

“ ... STATE-OF-THE-ART PERFORMANCE ... ”

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The
\$ENSEIBLE
Sound

*“... as good (or better)
than most systems
selling for thousands
more. ... The Paradigm
Reference Studio/100's
are the ultimate in
'The \$ensible Sound.' ”*

by Joseph M. Cierniak

Let's get one thing about this review out immediately: I owe an apology to Paradigm, ye olde T\$S editor, and the readers of the magazine for being so late with this review. I believe that no excuse is better than the best of excuses. I believe in apologizing and then moving on. No excuses and my apologies to all concerned.

Several days before the Paradigm Studio/100 Reference Speaker System arrived at my home, I received a letter from Mark Aling, the Paradigm Marketing Manager. The letter was a highlighting of the quality parts used in the speaker's construction and various other reasons why the Studio/100 was *the* speaker. A portion of one sentence really caught my attention: “... we would please ask you to not hold our low price against us.”

Mark! Are you kidding!? Me, hold low price against you? In an audio world fraught with pricing insanity and mystical

The New Studio/100

*(Improved over version
reviewed for even
better sound.)*

claims (that by comparison elevate the *National Enquirer* to a scientific status approaching Newton's Principle), I welcome with open ears any audio product that gives high performance for a \$ensible price.

Bearing on the above I note that in Issue 59 Tom Nousaine did a review (among several) of the Paradigm PS-1000 subwoofer. I pay attention when Tom raves about a product; he raved about the PS-1000's. There was a mention by Tom of the PS-1000's being pulled from a review of subwoofers for another magazine he was reviewing for because they objected to the fact the PS-1000's didn't cost enough! And according to



Tom, the PS-1000 would have finished in the top third at a cost of \$250 less than the arbitrary low price point of \$750 set by that magazine! I'll stop at this point but not before I assure my readers and Paradigm that I am not part of the pseudo-intellectual group of audiophile reviewers who are so arrogant as to imply that performance is directly proportional to price. Enough!

"... smooth as silk in the midrange, with highs that ascend effortlessly and pleasurable to the audio equivalent of the upper stratosphere."

The first thing I do when I receive a full-size speaker system for review is to remove my reference speakers from the listening room. In my case the reference speakers are the Carver Platinum Amazings MK IV, augmented at the low end with a Sunfire Astonishing (aka "True") Subwoofer. It isn't fair to be constantly comparing your reference speakers to the new speakers, which is the inevitable consequence of having both speakers in the listening room at the same time. Things tend to get blurred with both speakers in the same room at the same time and the blurring usually favors the speakers you're most familiar with. So, I move the Platinum Amazing behemoths (110 lbs each, 4 ft wide and 5+ ft tall!) into the den along with the Sunfire Subwoofer. I will then bring in the Paradigm Studio/100's. I will listen to music (at least two hours per evening) on the system under review. I may move the speakers around a bit for optimal sound but no tweaky time consuming nonsense of adding or changing amplifiers, cables, preamps, CD players, power conditioners, magic clocks and other assorted nauseating tweak rituals. I want to spend the time getting to know the sonic pluses and minuses of the sound emerging from the speakers under review.

"... the Studio/100's are a true full-range system with bass response that is unheard of from many speaker systems, including some with pricing that is five places to the left of the decimal."

The Studio/100's are 45" high, 10" wide, 16" deep, weigh in at 84 lbs each, and are finished in black ash with rosenut and light cherry finishes optional. Unpacking them for one individual (me) is a chore somewhere between easy and difficult. Removing a speaker this tall and heavy from the end of the shipping container is a chore. According to James T. Frane in Issue 59, NHT packs their speakers in boxes that open along their length; I would heartily recommend this type of box to Paradigm and other speaker manufacturers, particularly for relatively tall and heavy speakers.

Included with each Studio/100 are four heavy gold-plated disks approximately 2" in diameter 0.25" thick, with a threaded hole in the middle. Also included are four spiked feet, which I assume are meant to be locked into place using the above mentioned disks (the instruction book doesn't mention anything about installing the feet). My choice was to turn the spike around (the spiked end screwed into the speaker) and use the disks as the feet.

However, I have no use for spiked feet. One, my listening room is carpeted so moving speakers with spikes becomes a frustrating chore. Two, although everyone talks about the sonic benefits of spikes I have never seen any rigorous listening tests done to prove this claim. Until this claimed benefit is more than just a golden ear myth I will not endure any unnecessary suffering just to accommodate a current audio fad.

Another reason given for using spikes is that they prevent the speakers from moving around the room due to the vibrations from the reproduced sound. I did some quick calculations and came up

with a figure of 21 pounds of weight on each foot. Imagine a 21 pound bag of lead glued to each foot. How far do you think the foot would move as a result of the acoustic energy radiating from the speaker? Who needs spikes! Have to mention this: If these gold plated disks and spikes were offered for sale by one of the fad accessory manufacturers, they could easily sell for \$500 without anyone blinking!

"Very simply, the cannon shots were as close to the real thing as I've ever heard ... regardless of price."

A removable grille covers the four drivers. The inside of the grille is a wooden template that surrounds the speakers and is exactly the same thickness as the distance that the speaker frames protrude from the enclosure (approximately 7/16"). With the grille in place, the speakers are now flush with the template, minimizing refraction, making for a cleaner signal being launched from the enclosure. It seems obvious that these speakers should be used with the grilles on.

The four drivers are – from top to bottom – a 25 mm/0.98" pure-aluminum dome tweeter, a 170 mm/6.69" mica-polymer cone midrange, and two 215 mm/8.46" polypropylene cone woofers. There's an interesting arrangement of the four drivers. The drivers are placed so that the bottom of the tweeter frame (a straight 4.5" edge) is mounted flush with the top of the midrange frame (a straight 4.25" edge). The bottom of the midrange frame (a straight 4.5" edge) is mounted flush with the top of the first woofer's frame (a 5.5" straight edge) and the bottom of the first subwoofer (a 5.5" straight edge) is mounted flush with the top of the bottom subwoofer's frame (a 5.5" straight edge).

Now for the remaining nitty-gritty details. The woofers and midrange cross over at 250 Hz with a slope of 18 dB/octave. Just below the woofers is a tuned port, which completes a tuned port/vented box configuration for the

woofer portion. I am not a speaker designer but looking at the diameter and length of this port tells me that this system is tuned much lower than most. I would guess 25 Hz, perhaps lower but not any higher. The midrange crosses over to the tweeter at 2.0 kHz with the same 18 dB per octave slope. I think it's an important point that all the drivers are designed and manufactured by Paradigm, as are the crossovers. I've said this many times and will say it again: They who design and build their own drivers are not at the mercy of a supplier, either delivery wise or specification wise. Manufacturing your own drivers allows for all facets of the important driver/crossover integration to be controlled and tailored for optimization of speaker performance.

"... bass has an authenticity that belies the relatively modest pricing of the Studio/100's."

Everything about the Studio/100's exudes quality construction with quality parts. Although I didn't remove any of the drivers or crossovers (I was tempted) a look at the tweeter impresses one with its construction. The tweeter is mounted in a 4.5" wide, 3.5" high, high-pressure die-cast aluminum chassis. Again, you don't have to be a speaker designer to appreciate that a relatively massive aluminum chassis is going to minimize mechanical vibrations, flexing, and will also more readily dissipate heat, the arch-enemy of all drivers but particularly tweeters.

Each speaker has two sets of all-metal gold-plated input connectors connected together with gold-plated jumper bars. I wouldn't have a problem with the more traditional five-way speaker connectors, including the plastic screw-on nuts, but I must admit the all-metal gold-plated connectors add a certain elegance and quality aura to the Studio/100's. The jumper bars may be removed to configure the speakers in a bi-wire configuration, passive vertical bi-amping, or passive horizontal bi-amping. For all of my listening, I kept it simple. The jumper bars remained in place and each speaker

was connected by a single cable to its own amplifier (Carver Sunfire running in monoblock configuration). Again, let's be fair and not use a review as our own personal experimental session to screw around with all sorts of tweak configurations at the expense of taking time away from the speaker under review.

"Everything about the Studio/100's exudes quality construction with quality parts."

As I was moving the speakers into position, I took a few minutes to tap the enclosure using a small rubber head mallet (having your own rubber head mallet to test for enclosure solidity must mean you've arrived as a speaker reviewer). The rubber hammer test indicated no resonances or other funny sounds emanating from the enclosure: Solid as a rock. Paradigm mentions in the product literature that the enclosure is constructed of 3/4" Medium Density Fiberboard (MDF) and the internal bracing is unique enough to have its own trademarked name ("Cascade"). The innards of the enclosure are filled from top to bottom with ultra-fine high-loft polyfibre damping material.

The Studio/100's are fairly easy to move about for positioning, assuming you don't use the spikes. The instructions state that the speakers are to be separated by a distance equal to 2/3 of your listening distance from the speaker. Since my equipment racks are 6' wide I worked the equation backwards. Spacing the speakers at 6' apart meant that my listening position was 9' from the speakers. Surprisingly, this 9' wasn't that far removed from my normal listening distance of 9-10 feet. I toed the speakers in so if the tweeters were sending out laser beams, the beams would have intersected just behind my head. Enough of the minutiae, let's get on with the listening session.

Having recently reviewed the Sunfire Astonishing Subwoofer, I still had (out) many of the plentiful bass content CD's

that I had used to evaluate the subwoofer. Playing these CD's left no doubt that the Studio/100's were producing lots of low and loud bass (LLLB). It's one thing to say LLLB, but I wanted to quantify how low and how loud. To do this properly, but not overwhelm the reader with too many charts/measurements, requires a delicate touch from the reviewer. Here's what I did:

I checked the anechoic bass frequency response of the Studio/100's. Not having an anechoic room I had to make do with my listening room. I placed one of the speakers in the middle of the room and placed a Radio Shack Sound Pressure Level meter 3" away from and centered with the dust cap of the bottom woofer; the closeness of the SPL meter to the speaker was my way of minimizing room reflections. Using the *Stereophile Test CD 2*, I referenced 63 Hz at 90 dB, utilizing the 1/3-octave warble tone from the Test CD. I chose 63 Hz since it was in the middle of the eleven (bass) test tone frequencies. I picked 90 dB as a reference since 80 dB seemed too low and 100 dB seemed too high. Shown below are the eleven referenced frequencies, the dB level associated with each frequency, and deviation in dB for each frequency when referenced to 90 dB.

Deviation	Frequency	Sound Pressure
-15	20.0	75
-13	25.0	77
-10	31.5	80
-5	40.0	85
-1	50.0	89
0	63.0	90
0	80.0	90
-1	100.0	89
-2	125.0	88
-1	160.0	89
-1	200.0	89

As you can see, the Studio/100's are a true full-range system with bass response that is unheard of from many speaker systems, including some with pricing that is five places to the left of the decimal. The highest compliment I can pay the Studio/100's is that I, a member of the bass lover's lunatic fringe, could, if need be, live with these speakers, knowing that

they were producing an honest 20 Hz. Never in my listening sessions (almost six months!) did I bring out the Sunfire Astonishing Subwoofer to augment the lower end of the Studio/100's.

"There are no pronounced colorations, frequency dips, crossover anomalies, cabinet resonances, difficult load (6 ohms nominal, 4 ohms minimum) or other assorted speaker gremlins."

Oh, I was tempted, and just before this review was submitted I did do some quick comparisons between the Studio/100's and the Sunfire Astonishing. Sure the subwoofer added to the low frequency enjoyment. But let's be fair. Comparing the two is like comparing a middleweight boxer to a heavyweight. Both may be great in their division but a comparison is not valid. Same thing applies here.

I'll describe just two of the CD's I used for "checking out" the bass. The first is my reference *1812 Overture* on Telarc CD-80041. Very simply, the cannon shots were as close to the real thing as I've ever heard from a box speaker ... regardless of price. Having been associated with the military, I have heard my share of cannon shots, including the sound produced by cannon from the 19th century (similar to the cannon on the Telarc recording). Contrary to popular belief, the cannon shot is not solely bass frequency territory; the initial "crack" of the cannon lies in the 2-3 kHz frequency range (as you increase the volume to impress your friends with the cannon shot, keep an ear on that tweeter!) It's the follow-up boom that really puts the bass response to the test. The resulting bass has an authenticity that belies the relatively modest pricing of the Studio/100's.

Please keep in mind that part of this authenticity equation is being able to play the Studio/100's at levels that require a speaker with an appropriate power

handling capability. The Studio/100's are rated at a maximum of 210 watts input power with a stated amplifier range of 15-350 watts, and an efficiency of 91 dB in a "room" enclosure (as compared to an efficiency of 88 dB in an anechoic enclosure). The combination of power handling capability and efficiency will result in sound levels appropriate to the source material.

"These transducers are as neutral as neutral can be."

The second bass CD I used was Telarc CD-80104, *Encores a la francaise* with Michael Murray at the organ. I had overlooked this recording until it was brought to my attention by reader John Winchester Dana of Hamden, Connecticut. On track 10 of this recording (*Concerto in G Minor for Organ, Strings, and Timpani* by Francis Poulenc), at 22 minutes and 57 seconds there is a sustained, 20 Hz note that lasts for approximately 2 minutes. This is a hellish test of both low frequency response and speaker durability! The Studio/100's passed this test with flying colours. Try this cut on those trendy \$2,000 plus mini-monitors that strain to reach an honest 50 Hz ...

As usual, my test of the Studio/100's midrange and high frequency response was based on my listening experience with the human voice. In this case a serendipitous occurrence resulted in my (almost) being able to compare a live performance to a recorded performance of the same work. Just before this review went out, I attended a live performance of Handel's *Messiah* as presented by the Handel Choir of Baltimore. It was an outstanding and enjoyable performance by a top-rated group. The hall (a church) was not small but not so large that it wasn't listener friendly. Best of all, the acoustics were excellent and no sound reinforcement was used. Upon arriving home from the concert I immediately started an extended listening session with Telarc CD-80348, *Messiah Highlights*, the Boston Baroque Orchestra and Chorus, Martin Pearlman conducting. I say immediately because one's aural

memory is a fragile thing at best; even by the next day an aural memory comparison becomes less valid than if the comparison is done immediately after the live performance. Lest there's any misunderstanding me ... what I am doing is an A/B comparison at best. The closer the time interval between live and recorded performance the better the A/B comparison.

"These speakers are so low-priced and such outstanding performers ... proof that state-of-the-art performance no longer implies exorbitant pricing."

There are voices on this recording, and how! There are solo voices in the Soprano, Mezzo-Soprano, Tenor, and Baritone range. And massed voices in the Soprano, Alto, Tenor, and Baritone range. If things aren't just right with the speakers (particularly at the crossover points), the result will be an emotional let-down when compared to the actual performance. Now I don't care how good the speaker, there will always be an emotional let-down when comparing reproduced to live. The degree of this emotional let-down is a good "gut" indication of how good the speakers are. I guess you could say it's the degree of disappointment in what you hear from the speakers. I'm not about to embarrass myself by quantifying this feeling! But A Degree of Disappointment (DOD) is at least a starting place for the many people out there who want to compare speakers but don't have a working knowledge of the speaker performance vocabulary (subjective).

The above stated, I would rate the Studio/100's sound (using my described DOD) as minimal. There are no pronounced colorations, frequency dips, crossover anomalies, cabinet resonances, difficult load (6 ohms nominal, 4 ohms minimum) or other assorted speaker gremlins. These transducers are as neutral as neutral can be. If you want sound colorations, go with some of those vulgarly

overpriced behemoths that are built for the export ear. If you really want the ultimate in coloration, use an LP and a 3-watt single-ended triode.

“Remember not to hold their low price against them!”

Being neutral, the Studio/100's affect the sound of the human voice minimally. One of the things I listen for in a speaker is any exaggeration of the sibilant sounds produced (characterized by “s” and “sh”). These sounds are in the 8 kHz range according to J. Gordon Holt (*The Audio Glossary*, Old Colony Sound Laboratory). If the speakers exaggerate the sibilant sound it's the audio equivalent of scraping one's fingernails across a blackboard. If the speakers repress this sound the result is voice reproduction that seems slightly dulled. There's a fine line between “exaggeration” and “repression.” The Studio/100's do a fine job of optimizing the thickness of this line.

In summary, the Studio/100's are bass-producing behemoths, smooth as silk in the midrange, with highs that ascend effortlessly and pleasurably to the audio equivalent of the upper stratosphere. Imaging and soundstaging are bettered only by speakers costing mucho dollars more than the Studio/100's. Perhaps I should use a comparison to show how good the Studio/100's are. Several years ago, I owned a fine pair of British speakers (which I've since sold). Today the same speaker goes for \$5,500 with what I consider marginal improvements. This speaker is not only used as a monitor by the recording studios but also as a reference standard by several of the well known speaker reviewers. The Studio/100's go for less than half this price. If I told you that the Studio/100's were at least as good as the \$5,500 reference speaker ... and you were shopping for a new speaker ... need I say more? The Studio/100's represent a better deal than the purchase of Alaska at a penny per acre! Buy the Studio/100's and use the money you have left over (from \$5,500) on cables or interconnects or wooden hockey pucks or other really important audio accessories.

But seriously, folks, I am amazed at such state-of-the-art sound at such a modest price. I don't know how Paradigm is able to keep the price so low and the performance and quality so high. I attribute the quality and low pricing of the product to the fact that Paradigm does their own in-house manufacturing of all speaker components, including the drivers. The performance aspect is a reflection of good design and controlled listening tests. Controlled listening tests are going to separate what seems to be from what is actual. Even a panel of qualified and experienced listeners may disagree on certain aspects of a speaker's sound. The controlled listening tests will determine very quickly what is imagined and what is real. Much of the guesswork of listening sessions is eliminated or a least reduced significantly, enabling Paradigm to obtain quality sound with a minimum of time and effort. Keeping time and effort to a minimum certainly contributes to the cost savings, resulting in a (very) modestly priced product.

I really have to dig for any negatives. The best I can do (and this is really digging) is to complain about their boxy look! Okay, a small but legitimate complaint is the size and scope of the instruction manual are minimal. It's a three-page foldout with three pages on one side in French and three pages on the other side in American. (Note to the editor: Do not change “American” to “English” – there's a difference.) (OK, Joe, but I did change some – but not all – of the Cierniakian into English – there's a difference.-KWN)

One last thing about the Studio/100's. These speakers are so low-priced and such outstanding performers that I can't imagine anyone buying super expensive mini-monitors that don't go below 50 Hz (if that!), with maximum sound pressure levels approaching 0 dB in the bass regions. There seems to be a recent rash of reviews on these mini-junks where the reviewer justifies the purchase (usually for a friend) by using the dumb reason that if you live in an apartment this is the way to go. It doesn't seem to dawn upon these mini-trash worshippers that apartment living is usually only

temporary! I see no rational reason for spending more than \$600 for a mini-monitor. If I lived in an apartment, had just purchased the very high priced mini-junk and heard the Studio/100's, I'd want to kill the person that recommended the minis. If I lived in a closet I'd find room for the Studio/100's!

A recent review in another magazine of a set of mini-monitors (selling for \$1,999 plus standard stands at \$350/pair or deluxe stands at \$650/pair!) states that 95% of the frequency range of music occurs above 50 Hz! Huh? Of course this reviewer's self-proclaimed and unsubstantiated statistic might have something to do with the 45 Hz low-end limit of these speakers. Do yourself a favor. Before you think that anything below 50 Hz isn't important and sound pressure levels don't matter, just listen to a good speaker that goes low and can play loudly. The Studio/100's are a good place to start; you may go no further.

BOTTOM LINE:

If you're in the market for a full-range speaker system I think the Paradigm Studio/100's are as good (or better) than most systems selling for thousands more. I have always preached that exorbitant pricing does not ensure state-of-the-art performance. Conversely (sort of) the Paradigm Studio/100's are proof that state-of-the-art performance no longer implies exorbitant pricing. Are you in the market for a full-range, full-performance speaker system at an affordable price? The Paradigm Reference Studio/100's are the ultimate in “The Sensible Sound.” Remember not to hold their low price against them!