



B-20  
POWERED MODULAR  
STEREO  
SUBWOOFER SYSTEM  
  
OWNER'S MANUAL

B-20 CONTROL AMPLIFIER SERIAL NUMBER: \_\_\_\_\_  
B-20 SUBWOOFER SERIAL NUMBER: \_\_\_\_\_  
B-20 SUBWOOFER SERIAL NUMBER: \_\_\_\_\_

# SAFETY INSTRUCTIONS -- PLEASE READ FIRST

**CAUTION:** To reduce the risk of electric shock, do not remove the cover. No user serviceable parts are inside; refer servicing to qualified personnel.

**WARNING:** To reduce the risk of fire or electric shock do not expose this appliance to rain or moisture.



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure that may be sufficient to constitute a risk of electric shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual.

## DETAILED SAFETY INSTRUCTIONS:

All the safety and operation instructions should be read before the appliance is operated.

### Retain Instructions:

The safety and operating instructions should be retained for future reference.

### Heed Warnings:

All warnings on the appliance and in the operating instructions should be adhered to.

### Follow Instructions:

All operation and user instructions should be followed.

### Water and Moisture:

The appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool etc.).

### Ventilation:

The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings, or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

### Heat:

The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including other amplifiers) that produce heat.

### Power Source:

The appliance should only be connected to a power supply of the type described in the operating instructions or as marked on the appliance.

### Grounding and Polarization:

Precautions should be taken so that the grounding or the polarization means of the appliance is not defeated.

### Power Cord Protection:

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles and the point where they exit from the appliance.

### Cleaning:

The appliance should be cleaned only as recommended by the manufacturer.

### Nonuse Periods:

The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

### Object and Liquid Entry:

Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

### Damage Requiring Service:

The appliance should be serviced by qualified service personnel when;

- The power supply cord or the plug has been damaged; or
- Objects have fallen, or liquid has been spilled into the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a change in performance; or
- The appliance has been dropped, or the enclosure damaged.

### Servicing:

The user should not attempt to service the appliance beyond what is described in the Operating Instructions. All other servicing should be referred to qualified service personnel.

## INTRODUCTION:

Thanks for your purchase, and congratulations on your selection of the B-20 active modular subwoofer system. The B-20 will add incredible dynamics and extended bass response to any pair of monitors, or to the LFE channel for surround mixing.

Although the B-20 was designed to mate specifically with the Vergence A-20 stereo monitors and C-20 center channel monitor, its extensive control set makes it an ideal addition to near or mid- field monitor system you may already own. Your time invested in learning about the B-20's features and capabilities will reward you with the best possible performance.

Now would also be an excellent time to fill out and send in your warranty registration card or, optionally, register your purchase online at [www.vergenceaudio.com](http://www.vergenceaudio.com) under the Support section. This action will automatically extend both the parts and labor warranty for an additional two years for a total of three years! If at any time, you require assistance, call our customer service hotline at (800)-NHT-9993 (648-9993 or e-mail us at [tech@nhtpro.com](mailto:tech@nhtpro.com)).

## GETTING STARTED:

The B-20 is unique in that it combines a dedicated control amplifier with subwoofer cabinets, using controlled impedance cables that actually form part of the crossover network. By designing the system as an integral package of control amp, cables, and subwoofers, many of the advantages of self-powered subwoofers can be realized without the usual attendant performance compromises.



**WARNING:** The B-20 subwoofers must only be used with the B-20 Control Amp, cables, and vice versa.

The following are included in the Control Amplifier carton:

- |                                |                                |
|--------------------------------|--------------------------------|
| I - Control Amplifier          | 2 - 20' Monitor Output Cables  |
| I - 6' IEC Power Cord          | 4 - 10-32 Rack Mounting Screws |
| I - Warranty Registration Card | 8 - Plastic Insulating Washers |

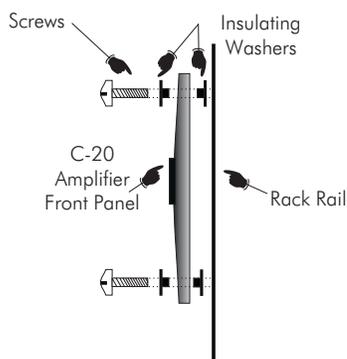


Fig. 1: Rack Mounting Detail



Fig. 2: Cone Feet Installation

## INITIAL INSTALLATION:

**AMP MOUNTING:** The B-20 Control Amplifier may be used on a shelf, or mounted in a standard 19" equipment rack using the screws and washers supplied. For rack mounting, remove and retain the four feet from the bottom of the amp chassis using a #2 Philips screwdriver. Refer to figure 1 above. Two vertical rack spaces are required, but we recommend you leave at least one additional open space above and below the B-20 Control Amplifier for improved cooling, as you would with any high power amplifier. For table or shelf use, the four feet must remain attached to allow for air circulation.

**SUBWOOFER FEET:** For best performance, the subwoofers need stable footing. Install three speaker cones into the threaded inserts in the bottom of each subwoofer, or, if the subwoofer is to be placed on a hardwood floor, apply rubber feet. The cone points are sharp so please use caution. For now, position each B-20 subwoofers next to the left and right monitors. For more detailed speaker placement tips, see page 7.

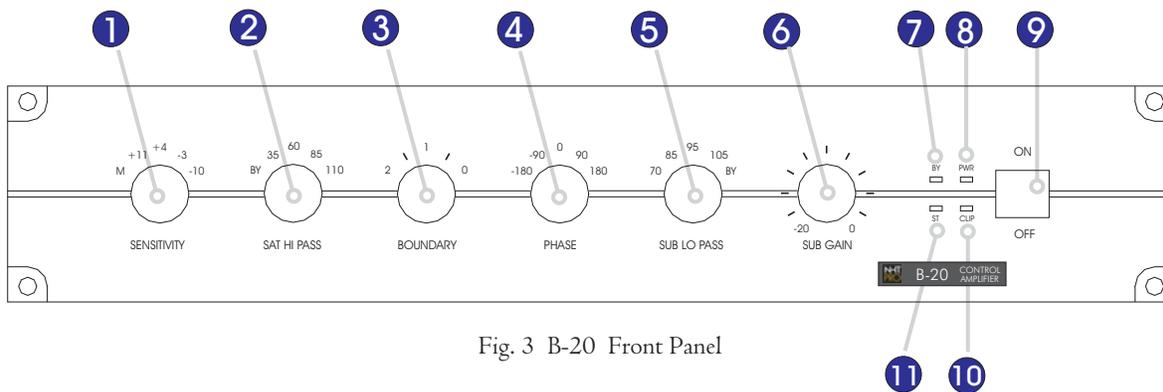


Fig. 3 B-20 Front Panel

## CONTROLS/FRONT PANEL:

- 1** Input Sensitivity Control:  
 This control affects both the subwoofer input and the high pass circuit. There are five settings: +11dB, +4dB, -3dB and -10dB and M ( Mute). Typically +11dB and +4dB are used with higher output professional gear such as mixers, while the -3dB and -10dB positions match the levels used in consumer products such as CD players and sound cards. Check the output specifications of the source equipment you are connecting to the B-20 Control Amplifier and set accordingly.
- 2** Monitor High Pass (HP) Frequency Control:  
 This control sets the lowest frequency you wish to send to the main left and right monitors you're using with the B-20. There are 5 settings; BY (Bypass), 35Hz, 60Hz, 85Hz and 110Hz. Selecting the proper switch position (see the Initial Control Settings section on Pg. 6) will help blend the overall system response and increase power handling. Engaging BY (bypass) turns off the high pass circuit, and sends fullrange sound to the monitors.
- 3** Boundary Control:  
 The Boundary selector switch is a control for the lowest frequencies, and is designed to compensate for the boost in bass that occurs when subwoofers are placed near walls or in corners. The five switch indications refer to the number of walls adjacent to the woofer cabinet; '2' is for corner placement; '0' for open space; the control offers three additional settings in between for near corner and near wall placements. Setting the control to the '2' position will produce the least boost; setting it to '0' will give the most.
- 4** Phase Control:  
 This five-position control provides phase compensation for such variables as room placement, listening position and the types of monitors you're using with your B-20 system. Adjust the control in both directions until you find the position that produces the greatest bass level. This position assures the best possible low frequency summing with the monitors you're using with the B-20.
- 5** Sub Low Pass Frequency Control:  
 This control adjusts the highest frequency the subwoofers reproduce, allowing you to match the precise point where your monitors' low end rolls off. The low pass control is typically set to correspond with the Mon. High Pass but experimenting may produce better response in your system. The BY (Bypass) setting allows you to disengage the control if you use external bass management, or to match some surround protocols.
- 6** Subwoofer Gain Control:  
 The subwoofer level control matches the B-20 output level to the monitors' output level. This control differs from most as it doesn't turn the woofer all the way off (use Bypass), but offers a 20dB range of adjustment. When set fully counter clockwise, this control attenuates the sub output by 20dB.
- 7** Bypass LED:  
 This amber LED is illuminated when the B-20 Control Amplifier is in the bypass mode, indicating that there is no subwoofer output, and a full-range signal is going to the monitor (satellite outputs).
- 8** Power LED:  
 This green LED indicates the B-20 Control Amplifier is connected to AC mains and that the power switch is turned on. If the LED does not light up after you've connected the B-20 system to the AC mains with the power switch in the on position, this indicates a blown fuse or trouble with the unit. Disconnect the AC cord, and follow fuse replacement instructions carefully!
- 9** Master Power Switch:  
 Controls the on/off operation of the Control Amplifier.
- 10** Clipping LED:  
 This red LED indicates a clipping or overload condition. Occasional flashing of this indicator is a gentle warning you are reaching the system's limits. If the LED glows continually, severe clipping is occurring. The input signal or system gain should be reduced to avoid the risk of possible system damage.
- 11** Stereo LED:  
 This blue LED is illuminated when the B-20 is operating in the stereo mode. Conversely, when operating in the mono mode, this LED will not be illuminated.

## CONNECTIONS/REMOTE CONTROL

- 13** Stereo/Mono Switch:  
Remotely selects between the stereo and mono operating modes. The mode you've selected will be confirmed by the B-20 Control Amplifier's Blue LED, as previously described.
- 14** Sub Bypass Switch:  
Remotely selects either bypass or operational mode for the B-20 Control Amplifier; the green LED will confirm the mode as described above.

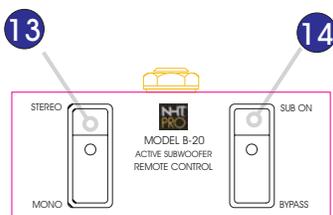


Fig 4. Remote Control

## CONNECTIONS/REAR PANEL:

- 15** Subwoofer Output -- Left and Right:  
The output connectors to the two subwoofers are XLR. Two 20' red XLR cables are included to connect the B-20 Control Amplifier left and right outputs to the B-20 subwoofers.
- 16** Satellite Output -- Left and Right:  
The TRS output jacks pass the left and right signals to the left and right monitors used with the B-20 system. Their frequency output is determined by the settings on the front panel SAT HI PASS control and the remote control bypass switch. If the B-20 is used strictly on an LFE channel, no satellite connection is necessary.
- 17** Input Section:  
The B-20 has two different input options: balanced TRS or XLR. Standard 1/4" connectors may be used in place of the TRS type if the source equipment employs unbalanced outputs, but this method will not provide the noise cancellation advantages of fully balanced operation. Tech Tip: The XLR and TRS input jacks are wired in parallel. You can therefore use the unused input as an output to another device like a DAT machine or additional monitor system. You can also daisy-chain multiple subwoofer/satellite systems for fixed installations.
- 18** Remote Control Input:  
This is where the supplied RCU (remote control unit) is connected. A 13' TRS cable is included; one end connects to the remote control input on the B-20, the other to the B-20 remote control itself.
- 19** Power Section:  
Here you'll find the power cord receptacle, and a spare fuse located within the power connector, as well. To get at the fuse, remove the power cord and use a small flat-head screwdriver to access the fuse compartment. When replacing the fuse with a spare, use only a fuse of the same power rating. Located next to the power cord receptacle is a voltage selector, preset at the factory for the destination country; the power cord supplied is appropriate for that voltage. As noted elsewhere in this manual, confirming the voltage selector setting before powering up the system is a good idea.

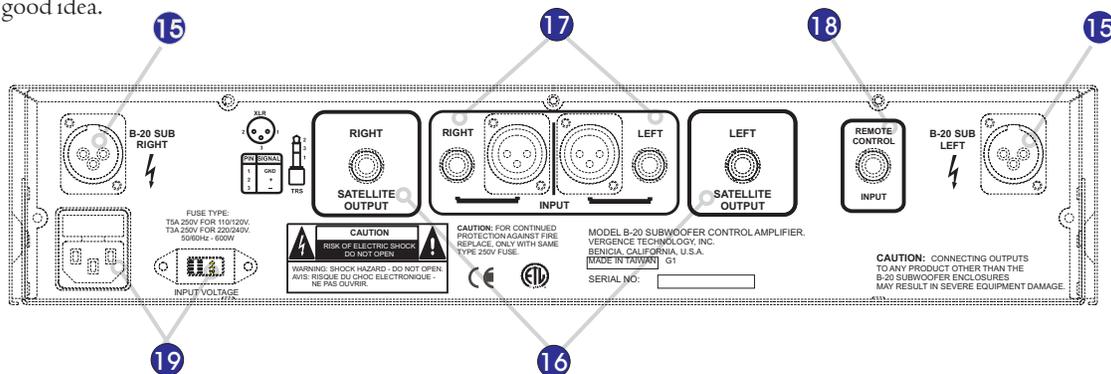


Fig. 5 B-20 Control Amplifier Back Panel

## CONNECTING THE B-20 ACTIVE MODULAR SUBWOOFER SYSTEM:

THE B-20 IS TYPICALLY USED IN ONE OF TWO WAYS:

- As a stand alone subwoofer for a surround system; i.e., as a .1 or LFE (low frequency effects) channel (FIG. 6);
- To augment the range of an active or amplified monitor system (FIG. 7).



WARNING: The B-20 was designed to be connected only to powered monitors, or through the amplifier of externally amplified passive monitors. Do not attempt to directly connect passive monitors or subwoofers to the B-20 Control Amplifier.



WARNING: As a precaution, check the setting for appropriate voltage prior to plugging the B-20 Control Amplifier into AC outlet.

### AS A STAND ALONE SUBWOOFER:

Connect either an XLR or TRS from your designated LFE channel or buss output assignment to either the left or right input on the B-20 INPUT section. If more subwoofer sensitivity is required, set the RCU to mono mode. Be sure to utilize surround test tone signals if available to properly balance the woofer level with the other monitor channels. Please read through the Subwoofer Placement and User Controls sections before you begin.

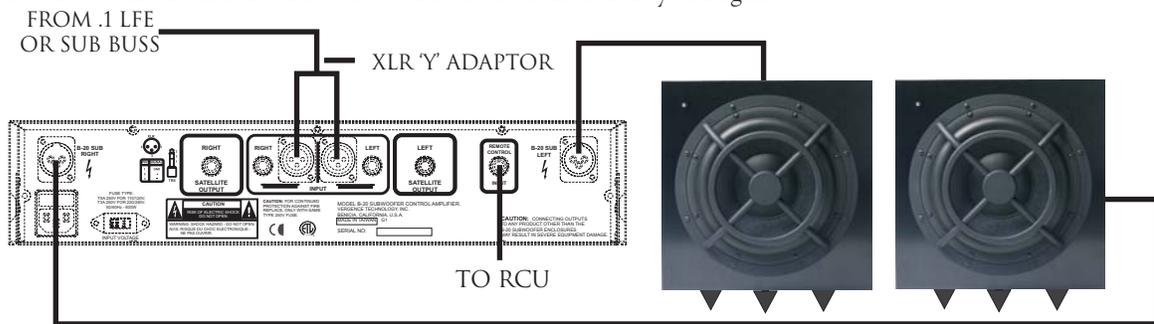


Fig. 6 Typical Stand Alone Hookup

### FOR FREQUENCY RANGE AUGMENTATION:

Connect the left and right output from your mixer or source unit into the corresponding left and right INPUT section, using either the XLR or TRS jacks of the B-20 Control Amplifier. Now connect the supplied left and right TRS cables from the TO SATELLITE output jacks on the Control Amplifier to your monitors' input jacks. Connect the supplied B-20 RCU (remote control unit) using one of the supplied TRS cables (or any standard TRS cable if a different length is required) into the B-20 Control Amplifier's REMOTE CONTROL input.

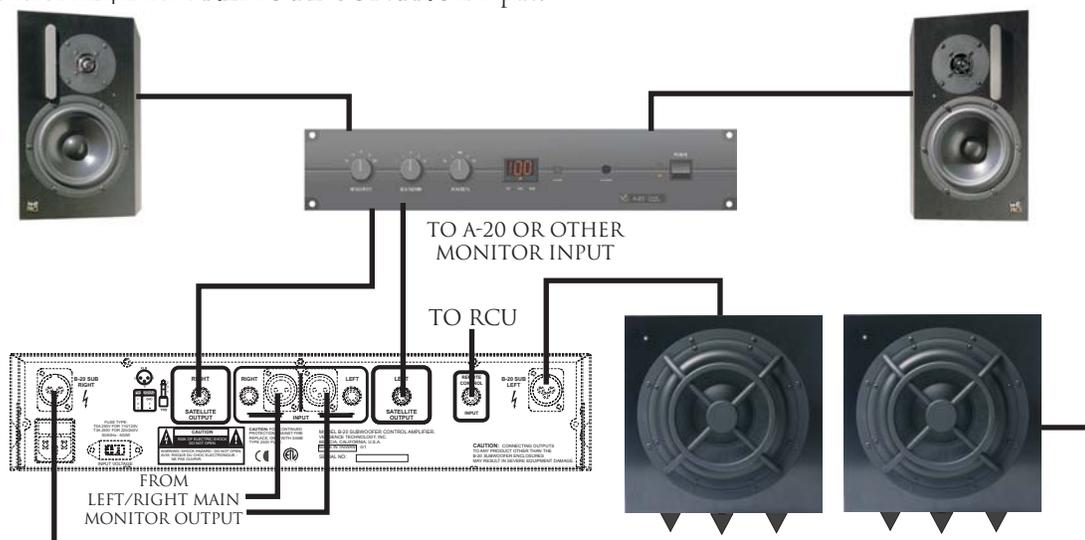


Fig. 7 Typical Hookup as Bass Augmentation for Monitors

## INITIAL CONTROL SETTINGS:

### SENSITIVITY Control:

This switch affects the input sensitivity of the XLR and TRS input jacks. When satellites are connected to the B-20 control amplifier, the subwoofer becomes the master sensitivity control for the system. Set the sensitivity on the B-20 to the appropriate setting for your source equipment, and your monitor system to +4dB.

### SAT HP Control:

If you are using A-20 monitors as satellites, set the SAT HP frequency to 85Hz. If using a different brand of powered monitors, begin with the setting below that best matches your monitors:

110Hz - Mini-Monitors utilizing a 5.25" woofer or smaller.

85 Hz - Monitors utilizing a 6.5" woofer or smaller.

60Hz - Monitors utilizing a 8" woofer or smaller.

35Hz - Monitors utilizing a 10" woofer or larger

### BOUNDARY Control:

Set the switch according to the number of walls adjacent to a single B-20 subwoofer cabinet. Adjust later to fine tune to the amount of room gain or lack thereof as necessary.

### PHASE Control:

Begin your listening with the control in the "0" setting. Adjust both clockwise and counter clockwise to the 90 and 180 positions. Listen to all positions and ultimately set the control to where you hear the greatest bass output in the crossover frequency range.

### SUBLO PASS Control:

Start with the control set to the same setting as the SAT HP control. Use a variety of familiar material to determine whether the bass sounds either too "punchy" (in which case turn the control counter clockwise towards 70Hz) or too thin (in which case turn the control clockwise towards BY). Getting this setting right may take some time.

### SUBGAIN Control:

This level will depend largely on placement. We suggest you start with this control in the 2 o'clock position, and adjust clockwise for more bass output, counter clockwise for less. Adjust the level so that the B-20 seamlessly integrates with the monitors i.e. so that you can tell it's operating but can't "hear" it as a separate entity.

## SUBWOOFER PLACEMENT:

Where you locate the B-20 subwoofers will have a profound effect on the systems performance. Unfortunately, there are no hard and fast rules to find the best location. If you have some flexibility, we encourage you to experiment.

Placement near walls and corners will reinforce low frequencies; conversely, placement out into open space will add definition, but will reduce bass weight and extension.

Ideally, the subwoofers should be adjusted so that you hear the additional bass extension, but cannot localize the subwoofer itself.

Listen as you go using a wide variety of program material. Jazz recordings with acoustic bass and piano are particularly helpful in determining location, sub level and crossover settings. Transparency and integration are the goals.

The B-20 subwoofer amplifier has a number of controls which can help in determining optimal placement; try them all!

TECH TIP: Using the B-20 remote control bypass switch can also be very helpful when setting up and tuning the B-20 to your room. When switching the woofer in and out, no tonal difference should be noticeable, just added bass extension, or lack of it.

## SYSTEM OPERATION:

The B-20 in conjunction with good near field or mid field monitors, like the A-20, can play very loud with very low distortion, but every speaker has its limits. Harsh breakup is an indication your monitors or subwoofers have exceeded their output limits. Excessive boosting of bass, treble or equalizer controls can worsen the problem. If you hear continuous distortion or feel heat emanating from the drivers, reduce the level immediately. Most speaker damage occurs from sustained high volume levels, not from transient sounds or brief musical peaks. Listening at high volume levels is potentially dangerous and can lead to permanent hearing loss, especially when listening in the near-field. Protect your ears and use common sense.

## SYSTEM MAINTENANCE:

Except for the occasional flattering comment, your B-20 needs no regular maintenance. The B-20 cabinet is finished with a durable, scratch resistant laminate. Light dusting is usually sufficient, although the cabinet can be cleaned with a nonabrasive, water based cleaner. The grill covering the woofer should not be removed. The Control Amplifier can, as well, be lightly dusted. Never spray any type of cleaner onto the amplifier or woofer cone directly!

## TECHNICAL SUPPORT:

Toll free: (800)-NHT-9993 (648-9993. Fax: (707)-747-1252. Email: tech@nhtpro.com  
Postal Mail: NHTPro, 6400 Goodyear Rd., Benicia, CA 94510

## SPECIFICATIONS:

### SYSTEM:

Type: Active, modular stereo subwoofer system.  
Configuration: Acoustic Suspension  
Woofer: Two, 10" ultra long-excursion (1.0" linear, peak-to-peak), treated paper.  
Low Frequency Response: 29Hz - 100Hz  
-6dB LF cutoff: 25Hz (in room response).  
Peak Acoustical Output: 114 dB SPL @ 40 Hz.

### CONTROL AMPLIFIER:

Amplifier Power: 250W RMS/Ch., 400W peak (500ms).  
Dimensions: 3.5" h x 19" w x 13.375" d.  
Weight: 37 lbs.  
Shipping Weight: 45lbs./20.4kg.

### FEATURES/CONTROLS:

Input Connectors: XLR, TRS (wired in parallel, fully differential balanced)  
Satellite output connectors: TRS (fully differential balanced)  
Switchable Input Sensitivity: Mute, +11dB, +4dB, -3dB, -10dB  
Switchable Phase Control: -180, -90, 0, 90, 180 degrees.  
Continuously Variable Gain: 0 ~ -20dB  
Switchable Subwoofer LP Frequency: 70Hz, 85Hz, 95Hz, 105Hz, By (230Hz) @ 12dB/Oct.  
Switchable Monitor High-Pass Frequency: Bypass, 35Hz, 60Hz, 85Hz, 110Hz, Bypass @ 6dB/Oct.  
Subwoofer Bypass via supplied remote control  
Subwoofer Mono/Stereo mode select via supplied remote control

### WOOFERS:

Material: 3/4" MDF (medium density fibreboard).  
Finish: High pressure applied, Arpa brand Italian laminate.  
Dimensions: 14" h x 14" w x 16" d (with grill).  
Weight ea.: 38lbs.  
Shipping weight ea.: 43lbs./19.5kg.

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