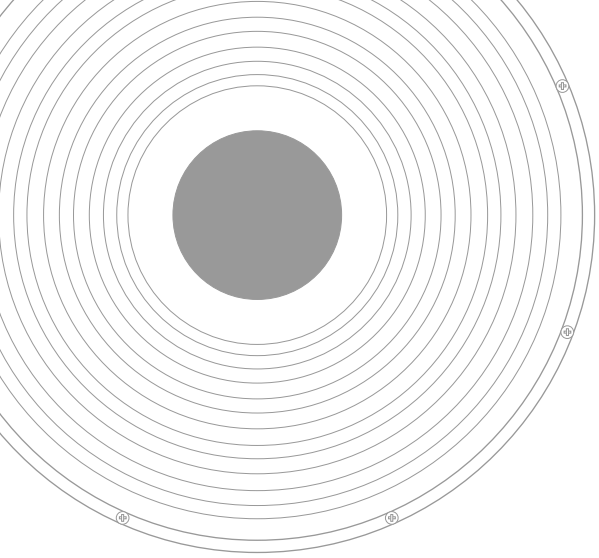
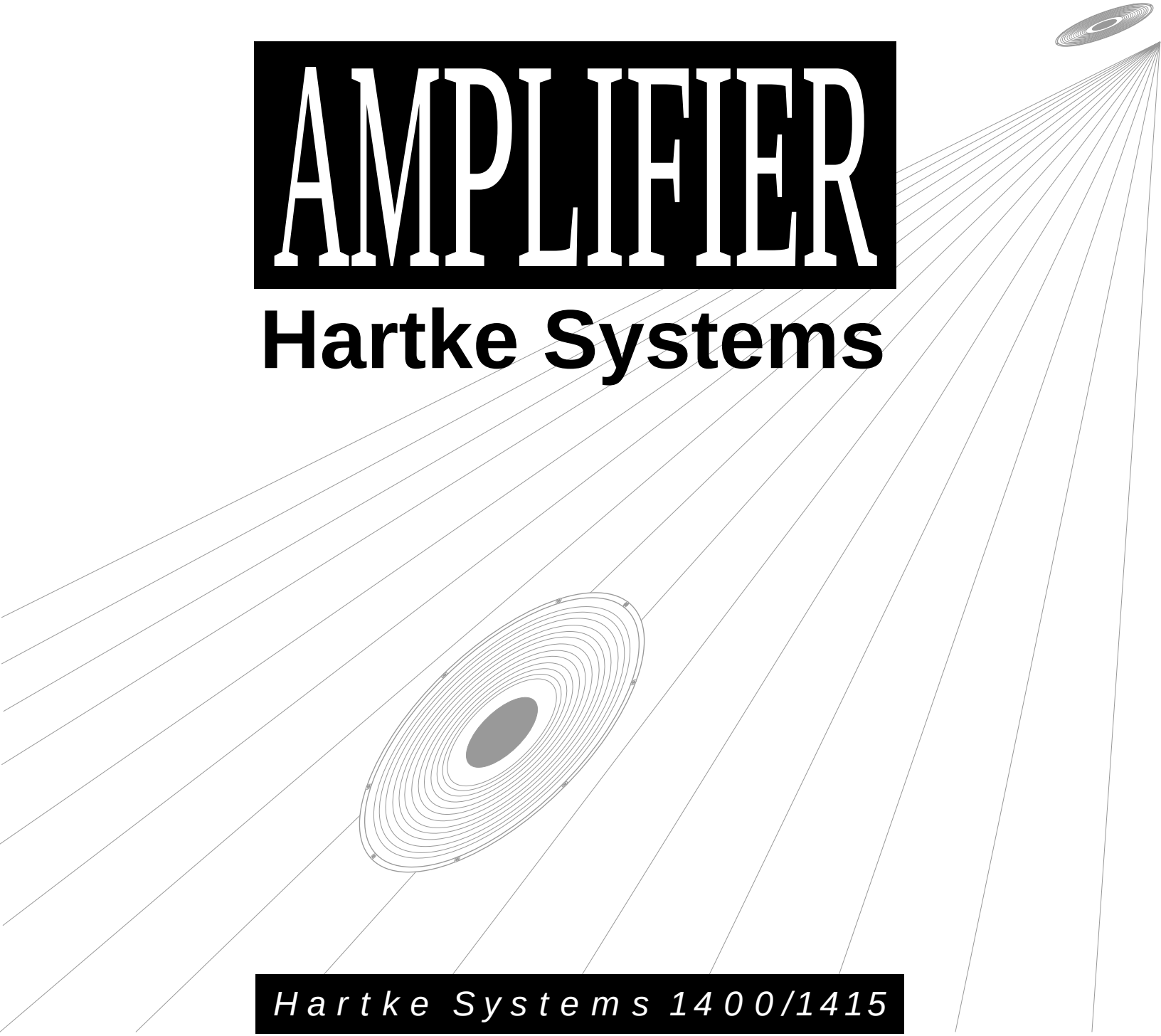


AMPLIFIER

Hartke Systems



Hartke Systems 1400/1415

Introduction

Congratulations on purchasing the Hartke Systems Transient Attack® 1400/1415 Bass Amplifier! Although this device is designed for easy operation, we suggest you take some time out first to go through these pages so you can fully understand how we've implemented a number of unique features.

The two models covered by this manual differ in that the Model 1415 is a combo amplifier which comes with a matched rear-ported 15" bass speaker, while the Model 1400 is an amplifier head alone which can be used with any 4, 8, or 16 ohm bass speaker cabinet. Both are optimized for use with electric bass instruments, and the actual amp circuitry in both models is identical. You'll find the Model 1400/1415 to be the perfect system for use in small venues (such as club dates); in addition, its dedicated headphone output makes it an excellent practice amp.

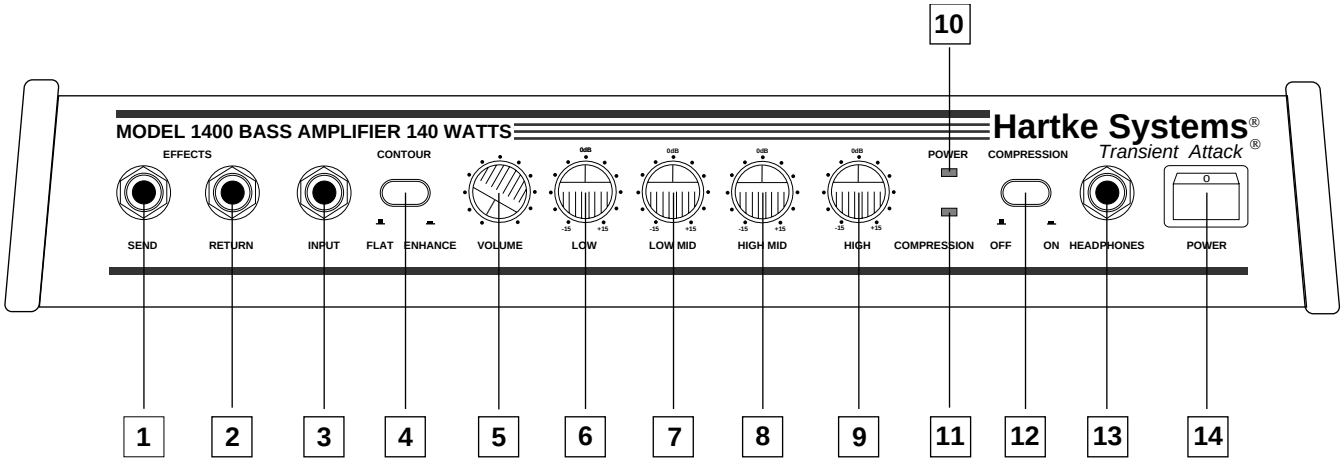
In these pages, you'll find a detailed description of the many features of the Model 1400/1415 Bass Amplifier, as well as a guided tour through its front and rear panels, step-by-step instructions for setting up and using the unit, and full specifications. You'll also find a warrantee card enclosed—please don't forget to fill it out and mail it so that you can receive online technical support and so we can send you updated information about other Hartke and Samson products in the future.

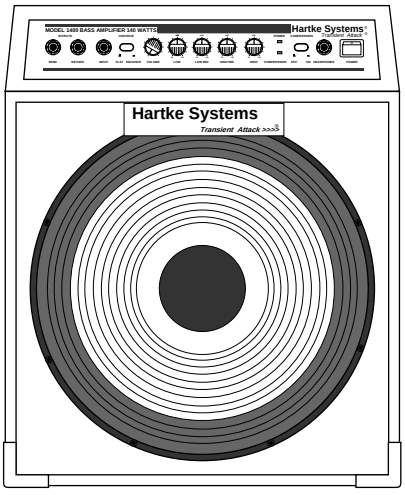
SPECIAL NOTE: Should your unit ever require servicing, a *Return Authorization* number (RA) is necessary. Without this number, the unit will not be accepted. Please call Samson Technologies at (516) 932-1062 for a Return Authorization number prior to shipping your unit. Please retain the original packing material and, if possible, return the unit in its original carton and packing materials.

The Hartke Systems Transient Attack® 1400/1415 Bass Amplifier offers all the newest concepts in state-of-the-art bass amplification. Here are some of its main features:

- Power to spare—a full 140 watts into 4 ohms.
- Bipolar design for clean, crisp sound—as well as our Transient Attack® circuitry, which ensures that every nuance of your bass performance is reproduced faithfully.
- Four-bands of high-quality equalization, allowing you to create a broad range of tonal colors for your bass instrument.
- A unique contour switch, which simulates classic tube amplifier sound.
- A built-in compressor utilizing “soft” clipping—this not only adds real “punch” to your bass, it also allows you to smooth out volume differences between notes.
- A separate headphone output which automatically mutes the speaker output, making this the “perfect” practice amp.
- A feedback-type input that accommodates a broad range of input levels (up to 15 volts), so that you can use the Model 1400/1415 with pretty much any kind of bass, from passive models to those with active circuitry.
- Effects loop send and return jacks that allow you to interface professional outboard effects processors.
- The Model 1415 Combo amp includes a special Hartke 15” 4-ohm driver mounted in a rear-ported bass reflex cabinet; these components are specifically designed to match the amplifier circuitry.
- Rugged construction and carpeted exterior makes the Model 1400/1415 eminently road-worthy.

Guided Tour - Front Panel





1. Effects Send jack - Use this standard 1/4” unbalanced jack to send signal from the Model 1400/1415 to a professional outboard effects processor such as a reverb, echo, chorus, flanger, or harmonizer device.* Output level is approximately 0 dB and is unaffected by the setting of the Volume control. You can also use the Effects Send jack as a direct output (at unity gain) for routing signal to an external mixing console or amplifier.

2. Effects Return jack - Use this standard 1/4” unbalanced jack to return signal to the Model 1400/1415 from a professional outboard effects processor.*

3. Input jack - Connect your bass guitar to the Model 1400/1415 here. This standard 1/4” unbalanced jack provides a high impedance input and is specially designed to handle a broad range of bass pickup signals up to 15 volts (allowing you to use any kind of bass, including those models that contain active circuitry).

4. Contour switch - When pressed in (the “Enhance” setting), the Model 1400/1415 activates a special equalization curve that is designed to emulate the sound of classic tube bass amplifiers. When out (the “Flat” setting), Contour is inactive. For more information, see the “Effect of the Contour Switch” section in this manual.

5. Volume control - This is the overall volume control. For best signal-to-noise ratio, keep the output of your bass at or near maximum and adjust the amp’s Volume to the desired level.

** In-line effects (such as footpedals) intended for low signal levels should be placed between the bass and the amplifier Input and not connected with the Effects Send and Return jacks.*

6. Low EQ control - This control provides approximately 15 db of cut or boost at 33 Hz, with a resonant (bell) curve. When the knob is at the 12 o'clock ("0") position, there is no boost or attenuation (that is, flat response). As it is turned clockwise from the "0" position, the frequency area is boosted; as it is turned counterclockwise from the "0" position, the frequency area is attenuated. For more information, see the "About Equalization" section in this manual.

7. Low Mid EQ control - This control provides approximately 15 db of cut or boost at 80 Hz, with a resonant (bell) curve). When the knob is at the 12 o'clock ("0") position, there is no boost or attenuation (that is, flat response). As it is turned clockwise from the "0" position, the frequency area is boosted; as it is turned counterclockwise from the "0" position, the frequency area is attenuated. For more information, see the "About Equalization" section in this manual.

8. High Mid EQ control - This control provides approximately 15 db of cut or boost at 240 Hz, with a resonant (bell) curve. When the knob is at the 12 o'clock ("0") position, there is no boost or attenuation (that is, flat response). As it is turned clockwise from the "0" position, the frequency area is boosted; as it is turned counterclockwise from the "0" position, the frequency area is attenuated. For more information, see the "About Equalization" section in this manual.

9. High EQ control - This shelving control provides approximately 15 db of cut or boost at 2.5 kHz. When the knob is at the 12 o'clock ("0") position, there is no boost or attenuation (that is, flat response). As it is turned clockwise from the "0" position, the frequency area is boosted; as it is turned counterclockwise from the "0" position, the frequency area is attenuated. For more information, see the "About Equalization" section in this manual.

10. Power LED - Lights whenever the Model 1400/1415 is powered on.

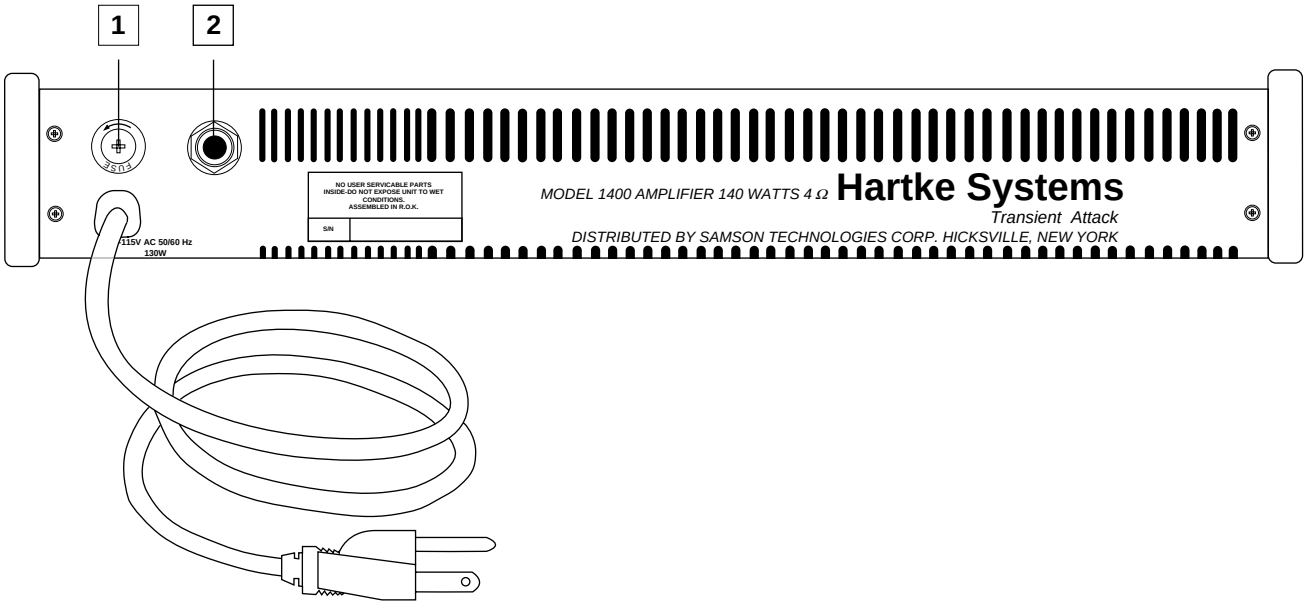
11. Compression LED - Lights whenever compression is being applied to the incoming signal. If Compression is on, this LED "follows" the incoming signal, flashing when small amounts of compression are being applied and lighting steadily when "soft-clipping" limiting is being applied.

12. Compression switch - When pressed in, the Model 1400/1415 compression circuitry is activated so that, when power output exceeds 140 W or Total Harmonic Distortion (THD) rises above 1%, the incoming signal is compressed or limited. When out, no compression will occur. For more information, see the "About Compression" section in this manual.

13. Headphones jack - Connect any standard stereo headphone (600 ohms or less) to this standard 1/4" stereo jack. When a plug is inserted into the headphone jack, the speaker output is muted (in the Model 1415, the built-in speaker is muted). The level of the signal sent to the headphones is determined by the setting of the Volume knob—when set to the point where a connected speaker would clip, the headphones will clip. **WARNING: Because the Model 1400/1415 is capable of generating extremely high headphone signal levels, *always* start with the Volume knob at minimum and then *slowly* turn it up. In particular, a clicking sound is an indication of distortion and possible damage to the headphones (and/or your hearing!); don't let things get to that point!**

14. Power switch - Use this to power the unit on or off.

Guided Tour - Rear Panel



1. Fuse holder - Insert a 4 amp, 250 volt fuse here for 115 volt operation. We recommend the use of slow-blow fuses.

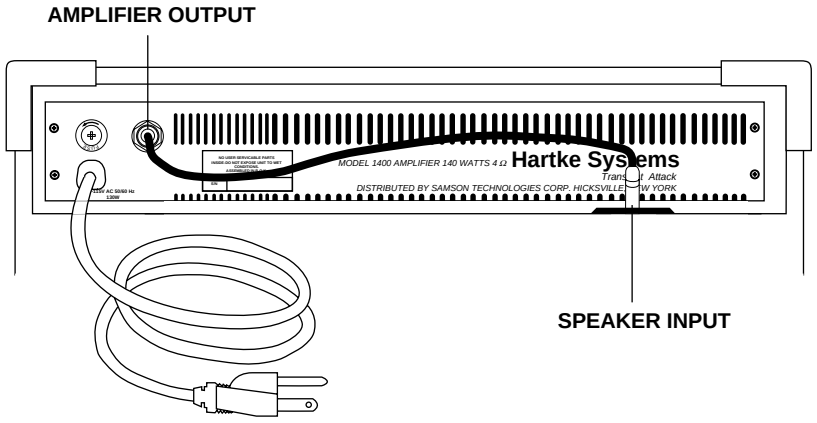
2. Speaker output - Connect any 4, 8, or 16 ohm bass cabinet to this standard unbalanced 1/4” jack. **WARNING: Because of the high power levels and low frequency content of the signal generated by the Model 1400/1415, use only appropriately rated speaker cabinets that are specifically designed for bass instruments.**

Setting Up and Using the Hartke Systems 1400/1415

Setting up your Hartke Systems 1400/1415 Bass Amplifier is a simple procedure which takes only a few minutes:

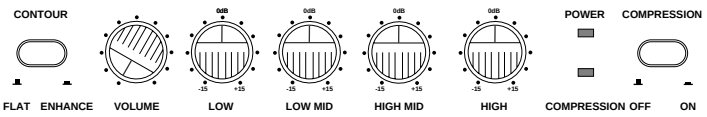
1. Remove all packing materials (save them in case of need for future service) and decide where the amplifier is to be physically placed. To avoid potential overheating problems, make sure that the rear panel is unobstructed and that there is good ventilation around the entire unit. Because the Model 1415 contains a rear-ported speaker, it should not be placed up against a wall—allow at least 2 - 3 feet of clearance.

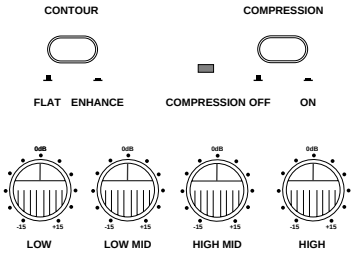
2. In the Model 1400, begin by hooking up a speaker, using the 1/4" unbalanced Speaker output connector on the rear panel. It is never a good idea to power up any amplifier that is not connected to loudspeakers. Any appropriately rated bass cabinet with a minimum impedance load of 4 ohms (that is, 4 ohms or greater) can be used. The Model 1415 is shipped with a connector between the amplifier output and the built-in speaker input; check to make sure this is in place.



3. Next, connect the 3-pin AC plug into any grounded AC socket. Don't turn the amplifier on just yet, though.

4. Use a standard music instrument cable to connect your bass to the Input jack on the front panel. On the front panel of the Model 1400/1415, turn the Volume control to its minimum (fully counterclockwise) position, set all four EQ controls to their "0" (12 o'clock) position, and start with both the Contour and Compression switches out (that is, off).





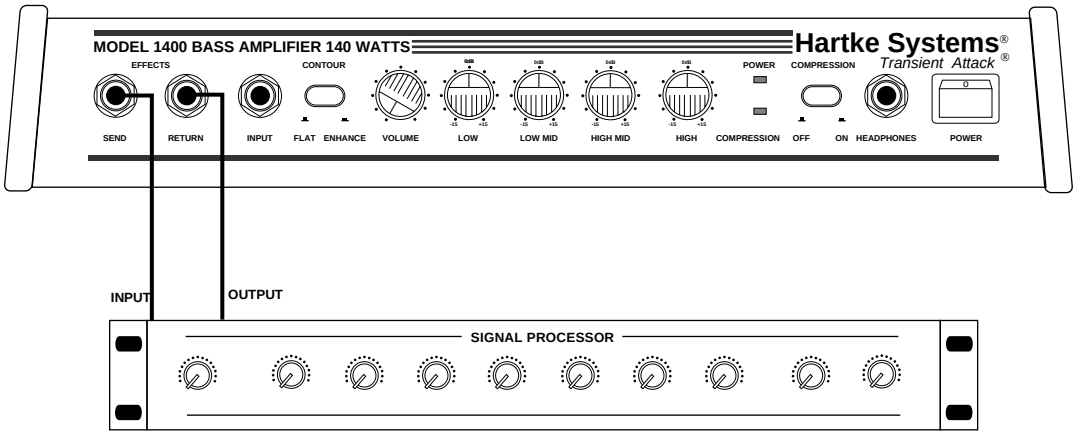
5. Press the front panel Power switch in order to turn on the amplifier.

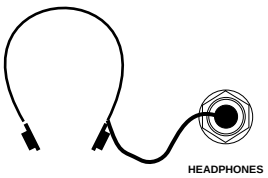
6. Set the output of your bass to maximum and then, while playing, slowly turn the Model 1400/1415 Volume control up until the desired level is achieved. If you hear distortion even at low amplifier Volume settings, back off the output of your bass (or check for a faulty cable).

7. If desired, press in the Contour and/or Compression switches. The Compression LED will flash whenever small amounts of compression are being applied and will light steadily when “soft-clip” limiting is being applied.

8. Adjust the equalization controls to taste (when you get a great setting that complements your instrument and playing style, it’s a good idea to write it down for future use).

9. If you’re using an external signal processor, turn the Model 1400/1415 off momentarily and then connect a standard audio cable between the Effects Send jack and your effects processor input and another standard audio cable between the Effects Return jack and your effects processor output (if required, multiple effects processors can be daisy-chained together, output to input). Turn the Model 1400/1415 back on and continue playing while adjusting the controls of your outboard effects processor. For best results, set both the input and output gain of the effects processor to 0 dB (unity gain), so that there is no increase or decrease in level whether the effects are switched in or out.

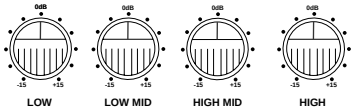




10. Test the headphone output by turning the Volume control to its minimum (fully counterclockwise) position and then connect a standard stereo headphone to the front-panel Headphones jack. While playing your bass, *slowly* turn the Volume control up—you should hear sound from the headphones and none from any connected speaker(s). We recommend the use of large size headphones (those with large transducers) for optimum bass reproduction.

If you have followed all the steps above and are still experiencing difficulties, call Samson Technical Support (516-932-1062) between 9 AM and 5 PM EST.

The Hartke Systems Transient Attack® 1400/1415 Bass Amplifier gives you enormous control over shaping the sound of your bass, using a process called *equalization*. To understand how this works, it's important to know that every naturally occurring sound consists of a broad range of pitches, or *frequencies*, combined together in a unique way. This blend is what gives every sound its distinctive tonal color. EQ controls allow you to alter a sound by boosting or attenuating specific frequency areas—they operate much like the bass and treble controls on your hi-fi amp, but with much greater precision. The Model 1400/1415 provides you with four bands of equalization. Each EQ knob (labeled *Low*, *Low Mid*, *High Mid*, and *High*, respectively) affects a different frequency area (33 Hz, 80 Hz, 240 Hz, and 2.5 kHz, respectively) and provides approximately ± 15 db of boost and attenuation.

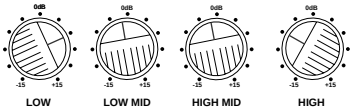


We carefully selected these frequency areas because they have maximum impact on bass signals. For example, the Low (33 Hz) control affects the very lowest audible frequencies (in fact, most humans cannot hear below 20 Hz), while the High (2.5 kHz) control affects the "twang" of a bass string. When an EQ knob is in its center detented position ("0"), it is having no effect. When it is moved right of center, the particular frequency area is being boosted; when it is moved left of center, the frequency area is being attenuated. Turning all EQ controls up the same amount will have virtually the same effect as simply turning up the Volume; conversely, turning them all down the same amount will have virtually the same effect as turning down the Volume. Both approaches are pointless (after all, that's why we gave you a Volume control!)

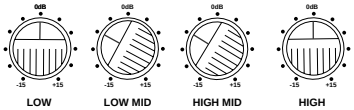
In many instances, the best way to deal with equalization is to think in terms of which frequency areas you need to attenuate, as opposed to which ones you need to boost. Be aware that boosting a frequency area also has the effect of boosting the overall signal; specifically, too much Low or Low Mid EQ boost can actually cause overload distortion or even harm a connected speaker, though the Model 1400/1415's Compressor—if on—will act to some extent to prevent this from occurring. In general, if you're going to apply a fair amount of Low or Low Mid EQ boost, it's a good idea to keep the Compressor on, if only to protect your speakers from potential damage.

About Equalization

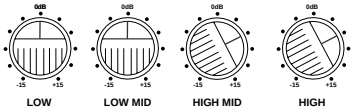
The specific EQ you will apply to your bass signal is very much dependent upon your particular instrument and personal taste and playing style. However, here are a few general suggestions:



• For that super-deep reggae or Motown sound, boost the Low EQ slightly while attenuating the High control (leave the Low Mid and High Mid flat or slightly attenuated).



• To remove boxiness and make your instrument sound more “hi-fi,” try attenuating the High Mid and/or Low Mid frequencies while leaving the Low and High settings flat.



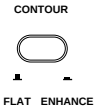
• For a twangy, cutting sound, try boosting the High and High Mid frequencies (putting new roundwound strings on your bass will help a lot also!).

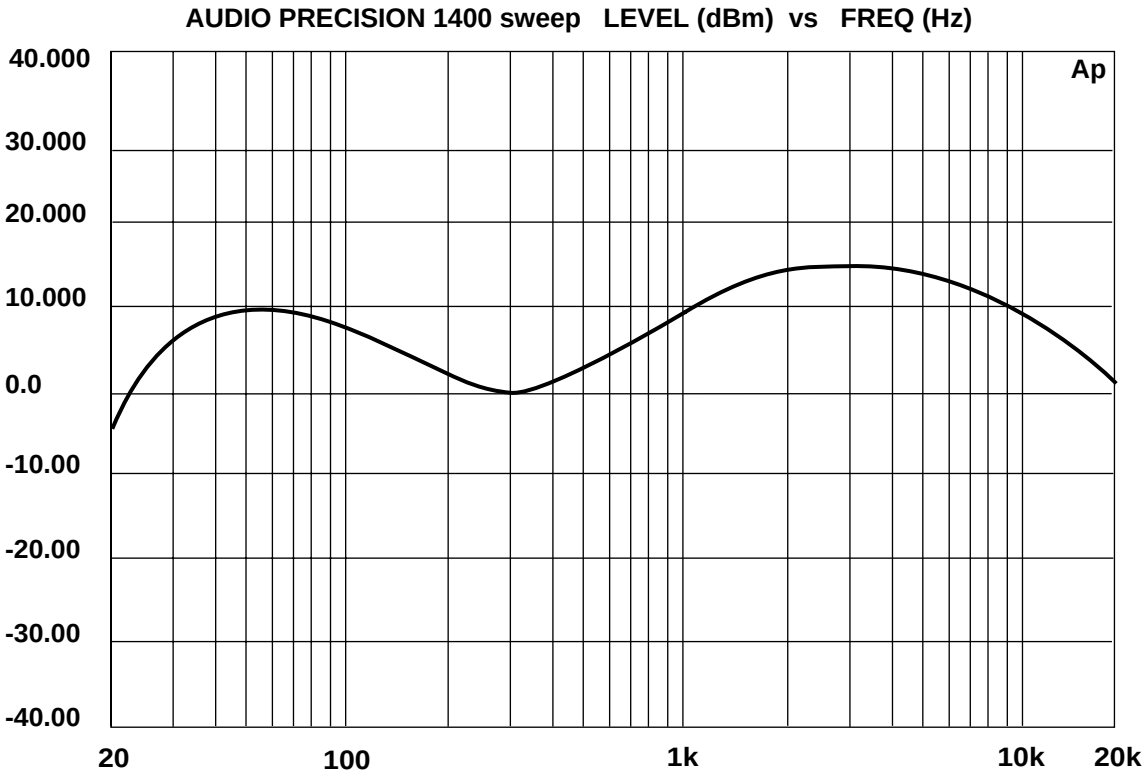
• Whenever you get a really good EQ setting for a particular instrument or song, *write it down* (you’d be amazed how easy it is to forget these things!).

Finally, as you experiment with the EQ controls of the Model 1400/1415, don’t forget that your bass also provides EQ controls in the form of its tonal settings—this can be particularly effective in instruments that have active circuitry. Also, try various EQ settings with and without the Contour switch in and also with and without Compression. For more information, see the “Effect of the Contour Switch” and “About Compression” sections below.

Effect of the Contour Switch

The Contour switch provides a unique control that allows the Model 1400/1415 to emulate the sound of a classic tube bass amplifier. When pressed in (the "Enhance" setting), a special kind of equalization curve is activated that provides moderate boost at 45 Hz, deep attenuation at 240 Hz, and gentle boost that peaks at approximately 3 kHz. This curve is illustrated below:

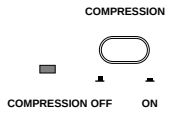




Even when Contour is on, the front-panel EQ controls are still operational. When all of them are set to their "0" (flat) position, the boost or attenuation performed by the preset Contour curve is as shown above. However, when any EQ controls are turned left or right of their 12 o'clock ("0") position, their boost or attenuation effect is superimposed upon the preset Contour curve. This way, you can start with the classic tube sound and customize it further still to complement your instrument and playing style.

When the Contour switch is out (the "Flat" setting), the EQ controls operate normally, with no preset curve imposed.

About Compression



The *dynamic range* of a sound is the difference between its loudest and softest points. For example, as you play your bass, you'll probably find that some notes (for example, notes played on the upper frets of the lowest string) are considerably louder than others. The function of the compressor in the Model 1400/1415 Bass Amplifier is to reduce overall dynamic range by automatically attenuating the loudest sounds input so that they are closer in level to softer ones—the end result is that the sound "evens out" and all notes played have pretty much the same level.

When you press in the "Compression" switch on the front panel, this automatic circuitry is engaged and the loudest sounds you play (those that might cause 1% or more of Total Harmonic Distortion) are reduced in level so that they more closely match the level of softer sounds—when this occurs, the Compression LED will flash. Very loud sounds will be *limited*—this is a more severe form of compression, whereby the output remains virtually constant regardless of input. When this occurs, the Compression LED will light steadily.

Compression has three main uses. First, as just described, it "evens" out the notes played by your bass so that they all appear at virtually equal level. Second, it adds "punch" to a sound; since all levels are nearly the same, you can play with greater force without worrying about the loudest notes distorting. Finally, it serves to protect your loudspeakers from damage as a result of brief (*transient*) high output levels, as might be caused by finger-popping or other performance techniques. The Model 1400/1415 compression circuit uses a function called *soft clipping* to prevent sounds from overloading the amplifier output—this, in turn, serves to prevent connected speakers from producing distorted, *hard clipped* sound.

Whether or not you need to use compression with your Model 1400/1415 will be a matter of personal taste and playing style—experiment and see if you like the effect. If you usually play at low Volume levels, you'll find that, even with the Compression switch in, the Compression LED doesn't flash or light at all—in this case, the circuitry isn't being used anyway, so it might as well be off. In general, if you don't need compression, leave it off.

Specifications

1. Rated Output Power (at 1 kHz, 4 ohm, THD 1%)		146 W
2. Total Harmonic Distortion (with 30 kHz LPF, 4 ohm, 140 W)		0.05%
3. Signal To Noise Ratio (with 30 kHz LPF)		-68.6 dB
4. Frequency Response (at flat S/W on)		
	20 Hz	-11.3 dB
	40 Hz	- 0.4 dB
	20 kHz	- 6.2 dB
5. Input Sensitivity		10.8 mV
6. Equalizer		
	Low (33 Hz)	±15 dB
	Low Mid (80 Hz)	±15 dB
	High Mid (240 Hz)	±15 dB
	High (2.5 kHz)	±15 dB
7. Compressor Effect		
	Input level -39 dB	- 5.2 dB
	Input level -29 dB	- 3.1 dB
	Input level -19 dB	- 1.8 dB
	Input level - 9 dB	- 0.9 dB
8. Residual Noise (VR down, EQ flat, Contour flat)		-56 dB
9. Idle Current		10 mV
10. DC Offset Voltage		0 V ± 100mV
11. Send Output Level		0 dBM
12. Return Input Level		0 dBM
13. Headphone Level	R (32 ohm load)	275 mW
	L (32 ohm load)	275 mW