



FIELD-SHAPING GROUND PLANE RIBBONS

OWNER'S MANUAL

Underlying Physics and Design Concept

The ground plane of your sound system is the ensemble of all the grounded wires and all the grounded metal (e.g. your component enclosures) throughout your system. That ensemble forms the zero voltage reference for the electric fields that surround every power and signal conductor in the system. Those electric fields are created whenever and wherever one of those power or signal conductors carries a voltage different than zero (i.e. the voltage on the ground). The fields form between--and extend well beyond--the ground plane and each non-zero conductor in the system. As the voltage of any given conductor increases and decreases, the associated field expands and shrinks.

Any non-conducting (i.e. dielectric) material within an expanding field will absorb energy from the increasing field strength; when the voltage decreases and the field shrinks, the non-conducting material will re-release energy back into the field (with a time delay). Different materials will have better or worse energy absorption and delay characteristics. The absorption of energy from the field compresses the dynamics of the music signal; the time delay of the re-released energy then smears the music signal. So any non-conducting material inside or near your system—insulation on wires, plastic enclosures, room drywall, concrete (or tile or wood) floors, plastic moldings or veneers on your rack, artificial fiber rugs or curtains, etc.—will degrade sound. How much so depends on the strength of the fields permeating the non-conducting material—and, of course, on the specific dielectric absorption qualities of the material itself.

The existing strength and shape of the fields surrounding all the wires in your system—both those inside your components and those connecting your components—are determined largely by the “accident” of where your power wires, interconnects and speaker cables happen to lie. If you wish to reduce the sound-degrading energy absorptions and re-releases associated with the non-conducting materials near your system, all you have to do is reduce the fields permeating these materials.

This is where the Ground Plane Ribbons (GPRs) come in. The existing field strength between any given signal (or power) wire and the local ground plane at any place throughout your system can be significantly reduced *by introducing a second ground plane*. That causes the electric field to be divided between the two ground planes. In other words, the intensity of the field is reduced and the field's further reaches (known as the fringing field) are shrunk by the second ground plane.

Translating this powerful idea into a practical design that maximizes the sonic upgrade achievable requires extensive experimentation and listening tests. Variables that we tested to arrive at an optimum configuration included: GPR conductor length, conductor alloy and purity, conductor cross-sectional

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geometry/thickness/width, conductor directionality, best conductor grounding points, conductor placement relative to existing system ground planes and relative to large masses of dielectric (for instance, rugs). Our tests established that even as few as two GPRs could make startling differences in the sound of almost any system—and that each of the variables in the preceding list had major impacts on how much improvement could be achieved.

Ground Plane Ribbon Installation

1. For the first two GPRs, attach one to each amplifier channel's black (-) speaker output binding post. Then stretch the GPR to its full length parallel to—and roughly 4" away from--the speaker cable for that channel. If the floor has artificial fiber carpeting, plastic tile, linoleum, engineered wood or thick polyurethane varnishing, then raise the GPR off the floor (preferably by 8", if possible); to do this, use polystyrene coffee cups, Triads, or Cable Trestles to support the GPR. If the far end of the GPR is too long and runs into a room sidewall, you can bend it 90 degrees to follow that sidewall.

If you have speaker cables that have both + and – conductors bundled, then it makes no difference whether you run the GPR 4" in front of, in back of, or above the speaker cable. If you have speaker cables with separated + and – wires (e.g., Clearview Double Helix or Omega Mikro Planar Cables), then array the GPR 4" from the + wire with the – wire running on the opposite side of the +, the side away from the GPR. If your amplifier output is in inverted polarity, you will need to order our special Invert GPR. Our standard GPR will have the wrong directionality and will not sound as good.

2. To get even further improvements beyond the first two GPRs, run a third GPR from the amp ground (either a chassis ground or one of the two black speaker output binding posts, whichever is more convenient). This third GPR should run about 4" away from and parallel to the sequence of interconnects leading to the amp (for instance, the CDP-to-preamp interconnect and the preamp-to-amp interconnect). If your components are arrayed vertically on a rack, that means this third CP would run vertically up the back of the rack (or up the wall behind the rack).

If you have interconnects with separated + and – conductors for each channel (e.g. Clearview or Omega Mikro interconnects), then array the four conductors so that they lay -,+, +, - going from left to right (and assuming that the interconnects are running vertically between components one above the other on the shelves of a vertical rack). Then run the third GPR vertically behind the rack, halfway between the two + wires and far enough in back of the rack to preserve at least 4" spacing from the + wires. If your components are arrayed horizontally on a long shelf or the floor, follow the same arraying geometry as above, but translated 90 degrees so that the interconnects and the GPR are all running horizontally.

3. If you have the inclination to tweak further, by all means try variations on the above geometries and spacings. You may well be able to do even better by tailoring your GPR geometry more specifically to your system's unique arrangements of components and nearby dielectrics. As in every other aspect of audio, trust your ears above all instructions and all theories.