

M-AUDIO



EX SERIES

EX66

Active Loudspeaker Monitor

User Guide

English

Introduction

Congratulations on your purchase of M-Audio's EX66 reference monitor. Recording engineers and music producers around the world rely on M-Audio reference monitors to ensure their mixes are accurate. The EX series active monitors from M-Audio improve upon that reputation as a top-of-the-line solution for the most demanding applications. Engineered to the highest sonic standards, the new EX66 monitor addresses the needs of the most critical professional users. Furthermore, the speaker's "midwoofer-tweeter-midwoofer" (MTM) configuration is particularly well-suited for multichannel monitoring and for rejecting vertical early reflections.

The EX66 represents the culmination of nearly two years of design and development. Custom-tuned cabinets, state-of-the-art driver design, selectable analog and digital inputs, and flexible digital signal processing combine with ultra-clean built-in amplification to deliver the best sound available in an active loudspeaker monitor. We are pleased to present to you what we believe to be the most versatile and accurate audio monitoring solution for professional and high-end applications.

What's in the box?

Your EX66 box contains:

- One EX66 speaker monitor
- Frequency response curve
- One detachable AC power cord
- One audio CD containing calibration signals
- This manual

EX66 Features

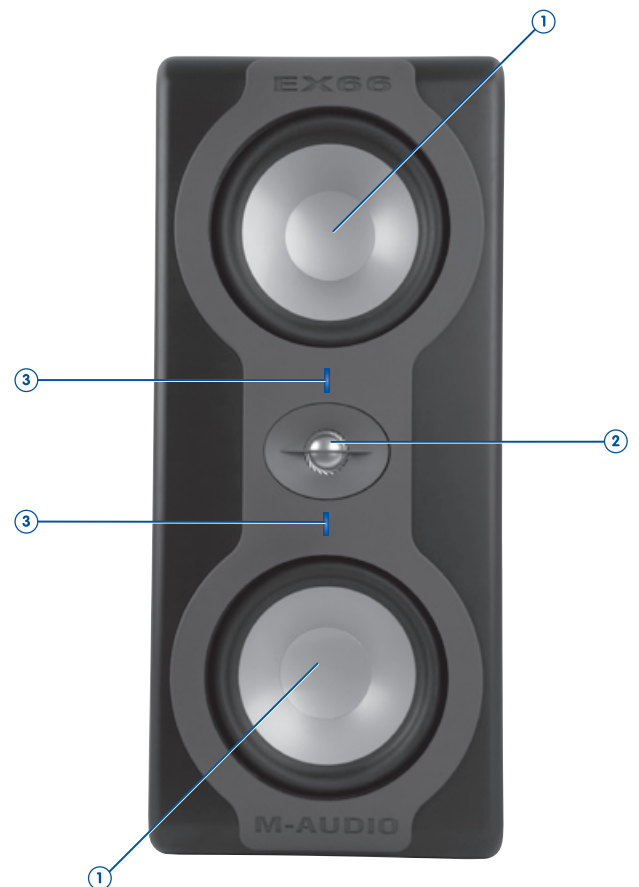


Figure 1: Front View of the EX66

Did You Know...?

...that the box can double as a sturdy transport case for your EX66? We designed the packaging to make it easy for you to carry your EX66 monitors between your studio, home, or anywhere you want to take them. So save the box!

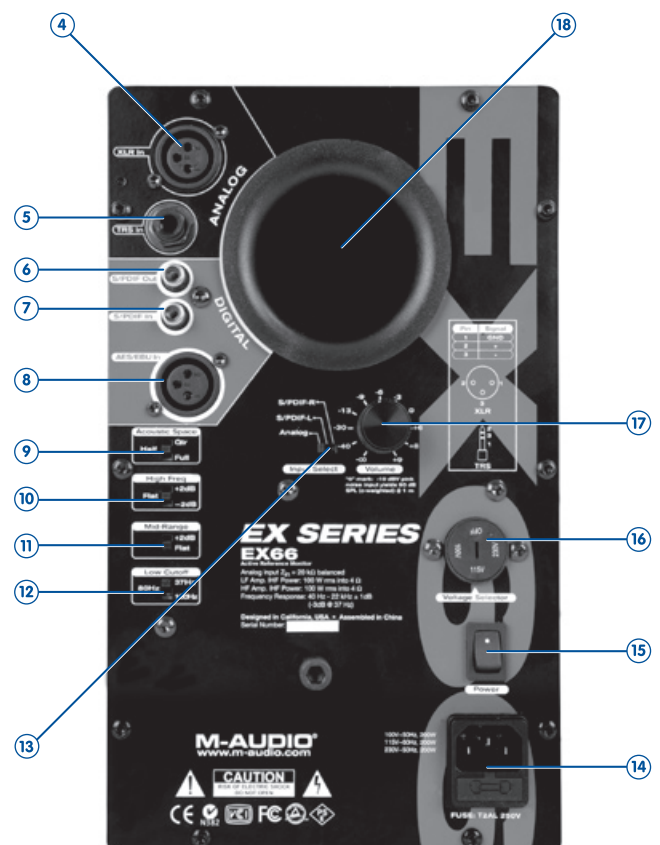


Figure 2: EX66 Rear Panel View

What's with the Two Silver Woofers? ①

The EX66 uses a midwoofer-tweeter-midwoofer (MTM) vertical array configuration to provide an extraordinarily versatile sound radiation pattern (degrees of arc for the sound wave, vertically and horizontally). Consider the following: conventional 2-way speakers in a stereo setup require that you listen to them in a fairly narrow “sweet spot” (where you position yourself at the apex of an isosceles triangle with the speakers). By contrast, a stereo pair of EX66 monitors provides a wide sweet spot, creating a proper stereo image even when you are not exactly equidistant from each speaker. This means more people in the room can benefit from the EX66s’ accuracy and detail without having to fight for the “money” seat.

Also, while our MTM configuration gives you a wide horizontal sweet spot, it limits vertical sound diffusion to a cardioid pattern. This helps minimize reflections off of mixing desks and improves sound intelligibility. (As near-field monitors are often positioned on top of mix consoles, there is a persistent problem of early reflections off the desk surface which can “smear” sonic details; the EX66 vertical axis rejection characteristic greatly reduces this problem.)

Finally, we designed the woofers from a state-of-the-art material that happens to be a nearly perfect reproducer of sound. Our drivers have exceptional intrinsic damping characteristics and absolutely no frequency response peaks (resonances) in the audible band. They provide truly linear pistonic action over the entire musical spectrum, revealing more of music's subtle details, and bringing all portions of each musical transient into correct alignment. But don't just take our word for it—as the old proverb goes, “the proof of the pudding is in the eating.” In other words, listen for yourself!

Did You Know...?

...that our drivers can withstand extreme temperatures, moisture, humidity, sunlight, and salt? The material we use to make our EX-series cones is reminiscent of that employed at one time by NASA scientists to form heat shields for Space Shuttle orbiters.

Other Noteworthy Characteristics

Titanium Tweeter ②

We've discussed the woofers in some detail, but of equal importance is the high-frequency driver. Our 1" tweeter sounds as smooth as it looks. Titanium is known in the aerospace industry for its high tensile-strength-to-weight ratio and its resistance to corrosion. We made our tweeters out of titanium in order to create a stiff, yet responsive piston that moves natural resonant modes well above 20kHz, allowing the tweeters to track every nuance of musical detail as accurately as possible, without smearing any high-frequency energy. We designed and tuned these custom tweeters to sound crisp and transparent, without the harshness sometimes associated with rigid high-frequency drivers. The result is a natural complement to the low-frequency drivers, providing smooth, coherent reproduction over the entire audio band.

Bass-Reflex Port ⑬

Many loudspeaker enclosures use an air vent (or port) to form a Helmholtz resonator, which improves bass response. In some ported speakers, however, you can hear friction noise from air moving in and out of the enclosure—but not here. We developed a rear-cabinet port with dual flanges to minimize the vibrations normally generated by low-frequency signals. This custom port is extremely efficient in its air transfer characteristics and it is virtually noise-free.

Enclosure

Like the other components, the EX66's enclosure has an important role in shaping the overall sonic response. In order to provide more stable performance, we designed an enclosure made of a special high acoustic efficiency medium density fiberboard (MDF) and unique interior reinforcement designed to absorb vibration and impact generated under extreme conditions. Further, our custom-designed waveguides on the front panel minimize diffraction and improve stereo imaging.

Digital Signal Processing

All mechanical and electrical systems are inclined to vibrate (or resonate) at certain frequencies when excited by external forces. For loudspeaker cabinets, resonances can be a particularly insidious problem because they color the timbre of the music. The human ear/brain mechanism is capable of perceiving even extremely subtle resonances, and it's this phenomenon that allows critical listeners to distinguish easily between exceptional loudspeakers and mediocre ones. At M-Audio, we decided to address the problem of cabinet resonances with a novel yet highly effective solution.

The EX66 contains sophisticated digital signal processing (DSP) technology to tune the cabinet and crossover with exceptional precision. The EX66 eradicates all resonances from the cabinet by using IIR (infinite impulse-response) filters in its on-board processor. The EX66 also uses DSP to achieve its precise and maximally flat 4th-order Linkwitz-Riley crossover.

Bi-amped Efficiency

The EX66 uses two separate 100-watt PWM power amplifiers to drive the 4Ω woofer combination and 4Ω tweeter separately in a high-end bi-amp structure. The ultra-low distortion at 200 watts per channel rounds out the EX66's profile as a truly world-class active loudspeaker monitor.

Versatile Connectivity

We've provided high-impedance (20 kΩ) balanced XLR ④ and TRS ⑤ analog inputs as well as 110 Ω AES/EBU (AES3 ⑧) and 75 Ω (S/PDIF ⑦) digital inputs—all to give you maximum flexibility in your connections. The digital inputs automatically detect the bit depth and sample rate of the incoming signal and can lock to incoming clocks up to 192kHz and with 24-bit resolution—all with the lowest jitter specs in the industry.

Setting up your EX66 Monitors

They're only speakers, so how hard can it be... right? Depending on your experience with vertical array speakers, it may not be that simple. The following section can give you useful information on how to get the best acoustic response out of your EX66 monitoring setup.

Warning - Don't touch the speaker cones! The woofers ① and tweeter ② are made from rigid but sensitive materials, so it's easy to damage them by poking them with your finger. Once they're damaged, they're nearly impossible to fix and will probably need to be replaced. The front baffle includes a protection bridge for the tweeter to reduce the likelihood of accidental damage, but you should still be careful.

Important - The EX66 contains an internal power supply that can operate with AC power sources of 100V~50/60Hz, 115V~50/60Hz, and 240V~50/60Hz, allowing you to use them anywhere in the world. Before you do anything, please make sure the Voltage Selector switch ⑬ on the back of the cabinet is set to the correct voltage for your AC mains supply. (The voltage reading in the 6 o'clock position is the active one. You can use a flat-head screwdriver to rotate the switch to the proper position if necessary).

Before plugging in and turning on your EX66 monitors, we recommend you put some thought into speaker placement.

Speaker Placement

Directivity and Room Response

The subject of speaker placement is surprisingly vast as there has been (and continues to be) quite a bit of research and debate on the subject. Rather than embarking on a detailed discussion of electroacoustic transfer functions, reverb time psychoacoustics, on-axis and off-axis radiation patterns, diffusion and room reflections, etc., let's just go through a few basic tips to help you get the best sound out of your EX66 monitors.

As you may know, a room affects the sound of a speaker by the reflections it causes. Some frequencies of sound get reinforced and others get suppressed, the result of which alters the overall character of the sound. In any listening environment, what you hear is a mixture of both the direct and reflected sounds. Direct sound arrives at your ears straight from the speaker diaphragms while reflected sounds can bounce off of any hard surface to reach your ears after the direct sound. In general, the direct sound from the speakers is primarily responsible for the image, while reflected sounds contribute mostly to the tonality and timbre of the speakers (richness, leanness, etc.). Any boundary surface (back wall, side wall, ceiling, etc.) can cause a reflection, so you should think about reflective surfaces when placing your speakers. To complicate matters, there are so-called "early" reflections (where sound bounces off of nearby surfaces, as opposed to far-away ones) which tend to smear the image because the sound from them reaches your ears very soon after the direct sound. We usually consider early reflections to be those occurring within the first 100 milliseconds or so.

As discussed earlier, the vertical array of the EX66's MTM configuration greatly minimizes early reflections above and below the listening position—but you only get this benefit if you position them correctly in a vertical orientation. So, unlike with traditional 2-way designs, you shouldn't have to worry about reflections from the ceiling or mixing console (if your monitors are sitting on top of a large-format mixing desk).

Important - The EX66 works best in the vertical position. If you place the speaker horizontally, you will lose many of the benefits of the MTM design and the sound image will deteriorate.



Figure 3: Vertical Orientation—GOOD



Figure 4: Horizontal Orientation—BAD

General considerations

In deciding where to place the EX66 monitors, the goal is to excite as few standing waves as possible—but the exact way to do this depends on the specific geometry and setup of your listening environment. Here are a few rules of thumb to get you started:

- (1) The further away you place your EX66 monitors from horizontal reflecting surfaces (like untreated side walls), the better.
- (2) Try to achieve symmetry within the room; if the left speaker is 1.5 meters from the back wall and 2 meters from the side wall, place the right speaker the same way (if possible) in order to give each speaker a similar acoustic environment.
- (3) We recommend that you place your EX66 monitors a different distance from the back wall than from the side walls. In other words, if your EX66s are 0.5 meters from the back wall, make sure they're not also 0.5 meters from the side walls.
- (4) As discussed earlier, the EX66 contains a bass-reflex port ⑭ located on the rear panel. We suggest you leave at least 150 mm (about 6 inches) of space between the back wall and the monitor in order to minimize obstructions to air flow.

Also, remember that the EX66's narrow vertical cardioid radiation pattern makes it important for you place them so that the tweeters are at the same height as your ears.

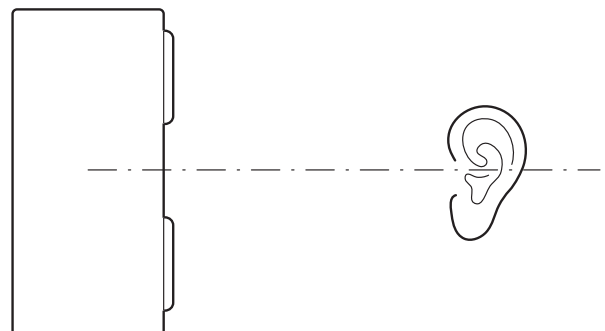


Figure 5: Optimal Listening Height

Finally, because of the EX66's wide horizontal radiation pattern, you do not need to "toe in" the speakers. Having the speakers point straight, rather than turned in toward the listener, should provide the proper ratio of center-fill to soundstage width.



Figure 6: Straight alignment, no "toe-in"—Correct



Figure 7: Angled alignment with "toe-in"—Not Recommended

We encourage you to experiment with speaker location to get optimal results. Trial and error will tell you quite a bit about how the EX66 monitors react in your environment.

Rear Panel Connections and Adjustments

Now you should be ready to hook up your EX66 monitors. Here, we'll give you some guidelines for connecting your audio signal and making adjustments (if necessary) to the EX66s' frequency response in order to match them to their location and your room's environment. Please follow these steps in order.

1) Connecting your audio signal

For your convenience, we've provided a variety of inputs to maximize flexibility.

■ Analog Inputs

If you're using an analog source, set the Input Select switch ⑬ to "analog." Note that the XLR and TRS connectors accept both balanced and unbalanced signals and are wired according to AES/IEC standards:

XLR Input		
(20 kΩ)	Pin 1	signal ground (shield)
	Pin 2	signal positive (+), also called "hot"
	Pin 3	signal negative (−), also called "cold"
TRS (1/4") Input *		
(20 kΩ)	TIP	signal positive (+), also called "hot"
	RING	signal negative (−), also called "cold"
	SLEEVE	signal ground (shield)

For optimal (hum-free) sound, we recommend you use balanced (differential) lines whenever possible.

* Unbalanced 1/4" wiring can involve either a two- or three-conductor (TS or TRS) plug. A two-conductor (TS) plug automatically grounds the signal negative input, whereas a three-conductor (TRS) plug, wired to be unbalanced, provides the option of leaving the negative input open or grounded. If you choose to use an unbalanced line, we recommend that you ground the unused negative input (wiring the ring and sleeve of the TRS plug together)

The XLR and 1/4" TRS inputs are summed, so you can use both inputs at the same time.

Important - If you're using an XLR plug, make sure you feed it into the "XLR" ④ input in the "Analog" portion of the EX66 rear panel—and NOT the AES/EBU input. In low light conditions, the two jacks can look similar, and even some of our beta testers got them mixed up!

■ Digital Inputs

The EX66 contains high-quality digital inputs that automatically detect the bit depth and sample rate of the incoming bitstream. The circuitry accepts 16- or 24-bit signals and the on-board phase lock loop (PLL) locks to any sample rate from 32kHz to 216kHz. The EX66 contains a digital bitstream pass-through (labeled S/PDIF Out ⑥) so you can assign each monitor to reproduce either the Left or Right signal.

If you're using a digital source with an AES/EBU (AES3) interface, you can feed it directly into the AES/EBU input ⑧ on the back of one of your EX66 monitors. You must set the Input Select switch ⑬ to either S/PDIF L or S/PDIF R, depending on whether that speaker will be reproducing the left or right half of the digital bitstream. Next, run a high-quality 75Ω S/PDIF cable from the S/PDIF Out jack ⑥ of that speaker to the S/PDIF In jack of your second EX66 monitor, and make sure the Input Select switch ⑬ is set to the appropriate setting for that speaker.

Important - Make sure you don't accidentally plug your AES/EBU signal into the analog XLR input—if you do, you won't like the results.

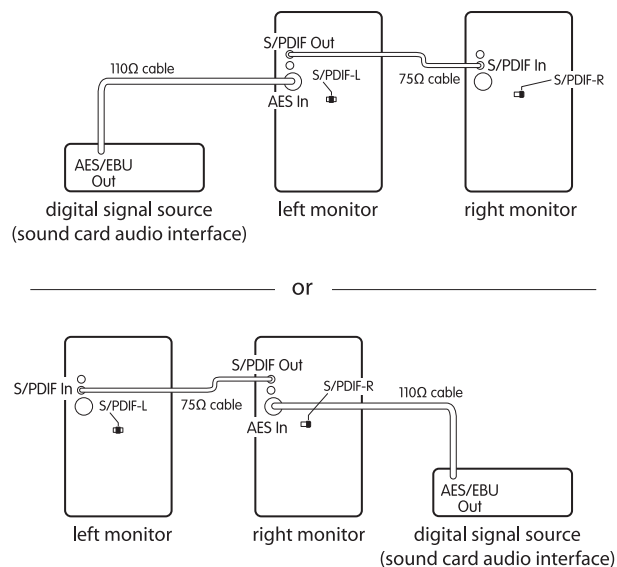


Figure 8: Digital Connections Using the AES/EBU (AES3) Interface

If you're using a digital source with a S/PDIF interface, you can feed it directly into the S/PDIF input ⑦ on the back of one of your EX66 monitors using a high-quality 75Ω S/PDIF cable. You must set the Input Select switch ⑬ to either S/PDIF L or S/PDIF R depending on whether that speaker will be reproducing the left or right half of the digital bitstream. Next, run a high-quality 75Ω S/PDIF cable from the S/PDIF Out jack ⑥ of that speaker to the S/PDIF In jack of your second EX66 monitor, and make sure the Input Select switch ⑬ is set to the appropriate setting for that speaker.

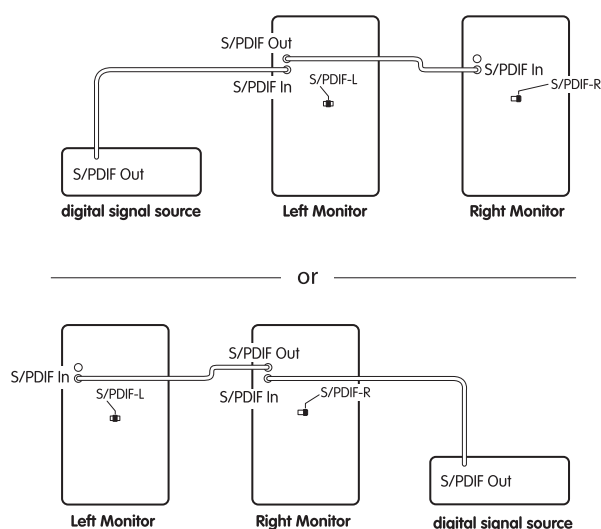


Figure 9: Digital Connections using the S/PDIF Interface

2) Powering On the EX66

As stated earlier, please make sure the Voltage Selector switch ⑩ on the back of the EX66 is set to the proper AC mains supply. You can rotate the switch with a flat-head screwdriver if necessary. Note that the operating voltage is the one corresponding to the 6 o'clock position.

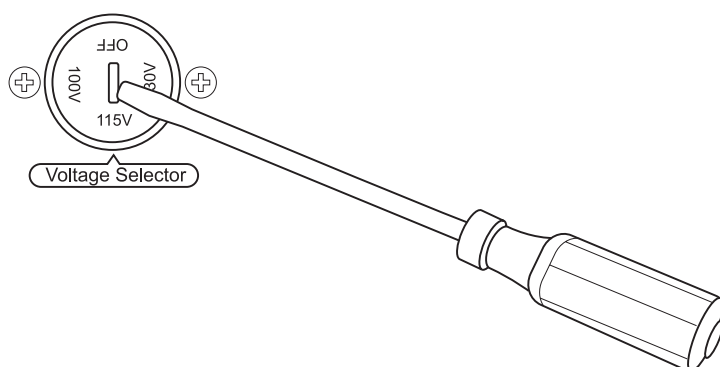


Figure 10: Voltage Selector Switch (Note: Improper combinations can lead to hazardous conditions and/or damage to speaker components not covered by speaker warranty!)

Now that you've connected your audio signal input, you can power on your EX66 monitors using the following procedure:

- 1) Connect the supplied AC power cord to the IEC connector ⑭.
- 2) Plug the other end of the AC power cord into a grounded outlet that is configured to correspond with the Voltage Selector switch ⑩.
- 3) Turn the Volume knob ⑰ all the way down.
- 4) Flip the Power switch ⑮ to the On position. You should see the blue LED indicators ③ light up on the front face of the EX66.
- 5) With the Volume knob ⑰ still turned down, start playing your audio signal at a normal level. Gradually turn up the Volume knob.

Important - When shutting down your equipment, it's always best to power off the EX66 monitors first in order to prevent a "pop" noise from coming out of the speakers when you power down your mixing board, computer, or sound card. Likewise, you should always power up the EX66 monitors last to prevent a "pop" noise generated from equipment upstream.

3) Setting the Acoustic Space Switch

Earlier, we went over some tips for how best to position your EX66 monitors. Depending on where and how you've placed them, you'll want to adjust the three-position Acoustic Space switch ⑨.

- **FULL:** If you've mounted your EX66 monitors on tall (0.5m to 1.2m) speaker stands away from walls and corners, we call this "full space." (Mathematically, it approximates the effect of a simple source operating in free air emitting an omnidirectional acoustic radiation pattern.) In this condition, it's best to set the Acoustic Space switch ⑨ to Full, which will give you the flattest near-field frequency response.
- **HALF:** If you've mounted your EX66 monitors on stands and placed them against a wall, or if you've mounted them on the meter bridge of your console in the center of the room, we call this "half space." (Mathematically, this situation approximates the effect of a simple source operating against an infinite baffle, which radiates an acoustic pressure twice that of the full space scenario.) In this condition, it's best to set the Acoustic Space switch ⑨ to Half, which activates a shelving filter to reduce the low-frequency output by 2dB to compensate for the bass buildup.
- **QTR:** If you've mounted your EX66 on stands in a corner, or on your console meter bridge against a wall, or on shelves against a wall, we call this "quarter space." (Mathematically, the acoustic power is equivalent to the full space condition times a factor of four, or twice that of half space.) In this case, we recommend you set the Acoustic Space switch ⑨ to Qtr, which activates a shelving filter to reduce the low-frequency output by 4dB to attenuate the buildup of low-frequency acoustic energy.

Did You Know?

...that it's possible to use acoustic image wave equations to predict what can happen when you change the position of the EX66 in a given room? There is a mathematical construct known as a "simple spherical source" which emits wavefronts contained in a sphere of radius $R < \lambda/2\pi$ where λ is the wavelength and R is the radius of the smallest sphere of instantaneous acoustic pressure. We can model the acoustic pressure (p) as a function of concentric radii (r) using the following function:

$$p(r) \cong j\omega\rho_0 2U \frac{e^{-jkr}}{4\pi r} \text{ where } \rho_0 \text{ is}$$

air density, ω is $2\pi \times$ frequency, U is volume velocity, and k is a constant.

Given that only low-frequency energy from a loudspeaker radiates as a simple source, we can conclude that the bass response (acoustic power) from the EX66 will double in half space and will quadruple in quarter space. Further, because intensity varies as the square of the pressure, we know that moving the EX66 from a speaker stand in the middle of the room to a shelf against the wall will increase the intensity by a factor of 16!

4) Setting the Volume Level

The EX66 contains a calibrated Volume knob ⑰ (which is actually an input trim). For your convenience, we've marked a reference level of "0"—the setting at which a -10dBV pink-noise input signal yields 90dB SPL (c-weighted) at 1 meter from the front baffle. If you're driving the EX66 with a hotter signal (e.g., +4 dBu level), you may wish to turn down the Volume knob (perhaps close to the -13 mark).

We recommend you play a stereo pink-noise signal through your EX66 monitors and measure the output of each speaker using a sound pressure level meter (using a c-weighting filter). This will give you objective criteria with which to match the levels. Alternatively, if you know that each EX66 monitor is in the same acoustic environment (considering relative distances to reflective surfaces), you can simply turn the Volume knob all the way up on each monitor and feel confident that the levels are closely matched.

By the way, in case you were wondering, the Volume control adjusts the level in the analog domain (prior to the digital conversion), so it does not deteriorate the full digital dynamic range.

5) High Frequency Adjustments

The High Freq switch ⑩ allows you to make your EX66 monitors sound more "bright" or more "dark," depending on your preference. Technically speaking, the three-position switch activates a gain/attenuation circuit in the tweeter channel. It offers 2dB of boost or cut starting at the 2.56kHz crossover point—similar in concept to the high-frequency adjustment function found in the classic BBC monitors.

We recommend you start with the High Freq setting of "flat" (or 0dB) as this provides the most natural high-frequency response, other things being equal. If you are monitoring material requiring extra attention to high-frequency details—as is often the case when mixing orchestral music, for example—you may want to experiment with setting the High Freq switch to the +2dB position. If you're mixing a Bollywood film score, you may find the -2dB setting more appropriate (unless you want your ears to bleed).

Keep in mind that if your monitoring setup is too bright, your mixes may end up sounding dull everywhere else; and of course, in the reverse situation the opposite is true. When in doubt, use the flat setting—it's what is "most correct."

6) Mid-Range Boost

The Mid-Range switch ⑪ offers a low-Q (wide bandwidth) 2dB boost centered in the 1kHz to 2kHz range. Effectively, it brings the image forward a bit and can be useful in examining timbral details of lead instruments. Start by leaving this switch in the "flat" (unaltered) position, but feel free to experiment with it to see if you like the results.

7) Low Cutoff Switch

The Low Cutoff switch ⑫ allows you to adjust the bass roll-off response of your EX66. It's a high-pass filter with a 6th-order Butterworth alignment (36dB/octave), and you can set the corner frequency to 37Hz, 80Hz, or 100Hz. We recommend you start with the filter all the way open (37Hz setting) and only raise the cutoff frequency in order to protect the woofers at low frequencies (i.e., to avoid problems of the voice coil hitting the back plate).

Protection Circuits

In order to safeguard your EX66 from accidental damage, we've built in some protection mechanisms.

Overload Protection

The EX66 can react to two types of electrical issues: "over-current" and "over-voltage." In the case of the former, when the system is driven so hard that it approaches the upper limit of the drivers' piston range, the output waveform will soft clip (at 11 amps) in order to protect the drivers. We've even taken further precautions to protect the drivers by exploiting the 6th-order alignment (referenced earlier) with a 2nd-order high-pass filter that limits excessive excursion at low frequencies that might otherwise cause the voice coil to hit the back plate of the driver. In the case of an over-voltage condition (where the AC power to the monitor exceeds safe limits), the EX66 automatically activates a circuit that mutes the output and draws no current until the over-voltage condition is remedied.

Thermal Protection

Have you ever noticed that most power amplifiers use big heat sinks? These are necessary because traditional power amplifiers generate quite a bit of thermal energy that has to be dissipated away from the output transistors. While all amplifiers generate and dissipate heat, our PWM architecture is particularly efficient in that there is very little wasted energy—so the EX66 produces relatively small quantities of heat. Nevertheless, we've taken precautions to prevent the [unlikely] possibility of overheating. If the power amp gets too hot, the over-temperature circuit mutes the output to allow the heat to dissipate to a normalized hysteresis level, at which time the EX66 will start up again. If your EX66 happens to overheat and activate the thermal protection circuit, you probably need to examine your speaker placement and setup to make sure there's nothing obstructing airflow around the cabinet.

Magnetic/Video Shielding

Many of our customers are computer-centric musicians or film/TV score composers, so we've made sure that all of our loudspeaker monitors are designed to be used next to traditional video monitors (containing cathode ray tubes). While the EX66 drivers do contain fairly sizeable magnetic structures, they're also shielded so that the B-fields they generate don't interfere with adjacent video monitors.

Protecting Your Ears

As a musician, composer, or engineer, your hearing is one of your most valuable assets. So we'd like to advise you about protecting yourself from high sound pressure levels (SPLs), which can lead to hearing loss. It is interesting to note that while hearing loss is a common occupational illness, people often ignore it because there are no visible effects, most often it develops over time, and usually there is no pain. But we believe it's critical to protect your hearing because good hearing is so essential to communication, socialization, responsiveness to the environment, and—perhaps most importantly—the enjoyment of music.

Please be aware that the EX66 monitors are capable of generating very high SPLs over sustained periods of time; but because these monitors have very low levels of distortion (even at high volumes), you may not always notice that the sound level is high while working with them. Health experts say that levels over 90dB for 8 hours per day can eventually cause permanent hearing loss. According to the US Government's Occupational Safety and Health Administration (OSHA) and the National Institute on Deafness (NIDCD), you should limit your exposure using the following guidelines, lest you risk losing your hearing:

- **90 Decibels:** avoid prolonged exposure at this level (examples: small jazz trio; piano fortissimo; train whistle at 500ft.)
- **100 Decibels:** no more than 15 minutes at this level (examples: very loud orchestral music; wood shop)
- **110 Decibels:** avoid unprotected exposure of more than 1 minute (examples: front row of a loud rock concert; chain saw)

If you plan to use the EX66 monitors regularly at high volumes, we recommend you periodically use a sound level meter capable of integrating the sound level over a period of time according to noise control standards. This way you can check to make sure your listening levels are always within safety limits.

Do You Know...?

...what Ludwig van Beethoven has in common with Bill Clinton?

Beethoven suffered from—and Clinton currently suffers from—permanent hearing loss.

While Beethoven's complete deafness was likely caused by an autoimmune disorder, former President Clinton's (relatively mild) hearing loss is largely attributed to years of exposure to loud music—and specifically from his playing saxophone in a loud band as a teenager. (In 1997 Clinton was fitted with a hearing aid—which he said he needed in order to make out what hecklers were shouting at him during his speeches.)

Concluding Remarks

M-Audio is committed to developing active loudspeaker monitors for those who demand the most accurate and transparent sound. We believe a well-designed speaker should be both revealing and absolutely effortless to work with—making your job easier and more enjoyable. We encourage you to compare our EX series monitors with any others on the market, and we trust you'll agree they're unbeatable for natural (and great-sounding) reproduction.

Appendix - Technical Specifications

Type:	MTM studio reference monitor
LF Driver:	two 6-inch woofers
HF Driver:	1-inch titanium dome tweeter with wave guide
Frequency Response:	37Hz to 22kHz, near-field acoustic response
Crossover:	2.56kHz 4th-order Linkwitz-Riley maximally flat alignment
LF Amplifier Power:	104 watts (IHF dynamic power into 4 Ω)
HF Amplifier Power:	104 watts (IHF dynamic power into 4 Ω)
THD+N:	<0.3% (@ 50 watts into 4 Ω)
Maximum SPL @ 1 meter:	109dB (115dB for a stereo pair) peak
Analog Inputs:	<ul style="list-style-type: none"> • XLR balanced (20 kΩ) • 1/4" TRS balanced (20 kΩ)
Digital Inputs:	<ul style="list-style-type: none"> • S/PDIF – In and Thru (75 Ω) • AES/EBU (110 Ω) • built-in phase lock loop (PLL) to reclock incoming bitstreams with low jitter (<250 psec p-p); the S/PDIF receiver can lock to an incoming clock of up to 216kHz
DSP	32-bit processing
Controls:	<ul style="list-style-type: none"> • Acoustic Space (full, half, quarter) • High Frequency Adjust (+2dB, flat, -2dB) • Mid-Range Boost (flat, +2dB) • Low Cutoff (37Hz, 80Hz, 100Hz)
Polarity:	positive signal at + input produces outward LF cone displacement
Input Sensitivity:	-10dBV pink noise at input yields 90dB SPL (c-weighted) @ 1 meter; variable using input sensitivity ("volume") control
Protection:	RF interference, output current limiting, over temperature, turn-on/off transient, subsonic filter, external mains fuse.
Indicator:	power on/off indicator on front panel
Power Requirements:	user selectable for 100V ~50/60Hz, 115V ~50/60Hz, and 230V~50/60Hz
Cabinet:	painted high acoustic efficiency MDF
Dimension:	<ul style="list-style-type: none"> • 482.6 mm (H) x 209.6 mm (W) x 241.3 mm (D) • 19 inches (H) x 8.25 inches (W) x 9.5 inches (D)
Weight:	<ul style="list-style-type: none"> • 11.18 kg/monitor (without packing) • 24.65 lbs/monitor (without packing)

* Above specifications subject to change without notice

Warranty Terms and Registration

Warranty Terms

M-Audio warrants products to be free from defects in materials and workmanship, under normal use and provided that the product is owned by the original, registered user. Visit www.m-audio.com/warranty for terms and limitations applying to your specific product.

Warranty Registration

Thank you for registering your new M-Audio product. Doing so immediately both entitles you to full warranty coverage and helps M-Audio develop and manufacture the finest quality products available. Register online at www.m-audio.com/register for the chance to win M-Audio giveaways.

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