

Benchmark
...the measure of excellence!TM

Benchmark *SMS1* Instruction Manual

Stand-Mount 2-way Speaker System



Overview

Thank you for selecting the Benchmark **SMS1** 2-way speaker system.

These speakers are designed to provide exceptional clarity, low distortion, and broadband frequency response.

Impressive low-frequency extension was achieved using a custom designed 170mm copolymer woofer in an acoustic-suspension enclosure. This port-free design eliminates the noise that can be created by port turbulence, while still achieving extended low-frequency response.

The silk dome tweeter was selected for its clean, non-fatiguing high-frequency response.

We have selected the finest crossover components available. We have specified ClarityCap film capacitors in custom-built precision values. These capacitors contribute to the exceptional vocal-range clarity of the **SMS1** speakers. Likewise, we have specified precision wound air-core inductors and have eliminated the more typical iron-core inductors. Air-core inductors totally eliminate the distortion that can be caused by core materials. The precision capacitors and inductors minimize crossover variations and provide precise unit to unit matching. This precise matching contributes to the exceptional stereo imaging of the **SMS1**.

The speaker grills are constructed from acoustically transparent microphone grill material. These grills provide exceptional protection and a unique appearance while outperforming cloth or foam grills.

Unique features include high-performance NL4 twist-lock input connectors, a bi-amp switch, and a choice of furniture-grade hardwood side panels.

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Safety Information

Provide a Stable Mounting Surface

Do not place this product on an unstable cart, shelf, stand, bracket, or tripod. The unit may fall, causing serious injury and/or serious damage. Support must be stable, and must be capable of supporting the weight of the product. Many speaker stands have provisions for adding ballast to improve stability - use this feature when available.

Secure all Cords

Speaker cords can cause a tripping hazard and may cause a speaker to fall. Keep all cords away from areas where they could cause a tripping hazard. When using stands, cords should exit from the bottom of the stand, or should be secured at the bottom of the stand. Cords should always be secured to prevent pulling the speaker from its mounting.

Risk of Hearing Damage

High sound pressure levels can damage your hearing. Do not get close to the speakers when operating them at high volumes.

Magnetic Interference

Loudspeaker drivers are electro-magnetic devices. They emit magnetic fields that may interfere with older CRT-type monitors. Do not place magnetic items near the drivers. Magnets and magnetic materials can damage the drivers.

Quick Start Guide

Thank you for selecting the Benchmark **SMS1** loudspeakers. The suggestions in this guide will help you to get the most enjoyment from these high-quality speakers. If you have questions, our support staff is available at 1 800-BNCHMRK, +1-800-262-4675, +1-315-437-6300, or at support@benchmarkmedia.com Please do not hesitate to contact us. We are here to help.

Speaker Placement

Provide a Stable Mounting Surface

A stable vibration-free mounting surface is important for achieving proper stereo imaging. It is also an essential consideration for safety.

Do not place this product on an unstable cart, shelf, stand, bracket, or tripod. The unit may fall, causing serious injury and/or serious damage. Support must be stable, and must be capable of supporting the weight of the product. Many speaker stands have provisions for adding ballast to improve stability - use ballast features when available.

Orientation

The **SMS1** speakers are designed to be oriented vertically (tweeter above the woofer). Do not place the speakers on their sides.

Height

The **SMS1** should be mounted so that the tweeters are at ear height, or a few inches above ear height. If the speakers must be mounted higher or lower than this, they should be angled so that the tweeters point directly toward or slightly above the listener's ears.

Distance to Listening Position

Depending on the application (near-field or mid-field), your speakers should be located 4 to 16 feet from the primary listening position. The distance between the speakers may range from 4 to 8 feet depending on the application, but this distance should not exceed the distance between the speaker and the listening position. Both speakers should be exactly the same distance from the primary listening position.

The Stereo Triangle

Ideally, the speakers and the listener should form a triangle where the listener is exactly the same distance from both speakers. During set-up, we recommend measuring to ensure equal distance.

Optimum stereo imaging is only achieved when the listener is exactly the same distance from both speakers. Variations of a few inches will diminish the accuracy of the stereo imaging. When this geometry is incorrect, center-stage high-frequency sounds will move out to the right and left speakers.

Toe In

The speakers should be angled directly toward the listener. Start with the left-hand speaker angled toward the listener's left shoulder, and the right-hand speaker angled toward the listener's right shoulder. Feel free to experiment, small changes in toe in may widen the "sweet spot" of the listening room.

Room Interactions

No listening space is perfect, but proper speaker placement can reduce undesirable interactions with the room.

For best results:

- Avoid placing the speakers near room corners or side walls.
- Avoid other reflective surfaces whenever possible.
- In most rooms, the speakers should stand more than 2 feet out from the front wall.
- Avoid placing the listening position too close to the rear wall.

Placement near walls can stimulate room modes and enhance the bass energy at specific frequencies. If some enhancement of the bass is desired, move the speakers slightly closer to the wall. Use caution, room modes can produce significant peaks and other inaccuracies in the low-frequency response.

Reflective side surfaces will interfere with stereo imaging. If speakers cannot be moved away from side surfaces, these surfaces should be angled away from the listening position, or should be treated with acoustic materials. Surfaces that reflect an image of the speaker directly to the listening position should be given the most attention.

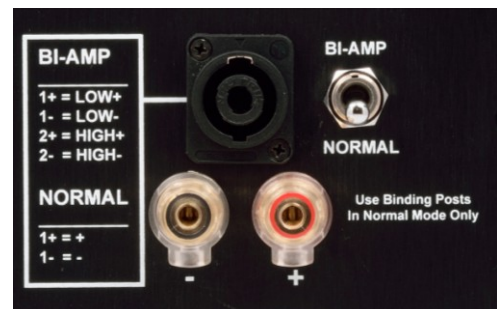
Amplifier Selection

Recommended amplifier power is 30 - 200 Watts. The Benchmark **AHB2** is an ideal match for the **SMS1** speakers. The **AHB2** delivers 160 Watts per channel into the 6-Ohm **SMS1**. There is no need to run the **AHB2** in mono mode as this will overpower the **SMS1** speakers.

Amplifier Connections

The **SMS1** has two sets of input connections; traditional binding posts, and high-performance SpeakON NL4 twist-lock speaker connectors. Both sets of connectors support standard 2-wire connections from the power amplifier. The NL4 connectors also provide separate connections to the high-frequency and low-frequency sides of the crossover network when the **BI-AMP** switch is activated.

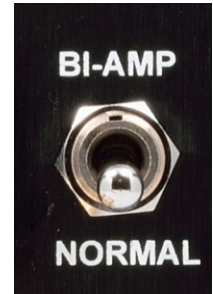
The NL4 connectors are compatible with 4-pole NL4 plugs or 2-pole NL2 plugs. Use two-pole NL2 pugs and cable for standard wiring. Use four-pole NL4 pugs and cable for Bi-Wire and **BI-AMP** applications.



If you choose to use the binding posts, be careful to keep all connections properly polarized (connect + to + and - to -). Do not turn the power amplifier on until all binding-post connections are secured.

BI-AMP Switch

The BI-AMP switch must be set to **NORMAL** for most applications. It must always be set to **NORMAL** when using the binding posts. If this switch is in the wrong position, the high-frequency driver may not receive an input signal.



Break-In Period

The **SMS1** speakers require a 20 to 30 hour break-in period to reach full performance. Speaker drivers are electro-mechanical devices and the materials used in these devices undergo minor mechanical changes during the break-in period. You should hear increased energy in the lowest octave, and a more relaxed midrange, when the break-in period is completed.

Proper Care

Your speakers carry a warranty against defects. However, the warranty does not cover failure from abuse. Please use good judgment.

Tweeter failures are often related to underpowered or overdriven systems. A clipping power amplifier can produce unusually high levels at the input to the tweeter. Do not touch the silk-dome tweeter. It is very delicate and is easily damaged.

The woofer can be damaged by excessive power.

Grill Removal and Insertion

The speaker grills are designed to protect the drivers from accidental contact while providing excellent acoustic transparency. We recommend keeping the grills in place.

Each grill is attached with four press-fit pins and sockets. There is one pin on each corner of the grill. Use extreme care when attaching or removing grills.

To remove grill:

- Grasp the bottom of the frame and gently pull the grill until the two bottom pins are free.
- Grasp the top of the frame and gently pull to clear the remaining two pins.
- Avoid twisting the grill frame when inserting or removing.
- Do not pull or press on the sides of the grill frame.

To insert grill:

- Grasp the top of the frame and gently insert the two top pins.
- Grasp the bottom of the frame and gently insert the two bottom pins.
- Avoid twisting the grill frame when inserting or removing.
- Do not pull or press on the sides of the grill frame.

Bi-Amp and Bi-Wire Operation

Bi-Amp Operation

Set the switch to **BI-AMP** when driving the tweeter and woofer from separate amplifiers. In **BI-AMP** mode, two amplifier channels will be required for each speaker. A four-pole NL4 cable is required for all **BI-AMP** applications. In **BI-AMP** mode, the passive crossover is split into separate high and low frequency sections. Both drivers still receive the proper range of frequencies and no external crossover is required. This topology simplifies the use of the **BI-AMP** mode while protecting the drivers from incorrect wiring.

Bi-Amp Operation May Reduce Power Amplifier IMD

BI-AMP connections use separate amplifiers to drive the woofer and tweeter. With many amplifiers, this will reduce IMD (intermodulation distortion) and may improve the sound quality.

Please note that it is not necessary to use a Benchmark **AHB2** in **BI-AMP** mode. The **AHB2** is virtually distortion free, and the use of bi-amplification will not reduce distortion. However, bi-amplification can offer an opportunity to add separate active filters for the high-frequency and low-frequency drivers. In such a system, a **BI-AMP** connection from an **AHB2** will allow fine-tuning of driver and room response.

Using Bi-Amp Mode to Add Correction Processors

BI-AMP connections provide an opportunity to fine-tune the frequency-domain and time-domain response of the speakers and room using external active processing. This processing can be added as an analog process (between the DAC and power amplifier), or as a digital process (before the DAC). If the correction is digital, two channels of D/A conversion and two channels of amplification will be required for each speaker. If the correction is analog, there is no need to duplicate the number of D/A channels, but two channels of amplification will still be required for each speaker.

When using a Benchmark **AHB2** for **BI-AMP** connections, connect the four-pole NL4 cable to the "1&2" output connector on the **AHB2**. Channel 1 drives the woofer, channel 2 drives the tweeter.

Bi-Wire Operation

The **SMS1** supports Bi-Wire connections when the speakers are set to **BI-AMP** mode. Bi-Wire connections use separate conductors for the woofer and tweeter. Unlike **BI-AMP** connections, both sets of conductors are driven from a common amplifier channel. Bi-Wire connections offer no advantages when high-quality cables are used over relatively short runs. Bi-Wire connections may be useful for long cable runs. Special two-pole to four-pole cables are required for Bi-Wire connections. The high-frequency and low-frequency conductors must be connected together at the power amplifier, but must be connected to separate pins in the NL4 plug at the speaker end of the cable. NL4 pin assignments are shown on the rear plate of the **SMS1**.

Technology

Crossover

The **SMS1** has remarkable vocal clarity. Much of this can be attributed to the low-distortion crossover design and to the choice of the crossover frequency.

To achieve unusually low distortion, the **SMS1** crossover uses some of the highest-quality components available.

Film Capacitors

The **SMS1** uses film capacitors custom-built for Benchmark by ClarityCap. Metalized polypropylene film capacitors produce much less distortion than other types of capacitors. In our opinion, ClarityCap builds the best audio capacitors available. Each capacitor is built to tight tolerances at the exact non-standard values required for our crossover. ClarityCaps are also mathematically modeled and designed to minimize microphonic effects that can cause high-frequency distortion.

Air-Core Inductors

Most passive crossovers use at least one iron-core inductor. The iron-core reduces the size and cost of the inductor, but the core can produce distortion. We chose to entirely eliminate iron-core inductors from the **SMS1** crossover. This choice eliminates harmonic distortion caused by low-bass frequencies interacting with the iron core. This distortion usually adds clutter to the mid-bass and vocal frequencies. In our listening tests, we preferred the clean sound of the 100% air-core design.

Strategic Crossover Layout

Crossover inductors can interact with each other and with the voice coils on the drivers. The **SMS1** crossover placement and layout are specifically designed to minimize these inductive interactions. This reduces unwanted variations in the frequency response while reducing the distortion that can be caused by inductor crosstalk.



Non-Inductive Wire-Wound Resistors

Wire-wound resistors have excellent temperature coefficients. This prevents changes in resistance that can occur when resistors are heated by music power. Crossover resistors dynamically change temperature at the peaks of music waveforms. The low temperature coefficient keeps the resistance constant and prevents thermally-induced distortion.

The resistors used in the **SMS1** are also specially wound to minimize inductance. This construction eliminates interactions between the resistors and inductors, while producing a resistor that behaves in an ideal manner.

3 kHz Crossover Frequency

The **SMS1** uses a higher crossover frequency than most 2-way speakers of similar size. Most 2-way speakers place the crossover right in the middle of the vocal band. At 3 kHz, the **SMS1** crossover is comfortably above the vocal range and this improves the clarity of the vocals.

SpeakON NL2 and NL4 Cables and Connectors

The NL4 connectors on the **SMS1** provide very low impedance connections and are rated for high-current professional applications. The NL4 connectors are rugged, reliable, and easy to use. In our tests, they consistently outperformed binding post connections. The NL4 connector can be used with four-pole NL4 plugs, or two-pole NL2 plugs.

The NL4 connectors also prevent polarity reversals, loose wires, and short circuits. We highly recommend selecting NL4 or NL2 cables instead of cables that use traditional binding-post terminations.

The Benchmark **AHB2** power amplifier is also equipped with NL4 SpeakON connectors. This makes system set-up quick, easy, and reliable.

Use a pair of two-pole NL2 to NL2 cables to connect one **AHB2** power amplifier to a pair of **SMS1** speakers operating in **NORMAL** mode. Use a pair of four-pole NL4 to NL4 cables to connect two **AHB2** power amplifiers to a pair of **SMS1** speakers operating in **BI-AMP** mode.

Woofer

The proprietary 170 mm (6.7") woofer features a copolymer cone and a long excursion. It is specifically designed for use in our acoustic suspension cabinet.

Tweeter

The 25 mm soft dome tweeter was selected after extensive listening tests. It provides clean, accurate, and detailed high-frequency output with low unit-to-unit variance.



Acoustic Suspension

We know that small ported loudspeakers have become fashionable. We don't do fashion. Ported speakers create the illusion of bass extension by emphasizing certain frequencies (hence the name "tuned port"). In smaller speaker enclosures, ports often produce a non-linear bass response - sometimes described as "one note bass". Ports can make a small speaker seem large, but accuracy can suffer in the name of big bass.

Ports can also create turbulence that can produce a "chuffing" sound. Smaller enclosures often have high-velocity ports that suffer from this problem.

The **SMS1** is an acoustic suspension loudspeaker; it has a sealed cabinet, without ports. By nature, it is more linear than a ported design. It can still produce impressively deep bass. The trade-off is efficiency. The **SMS1** will require slightly more power than comparably sized ported designs.

Speaker Grills

The stainless steel mesh used on the speaker grills was originally designed for microphone screens. The material is designed to provide acoustic transparency while providing substantial protection to precision microphones. It's rigid appearance may give the impression that it is not transparent, but it actually outperforms most cloth grills while providing a unique appearance.



Specifications

The **SMS1** is a 2-way passive acoustic-suspension monitor/loudspeaker with **BI-AMP** capabilities.

Drivers

- 170 mm Custom Copolymer Low-Frequency Driver
- 25 mm Soft Dome High-Frequency Driver

Passive Crossover

- Air-Core Inductors for Minimal Distortion - Custom Built for Benchmark
- Top-Quality Precision Film Capacitors - Custom Built for Benchmark
- Non-Inductive Wire-Wound Power Resistors
- Precision Component Tolerances for Precise Matching
- Asymmetric Crossover Optimization
- 3 kHz Crossover Frequency

BI-AMP Mode

- Switch-Selected **BI-AMP** Mode
- Uses NL4 4-Pole Input Connector

Input Connectors

- One SpeakON NL4 High-Current 4-Pole Twist-Lock Input Connector
- Two Fully-Insulated Multi-Way Binding Posts

Dimensions

- 10.75" W x 13.5" H x 9.87" D (270 mm W x 345 mm H x 250 mm D)
- Recommended [Stand](#) Height: 29" to 36" (736 to 914 mm) - Floor to Base of Cabinet

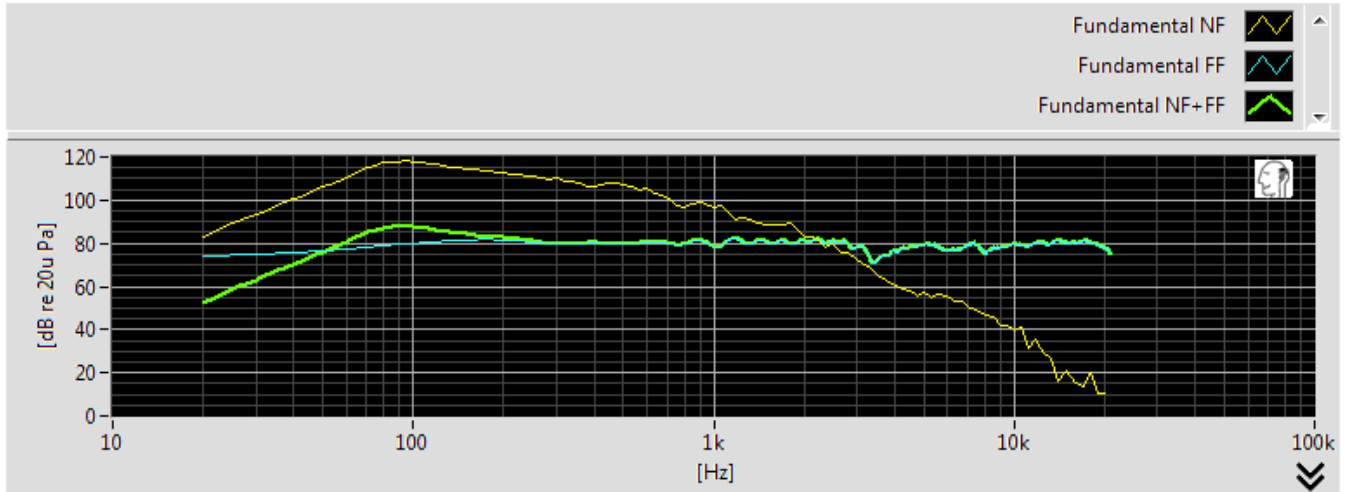
Weight

- Unit Weight: 23 lbs. (10.4 Kg) - One Speaker with Grill
- Shipping Weight: 52 lbs. (23.6 Kg) - Speaker Pair in Single Carton

Performance

- Frequency Response: 44 Hz - 22 kHz
- Crossover Frequency: 3 kHz
- Sensitivity: 88 dB
- Input Impedance: 6 Ohms
- Recommended Power: 30 - 200 W

Frequency Response Plots



The green curve shows the combined response of the woofer and tweeter at a distance of 6 feet. The measurement is on-axis with the tweeter.

The yellow curve shows the near-field response measured at the woofer.

The blue curve shows the far-field response measured at a distance of 6 feet.

The measurement system combines the near-field and far-field measurements in order to calculate the anechoic combined response shown by the green curve.

Regulatory Compliance

RoHS Compliance Statement

This statement clarifies Benchmark Media Systems, Inc. product compliance with the EU's (European Union) directive 2002/95/EC, or, *RoHS* (Restrictions of Hazardous Substances).

As of July 01, 2006, All Benchmark Media Systems, Inc. products placed on the European Union market are *compliant* (containing quantity limit weight less than or equal to 0.1% (1000 ppm) of any homogeneous Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr VI), and flame retardant Polybrominated Biphenyls (PBB) or Polybrominated Diphenyl Ethers (PBDE)).

Warranty Information

Benchmark 1-Year Warranty

The Benchmark 1-Year Warranty

Benchmark Media Systems, Inc. warrants its products to be free from defects in material and workmanship under normal use and service for a period **of one year from the date of delivery.**

This warranty extends only to the original purchaser. This warranty does not apply to fuses, lamps, batteries, or any products or parts that have been subjected to misuse, neglect, accident, modification, or abnormal operating conditions.

In the event of failure of a product under this warranty, Benchmark Media Systems, Inc. will repair, at no charge, the product returned to its factory. Benchmark Media Systems, Inc. may, at its option, replace the product in lieu of repair. If the failure has been caused by misuse, neglect, accident, or, abnormal operating conditions, repairs will be billed at the normal shop rate. In such cases, an estimate will be submitted before work is started, if requested by the customer.

Attempts to deliberately deface, mutilate, or remove the product's label will render this warranty void. Benchmark will not honor warranties for any products disingenuously purchased on the US or Canadian markets for export.

The foregoing warranty is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness or adequacy for any particular purpose or use. Benchmark Media Systems, Inc. shall not be liable for any special, incidental, or consequential damages, and reserves the right to change this information without notice. This limited warranty gives the consumer-owner specific legal rights, and there may also be other rights that vary from state to state.

Benchmark Extended Warranty Options

The Benchmark Extended 5-Year Warranty *

Benchmark Media Systems, Inc. optionally extends the standard 1-year warranty to a period of **five years from the date of delivery**.

*For the extended warranty to become effective, the original purchaser must register the product at the time of purchase either by way of the enclosed registration card or through the product registration section of the Benchmark Media Systems, Inc. website. This optional warranty applies only to products purchased within the US and Canada and is extended only to the original purchaser.

Attempts to deliberately deface, mutilate, or remove the product's label will render this warranty void. Benchmark will not honor warranties for any products disingenuously purchased on the US or Canadian markets for export. The terms of the extended warranty are subject to change without notice. For products purchased outside the US and Canada, please refer to the Extended Two 2-Year International Warranty.

The Benchmark Extended 2-Year International Warranty **

Benchmark Media Systems, Inc. optionally extends the standard 1-year warranty to a period of **two years from the date of delivery**.

**For the extended warranty to become effective, the original purchaser must register the product at the time of purchase either by way of the enclosed registration card or through the product registration section of the Benchmark Media Systems, Inc. website. This optional warranty applies only to products purchased outside the US and Canada and is extended only to the original purchaser.

Attempts to deliberately deface, mutilate, or remove the product's label will render this warranty void. Benchmark will not honor warranties for any products disingenuously purchased on the US or Canadian markets for export. The terms of the extended warranty are subject to change without notice. For products purchased in within the US and Canada, please refer to the Extended Five 5-Year Warranty.

Notes on Warranty Repairs

An RMA (return merchandise authorization) number, issued by our Customer Service Department, is required when sending products for repair.

They must be shipped to Benchmark Media Systems prepaid and preferably in their original shipping carton with the RMA number clearly visible on the exterior of the packaging. A letter should be included giving full details of the difficulty.

Made in the USA



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