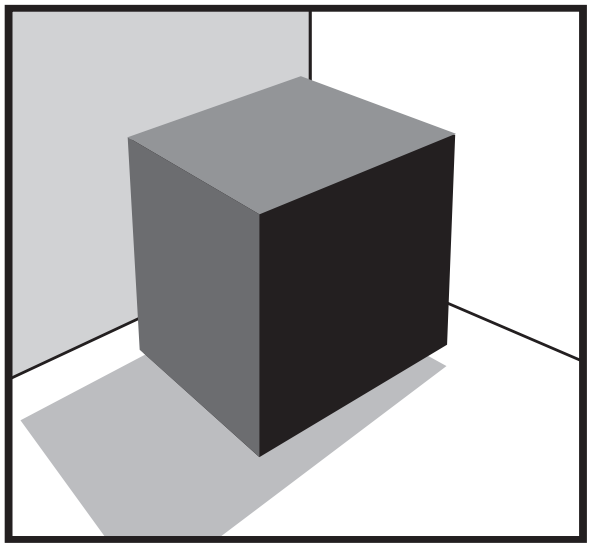
HSU RESEARCH

VTF-15H MK2 Subwoofer Manual



Features

Variable Tuning Hybrid Technology.

"Now you decide how deep to play." The large flared ports can be re-tuned with the flip of a switch and the addition or removal of a port plug(s). With support for five different operating modes, including ported and sealed hybrid modes, this subwoofer offers state-of-the-art performance in virtually all rooms.

Custom built woofers.

"The end of featureless boom." We design our woofers from the ground up to have exceptionally flat response and low distortion, so you will hear clean and detailed bass not found in lesser subwoofers.

Powerful BASH amplifiers.

Our custom built amplifiers have ultra-high headroom, soft clipping, subsonic filtering, adjustable Q, and class A/B output stage to provide extremely high fidelity, low distortion, and high output.

Flexible room placement.

The luxurious and smooth non-vinyl finishes, rounded corners and edges, and front-firing woofer and ports allow for close placement next to listeners, in corners, and even inside built-in entertainment centers.

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. low pass filters.

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 presence 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.

Important Safety Instructions

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. 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, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

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 cord or 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. WARNING: To reduce the risk of fire or electric shock, this apparatus should not be exposed to rain or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.

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

15. The mains plug of the power supply cord shall remain readily operable.

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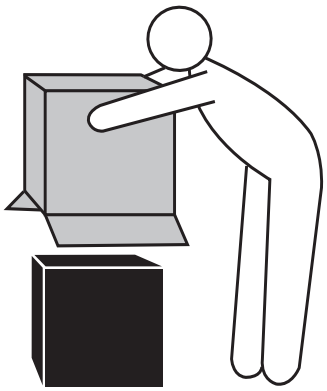
Set-Up

Step 1: Unpacking



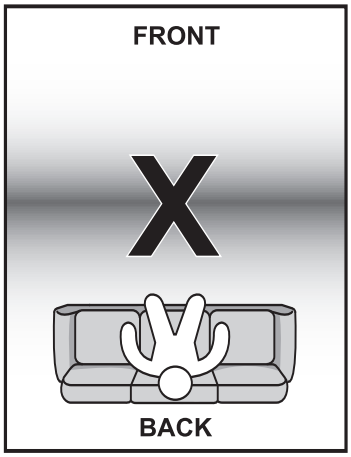
If your room does not have carpeting, unpack the subwoofer on a throw rug or piece of carpeting to avoid unwanted scuffing or scratching. If the subwoofer is too heavy, please ask for assistance. Find the top of the box and open it. Holding the flaps open, roll the box over until it is upside-down. Lift 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 HSU Research as soon as possible. We will help you find a solution.

Moving the subwoofer

If necessary, place the subwoofer feet on gliders or on a throw rug to move it into position.

Step 2: Placement



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

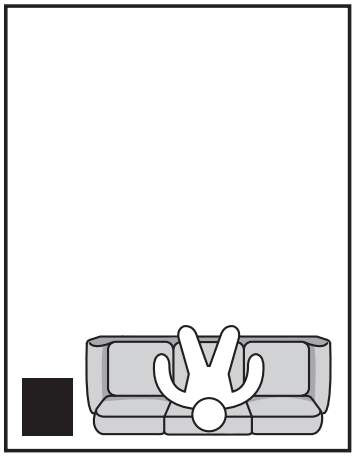
Placement is extremely important because it dramatically affects the bass quality. An optimally placed subwoofer will be more powerful and will sound better than a poorly placed one. There are many myths about subwoofer placement. For example, there is no need to center a subwoofer between the left and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

Important guidelines

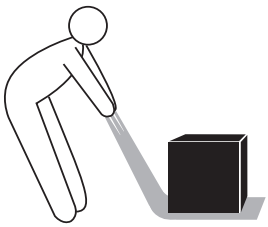
- *Always maintain at least 3 inches of clearance between the driver and ports on the front of the subwoofer and nearby surfaces.*
- *Your subwoofer does not have magnetic shielding. Keep the subwoofer at least 5 feet away from CRT type monitors. LED, LCD, Plasma, and DLP TVs are not affected, and the subwoofer can be placed next to these items with no magnetic interference. Keep the subwoofer at least 4 feet away from computer hard drives in order to prevent the hard drives from being erased.*

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 to maximize headroom, or separate them to potentially smooth out in-room response.
- 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 one inch of space is maintained around the back, top, and sides of the subwoofer. You may need to secure items in the cabinet so they don't vibrate. If you cover the front of the cavity, make sure it is acoustically transparent – slatted, cloth, etc.



Corner and nearfield placement usually sound best.

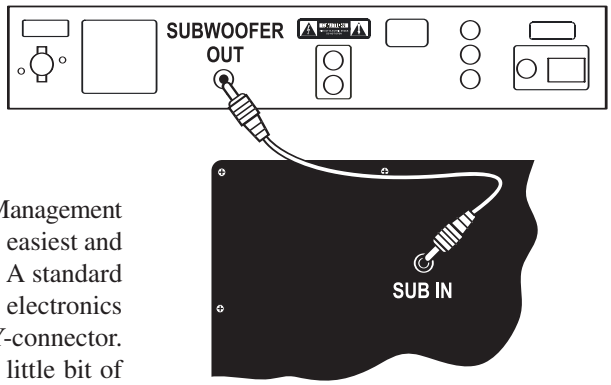


Moving the subwoofer

Always use two people to lift and move the subwoofer into place. Do not drag the subwoofer, as this can leave streak marks on the flooring surface and scratch marks on the subwoofer. Screw on the rubber feet securely before moving the subwoofer into place.

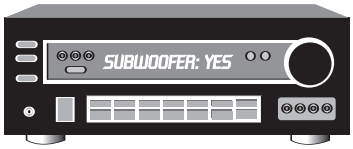
Step 3: Hookup

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

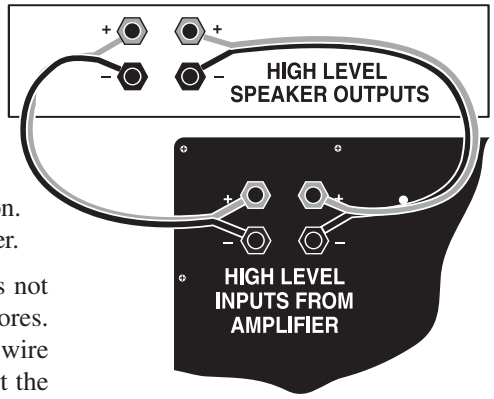
If you have this, you should use it. All Dolby Digital, DTS, THX, and Bass Management equipped controllers have a low level SUBWOOFER or LFE output. It offers the easiest and best connection. Run a cable from it to the subwoofer's low level SUB-IN input. A standard mono interconnect cable with RCA jacks 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.

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.

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.

Method C. Connecting to controllers with PRE-OUTs.

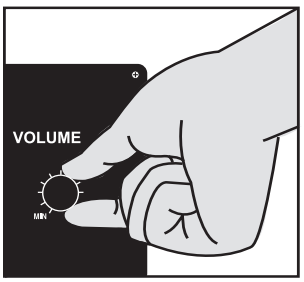
If you do not have a SUBWOOFER or LFE output but have an extra PRE-OUT, you can use this instead of the speaker outputs. Run a stereo RCA interconnect from your PRE-OUT to the left and right inputs on the subwoofer. For Dolby Pro-Logic controllers, your center channel must be switched to NORMAL. For 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 HSU Research for details.

If your controller has balanced outputs, connect to the balanced XLR inputs on the subwoofer.

Turning the subwoofer ON for the first time

On the subwoofer, check that the phase switch is set to 0 degrees, the Q control set to .7, EQ switch set to 1, one port plugged (remove one foam port plug) and with the volume level knob set to minimum. If you are using a controller with bass management, set the crossover switch to out. If your controller does not have bass management, set the crossover switch to in with crossover set to 90 Hz.



Step 4: Volume Level

Set the volume knob to the 8 o'clock position to start. 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 small satellites 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 low pass filter to remove upper bass and midrange from the subwoofer when CROSSOVER is switched IN. 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

By adding or removing a foam port plug(s) and flipping a switch on the sub amplifier, the user can operate this subwoofer in one of five different hybrid operating modes, providing the user with ultimate performance and flexibility for virtually all types of music and movie program material.

1) Ported Max Output Mode: 2 ports open, and operating mode switch set to 'EQ2". This mode is ideal for those with medium-to-large room sizes who listen at high playback levels and want the strongest mid-bass possible. NOTE: Never operate the subwoofer with 2 ports open and operating mode switch set to 'EQ1', as this may damage the driver and void the warranty.

2) Ported Max Extension Mode: 1 port open, and operating mode switch set to 'EQ1'. This mode is ideal for those with medium-to-large room sizes, or small to medium rooms but who listen at low-to-moderate playback levels where the rising low bass from room gain will help compensate for the ear's insensitivity to bass at lower levels.

3) Ported Max Headroom Mode: 1 port open, and operating mode switch set to 'EQ2'. This mode is ideal for those with medium-to-large room sizes who listen at high playback levels and want the deepest bass extension.

4) Sealed Max Extension Mode: 0 ports open, and operating mode switch set to 'EQ1'. This mode is ideal for those who prefer a sealed box sound and deepest bass extension.

5) Sealed Max Headroom Mode: 0 ports open, and operating mode switch set to 'EQ2'. This mode is ideal for those who want the sealed box sound and listen at high playback levels.

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 this section, we assume that you have a controller with bass management and you have set the main speakers to small so bass is re-directed to the subwoofer. Set the volume on the sub to 8 o'clock, crossover out, sub out level on the receiver to 0dB.

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. Various SPL meters are available online. Get one of these. Use the "C" weighting and "SLOW" settings and place the meter at the listening position at ear level. C weighting is down 9 dB at 16 Hz, 6 dB at 20 Hz, 4 dB at 25 Hz, 3 dB at 31.5 Hz, and 2 dB at 40 Hz. Add these numbers to the readout on the SPL meter to compensate.

1) Using a test disk with one-third octave filtered pink noise or warble tones (such as the Hsu/BAS Test CD-1), play the 50 Hz test tone and adjust the master volume level on the controller so that the SPL meter reads 80 dB at the listening position.
2) Play test tones from 20 Hz up to 200 Hz, and note the SPL reading on the meter at each frequency.
3) Take the average of four test tones below the crossover frequency (ie. 63/50/40/31.5 Hz when using 80 Hz crossover).
4) Take the average of four test tones above the crossover frequency (ie. 100/125/160/200 Hz when using 80 Hz crossover).
5) Adjust the subwoofer level so that the lower range average equals the upper range average (ie. if the lower range average is 5 dB more than the upper range average, then adjust the subwoofer level down by 5 dB). If your controller allows you to adjust subwoofer channel level, use this to adjust the subwoofer level. Otherwise simply adjust the subwoofer volume knob instead.

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.

Setting the Q Control

We have added an adjustable Q control on the subwoofer amplifier in order to give the user higher headroom, flatter in-room response, and better ability to take advantage of room gain. Set Q = 0.3 for the highest mid-bass headroom in all room sizes, and for the flattest deep bass response in small-to-medium room sizes. Set Q = 0.5 for the flattest deep bass response in medium-to-large room sizes. Set Q = 0.7 for the flattest deep bass response in large room sizes. Note that the low bass is more rolled off in the lower Q settings. This means that higher Q settings can result in less low bass headroom, ie. the subwoofer will run out of steam in the low bass earlier when the Q setting is higher.

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.

If you are using any auto EQ (such as Audyssey) to equalize your subwoofer, set the subwoofer to one port open, EQ1, Q = 0.7, as this will help to counteract the auto EQ's tendency to over boost very low frequencies. After running the auto EQ, you can set the subwoofer to any mode of your choice.

Enhancing performance in the future

The best way to enhance performance in the future is to add a second identical true subwoofer (and/or mid-bass module) to the system. With a single true subwoofer in the system, it is very difficult to achieve optimal mid-bass and deep bass performance. The addition of a second identical true subwoofer (and/or mid-bass module) results in much higher headroom, much lower distortion, and potentially much flatter frequency response in-room due to better ability to optimize for strong mid-bass and deep bass output and response.

Troubleshooting

If you think your subwoofer has a problem, please do everything you can to confirm the problem before contacting us 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.	• Disconnect all interconnects from the amplifier. If still hums, call/email technical support.
	Your speaker wires or interconnects are the cause.	• 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.	• Use an AC line filter or plug the unit into a different circuit.
	You have a problem with other equipment.	• 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.	• 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. • Check to see if crossover on the receiver is set too low and/or if the crossover on the sub is set to 'in', and crossover on the sub is set too low. This will greatly reduce the signal going to the sub and hence make it go into standby mode.
No output from the subwoofer (the LED does not light up).	AC power is not getting to the amplifier.	• 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. • Try another power cord such as a desktop computer power cord.
	Amplifier is not working.	• If you have determined that the power outlet has power, and that the power cord is plugged in properly and the LED is still not lighting up, the amp needs service. 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 with power switch set to auto)	The subwoofer is not receiving a signal.	• Recheck the connections between the source and the subwoofer.
	Subwoofer amplifier is faulty.	• Set the subwoofer level to minimum. Use a different RCA cable to hook the sub to a DVD player's analog output or to an MP3 player. Play some music and slowly turn up the volume on the sub. If the sub plays, then the sub is fine and the problem lies either in the subwoofer cable or the setting on the receiver, or you have connected to the wrong jack on the receiver. If there is still no noise, call/e-mail technical support.
No output from the subwoofer (LED turns green with power switch set to auto)	Connection between subwoofer amplifier and woofer is faulty.	• If wire is loose, tighten the connector and reconnect.
	Driver or amplifier is faulty.	• Take the driver out of the cabinet and connect to your main amplifier. If it plays fine, then the amp is bad. If it does not play, then the woofer is bad. Call/e-mail technical support for authorization to send non-working part back for service.
No output from the subwoofer (LED lights up red with power switch set to on)	Ribbon cables between boards not fully inserted (shaken loose during shipping).	• Take out the amplifier and make sure all the cables between the boards are fully and securely inserted into the sockets on the boards.
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.	• 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.	• Connect only to the channel that has a true ground ' - '. If neither channel has a true ground ' - ', e-mail/call technical support.
Bass output from subwoofer is low.	Level on subwoofer or receiver's subwoofer output is too low.	• 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.	• 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 tech support via e-mail (24/7) or call 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.

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.)

Specifications

	VTF-15H MK2
Frequency Response (+/-2 dB) (1 Port Open, EQ1, Q=0.7)	15 Hz
Frequency Response (+/-2 dB) (2 Ports Open, EQ2, Q=0.7)	20 Hz
Woofer Size	15 inches
Amplifier Power	2000W short-term, 600W cont.
Crossover Frequency Range	30-90 Hz, bypassable
Crossover Slope	24 dB/Oct
Crossover Type	low pass only
Q	0.3 - 0.7
Phase	0°/180°
Inputs	Balanced XLR (2) 10k ohms RCA Line Level (2) 10k ohms Speaker Level (2) 300k ohms
Dimensions (excluding feet/grille)	24″(h)/18″(w)/26″(d)
Product Weight	95 lbs.
Power Outlet Requirement	700 Watts

Warranty Service

Warranty service must be performed by Hsu Research or an authorized service center.

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

HSU
RESEARCH

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1-800-554-0150
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