



Predator Series AC Noise Filtering



Why you need Predator AC power conditioning

The benefits of Predator Series AC Noise Filtering

How Predator Series products are your powerline noise solution



MIT
Music Interface Technologies™



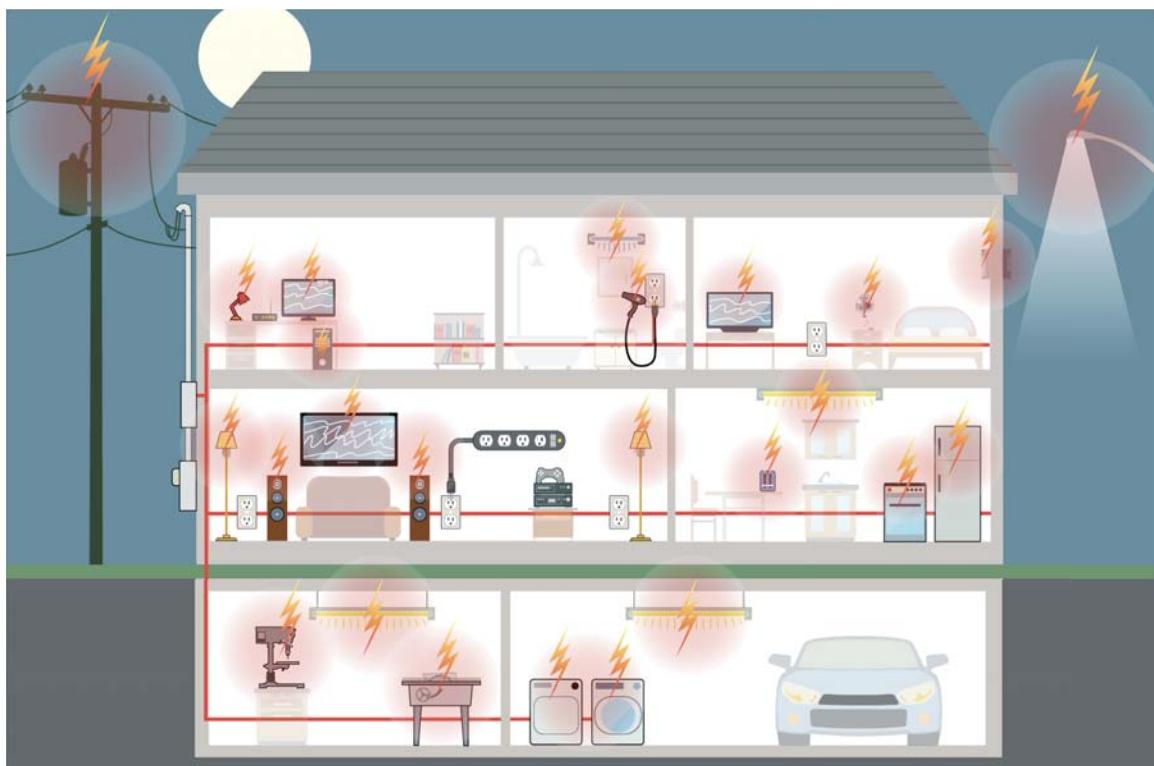
Predator™ Series AC Noise Filtering



Why you need Predator AC power conditioning.

The very power it takes to drive your audio (or home theater) system can have a damaging effect on audio and video fidelity by allowing noise pollution into your system.

It is the quality of the power that counts. Most audio and home theater equipment (in the US) is designed to function at 120 volts at a frequency of 50–60 Hertz. Usually, powerlines feeding AV components not only carry usable frequencies (50-60Hz), but also carry frequencies above and below this operative range. It's those uninvited frequencies that inject distortions directly into the audio and video path. This results in distortions you can see and hear.



Powerline noise can be introduced to your stereo system, flat-screen displays, internet router, even game controllers, either directly from your appliances and tools, or indirectly, when the AC line itself acts as an antenna to inject external radio frequency and electromagnetic interference. Any device connected to your AC line can be a potential source of distortion. Generally, most appliances plugged into your walls are not sensitive to these problems. When it comes to lights or the refrigerator, the quality of the power does not really make an operational difference. Because of that, normal household power is not stabilized, filtered or conditioned—certainly not for precision audio or video equipment. The higher the fidelity, the more noticeable AC distortions become. Many times, a noise source might be coming from a neighbor's table saw down the street!



Q: Where does the noise come from?

A: Powerline noise can come from a number of sources.

Noise coming directly through the powerline or, "direct-coupled" noise, is caused by equipment such as electric motors, arc welders, power supply switching-circuits (found in flat screen TVs), as well as most household appliances. Any device connected to your AC line can be a potential source of distortion. Many times, a noise source might be coming from a neighbors table saw down the street! Noise that is induced from indirect contact with the line is called "field coupled" noise. This mode occurs when the line itself behaves as an antenna to external fields. These fields are generated by broadcast stations, radar, and many other sources of field radiation, including other unshielded cables positioned nearby.

Computers, video components and digital audio equipment all feed noise into the AC powerline which results in distortion!



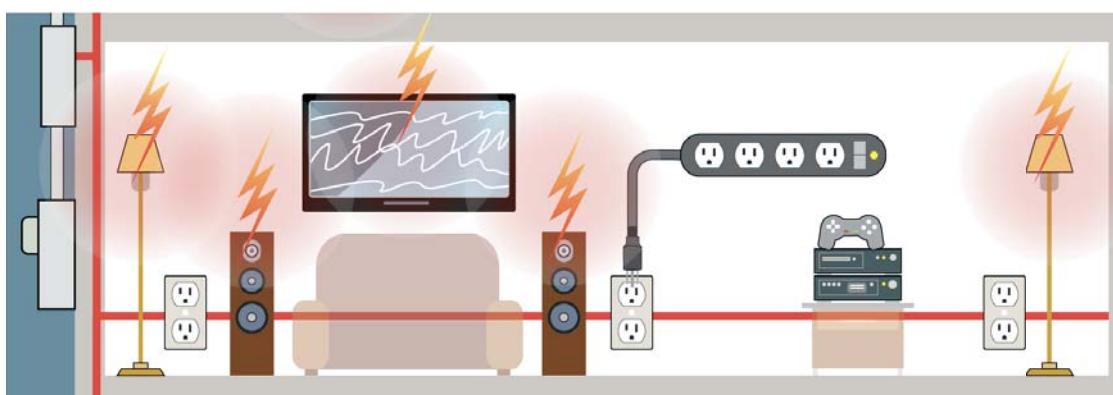
Even in tiny amounts, powerline problems are interfering with the quality of the audio and video reproduction you have already paid for. Every piece of electronic equipment in your home adds to powerline noise. These sources would include refrigerators, lights, computers, even air conditioning!

Predator™ Series AC Noise Filtering



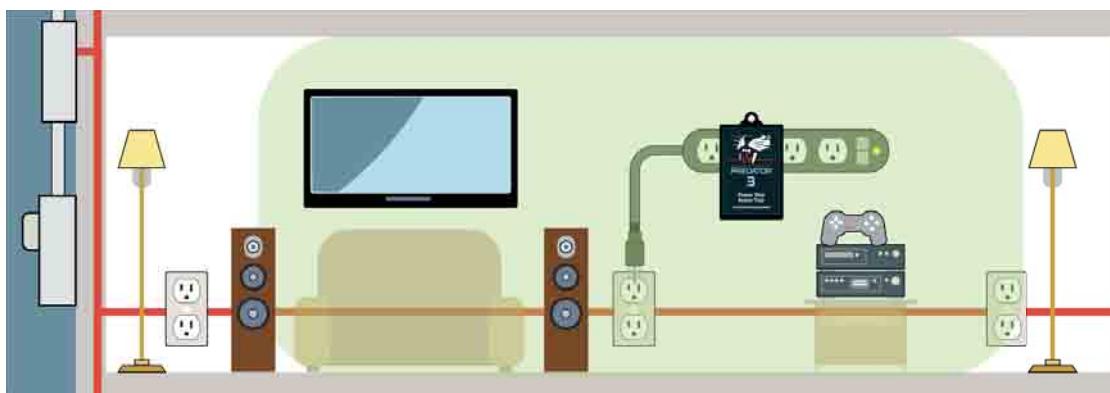
Noise In—Noise Out!

Powerline noise affects both our audio and video signals, as well as slowing down the digital data streams on our networks. Audio can be affected by distortions introduced in contaminated equipment, and can manifest itself as subtle distortions and unnatural or harsh timbre. Video picture quality will suffer in the form of slight graininess or snow, especially in darker pictures. The level of contrast and depth of field are affected, as is the natural detail that comes from accurately passing very high frequencies.



Powerline
noise
results in
audio and
visual
distortion.

Increase the
benefits by
using more
than one
power
filtration
device on
the same
circuit.



Predator Devours Noise!

Watch our Predator Power Filtration and Predator Product Videos
MIT Cables YouTube Predator Playlist bit.ly/predatorvideos



Predator™ Series AC Noise Filtering



Q: How does dirty power affect audio quality?

A: With audio components, powerline problems will result in:

- Compressed imaging and sound staging
- Increased background noise
- Unnatural tonality
- Grainy, gritty distortion
- Digital data loss and errors
- Reduced power output

Q: How does dirty power affect my video system?

A: With video components, powerline noise causes problems you can see as:

- Video noise (grain, grit or snow)
- Hum-bars passing through the picture and letterbox fields
- Loss of contrast, definition and depth of field
- Unnatural color shifts and increased dot crawl in shadows

Enjoy the same MIT patented technology used in many Hollywood production facilities including Skywalker Sound, a Lucasfilm, Ltd. company, and multiple Grammy awarded recording studios.



*Read about
"MIT at the movies"
bit.ly/mitatthemovies*

The Solution is Parallel AC Filtering

The Predator Series of power products from MIT uses patented parallel "AC Filterpoles"™; a tuned LCR technology. MIT Filterpole technology eliminates reflections by efficiently absorbing all forms of AC noise from the mains, and then converting it into harmless thermal heat. The result?

Once the Predator circuitry is working to clean, condition and protect your AV system, you will instantly enjoy "blacker" blacks, better color saturation, and increased shadow detail; movie sound tracks will deliver dialog, Foley sounds and background music with theater-like quality. Because your audio system now has a lowered noise floor, you will have pinpoint audio image placement within a lifelike sound stage, all with clear and authoritative bass.



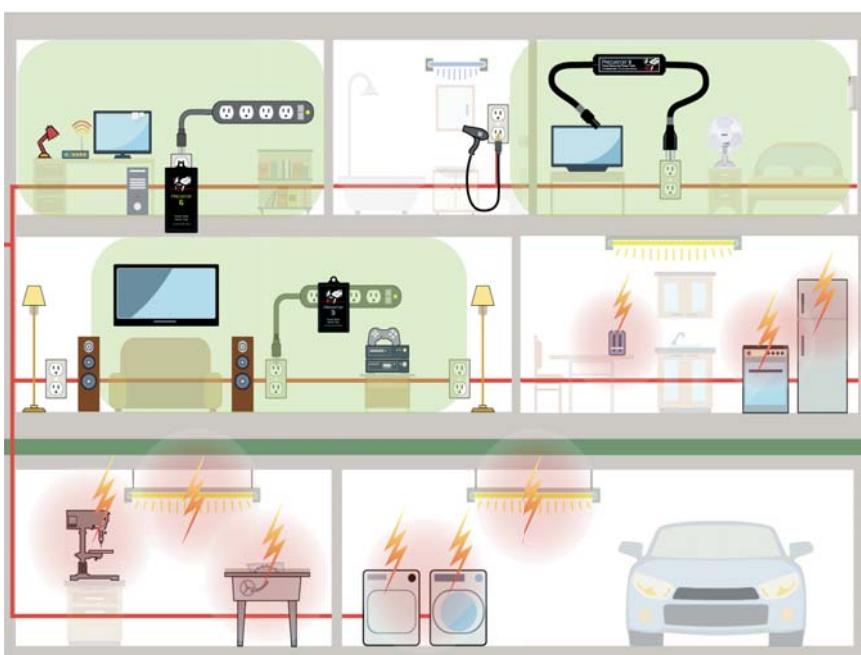
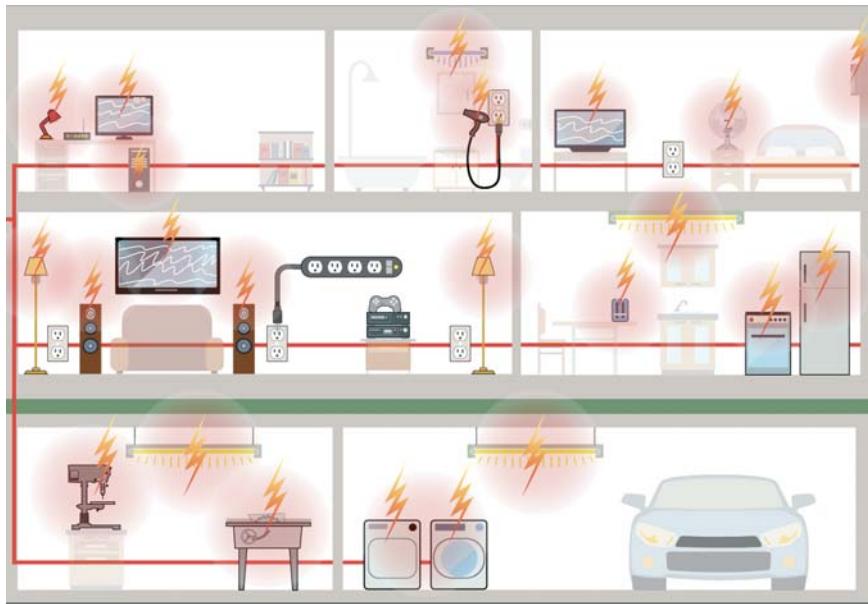
Predator™ Series AC Noise Filtering



Q: Where do I place a power filter?

A: Place power filters anywhere you desire improved performance, such as:

- Near or in your audio/visual equipment closet/rack (Predator Power Strip Noise Trap or Noise Devouring Power Cable).
- Directly to power any hifi audio and video equipment such as HDTV, Stereo Receivers, DVD players, etc. that uses the standard IEC power connector (Predator Noise Devouring Power Cable).
- You can increase the benefits by using more than one power filtration device on the same circuit. Maximum of three recommended for high-end A/V. More than three will begin to affect power factor.



Install a Predator AC Noise Trap or Predator Power Cable anywhere where critical audio, video or data equipment can benefit and work more efficiently from clean power.

Predator™ Series AC Noise Filtering



The Predator-3 Power Strip Noise Trap

The Predator-3 Power Strip Noise Trap houses the same patented parallel AC Filterpole Technology, using three filter poles, optimized for AC powerline and video noise reduction.

THE PREDATOR-3 POWER STRIP NOISE TRAP FEATURES AND BENEFITS:

- Three Filterpoles optimized for AC RFI noise reduction
- Noise filtering benefits, improving black levels and color saturation
- Lower noise floor, resulting in improved dimensionality and more natural timbre reproduction for your audio
- No installation needed, just plug into an outlet or power strip.



SKU: HS-3 MSRP: \$199.00

The Predator-6 Power Strip Noise Trap

The Predator-6 Power Strip Noise Trap houses the same patented parallel AC Filterpole Technology, using six filter poles, optimized for AC powerline and video noise reduction.

PREDATOR-6 POWER STRIP NOISE TRAP FEATURES AND BENEFITS:

- Six Filterpoles optimized for AC RFI noise reduction
- Noise filtering benefits, improving black levels and color saturation
- Lower noise floor, resulting in improved dimensionality and more natural timbre reproduction for your audio
- No installation needed, just plug into an outlet or power strip.



SKU: HS-6 MSRP: \$349.00

The Predator-3 Noise Devouring Power Cable

The Predator Noise Devouring Power Cable houses three patented parallel AC filterpoles, eliminating reflected noise and converting it to harmless thermal heat, discharging it to ground. This is done by creating a very low impedance across the load at a variety of frequencies corresponding to sources of unwanted noise. Just plug it in, and let Predator bring you a new experience through your headphones!

THE PREDATOR-3 NOISE DEVOURING POWER CABLE FEATURES AND BENEFITS:

- Three Filterpoles optimized for AC RFI noise reduction
- Noise filtering provides improved black levels and color saturation
- Provides lower noise floor, resulting in improved dimensionality and more natural timbre reproduction for your audio
- High quality power cord for better current delivery



SKU: HA-3 MSRP: \$349.00

The Predator-6 Noise Devouring Power Cable

The Predator Noise Devouring Power Cable houses six patented parallel AC filterpoles, eliminating reflected noise and converting it to harmless thermal heat, discharging it to ground. This is done by creating a very low impedance across the load at a variety of frequencies corresponding to sources of unwanted noise. Just plug it in, and let Predator bring you a new experience through your headphones!

THE PREDATOR-6 NOISE DEVOURING POWER CABLE FEATURES AND BENEFITS:

- Six Filterpoles optimized for AC RFI noise reduction
- Noise filtering provides improved black levels and color saturation
- Provides lower noise floor, resulting in improved dimensionality and more natural timbre reproduction for your audio
- High quality power cord for better current delivery



SKU: HA-6 MSRP: \$699.00

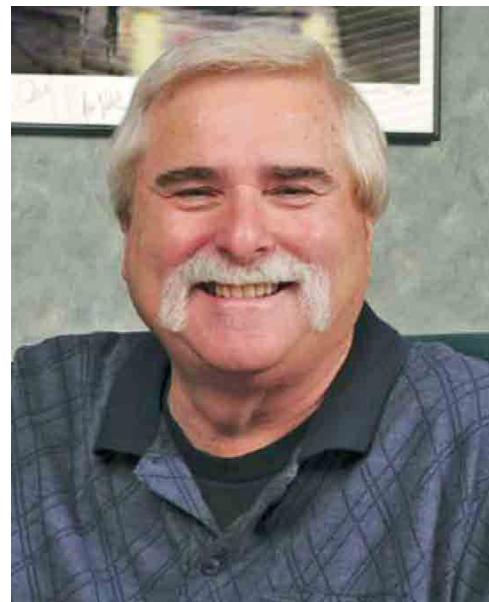


A History of MIT Cables

Bruce Brisson began designing audio cables in the 1970's after "hearing" the sonic problems inherent in typical audio cables of the day. In 1981 he licensed the first of many of his designs and patents to Monster Cable. Many of Monster's products are still using his designs today ("Bandwidth Balanced", "Phase Correct" windings, "Time Coherent windings, for example), and have become some of Monster's most enduring and successful products. In 1984, he founded Music Interface Technologies (MIT), which as been a leading force in the research design, and manufacturing of high performance audio, video and AC cables ever since. Using his patented Varilay designs, Brisson designed MI-330 interconnect, Music Hose Speaker cable (MH-750), and the now legendary 330-Shotgun and 750-Shotgun cables. With these designs, Brisson had taken wire to a new level, but he wanted even greater performance to complement the emerging sophistication of other audio components. In 1989, he created the low-pass filter network concept, designing the patented CVT® and Terminator™ technologies that are contained in the distinctive modules for which all MIT products are known.

These technologies have excellent measured performance because they control the efficiency of the network throughout the entire audio range, allowing the entire music signal to pass throughout the system with minimal distortion.

Since forming MIT, Brisson has also designed or manufactured technologies for many other well know audio companies, such as Spectral Audio, Inc., Jeff Rowland Design Group, Wilson Audio Specialties, Martin Logan Electrostatic Loudspeakers and Goldmund Audio. MIT products are used in many recording studios and have become crucial components in many Hollywood production facilities (see MIT "At the Movies" about our association with Skywalker Sound). If you have listened to a hit record or attended a hit movie within the last decade, you have undoubtedly heard many of our products.



Bruce Brisson
MIT Cables Founder and President



4130 Citrus Avenue, Suite 9
Rocklin, CA 95677

916/ 625-0149 Fax: 916/ 625-0149

Predator™ Series AC Noise Filtering



Powerline Noise: How Series Filters Work

**Power-line Noise:
How Series Filters Work—
(AND WHY THEY DON'T ALWAYS)**

Most powerline noise products respond upon series filters to combat AC line noise problems in audio/video systems. However, these series filters, unlike MIT's parallel filter system, have inherent flaws that make them ineffective of many what frequencies in AC power lines. In this paper we will explain how and why they remove. In this paper, we will explain how:

- series-filter noise injection is ineffective in real-world systems
- series inductors create distortion noise at audible frequencies
- noise that's supposed to go to "ground" is fed back into the circuit
- series filters require the use of inductor/capacitor to reduce noise
- series filter resonances actually create noise of audible frequencies

Utility powerline related noise. Utility powerline related noise is one of the most significant sources of noise in our studio & video systems. The primary source of noise is the power company's AC power lines in series with the AC Utility line. Over the years, improved use of insulation and one form of DC power supplies have reduced some of the noise from existing circuits. Improved grounding techniques within the chassis (e.g., star grounding - please see Glossary page 6) and other changes have improved studio system noise levels.

These "line" filters are composed of inductor (L) and capacitor (C) networks placed in series between the AC line and the audio equipment. However, depending on how the noise is coupled to the powerline, a great deal remains to be done to remove its effects from our systems...

MIT
Music Interface Technologies
© 2002 MIT Cables, Inc.
For further information call 800.330.0200
The MIT logo is a registered trademark of MIT Cables, Inc.

Utility powerline related noise, as most of us know, affects the audible performance of our audio & video systems. The primary means of reducing noise in the audio equipment's circuits is passive AC line filtering placed in series with the AC utility line. Over the years, increased use of electronic filtering and regulation of DC power supplies have also helped isolate the powerline noise from amplifying circuits. Improved grounding techniques within the chassis (e.g., "star grounding" - please see Glossary, page 6) and from chassis to chassis have improved audio system noise performance.

These "line" filters are composed of inductor (L) and capacitor (C) networks placed in series between the AC line and the audio equipment. However, depending on how the noise is coupled to the powerline, a great deal remains to be done to remove its effects from our systems...

To download a PDF version of this publication:
mitcables.com/pdf/powerline_noise.pdf

What are MIT Filterpoles™?

Poles of Attenuation (Referenced in The Impedance Domain) A properly built AC filter will not only attenuate un-wanted noise on the AC powerline, but it will also optimize the power factor. Power Factor is a (dimensionless) number between 0 and 1. When power factor is equal to 0, the energy flow is entirely reactive, and stored energy in the load returns to the source on each cycle. When the power factor is 1, all the energy supplied by the source is consumed by the load and nothing is reflected back to the source. MIT was awarded a patent on this technology regarding audio in July 13, 1993: number 5,227,962.

The best way to attenuate unwanted noise is to create a very low impedance (a zero of impedance across the load which acts as an attenuation pole to the noise) surrounding the frequency (or frequencies) of the undesirable noise. In the case of audio, that would be at any frequency other than the powerline frequency. This is best accomplished by placing a tuned circuit in parallel, around the load. MIT was awarded this patent in November 9, 1993: number 5,260,862.

For information on all MIT Cables' Patents visit: bit.ly/mitcablespatents



Visit MIT Cables' corporate website at MITCables.com for technical documents, white papers and articles.