (as I witnessed in a performance of the Beethoven Opus 111). This kind of effect can be replicated by any high-quality system with superb resolution and a low noise floor. However, the other kind of acoustic bloom, caused by excitation of room resonances in the recording venue which expands the volume of the projected tone as primary, nearfield and ambient waves coalesce, increases the perceived volume both in terms of decibels and in terms of its dimensionality. Thus far, in over three decades of listening, only certain tube amplifiers have been able to recreate this effect in the few instances that it has been captured on a recording. I even directly compared a beautifully quiet and transparent \$16,000 Class-A solid state amp with a lowly \$3,000 tube amp, and only the tube amp recreated this effect. I do not fully understand the specific engineering principles which would account for this, but it has been proven out consistently in real world experiences. That doesn't mean tube amps trump expensive solid state amps in every performance parameter, but in terms of acoustic bloom only tubes seem able to re-create this effect.

I recall hearing John Browning play the Rachmaninoff Sonata in concert where through projection of his Steinway and through masterful voicing I heard both the undulating bass wave effect and the air-borne 'acoustic bloom' effect. Listeners only listening to notes, or how he stitched together his own hybrid edition of the sonata, probably missed the marvel of sounds that he was creating. Anyway, the Delos recording from a closed session seems to have captured both just as I heard in the live concert, and a good tube amp will convey this magical effect. Even so, I'd never recommend a tube amp for a beginner audiophile or music-lover who wants hassle-free reliability.

Again, I want to emphasize that 'Ansel Adams Types' will not care a wit about anything I've been talking about here. But any listener with a fine sensual-aesthetic attunement will be enraptured by music reproduction that conveys the finer points of realism as one experiences in the presence of live musicians. I'm also somewhat irritated by naysayers who have tin ears. I was once quite surprised that my aunt, who was a hair stylist at the time, spent \$600 for a pair of scissors (and this was back in the 80's). I couldn't imagine a pair of scissors being worth more than fifty dollars even if gold plated. But she patiently described the benefits of superior design which offered perfect balance in the hand, and perfect cutting tolerances across the length of the blades. For the professional who uses scissors all day long, the price was well justified. The point here is that I knew nothing about scissors and reacted with incredulity over this seeming extravagance. After that experience, whenever a topic comes up that I may not be expert at—bicycles, exotic cars, sports equipment—I just accept that people who have expended a great deal of effort to immerse themselves in a certain area will have a greater perception of, and far greater sensitivity to, varying degrees of quality than I may ever perceive. So I don't go around deriding somebody who spends \$4,000 on a mountain bike as being outlandish. Label shopping just to have a certain logo on a

handbag is another matter, or the whole fake Rolex issue, but what I'm talking about is true quality that some may discern and appreciate and others not recognize or care about. As counterintuitive as some aspects of audio reproduction may seem, not everything is delusional smoke and mirrors tricks, though some things are clearly more marginal than others. The point is, people who don't appreciate fine audio or fine pianos, or any other area in which they are uninformed, should afford a degree of respect for those who are more informed.

For those who do appreciate realistic sound reproduction, naturally, the more budget one has to work with the more realism one can attain and the fewer compromises one will have to deal with. But, purely as a reflection of my own buying strategy as a music lover with Champagne taste and a beer budget, I'm always looking at ways to achieve the most realism by spending the least amount of money. If that is not your situation, then you may be lucky enough to just buy your way straight to nirvana!

As I look at smaller, more modest systems, I would want to be sure that a minimum threshold of realism (resolution) is present, and that the full emotional power (full-range reproduction) is not compromised. You can buy inexpensive floor-standing speakers at Best Buy that will envelope you in a wall of sound and convey the raw power of the music, but have almost zero sense of realistic resolution; or you can buy a high-resolution two-way mini-monitor and hear lots of resolution but wonder who stole the bass (and all the emotional foundation of the music). Finding that right balance is very difficult. If I had very little expendable income, I suppose I would opt for emotional power over realistic resolution, but there is a point below which I'd rather just listen with headphones. Even as a poor college student I chose to drive a used car and spent all my money on good speakers and a Luxman tube amplifier. You have to decide if music is really that important in your life. For me, it is.

Here are some of the lessons I learned which may make your own experiences more productive (or less frustrating). First off, I hate to say it, but forget the magazines and making lists of equipment you want to hear and then going into specialty stores with preconceived ideas. Many of the dealers that listed certain brands on their websites didn't actually have any product in the store. One dealer admitted he hadn't had any product from that brand in two years, but maintains the brand option in case somebody wants to special order something. Another dealer carried the entire brand I was after except for the one specific model which apparently had a crossover made in China that the dealer found questionable. Same with another dealer who carried everything of the brand except the one model I was after, and the only one given high recommendation by The Absolute Sound. When I asked why they didn't carry that one model, the manager said he had a backroom full of product from a rival manufacturer that he was obligated to move in order to retain his status as a referred dealership. I heard lots of excuses, and found very little product in my price range.

How Dealers Pick Their Brands

It may be worth an aside here to explain how and why dealers carry the brands they do. Oftentimes it has nothing to do with what they are really passionate about. As I looked online at audio stores up and down both the West Coast and East Coast (because that's where I generally travel), I discovered that many small independent audio stores were almost literal cookie-cutter copies of other stores in other states. I'm not talking about chain stores here, but truly independent local audio shops that to a brand and display configuration seemed to duplicate what another shop was doing three states over this way, or two states down that way. How does this happen? Well, the truth is that there are only a handful of key distributors that control most of the desirable brands you find. Most small audio stores work with just one or two of these distributors. The benefits make obvious sense to the small business owner: you save on shipping by bundling together diverse products in a single delivery, the distributor will often have annual minimums of sales to maintain the lines, but this can be spread over the entire product line of several or even many different brands, and there are often 'flooring plans' which allow a dealer to display product for 90 days without buying the product outright (usually there is a small fee for this service). There are also incentives to maintaining a strong relationship with a single distributor instead of spreading the wealth around to numerous distributors. With a strong relationship the dealer may receive cost-free demonstrator loans of expensive equipment that they can display for 120-days, a year, or indefinitely. The manufacturer gets a presence, the dealer has people coming in who may be potential buyers, and everybody wins as long as the occasional sales keep the machine oiled.

Let's say a dealer has heard a certain brand of speakers at a trade show and really wants those speakers for the store. There may be no other dealer carrying those speakers for hundreds of miles, but the dealer still cannot get the speakers because they are bundled together in a distributor's package, a distributor that supplies a competing dealer across town. Doesn't matter that the other dealer has never carried those speakers, and expresses no interest, the distributor (in most cases) is not going to split up their product line between two competing dealers in the same area.

As I already mentioned about the manager of a store who had a backroom full of product at a certain price point that he was obligated to sell, thus precluding any thought of carrying another brand of speaker at this price point (and dilute sales numbers from his obligation), there are many behind-the-scenes issues that remind me of Republican and Democrat party politics. The infrastructure of this distributor-dominated business model really means that dealers are not completely free to pick and choose their product lines, and it is the customer who suffers from having lack of true diversity.

But back to shopping, and dealing with the realities of what you find. As I said, don't bother to make lists of product you are interested in. Just know your general

budget (and be prepared to go over a bit) and go and listen to some systems. For some people, the choice may not be so much whether you prefer the German product at this dealer or the British product at this dealer, but the dealer himself. The manner of each personal interaction will be a good indicator of whether you feel comfortable developing a business relationship with one dealer or another.

There's no need to feel defensive or apprehensive when auditioning equipment. Dealers want the chance to earn your business, and you have taken the time and energy to allow them to present their product. It's a two-way street, so don't be bullied by salespeople that radiate confidence about products they sell if the product just doesn't ignite any urge for you to buy it. At one store the salesman gave me a quick two-minute pitch on a certain \$4,500 speaker and why it was so great, and it completely distorted on the first CD I put on (the Delos CD of the Rachmaninoff Sonata that I was using as one of my evaluation discs). Even the salesman grimaced and quickly moved me onward and upward on the price scale.

At another place I took in an SPL meter and set the volume to a realistic level from a test CD to audition a pricey \$5,500 monitor speaker which the dealer was raving about and it distorted on the glissando in Debussy's *Feux d'artifice* (Connoisseur Society recording with Ruth Laredo). I would have thought any speaker selling at these prices could handle the dynamic range required, and that what I would be focusing on would be nuance, not simply survivability!

Try not to be too thin-skinned about commentary from salespeople who may have had a trying day. After hearing my response about the dynamic response of a Bartok Piano Concerto on the first system I tried at this store, the salesman suggested that what I really needed to do was try a another recording of the work with a different conductor. Oh, really? (I had just completed my comparative survey on the Bartok concerti!). As I maintained my reservations on the next three systems which didn't seem to have any engaging sense of presence during low-level passages, he finally took me right to the most expensive system he had, a \$95,000 mega system. Finally he heard what I was talking about, that even during pianissimo sections the soundstage and shimmering harmonics didn't disappear. So it wasn't the conductor's fault, merely that all of the systems anywhere near my price point did not reproduce the sound with sufficient realism for me to even feign a positive reaction. By the way, I'd give this mega system a rating of a B+, the same as another system I auditioned selling for \$8,500 which also conveyed this sense of low-level *frisson*. Spending more doesn't mean spending better!

One of the benefits of maintaining an open mind is that you may make some delightful discoveries that weren't even on your radar. One dealer recommended I listen to a speaker I had never heard of, and which had virtually no reviews by any of the major American reviewers. But this turned out to be one of the two best speakers I heard, and really some of the most realistic sound staging I had heard from any speaker in twenty years. Like I say, don't go in with a fixed agenda in mind.

The downside to being open and relaxed is that you can end up spending a lot of time going down blind alleys. One kind soul, one of the friendliest, showed me four systems in about as many hours, and much as I'd like to support that kind of business model, the fact was that none of the four systems was close enough to what I wanted for me to give him my business.

Another tip: avoid weekends! Try to go on a slow day like Monday or Tuesday, and target the 11am to 3pm time frame to have a better chance of being alone and without bleed-thru of others systems disrupting those pianissimo sections. Classical music really requires a quiet background because of the range of dynamics.

I'll be making some specific system recommendations at the end of this essay, but for now, just some general conclusions....

Speaker Design Problems

Obviously the speaker is the most important consideration, so you can't really even consider how much power you might need until you make that decision. If you have a smallish room (say 250 sq. ft. or less) you won't have room for a large panel speaker, or for a large dynamic speaker. But don't be tempted to go for a mini-monitor and subwoofer system; the gap in dynamic power between the sub and the sweet spot of the monitor's small 5" woofer means the mid-bass will be lean and certainly lagging in dynamic response. That means that while the low bass and treble increase with the crescendo, the mid-bass will hit a plateau and stay there (or distort) and this alters the tonal balance of the music. I've listened to three top-rated monitors in the \$5,000-6,000 range that all have the same issue. Probably the best monitor-size speaker I heard was the Amphion Argon 3 (\$4,000) because it uses a sufficiently-sized 6½" woofer and showed no signs of distress in playing back piano music at satisfying levels. Part of the reason it sounds so good is because it has a high volume-to-mass ratio (which I explain later). This is a speaker that sounded fairly satisfying with even an entry-level integrated amp (the Naim Nait 5si), but also showed its full potential with a \$24,000 pre-amp/power-amp system.

Small "tower speakers" have the same problem, even some that I auditioned costing up to \$9,000. In my opinion, based on the facts I experienced in the real world, the 5" - 5¼" woofers common in many designs are just too weak in the mid-bass, and distorted or topped out dynamically when trying to reproduce the weight of a concert grand Steinway played full out. Multiple 6½" cones to spread out the demand are better, but still require a subwoofer for the lowest two octaves. The larger 6½" woofers also stand a better chance at providing a seamless transition from the subwoofer to the treble. The larger 8" woofers on the new Monitor Audio silver series or the 9" woofers on the Sonus Faber Liuto are even better.

Tower speakers with a slender profile are good at minimizing the diffraction issues that plague wide box designs, but if they are tall and skinny and without sufficient mass then you end up having the long dimension swing and flex with low frequencies and this creates a billowing cloud of muddled bass. One pair of speakers that has been getting front page advertising in the audio magazines proved that impressive size without sufficient mass is a recipe for mediocre performance. If your room is small, I'd recommend the Amphion Argon 3, or the Avalon Idea, which both image superbly and have no box coloration.

The Subwoofer Dilemma

Now here's the dilemma: I've never heard a system with the sub blended-in with the mains that was convincing. Two rather pricey systems came close but when one really listens closely, there is no getting around the clarity and focus of having the sub directed by an active crossover. That means another cost, another connection, and the real estate of having another component on the rack. I favor the Bryston crossover (\$3,500) because it doesn't introduce any added noise to the system, but the Hsu Research Class-A crossover is also a worthy contender with fewer features but good, clean sound and sells for only \$450. Unfortunately, quality crossovers rarely appear on the used market, and they hold their value. I recommend starting with the Hsu because the value it adds to proper bass management is one of the smartest investments you can make.

There is one new entry-level preamp on the market, the Parasound P5, which has a built-in crossover. It is not as sophisticated as the Bryston, and the crossover curves are set at 12db per octave which is really not ideal in my opinion (6db and 12 db slopes have their place in speaker design, but for bass management you really want an 18 or 24 db slope)—but it's better than nothing and the convenience of having a built-in crossover, mm/mc phono section and built-in DAC may be impossible for some to resist at its meager asking price of only \$950.

Dealers who sell REL subwoofers (I have a Stadium III) will insist you don't need an active crossover if you use the proprietary Neutrik connector. That's an option to consider as a temporary compromise if you lack the budget to go with the active crossover right off. The problem with REL is that they don't have a built-in DSP feature which is absolutely critical if you want to balance the overall bass response between the sub and mains. You can buy an external DSP device if you have a separate preamp and power amp, but you're out of luck if you're trying to use an integrated amp or receiver. The fact is, most of the dealers I've interacted with don't often sell subwoofers with active crossovers for audio-only systems. There is a perceptible prejudice that subs are for home theater video, and if you want serious bass in a two-channel system you just pay the big bucks for one of the \$30,000 speakers they're selling.

The biggest issue for me is that two different sets of woofers with different size and weight are trying to play the same notes while being located in physically different

spaces within the room. I'll discuss in more detail later the concept of room pressurization and why bass tones below 100 hertz are not truly non-directional as is often said. Blended-in subwoofer systems cause so much muddled time phase incoherence it drives me crazy. These problems are only exacerbated if there are already existing problems with room nodes and resonances. The second big reason why blending is just a cop out is that any speaker that needs a subwoofer is a speaker that is trying to play beyond its comfort zone, zapping untold amount of power from the poor amp that is never properly converted into useable music, and often distorting or creating dynamic congestion. With a dedicated crossover, or the Parasound preamp, you can roll off the bass signal going to your main speakers so they aren't creating distortion, non-linear dynamic response, or sapping excess power from the amp. Whatever budget you have for speakers, consider the whole system cost, including subwoofer and proper bass management with some sort of crossover and/or DSP solution. A decent sub and crossover are going to cost out at a minimum of \$2,000, so you wouldn't go to that bother with a pair of \$800 speakers on sale at Best Buy. Realistically, I don't see assembling a satisfying speaker/sub/crossover system for any less than about \$4,500.

To my ears this minimal investment in getting the speaker system right is all far more important than starting with a middling speaker system and trying to doctor it up later on with upgrades (speaker cables, power line filters, a new DAC, etc.). When I discuss my choice of audition CDs you will see that full range reproduction is important even for piano music. Subs are not solely for listeners who listen to room rattling pipe organ music all day. But the bass must be clean and articulate. Muddled and inarticulate bass will kill your appetite for extended listening sessions.

To avoid all this subwoofer and crossover hassle, if your budget allows, I highly recommend going for the Legacy Focus SE which is truly a full-range transducer that doesn't require a subwoofer. At \$9,200 they are pricey, and a bit past my budget range, but consider that you won't require a subwoofer system and all the hassle that entails. Legacy is currently offering a three year 0% incentive, if that helps. Finding a dealer where you can actually hear these speakers will be a challenge (I had to go across country to hear them) but if you like them, it sure solves a lot of issues.

Once you've decided on a speaker, usually with associated equipment that the dealer thinks is optimal for the speaker, ask to hear a demonstration of the speakers with a less expensive, or more expensive amp, and see if the differences in sound are important to you. For me, differences in CD players, cables, preamps (except phono stages) have a very minimal impact on the overall character of the system. But the speaker-amplifier interface has in my experience time and again proven to be a crucial consideration in the overall sound. And I'm not just talking about power and dynamic capability. I'm talking about the balance of tones, the portrayal of sound staging, and the stability of powering the speaker equally across

the entire frequency spectrum. The reasons why speakers interact differently with various amplifiers is very technical, and while interesting for me to understand (and maybe to you as well) it is just beyond the scope of this essay. Think of it like this: the weight of an 8" woofer and a 1" tweeter are very different, and the demands they make on the amplifier are very different; with the small low mass driver you need transient speed, with the slower moving heavier mass woofer you have the matter of mass momentum or what they call "damping factor". It's all like car enthusiasts who debate about torque versus horsepower in high performance cars.

The other big issue is how capably the amp can provide for micro-bursts of energy which may momentarily surpass the continuous watt output rating. Better amplifiers have more robust power supplies to draw the needed energy (provided your AC lines are not already overtaxed and incapable of pumping out the juice when needed). Leaving aside the matter of power, if you want to hear the most obvious contrast in sound between amps, just compare a tube amp and solid state amp of the same price. If you are like me, you will hear a tremendous difference. I'm a big fan of tube amps myself, but there are many cases where solid state works better. My Eminent Technology panel speakers have never sounded better than when paired with Rowland Research solid state preamp and power amps, and the low ohm and inefficient rating of these speakers have blown two tube amps I tried with them. Tube amps work great with high-efficiency dynamic speakers, and especially so if you have a power subwoofer in the system so the tube amp isn't having to pump out so much power on those sustained bass lines.

So many things to know, and even though I've been at this since 1974 (and really into high-end since 1978 when I heard my first Dayton-Wright electrostatic speaker), the products and technology change all the time, so I'm always learning something, too. About the only safe recommendation I can make regarding power amplifiers is that you should avoid receivers and audio-video processors which try to pack too many functions into a single chassis. I also have serious hesitations about getting onboard with the latest trend for pricey integrated amps. Basically, unless you are spending \$9,000 or more on a pair of serious speakers, you are going to need a subwoofer. To properly integrate any subwoofer your end goal should be to use an active crossover and possibly some sort of DSP room resonant control. To use an active crossover or DSP room correction you must insert those components between the preamp signal and the power amp, because the signal is split in two, one part going to your main speakers, the other part (with just the bass frequencies) going to your sub. I've read that some people who are heavy into computer audio have pronounced preamps as being a thing of the past. You can read my separate essay **Shopping for Classical Music Online** to discover why I'm not a fan, but if that's your thing, and you have no phono system or tape deck, some of the new DAC units and digital servers allow you to plug them directly into an amp. But for traditional setups using multiple sources, you just don't have this capability if you're stuck with an integrated amp. Some of the integrated amps I

auditioned sounded pretty good, the Naim Nait at \$1800 stands out, but some of them at \$6,000 and even \$10,000 didn't overwhelm me, and I certainly don't see that kind of expenditure as a savvy investment.

If your budget is tight and you can't go for entry-level separates, I recommend spending as little as possible for something that will be satisfying but knowing that the intention will be to upgrade as soon as possible. The Marantz 8004 integrated amp is well-built and while not as refined or transparent as some top audiophile products, it also costs only \$999 (MSRP, usually not discounted more than about 10%, and that usually only as a complete package discount). The 8004 is thankfully devoid of any artificial glare or dynamic compression like some of the brands sold at big box stores. I do recommend bypassing all the tone controls on the unit to achieve the most pure signal transmission. But the important thing is that it has a proper pre-out function so that when you want to upgrade to a better amp you can still retain the Marantz as your control and not have to spring for a pricey preamp in addition to the new amp. And the amp is the more important component. To me, an integrated amp at this price serves a useful function, and you can always keep the unit as a backup amp, or to use in a separate Audio/Video system.

However, the goal should always be toward having a separate preamp and power amp. Rotel makes good quality entry-level products that can get you started, and maybe you'll like them enough to keep them long term. The \$700 preamp with workable mm phono stage (for high output cartridges) is pretty good, a product which can bridge the gap between mid-fi and hi-fi in the right system, though the newer 1570 is even better and has some positive commentary from perceptive audiophiles. It also has handy features like a built-in DAC and digital readout of volume (I keep post-it notes in all my CDs as a listening log and also with notes on optimal volume settings, so it would be handy to be able to go exactly to a volume setting of 39.5, for example). The Parasound P5 mentioned above is also a worthy candidate for your consideration, and you get your preamp and crossover functions all in one handy and well-built unit.

Finding good quality entry-level power amps is more of a challenge. Marantz makes a fairly clean and non-fatiguing 140-watt amp with reasonable peak amp power supply for only \$700, but I'd only consider this unit if you have somewhat hyperactive speakers, otherwise the Marantz doesn't convey a lot of micro-dynamic excitement. The Parasound A23 is also very good, though a little lean in the lower mid-range, and a bit coarser in the upper treble, thereby dictating careful speaker matching. Sonus Faber would be a good choice. The Vincent SP-331 at \$1300 would probably be my pick for best-value amplifier. It has a robust 48-amp peak current power reserve so dynamic excitement is good, and the amp is stable with impedance loads down to 2 ohms. Most listeners will be perfectly satisfied with these units.

If your budget allows you can consider the option of tubes. Once you hear a good tube amp in the right system you may cry if you can't afford to take the tube amp

home. I recently compared Hegel's well-reviewed \$6,000 solid state integrated against another integrated amp at the same price using KT-120 tubes, and what a difference! The Hegel was clean and quiet but narrowed the soundstage somewhat and seemed politically correct and emotionally neutered when compared against the tube amp. The tube amp fleshed out individual instruments so you could hear the internal resonance of them and precisely define where they were placed on the soundstage. The subtle expressive nuances and emotional clues in Janet Baker's voice singing Mahler's Ruckert Lieder drew forth a fully engaged response from me through the tube unit, while with the Hegel I just sat still and remained stuck in a passive, analytical mode. I don't think the composer intended such a passive reaction, given that the song is about passing on to another life. In any case, you just can't find these kind of quality tube amps in the lower price range. Even some of the used-market tube amps with KT-120 conversions will set you back about \$3,500. But they are a worthy goal to strive for as your budget allows for upgrades.

The entire idea here is that by starting with entry-level separates you at least have the proper infrastructure in place to where you can consider upgrading piece by piece as budget allows. And only with separates would you be able to implement an active crossover if you plan on using subwoofers.

If the high dollars are scaring you here, it is possible to sleuth around and assemble a system from the used market and dealer demos. I heard a very good system at a big box store that was closing out the discontinued line of Veritas 2.4 speakers, using a REL subwoofer blended in, and a Marantz integrated amplifier. That total system cost out at under \$4,000. But it's not something you can go down and buy today (as I look on the internet right now there are no more of these close-out speakers being offered). I also heard the same speakers with a Velodyne subwoofer and Conrad Johnson Classic series separates with an EL-34-based amp, and the sound was very liquid, had exceptional soundstaging, and conveyed that elusive sense of acoustic bloom that I talked about. That system ran about \$8,000 and shows what a 'modest' pair of speakers can do when matched with the right amp that brings out the magic of music. So it is possible with a lot of time and effort to put together a good system for less. But odds are that you'll need to spend at least \$6,000 to cover the basics I've talked about.

So now that you know what to listen for, and the kind of budget realities needed to get a semblance of realistic reproduction, here are some tips on how to go about shopping for audio equipment.

The Audition Process

Take along at least three contrasting CDs but always lead with a good all-purpose recording that can at least tell whether it is worth your time to continue listening or not. Depending on circumstances you may not have the time or ideal conditions to listen to all your CDs on every system. In my first months of

auditioning I always started with the Busoni Toccata, later I started with the Bartok Concerto. With the Busoni, for example, if I heard any splatter on the top treble notes or emaciated mid-bass with no palpable punch on the chords, then I just moved on to another speaker. The problems I just noted all stem from speaker performance, and no switching of amps or speaker cables is going to remedy those particular problems. I also took along the Delos CD of the Rachmaninoff Sonata because it is all in one continuous track and I check to see how user-friendly CD players are in fast-forwarded to about the 22-minute mark.

I can't believe how many of the highly-touted and expensive units such as Simaudio Moon and \$12,500 Levinson are a pain to use (as in taking four minutes to chug its way to where I wanted to be). Not only that but the Levinson gave me "no disc" readings four times during an audition. My twenty year old Denon CD player works better than that!

Many salespeople have never had anyone trying to fast forward through a long track, so they were clueless about how to help. I have had the best luck with the top-model Japanese CD players, such as the Sony 5400ES, or the Marantz 8004 which has four levels of fast-forward speed. Maybe others will not require fast-forwarding for typical home use, but it seems I use several CDs over and over for equipment evaluation that have testing passages buried deep within a track. Also for conducting my surveys, it is helpful to be able to go back to certain passages without wading through twelve minutes of a movement. I use the fast-forward all the time, so it's an issue for me.

At the end of this essay I offer a few suggestions for complete systems that I know work well together synergistically. However, just as with reading juicy reviews of equipment in the mainstream publications, you may simply be unable to find in your area some of the components or speakers I recommend. I know that after I went to great lengths to track down all the speakers on my short list of models recommended by The Absolute Sound, half of them proved to be disappointing when I subjected them to serious 2-channel auditions. You really have to go back to the original full reviews and try to divine some of the more specific response characteristics that are omitted in the recommended components overviews. Many of the speakers such as the Golden Ear Triton (Product of the Year!) were to put it mildly, a joke when it comes to the kind of serious listening I'm talking about. So, I'm not so sure recommended lists do anybody any good. You just have to go with an open mind and hear some speakers yourself.

That being said, it would be a shame if some of the extensive comparative impressions that I've gleaned from this six-month project comparing 38 different speakers (and the thirty years of background experience to put that all in context) were not shared with readers who may be interested. And that interest need not extend any further than simply making a point of hearing something I talk about if it is available in your area. The advantage that you have with my guidance is that in theory we share the same interest in the kind of music we listen to. Many of the

reviews in the other publications talk about music and musicians I've never even heard of, and they are not systematic in consistently using the same selections. Many of the token classical selections they refer to are really absurd choices that can hardly be considered definitive reference points for either sound or interpretation. And their methodology is certainly not as rigorous as my own which includes recordings where I was actually present at the recording session or where I have heard the musicians in the same concert hall as the recording. I don't mean to beat my own drum too loudly, but compared to my own methodology some of the vagueness of these reviews really irks me. I just read an online review comparing two of the exact speakers I've talked about in this essay, and the key defining distinctions between each were not described at all.

Let's talk about the importance of system synergy. Singling out individual components for distinction is problematic because the end sound that you hear is the result of the interactions of many diverse components and signal pathways. And don't believe any of the sales hype or techno talk about any products. During one of my audition forays the salesman pointed out that China has now imposed a huge tariff on large-size rare Earth magnets. So one speaker designer experimented with using a dozen smaller magnets instead of one large magnet as is common, and found that at least for the tweeter, the results were actually superior and more agile in response than using a large magnet. Sounds great in theory, and maybe the tweeter truly is a superior product, but how it is affixed to the cabinet, the design and diffraction characteristics of the front baffle and cabinet construction, crossover point and slope, interaction and phase-alignment with the other drivers, and so much else, can render a superior tweeter as musically ineffective. The speaker in question sounded clean and quick, but also with a distinctly hi-fi sound rather than natural musical immersion. The soundstage was also very narrow and was impossible to remedy even with no toe-in of the speakers. By comparison the Amphion speakers sounded more natural but also tended to be just a bit wider in soundstage on some recordings than I'd consider to be completely realistic, though I found a good happy medium by moving the speakers a bit closer together and with careful adjustment of the toe-in. No amount of fiddling with the other speaker gave a satisfactory recreation of a symphonic soundstage. With the Amphion speaker Schiff's Goldbergs, and Schiff's Bartok concerto were about as close as I've heard in many years to the sound of having a front row seat in a good venue and hearing a piano up on the concert stage. System synergy: the one speaker may very well have the better tweeter, but the end result was just not as musical when compared against another product at the exact same price point.

Now for a few pointers on what to take along for your audition. For my bare-bones auditions I'll play recordings of solo piano, piano with orchestra, and piano with voice. For medium-level auditions I'll then supplement those three CDs with solo piano recorded in a studio, a concert hall, on a Hamburg Steinway, on a Bösendorfer, and I'll also include some harpsichord music, pipe organ music, and maybe something operatic. When I settle in for the most serious evaluations that I

may be considering for purchase I also intentionally include at least one CD that does not have the most stellar sound. For me that would be Karajan's Bruckner Seventh on DG, which can often have an unpleasant glaring string tone on some speaker/amplifier combinations (remember, the same speaker can sound very different with a change of amplifier!) Anything you end up buying will have to serve all your music listening needs, not just the audiophile sonic spectaculars.

Before setting out on your quest listen to a variety of recordings from your collection, and also listen to them on a good pair of headphones so you really hear the potential of the recording. Then pick your lead-off CD, for the yes or no vote on whether to proceed, then your next few favorites that demonstrate all the kinds of music that you typically listen to. Here is a list of some of my auditions CDs, and some of the reasoning behind why I take them along. On my own shopping quest I listened to 38 speakers with my 'yes or no' CD, then with 29 of those I proceeded onto the next three CDs, 16 made it to the medium-level round, six received extensive auditions, and two made it to the final showdown. I'll be posting a full report on all my observations in the future.

You'll also note that I don't use any of the so-called audiophile recordings for testing, and this is because most of them are produced by people coming from the technology side or pop and jazz side of the business, and they just don't understand the underlying principles of realistic recording of classical music. Full report on that forthcoming.

Obviously if I were shorter on time or unwilling to travel for hours to hear some of these speakers, then the whole process would have been much shorter. For my final contenders I listened to twenty tracks of music. But really, it was the first four tracks that told me the most; if those first four were only of middling performance nothing I heard later on suddenly made me turnaround my initial impressions. Bottom line, your quest needn't be the marathon I made mine into. I hope some of my suggestions will make your own search a little easier. ☺

Some of my Audition CDs

Bare-Bones Audition:

Busoni Toccata, Claudius Tanski (MDG).

This is a studio recording with a vintage Hamburg Steinway. The upper staccato notes reveal any problems with tweeter dispersion characteristics (do the treble notes stay stable within a clearly defined acoustic space or do they splatter outside this area when certain resonant frequencies or cabinet resonances are activated?). Sufficient mid-bass weight? Are there clearly defined room boundaries of the studio (near-field reflections help place the piano in an actual physical space rather than just some surrealistic void)?

Bartok Concerto 2. Schiff/Fischer (Teldec).

Set your volume level by the vigorous third movement, about as loud as you'd hear from somewhere in the front ten rows of prime listening seats. Do the woofers smear all the varied textures of bass coming from timpani, piano, brass and bass drum? Are the timpani clearly defined behind the piano? Are the timpani whacks dull, or can you actually hear the transient impact of the beater against the drum head? Now proceed to the second movement. Without turning up the volume you should perceive a bristling sensation of rosen on strings even in this shimmering pianissimo passage. How much do you have to adjust the volume upward to get a sense of presence? The greater the disparity between the realistic yet comfortable level in the third and what you need to have a sense of presence in the soft second movement, the worse the resolution of the system. Or to put it positively, the less you have to adjust the volume the better the system. Ideally, you should not have to adjust the volume, but you are only likely to achieve that ideal in very expensive systems.

Mahler *Ich bin der Welt abhanden gekommen* (from Rückert Lieder) Janet Baker, mezzo, Barbirolli, conducting. EMI.

First and foremost, there should be no stridency on the vocal climax; you don't hear this on the best systems or on headphones, but many entry-level speakers produce glare and harshness on the loudest notes. Do Baker's soft notes recede into an undefined void, or is the illusion of her standing before you remain intact? Does the orchestra emerge out of some void, or can you envision the placement of the side walls, and even hear the sound of the woodwinds playing in thirds as they bounce off the upper ceiling? Most (but not the best) non-planar speakers fail on that one. Listen for the distinctive harmonic character of the French horn (often too thin with small woofers) and the English horn (bigger bore, lower resonant point than an oboe). Can you hear the pianissimo plucks of the harp at the end?

Here are some of the other recordings I frequently used for more extensive auditions (if there is any feedback from interested readers I may very well give a full description of these sometime in the future):

- Rachmaninoff Sonata, John Browning (Delos).
- Bach Goldbergs Schiff (Decca).
- Debussy Sunken Cathedral, Rosenberger (Delos).
- Strauss Morgen, Baker/Moore (EMI).
- Bach Goldbergs, Leonhardt (Teldec).
- Bach g-minor fugue, Biggs (Sony).
- Fazil Say Istanbul Symphony, (Naïve).
- Victoria *O Magnum Mysterium*, Flummerfelt (Chesky).

- Brahms Concerto No. 1, Barenboim/Barbirolli (EMI)
- Bruckner Symphony No. 7, Karajan/Vienna (DG)
- Liszt Concerto No. 1 Janis/Kondrashin (Mercury)
- Shostakovich Symphony 8, Previn (EMI)
- Mahler Symphony No. 2 (final *enstanden*) with Solti/Chicago (Decca), or Symphony No. 8 (final scene) with Dudamel (DG)
- Strauss Salome Final Scene, Barstow (Decca)

For Subwoofer tests:

Liszt Prelude and Fugue on B-A-C-H, David Higgs (Delos).

The 64-foot tuba mirabus at 10:59 shows why small 'designer' subwoofers just don't cut it. This is a tone with an Earth-shaking fundamental of 8 hertz, so you really need to hear the big 18" Velodyne or a stereo pair of Monitor Audio's 15" Platinum subwoofers to experience this.

Proper set-up of a subwoofer system

I recently re-configured my listening room so I could achieve a wider stereo spread along the long wall, and I now sit with my listening chair against the opposite long wall. The dimensions of the room are 22'3" long by 12'9" wide. Before I had the planar speakers well out into the room directed long ways into the room and my listening seat was about two-thirds back in the long dimension of the room. With the current reconfiguration I now enjoy some of the best imaging I've heard anywhere in the last thirty years. Musically, the most amazing thing is that when the speaker imaging is just right concerto recordings sound quite realistic. When listening to the Brahms D-minor Concerto with Barenboim and Barbirolli I always felt the piano entrance was a little reticent and disappointing after the tumultuous introduction from the orchestra. Now, there is depth to the piano so that even when played softly you can sense the mass and latent power of the Steinway. Just like at a real concert when you have a good seat third row center up near the stage.

While I was doing this and getting all the nitty-gritty toe-in just right and distance from the back wall, I experimented with placement of my REL Stadium III subwoofer in every conceivable position, and with myriad permutations of crossover points and volume settings. For this evaluation I used both ear evaluation and an SPL meter with various music recordings and the Stereophile Test CD with its subwoofer/room modes bass tracks. Of course, every room will have its different issues: mine has three solid exterior walls of thick paneling affixed to cinderblock, and one weaker wall with thinner flexing panels on a studs that are 18" apart (if walls cannot be affixed directly to solid masonry then studs 12"-14" apart are better for dedicated listening rooms, and double layers of drywall, or thick paneling with non-warping construction backing). That one flabby wall eats up a lot of bass energy. I've put off having workers come in and doing that wall right because the carpeting would come up an inch short and then the project becomes quite involved and disruptive.

The best solution would be to use two forward-firing subs aimed at the listener, thereby loading the room symmetrically and with the initial direct wave passing the listener and reflecting backward from the listening wall. The bass energy would then be somewhat absorbed by the flabby wall and this might actually help with excessive pressurization in the room. Could very well turn lemons into lemonade! Meanwhile, using just the one REL sub with its down-firing orientation, that flabby wall eats up low bass energy such that 20-25 range is not really effective. The louder I turn up the sub the louder the upper bass gets, but that wall just eats up more 20hz energy like a sponge. So, where did I get the best sound so that now my concerto recordings sound so great? Well, fasten your seatbelts because the conventional recommendations proved to be the worst!

Here are my two big bombshell announcements:

- **corner placement is never a good idea**
- **12 db crossover slopes are simply inadequate for bass management.**

Corner placement protocol. Yes, efficiency was increased substantially with the corner placement, but the REL can put out plenty of power, so ultimate decibels is not the goal. Linearity of response is the goal. Corner placement made the 50-63 range much more powerful, but did nothing to boost the 20-25 range. The result was a greater disparity in response, with celli and double bass overly ripe, and bass drum undernourished. DSP can

correct some of this, but not all. Not only that but low bass information was too obviously outside of the soundstage image, originating far left. Even hall noise on some older recordings creates a rush of noise that was clearly outside of the soundstage image. And I'm talking about volume settings between 10:00 and 11:00 and sometimes just above the activation threshold at about 9:15. With the sub in proper balance with the main speakers I was also able to perceive the origin of the room pressurization point with any subwoofer placement that did not have the sub between the two main speakers.

Even if I had my weak wall fixed, or set up in another listening room altogether, really deep bass does not pressurize the room instantaneously. Yes, they talk about the non-specificity of bass tones below 100 hertz, and that's true for sustain pipe organ notes, or orchestral basses, but bass drum whacks or even deep piano octaves take a moment to fill the room and stabilize, in the meantime, a perceptive ear can tell where the pressurization is coming from. Dr. Hsu recommends placing the sub right next to the listening chair so that this effect is minimized. I liked that idea but without a steep crossover curve, I was actually able to hear upper melodic material out of my sub even when I had the crossover set at 34 hertz. So I did an experiment: I turned off the main speakers and listened to just the sub playing various recordings. I was astonished that I could follow every melodic and chordal texture in the Rachmaninoff Sonata through my sub! When placed between the speakers one will not notice that the sub is doing this. I then tried all the various crossover points, and only when I had set the sub at A1 or A2 (a crossover point of 23 hz!) could I not hear melodic material coming from the sub. Steep crossover slopes are essential!

My advice, and my intention in the near future, is to have two stereo subs, each near its corresponding main speaker. Meanwhile I have my single sub in exactly the middle of the two mains, which is another reason why you should separate video entertainment from serious two-channel audio. If your system must serve both functions, mount the flatscreen on the wall and put the sub under it, your equipment stacked on each side. Use a very low crossover point, or else a steep crossover slope that is set well below the standard 80-100 hertz recommendation. My recommendation would be to select a crossover point one-half an octave above the main speaker's -3db point. If the speaker's -3db point is 40 hertz, then an octave above that is 80 hz, and a half octave would be 60hz. I'd aim for a 60hz crossover using an 18 or 24db slope, in which case any notes 120hz or above should be inaudible from the subwoofer.

My main speakers used to be seven feet apart but now I have them 8'8" apart (measuring from the inside edge of the left speaker to the inside edge of the right speaker) and have no hole in the middle. I auditioned one pair of speakers that were 140" inches apart (that's 11 foot 8 inches apart) and there was absolutely no hole in the middle whether I sat back at the perfect triangle point (140") or moved in nearfield to about seven or eight feet. Therefore, forget the triangle rule, to get decent and realistic soundstage width you'll have to set your speakers further apart than you might think, so orient them along the long wall and sit relatively nearfield if you have to. In over thirty years of fiddling and tweaking, this was the biggest improvement I've ever made to my system. The imaging is even fairly good for three people, very good for two, and superb for one. The sound in the sweet spot is so good that I may start charging for admission!

The Ratio of Weight to Cubic Volume as a Performance Guideline

As I pondered over the impressions of the 38 speakers I had recently auditioned I came across an idea that fairly accurately explains some of the results I heard. Now, these calculations I've come up with will probably seem crude to engineers and speaker designers, and I'm certainly no mathematician or statistician, but in all the years I've followed audio I've never read one article that so neatly predicts image stability as what I propose here.

Basically, you take the cubic volume of a speaker and divide by the weight. Take that number and subtract from a theoretical ideal of 100 and you have the volume-to-mass index of the speaker. The higher the number the better. This number very closely matches the relative performance of these speakers based on my judgment by ear. The numbers merely support the conclusions I had already arrived at. The value of having such a formula is that it can predict the likely outcome of a speaker before you invest time and energy to tract down the speaker for an audition.

Before I explain more of the specifics, a few disclaimers are inevitable. Firstly, this formula only applies to enclosed speakers, not to planars or open omnistatic designs. Planars avert issues of enclosure resonance by allowing all the backwave energy to dissipate on the other side of the drivers. Secondly, over a certain point sheer mass will tend to negate most of the ill effects of cabinet resonances. The problem is, even though I could tell a hundred pound speaker was less prone to spurious vibration than a fifty pound design, I couldn't come up with a formula to calculate what the actual trigger mechanism would be to determine a threshold point. But in the end, the formulas without this were still fairly accurate. Also, there are so many design permutations to consider—material density, Q factor, and bracing construction—that a truly accurate formula would have to be very long and complex. Indeed, I tried this myself by trying to account for contoured and cutaway cabinet designs, bolt-thru designs like employed by Monitor Audio, internal volume as a means of reducing driver stress, the effects of multiple small drivers versus single large drivers, and other criterion. After I spent a whole day doing this the numbers I came up with were always within one point of the simple formula. So, what the heck, simple sounds good to me.

A third consideration that relates less to cabinet vibration and more to dynamic constriction and textural congestion, is that 5" drivers are simply not suitable to reproduce the full weight of loud mid-bass music without constriction or outright distortion. 6½" drivers eliminate the outright distortion and dynamic constriction but still lack weight and visceral impact. 7", 8" or 9" drivers have consistently been best in all the evaluations. I did not include this variable in the calculations because it offers too many complexities. I would consider a 6½" driver as point zero, smaller and I would subtract points, larger and I would add points. You can play with that if you like.

Judging by ear, which to some degree reflects the 'emotional' quotient of being pleased or displeased with an experience, my "by ear" scores show a little bit more spread than the objective raw data shows. I have included my ear rating alongside the raw data, and also a third figure which calculates the adjusted value if a subwoofer with an active crossover is employed to reduce stress on the main speakers. Speakers with lower initial scores

generally benefit the most from an active crossover/subwoofer configuration, and I'll explain that formula as well.

The volume-weight ratio formula fairly accurately estimates a speaker's ability to maintain stable imaging in the critical low-bass to upper bass range. Tweeter stability is another matter, but at least based on my experience, not nearly as widespread a problem as lower frequency distortions due to enclosure resonance, and cabinet flexing. When a cabinet flexes during more vigorous dynamic levels the lower range of the piano will jump forward of the previous image (its perceived placement on the sound stage), while the middle and upper range remain where they were. Additionally, whether the image jumps or not, there are issues of harmonic congestion (where complex and multi-textured passages turn to a clotted and indistinct blur of sound) or dynamic constriction where the mid-bass tops off dynamically while the lower and upper ranges expand (thereby distorting the tonal balance). Speakers with lower scores often conveyed muddled bass passages when playing at volumes that began to generate cabinet distortions. I was surprised at how often I encountered these problems in speakers that have been given passing grades by reviewers, and which sell for five or six thousand dollars.

Okay, to arrive at the volume of a speaker multiply the height by width by depth. Now determine the displacement value of the bass driver(s) by adding up the combined amount of inches they represent and subtract that from the gross volume. For example, a single 9" driver such as found in the Sonus Faber Liuto would subtract 9" from its gross enclosure value. The three 6½" drivers on the Focal Aria 936 would combine to 19½ inches to subtract from the gross volume. So far: gross volume minus woofer displacement = net enclosure value. Now divide that number by the weight of the speaker, and subtract that resulting figure from 100 to arrive at the mass/enclosure ratio score.

Some non-rectangular enclosures such as the Golden Ear Triton are easy to determine by taking the front figure and back figure and splitting the difference. Say the front is 5" wide and the rear is 7" wide, split the difference at 6" and use that as the overall width of the speaker. Other designs such as Avalon's distinctive cutaway design are more difficult to calculate, but as I said, even the adjusted figures always came to within one point of the coarse dimension measurement.

To calculate the benefits of an active crossover/subwoofer configuration. First, the relative value of crossover slopes (as a function of practical benefit in bass management) is as follows: 6db = 1 point, 12db = 2 points, 18db = 3 points, 24db = 4 points. Now, take the raw data score of a speaker and subtract that from 100. Say a speaker's full-range raw data score is 91.6, subtract that from 100 and you get 8.4. Let's say you are contemplating a crossover system which will employ a 24 db slope, take the 8.4 number and multiply by the four points for a 24db slope, and take that number and divide by 10. Thus: $4 \times 8.4 = 33 \div 10 = 3.3$. Take the raw data score of 91.6 and add 3.3 for a new score of 94.9 to derive the estimated benefit of having a subwoofer take over the stress of low frequency reproduction. In my opinion, this is a conservative calculation, adding a subwoofer may in many cases almost completely ameliorate cabinet distortions at normal listening levels.

Real world application. This formula only addresses the issue of image stability and the deleterious effects of vibration-induced distortions. Matters of resolution, frequency response, dispersion characteristics, and others are not addressed here. But in my

experience, no amount of finesse in these other areas matters if there are problems with bass-range coherence or cabinet colorations.

Another factor which can greatly influence our perception of a speaker's response is the amplifier that drives it. Case in point was the Sonus Faber Liuto which I auditioned at four different dealers just because they all seemed so excited to show it. The first auditions with a McIntosh tube amp and VTL's EL34 tube amp left me completely underwhelmed. The sound was too soft and undifferentiated in textural delineation. Then I heard them through the new Rega Elicit integrated amplifier which gave a more respectable impression. Finally I heard them through the Naim NAC-202/NAP-200 combo and suddenly the speaker came to life. That last configuration catapulted the Liutos into the top handful of speakers I considered for purchase. Same speaker and same raw data, but when other factors were at play, especially overcoming the speakers recalcitrance with micro-dynamic energy, my rating by ear ranged from a low of about 86 to a high of about 92, and that's with using the same audition recordings each time. Nevertheless, the weight-mass ratio is a helpful tool, because any rating below 90 points is probably not going to be a top contender even with the finest associated equipment.

Here are some examples taken from my recent speaker evaluations:

<u>Speaker</u>	<u>"By Ear"</u>	<u>Raw Data</u>	<u>With Subwoofer</u>
Amphion Argon 3 stand monitor	95	94.8	96.8
Avalon Eidolon	95	94.1	96.4
Focal Aria 948	82	86.1	91.7
Golden Ear Triton II	84	92.3	95.3
KEF R900	85	84.9	90.9
Legacy Signature S.E.	94	93.5	96.1
Monitor Audio RX-8 (old)	90	88.2	92.9
Monitor Audio Silver 10 (new)	92	92.4	95.4
Monitor Audio GX-300	93	92.7	95.6
PSB T Tower	88	89.9	93.9
Sonus Faber Liuto	92	90.8	94.4

Importance of System Synergy

The systems I recommend assume that the reader has a listening room suitable for serious, full-range audio reproduction. Apartment dwellers or condo owners may not be able to consider full-scale symphonic reproduction with deep, thrumming subwoofers. If such is the case, a good pair of headphones and a quality headphone amp will be necessary, along with a more modest set of loudspeakers for listening as background music or at moderate sound levels. However, even at reduced sound levels one can readily appreciate the difference between a quality speaker design and a cheap bookshelf speaker from a big box electronics store.

As for headphones, each listener will have a highly individual reaction to the fit and long-term comfort of various headphone designs. I recommend the Beyer Dynamic 990 headphones (~\$300) for the QPR (quality price ratio) of comfort and sound realism that approaches the level of some of the thousand dollar-plus super headphones. But they are hard to find; I'm not sure what the problem is with the distributor in this country.

Quality integrated amps will have headphone jacks with a decent built-in headphone amp, but if this kind of listening is your primary source for enjoying music it is well-worth investing in a separate, dedicated headphone amp. There are so many of them now that the concept has become rather trendy, and I certainly haven't heard them all, but of those that I have heard I was impressed by the liquidity and non-fatiguing sound of the Cayin HA1 (~\$950), and non-fatiguing is going to be important if you have a sound source right against your ears for a couple of hours. The headphone amp in the Marantz 8004 integrated amp is about as good as some of the entry-level headphone amps in the two-and-three hundred dollar price range, and may be satisfactory for most listeners, but in direct comparison most would agree that the Cayin would be a clear step up.

Some listeners are just not ever likely to listen to a Mahler symphony at full tilt. Moderate volume levels, just enough to engage a sense of presence and an immersive soundfield are the primary listening mode, and usually with a preference for a treble that is smooth and never strident and a bass that is agile and never bloated. I call these kinds of listeners "Armchair Connoisseurs" because they enjoy their music like a discerning oenophile would enjoy sipping on a fine grand cru champagne: elegance, refinement and never with a vulgar display of emotion. Such a listener, if they were to have Volodos come over and play on their grand piano, might actually proffer (with proper British aplomb): "I say dear chap, mightn't you please engage the soft pedal?" For such a listener, in the comfort of their velvet-draped lair, I might recommend the highly refined Vienna Acoustics Beethoven Baby Grands (~\$5,000), or a pair of Quad electrostatic speakers as a classic choice. It's all a question of money and aesthetic preferences.

All of the systems I recommend will be capable of full-scale dynamic reproduction, and they are all dedicated two-channel systems (as per the nature of this essay). In

most cases it wouldn't be too disruptive to the imaging to insert a flatscreen TV between the speakers and enjoy video through your quality two-channel system. The other assumption I'm making is that the primary music source will be CDs rather than computer audio or analog sources such as LPs. Although I still enjoy phono reproduction and have a rather expensive system for it, I have not embraced computer audio, and you may read my reasoning for this in the essay **Shopping for Classical Music Online**.

Although I've included suggestions for speaker cables in cases where I've noted an especially good synergy (because you'll need to get something to connect them) in general I've found power supplies, power cord upgrades and interconnects to have the least amount of effect (if any) on a system's character. As for power cord upgrades and some of the crazy prices out there for them, I've yet to have it demonstrated to me that a \$1500 power cord makes that much difference in the overall sound. Perhaps if one has a quarter-million dollar system that is ultra-resolving of any imperfection, but in most systems the money would best be spent in other directions. If you are not an attentive and critical listener the benefits of these products will probably go unnoticed. The main thing is to get the proper infrastructure of the system right, tweaks can come later.

Keep in mind that the prices indicated are the manufacturer's suggested retail price; if you buy a complete package system from one dealer you can expect at least a 10% discount, sometimes 15%, and on rare occasions 20%. Demo models and close-out items are another way to save money while still buying new products with warranties. The used market is a whole other can of worms.

I strongly encourage developing a rapport with a local dealer if at all possible. It just makes life easier to be able to hear products and have hands-on demonstrations, have helpful advice for set-up, and go back to in the future when they may take your previous speakers or components and give you a good trade-in allowance towards that upgrade you want. However, there is no question that online suppliers are a force that is growing exponentially. Avoid grey market and liquidation sites and go with reputable suppliers such as Acoustic Sounds.com or MusicDirect.com. I've also used the CableCompany.com which has a unique lending library service for cables and headphones so you can audition the product and determine if it really is a good fit for your specific situation.

During my six-month quest I visited 14 specialty dealers and several Big Box stores, and auditioned 38 speakers. Sometimes it was clear from the start who I was comfortable dealing with and who I wasn't. Some were the classic sales types who were always ready with a sales pitch, some were friendly but not especially astute listeners, and there were others who actually listened to my music and heard my criticisms with an ear toward finding a solution and dispensing helpful information. A by-product of actually going out in the world instead of shopping online is that I discovered some outstanding products that hadn't even been on my radar. For example, the Amphion speakers have received zero press coverage in

this country (though they are highly recognized in Europe) and they were far more impressive than most of the speakers that Stereophile and The Absolute Sound had recommended in this price range. I also have new respect for Naim (the entry-level 5si system integrated amp and CD player, the NAC-202/NAP 200 system, all the way to the pricey NAP 300 amp) when before I just never even listened to them for the simple reason that I just don't like the look of them with their flat, anodized finish. But the sound is outstanding, the integrated amp especially, for solid state amplifier in this price I haven't heard anything better (not even the acclaimed Hegel integrated); the Naim was transparent, immersive in its soundstage presentation and completely non-fatiguing even at vigorous volume levels. When other brands give me static shock when I touch them, Naim's powder coated non-magnetic finish seems inert to static charge. Now that I've heard the sound, and seen the functionality of the design, somehow the look of the equipment is far less of an issue!

RECOMMENDED SYSTEMS

In ascending price order

No Fuss Budget System: \$4,300

For the plug n' play kind of person who wants to buy something reliable and not worry about upgrades down the road. The Marantz 8004 combo usually comes with a discount when purchased together, the 8004 series now being closed out for even better discounts as the new 8005 series hits the market at a higher price. The Marantz also allows USB connection to its high-quality internal DAC so you can get superior sound from iPhones and computer files. The Silver 10's may have enough low bass impact for small rooms or apartment dwellers that a subwoofer will not be required.

Speakers: Monitor Audio Silver 10	\$2,500
Integrated amp: Marantz 8004	\$ 900
Digital Source: Marantz SA-8004	\$ 900

Integrated Planar System: \$4,850

Magnepan's model 12 planars have been somewhat overlooked by the press, but they outperform speakers costing four times as much. They'll play plenty loud in a normal size room (250 sq feet or less) but not necessarily so loud with the modestly-powered amp recommended here. This particular configuration is about achieving an immersive sense of realism at a modest cost. You throw a bigger sub and a more powerful amp (perhaps Rogue Audio's 90-watt Chronos Magnum integrated amp) and you don't have to worry if you crank up the volume for the ending of the Mahler Second. VTL is a perfect match for Magnepan speakers (and how can you not like the cool glowing tube window?), but for those who absolutely do not want to fool with tubes you might look at the Luxman 505 100-watt solid state integrated amp (\$3,999).

Speakers: Magnepan Model 12	\$1,200
Subwoofer: REL T-7	\$ 900
Integrated amp: VTL IT 85	\$2,150
Digital Source (CD/SACD): Marantz UD-5007	\$ 600

Good Starter System: \$5,990

This is a system which puts into place the infrastructure for full-range realistic sound reproduction and the proper integration of a subwoofer system. This is a more vivid and present sounding system than most in this price range, though the Gold series GX-300 with the ribbon tweeters is even more vivid. One could save a small amount of money and go with the smaller Silver 8 model, and if you get the subwoofer at the same time, that may be a valid option. However, the larger 8" woofers on the Silver 10 allow you to enjoy deeper and more visceral bass response until the time comes when you can get the subwoofer. For many listeners who are not into ultimate resolution, either speaker, silver 8 or Silver 10, could easily be a speaker to settle in with for a very long time. The Silver 10 with its bolt-thru design for cabinet rigidity is significantly more robust and image-stable than any other dynamic speaker I've heard for under \$3,000. Some may prefer to get the matching Parasound A23 amp to go with the Parasound preamp, but if a little mix-and-match doesn't bother you I found the P5 preamp very clean and neutral while the A23 brought forth just a touch of 'glare' through the somewhat forward Silver 10 speakers (the Vincent will provide a non-fatiguing presentation).

Speakers: Monitor Audio Silver 10	\$2,500
Preamp/Crossover: Parasound P5	\$1,095
Power Amp: Vincent SP-331 hybrid amplifier	\$1,395
Digital Source (CD/SACD/USB): Marantz SA8004	\$1,000

Future upgrades: Monitor Audio Silver 12 subwoofer as soon as possible. If you have a smaller room and/or don't plan on listening to Mahler's Symphony of a Thousand full out, you may be able to improve the sound of the Silver 10's by substituting the Parasound combo with the Mystere iazi integrated amp (\$2,995). It only has 50 watts, but they will elicit a richer and smoother sound in the upper bass and lower midrange without affecting resolution or dynamic energy. The Mystere employs an auto-biasing system so that you never have to fool with the tubes, just sit back and bask in their inviting glow and enjoy the sumptuous music. As for using a subwoofer with the Mystere, you will have to forego an active crossover and DSP room correction and use the speaker taps on the amp to connect to a REL subwoofer with its high level inputs. However, many listeners in small rooms will find the bass response of the Silver 10's satisfying enough without using a subwoofer.

Symphonic Panorama System: \$8,260

Speakers: Magnepan 1.7 panel speakers (65 x 19 x 2)	\$2,150
Subwoofer: Hsu Research 15	\$1,000
Crossover: Hsu Research w/51 hz card	\$ 465
Preamp: Mystère 21	\$2,250
Power Amp: Vincent SP-331	\$1,395
Digital Source (CD/SACD/USB): Marantz 8004	\$1,000

The Mystère preamp works wonders with the Maggies, providing a wonderful burnished tone to French horns, and a soulful melancholy depth to English horns while also keeping the very top treble from any aggressive tendencies. Unfortunately, the matching Mystère amp is not quite powerful enough to comfortably run the Maggies to 'enthusiastic' levels. In this price point VTLs EL34 amp is a little lackluster with these speakers. Therefore the suggestion for the Vincent hybrid amp which yields more than 150 watts into the Maggies impedance load, and has a whopping 80,000 peak amp power reserve. I've not yet heard the new Mk II version which sells for \$2,495, but it runs pure Class-A at lower power levels. A Vincent preamp might also be an option if you like neat and tidy pairing of equipment, but I'd stick with the Mystere and hope that someday they make a more powerful amp in the 100-watt range which is what these speakers really need.

Hail Britannia System: \$8,900

This full-range system with subwoofer provides an exciting and visceral presentation which really brings the music to life, yet it is never harsh or fatiguing. The folks at Monitor Audio often use Naim electronics to develop and showcase their products and the system synergy between the two is readily apparent. The Naim system also comes with the proprietary-designed Naim speaker cables, so that will save some money, and you're guaranteed a good sound match. The Silver 12 subwoofer comes with a DSP-type room-resonance control that smooths out the overall blend of bass between the mains and the sub. The Naim integrated at 70 watts may seem somewhat modest, but the amp has incredible peak transient power reserves, and the Silver 10's are fairly efficient to start with.

Speakers: Monitor Audio Silver 10	\$2,500
Subwoofer: Monitor Audio Silver 12	\$1,600
Integrated amp: Naim Nait xs-2	\$2,400
Digital Source: Naim CD 5xs	\$2,400

Future upgrades: depending on how enthusiastic you are with playback levels adding a second matching subwoofer will lower the stress of one subwoofer pumping out all the low-bass energy, and placing them on the outside of each main speaker you will increase the apparent width of the soundstage. Other than that, you're set to sail with your speakers and amp, so you might consider getting that final phono system you've been thinking about, something British, of course. Townshend Audio for a top phono system, or Music Hall or Rega for high QPR.

Night Owl System: \$9,115

This is a system for the late-night listener who likes to listen with headphones, dim the lights and soak up every detail of a recording's musical magic. The choice of headphones will be very personal because comfort and ergonomics play such a major role. Personally, when I spend hours on headphones conducting my comparative surveys the Beyer Dynamic headphones are the only ones I can handle for the long haul. But for a single session, I'd have to say the Audeze is a good second choice for comfort and they are superior in resolving all the fine details of the recording. I've tried Stax, Grado, Sennheiser, AKG, B & W, and Sony and found them all quite uncomfortable. The HiFiMan series are a bit heavy but reasonably comfortable. For daytime listening, once you've been spoiled by the resolution of the top-of-the-line Audeze headphones, you'll probably want either electrostatic speakers or something with a very resolving ribbon tweeter. The Monitor Audio Gold GX-100 satellites are plenty detailed and great for classical guitar, string quartets, or Baroque music of any kind. Any tube amp with KT-120 tubes will really flesh out the mid-range and give an incredible three-dimensional image to the instruments. Just save the heavy lifting for the headphones.

Headphones (by night): Audeze LCD3	\$1,950
Speakers (by day): Monitor Audio Gold GX-100	\$2,195
Preamp/Headphone amp: Cayin HA-1A	\$ 975
Power Amp: Mystere pa 21 KT-120 version	\$2,995
Digital Source: Marantz SA-8004	\$1,000

Super Imaging Sat & Sub System: \$10,845

This system will provide superb soundstaging, 3-D imaging, and fatigue-free listening for hours on end. It also has a surprisingly generous sweet spot either in terms of being close or far away or to the left or right of center. Read the reviews by Alan Sircom and Philip Beudette about the Argon 3 monitor speakers to reinforce my own enthusiasm before you go to any lengths trying to track down the few Amphion dealers in the U.S. For best bass management the sub must be between the two satellite speakers; if adding a second sub then each sub to the outside edge of each satellite. Monitor or JL subs would be options to consider if you are uncomfortable ordering factory-direct from Hsu Research without first hearing them. I just think that without the middleman, you get a lot more sub for the money with the Hsu system. As for tube amps, the Argon's impedance never dips down too low, so 50 or 60 watts of tube power is plenty. Anything with KT-120 tubes will bring these speakers to life, or you might find an OTL amp for a reasonable price on the used market. I recommend the Mystere because they are superbly built and have auto-biasing feature so you don't have to fuss with checking on the tubes. I found The Sony ES CD player it to etch out a little more detail from the Argon 3 tweeters than the Marantz that I normally recommend.

Speakers: Amphion Argon 3 with stands	\$4,000
Subwoofer: Hsu Research 15	\$1,000
Crossover: Hsu Research	\$ 475
Preamp/Headphone amp: Cayin HA-1A	\$ 975
Power Amp: Mystere pa 21 KT-120	\$2,995
Digital Source (CD player): Sony XA 5400 ES	\$1,400

Possible upgrades: Add a second Hsu 15 for much better room loading and soundstage realism (not to mention distortion-free bass impact). Eventually you'll probably want a proper preamp that can accommodate several input sources (the Cayin only allows for one input source). Possible suggestions that I have actually heard would be for a Naim pre and power amp combo with Naim CD player which sounds amazingly fluid and spacious with these speakers. However, due to Naim's rather quirky grounding system you'll have to forego active crossover and DSP controlled subs and settle for a REL subwoofer to augment the lower end. Well, you could use the Naim active crossover, but that's quite an additional expense. Sticking with the idea of the Hsu active crossover, the Simaudio Neo system with the impressive 330a amp is also a very nice match for these speakers.

Dynamic Full-Range System: \$10,950

Speakers: Sonus Faber Liuto	\$5,500
Subwoofer: Hsu Research 15	\$1,000
Crossover: Hsu Research	\$ 450
Preamp: Rotel RC-1570	\$1,750
Power Amp: Rotel RB 1552 mk II	\$1,250
Digital Source (CD/SACD/USB): Marantz 8004	\$1,000

Later upgrades: Depending on the size of the listening room you may wish to add a second subwoofer which in any case will help load the room for improved symmetrical phase coherence and improved soundstage definition. The Hsu subs have a built-in DSP-type room correction feature. Electronics upgrades should be focused on top-quality solid-state gear as these speakers tend like an amp with a high damping factor to control the 9" woofer. The best I ever heard these speakers was through a Naim NAC-200/NAP-300 system.

Totally Tubular Planar System: \$11,850

Speakers: Magnepan 1.7	\$2,150
Subwoofer: Hsu Research 15	\$1,000
Crossover: Hsu Research	\$ 450
Preamp: VTL 2.5	\$1,750
Power Amp: VTL ST-150	\$5,500
Digital Source (CD/SACD): Marantz SA-8004	\$1,000

The Maggie 1.7 represents such a tremendous value for a true high-end product that you'll have money left over to buy that final phono system you've been lusting after. The Nottingham Ace Space 294 turntable and matching 12" tonearm is one of the three finest phono systems I've heard, and is less fussy and less costly than the other two. Other options might be to splurge for the Conrad Johnson MV-125 amps fitted with KT-120 tubes. No matter what components you choose, or how high up you go in the audio chain, these Maggies will reveal each improvement along the way. I recommend using the 1-ohm resistor in the treble attenuator (they also make resistors up to 5 ohms), so if you audition the speakers and find the high end just a little much for long-term listening sessions, the resistor tones down the top octave without any loss of critical transient information.

Hassle-Free Full-Range System: \$19,700

Parameters: simple but high quality, no subwoofer and crossover hassle and no fussy tube amps.

Speakers: Legacy Focus SE	\$9,250
Preamp: Rowland Capri	\$3,950
Power Amp: Jeff Rowland 525	\$5,500
Digital Source (CD/SACD/USB): Marantz 8004	\$1,000

Other options: This is a case where a more expensive integrated amp may not be so foolish, because in most rooms this system will never require subwoofers and crossover. Look at the new Luxman series class-A integrated amps (I have an older unit from 1974 that still works beautifully). You'll notice that the Capri and 525 are not from the same series from Rowland and that's because I always considered the Capri preamp the standout unit, and the matching 102 amp not quite as distinctive. The 525 costs more but what a sound!

Heart-Rate Monitor System: \$27,965

Parameters: the highest level of realistic reproduction before crossing over into the diminishing returns of a cost-no-object mega system. Dynamic realism will be a real adrenalin rush, yet with C-J tube equipment the sound will never be overly aggressive or fatiguing to the ear. I like tube equipment with these ribbon tweeters, but top-quality solid state from Naim, Rowland or Simaudio would also work very nicely. At this level there are many choices for electronics that will showcase these speakers. This system will provide a very 'present' sound with a lot of visceral impact. Especially compelling with solo piano studio recordings, the Platinum 300's provided the most realistic rendering of my Busoni Toccata test CD. Naim electronics will put Volodos up so close and personal that you'll worry about catching some flying sweat from the pianist. Tube amps will back up the pianist a few feet and give a more detailed sense of the room and instrumental boundaries. Choose the type of system based upon your listening preferences—are you a front row person or do you prefer to sit back a bit? Either way, the sense of being in the presence of the musicians is startlingly realistic.

Speakers: Monitor Audio Platinum 300	\$11,000
Subwoofer stereo pair: Monitor Audio Platinum 15	\$5,000
Crossover: Hsu Research	\$ 465
Preamp: Conrad Johnson Classic S.E.	\$2,250
Power Amp: Conrad Johnson 125 KT-120	\$8,250
Digital Source (CD/SACD/USB): Marantz 8004	\$1,000

Finest I've Heard System: \$100,450

Speakers: SoundLab Ultimate Electrostatics	\$39,950
Subwoofer stereo pair: JL Fathom 113	\$ 8,000
Crossover: Bryston 10 Sub	\$ 3,500
Preamp: Atma-Sphere MP-3	\$ 5,000
Power Amp: Atma-Sphere MA-2 OTL	\$40,000
Digital Source: Marantz Reference SA 11S3	\$ 4,000

This is the ultimate smooth like butta' system. Because of the nature of planar speakers you won't get quite the direct impact of Volodos' fury as you would with the Platinum 300/Naim system, but more of a good third row center perspective. The advantage here is that you also get glorious vocals, huge soundstage, and layers and layers of the finest details captures by the microphones. This system very closely replicates the system I had in the 90's which I assembled based on advice from J.Gordon Holt. Unfortunately I can neither afford such a system now, nor do I have the space to accommodate such a large system. But it sure was a glorious sound that I've still not heard surpassed, the only contender that came close was a quarter-million-dollar system based on Martin Logan Statements and a bank of Jadis class-A tube electronics. The OTL amps remain essentially unchanged in character, and I've heard the SoundLabs with various OTL amps including Futterman, Counterpoint, Atma-Sphere and Transcendent; all sounded superb with the SoundLabs. The one thing that has changed is that now Roger West has put the large electrostatic speakers into heavy, non-resonant frames which supposedly increased image precision. I used to put my hand on the wood frames of my SoundLabs and feel the vibrations during pieces like the Saint-Saens Organ Symphony, and I always wondered if that was creating any image smear. Now, you needn't worry about such obsessive details. The other change is in the subwoofers. Some of the best bass I've ever heard with the SoundLabs was a multi-driver Entec sub, and also a Velodyne 18" sub. Nowadays, the JL Fathom is considered one of the best, though I've never heard it with 'stats to know for sure. In any case, with most music, piano solo, chamber, lieder recitals, anything but the biggest symphonies or organ music, I'd disconnect the subs and crossover system and run the SoundLabs full-range for utmost in purity and top-to-bottom cohesion. There is plenty of power at the low end of the piano that you won't miss the subs. With a system like this it would be a shame to keep it to yourself, so why not charge admission and put on some Audio Concerts?

Product Review

It may be impractical to try and duplicate the exact system configurations I recommend (due to what happens to be available in your area) so here is a list of products that impressed me with the potential to be part of a good system. I may be posting detailed reviews of some of these that have made it into my systems. Do make an attempt to hear them if you get a chance. These are all products I'd use myself or recommend to friends and family. Remember prices indicated are MSRP (as of Jan. 2014), you may often find products on sale, or demo units with warranties at substantial savings.

Products with Good Quality-Price Ratio for a Starter System

- Marantz PM8004 integrated amp (70 watts) \$999
- Marantz MM7025 140-watt amp \$799
- Monitor Audio Silver 10 speakers \$2,500
- Parasound P5 preamp w/crossover/DAC/mm/mc phono \$1,095
- (Parasound A 23 amp \$950)
- REL T-5 subwoofer \$700
- Rotel 1550 preamp \$700
- Rotel RC-1570 pre-amp w/phono and DAC \$999
- Rotel RB-1552 MKII power amp (120 watts) \$999
- Vincent SP-331 hybrid amplifier \$1,395

Products which may Serve Well in a High Resolution System

Speakers:

- Amphion Argon 3 w/stands \$4,000
- Amphion Argon 7 \$6,950
- Legacy Focus S.E. \$9,250
- Legacy Signature S.E. \$6,400
- Magnepan Model 12 \$1,200
- Magnepan 1.7 \$2,150
- Monitor Audio Platinum 300 \$11,000
- SoundLab Electrostatics (any model)

Subwoofers:

- Hsu Research powered 15 \$1,000
- JL Fathom 113 (13½" woofer) \$3,600
- Martin Logan Descent (now on close-out for \$2,400)
- Monitor Audio Silver 12 (\$1,650) or Gold 15 (\$2,795)
- Velodyne DD 18 (\$4,750)

Electronics:

- Atma-Sphere M-60 OTL power amp \$7,000
- Conrad Johnson SE 120 tube amp
- Mystère ia 21 integrated amp \$2,995
- Mystère ca21 preamp \$2,995
- Mystère pa21 (KT-120 version) \$2,995
- Naim Nait integrated amp (50 watts) \$1,875
- Naim Nait xs-2 integrated amp (70 watts) \$2,800
- Naim separates (especially 202 preamp and 300 amp)
- Jeff Rowland Capri preamp \$3,950 (\$4,400 w/phono)
- Simaudio P7 preamp (now being closed-out under \$5,000)
- Simaudio Neo 330a amp \$4,300
- VTL ST-150 triode/ultralinear tube amp \$5,500

CD Players:

- Marantz SA 8004 \$999 (now replaced with new 8005 for \$1199)
- Naim CD 5XS \$2,400
- Sony XA 5400 ES \$1,400

Phono Systems:

- Nottingham Ace Space 294 with 12" tonearm \$3,950
- Townsend Rock 7 \$3,250

Headphones:

- Beyer Dynamic DT-990 Pro 250 \$300
- HiFiMan HE-400 \$400
- Audeze LC2 \$975
- Audeze LCD3 \$1950