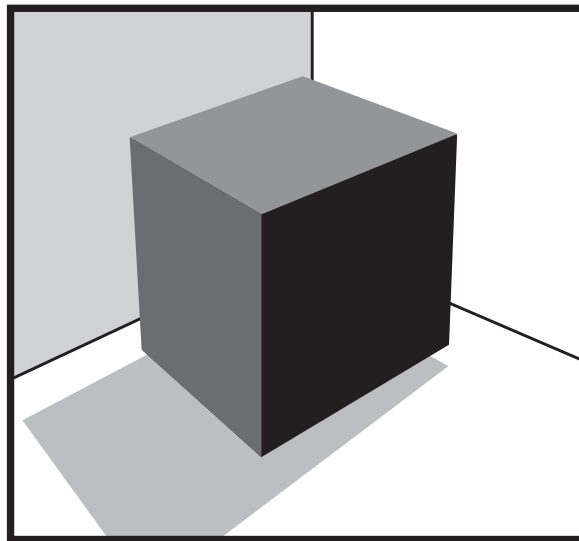


HSA

RESEARCH

VTF MK 2 Subwoofer Manual



Features

Variable Tuning Technology.

“Now you decide how deep to play.” The large flared ports can be re-tuned with the flip of a switch and the removal of a port plug. In Maximum Output mode, the subwoofer transforms into a different device capable of playing louder material with less distortion at the expense of some deeper bass.

Custom built woofers.

“The end of featureless boom.” We design our woofers for sound quality, so you will hear clean and detailed bass not found in lesser subwoofers.

Powerful BASH amplifiers.

Our custom built amplifiers work in concert with the woofer, protecting the subwoofer from damage and keeping distortion to a minimum.

Flexible room placement.

The unobtrusive finish, rounded corners, and overall design allows for close placement next to listeners or discreet placement in corners.

Connects to almost any system.

“Integration is easier than ever.” Thanks to modern receivers that use Dolby Digital, DTS, THX, or Bass Management, you can connect the subwoofer to your system with one cable. If you have invested in a stereo-only system, integration is also simple thanks to true 24 dB/Oct. crossovers.

NO USER SERVICEABLE PARTS ARE INSIDE.



WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Le symbole éclair avec point de flèche à l'intérieur d'un triangle équilatéral est utilisé pour alerter l'utilisateur de la présence à l'intérieur du coffret de "voltage dangereux" non isolé d'ampleur suffisante pour constituer un risque d'électrocution.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est employé pour alerter les utilisateurs de la présence d'instructions importantes pour le fonctionnement et l'entretien (service) dans le livret d'instruction accompagnant l'appareil.

SAFETY INSTRUCTIONS

1. Read these instructions – Read all the safety and operation instructions before operating the subwoofer.
2. Keep these instructions – Keep the safety and operating instructions for future reference.
3. Follow all instructions – Follow all operating and other instructions.
4. WARNING: To reduce the risk of fire or electric shock, this apparatus should not be exposed to rain or moisture. Do not use this apparatus near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement or near a swimming pool.
5. Clean only with dry cloth.
6. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
7. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
8. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet or extension cord so the blades are fully inserted, consult an electrician for replacement of the obsolete outlet.

9. Keep the power cord in operable condition. Protect the power cord from being walked on or pinched.

10. Only use attachments/accessories specified by the manufacturer.

11. Unplug this apparatus during lightning storms or when unused for long periods of time.

12. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

13. To completely disconnect this equipment from the mains, disconnect the power supply cord plug from the receptacle.

14. Connect the subwoofer to a power supply of the type described in these operation instructions or as marked on the subwoofer.

This apparatus does not exceed the Class A/Class B (whichever is applicable) limits for radio noise emissions from digital apparatus as set out in radio interference regulations of the Canadian Department of Communications.

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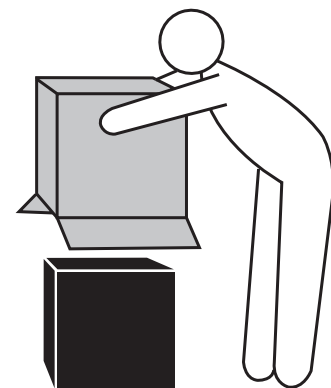
Set-Up

Step 1: Unpacking

If your room does not have carpeting, unpack the subwoofer on a throw rug or piece of carpeting to avoid unwanted scuffing or scratching. If the subwoofer is too heavy, please ask for assistance. Find the top of the box and open it. Holding the flaps open, roll the box over until it is upside-down. Lift the box off.

Stop for a moment to inspect the protective bag for any rips or tears that may have occurred during shipping. If there is damage to the subwoofer underneath, or if there are missing items, notify your local dealer or HSU Research as soon as possible. We will help you find a solution.

Leave the protective bag on for now because it will protect the subwoofer when you move it into position.



Step 2: Placement

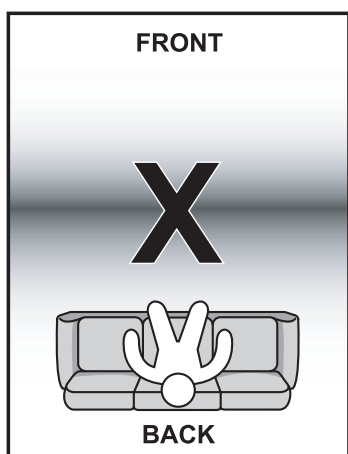
Placement is extremely important because it dramatically affects the bass quality. An optimally placed subwoofer is much more powerful and nice sounding than a poorly placed one. There are many myths about subwoofer placement. For example, there is no need to center a subwoofer between the left and right front speakers. Good subwoofers radiate bass in all directions and cannot be located in the room by sound alone.

Important guidelines

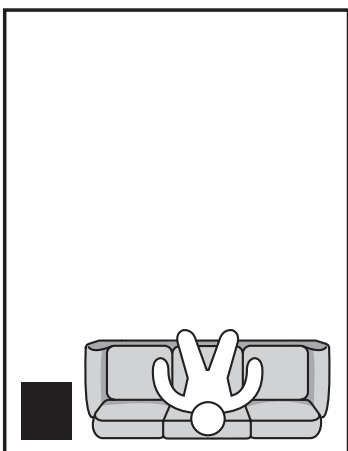
- Always maintain 3 inches clearance between the port hole on the back of the subwoofer and nearby surfaces.
- Your subwoofer has magnetic shielding, but 3 feet of space is still required between the subwoofer and a television or other CRT type monitors. Computer hard drives are not in danger of being erased.
- Your subwoofer was designed to fire downward onto carpet. If you have hardwood flooring, use a throw rug under the subwoofer.

Rules of thumb for placement

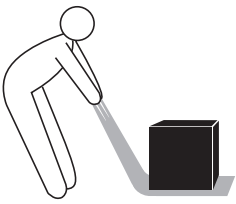
- **Avoid the center of the room:** In general, avoid placing the subwoofer half way between the front and back walls. This is where you get a strong null from your room's standing waves. You should also avoid sitting in that area. No matter how powerful the subwoofer is, there will not be much bass around the center of the room.
- **Use corner placement:** Subwoofers usually sound best tucked in a corner. A good corner is far from wall divisions and has at least 6 feet of wall to either side. If you have more than one good corner, use the one farthest away from large room openings or the one closest to the listener. Keep the subwoofer within 1 foot of the wall.
- **Use nearfield placement:** A good subwoofer usually sounds best close to the listening position. As an added bonus, the subwoofer's volume level will be lower so neighbors are less disturbed. We strongly recommend this method if your couch is up against the back wall and your room is over 18 feet deep.
- **Use "subwoofer crawling":** This excellent technique is not as hard as it sounds. The room's acoustical reflections are used to your advantage. Place the subwoofer in the listening position, in a seat, towards ear level. Connect the subwoofer to the system and play some music with steady and constant bass. Walk around the room, listening for the nicest and most even bass. When the bass sounds good, crouch down and listen where the subwoofer would normally be. You may use a SPL meter to measure the evenness of the bass. Mark the best sounding place. The subwoofer should be placed there.
- If you are using two subwoofers, place them side-by-side.
- If you are not able to place the subwoofer in an ideal location, the subwoofer should be placed within a foot of a wall for better bass.
- You may place a subwoofer inside a cavity in your entertainment center if three inches of space is maintained around the back and top of the subwoofer, and one inch is maintained around the sides. You may need to secure items in the cabinet so they don't vibrate.



Avoid placing the subwoofer halfway between the front and back walls. Avoid sitting there as well.



Corner and nearfield placement usually sound best.



Moving the subwoofer

Pull the subwoofer across a carpeted floor or drag it on a throw rug. Drag it on a flat side, NOT the side with the woofer or amplifier. Once in place, remove the plastic bag.

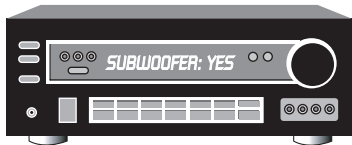
Screw on the spiked feet. You may place the subwoofer so the amplifier panel faces out to make setup easier.

Step 3: Hookup

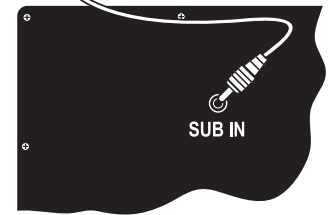
We will refer to receivers, integrated amplifiers, and preamps as *controllers*. Take a look at the back of your controller. The output connectors available determine the best method of hooking up your subwoofer.

Method A. Connecting to controllers with a SUBWOOFER or LFE output

If you have this, you should use it. All Dolby Digital, DTS, THX, and Bass Management equipped controllers have a low level SUBWOOFER or LFE output. It offers the easiest and best connection. Run a cable from it to the subwoofer's low level SUB-IN input. A standard mono interconnect cable with RCA jacks on both ends can be purchased from electronics and audio stores. A special subwoofer cable is not needed, and neither is a Y-connector. When wiring, allow for an extra yard or two. The cables should lie flat with a little bit of slack to give you some placement flexibility.



Set your controller to enable subwoofer output. To do this, go to the SPEAKER SET-UP or BASS MANAGEMENT menu and set the SUBWOOFER to ON or YES. All the speakers should be set to SMALL if possible. This directs the deep bass from the satellites to the subwoofer, freeing them and their amplifiers from the rigorous demands of reproducing bass.



Method B. Connecting to controllers with HIGH LEVEL speaker outputs.

If your system does not have a SUBWOOFER or LFE output (for example, stereo-only integrated amps or older Dolby Pro Logic receivers) you can use the HIGH LEVEL speaker outputs. The subwoofer taps the signal from the controller's amplifier, letting the subwoofer reproduce the bass of the left and right channels. This method is also called bass augmentation. Since the subwoofer uses its own amplifier there is no noticeable drain on your main amplifier.

You will need to run two lengths of two conductor speaker cable or zip cord. This wire is not included with your subwoofer but can be purchased at electronic or home improvement stores. Strip 1/2" of insulation from each end of the wire to expose the bare metal. If your speaker wire is fraying, tightly twist the metal. Unscrew the plastic hex nut on the binding post to insert the exposed wire into the hole. Tighten the binding posts by hand.

Run the wires from your system's amplifier to the subwoofer's HIGH LEVEL INPUTS. For each channel, run wire from the red (+) outputs on the amplifier to the subwoofer's red (+) inputs, and from the black (-) outputs on the amplifier to the subwoofer's black (-) inputs. Make sure the black amplifier outputs are "true ground." Bridged outputs cannot be used.

Be sure to double check all connections for the correct polarity so that the positive (+) terminals go to positive (+) terminals and negative (-) terminals go to negative (-) terminals. Most wire has some marker to help you keep track of the polarity, such as ribbing, color coding, or writing on one of the two strands. Tighten the binding posts by hand. If you prefer to terminate your cables, we recommend springy banana plugs for a reliable connection. They are available from electronic and audio stores.

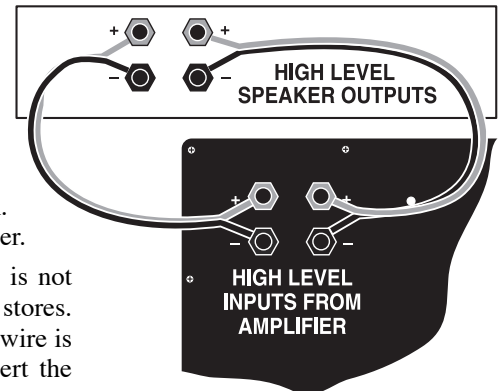
For older Dolby Pro-Logic controllers, your center channel must be switched to NORMAL instead of WIDE, or else the bass from the center channel will not be fed into the subwoofer. For Dolby Digital controllers, go to the SPEAKER SET-UP or BASS MANAGEMENT menu on your controller and turn the subwoofer to NO or OFF and set the left and right channels to LARGE.

If you are using Method B, you may run speaker wire from the subwoofer's OUTPUT TO SPEAKERS connectors to your satellites. Since the speaker cables will be carrying the current for the main speakers, you will need thicker speaker wire. For runs under 10 feet long, use 18 gauge AWG wire or thicker. For 10 to 25 feet, use 16 gauge wire or thicker. For over 25 feet, use 14 gauge wire or thicker.

Method C. Connecting to controllers with PRE-OUTs.

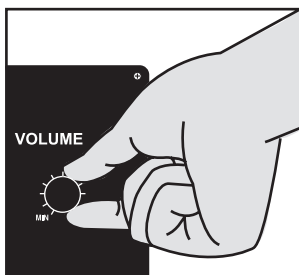
If you do not have a SUBWOOFER or LFE output but have an extra PRE-OUT, you can use this instead of the speaker outputs. Run a stereo RCA interconnect from your PRE-OUT to the left and right inputs on the subwoofer. For Dolby Pro-Logic controllers, your center channel must be switched to NORMAL. For Dolby Digital controllers, the subwoofer must be switched to NO or OFF and the left and right channels set to LARGE.

If your system (a) has a MAIN-IN connected with a metal jumper to a PRE-OUT, or (b) you have an external amplifier, you can purchase our HSU High Pass Box for the added benefit of keeping the bass out of your speakers. Please contact your local dealer or HSU Research for details.



Turning the subwoofer ON for the first time

On the subwoofer, check that the phase switch is at 0 degrees, the volume level knob is at the minimum, and the crossover is at 90 Hz if using the subwoofer's crossover. Run the power cord from the wall to the subwoofer and flip the power switch to the AUTO-ON or ON position.



Step 4: Volume Level

Many people use ordinary music recordings or soundtracks for setting the subwoofer's volume level. If you are using this method, try adjusting the subwoofer's volume level so it matches the main speakers at the listening position. Since most people do not listen to material at very loud reference levels and the ears are less sensitive to bass at lower levels, some listeners prefer to set the bass level a little higher than the main speakers. A good approach is to set the subwoofer level to the highest level where it sounds nice and where bass and kick drums still sound tight and non-boomy. For home theater applications, most prefer to set the subwoofer level higher than the other speakers. We suggest setting it about 3 dB higher. Some processors/receivers allow you to set different bass levels for different sources.

Optional: subwoofer integration will be more accurate when using test tones and a SPL meter. See Step 6 (Fine Tuning).

Step 5: Crossover

If you are using the SUBWOOFER or LFE output on your controller, you may optionally set the CROSSOVER switch to OUT. This lets the controller handle the crossover between the subwoofer and other speakers. However, if the bass sounds boomy, it may sound better with the crossover switched IN and the CROSSOVER FREQUENCY set to 90 Hz. You may skip the rest of this step.

If you are using the HIGH LEVEL speaker connections, you will be using the subwoofer's crossover. Look up the lowest frequency your left and right speakers will output (the frequency they are "-3 dB" at) and set the crossover approximately to this point. Play program materials with steady, consistent bass around this frequency such as filtered pink noise or music containing bass drums, double basses, bass guitar, etc. Turn the crossover to the left until you hear the subwoofer and L/R speakers as separate sources. Slowly turn the control back to the right until the sound of all three speakers is well integrated. When using tiny front speakers that don't have much bass, the 90 Hz setting on the control will probably yield the best results.

Your subwoofer has a sharp 24 dB/octave crossover to remove the midbass and midrange in the subwoofer. This makes your subwoofer non-directional. Unlike many other subwoofers on the market, the 24 dB/octave slope stays steep at all available frequencies, not just the high ones.

Step 6: Fine Tuning

Now that the basic setup is complete, it's time for optimization. Mark down the current volume and crossover settings with a soft pencil so you can go back to where you started.

Variable Tuning

If you don't like the air shaking feeling of very deep bass, or if you often listen to extremely loud chest-thumping material that has less deep bass, Maximum Output mode is for you.

You can switch over to Maximum Output mode when the system's volume level is low or the subwoofer is OFF. There are two steps:

- 1) Grip and pull out the foam port plug that is inserted in one of the port holes on the back of the subwoofer.
- 2) Flip the BASS EXTENSION switch on the back of the subwoofer to the MAX OUTPUT mode.

In technical language, you will get about 4 dB of extra head-room so that bass can be played louder, at the expense of some deep bass extension. In other words, the subwoofer has been transformed into a louder device with less deep bass.

Switching back is simply a matter of firmly re-inserting the port plug into one of the port holes, and flipping the switch back to MAX EXTENSION mode. Make sure that the switch setting is consistent with the port setting. Using the wrong switch position at loud volume levels may damage your subwoofer and void the warranty.

Setting the Phase

Depending on the absolute phase of your main speakers and amplifier, and the distances of the subwoofer and the main speakers from the listening position, the bass in the crossover region may be smoother if you reverse the phase of the subwoofer. Switch the phase switch to 180 degrees to see if the bass sounds louder in the seating position. Play program materials with steady, consistent bass in the crossover region (30 – 90 Hz). Filtered pink noise is best, but you may use music containing bass drums, double basses, bass guitar, etc.. The more bass-heavy setting is where the output of the subwoofer and the main speakers are most in phase. If the 180 degree position is louder, you will need to go back and adjust the volume level (Step 4). Otherwise, just switch the phase switch back to the original position.

Volume fine tuning

For the most precise integration with your main speakers, go through test tones with a SPL meter. Setting the level using test tones by ear may result in misconfiguration, so please use a meter. An analogue Radio Shack SPL meter is inexpensive and works better for this application than the digital Radio Shack SPL meter. It is available at RadioShack.com. Use the "C" weighting and "SLOW" settings.

Using a test disk with one-third octave filtered pink noise or warble tones, measure from the listening position with the volume at 75 dB with a 50 Hz tone. Test tones are available on the Stereophile Test CD 1, available at Stereophile.com. Do not play the test tones extremely loud as this might damage your speakers. Take measurements of four different tones above the crossover point and four different tones below the crossover point. Note that the Radio Shack meter is down about 12 dB at 16 Hz, 7 dB at 20 Hz, and 3 dB at 30 Hz, 2 dB at 40 Hz, and 1 dB at 50 Hz. Add these numbers to the readout to compensate. Average together each set of four measurements and adjust the subwoofer's volume level to compensate. Repeat the measurements until the subwoofer matches the other speakers.

A less accurate method uses the receiver's test tones, which are usually not in one-third octave increments. Measure from the listening position and set the subwoofer volume level to match the other speakers.

Removing buzzes and rattles from the room:

Annoying sounds can be fixed by using adhesives, tape, or felt pads in the area where objects are vibrating against each other.

Equalizing the subwoofer

If you have an equalizer, avoid raising dips in the frequency response. Instead, use the equalizer to remove peaks. This will prevent potential speaker damage.

Troubleshooting

If you think your subwoofer has a problem, please do everything you can to confirm the problem before contacting your dealer or calling for service, including reading through the troubleshooting section. Many times the problem actually is caused by other items in the system or the subwoofer's interaction with those items. Much of the time, the service department will not be able to reproduce the error.

Problem	Cause	Solution
Humming or buzzing noise	You have an amplifier problem.	<ul style="list-style-type: none"> • Disconnect all interconnects from the amplifier. If still hums, contact your dealer or call/email technical support.
	Your speaker wires or interconnects are the cause.	<ul style="list-style-type: none"> • It is possible that some cables have a poor or broken ground due to poor construction, oxidation, or damage. Also, poorly shielded cables can potentially pick up noise. Try another interconnect or speaker wire. Also, move the signal cable away from AC cables, power transformers, or other EMI sources.
	A light dimmer or other triac based (SRC) device is on the same AC circuit.	<ul style="list-style-type: none"> • Use an AC line filter or plug the unit into a different circuit.
	You have a problem with other equipment.	<ul style="list-style-type: none"> • If hum goes away when interconnects are disconnected, the hum is coming from the rest of your equipment. Add them back one piece at a time. The one that causes the system to hum is the source of the hum.
Subwoofer goes into STANDBY mode while material is playing.	The source is not providing enough signal.	<ul style="list-style-type: none"> • The unit is going into STANDBY mode during the quiet passages. Try turning the source signal up. On a Dolby Digital receiver, turn the SUBWOOFER level up in the SPEAKER SET-UP menu. After you turn the signal up, turn down the volume knob on the subwoofer to compensate. • An alternative is to turn the subwoofer ON/AUTO/OFF switch to the ON position. It does not use any more power and does not affect reliability.
No output from the subwoofer (the LED does <u>not</u> light up).	AC power is not getting to the amplifier.	<ul style="list-style-type: none"> • Check that the power cord is plugged in securely at both ends and make sure that the power outlet the subwoofer is plugged into is working.
	The amplifier's fuse is blown.	<ul style="list-style-type: none"> • Check the fuse. The fuse is located on the amplifier, near the power plug. Unplug the power cord and remove the fuse holder with a flat head screwdriver. If the fuse is blown, the output transistors are probably damaged. Contact the dealer or call/e-mail technical support for authorization to send the amplifier back for service.

Problem	Cause	Solution
No output from the subwoofer (LED lights up red).	The subwoofer is not receiving a signal.	<ul style="list-style-type: none"> • Recheck the connections between the source and the subwoofer.
	Subwoofer amplifier is faulty.	<ul style="list-style-type: none"> • With the volume on the subwoofer turned to a low setting, try plugging the subwoofer directly into a CD player or lightly touching the unplugged end of the input cable. If you hear noise from the subwoofer, the problem is with your connection to the system. If you hear no noise, try turning the volume on the subwoofer up some more. If you still hear no noise, contact your dealer or call/e-mail technical support for authorization to send the amplifier back for service.
No output from the subwoofer (LED turns green).	Connection between subwoofer amplifier and woofer is faulty.	<ul style="list-style-type: none"> • Return the subwoofer to the dealer or contact HSU Research.
	Driver or amplifier is faulty.	<ul style="list-style-type: none"> • Return the subwoofer to the dealer or contact HSU Research.
Little or no sound from one main speaker..	You used speaker level connections and have mixed up the polarity of the wires, thus shorting one channel of the main amplifier.	<ul style="list-style-type: none"> • Correct the polarity of the speaker wires by matching the +/- from the receiver/amplifier to the +/- of the subwoofer's speaker level input.
	You used speaker level connections and one or both your main amplifier's ' - ' are not true ground.	<ul style="list-style-type: none"> • Connect only to the channel that has a true ground ' - '. If neither channel has a true ground ' - ', contact your dealer or e-mail/call technical support.
Bass output from subwoofer is low.	Level on subwoofer or receiver's subwoofer output is too low.	<ul style="list-style-type: none"> • Increase the volume of the subwoofer and the subwoofer level or LFE level on the receiver or other source. It is best to set the level of the subwoofer relative to the other speakers using a test disk and a Radio Shack SPL meter, or built-in tones on your pre-amp/processor. See "Volume Level" in Step 4.
Subwoofer thumps when the system is being turned on and off.	Noise is being generated by upstream equipment.	<ul style="list-style-type: none"> • When you shut down your equipment, turn off the subwoofer first. When powering up, turn on the subwoofer last.

Repair

If your unit needs service, please re-review the troubleshooting section first.
 Contact your dealer or call tech support at 1-800-554-0150 9am to 5pm Pacific time, Monday through Friday.
 We will try and respond to emails sent to techsupport@hsuresearch.com within two business days.

Specifications

	VTF-2 MK 2	VTF-3 MK 2
Frequency Response +/- 1 dB (Max. Extension Mode)	25 Hz	20 Hz
Frequency Response (Max. Output Mode)	32 Hz	25 Hz
Woofer Size	10 inches	12 inches
Amplifier Power Rating (RMS)	250 Watts	350 Watts
Peak/Short Term Power	1000 Watts	1400 Watts
Crossover Frequency Range	30-90 Hz, bypassable	30-90 Hz, bypassable
Crossover Slope	24 dB/Oct	24 dB/Oct
Crossover Type	low pass only	low pass only
Phase	0°/180°	0°/180°
Dimensions	19.5"(h)/14"(w)/18"(d)	22"(h)/15"(w)/23"(d)
Ship Weight	56 lbs	82 lbs
Power Outlet Requirement	300 Watts	430 Watts

HSU Speaker System Limited Warranty

If the speaker system proves to be defective in materials or workmanship within seven years from the date of the original customer's purchase, or the amplifier within two years, we will, at our option, repair or replace the defective product.

*DISCLAIMER

THE WARRANTY STATED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE AND ALL OTHER LIABILITIES AND OBLIGATIONS OF HSU, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. HSU HAS NOT MADE AND DOES NOT HEREBY MAKE ANY OTHER REPRESENTATION, WARRANTY OR COVENANT WITH RESPECT TO THE CONDITION, QUALITY, DURABILITY, DESIGN, OPERATION, CAPACITY, FITNESS FOR USE OR SUITABILITY OF THE SPEAKER SYSTEMS.

Exclusion of Certain Damages

HSU's liability for any defective product is limited to repair or replacement of the product at our option. HSU shall not be liable for incidental or consequential damages of any kind or character because of product defects. Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply.

This Warranty Does Not Cover:

- Damage caused by abuse, accident, misuse, negligence, or improper operation.
- Products that have been altered or modified.
- Any product whose serial number has been altered, defaced, or removed.
- Normal wear and maintenance.
- Damages caused by shipping. (All claims for shipping damage must be made with the carrier.)

Warranty Service

Warranty service must be performed by an authorized service center, usually a HSU Speaker Systems dealer or its authorized agent. You may obtain a list of authorized service centers by writing to the address below.

All warranty repairs must be accompanied by the original bill of sales. No other document is acceptable or is required. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Due to our continual efforts to improve product quality as new technology and techniques become available, HSU reserves the right to revise its Speaker Systems specifications without notice.

Notes

Notes

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RESEARCH

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3160 E. La Palma Avenue #D
Anaheim, CA 92806
800-554-0150
HSURESEARCH.COM

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