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Not Just Another Power Line Conditioner

The Sound Application CF-X

BY JERRY KINDELA

Jim Weil reaches for the 1500-grit black sandpaper, wets it and begins the final buffing stage of the buss bar. He's already been through the dry buffing stages, which included work with 600-, 1000-, 1200- and 1500-grit sandpaper, and now small shafts of light reflect in various geometries—you know, angle of incidence equal to the angle of reflection stuff—as he moves the polished bar beneath his working lamp.

We have just caught Jim Weil as close to pure focus as a human can get, a flawless balancing act of chi in which nothing else exists but this second in time, this deep engagement in process. Sure, there's an end result, "ultimately the CF-X, a non-current limiting, ultra-wide bandwidth AC filter/surge protector with -60 dB of transverse noise reduction," but as we observe him, the wet circumferential strokes around the buss bar are his world at the moment.

"It's a form of meditation, everything else just fades away," he'll explain later. "I become extremely focused. A bomb can go off and I wouldn't notice." This brief anecdote is to be understood as metaphor, one that explains how each Sound Application CF-X Power Line Conditioner is birthed in Jim Weil's 12 by 16 work room, which is filled with everything he needs "including some 1,200 needle nose pliers (different edges for different types of wire, different leverage angles, different lengths)" to build a state-of-the-art interface between the

wall outlet and the rest of the audio system downstream.

It is becoming increasingly clear that the single worst impediment to the optimum performance of any audio system lives at your wall outlet. Actually, there are a number of impediments: AC fluctuations, both under and over-voltages, or sags and surges, and radio frequency (RF) and electro-magnetic (EM) pollution, more commonly referred to as interference, hence RFI and EMI.

GARBAGE ON YOUR LINES

Clearly, power line problems are multifaceted. Take surges and sags, for instance. Your audio system and home or apartment are connected to your street and neighborhood power subgrid, which is connected to other subgrids, which comprise even a larger grid and so. Depending on the time of day, the power demands of all these grids will vary, causing the local utility to adjust its delivery of juice to meet the demands. These ups and downs

impact how your audio gear functions, most often not well, especially with high-resolution equipment. Ever notice how well your system sounds after nine or ten p.m., when your grid's power demands drop significantly and the juice to your home is a much more stable 115-117 V of constant power?

Most power line conditioners can do very little for over- or under-voltage problems, and one solution for more consistently stable power delivery is to install a couple of separate 20-amp lines to nourish your audio system. These will be bit slightly less affected by transient power fluctuations and virtually eliminate common mode noise. If you haven't taken time to do this, your standard house lines (15 amps per spur) can often prove to be less than adequate for delivering the musical bliss your system is capable of.

The other and perhaps more pernicious problem is the noisy spuriae riding on your power lines. Refrigerators, air conditioners, electric-based heating equipment, halogen and fluorescent lights and so on in your home, your neighbor's home, the 7/11 down the street and even the shopping mall several miles away all feed electro-magnetic noise back into the grid.

Then there's the RFI, emitted by assorted radio and microwave equipment, from shortwave gear to microwave transponders to cell phones and so forth. Essentially, the wiring in your house acts like a giant antenna for this form of noise.

You can be certain that a good part of the accompaniment to Yusef Lateef Live at Pepe's (Impulse 314 547961-2), for example, is unrecognized noise filling the space between Yusef's lips and flute and every other space on this and virtually all other compact and vinyl discs you're likely to

Sound Application

play. Sure, you may not hear that noise directly, but it's there in the form of brightness, stridency, smearing, compression factors, sibilance, bloated kick drum and upper bass notes, foreshortened sound-space, lateral elision or attenuated decay. Essentially, the noise diminishes, on occasion even destroys, nearly all of the very qualities that make listening a cathartic experience.

The Sound Application CF-X won't regulate line voltage, but it will clean up all the RFI and EMI across a bandwidth that stretches out to the microwave range. Rated from 50 kHz to 2.5 Gigahertz, I don't think another line conditioner even comes close to the cleansing properties of the CF-X.

OBSESSIVE EXPERIMENTATION

Now, let's backtrack to the opening metaphor, the business about CF-X creator Jim Weil. Jim has devoted the last 12 years experimenting, refining, testing various topologies, wires and parts, attending to the "process" at each stage of development. You've gotta understand that this near-meditative state may be a counterpoint to his other side: Jim talks AK-47-style. Ask this guy (who is given to wearing black racing cap, black jeans, and black polo shirt and shoes, like the Lash Larue of power mavens) an audio-electrical question, and the retort is not unlike a fusillade of wisdom packed densely on top of more information packed on top of even more information. You realize quickly, despite the wealth of data along with considered opinion, Weil is only grazing the surface of what he knows about electrical-electronic parts, from function to quality, as they relate to power. The rapid-fire minutiae can be overwhelming, but it is always instructive and awesome in the truest dictionary sense.

While all power moguls are reluctant to openly discuss their topologies, I was able to obtain the following information from Weil (actually, he readily volunteered a helluva of lot willingly, though he indicated that much of the information was proprietary).

According to Weil, the first conditioner built some 12 years ago, a classic doubt-T filter with 142 active circuit elements, was five orders of magnitude more powerful than the CF-X. A good part of the last dozen years has been spent refining and simplifying the topology down to 25 ele-

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ments, and with it a reduction in price. The original would have sold for something like \$10,000 to \$15,000, while the present still pops for a not inexpensive \$4,200, without the MAC 2 Power Cord (\$5,000 with). The CF-X is a transformerless design. "Anything to do with a transformer, you should avoid like the plague," he laughs, "unless it's gargantuan, we're talking in the 1,000-pound category. Anything smaller, and the transformer will always give you a hard edge, you'll lose dynamics, and the soundstage will be compressed."

Basically, the CF-X is a low impedance capacitive shunt to ground device. The piece, consisting of a 23-step stage filter of capacitors, is designed to shunt off high-frequency RF. Each of the capacitors, which are custom built except for the silver mica caps utilized for the high frequency range, covers a portion of the bandwidth, while the impedance per capacitor in its operating range approaches zero.

Jim Weil claims to have tested nearly 5,000 capacitors in developing the CF-X, a process (that word again) that led him increasingly to distrust sole reliance on testing procedures. While similarly rated capacitors would measure equally—"self-resonance frequencies basically in the same neighborhood within a few kilohertz of each other," notes Weil—"not all of them sounded equally when implemented. Clearly, the test-and-try process took years before he settled on the appropriate sounding capacitors (he obtains caps from assorted vendors depending on what portion of the band he's cleaning up).

Then there's the resistor side: Again, after years of experimenting he says he settled on custom-made Caddock's. One tolerance measurement of a resistor is its

Temperature Coefficient Resistance. Caddock precision resistors measure a TCR of 50 parts per million (ppm), while its Ultraprecision babies rate at 15 ppm, which translates to a vanishingly low noise floor. Well, Jim's specially made Caddocks measure 5 ppm, super-super quiet.

Also unique to the CF-X are Varistors, or surge protectors, that follow NEMA's 250 V recommendation. Other conditioners, he notes, do not offer such a high rating. Weil's product goes one better, however: He also uses a 500 V input varistor to protect the remaining bank of varistors, essentially protecting the surge protectors from surges themselves. Moreover, he says his nonstandard approach to lashing together the varistors improves the final sound quality coming out of the speakers (most power conditioner manufacturers, claims Weil, follow a more standard approach which degrades sound). He says he came up with this proprietary topology after years of relying on the "process."

IT'S IN THE DETAILS

The attention to detail is nothing short of staggering. When Weil displayed the guts of a CF-X, I saw not mere wire and parts, but electronic art worthy of display. The entire set-up was point to point, since Jim has come to believe that circuit boards within power conditioners only degrade signal transfer. The power distribution wires are imported, according to Weil, from South Africa, "because at a quality of six-nines copper, they simply sound better." These are given a full 360 to 720 wrap around the gleaming six-nines 1/8-inch copper buss bars: He notes that his buss bar copper is government certified ("It's the same stuff sold to NASA and it comes with papers. I doubt anyone else has such certification in their power conditioners").

Sound Application

Obsessive, you say, but consider this: the spacing of the three buss bars, the hot, neutral and ground, is set at specific intervals, because, notes Weil, “When you’re trying to attenuate microwave frequencies, the distances become critical.”

Solder joints themselves appear to be flawless, which speaks to his 35 years of soldering iron work and to the fact that he uses an Argon drip while soldering. The Argon cools the joints more rapidly than free air, while preventing the more sensitive capacitors from baking. And so it goes. Nothing within Weil’s “process” has been left to chance, including such seemingly miniscule elements as the thickness of FEP insulation (“The thickness of the dielectric impacts the sound, especially when you’re dealing with higher voltages. That’s why I’ve chosen thinner insulation.”) and the color of shrink tubing (“Pigments have sonic effects too, so the colors I use are specially chosen as well.”).

After 12 years of “process” the CF-X comes to market in its most developed form. And what it does for music is nearly

I’ve never been able to get so close—this close—to the original source.

indescribable. Forget the stuff about removing veils or Windexing windows — each is understatement when it came to the impact the CF-X had on my system. Simply, with the CF-X as my front-end, I’ve never been able to get so close—*this close*—to the original source. Period. Finito.

Take Ray Brown Trio’s *Live at Starbuck’s* (Telarc CD-835020). Track after track, the presentation is open, spacious, with Brown’s bass work positively nuance-filled and not buried deep in the mix as he tends to sound without the CF-X in place. The delicate yet powerful bass work is particularly evident on Brown’s solo “Love You Madly.” The fundamental of each struck note is clear, while the overtones emanate

roundly without bulging into flabbiness.

For a taste of the other frequency extreme, few discs offer greater problems of resolution than David Grisman’s Quintet’s *Dawganova* (Acoustic Disc ACD17). Until the CF-X arrived, this compact disc seemed too bright, but all it needed was to have the noise artifacts removed from the chain. Sure, Grisman’s mandolin still sounds a tad hot, but with the power line conditioner in place, much more of the tonal palette of the instrument is revealed. The same can be said for Matt Eakle’s flute playing, Enrique Coria’s guitar work and Joe Craven’s violin work. Simply, the instruments now have more characteristic body, and their positions in

the soundstage are more precise and fleshed out. The word continuous comes to mind, disc after disc, in fact.

As in most things audio, one does not know how much EMI and RFI infect one's music until the infection is removed. Producer Daniel Lanois loves to add ambience/reverb, an ethereal spaciousness to his work of which Willie Nelson's *Teatro* (Island 314-524-548-1 IN02) is a prime example. Line noise smears the effect to such a degree that one may dismiss the entire compact disc as overprocessed. Not so with the CF-X in place: The ambience added to each instrument and voice builds a smoky, engrossing soundstage without in the least stealing from the fundamental signature of each note and instrument, including Nelson's vocals. His voice is clearly and naturally Willie's, although now it has a warm halo that counterpoints its world-weariness. With the CF-X in place, I came to love the beauty of this compact disc.

I could rhapsodize about the stunning effect of the CF-X to the point of nausea,

but I'll spare you that. Suffice it to say, this power line conditioner will max out every audiofillet virtue your equipment is capable of. It will allow you to hear what you've never heard before; more precisely, it will bring you significantly closer to the recording venue. I'm now trying to figure out a way to purchase the two units (one for digital, one for analog) that serve as the ultimate front-ends in my listening room, and if you own a high-rez, pricey system, you'll regret it if you don't give the CF-X serious consideration.

One final note about Jim Weil's "process," which as it turns out, is endless: Jim has started replacing the hospital-grade outlets in his conditioners, which can be custom built to meet any need of the end user, because he's just discovered a new (and as yet unavailable to the consumer) Hubbell outlet. The new plug uses a phenolic (not nylon) body and measures nearly 75% of the conductivity of copper wire (no other plug, notes Weil, comes close to measuring this well). He says he's also found that treating the plugs cryo-

genically (for extra cost) further improves their conductivity. I don't know about this freezing business, but I noticed yet another distinct improvement, a greater clarity of presentation, in my room after I swapped out the old wall plugs with these new versions.

If Jim Weil were a brain surgeon, he just might be the best. Thanks to his obsessive "process" he'd certainly never leave a sponge behind. But instead he's in audio, and that make us all the luckier for it. ●

► **Sound Application CF-X Power Line Conditioner, Sound Application, PO Box 9001, Berkeley, CA 94709. Tel./Fax.: (510) 525-1065. Web site: www.soundapplication.com. Designer: Jim Weil. Description: Power line conditioner, non-magnetic Al housing, CarlingSwitch magnetic circuit breaker, 20-amp IEC power inlet socket. Operating bandwidth: 50 kHz to 2.5 GHz. Transverse noise rejection factor: up to 60 dB. Number of AC duplexes: six custom selected Hubbells. Price: \$4,200 w/o power cord; \$5,000 with the MAC Delta power cord.**