EBTECH®
YOUR PARTNER IN CRYSTAL CLEAR SOUND

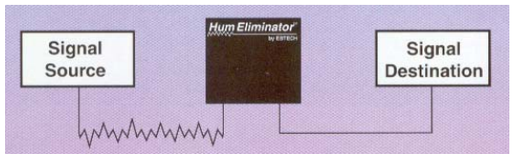
Hum Eliminator™ User Instructions

Silence AC Hum, forever!

Do you hear a hum or buzz in your audio signal? Are long unbalanced lines across stage creating noise problems? Get the Hum Eliminator™ from Ebtech®.

Almost all AC hum (60Hz in the US, 50 Hz in most other countries), is caused by ground loops. These ground loops act like radio antennae picking up hum and noise. The Hum Eliminator™ completely eliminates this by breaking the ground loop, making it impossible for the signal lines to pick up the AC hum and noise in the first place.

Just plug the Hum Eliminator™ in the signal lines between the offending pieces of equipment and you're done! Quick and easy.



No buzz, no hum. No signal degradation. No filtering. No noise gates. No dangerous ground lifts.

- Eliminates AC hum / 60Hz buzz and noise, quick and easy
- Breaks ground loop safely, while leaving all signal grounds intact
- Automatically translates signal voltages to match differences in ground potentials, avoiding clipping
- Converts automatically back and forth between balanced and unbalanced lines at either end
- Completely passive design with audiophile quality components assures the best possible performance
- Frequency response 20Hz to 70kHz plus or minus 0.5dB
- Distortion less than 0.005% THD @ 1kHz
- Crosstalk better than –97dB
- Maximum source impedance 1kOhm. Minimum load impedance 10kOhm
- Cold Rolled Steel Housing
- One Year warranty

GETTING STARTED

WHAT WILL THE HUM ELIMINATOR™ SOLVE? The Hum Eliminator™ is a unity gain signal and ground path isolator designed to break ground loops. Hum and noise caused by the presence of a ground loop can be stopped by inserting the Hum Eliminator™ in the line level signal path (+4dBu or -10dBV). This eliminates the ground loop without degrading your signal. The Hum Eliminator™ will not reduce hum or noise normally generated by a piece of equipment. In other words, for noisy preamps, noisy single coil pickups or noise caused by faulty tubes, other corrective action would apply.

USING THE HUM ELIMINATOR™: First, identify the cause of the ground loop. Note: not all ground loops cause noise or hum. For complex systems, you may need to repeat these steps starting with a different piece of equipment in various combinations to locate the problem:

1) Strip the system down to one piece, by disconnecting all interconnects and AC cords except for the mixer.
2) Add one piece of equipment at a time; hook up AC and interconnects then listen for hum or noise.
3) Turn on and off the power each time you add equipment to avoid pops / shorted outputs.
4) Proceed until you find the offending piece(s) causing the problem.
5) Insert the Hum Eliminator™ on all cable connection between the offending equipment.

Note: Never use the Hum Eliminator™ between an amplifier and speaker or you will damage your equipment. Use only on non-powered line level signals.

With a rack of amplifiers, we recommend putting an eight channel Hum Eliminator™ in front of your amps inputs so you do not have to solve ground loop problems during sound checks. A common path for ground loops is through a chassis into the rack and then into another chassis. Test this by removing the chassis from the rack. The Hum Eliminator™ will help this problem but you should also try isolating the chassis from the rack with electrical tape or insulating the rack screws with nylon washers. Most ground loop problems can be solved using the Hum Eliminator™ but patience is a necessity when attempting to diagnose the cause of ground loop! Many popular mixers with TRS balanced line inputs do not have common mode rejection. They drop the inverted signal, creating unbalanced inputs! To get the benefits of balanced inputs, run your balanced line into the Hum Eliminator™ and run a mono 1/4" line from the Hum Eliminator™ outputs to the mixer's TRS inputs. This way you are running a balanced line all the way up to the Hum Eliminator™ and you will not lose common mode rejection.

COMMON USES FOR HUM ELIMINATOR

The Hum Eliminator™ does more than just prevent AC hum from being picked up by your sound systems. It also can be used as one of the most cost-effective ways to convert unbalanced signals to truly balanced signals. On the HE-2-XLR, you can use the 1/4" and XLR jacks in any combination.

GROUND LOOPS - The Hum Eliminator™ prevents ground loop antennae from forming and picking up AC hum. AC hum & noise is almost always caused by a loop antenna effect across signal lines between two or more pieces of gear, or by long unbalanced cables picking up noise. Loop antenna(e) are basically a type of radio antenna, which tend to pick up the 60Hz and harmonics (50Hz in other parts of the world) AC signal being broadcast by a building's electrical current. These loop antennae are closed circuits usually along the ground wires and hence are commonly called ground loops.

BALANCED / UNBALANCED CONNECTIONS - Unbalanced signals are more susceptible to picking up electrical noise & RF interference than balanced signals are. The longer the unbalanced cable is the greater the chance of a problem. The Hum Eliminator™ is one of the most cost-effective ways to convert between unbalanced signals and true balanced signals.

BROADCASTING / VIDEO - Press Boxes and broadcast studios have many feeds all going to different gear; which can create ground loops and hum/buzz problems. Use a Hum Eliminator™ on these feeds to eliminate the problem. Placing a Hum Eliminator™ on the audio feed of a video camera can help prevent video hum (snow) as well as video hum bars that are caused by ground loops.

COMPUTER SOUND CARDS - Most sound cards have unbalanced inputs / outputs. Balance these with the Hum Eliminator™. Even balanced sound cards have tremendous susceptibility to ground loops because of the computer's power supply. If you hear a buzz, use a Hum Eliminator™.

GUITAR OR BASS - Whenever possible, we recommend you use our Hum X product for GROUND RELATED hum issues on a guitar or bass rig setup. If you're in a part of the world where the Hum X cannot be used, the Hum Eliminator™ is the next best solution. If any of your FX pedals have a 3 prong ground power plug, you will need to put the Hum Eliminator on the audio feed to the amp. When using two or more guitar amplifiers (with stereo FX or ABY splitters) ground loops can form between the amplifiers; place the Hum Eliminator™ on the audio signal between the ABY and the amp that is buzzing. Bass amps can get ground loop hum from the DI connection to the PA; simply run that DI feed through the Hum Eliminator™.

COMMON USES FOR HUM ELIMINATOR™ (continued)

HOME THEATERS • Most modern Home Theater systems utilize many different components hooked together via a mixer or distribution device. These days more and more consumer audio/video equipment has a three-prong grounded plug. This creates a large potential for ground loops which results in hum or buzz in the audio. Placing the Hum Eliminator™ between offending gear will solve the noise issue. The Hum Eliminator will even get rid of Video Hum Bars that are caused by Ground Loop!

KEYBOARDS / SAMPLERS / SYNTHS • Most keyboards, samplers, and synthesizers have unbalanced -10dBV outputs. Use a Hum Eliminator™ to balance the signals if using with other -10dBV equipment. To use a -10dBV unbalanced device with a +4dBu balanced device, use an EBTECH® Line Level Shifter™.

LIVE SOUND / DJ MIXERS - A common problem with live performance is long unbalanced cables picking up hum along the way. Balanced signals are more immune to picking up noise. Use the Hum Eliminator™ to balance long unbalanced signals. Mobile DJs or bands never know when setting up their system if they're going to get a hum or not. The electrical wiring changes from one building to another. What works fine at one gig might not work at the next. It's worth the low cost to keep a Hum Eliminator™ available, nobody can afford to lose a gig because of hum problems. Some DJs run everything in their rig through a Hum Eliminator™ to play it safe. The main outs on most DJ mixers are -10dBV unbalanced RCA. When using with a +4dBu power amp, over 2/3rd's of the amp's volume can be lost. Use an EBTECH® Line Level Shifter®.

MIXERS/RECORDING - Many mixers have either unbalanced or "impedance balanced" monitor outs / aux sends. Use a Hum Eliminator™ to get true balanced monitor outs for noise-free performance. When using more than one mixer (or sub-mixing), there's a huge chance of getting ground loops (and that buzz!). Use Hum Eliminators™ to prevent these ground loops. Eliminating hum is one of the biggest challenges facing studios. Many studios will run all of their line level gear through Hum Eliminators™ to help ensure noise-free recording.

POWER AMPLIFIERS - Running multiple amplifiers can create ground loops between the amplifiers, which will pick up the dreaded hum and buzz. Run each amplifier's input line through a Hum Eliminator™ to prevent this problem. IMPORTANT NOTE: Do not place the Hum Eliminator™ between the power amp outputs and the speakers. Doing so will damage the power amp and/or the speakers.

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