



# CGS

GP-NR GROUND PLANE  
NOISE REDUCTION

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CGS SHASSIS GROUND SYSTEM

## CHASSIS GROUNDING — HISTORY

Many of the best practices used in audio have come from the early telecommunications industry. It is common practice to mount equipment in a metal rack. The equipment in the rack would be connected to a common grounding lug or terminal 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 industries. 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 the associated hum. Components of the era were commonly equipped with single-ended, RCA or phono jacks that are all quite susceptible to ground currents.

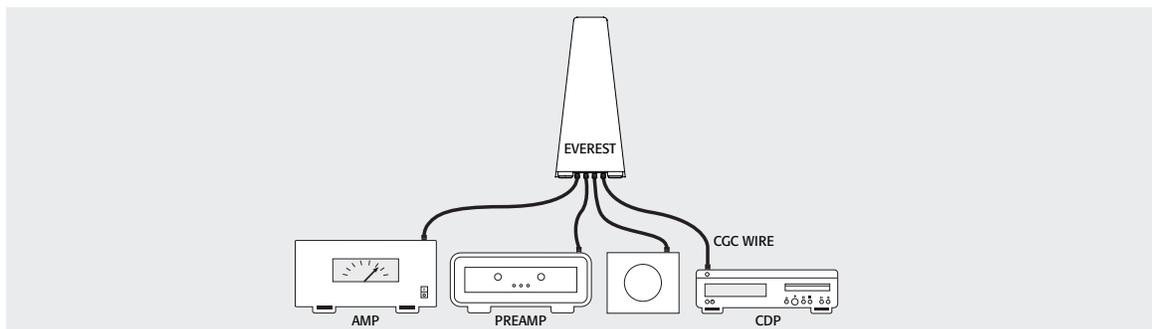
With the advent of modern day, mass-market consumer audio products and plastic chassis, many components no longer include a ground terminal. The most common exceptions are turntables and phono preamps where ground terminals are required to prevent phono hum. Of course, turntables and phono preamps are "legacy components" 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 there are no audible ground loops or hum.

### GP-NR

The Everest features internal GP-NR (*ground plane noise reduction*) technology that uses patented NIC™ noise isolation chamber technology. The CGS (Chassis Ground System) is a feature that provides a common grounding point for all components in the system and extends the GP-NR's noise reduction capabilities to components external to the Everest. This significantly reduces AC ground voltage differences between component chassis and may help to reduce potential ground loops.

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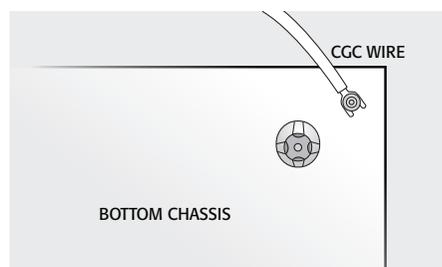
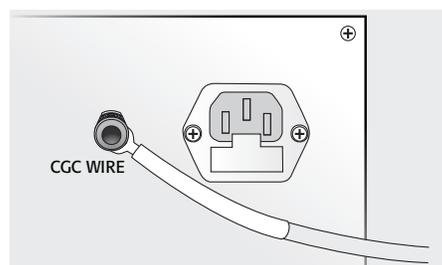
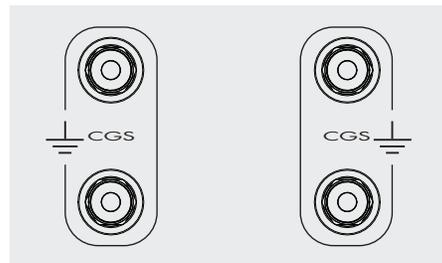
### CGS GROUND TERMINALS & CGC GROUND CABLES

While you can use any good quality wire to make the chassis ground connections, we recommend Shunyata Research's own CGC (*chassis grounding cables*) for best performance. It is preferable to use a large gauge wire of 12-10 gauge or larger for best results. 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.

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

Venom CGC	12 gauge VTX wire
Delta CGC	10 gauge VTX wire
Alpha CGC	8 gauge VTX wire
Sigma CGC	8 gauge VTX-Ag wire

See price list for termination options.



## **FAQ — FREQUENTLY ASKED QUESTIONS**

### **What performance improvements can I expect from using the CGS?**

System grounding is complex and can be unpredictable as 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 more complicated and less predictable.

The sonic improvements are often described as a reduction of background noise along with broader range of dynamics. The timing of dynamics can also improve, along with more dimensional and precise image placement. These improvements may be more obvious in some systems and more subtle in others. Our advice is try it and 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 metal equipment racks and anti-static mats if used in the system.

### **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, connecting the ground on some amplifiers to the CGS may produce no results or may degrade the sound quality. It is important to test each of the ground connections independently, one at a time.

### **If a component's power cord is connected to the Everest — do I need to run a ground wire to the CGS?**

If a component is connected to the Everest with a power cord where the ground wire and AC plug pin are functional, the chassis of the component will be connected to the internal grounding system of the Everest through the power cord. 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?**

If your components include a dedicated ground terminal, the connection is straight-forward: connect one end of the ground wire to the component's ground terminal and the other end to a CGS terminal on the back of the Everest.

If a component does not have a dedicated ground terminal, you may use a ground wire with a small spade and attach it to one of the chassis screws on the bottom of the component.

*NOTE: 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 your component's service manual if possible.*

### **Are CGC ground wires included with the Everest?**

There are no ground wires included in the Everest 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, Entreq or other grounding box products?**

There are many *chassis grounding* and *signal grounding* products, and both types of products provide a common grounding point. However, the method of reducing ground noise varies by manufacturer. The CGS is a patented *chassis grounding system only* and was not designed for *signal ground* connections. The CGS Chassis Grounding System is compatible with any *signal grounding* type product — just don't connect them together.

### **Can I use TRIPOINT or Entreq ground cables?**

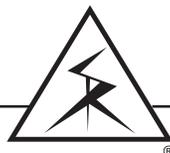
Yes, any good cable or wire that has a low DC resistance and low impedance is suitable.

### **What is the best method to connect a turntable and a phono preamp?**

It is usually best practice to connect the phono turntable ground wire to the phono preamp. Then, connect the ground terminal of the phono preamp to one of the Everest CGS terminals.

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