BGM 4.1 Indoor Outdoor 6.5 Inch sub with 4 x 2.5 Inch Satellites 70V and 8Ω

P/N **16220**

User's Manual

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SAFETY WARNINGS AND GUIDELINES

- Turn off and unplug all equipment prior to making electrical connections, including speaker wire connections.
- Reduce the volume level prior to making any change to the audio input source, e.g., changing radio stations or changing CDs.
- This passive speaker system is rated IPX4, meaning that it is protected from dripping or splashing water from any direction. However, it should not be installed in an area where it is directly exposed to rain and other weather conditions. The speakers should always be installed under a full cover.
- The satellite speakers should be mounted with a 15° down angle to prevent water accumulation.
- The subwoofer should be mounted in the horizontal position to prevent water from entering the terminal area.
- Ensure that the subwoofer is installed in a location where it cannot fall on people or animals if it becomes dislodged.
- Ensure that the subwoofer terminal cover is properly secured with the wires exiting from the bottom to of the cover with the rubber flap to maintain the IPX4 waterproof rating.
- When using this speaker as part of a constant voltage speaker system, ensure that the amplifier power is at least 20% higher than the total power settings of the connected speakers.
- Most speaker damage is caused by clipping, which is heard as distortion. If you hear distortion, reduce the volume level until the audio is no longer distorted.
- Take care to ensure that the speaker wire connections are properly polarized. Inverted polarization can result in unnatural or attenuated sound, especially in the bass frequencies.
- Do not use chemical cleaners or solvents to clean this speaker. Use only a soft, dry cloth. Moisten the cloth with warm water for particularly stubborn deposits.

INTRODUCTION

Thank you for purchasing this BGM 4.1 Indoor/Outdoor Speaker System! This passive speaker system features a 6.5" subwoofer and two pairs of 2.5" stereo satellite speakers. It can be used as a standard 8-ohm speaker system or as part of a 70-volt speaker system with 30-watt and 60-watt taps. When properly installed, the speakers carry an IPX4 protection rating, which means that they are protected against dripping or splashing water.

FEATURES

- 6.5" passive subwoofer
- Two pairs of 2.5" stereo satellites
- 50 Hz ~ 20 kHz frequency response and 160 Hz crossover
- Suitable for outdoor use with an IPX4 protection rating
- Usable as an 8-ohm system or as part of a 70-volt system
- 120-watts maximum power handling capacity in 8-ohm mode
- 30-watt and 60-watt taps for 70-volt mode
- Includes wall mounting brackets for the satellite speakers
- Wall mounting option for the subwoofer

PACKAGE CONTENTS

Please take an inventory of the package contents to ensure you have all the items listed below. If anything is missing or damaged, please contact Monoprice Customer Service for a replacement.

1x 6.5" passive subwoofer speaker

4x 2.5" full range satellite speakers

4x Satellite speaker wall mount brackets

4x Rubber feet for the subwoofer

2x Keyhole brackets for the subwoofer

4x Screws for the keyhole brackets

1x Wall mounting template

SPEAKER BREAK-IN

In the same way that a new car requires a break-in period before it can be safely operated at high engine RPMs, speakers require a break-in period before they can be safely operated at maximum volume levels. Proper break-in ensures that the moving parts of the speaker (the cone and cone suspension) are allowed to flex and soften, losing the initial stiffness and allowing the speaker to move through its full intended range. After the break-in period, the speakers will produce richer and fatter sounding lows, warmer and smoother sounding mids, and cleaner and more accurate highs, without any hint of distortion.

The best way to break-in speakers is simply to play normal music or watch movies at moderate volume levels. The amount of time required for speaker break-in varies based on the operating environment, but is typically in the area of 50~80 hours. It will take a bit longer in a cold or dry environment and a little less time in a warm or humid environment.

Note that the break-in period does not have to be continuous.

SPEAKER PLACEMENT

Before making any connections, you should examine the room and determine where you will place each speaker. This system is intended for open spaces as large as 30 feet by 50 feet. If installing to a larger room, multiple systems should be used in a 70-volt speaker array. Some basic "rules of thumb" for the proper placement of this speaker system are outlined below.

- The left and right channel satellite speakers should be placed in a staggered manner, with a stereo pair along one wall and across the room on the opposite wall.
- If the ceiling is at least 9 feet above the floor, the satellites should be installed about 8 feet or more above the floor surface.
- The subwoofer should be placed in a corner, which allows the adjacent walls to act as a sound amplifier.
- Ensure that the bass port is unobstructed.

CONSTANT VOLTAGE VS 8-OHM SPEAKER SYSTEMS

A constant voltage speaker system differs from a traditional 8-ohm speaker system in that it uses a step-up transformer at the audio source to raise the voltage and lower the current on the transmission line. At the speaker end, a step-down transformer converts the signal back to a normal speaker level voltage. This reduces power loss during transmission, which allows for the use of longer speaker wire runs using smaller gauge wire.

Additionally, a constant voltage speaker system allows for the use of multiple speakers on each channel, without the need for complicated impedance calculations and configurations. In a constant voltage system, all speakers on a given channel are connected in parallel and the complicated impedance calculations are replaced by simple wattage calculations.

For example, if you want to connect two speakers per channel in a traditional 8-ohm speaker system, you must either connect them in series, which results in an overall 16-ohm impedance, or in parallel, which results in an overall 4-ohm impedance. In the first case, the 16-ohms impedance effectively halves the output power of your amplifier, resulting in

lower overall volume levels. In the latter case, the 4-ohms impedance means that your amplifier will have to work harder and must be rated as stable at 4 ohms. Adding a third speaker to the mix would complicate it further, producing either a 24-ohm or 2.67-ohm overall impedance. Note that very few amplifiers are stable under 2-ohm loads, so that is usually not an option.

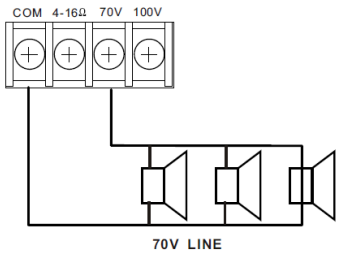
On the other hand, with a constant voltage system, you consider first the RMS output wattage of the amplifier. This should be reduced by 20% to compensate for insertion loss. For example, if using a 100-watt amplifier, the total load from speakers should not exceed 80 watts.

Each individual speaker on a given channel is set to a value such that the total does not exceed the rated power, less 20%. You do not need to worry about making the total as close as possible to the limit; just ensure that the total does not exceed the limit.

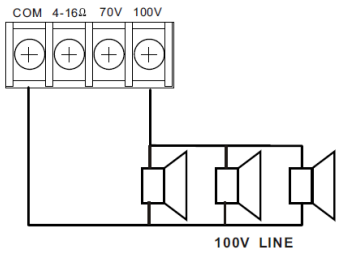
If all speakers are set to the same wattage value, they will all have the same volume level. If one speaker is set to a higher wattage value, it will be louder than the others, while a speaker set to a smaller value will be quieter than the others. This allows you to compensate for the environment in which the speaker is placed. For example, a speaker placed outside would need to be louder than a speaker placed in a small room.

SPEAKER WIRING

Most constant voltage speaker installations will consist of multiple speakers per channel, with all speakers connected in parallel, as shown in the diagram to the right.



To wire speakers in parallel, connect the first speaker to the amplifier as normal. Connect the positive terminal on the first speaker to the positive terminal of the second speaker, and the negative terminal on the first speaker to the negative terminal on the second. Repeat for each additional speaker in the array.



SPEAKER CONNECTIONS

Warning! To prevent possible personal injury and/or damage to your equipment, turn off and unplug all equipment before making connections!

Before attempting to make any connections it is best to look at the situation, get all the necessary materials together, and then make all the connections at once.

First, look at the back of your amplifier or receiver to determine what options it offers for making connections. Amplifiers and receivers typically employ either 5-way binding posts, spring-loaded terminals, or push terminals for the speaker connections.

A 5-way binding post can accept bare speaker wire, spade terminals, pin plugs, and banana plugs, while spring loaded and push terminals can accept either bare speaker wire or pin plugs. Refer to the documentation that came with your amplifier or receiver to determine the maximum size/gauge speaker wire the speaker terminals can accept.

At the subwoofer end, all connections are made using screw terminals. While you can make a bare wire connection, it is highly recommended to use Cable Lugs or Spade Terminals. This includes the terminals for connecting the speaker wire from the amplifier as well as those for connecting to the satellite speakers. The screw terminals will accept #6 or #8 terminals/lugs with 4mm inside space and 8mm outside width.

The satellite speakers use Spring Terminals, which can accept bare speaker wire up to 14AWG or pin plugs. Pin plugs are recommended both for their convenience and their ability to connecter larger diameter speaker wire.

Regardless of how you choose to make the connection you will need some speaker wire. The thickness, or gauge, of the wire needed depends primarily on the distance over which the signal will be sent. The following table serves as a guideline for determining the minimum wire gauge to use in a standard 8-ohm installation:

Wire Gauge	Distance (feet)
18 AWG	10
16 AWG	20
14 AWG	35
12 AWG	60
10 AWG	100

In general you should use the heaviest gauge speaker wire that will fit in the connectors (remember, the smaller the AWG number, the heavier/thicker the wire). Using pin plugs, spade terminals, and cable lugs can allow use of heavier gauge wire.

Rather than using fixed length speaker wires, it is best to get a roll and cut the wires to the length you will need them. This ensures that there is a minimum amount of excess wire. However, even if your amplifier is off-center, the lengths of wire used for each speaker pair (front mains or surrounds) should be identical. This keeps the impedance on each channel the same, which ensures that the volume levels, frequency ranges, and tonalities are identical. Any excess wire should be snaked back and forth, but not coiled, to avoid creating an inductor/antenna for stray radio signals.

Before making the actual connections, cut each length of wire to size. Note the markings on the wire that differentiate between each conductor. Sometimes the marking clearly identifies a positive and negative side. Some common clearly positive and negative markings or identifiers are:

Positive	Negative
Red	Black
Copper	Silver
+ + +	- - -

In many cases, the mark is a single stripe on the jacket of one of the connectors. In this case the side with the stripe is generally considered the positive side, but it really does not matter as long as you are consistent in always using the stripe as positive or always using it as negative.

If you use pin plugs and spade terminals/cable lugs (highly recommended), install the plugs on the wire, taking care to match the polarity of the plug (if applicable) with the polarity of the wire. Once you have constructed each wire assembly, double check each end to ensure the polarity matches that of the other end on the same strand.

> *Tip: Use a continuity tester, such as a digital multimeter, to verify that the polarity matches at each end.*

If you will be using bare wire for any of the connections, strip about 3/8" insulation from the wire end and twist it to prevent stray strands.

SUBWOOFER MOUNTING

The subwoofer can be either placed on a horizontal surface or mounted to a vertical surface. If mounting to a vertical surface, you will need two screws with screw heads with a 5-7mm head diameter (not included).

Horizontal Mounting

1. Peel the protective film from the back of one of the included rubber feet, then place it on one of the corners on the bottom of the subwoofer. Repeat for the other three rubber feet and corners.
2. Place the subwoofer on the horizontal surface at the desired location. If placing it above the floor, ensure that it is not in a position where it could fall on people or animals in the event that it becomes dislodged or knocked off its surface.

Vertical Mounting

1. Use the included wall template to mark the screw locations on your vertical surface. Ensure that it is not located in a position where it could fall on people or animals in the event that it becomes dislodged. Additionally, it should be positioned so there is no obstruction close to the port on the front.
2. Obtain two screws with a head diameter from 5-7mm (not included). The use of wall anchors is highly recommended. If necessary drill pilot holes using an appropriately sized drill bit. Screw the two screws into the wall, leaving about 1mm space between the wall and the screw head.
3. Using the four included screws, attach the keyhole brackets to the side of the subwoofer. Note that the narrow end of the keyhole should be on top.
4. Peel the protective backing from two of the included rubber feet and attach them to the side of the subwoofer, beneath the two keyhole brackets.
5. Position the large holes on the keyhole brackets over the screw heads in the wall, then slide the subwoofer down a few millimeters so that the screw shaft and head lock into the narrow part on the keyhole. Pull gently on the subwoofer to ensure that the attachment is secure.

SATELLITE SPEAKER MOUNTING

The satellite speakers can be placed on a shelf or other horizontal surface or attached to a vertical surface using the included wall mounting brackets.

Horizontal

No preparation is required for horizontal mounting.

Vertical

1. Determine where each wall bracket will be mounted to your vertical surface. Place the bracket against the wall and mark the holes using a pencil.

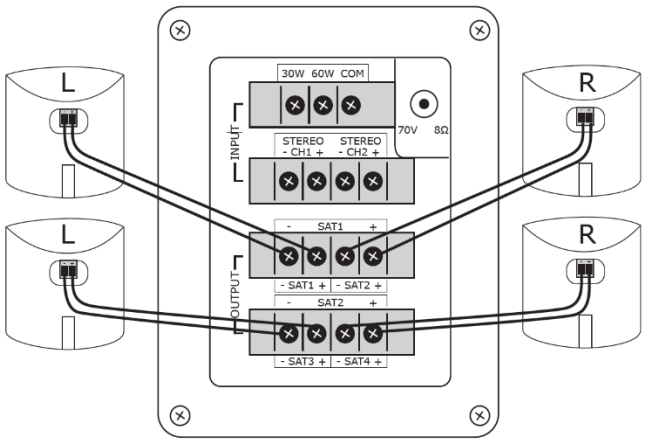
2. You will need to obtain four screws (not included) to mount each bracket to your vertical surface. The screws should have a shaft diameter no larger than 4mm and a head diameter of 5-6mm.
3. If necessary, drill pilot holes for the mounting screws using a drill bit of the appropriate size. Attach each bracket to the wall using the screws mentioned in the previous step.

   Note that, due to the space between the back of the speaker and the wall when the speakers are attached to the brackets, they will be attached after the wire connections have been made.

WIRING THE SPEAKERS

1. Power off and unplug your amplifier from its power source.
2. Using a Philips screwdriver, remove the terminal cover plate from the rear of the subwoofer.
3. Prepare wires for each satellite speaker to the subwoofer and from the amplifier to the subwoofer using the procedures mentioned in the *SPEAKER CONNECTIONS* section above. For best results, use pin plugs for the ends that will connect to the satellite speakers and spade terminals for the ends that will connect to the subwoofer. Your amplifier's speaker terminals will determine the appropriate plug or terminal to use for that end. If any of these wires will be routed through the walls, route them before attaching the terminals.

   Note that if any of these wires will be run through the walls, you must use in-wall rated speaker wire. Using unrated or improperly rated wires can risk the spread of fire and nullify insurance claims.



4. For each satellite speaker, connect one end of the prepared

speaker wire to the speaker's input terminals, then connect the other end to the appropriate terminals on the rear of the subwoofer. Take care to match the polarity at each end.

5. For each satellite that will be connected to a satellite wall mount bracket, remove the rubber plug from the bracket slot on the bottom rear of the speaker, along with the plastic insert. Detach the plastic insert from the plug. Position the speaker bracket slot over the T-shaped portion of the wall bracket, then slide it in place. Finally, slide the rubber plug into the lower portion of the bracket slot to "lock" it into place. Position the speaker so that it is angled downward about 15°.

   If the satellite will be placed on a horizontal surface, place it in the desired location.

6. For 8-ohm installations, using one of the wires prepared in step 3 above, connect one end of a wire to the left channel input on the subwoofer, then connect the other end to the left channel output on your amplifier, taking care to match the polarity at each end. Repeat the process for the right channel.

   For 70-volt installations, connect the prepared wire to either the 30W or 60W tap, plus the ground tap, in the 70-volt section on the subwoofer, then connect the other end to the 70-volt output on your amplifier, taking care to match the polarity at each end.

   Reminder: The total wattage of all taps connected to a 70-volt system must never exceed 80% of the amplifier's rated RMS power output.

7. If using the speakers as part of a 70-volt system, flip the **70V/8Ω** switch on the subwoofer to the **70V** position, otherwise flip it to the **8Ω** position.

8. Attach the terminal cover to the back of the subwoofer using the screws removed in step 2 above. Ensure that the wire opening is at the bottom and that the rubber flap is positioned over the wires. This is especially important in outdoor installations.

9. Plug in and power on your amplifier. Play audio material and verify that audio is playing on each connected satellite and on the subwoofer.

ONLINE SUPPORT

Monoprice is pleased to provide free online support. For order related issues, contact the Customer Service department through the Live Chat link on our website **www.monoprice.com** during normal business hours (Mon-Fri: 5am-7pm PT, Sat-Sun: 9am-6pm PT) or via email at **support@monoprice.com**

For technical issues, contact the Technical Support department through the online chat button on our website **www.monoprice.com** during regular business hours, 7 days a week. You can also get assistance through email by sending a message to **tech@monoprice.com**

SPECIFICATIONS

Model	16220
Subwoofer Driver Size	6.5"
Satellite Driver Size	2.5"
Frequency Response	50 Hz ~ 20 kHz
Crossover Frequency	160Hz
Maximum 8Ω Amplifier Power	120 watts
70-volt Power Taps	30W, 60W
Subwoofer Dimensions	12.0" x 11.8" x 6.7"
Subwoofer Weight	12.1 lbs
Satellite Dimensions (each)	3.5" x 3.5" x 4.3"
Satellite Weight (each)	1.1 lbs.

Cables

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