APPLICATION GUIDE

CGS
CHASSIS GROUND SYSTEM

CHASSIS GROUNDING — HISTORY

Many of the practices that we use in audio have come from the early telecommunications industry. It was common practice to rack mount equipment in a metal rack. Everything in the rack would be connected to a common ground using braided ground conductors. Every piece of equipment had a dedicated grounding lug for this connection. This practice continues today in both the telecommunication and networking industry. Connecting all equipment to a central ground point ensures electrical safety and eliminates voltage differences between component chassis'.

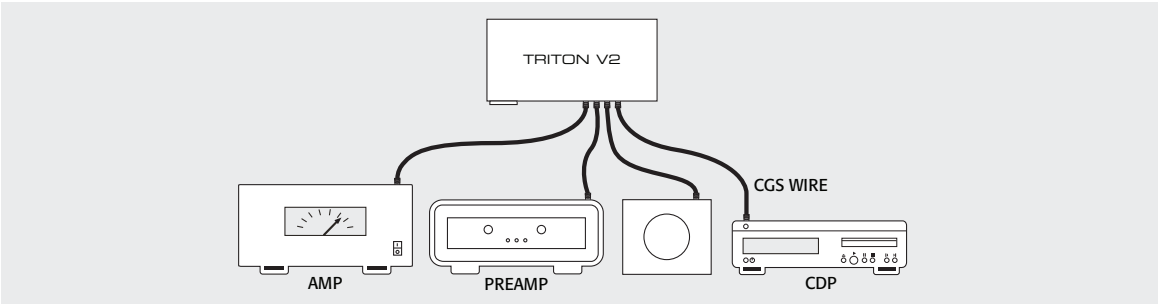
In the early days of audio, virtually all audio manufacturers followed this practice with the inclusion of *ground terminals* on the back of the components. All the component's chassis grounds could be wired together with ground braid. This helped to reduce ground loops and hum since most equipment came with single-ended RCA or Phone jacks instead of balanced connections.

With the advent of mass market consumer audio products and plastic chassis' there were more and more components that did not include a ground terminal. The one exception being for turntable and phono preamps where ground terminals are required to prevent hum. Of course, turntables and phono preamps are remnants that have survived from an earlier generation of audio systems.

Although some equipment no longer comes with a dedicated chassis ground terminal, it is still advantageous to ground all of your equipment to a common ground point. This reduces ground loop hum and noise problems. It can also improve system performance even if you don't have any audible ground loops or hum.

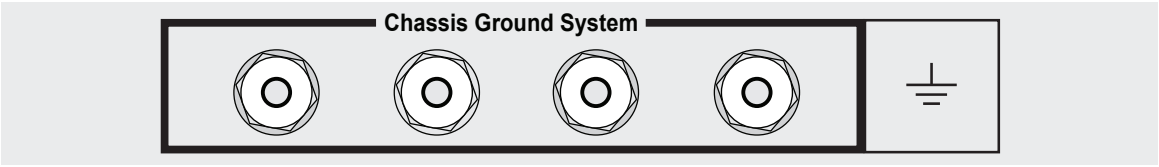
TRITON v2 and CGS

The TRITON v2 has an internal ground-buss noise reduction system that uses patented NIC™ technology. CGS (*Chassis Ground System*) is a feature that provides a common grounding point for all components in the system and extends the noise reduction capability of the TRITON to components external to the TRITON. This eliminates AC voltage differences between component chassis' and *may* help to reduce potential ground loops.

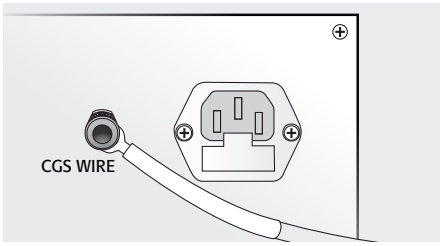


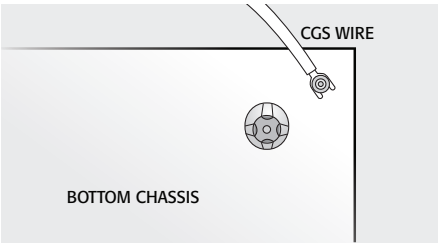
CGS GROUND TERMINALS

You can use any good quality wire to make the chassis ground connections. It is best to use a large gauge wire of 12-10 gauge. Solid core wire is very stiff in large gauges so it is easier to use a fine stranded wire or a ground braid since it is more flexible.



If the equipment has a dedicated ground terminal the connection is easy. Connect one end of the ground wire to the component's terminal and the other end to a CGS terminal on the back of the TRITON.





If a component does not have a dedicated ground terminal, use a ground wire with a small spade and attach it to one of the chassis screws on the bottom of the component. Care must be taken to ensure that you are loosening an actual chassis screw and not a screw that holds some internal part in place. Refer to a service manual if possible.

CGS GROUND CABLES

Shunyata Research makes CGS Ground Cables that are attractive, perform well, and are inexpensive. Check with Shunyata Research Customer Service or your dealer for more information.

FAQ — FREQUENTLY ASKED QUESTIONS

What performance improvements can I expect from using the CGS?
System grounding is complex and sometimes unpredictable since there are no standards that all equipment manufacturers follow regarding *signal grounds* and *chassis grounding*. It also depends upon the power circuit wiring, specifically the circuit's actual impedance to ground. If you use more than one dedicated power circuit it becomes even more complicated and less predictable. Common sonic improvements are often described as a reduction of background noise with an improvement in dynamics. The timing and dynamics in sound can also improve, along with more dimensional and precise image placement. These improvements may be obvious in some systems while more subtle in others.

So our best advice is try it to see what works best in your system.

What should I connect to the CGS?
All components in the audio system should be connected to the CGS grounding system if possible. Additionally, you may connect an equipment rack that is made from metal.

I have an amplifier(s) connected to a different dedicated line – should I connect them to the CGS?
Generally speaking, you should try it. This may reduce ground loop problems and improve sound quality. However, with some amplifiers connecting the ground to the CGS may produce no results or may degrade the sound quality. It is important to test each of the ground connections independently.

If a component's power cord is connected to the TRITON – do I need to run wire to the CGS?
If a component is connected to the TRITON with a power cord where the ground wire and contact are functional then the chassis of the component will be connected to the internal grounding system of the TRITON. You do not need to make another connection to the CGS terminal. However, some components *may* benefit from an additional chassis connection especially if you are using common stock power cords. Try it and see if performance is improved.

If a component does not have a ground terminal, how do I make a connection to the chassis and CGS?
You may loosen one of the chassis screws on the bottom of the component. The ground wire needs to be terminated with a small spade connector that can slip under the screw head. Care must be taken to ensure that you do not loosen a screw that is used internally to hold a part inside the component. Check with the user guide or the manufacturer. Generally speaking, the screws around the perimeter of the case are chassis screws. If you have any doubts – DO NOT loosen the screw!

Are ground wires included with the TRITON?
There are no ground wires included in the TRITON box. There is no way to know how many components you might have and how far away the connections may be. Check with Shunyata Research Customer Service or your dealer for more information.

There are only 4 terminals – how can I connect more components?
There are four terminals but each terminal can accept multiple wires. The spades can be stacked on top of each other and you may also use banana type terminals. You can easily attach 12 components to the CGS.

Is the CGS similar to TRIPOINT or Entreq products?
TRIPOINT and Entreq both make *chassis grounding* and *signal grounding* products and they both provide a common grounding point. However, the method of reducing ground noise varies by manufacturer. The CGS is a *chassis grounding* system only and was **not designed** for *signal ground* connections. The CGS Chassis Grounding System is compatible with a *signal grounding* type product – just don't connect them together.

The CGS noise reduction technology is patent protected by US 8,658,892

Can I use the ground cables that TRIPOINT or Entreq make?
Yes, any good cable or wire that has a low impedance is suitable.

What is the best method to connect a turntable and a phono preamp?
Try connecting the phono ground terminal to a CGS terminal and the phono preamp with a separate ground wire to a second CGS terminal. Then, try an alternate configuration: connect the phono terminal to the phono preamp with a ground wire – then connect just the phono preamp to the CGS terminal. Use the method that has less hum and noise or which one sounds best.