

Revel® Performa™ M22 Loudspeaker

Owner's Manual



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Part No. 350548-001 | Rev 0 | 12/03

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DOCUMENTATION CONVENTIONS

This document contains general safety, installation, and operation instructions for the Revel Performa M22 Loudspeaker. It is important to read this document before attempting to use this product. Pay particular attention to safety instructions.

WARNING Calls attention to a procedure, practice, condition, or the like that, if not correctly performed or adhered to, could result in injury or death.

CAUTION Calls attention to a procedure, practice, condition, or the like that, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

Note Calls attention to information that is essential to highlight.

This owner's manual assumes that two M22s are included in the loudspeaker setup.

ABOUT THE M22

Thank you for purchasing the Revel Performa M22 Loudspeaker. Delivering expansive sound that defies its compact dimensions, the M22 offers an impressive combination of wide frequency response, low distortion, and maximum output. Two proprietary transducers, a sophisticated filter network, and an acoustically inert cabinet enclosure allow the M22 to achieve acoustical precision and performance befitting the most demanding home entertainment systems.

A critical aspect of loudspeaker design, transducers convert electrical signals into audible sounds, profoundly affecting loudspeaker performance. Combining superior form and function, the transducers feature a distinctive design that allows for smoother frequency response. The woofer cone is constructed with Organic Ceramic Composite cone material to reduce distortion, while the spiders are constructed with a high-strength Nomex blend with optimized geometry for increased linearity.

A two-way design, the M22 transducers effectively cover a broad range of frequencies. Covering well over seven octaves, a 6.5-inch (165mm) woofer delivers highly refined mid-range and low frequencies with incredible dynamic range. A 1-inch (25mm) titanium-dome tweeter reproduces high frequencies well above audible levels, with wide dispersion for open, airy treble.

Separate Placement Compensation and Tweeter Level controls allow the M22 to deliver stellar performance under conditions that require less-than-ideal loudspeaker placement or listening room acoustics. The Placement Compensation control provides ultimate placement flexibility, allowing the M22 to be flush-mounted in a bookcase or wall unit or placed on a stand (such as the optional pedestal stand). A separate Tweeter Level control achieves precise balancing of high frequencies for optimal timbral balance.

An advanced woofer motor structure includes a high-grade Neodymium magnet placed at the center of the motor structure, inside the voice coil, for improved magnetic shielding. Inside the motor, a black-plated steel shield cup facilitates heat dissipation for higher power handling. An integrated aluminum flux-stabilization ring minimizes modulation inside the motor's static gap flux field, greatly reducing distortion. A copper ring inside the motor's gap reduces distortion even further. Both rings are optimally sized and placed to maintain constant linear voice coil inductance with forward and backward motions.

A high-order filter at 2.2kHz optimizes loudspeaker on and off-axis response, helping to ensure smooth octave-to-octave balance and timbral accuracy. Separate woofer and tweeter filter boards prevent mutual interference between filter network components, dramatically reducing distortion over a wide dynamic range. For even greater sound enhancement, the M22 cabinet is constructed with 0.75-inch (19mm) thick walls and extensive internal bracing to prevent cabinet-induced colorations as well as rounded baffle edges to minimize diffraction and optimize treble response.

Since 1996, Revel has stood at the forefront of loudspeaker design. Backed with Harman International's extensive research and design facilities, the Revel Performa Series Loudspeakers benefit from cutting-edge tools such as a multi-channel listening lab for double-blind listening tests; a laser interferometer for detailed driver and cabinet analysis; real anechoic chambers for precise tests and measurements; finite element analysis for advanced loudspeaker modeling; and a stereo lithography to provide tight tolerances.

Adding to the proud lineage of Revel's Ultima and Performa Series Loudspeakers, the M22 further solidifies Revel's reputation as a leading designer and manufacturer of high-quality, high-performance loudspeakers. Each M22 is individually hand-tuned during manufacturing to match the production reference standard within a fraction of a decibel, ensuring incomparable loudspeaker-to-loudspeaker consistency. As a result, the M22 offers unrivaled performance from a smaller loudspeaker.

HIGHLIGHTS

- Exceptional accuracy in a compact form-factor
- Proprietary 6.5-inch (165mm) Organic Ceramic Composite woofer
- Proprietary 1-inch (25mm) titanium-dome tweeter
- High output with low distortion
- Separate woofer and tweeter filter boards
- Gold-plated binding posts
- Placement Compensation Control
- Tweeter Level Control
- Flexible placement options
- Advanced woofer motor structure
- Magnetic shielding
- Large voice coils for wide dynamic range without compression
- Hand-tuned to match the production reference standard within a fraction of a decibel
- Elegant cabinet design in real wood veneer finishes

PRODUCT REGISTRATION

Please register the M22 within 15 days of purchase. To do so, register online at www.revelspeakers.com or complete and return the included product registration card. The product registration card serves no warranty purposes. Retain the original, dated sales receipt as proof of warranty coverage.

UNPACKING

The M22 requires special care and handling during unpacking. Pay particular attention to the precautions that appear in this section and to other precautions that appear throughout this owner's manual.

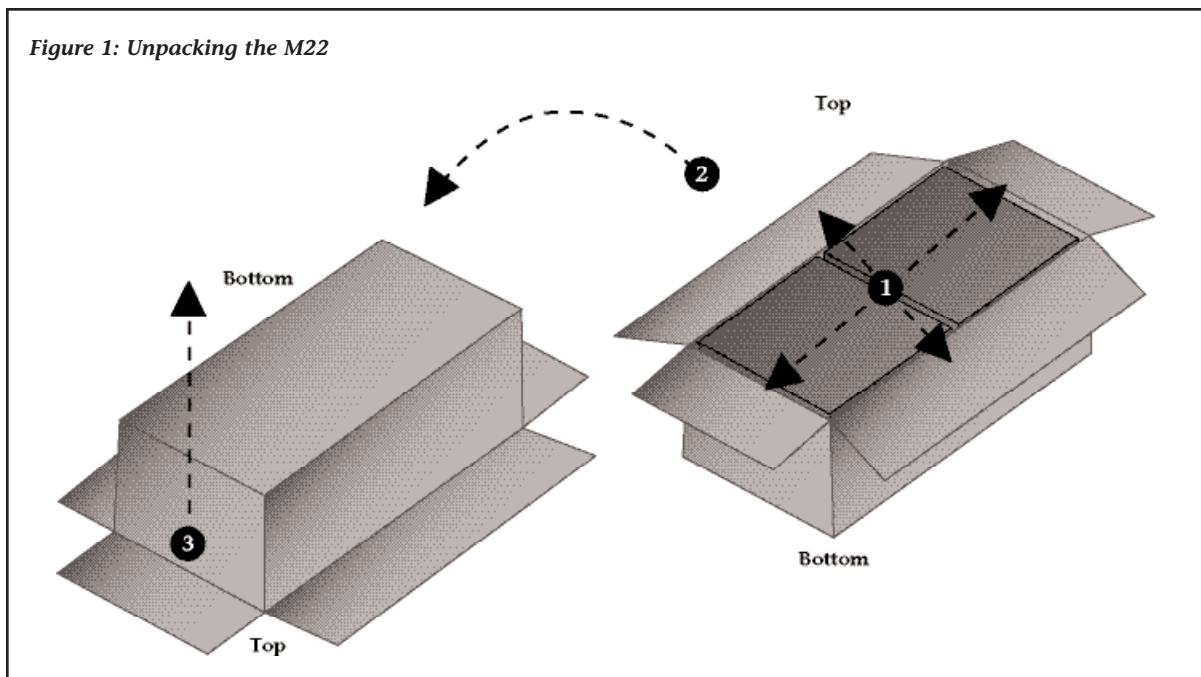
When unpacking, save all packing materials for possible future shipping needs. Refer to the Obtaining Service section on page 16 for additional information.

To unpack the M22:

1. Place the outer packing carton in the upright position and fully open the top flaps as shown in step 1 of Figure 1 at the top of the next page.
2. Without allowing the top flaps to close, move the outer packing carton into an inverted position shown in step 2 of Figure 1 at the top of the next page.
3. Lift the outer packing carton off of the inner loudspeaker cartons as shown in step 3 of Figure 1 at the top of the next page. At this point, the inner loudspeaker cartons will be upside-down.

(continued on next page)

Figure 1: Unpacking the M22

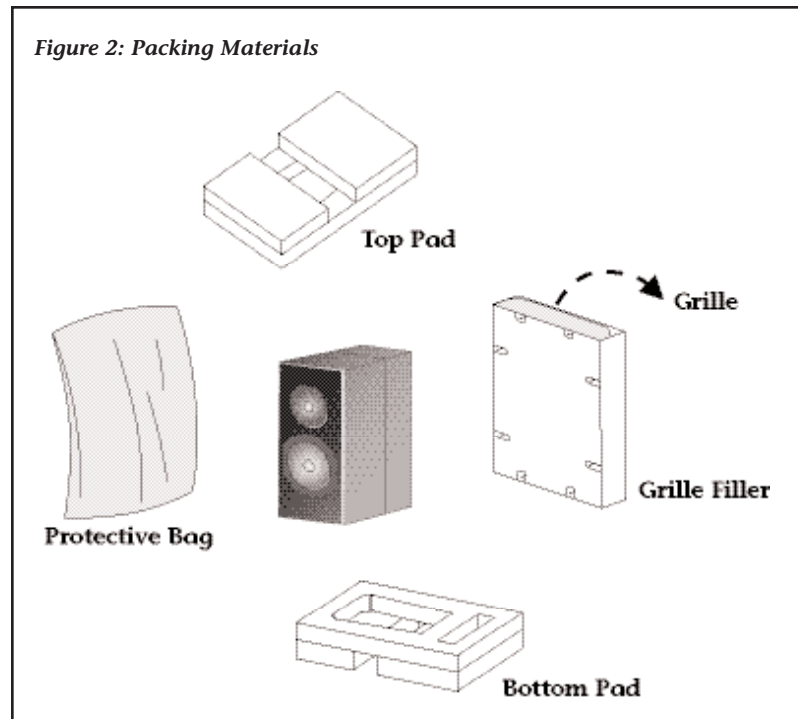


Unpacking (continued)

4. Repeat steps 1, 2, and 3 to unpack each of the inner packing cartons. When the inner packing cartons are lifted off of the loudspeakers, they will be upside-down.
5. Remove the bottom pad and grilles identified in Figure 2 (right).
6. Grasping the sides of the cabinet, place the first M22 in the upright position. Then, repeat this process to place the second M22 in the upright position.

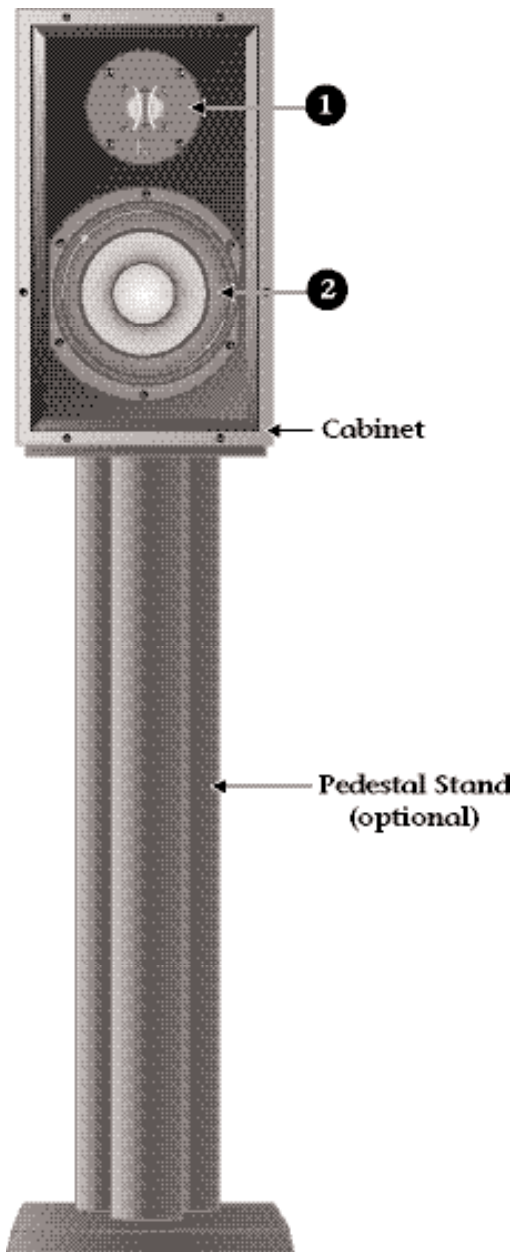
7. Remove the top pad identified in Figure 2 (right).
8. Remove the protective bag and, if desired, install the grille.

Figure 2: Packing Materials



LOUDSPEAKER OVERVIEW

Figure 3: Front View



The numbers in Figure 3 (above) correspond with the numbered items in the Driver Complement section that begins in the next column.

DRIVER COMPLEMENT

The numbers in Figure 3 (left) correspond with the numbered items in this section.

1. Tweeter

- 1-inch (25mm) titanium dome
- Under-hung with copper-clad aluminum wire for low distortion
- Ferrofluid for high-power handling with reduced compression
- Magnetic shielding to prevent video monitor interference

2. Woofer

- One 6.5-inch (165mm) cone constructed with Organic Ceramic Composite cone material for low distortion
- True pistonic operation for increased freedom from coloration
- A high-grade Neodymium magnet is located inside the voice coil for optimal magnetic shielding
- Copper ring inside the motor's gap for modulation control and low distortion
- Aluminum flux-stabilization ring for modulation control and reduced distortion
- Butyl rubber surround for large, linear excursion capabilities
- Carbon composite aluminum flat-wire voice coil wound on a 2-inch (50mm) fiber-glass bobbin for low mass and higher power handling
- Vented center pole for improved heat dissipation and low compression

CABINET

Reduces cabinet-induced colorations with 0.75-inch (19mm) thick walls and extensive internal bracing. For even greater sound enhancement, rounded baffle edges minimize diffraction and optimize treble response.

The cabinet's wood veneer finish does not require routine maintenance. However, cabinet surfaces that have been marked with fingerprints, dust, or other dirt can be cleaned using a soft cloth and a high-quality furniture polish. If a higher-gloss finish is desired, a high-quality wax can also be used.

To clean the cabinet:

1. Apply a high-quality furniture polish to a soft cloth.
2. Use the cloth to lightly wipe the cabinet surface.

Note

The grille can also be cleaned using a vacuum with a soft-bristled brush attachment.

CAUTION

To prevent cabinet damage, do not use a cloth made with steel wool or metal polish to clean the cabinet. To prevent possible transducer damage, do not apply furniture polish directly to the cabinet.

FILTER NETWORK

Optimizes loudspeaker on-and-off axis response with high-order filter at 2.2kHz, helping to ensure smooth octave-to-octave balance and timbral accuracy. Separate woofer and tweeter filter boards prevent mutual interference between filter network components, dramatically reducing distortion over a wide dynamic range. Gold-plated binding posts accommodate heavy speaker cables, while separate Placement Compensation and Tweeter Level controls provide precise balance to compensate for less-than-ideal loudspeaker placement and listening room acoustics.

WOOFER PORT

Enhances low-frequency extension. Computer-optimized internal and external flares minimize distortion resulting from air turbulence.

INPUT PANEL

The numbers in Figure 4 at the top of the next page correspond with the numbered items in this section.

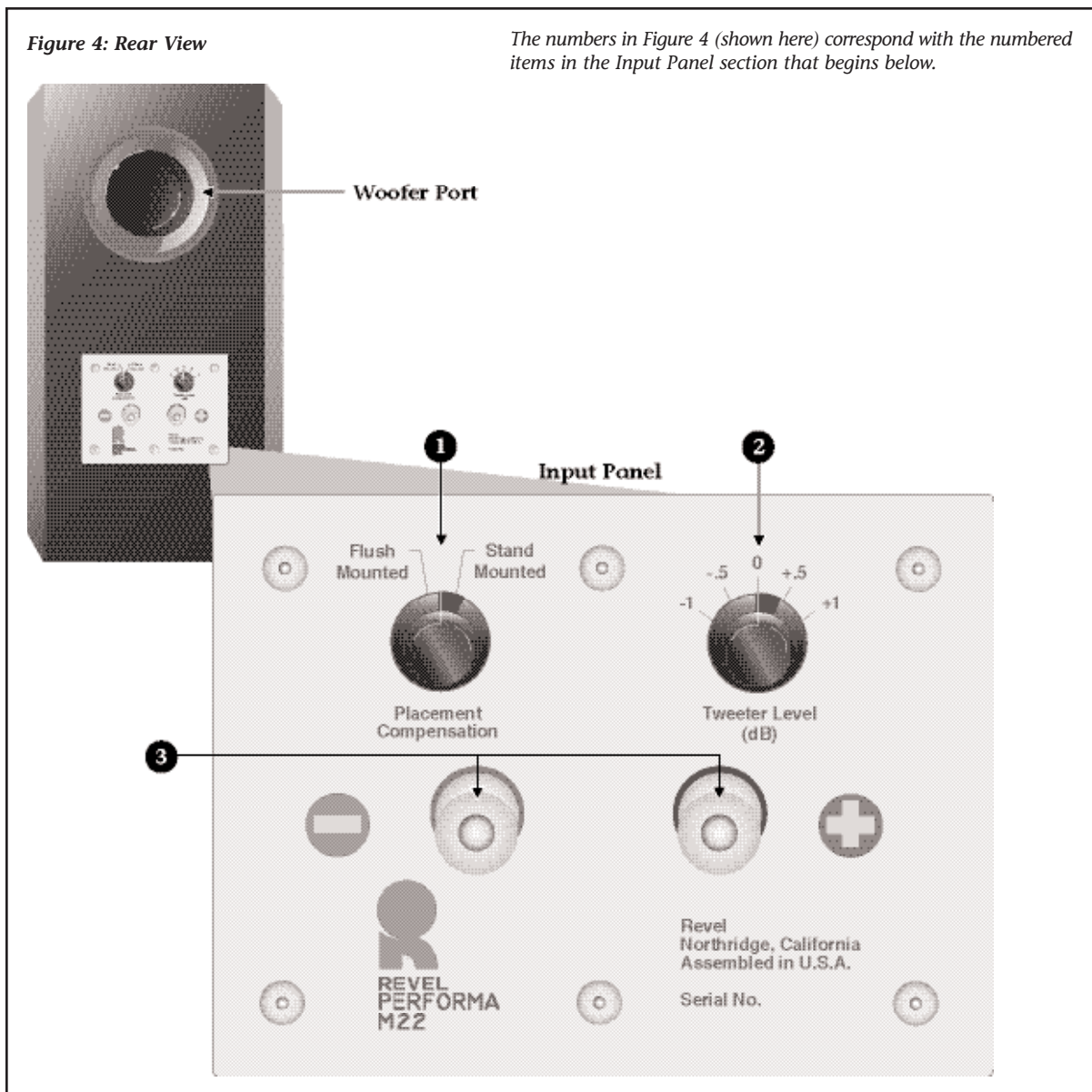
1. Placement Compensation Control

Optimizes the M22's response to different loudspeaker placements. Refer to the Loudspeaker Placement section that begins on page 10 for more information.

- Select the **Flush Mounted** setting if the M22 is placed in a bookcase or wall unit or if the M22 is located less than 2 feet (0.61m) from walls and other objects.
- Select the **Stand Mounted** setting if the loudspeaker is placed on a stand (such as the optional pedestal stand).

Figure 4: Rear View

The numbers in Figure 4 (shown here) correspond with the numbered items in the Input Panel section that begins below.



2. Tweeter Level Control

Alters tweeter output levels by -1, -.5, 0, +.5, or +1dB.

Note

Refer to the *Optimizing Performance* section on page 14 for more information about the *Placement Compensation* and *Tweeter Level* controls.

3. Input Connectors

Provide input from the associated power amplifier. One "positive" (+) and one negative (-) gold-plated binding posts are available. Refer to the *Making Connections* section that begins on page 12 for additional information.

INSTALLATION CONSIDERATIONS

Loudspeaker fidelity depends on the following three factors:

1. Loudspeaker accuracy
2. Loudspeaker placement
3. Listening room acoustics

Advanced Revel design features allow the M22 to achieve exceptional acoustical precision. Each M22 is individually hand-tuned during manufacturing to match the production reference standard within a fraction of a decibel, ensuring incomparable loudspeaker-to-loudspeaker consistency. As a result, experimenting with loudspeaker placement and listening room acoustics will have the most significant impact on the M22's performance.

LOUDSPEAKER PLACEMENT

The bulleted items that begin below indicate important loudspeaker placement considerations for the M22.

- Remove all obstructions between the M22 and the primary listening position. For instance, a coffee table between the M22 and the primary listening position will degrade stereo imaging and timbre. Placing the M22s near large objects may also cause unwanted reflections.
- For the best stereo imaging, place the M22s at equal distances from the primary listening position and the side walls as shown in Figure 5 (top-right).
- For optimal stereo imaging and timbre, point the M22s directly toward the primary listening position as shown in Figure 5 (top-right). The toe-in angle can be reduced to widen the soundstage,

Figure 5: Loudspeaker Placement

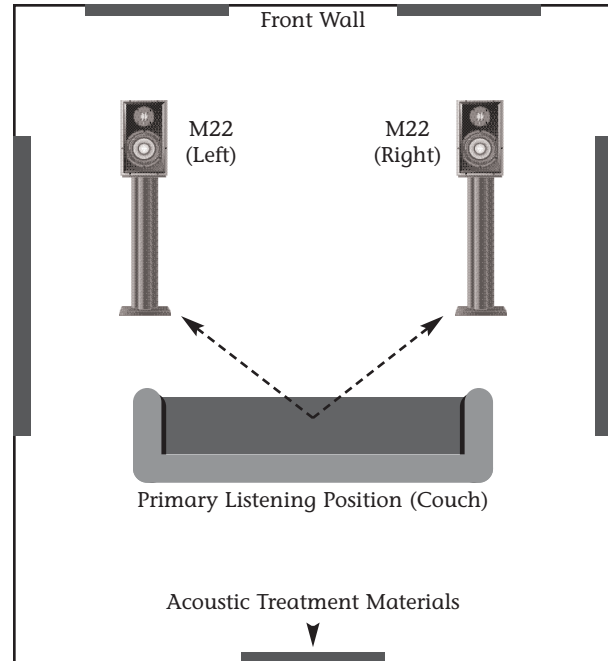


Figure 6: Stand Mounted

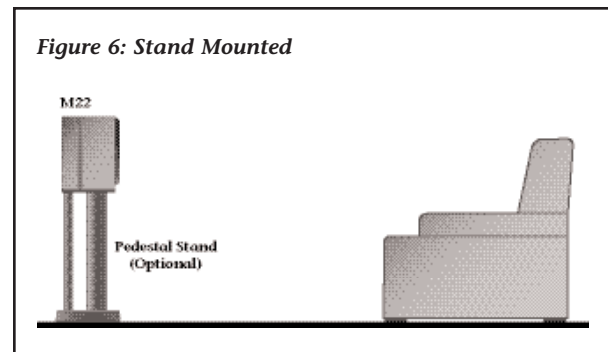
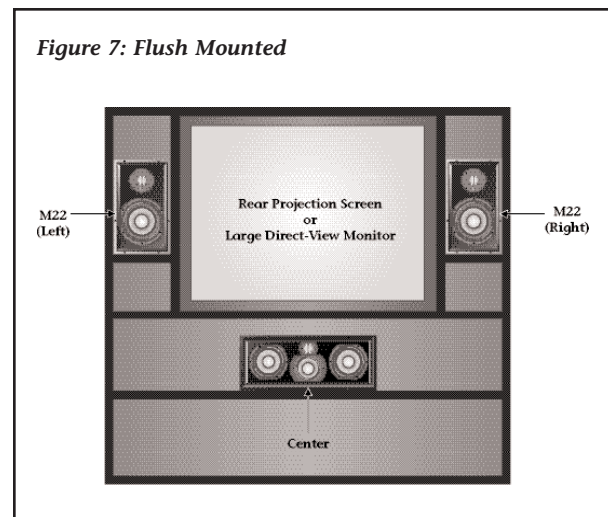


Figure 7: Flush Mounted



even to the point at which the M22s are pointing straight forward.

- Move the M22s farther from the front and side listening room walls to improve stereo imaging and the sense of spaciousness in the listening space.
- Move the M22s closer to the corners or walls of the listening room to increase bass response.
- Set the Placement Compensation control to **Stand Mounted** if the M22 is placed on stand such as the optional Performa Pedestal 22 stand shown in Figures 5 and 6 on the previous page. For best results, align the tweeter with the listener's ears as shown in Figure 6, with the front of the M22 facing toward the listener's head. Refer to the Performa Pedestal 22 Assembly Instructions that are included with the optional pedestal stand for additional information.

Note

The optional Performa Pedestal 22 Stand is available at authorized Revel dealers.

CAUTION

When placed on the optional pedestal stand, loudspeakers such as the M22 have a high center of gravity, which may cause them to fall if tipped or improperly positioned. To avoid this, anchor the stand to the floor and/or wall using the same procedures and hardware used to anchor bookcases, wall units, and other furniture. Harman Specialty Group assumes no responsibility for proper selection and installation of hardware or for any personal injuries or product damages resulting from improper installation or a fallen loudspeaker.

- Set the Placement Compensation control to **Flush Mounted** if the M22 is placed in a bookcase or wall unit as shown in Figure 7 at the bottom of the previous page.

LISTENING ROOM ACOUSTICS

Listening rooms have a profound impact on sound, particularly at lower frequencies. In fact, listening rooms can dominate sounds below about 400Hz. Ideally, listening rooms would include optimized dimensional ratios to minimize the effects of room resonances. But in reality, most listening rooms are not designed to enhance loudspeaker performance.

The interaction between loudspeakers and listening rooms is complex, depending on two important determinants that affect the loudspeaker and the listener.

1. Surfaces and other boundaries often cause large peaks and dips in low-frequency response. These peaks and dips often range 12dB or more.
2. Standing waves (also known as room modes or resonances) interact with both the loudspeaker and the listener, resulting in large frequency response errors.

Unfortunately, there is no simple solution that considers both factors. Even computer software programs that examine both factors may not calculate proper primary listening position or loudspeaker placement values.

In most cases, proper selection of the primary listening position combined with proper placement of the loudspeaker can still result in superior performance at lower frequencies. The difference between superior and inferior results is often just a small adjustment of the primary listening position or loudspeaker placement. Contact an authorized Revel dealer for assistance.

Acoustic Treatment Materials

The M22 features a high-order filter at 2.2kHz that optimizes its on and off-axis response, minimizing degradations that occur in overly “live” rooms. Placing minimal acoustic treatment materials at primary reflection points will reduce these distortions even further. Ideally, acoustic absorbers should be placed at the first reflection points on the front and side walls and either acoustic absorbers or diffusers should be placed at the first reflection point on the rear wall.

Because the listener’s eyes and ears are on the same plane, the “mirror method” is an accurate determinant of primary reflection points. This method can be used to determine reflection points for side walls, rear walls, front walls, and even the ceiling. Applying acoustic treatment materials to the side walls is most important, followed by the front wall, rear wall, and ceiling.

To determine reflection points using the mirror method:

1. Once the M22s have been placed, sit in the primary listening position.
2. Ask another person to slide a mirror along the listening room walls.
3. Note the locations at which the person sitting in the primary listening position can see either M22. Be sure to look for both M22s in the reflection on each room boundary. These are reflection points that require acoustic treatment materials.

If acoustic treatment materials are not available, hanging a rug over the reflection points will help to reduce reflections in overly “live” rooms. Carpeting the floor between the loudspeakers and the primary listening position and placing irregular surfaces such as bookcases at first reflection points will also help minimize strong reflections.

MAKING CONNECTIONS

The M22 features gold-plated binding posts and shorting-straps.

CAUTION

- **Never make or break connections unless all system components are powered off.**
-

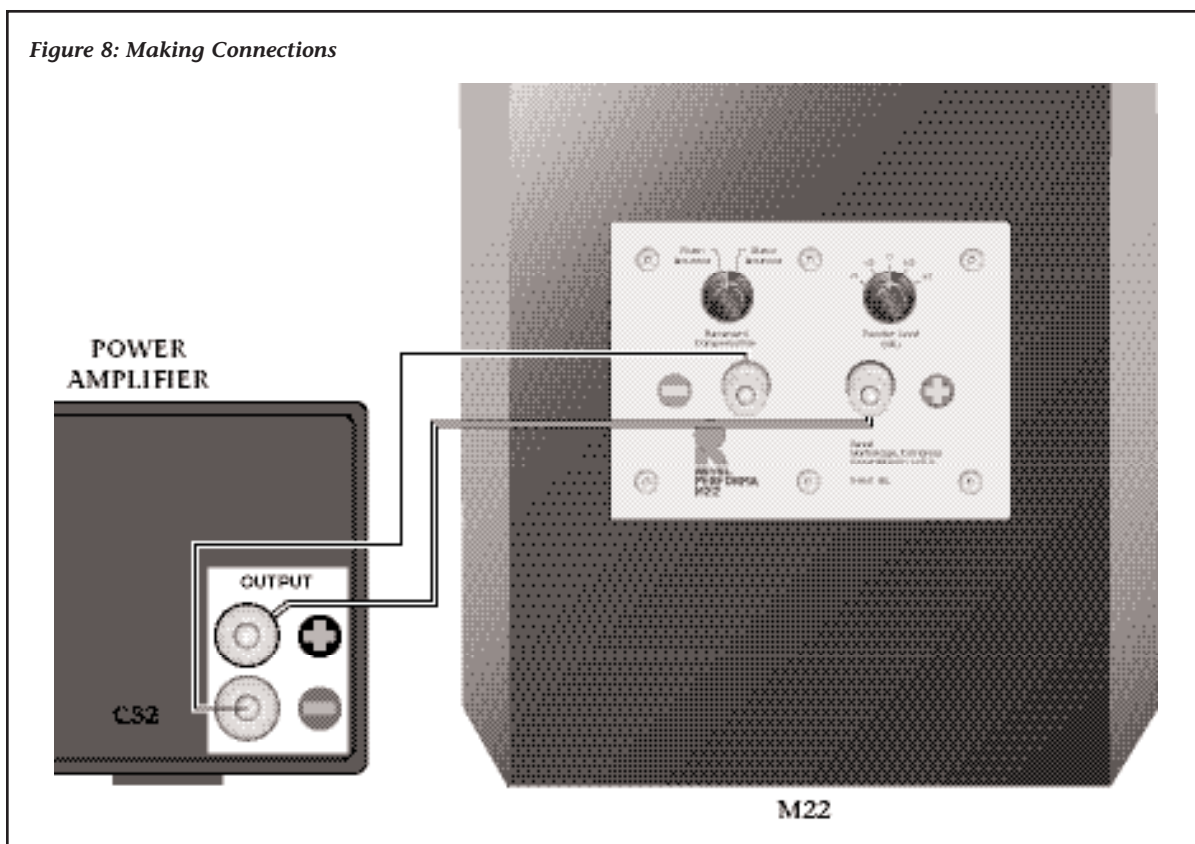
Before making connections, note the following:

- Use high-quality loudspeaker cable with a maximum total loop resistance of 0.07ohms or less (for each wire run). Refer to the table at the top of the next column to determine the appropriate maximum wire gauge.

Maximum Wire Gauge

Gauge (AWG)	Length (Feet)	Length (Meters)
6	87	27
7	69	21
8	58	18
9	43	13
10	34	10
11	27	8
12	22	7
13	17	5
14	14	4
15	11	3
16	9	3
17	7	2
18	5	2

Figure 8: Making Connections



Note

High loop resistances that exceed 0.07ohms (for each wire run) will cause the filter network to mis-terminate, resulting in considerable degradation of sound quality.

- Make all connections observing the proper polarity, positive-to-positive (+) and negative-to-negative (-). Connections that do not observe the proper polarity will cause poor stereo imaging and diminished bass response.

If desired, contact an authorized Revel dealer for information about the suitability of power amplifier components before connecting the M22 to the associated power amplifier.

- Review the owner's manuals for associated audio components to determine their connection procedures.

The M22 can be connected to the associated power amplifier output channel as shown in Figure 8 (above).

To connect the M22:

1. Connect one pair of loudspeaker wires to the M22 input connectors. Then, connect the same pair of loudspeaker wires to the desired power amplifier output channel.
2. Repeat step 1 to connect the second M22 to a separate power amplifier output channel.

OPTIMIZING PERFORMANCE

To optimize the M22 for best performance:

1. Set the Tweeter Level control to 0. (Different listening rooms may require other Tweeter Level control settings.)
2. Set the Placement Compensation control to the appropriate position.
 - Select the **Flush Mounted** setting if the M22 is placed in a bookcase or wall unit or if the M22 is located less than 2 feet (0.61m) from walls and other objects.
 - Select the **Stand Mounted** setting if the loudspeaker is placed on a stand (such as the optional pedestal stand).
3. Begin playback of a familiar music or film source.
4. Listen from the primary listening position, increasing volume to a comfortable level.
5. Experiment with the M22's placement to achieve the best overall tonal balance, image precision, and sense of spaciousness in the listening room. Refer to the Loudspeaker Placement section that begins on page 10 for additional information about loudspeaker placement.
6. Adjust the Tweeter Level control on each M22 to change high-frequency balance and timbre.
7. Repeat these steps to optimize performance of the second M22.

Note

For best results, set the Tweeter Level control on both M22s to the same position.

LOUDSPEAKER VOLUME LEVELS

High-order filters include steep cut-offs to reduce potential damage from “out-of-band” frequencies. Combined with carefully selected transducers and filter network components, this approach helps the M22 to maintain its performance under extreme operating conditions.

However, all loudspeakers have limits when it comes to continuous playback. To avoid these limits, avoid playback at volume levels that distort or strain sound.

CAUTION

To avoid damage, reduce volume level immediately if loudspeaker sound is not clean and clear.

Note

If desired, contact an authorized Revel dealer for information about the suitability of power amplifier components before connecting the M22 to the associated power amplifier.

SPECIFICATIONS

Specification	Value	Definition
Sensitivity	86.5dB SPL with 2.83Vrms @ 1m (4 pi anechoic)	Indicates the amount power the associated power amplifier must deliver to drive the loudspeaker at reasonable volume levels. Conservatively-rated specifications indicate moderate sensitivity, meaning that a massive power amplifier is not required to drive Revel loudspeakers to reasonable volume levels in large listening spaces.
Impedance	6.4Ω (nominal) 4.8Ω (minimum @ 160Hz)	Indicates whether the loudspeaker presents a “difficult” or “easy” load on the associated power amplifier. Combined with moderate phase angles, a minimal impedance specification of 4.8Ω allows any reasonably designed power amplifier to drive Revel loudspeakers.
Filter Network	Two-way, high-order @ 2.2kHz	Indicates the acoustical characteristics of the filter network. Steep filters indicate an optimized filter network that produces minimal acoustical interference, low distortion, and expansive dynamic range.
In-Room Response	±1.0dB from 46Hz to 16kHz	Indicates sound quality in context with other specifications. A breakthrough measurement, this specification closely correlates to sound quality in a single curve – a long-standing goal of loudspeaker engineers. Research and observation reveals that ubiquitous “on-axis” response curves cannot distinguish between two loudspeakers with radically different sound qualities.
Target Response	±0.75dB from 46Hz to 20Hz	Indicates sound quality in context with the individual loudspeaker's application, considering the acoustical impact of its placement. An ideal response goal, a target response is not flat at either end of the audible spectrum and is used when the ideal reference is not a flat line.
First Reflections Response	±1.5dB from 45Hz to 15kHz	Indicates the response listeners hear in relation to the first reflections from walls, ceilings, and floors. This specification indicates that Revel loudspeakers will remain accurate, even in listening rooms that cast strong reflections.
Listening Window Response	1.5dB from 45Hz to 16kHz	Indicates the on-axis response of the loudspeaker. An improved “on-axis” measurement, this specification reduces the visual confusion of inaudible interference. It retains full accuracy without using “spectral smoothing,” which results in significant data loss.
Low-Frequency Extension	-10dB @ 36Hz -6dB @ 41Hz -3dB @ 48Hz	Indicates the low-frequency response of the loudspeaker. Studies have shown that the -10dB specification best correlates to controlled listening tests. At low frequencies, most loudspeaker and listening room combinations demonstrate significant “room gain,” which produces an increase in levels as frequencies decrease. Unlike the -3dB specification, the -10dB specification reflects the steepness of low-frequency roll-offs.

Specifications are subject to change without notice.

DIMENSIONS & WEIGHT

Width: 8.625 inches (21.9cm)

Height: 14.5 inches (36.8cm)

39.937 inches (101.4cm) with optional stand

Depth: 11.875 inches (30.2cm) with grille

Weight: 24 pounds (10.8kg) without packaging

Specifications are subject to change without notice.

OBTAINING SERVICE

Before returning a loudspeaker for warranty or non-warranty service, contact Harman Specialty Group Customer Support to determine the extent of the problem and to obtain a Return Material Authorization (RMA) number. No loudspeakers will be accepted without an RMA number issued from Harman Specialty Group.

If a Revel loudspeaker must be returned for repair, Harman Specialty Group will assume no responsibility for the loudspeaker during shipment from the customer to Harman Specialty Group, whether the loudspeaker is or is not covered under warranty.

All returns must be:

- well-packaged using the original packing materials (if possible)
- properly insured and consigned
- pre-paid to a reliable shipping agent

The following information must be included when a loudspeaker is returned for service:

- name
- company name
- street address, city, state, and zip code
- telephone number, including area code and country code (if applicable)
- loudspeaker serial number
- a detailed description of the problem
- the preferred method of return shipment
- RMA number clearly marked on both the inside and outside of the package

Do not return accessories such as owner's manuals unless instructed to do so.

To contact Harman Specialty Group Customer Support:

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