



Review: E-MU PM5 Precision Monitor by Rick Paul - 9th May 2006 -



I've been at least peripherally aware of [E-MU](#) since the early-to-mid 1980's. Back in that time frame, their Emulator was perhaps the earliest "affordable" digital sampler. Okay, so they didn't quite get it down into my price range, but if you compared their price point to the other alternatives on the market in those days, you were talking about orders of magnitude, not just saving a few hundred dollars. Other classic E-MU instruments such as the SP-1200, Drumulator, and the various descendants of the Emulator, including the popular Proteus line, gave me the impression of a company that was very successful in building a range of products around a core of sampling and signal processing technology. More recent products, such as their Digital Audio Systems (DAS) line, including the flagship [E-MU 1820M](#) audio interface, and the Xboard range of USB MIDI controllers, veered somewhat from the notion of a sampling-based keyboard or rack module. Still, it was still possible to view E-MU's Emulator X software, running on a computer with one of the DAS interfaces, and controlled by an Xboard keyboard, as being a modern day, highly souped up descendant of the Emulator. Okay, so this modern system could do way more, but technology marches on!

Last Fall, though, E-MU threatened to rock my historically-based view of E-MU as a company when they announced their PM5 Precision Monitors. That's right, we're talking analog speakers -- active nearfield monitor speakers to be more, er, precise. Earlier this year, they announced the PS12 Precision Subwoofer, too, demonstrating that the PM5 announcement wasn't just going to be a one-off fluke.

You may be wondering if I'm forgetting that E-MU's parent company is [Creative](#), who have long marketed speakers aimed at gamers and other computer users. The thing is, despite E-MU's current parentage, the E-MU brand always felt somewhat distinct from the Creative brand, even though there was some technology sharing in both directions. Also, until the introduction of the PM5 monitors, E-MU's product offerings had seemed consistent with their pre-Creative heritage, or at least like a logical extension of that heritage. Not to mention that, even if you look at Creative's current, and quite broad, line of speakers, you won't find anything that looks even remotely like it is geared toward monitoring in a highly demanding studio environment.

Leaving any preconceptions on technological directions and history aside, though, if you look at the needs of E-MU's current customer base, which I'd guess would be largely comprised of owners of home studios and project studios, introducing a line of high quality, low cost monitors makes a lot of sense. Every studio needs monitors. When budget is an issue, home studio owners have been known to compromise in this area, using home stereos or inexpensive computer speakers, neither of which is very good for critical monitoring. The PM5 monitors aren't going to approach the price point of cheap computer speakers. However, if they could deliver significantly better studio monitoring capabilities at a price point that is low enough to at least make someone consider them before going with a compromise solution, the market for the PM5 monitors could be pretty wide. Most anyone who has already purchased one of E-MU's highly successful DAS interfaces could be a prime suspect for at least a pair of PM5 monitors, and maybe even a PS12 sub -- perhaps even additional PM5 monitors if surround monitoring is of interest.

We're getting a bit ahead of ourselves, though. Remember, the PM5 Precision Monitor is not only E-MU's first active monitor offering, but it is its first analog speaker period. Is this thing even any good? Let's take a look.

Background

E-MU indicates the PM5 Precision Monitor was, "designed from the ground up to deliver hyper-accurate audio in a compact design." While E-MU may not itself have a background one might expect to be introducing amplified speakers that fit such superlative-laced design goals, E-MU did not go it alone. Rather, they engaged Jun Makino, the veteran amplifier and speaker designer who founded Majeel Labs, which is known for audiophile-oriented products such as the Pristine A-S10 amplifier and Nagisa Active Monitor Speakers, to design the PM5 monitors.

The technical specifications for the PM5 Precision Monitor can be found in the sidebar on the right for the benefit of our more technically savvy readers. I don't include myself in that group, but I will be covering what I consider to be the bottom line of any technical specifications -- i.e. how the speakers sound, and how well they fulfill their intended purpose -- later in this review. For now, though, let's take a look at the more visible elements of the PM5 design, after which we'll look at basic connections and user-level controls.

At the high level, the PM5 is a two-way, bi-amplified active monitor. To get out of technospeak mode, this simply means we're looking at a single housing that includes both two amplifiers (i.e. one each for the high end and low end), with a crossover to split the incoming sound up between them, and two speakers (i.e. one for each amp).



The "5" in "PM5" signifies the size of the woofer (i.e. low frequency range speaker), which is 5 inches in diameter. I don't want to be redundant with the specs, but did want to highlight the woofer size, which is not huge. All things being equal (which they generally are not in real life), the larger the woofer, the lower in frequency a speaker can go. In the case of the PM5 monitors, the stated frequency response range only goes down to 67 Hz. For perspective, human hearing extends down to around 20 Hz, and it is not uncommon for studio monitors to go down into the 40 Hz range.

Looking at the front of the PM5 from top to bottom, at center top is a 1-inch tweeter (high frequency range speaker). Just to the right of the tweeter is the bright blue power light, which will turn red if the speaker's overload protection circuitry (which basically attempts to protect the speakers from being blown if the incoming signal is too loud) is

PM5 Precision Monitor Specifications

General

- Type: Two-way, bi-amplified nearfield reference monitor
- Frequency Response: 67Hz to 20kHz (± 2.5 dB)
- Maximum Sound Pressure Level (short term)
 - Single: =100dB SPL @ 1m
 - Pair: =103dB SPL @ 1m
- High-Frequency Driver
 - Type: Neodymium Soft Dome
 - Size: 25.4mm (1")
- Low-Frequency Driver
 - Type: Glass Fiber Cone
 - Size: 127mm (5")
- Dimensions
 - Height: 290mm (11.5")
 - Width: 175mm (6.9")
 - Depth: 245mm (9.7")
- Weight: 6.5kg (14.3lbs)
- Power: 120V, 60Hz (North America), 220V-240V, 50/60Hz (Europe)

Crossover Network

- Type: Active 2nd order Butterworth
- Input sensitivity control range: -21dB - 0dB
- Input impedance
 - Balanced: 47K ohms
 - Unbalanced: 47K ohms
- Crossover frequency: 2.5kHz

Amplifiers

- Type: Custom discrete with Class-A input/MOSFET output stages
- High-Frequency Amplifier
 - Power: 40W RMS into 4 ohms
 - Signal-to-Noise Ratio, referred to full output: > 98dB
 - Distortion: THD < 0.2%
- Low-Frequency Amplifier
 - Power: 40W RMS into 4 ohms
 - Signal-to-Noise Ratio, referred to full output: > 98dB
 - Distortion: THD < 0.2%

engaged. In the middle of the PM5 is the woofer. The bass port, which helps increase the energy in the lower frequencies (which can help compensate for smaller woofers) is below that.

Up near the top of the back panel are the heat dissipation fins from the amplifier component of the PM5. Just below that are the audio connections, as well as several user controls for the amplifier. We'll go into more detail on the connection possibilities and user controls below. Down at the bottom of the PM5 are the IEC power socket and the power switch for the amplifier.



There are few other points worth mentioning, and which may not be obvious from the photos or the technical specifications. One is that the monitors are magnetically shielded to prevent interference with computer monitors and other gear sensitive to magnetic fields. Another is that the cabinet design features a 1-inch thick front baffle to eliminate internal resonance. In fact, these monitors seem extremely solid in general, with the combination of cabinetry, amplifier, and power transformer adding up to a weight that feels significantly heavier than you'd expect from simply looking at the size of the monitors. Lifting a PM5 monitor feels a bit like lifting a bowling ball in terms of how much density is packed into a relatively small volume. And I don't mean one of those lightweight kiddie balls, either! The edges of the PM5 cabinets are rounded (E-MU calls them "radiused") to reduce cabinet edge diffraction in an attempt to improve imaging.

In addition to the PM5 Precision Monitor itself, the PM5 package includes a brief Owner's Manual, a power cord, and warranty and support information. Not listed in the packaging list or referred to in the documentation, but also included, are four stick-on rubber feet. If you aren't setting the PM5 monitors on a vibration-absorbing surface, it's probably a good idea to use the rubber feet to insulate the monitors somewhat from any vibrations of the surface.

So, what will all this cost you? The E-MU PM5 Precision Monitor lists for just under \$350. However, most everywhere I checked will sell one to you for right around \$250. Thus, we're talking \$500 a pair (plus any sales tax and/or shipping charges that might be applicable, of course). Oh yeah, and don't forget the cables if you're just setting up your first system, as opposed to replacing an existing system.

Connections and Settings

Honing in on the central area of the PM5's back panel, we find the key controls for personalizing the PM5 monitors to suit your environment. Why might you want to personalize something as "simple" (at least in concept) as nearfield monitors? Consider that these amplifier/speaker combinations have to be able to connect to many types of systems, from computer-based audio interfaces to portable all-in-one recording/mixing units to the control room monitor outputs of high-end consoles. They also must do this in all kinds of rooms, from the smallest bedroom studios to sonically treated professional studios. Thus, the reasons might include a variety of different cable and connector types, a wide range of audio input levels, and rooms with many different acoustic traits. Let's take a look at the PM5's facilities for addressing these areas, moving from left to right in the central area of the back panel.



Over on the left, we see a Neutrik combo connector for balanced (XLR or 1/4-inch TRS) connections, a Balanced/Unbalanced switch, and an RCA jack for unbalanced connections. The Balanced/Unbalanced switch may be a slight misnomer. It is actually switching between the Neutrik and RCA-style connectors, as opposed to between balanced and unbalanced wiring. In particular, though it isn't mentioned in the documentation, a query to E-MU support indicated that it is okay to use 1/4-inch unbalanced cables with the PM5 monitors. To do that, unless you were using an adapter to go to the RCA connector, you'd need to plug it into the Neutrik connector, which would mean you'd need to set the Balanced/Unbalanced switch to its Balanced position, despite using unbalanced cabling and connectors. Of course, it goes without saying that you are better off using balanced cabling if your equipment supports it, but this undocumented option may provide a convenient solution for anyone who needs to use unbalanced 1/4-inch cabling.

Next up is an Input Sensitivity knob, which provides up to 21 dB of boost. If the equipment you're connecting to the PM5 monitors doesn't provide the possibility of governing its output volume at the source (e.g. most cassette decks),

you will need to use the Input Sensitivity knob to adjust the PM5 volume to your tastes. You can also use this knob for input level matching applications. However, there are a few caveats. First, I would suggest that these are not volume control knobs in the sense of controls you will use frequently to turn something up or down. (I'm pretty sure E-MU doesn't intend them for that purpose since they are on the back of the units rather than in some more visible location). Any temptation to do that should disappear once you realize that, while there are some marked gradations surrounding the knobs, they are fairly difficult to see without direct light shining on them. This would be true even if you faced the back of the speakers toward you, which wouldn't be ideal for adjusting volumes by ear anyway. Also, there are only three feel-based reference points -- i.e. all the way down, all the way up, and a single detent position around the center of the dial. If you were only using a single PM5, that might not be a big deal. However, in the case of a stereo or surround setup, you will no doubt want the levels of both (or all) speakers to match. Trying to adjust multiple speakers to a common level by ear doesn't sound like much fun. Secondly, while the levels of the speakers seemed pretty well matched to my ears with the Input Sensitivity knobs set to their minimum positions, I did not feel like the levels of both speakers matched when I set them to the center detent positions. I didn't even try the maximum positions since the levels these things put out, even in their minimum positions, were plenty loud enough for my small bedroom-sized studio. In fact, I still ended up turning the volume of the device feeding them (an E-MU 1820M audio interface, operating at the balanced professional level of +4dBu) down at the source. If you do need to use the Input Sensitivity knobs to boost the levels for your environment, I would highly recommend using test tones, along with an audio level measuring device at your mix position, in order to accurately set the Input Sensitivity levels so both speakers match.

Over on the right-hand side are two three-position attenuation switches. First up is the HF (Treble Tilt) attenuation switch. In its default position, labeled "0" (zero), the response of the PM5 speaker is flat out to 20 kHz. The "1" and "2" positions result in high frequencies' being rolled off such that levels are down by approximately 2 dB or 4 dB, respectively, by 20 kHz, with any roll off starting around 1 kHz as best I can tell from the response curve included in the Owner's Manual. The LF (Bass Roll Off) attenuation switch similarly features three positions, labeled "0", "1", and "2", with roll off beginning at higher frequencies as the numbers increase from the default position of "0". The bass roll off curves are similarly shaped, and appear to have on the order of 20 Hz between each switch position in terms of the points where roll off begins or where each curve has rolled off 6 dB on the low end. For example, in the default Bass Roll Off position of "0", it appears that 6 dB has been rolled off around 40 Hz, whereas 6 dB of roll off is achieved around 60 Hz on the "1" position and around 80 Hz with the "2" position. I would guess the 67 Hz referenced in the frequency response range of the PM5 monitors represents the point at which bass roll off begins in earnest in the "0" switch position.

Since the main purpose of nearfield monitors is to try and get a flat, accurate portrayal of what is in your recording, why would anyone want to set the attenuation switches to anything other than their "0" positions? To be honest, I can't think of a good reason if using the PM5 monitors by themselves for judging mixes or masters, though perhaps some room anomalies that overly reinforced the high and/or low end of the frequency spectrum might make this make sense. On the other hand, if you were using the PM5 in combination with a subwoofer, depending on what crossover frequency possibilities were available on the subwoofer, perhaps that might yield some applications for the Bass Roll Off switch. As for the Treble Tilt switch, I think that would be less likely to get used in a studio monitoring application. However, listening to a few recordings through the PM5 monitors with the Treble Tilt switch in the "2" (i.e. maximum roll off) position made at least one application for the Treble Tilt control instantly apparent. In particular, I found the roll off to be very pleasant for pure listening purposes. That is, I might be missing some of the high frequency activity in my recording, but it was a pleasant effect. If I were using the PM5 monitors in, for example, a 5.1 home theatre system, or some other application that is less about critical listening and more about just hearing good sound, I might well choose to use the Treble Tilt switch to roll off some of the high end.

Listening and More

When my pair of PM5 Precision Monitors arrived, I decided to unpack one of them to have a look and check out the documentation to determine how best to hook it up in my SONAR 5 Producer- and E-MU 1820M-based studio. My first reaction, just picking up the box, but not yet opening it, was, "man, this thing is heavy!" After opening the box, and unpacking the speaker, my next reaction was, "man, this thing is small!" For context, you have to realize that, for the last roughly 10 years, my main studio monitors have been a pair of JBL 4206 Studio Monitors. We're talking

passive monitors (i.e. no built-in amp or power supply) that are actually very slightly heavier than the PM5 monitors. However, they are also considerably taller and wider (depth is nominally nearly the same, but I think the PM5 specifications must include the amp's heat dissipation fins, because the cabinet dimensions don't look as deep as those of the JBLs). We're talking extremely compact weight with the PM5 monitors, and this is with a big "hole" (i.e. bass port) in the front of each monitor.

Breaking out the documentation to look up the possible hookup options, I decided my first stop would need to be to the local music chain store to pick up some cables, even though I had a bunch of old cables hanging around. In particular, I decided I wanted to go for balanced connections at the professional +4dBu level. While I had been using 1/4-inch balanced connections between my E-MU 1820M audio interface and my 10+ year old Hafler trans*nova P1500 power amp, those were in the form of a multi-cable snake. In that configuration, the individual cables only had to go to one rack mount module, not two active monitors spaced far enough apart for nearfield monitoring. Also, the 1820M has no XLR outputs, so neither were XLR cables an option, and my other cables were either RCA (all too short for the distance I needed to go -- besides, I wanted balanced connections) or 1/4-inch TS unbalanced cables. The shortest length cables available at my local store that would still meet my needs were 4-meter Monster Cables (and that is the only brand they had for 1/4-inch TRS balanced cables, at least in a length I could use), at \$40 apiece. Remember I mentioned above, in talking about the cost, to remember not to forget to add the cables? Now you know why. Of course, if you are putting in a new system, you'd need to do this for any system for which you wanted to use balanced cables. I have to say, though, \$80 for a pair of cables sure makes \$500 for a set of good active monitors seem like an even better price than it already is!

With new "they must make these things out of gold!" (actually, they do -- at least parts of them) cables in hand, it was time to hook things up. Unfortunately, my studio is perennially cluttered, and my only reasonable choice for setting up the PM5 monitors that could both support their weight and keep them reasonably at ear level was to take down my old nearfield monitors and replace each with a PM5. I mention this for two reasons: First, this means I could not conveniently conduct A/B listening tests to compare the Hafler/JBL combination directly to the E-MU monitors. Second, the actual location of my speaker stands is geared toward my historical setup, back when I was using an ADAT recorder and a Mackie 32*8 mixer along with a rack of hardware synth modules, rather than toward mixing from my DAW as I have done for a number of years now. That means I am generally not mixing from the sweet spot, though I physically move over to the sweet spot from time to time to check things. My actual mix position is a little off center, and probably a bit over twice as far back as it should be for the position of the monitors (and I have to turn sideways to make it even be that optimal). Nevertheless, I am used to using this dealing with this non-optimal mix position. Thus, the key thing it affects is my perception of stereo imaging, which I would check via occasional trips over to the sweet spot.

I started with the PM5 monitors set to their minimum level on the Input Sensitivity knob, thinking that might be like turning the speaker volume off. Man, they can drive a lot of volume, at least for my small bedroom-sized studio, even on their lowest setting! I ended up turning the E-MU PatchMix mixer master volume down to put things at a more comfortable listening level, and saved the configuration so I can easily return to it in case I ever mess anything up. I trimmed 10 dB from the nominal 0 dB mix level (going out at +4 dBu). That is where I've left things ever since, though I sometimes trim levels down even further, for example, when playing loud, mastered CDs -- the level I use is aimed at working on tracking and mixing more so than mastering.

Just for curiosity's sake, and because I wasn't sure if there might be some sonic integrity-oriented advantages in achieving the same levels by gain staging things differently, I decided I'd also try out the center detent positions on the PM5's Input Sensitivity knobs. To do this, I obviously had to reduce the PatchMix output volume to get back to a comfortable listening level. However, I quickly abandoned that approach after noting that the signal levels from the right and left speakers seemed perceptibly different. Since I don't have any audio calibration equipment, I decided I was better off just turning things back down all the way, and the levels did sound balanced when I did that.

My initial impression when listening to some of my own recordings through the PM5 monitors was that they might seem a bit harsher to listen to than my old monitors. I felt I might be likely to get fatigued from listening to them earlier than I had with the old monitors. However, then I started playing commercial CDs through them, and my perception started changing (at least when I wasn't listening to a few hyper-compressed modern CDs that I know happen to be fairly harsh sounding and fatiguing through most any audio equipment).

Over time, I must have listened to at least 20 complete commercial CDs, including a number of Grammy winners, as well as many of my own recordings, through the PM5 monitors. Genres of music from the CD collection ranged from a classical string quartet to bluegrass-flavored country to classic folk rock to modern rock and pop/rock. The idea was both to get a feel for the performance of the speakers for listening to many types of music, and also to tune my ears to what well-recorded (at least in most cases) music should sound like through these speakers so I could better judge my own mixes.

Judging speakers is necessarily subjective, but I have to say I feel these speakers sound good, but not overly flattering. Most of the time, I did not feel any significant ear fatigue from long sessions. When I did, I could generally attribute it to a recording I knew was relatively harshly mastered -- e.g. overly bright and hyper-compressed. Despite the stated frequency response of these speakers, I did not find them to be bass-shy. In fact, my old JBLs have 6.5-inch woofers, versus the 5-inch woofers on the PM5 monitors, but my sense is the PM5 speakers put out more bass, or at least better-defined bass -- more on that when I talk about mixing through the PM5 monitors below. If I was in the sweet spot, stereo and front-to-back imaging seemed extremely good. In my non-optimal mix position, it was not as good, but that is to be expected, and I never felt my old speakers had very good imaging, especially for making front-to-back decisions, even in the sweet spot. Overall, I found these speakers to be quite good for critical listening. Were I purely listening for pleasure, I might be inclined to try playing with the Treble Tilt to roll off a bit of high-end.

The real test for nearfield monitors, of course, isn't how good or bad they may be for listening to other people's already-mixed and mastered music. Rather, it is how they work for mixing and/or mastering your own projects. Fairly early into use of the PM5 monitors, I mixed an original R&B-flavored pop song called "What Do You Want to Know" (you can listen to it [here](#), if you'd like to make your own evaluations on how the mix turned out). While I hadn't been using the PM5 speakers long enough at that point to say I'd adjusted to them, especially after over a decade of using my older speakers, I have to say I was very pleased with the way that mix translated to other speakers. In particular, the song features a synth bass part, and one big danger I've seen with my mixes in the past is that they would turn out very bass-heavy when played on my home stereo (which has three-way speakers with significantly larger -- I believe 12-inch -- woofers). This one was significantly less bass-heavy than I might have expected based on the nature of the song and past results. In fact, the overall mix felt better to me than most of my past mixes when played on a variety of speakers other than the ones the song was mixed on. Thus, my initial feeling was that the PM5 monitors might well be giving me a more accurate picture of what is actually in the mix.

A bunch of tracking and editing time, alongside lots more listening time, later, I had another project to mix and master. This time it was a cover song in a rock genre similar to a more modern version of a classic Bryan Adams mix -- that is, fairly heavy pop/rock, but without all the reverb of the mixes of that era. For licensing reasons, I can't let you hear that mix at this point. I can tell you, though, that the mix went significantly more quickly than most mixes I've made in the past, and the reason for follow-on mix iterations was not to correct mix issues, but rather simply to try different takes on a few creative decisions. The mix itself held up very well. When I got it to my big home speakers, again the overall mix held up well, with no hint of bass exaggeration, nor, for that matter, any bass-lightness. The translation to small speakers was similarly painless.

Closing Notes

It's tough figuring out how to sum things up with a product like nearfield monitors. It's not like I've had the opportunity to try a wide variety of them, nor even other current units at this same price point. Nor does comparing specifications mean all that much to me. Things really boil down to not what is on paper, but what you hear, and how what you hear in your own environment translates to your own personal results, which depend not only on what you hear, but also on your personal tastes and level of production skills. Thus, I'm not about to make any dramatic claims to suggest the PM5 Precision Monitors significantly raise the bar for nearfield monitor price/performance. It is certainly conceivable that they may do just that, but I simply do not have enough experience, or hands-on exposure to products on the market at this time, to say.

What I can say, though, is I have been extremely pleased with the PM5 monitors. I feel they have contributed to a perceptible improvement in my mixes compared to my previous setup, and I don't consider my previous setup to

have been significantly flawed at its price point, which, back a decade ago, was about double what a pair of PM5 monitors cost today. From past experience I can also say that anyone who doesn't yet have a quality set of nearfield monitors, who perhaps is monitoring on a home stereo setup or on speakers geared toward live use, is likely to benefit significantly from an upgrade to a set of PM5 monitors. At \$500 a pair, it's hard to imagine going wrong with these things.

In fact, I really can't think of any significant reservations. The only minor thing I can come up with is that, while most of the time I am doing solo work in my studio, so don't have to worry about what visual impressions my equipment makes on others, there are occasions when I have others in here. In that context, the physical size of these simply isn't as impressive as my older, larger speakers. Of course, in a tight home studio, there are advantages in more compact size, and the sleek, rounded black design of these units is quite stylish. Oh yeah, and the blue power lights really look cool!

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