

USER MANUAL



VS21-MK3

Single 21"
Powered Subwoofer

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Este manual está disponible en español en nuestro sitio web en bassboss.com/support

Overview

The VS21-MK3 Single 21" Powered Subwoofer offers low-frequency extension similar to vented dual 18" subwoofers in combination with the hard hitting punch of horn loaded subwoofers. The VS21-MK3 brings the world of extended low frequency together with the world of high-impact: You're no longer forced to choose either deep OR punchy, as the VS21 offers both.

The VS21-MK3 is a vented, short horn hybrid sixth order bandpass which features a massive displacement, long excursion 21" woofer, rear-loaded into a large acoustical volume that is tuned to a low frequency, and front-loaded onto a short horn. The vented enclosure section provides extended low frequency performance and the horn section provides increased upper frequency sensitivity and improved transient response.

The VS21-MK3 features a 2500W amplifier with an auto-sensing, globally compatible power supply that can run on mains supplies anywhere between 90 and 250 Volts. Full output power is available on anything over 110V. The amplifier's high peak-output voltage provides for intense high SPL hits while its sustained output is unparalleled in its ability to deliver the liquid lows. The amplifier is passively cooled via its external heat-sink and by woofer-generated air-flow through the port. When necessary, two blower-fans will engage to provide additional forced-air cooling capacity in more extreme conditions.

New to the MK3 are Neutrik powerCON True 1 TOP (Total Outdoor Protection) waterproof mains connectors. Waterproof mains connectors along with a totally isolated input connection section and cones that are waterproofed make the MK3 series the powered loudspeakers that can be used outdoors without fear of what the weather will bring. (Or used indoors without fear of what the partiers bring.)

Electrical power is converted into the much more desirable acoustical power by a robust, neodymium motor, 21-inch woofer with a massive 4.5-inch (115mm) voice coil. Neodymium magnets are lighter, and their higher intensity provides higher efficiency, so the result is a lighter and louder cabinet than those with ferrite drivers.

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The MK3 features an all-new DSP. The comprehensive suite of processing includes high-pass and low-pass filters as well as multiple protection systems and limiters to prevent driver overload in as many ways as possible, including thermal, excursion and clipping. The five levels of protection actively prevent overheating of the voice coil, minimize long-term thermal compression and limit excursion. Because they operate in 5 different modes, the limiters are sophisticated enough to have a largely unnoticeable effect on the transient response and allow the subwoofer to deliver peak output safely.

The new DSP features an Ethernet interface. This can be used to control the cabinets from a computer or to load software or firmware updates. The ethernet connectivity in conjunction with the DSP board allows signal to be sent via Milan AVB. Firmware updates will provide access to this feature.

Within the software, multiple cabinets can be grouped together, allowing them to respond to commands simultaneously. This permits the levels of multiple loudspeakers to be adjusted together and yet independently from the levels of other groups of loudspeakers. In addition to individual and grouped level controls, presets can be loaded and signal levels and temperatures can be monitored. Each cabinet includes a two-port switch so multiple cabinets can be chained on the same data cable.

The MK3 DSP features storage capacity of up to 100 presets, eight of which can be accessed at the touch of a button with no need for a connected computer. The eight directly accessible presets are compatible with all the presets in the MK3 Top Boxes and are also compatible with previous generation tops and subs.

Quick Start Guide

1. Ensure the cabinet is secure and stable, on level ground.
2. Attach any poles/additional mid-high cabinets to the subwoofer.
3. Connect signal via the XLR-F input.
4. Connect the XLR-M connector to additional subs or tops.
5. Connect the mains power and verify the "Ready" LED is lit.

BASSBOSS systems are easy to set up quickly. The best possible results are achieved consistently because of the integrated nature of the designs. All BASSBOSS loudspeakers are complete, integrated systems, featuring the cabinet, transducer, amplifier and a comprehensive suite of processing. Setup is particularly easy because the products integrate with each other.

Provided the cabinets are physically aligned, any BASSBOSS sub can be combined with any BASSBOSS top and their outputs will be phase-coherent. This means no cancellations and no gaps in the response at the crossover frequency, regardless of which preset is selected.

The on-board BASSBOSS processing allows for the following:

Any BASSBOSS powered subwoofer can be combined with any other BASSBOSS Powered subwoofer and their outputs will sum coherently. (i.e.: in phase with each other.)

Any BASSBOSS powered subwoofer or combination of BASSBOSS powered subwoofers can be combined with any BASSBOSS powered top and their outputs will sum coherently through the crossover region.

HOWEVER only one model of top should be used at a time. An assortment of different tops cannot be stacked together and still achieve coherence and clarity.

The following tops should be used individually, i.e. should NOT be arrayed:

- AT312 (Co-axial point-source Main)
- DiaMon (Co-axial point-source satellite)
- SV9 (2-way monitor with Satellite mode)

The following tops can be used in arrays:

- MFLA (Medium Format Line Array, up to 20 cabinets can be arrayed)
- AT212 (Horizontally arrayable when necessary)
- DV12 (Arrayable in PAIRS ONLY with the upper box of the pair inverted.)

Outboard Processing Warning

Third-party outboard processing (Drive Racks, etc.) are not recommended and are not necessary with BASSBOSS MK3 series powered loudspeakers. Outboard processing will not improve, and will very likely degrade the sound quality, reliability and output capacity. Using external processing inappropriately can cause driver damage that is not covered by warranty.

The internal processing can accomplish everything an external processor could accomplish without degrading the sound quality and without putting components at risk. Before considering using an outboard processor, contact BASSBOSS customer service with your use-case scenario for assistance in setting up the internal processing to achieve your goals.

Setup Procedure

Once the the cabinet is in the desired location, signal cables should be connected via the XLR-F input. It's recommended to run balanced signal cables to minimize the chance of noise and ground-loop hum. The incoming signal should be unprocessed because all the necessary processing is done in the built-in DSP. The signal should be run directly from the outputs of a mixer or controller.

The XLR-M connector provides a full-range, unprocessed, pass-through connection to additional cabinets. This output can be connected to additional subs or tops. Up to 12 cabinets can be connected on a single output from a mixer or controller.

Connecting the mains power. The power connector is a Neutrik PowerCON TOP waterproof type. The power connector inserts with the silver tab rotated counter clockwise from vertical, at about the 10:00 position, and once inserted, rotates clockwise to the 12:00 position to lock in place. Once locked, this connector is waterproof.

This connector also serves as the power switch. To disconnect and remove the connector, pull back on the silver tab to unlock it and rotate it counter clockwise. Once rotated to the insertion angle, the connector can be removed.

When connecting and disconnecting, no force should need to be applied. If the connector doesn't insert and rotate smoothly, either it's in the wrong position or it's damaged and should be replaced.

Always use a grounded outlet. The supplied power cord includes a standard grounding NEMA 5-15 (Edison) 120-Volt US wall plug. In unfamiliar locations it's recommended to verify the correct wiring of outlets before powering your system.

It's highly recommended to connect all signal and power cords to the speakers before plugging the power cords into mains outlets. When your speaker is powered on, you'll see all the indicator lights turn on and then show the system's current status.

Although the VS21 cabinet is equipped with a 35mm steel pole socket, DO NOT use this speaker on a tripod or extension pole. This socket is to be used with a special, short section of pole to prevent it from moving once stacked on a subwoofer.

Operation & Controls

There are 2 controls on the amplifier.

1: Input

This knob adjusts the input level from -72dB to -0dB. To avoid distortion and clipping, make sure the input signal doesn't exceed +22dB and the output doesn't reach clipping before you achieve the desired sound level.

While the amplifier has built-in limiters and safety features to protect itself and the speaker, it can't protect the speaker from distorted incoming signals. The amplifier will simply amplify the clipped signal, which can do the same damage as clipping an amplifier. Since it's essentially impossible for these amplifiers to clip, signal-level clipping is the most common cause of damage to these speakers.

If you hear distortion, lower the *input level* right away.

2: Preset Select

Pressing the Preset Select button cycles through presets 1-8, and pressing it again after preset 8 returns to preset 1. Each preset includes all necessary low-pass and high-pass filters at the selected frequencies and all the necessary alignments to maintain phase coherence in the crossover range when used with other BASSBOSS powered speakers.

Presets help you fine-tune the balance between the subwoofers and top speakers. More details on the different combinations are on page 7.

Indicator LEDs

Indicator LEDs - Left side, bottom to top:

Ready: Indicates that power is on and the system is ready to play.

Signal: Indicates the presence of input signal.

-12dB: Indicates there is 12dB of headroom remaining before reaching maximum output.

-6dB: Indicates there is 6dB of headroom remaining before reaching maximum output.

Limiting: Indicates one of the channels is reducing the incoming signal level to prevent overdrive.

Overheat: Indicates the amplifier is reducing output to prevent shut-down from overheating.

Protect: Indicates the amplifier is shut down due to a condition that could cause further damage.

The Protect LED also is engaged when the system has been muted via the software.

Comm Link: Indicates communication is active on the LAN connection(s).

Indicator LEDs, Right Side, Bottom to top:

Presets 1-8 - The illuminated LED indicates the corresponding preset is loaded.

How to Use the Presets

Setting the low-pass filter frequency on the subwoofer to match the top cabinet's high-pass filter frequency and balancing their levels will achieve the smoothest sound across the frequency range.

There are no incompatible combinations.

Selecting high numbered presets on subs with low-numbered presets on tops will result in increased system output in the overlap range, which can be helpful in some situations but can also result in a "boomy" sound.

When the subwoofer levels are to be run higher than tops levels, (which is almost always) the effective crossover moves higher in frequency. If you intend to run your system "bass-heavy" it's recommended to run lower-numbered presets on the subs and higher-numbered presets on the tops to avoid an excessively "boomy" sound.

Selecting low-numbered presets on subs with high-numbered presets on tops may result in a lack of "punch" in certain combinations. This is most likely when not enough level is available from the subwoofer(s).

When not enough output is available from the sub(s), using a preset combination with overlap can help provide a little more bass level but it does limit the maximum level of the tops due to the added demand for low-frequencies from the tops.

It's recommended that you try several, if not all, combinations when first setting up to determine which combination works best in each environment. You will likely choose different combinations for wood floors, concrete floors and outdoors.

Experiment with different combinations to dial in your preferred combination in different environments.

Pre-Installed Onboard Presets

High-pass and low-pass filters with included phase compensation.

Preset 1 - 27 Hz - 70 Hz

Preset 2 - 27 Hz - 75 Hz

Preset 3 - 27 Hz - 80 Hz

Preset 4 - 27 Hz - 85 Hz

Preset 5 - 27 Hz - 90 Hz

Preset 6 - 27 Hz - 95 Hz

Preset 7 - 40 Hz - 100 Hz (Vinyl/Good Neighbor Mode)-

Preset 8 - Cardioid Mode (Use only when cabinet is facing away from audience)

*Preset 7 raises the high-pass filter to 30 Hz, reducing the level of the deepest bass notes. This provides an option to keep operators out of trouble with neighbors, venue owners or local authorities in the event of noise complaints.

**Preset 8 is the Cardioid mode setting. More information on using Cardioid Mode can be found on page 10.

Additional presets are accessible through software. See "How to Use the Presets" section for more information.

New presets will be available for download at bassboss.com/software as they are developed.

To be notified when new presets are released register your gear at: www.bassboss.com/support

Instructions on linking to your computer for remote monitoring and control: www.bassboss.com/software

Information and setup tips about how to get the best and most out of your system:

bassboss.com/edu

Power Distribution

Connect no more than one 5000W or two 2500W subwoofer amplifiers to a single 20A circuit. If you need to share circuits don't exceed two BASSBOSS single-driver subwoofers or one double-driver subwoofer along with one or two top speakers on the same circuit.

Although amplifiers for tops and subs may be specified to have the same power capacity, amplifiers used for tops applications tend to draw significantly less current. Subwoofers draw far more current than tops due to the demands for level and the duration of the notes.

The amplifiers can operate on mains supply from 100 to 250VAC. To connect to voltages other than 120V, a different mains connector plug must be used. Contact your salesperson for information about purchasing cables for alternate voltages.

Pass-through Power connections can be used to power additional cabinets. With optional True 1 TOP cables, power can be linked between subs and tops. Do not connect equipment that will draw more than 15A on a single power outlet. Contact your salesperson for information about linking power cables.

Avoid powering all subwoofers on the same circuit. Instead, use separate circuits for each subwoofer and top speaker combo to help prevent overloading a single circuit and tripping a breaker.

Troubleshooting

If, after following the previous instructions for setup, you have no output from the loudspeaker:

Verify that the green Ready LED is lit. If NOT lit, check the following:

1. Is the power cord plugged into a live outlet?
2. Is the Neutrik powerCON connector rotated into the locked position?

If the green Ready LED is lit, check the following:

1. Is the red Protect LED illuminated? The unit may be in protect mode or set into mute via software.
2. Is the signal cable connected to the input?
3. Is the signal cable connected to an operating output at the other end?
4. Is there signal flowing to the input? Check the integrity of the cable against a different cable.
5. Is the volume knob turned all the way down or at a very low level?
6. Is the signal flowing to the input full-range?

Filters in the signal may remove the operating frequencies of the loudspeaker receiving them.

7. If you're connected via LAN, check the level and filter settings in the software.

Cardioid Mode

Preset 8: Cardioid Mode

To achieve cardioid operation, you need at least one subwoofer facing the audience and one cabinet in cardioid mode placed facing away from the audience. Ideally, you should have two cabinets facing the audience and one facing away from the audience. The cabinets facing the audience should have the same preset loaded in them. The cabinet facing away from the audience should be set to the Cardioid preset - Preset 8. The Cardioid Mode cabinet should be placed between the audience-facing cabinets for cancellation directly behind the array.

The main subwoofer cabinets face the audience and use one of the first 7 presets, while the cardioid cabinet faces away from the audience with Preset 8 selected. When two cabinets are facing forward and one is facing backward in cardioid mode, set the input levels the same for all cabinets, with the same signal going to all. When one cabinet is facing forward and one is facing backward in cardioid mode, set the cardioid cabinet's level 6dB lower than the forward-facing cabinet, with both cabinets receiving the same signal.

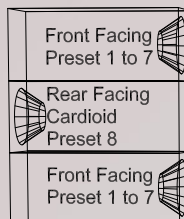
If there's only one cabinet facing forward and another one facing backward in cardioid mode, you can place the cardioid cabinet on top of the forward-facing cabinet. If you place the cardioid cabinet next to the forward-facing cabinet, position the forward-facing cabinets further away from the stage or the area where you want to reduce sound levels. The most significant sound reduction happens along an imaginary line drawn from the center of the forward-facing cabinet's woofer back through the center of the cardioid cabinet's woofer.

How and When to Use Cardioid Mode

Cardioid mode doesn't make the sound louder for the audience. Instead, it reduces the bass level behind the subwoofer stacks. When you have two subwoofers facing the audience and add a third one in cardioid mode, the sound level in front of the two subwoofers won't change much. However, the sound level behind them will decrease.

In some situations a wall or structure may reflect the sound radiating from the rear of the subwoofers back towards the audience. That reflected sound can cause phase cancellations leading to a loss of impact and uneven frequency response. Cardioid mode can help eliminate those cancellations before they happen, leading to better sound quality and impact for the audience.

**Area of
Reduced
Bass Level**



**Audience
Area**

Specifications

Acoustical

Description:	Single 21" self-powered 6th order hybrid subwoofer
Frequency Response (± 3 dB):	28 - 100 Hz (Preset dependent)
Maximum Measured Output:	135 dB SPL, 1 meter, half-space (ground plane)
Max SPL (Peak):	138 dB
Nominal Dispersion ($H^\circ \times V^\circ$):	360 x 360 - Cardioid mode available with multiple boxes

Electrical

Amplification:	2500 Watt RMS Class D Amplifier
Processing:	Integrated comprehensive DSP provides high pass, low pass, phase alignment and limiting
Electrical Connectors, Amp:	Neutrik powerCON True 1 TOP waterproof connectors
Electrical Connector, Mains:	Standard US 3-pin grounding 120V electrical plug: NEMA 5-15
Voltage Operating Range:	100-240V AC, 50-60Hz (Auto-sensing, auto switching universal supply)
Current Draw, Nominal:	4.6A @ 120 volts
Signal Input Connector:	XLR-F
Signal Output Connector:	XLR-M (Direct pass-through, unprocessed)
LAN Connectors:	EtherCON RJ45 (x2) with 2-port Ethernet switch

Physical

Enclosure Type:	Vented, short horn hybrid
Transducer:	1 X 21" diameter (540 mm) neodymium motor woofer with waterproof fiber composite cone
Cabinet Construction:	CNC machined 18 mm Birch plywood with dado and Rabbet joinery
Dimensions (HxWxD):	36" x 24" x 36" (91.44 cm x 60.96 cm x 91.44 cm) - 37.5" (95.25 cm) high with feet
Net Weight:	180 lbs. (82 kg)
Shipping Weight:	210 lbs. (104 kg)
Exterior Finish:	Weatherproof bonded high-pressure polyurethane
Grille:	Perforated, powder-coated steel
Pole Sockets:	4 (35 mm) pole sockets
Handles:	8 Integrated handles
Feet:	12 interlocking rubber feet
Suspension System:	16 X M10 threaded flypoints

Optional

Transport Dollies (H or V):	Dolly cart with 4 locking casters and recesses to accept interlocking cabinet feet
Cover:	Heavy-duty padded nylon transport covers for 1 cabinet
Online Information:	bassboss.com/vs21

Our proactive philosophy causes specifications to be subject to change whenever improvements are made.

Warranty

WARRANTY INFORMATION | Our fully-transferable warranty covers all BASSBOSS products.

STANDARD CABINET WARRANTY

BASSBOSS loudspeaker cabinet integrity, including all joinery, fasteners, handles and wood, is warranted against defects in materials and workmanship for a period of six (6) years from the date of purchase. This warranty does not cover items that are intended to wear and can be replaced if worn or damaged. Examples of items not covered by this warranty are cabinet feet, grilles and the finish or coating applied to the cabinet.

ENHANCED COMPONENT WARRANTY

BASSBOSS amplifiers and electronic components are covered against failures due to defects in materials and/or workmanship for a period of three (3) years from the date of purchase.

TRANSDUCER WARRANTY

Transducers are covered against failures due to defects in materials and/or workmanship for two (2) years from the date of purchase.

OUR SUPPORT

Warranty support is a service, and part of that service includes helping you prevent failures and minimize repair and shipping costs.

Please do not ship products without obtaining a return authorization number (RMA) by contacting BASSBOSS at bassboss.com/support. **If you need to ship your speaker for service, BASSBOSS technicians will provide assistance on shipping and packaging requirements specific to your service needs.**

WARRANTY LIMITATIONS

During the warranty period, if your loudspeaker malfunctions or fails due to any defect in components or manufacturing, the failed parts will be repaired or replaced. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse. Warranty coverage and eligibility will be determined upon inspection by BASSBOSS personnel. This warranty does not cover labor other than that authorized and performed by BASSBOSS personnel. Service will be performed upon the return of the failed unit, together with its original sales receipt or other proof of purchase, to BASSBOSS or an Authorized Service Facility. Purchaser is responsible for all costs of shipping and handling. Cosmetic damage is specifically excluded from this warranty. This warranty is rendered void if service, repairs and/or modifications are attempted or made by anyone not specifically authorized by BASSBOSS to perform said services. ***Please contact BASSBOSS or your local BASSBOSS dealer before attempting any repairs and before shipping parts in for service.*** This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Safety Information

Important information regarding safety and the use of your loudspeakers:

To prevent potentially dangerous exposure to high levels of acoustic pressure, never stand in the immediate vicinity of loudspeakers driven at a high level without hearing protection. Professional loudspeaker systems are capable of causing sound pressure levels detrimental to human health. When a transducer capable of producing high sound levels is being used, it is necessary to wear ear plugs or protective earphones to prevent hearing damage.

Even seemingly non-critical sound levels (from approximately 95 dB SPL) can cause hearing damage if people are exposed to it over a long period. Anyone exposed to these levels should use appropriate hearing protection devices. System and venue owners and operators are encouraged to make hearing protection devices available to all customers and staff members.

In order to prevent accidents when setting up the loudspeakers or loudspeaker stands, make sure they are standing on a firm surface. Ensure that all additional hardware, fixings and fasteners used for installation or mobile deployment are of an appropriate size and load safety factor.

Always use the included, factory installed, internally secured M10 fly points when supporting the cabinets. Use appropriately load-rated hardware. Never hang loudspeakers from handles. Never drill or screw into cabinets to attach lifting points.

Pay attention to the manufacturers' instructions and to the relevant safety guidelines. Regularly check the loudspeaker housings and accessories for visible signs of wear and tear, and replace them when necessary. Regularly check all load bearing bolts in the mounting devices.

Caution: Loudspeakers produce a static magnetic field even if they are not connected or are not in use. Therefore make sure when erecting and transporting loudspeakers that they are nowhere near equipment and objects which may be impaired or damaged by an external magnetic field. A distance of 3 feet (1m) should be maintained between loudspeakers and sensitive equipment such as CRT monitors or magnetic storage media.

Never attempt to carry out any operations, modifications or repairs that are not expressly described in this manual. Contact your dealer or BASSBOSS support if the product is not functioning properly.

For installation purposes BASSBOSS strongly recommends that this product be installed by a qualified, professional installer who can ensure correct installation and certify that it is installed in compliance with the regulations in force.

The audio system must comply with current local standards and regulations regarding electrical systems.

Important Notes

Shielded data cables must be used.

To minimize the occurrence of noise and interference, always use shielded signal cables. Avoid routing signal or data cables close to equipment that produces high-intensity electromagnetic fields such as transformers, power cables and loudspeaker wires.

Do not coil excess power cable. Do not coil or wrap power cables and signal or data cables together.



WARNING

This is a class A product. In a domestic environment, this product may cause radio interferences, in which case the user may be required to take corrective measures.

FCC Compliance Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.



Manufacturer

True Lee Loudspeakers | BASSBOSS 2028 E Ben White Blvd. #240-8220 Austin TX 78741

We declare, under our sole responsibility, that to the best of our knowledge to which this declaration relates, our products are in conformity with the applicable requirements.

Product: VS21-MK3 Subwoofer Intended use: Professional Audio Loudspeaker

VS21-MK3

Single 21"
Powered Subwoofer



Need more assistance?
We're here to help.

bassboss.com/support