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Logbook of a journey among mains cables and mains filters

by Fabio Cottatellucci

The interest in the power supply of our beloved Audio Video setups is rising day by day.

I have always seen my system as a chain beginning from the energy delivery point (that counter which we cannot interfere with) and ending at the inner power sections of each device. It looks intuitive to me that all this stuff can affect the performances of our machines, since images and sound are just electric energy modulated by our appliances.

On one hand, my experience tells me and many other enthusiastic people that in this field all fine-tuning actions are easy to spot out and show a high cost/benefit ratio. And this is evident even if our home mains network is connected to the power station by several miles of cable. Moreover, the need for a good power line is a widespread belief. Audio Research for instance recommends sockets which allow a good current delivery and cables minimising possible current drops. Nevertheless, too many people keep on asserting that any length of wire serving an audio-video setup brings the same result. Usually, those who share this belief haven't made any comparative tests at all, or run a setup needing major structural interventions and not just some fine-tuning.

On the other hand, maniacal attitude towards mains cords is growing among audio lovers. Some of them are keen to believe that a mains cable alone, made of some exotic materials, can enhance the performance of their setup. Others think that a DIY (Do It Yourself) project can achieve the above-mentioned result in spite of the statement of its very author. Others again cast over the Internet some messages in a bottle (like electric-waves shipwrecked people) trying to find out that particular brand of cable capable of turning lead into gold. Needless to say, a crowd of 230 or 110V magic pipers is ready to serve these friends of ours at very high prices.

Since jammed situations like these can be cleaned up only with good sense, and since good sense in this field means Galileo's "test and test again", I carried out a long test. Please notice this is far more tiring than boasting some guruish dogma.

The purpose was to verify under monitored conditions the effect of powering cables and mains filters in my own audio-video setup, the power line of which had been already tuned up down to its socket-block (included). I chose to verify which kind of device is more sensitive to mains cables quality and also what is to be expected from home made devices.

Walking down this path I couldn't help considering mains filters and their often-criticised selection and use (I still leave mains conditioning to pathological situations). All this work just to check out how far the whole mains optimisation can lead on the way to performance enhancement.

Even though all the stuff under test will be given an assessment, I'd like to point out that this article is not the n-th Audio-Video stuff test. A mains filters test by Francesco Bollorino is available on this same issue anyway.
My report is about the search for a method, and the statement of some principles, that can be used by everybody to improve their results. In fact, the value-adding part of a magazine close to the enthusiast is really this, not the search for The Revealed Truth or the organisation of some bloodshed test.

Hence, in a fine autumn day reddening the trees along my house avenue, only armed of good will and sound realism, I piled up a stock of different cables, mains filters and other weird stuff in my

listening room. Then I prepared a notepad for this test and started a three-week journey, made possible only by the wet weather of the season.

Some forewords

A **mains cord** (or mains cable) is the cable that leads power from the wall plug to your device. The longer it is, the more effective will be, anti – EMI RFI measures (shielding, special configurations etc).

A **mains filter** is a device studied to kill undesired current components (spurious, harmonics, interference and other disturbing), a task that it often carries out a damage for dynamics.

Conditioners and **stabilisers** are hardware that regenerates the electric wave and represent the next intervention level, commonly reserved to mains line pathology (e.g. significant tension drops). This because further to costing quite a lot of money they are traditionally blamed for "choking" dynamics – even more than filters. Anyway, if the National Grid sends to you a 40V-floating tension you don't have many choices left.

Different considerations for stabilisers and other appliances **not intended for Audio–Video duties** (e.g. PC ones); they commonly perform poorly for reasons that are long to explain and that fall beyond the target of this report.

Filters and shielding perform a **bi–directional action**, not only protecting a device or a cable from interference but also preventing it from releasing its own. The latter results in the protection of neighboring gear since all devices, especially **digital circuitry,** pollute the electricity line to some extent.

Mains current kills. If you go for a DIY mains cord, please have it checked by a **qualified electrician**. In all cases, always comply to your local safety rules. I will not even take into consideration frightening ideas like cut-off earth connections, inadequate conductors like satellite receiver's cable, shields made with tin paper that gets loose and makes contact God knows where, and so on. Please be also careful with just-unplugged connectors, caps keep tension for long and might reserve some bad surprises.

For **testing** purposes, my socket-block was moved in order to ease mains cords swapping, then nothing has changed in the setup, all test long (about three weeks). No appliance position or tuning was changed, except for what was under test or had to be swapped to double-check the outcome of the test itself. Anyway, never more than a piece each time. Before performing any tests my setup was warmed up, and all tests have been repeated under different electric line conditions (days, daytime). During these weeks I have changed neither location nor usual tasks to any household appliance, either. All devices had already been burned in or expressly have been for this review. I didn't take into consideration the configurations that nobody will ever use, e.g. the Playstation console as a CD player in my main hi-fi set-up.

Handcrafting aluminium so well is difficult and costly, but the result is a really beautiful and reliable appliance.

The Systems and Magic support

This Company won the wide appreciation of customers and Press for the absolute quality of its BlackNoise mains filters, bearing a CE marking, and for the excellent performance-to-cost ratio of its products. From recent times on, the Company shows in its catalogue energy distributors (special strip sockets), mains cords and other accessories like the Phaser, a little smart gadget to check out the electricity phase in any wall socket. Last but not least, Systems and Magic manufactures a mains cord, the BlackWire.

For what it may concern me, this brand also shows one further atout: its owner Roberto Amato, that I know well, had explained to me what the catalogue progression of his filters means. It is not just a matter of increase in their Ampere capability but also a specialisation by device to be filtered. Hence, model 2500 not only is five times more capable than model 500, but also performs a softer

filtering effect that makes life easier to big power amps while model 500 has a tighter filtering attitude that makes it suitable for pre amps but could make "heavy" gear suffer. Just as a better explanation, the lowest capacity filter, the 1A (230W/230V and 115W/115V) Extreme, is also the one that performs the most sophisticated filtering action. It's targeted on sources only (players, phono pres, step-ups) and in fact has a higher price than his bigger brother, the 2A (460W/230V and 230W/115V) model 500.

Thanks to this brand co-operation (thank you), I received an extended set of their products including three different BlakNoise filters (Extreme, 500 and 2500) and several BlackWire cables. I also could take advantage of some mains cords identical to BlackWire but with thinner cables, not marketed but used by the manufacturer for lab tests, and of a Phaser.

All this equipment gave me an opportunity that proved essential for this test, that of **using the product range of a single brand** known for its specific skills with all configurations and all test long: hence, keeping the same materials, the same layout logic, the same technical solutions.

It is worth recalling that tests here were aimed at evaluating fine tuning procedures, not at evaluating this or that product. I had therefore an opportunity to try each solution always ceteris paribus and had **one only** trusty benchmark for **DIY as well**.

Company's website is worth a visit since it contains a FAQ section that is a true **white paper** about Audio Video power supply, a diagram about **mains filters selection** depending on their duties and – coming soon – some interesting mains line poisoning graphs. Internet is also their preferential distribution channel

Equipment

Display
Philips 32" 16:9 flat screen CRT TV with no signal processing on.

Playstation
Sony Playstation 2 connected in RGB to the display. Digital optical link to multi-channel amplifier.

Player
Main VideoDVD, CD and SACD player was a Philips DVD 963 SA with no tweaks, that I preferred to let on its feet.

Multi – channel amplifier
Marantz SR 7000, a 5 x 100 W, very music – oriented machine but punchy too, with a strong power demand from electricity supply during dynamic transients.
I used it in Home Theater with my subwoofer switched off and with five - channel music from stereo tracks (horrible music outcome) with no sub again. This latter is a "twin stereo plus center speaker" configuration. These two settings force **all power amp sections to work and, more, to do it in full-range mode**. The amp has worked with both analog and digital inputs, and in the second case it was obviously providing A/D conversion too. Bearing no earth connector (it's an EEC rules-compliant "double insulation" device), it can use two-wire cords.

Stereo amplifiers
Galactron Mk 2016 preamplifier plus two Galactron Class A Mk 2151 mono block power amplifiers sporting balanced connections that drastically cut off interference and noise. These connections, along with Class A constant power demand always equal to maximum, allow this amps set to **have little need for help** from power cords and mains filters.

Speakers
Multi-channel and stereo front speakers Klipsch Klipschorn AlNiCo that merciless put set-up **dynamics** under pressure, very good therefore to test electricity supply lines and mains filters that are often criticised for "choking" this. Center speaker was a Klipsch KSC C-1, surround AR IV RedBox (three-way infinite baffle). ARs have been also used as front speakers because of their **low sensitivity,** in order to complete the two-channel tests carried out with the extremely sensitive Klipschorn. JBL 1200 subwoofer.

Connections
DVD player to display (SCART): G&BL High Power Video HSCB
Playstation to display (SCART RGB): Sony Playstation
Optical digital cable: G&BL HMD Pro
S/PDIF digital cable: Cambridge Audio
Player to pre analog cable: Van Den Hul 102 Mk III
Pre to power amps balanced XLR connectors: Galactron GC-2703
Power cables: DIY

"A" electricity line

This is the **optimized electricity supply line** that usually feeds my set – up. A 4mmq (AWG11 ca.) no-break dedicated cable starts from the safety appliances at electricity counter case to reach a plug next to my set–up. From here starts the socket-block cord, a five–meters (16,4ft.) cable that allows me alternative solutions. I am currently using a 3x2.5 **semi balanced cable** (that means three wires having a 2.5 square millimetres section each; i.e. three AWG13 ca. wires)**.**

"Semi balanced" means that a cable is provided with a copper shielding linked to the plug earth connector at its wall end only (therefore the shielding is obviously disconnected at its other end).
This cable feeds my Gewiss–components based **socket-block**. Such a mains line dramatically improves setup electricity supply, therefore **making it more difficult** to mains cords and filters to provide some added value.

"B" electricity line

This is a temporary line that I made up just for this test to simulate the average Audio Video-setup supply conditions. It is connected to the line that normally feeds my house through a Schuko wall plug placed in the living room and just neighbouring to an air conditioner. It consists of a 3x1mmq. (3xAWG17 ca.) connection cable with Schuko male and female plugs, a Schuko-16A adapter, and a good strip socket with a seemingly 3x1.5 (3xAWG15 ca.) cable, a 16A moulded plug and a switch bearing a warning light. All good components, matching what one often finds in **good level set-ups**.

Acoustics

Live end / dead end, trapeze - shaped room tuned with DaaD (Tube Trap – like, dramatically effective acoustic devices). Absorbing false ceiling and marble floor.

From left to right a manufacturer product – the BlackWire – and the PC Cable. First two cords have similar external diameter but quite different internal wires (3x1,5 vs. 3x2,5 – that mean 3xAWG15 vs. 3xAWG13)

Parade as above. PC Cables I used are all Schuko – plug fitted, but many others I found around were fitted with small 10A plugs

Main characters: a) industrial products by Systems and Magic and the "PC Cable"

BlackWire

3x2.5mmq (3xAWG13) semi – balanced shielded cable fitted with Schuko wall plug, 16A wall plug or custom lengths upon request, soldered connections, phase mark on the plug, coal gray sheating. Length: 1.5 meters (4,3 ft.); diameter: 11 millimetres (0.43"). Price 85 Euro.

Factory models

3x1.5 (3xAWG15) shielded cable, black sheating. Same as BlackWire, it is not for sale but used for comparison tests within factory's laboratory. Having a set of these allowed me to highlight the effect of cable section on current. Length: 1.5 meters (4,3 ft.), diameter 8 mm. (0.31").

BlackNoise mains filters

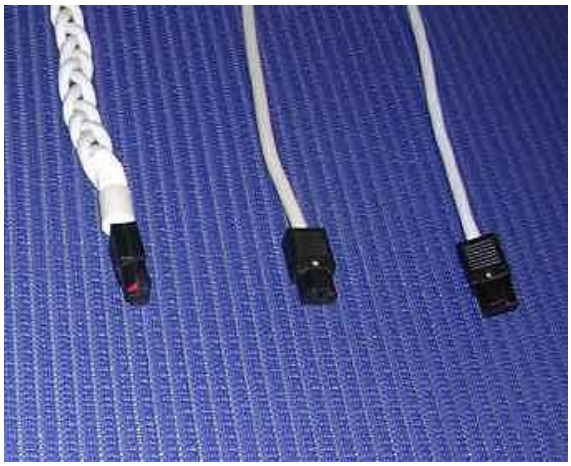
Each filter sports polypropylene, self-healing caps and oversize components that, along with full encapsulation and anticorodal case, make it look like a compact, 3.5-kilogram (7.7lbs. ca.) brick.
Because of its sharp edges, I suggest you not to let it drop it on your feet, though this should be difficult since filters mostly live on the floor. All BlackNoises have a button–restore surge protection system (better than a common fuse).

Last but not least, these devices are really, really beautiful and outstandingly hand-crafted so that it's a pity keeping them out of sight; they won admired comments from ladies they were showed to. And this seldom happens in our field.

Each unit is equipped with a pair of excellent multi–standard sockets. Their strong grip requires precise and thorough insertions that prevent mistakes and accidental loosening. They come with an IEC socket for a mains cord.

Official price list: **Extreme** 380 Euro, **500** 350 Euro, **1000** 420 Euro, **2500** 490 Euro.

The mains cords test benchmark: factory mains cables aka "PC cord"
I selected a 3x0.75 (3xAWG28 ca.) o 3x1 (3xAWG17 ca.) cable set with Schuko plugs well representing what one can find inside Audiovideo gear packages. This is anyway better than some pieces I have recently seen, that were fitted with 10A plugs (the abatjour ones). 1.5 meters (4.9ft.) long, typical outer diameter about 8mm (0.31"). Price: about 5-6 Euro.



Form left to right TTS, Italian Job and SBL. An electricity phase mark on an IEC plug is not mandatory but can always be useful.

TNT-TTS, Italian Job and SBL again. Please notice the fine Schuko Mennekes plug of the TTS and the Schuko of the SBL cord, that can be installed straight or 90° - angled.

Main characters: b) DIY (do it yourself) mains cords

TNT-TTS mains cord
This braid-configured, semi-balanced mains cord is one of the most known **DIY** pieces - and it deserves it. I used a 2x2.5 (2xAWG13 ca.) Baldassari cable instead of the original 3x1.5 (3xAWG17 ca.) Pirelli Screenflex cable, did not install the ferrite and the last wall-plug end braid twists to gain flexibility. Schuko wall plug instead of the 16A one of the original model. Fully silicon-encapsulated IEC plug.
2 meters (5.7ft. ca.) long, outer diameter 25 mm. (1"). Cost of material for my piece: about 15 Euro.

Italian Job mains cord
I jokingly gave that name to this multipurpose cord because I assembled it with an Italian cable (a Pirelli) and fitted it with a 16A plug (we call it "Italian plug"). This cable is a really flexible, not - shielded 3x2.5 mmq (3xAWG13 ca.) and it proves excellent in quick, temporary or cramped installations. Its thick section prevents mains current drops. 1.8 meters (5.9ft.) long, outer diameter 10 mm. (0.39"). Cost of material for my piece: about 4 Euro.

SBL (= "semi-balanced, light") mains cord
It's a one-only length of a Baldassari shielded 2x2.5 mmq (2xAWG13 ca.) semi-balanced cable. 1.5 meters (4.92 ft.), a Schuko plug that can be straight or 90° mounted to make socket-block plug-in easy. Fine bending and conductivity, can be used with devices that don't need to be grounded (I thoroughly closed the IEC mains socket with a plastic chip in order to prevent this cord from being used with devices requiring earth connection). 2 meter (6.56ft.) long, outer diameter 10 mm. (0.39"). Cost of material for my piece: about 5 Euro.

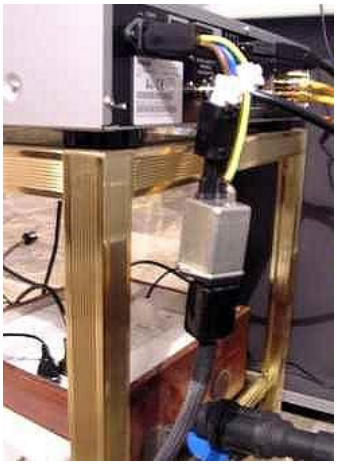
IEC mains socket filter
I assembled this small adapter fitted with a clamp ferrite that allowed me to test a couple of filtered IEC sockets. One was expressly bought choosing the one that seemed likely to best fit my needs and another taken away from a wrecked PC. Cost of the filter I purchased: 15 Euro.

And now, finally, the test: mains cables

A really extensive and diverse set of Video DVDs, CDs and SACDs has been involved, since tests lasted long and some of them were repeated in different days and daytimes.

Having my house an already optimised electric mains line starting at the electricity counter and ending at my home-made socket block, I resumed from this latter and went ahead step by step: i.e., mains cords first then mains filters.

Rule was to use BlackWire mains cords for the whole setup swapping them with other pieces only on the device(s) under test.



Here you can see the adapter I used to test filtered IEC mains sockets. No live parts reachable, but for your own safety please avoid replicating it.

I couldn't perform any cords tests on my TV set and my PS2 having these no IEC mains socket.
Plugging enhanced cables to my Philips player, and starting with some **Video DVDs,** I gained no **image** enhancement. Nevertheless, shielded cords made all movies less prone to random interference (like the one caused by a small, nasty halogen lamp).

I also obtained a slight enhancement in **soundtracks** panning smoothness and speech clearness when swapping from a PC Cable to BlackWire and TNT-TTS.

With my **Marantz multi - channel amplifier** differences with PC Cable were easy to spot out; the Italian Job offered stronger dynamics, the SBL added something more and improved speech clearness and soundstage even if it does not deliver much more details than factory mains cord.

A better performance came out by what proved to be the top couple: the BlackWire is a true member of BlackNoise family and delivers a **really convincing** performance in absolute terms, and even more if one takes into consideration its price. It's a hard contender to face for competitors with its evident improvements in low frequency range presence and control, in soundstage, in high frequency range that hears like "polished", in dynamics that benefits from sharper transients. It also delivers powerful and precise sound impact with Home Theatre soundtracks even with no powered subwoofer.

The TTS fights back even if it tends to be a bit "long" in bass management therefore losing on the control side. This feature may be less rigorous but turns out to be useful if you… want to close in to movie blasts or if you run some slightly sharp – sounding electronics.

For both mains cords positive outcomes stay unchanged in normal Home Theatre, in music playing and in these above – mentioned "stressing" configurations. No changes instead in comparison with PC Cable for D/A conversion chipsets (gaps from player conversion were the same regardless of changes in amplifier mains cord).

I found **it very interesting** that improvements **repeated alike in direction and amount for my stereo three - chassis amplifiers set** even if that more sophisticated devices highlighted all cords' good and bad points leaving only BlackWire and TTS to choose between. The former starred for balance and determination (two words that resume its attitude) and the latter performed well along with the SBL

(being single pieces, they were tested with the preamplifier only).

Letting three BlackWires feed my amplifiers I turned back to my **CD player** with **CD** and **SACD** software**.** Once more **the same ranking came out** with the same proportions even if, being the machine a CD Player, improvements were mainly felt in soundstage, sibilants and micro dynamics. Another good performance by the TTS which pleasantly smoothens 963's quite rhythm - driven sound. Soundstage improvements have been less evident.

So let's make some **assessments** about this mains cords test, assessments based upon my setup and upon my mains line but outlining a general procedure. More, being my setup little sensitive to mains improvement, I wouldn't be surprised if other gear showed larger improvements.

- If a device performs well, it performs well even with a PC Cable.
- If a device performs poor, a mains cord won't do a miracle for it.
- If a device performs well, with the proper mains cord it will do **better**.
  How much better does it work? Improvements (esp. if measured from a PC Cable to the BlackWire reference) are **evident** but not comparable by magnitude neither to a gear swap nor to loudspeakers proper positioning. I'll make an example to cut the story short (please don't weigh my words with a goldsmith balance). When I say that from PC Cable to BlackWire o TTS preamplifier bass range has got louder, I mean that on that machine it's got louder by something like a one-eighth turn of a tone control knob, but cleaner. By the way, if that was your problem it would be easier to turn the tone control up and keep your PC Cable. If you want to get a taste of this just **make a simple SBL** with the first available shielded cable (even a recycled one will be fine), a three-wire one if your gear must be grounded.

  This way you can accomplish an idea of the magnitude with your own gear and with your own electric mains line. But please do this before starting paying crazy prices for Spyrillion–made mains cords, or before starting to search the city looking for "Miracle Ltd." cable. In the future, testing other mains cords, you may simply discover that there's no further enhancement or that it isn't worth all that money. From this point of view I advise to try a BlackWire: it seemed a very good cable to me and, keeping in mind its price, one has to spend a lot of money to get something really better.

- Mains cords have **fewer intervention areas** than connection or power cables. Improvements are concentrated in few, specific areas and are likely to be referred to cable gauge and connections quality (dynamics, bass range) on one side, and to shields and anti - interference configuration on the other side (soundstage, micro dynamics, and control).

- **Dimensions count**. Thicker cables, longer cords if shielded, larger contact area connectors make your hardware sound better. That's why we insist with Schuko plugs. Systems and Magic laboratory cords clearly were BlackWire's thinner brothers but lost especially in dynamics.

- **Manufacturing counts**. A badly soldered connector can compromise the result. DIY pieces like TTS require good skills and time to find out the components, if you want to follow that way and don't feel at ease with complicated twisting please start from an SBL. Price your time: from a very good mains cord like the BlackWire you'll save (about 85–15) 60 Euro – and a second hand market to pick up from exists, too. Industrial products typically concentrate less on configuration and more on materials, DIY layouts do the contrary: therefore, shouldn't you find that specific cable, don't panic: you can use a similar one without travelling the entire world. You can't find two identical DIY pieces so one can expect that different ones behave differently.

- **Flexibility counts.** A complement device must not only work good and safe, it also must not cause your divorce or require a rumble with your setup. Compared to the 1,1 centimetres (0.43" ca.) of a BlackWire that is also very flexible, my TTS has a 2.5 cm. (1" ca.) cross section. That means stiffness, wide **bending** angle, **mechanical stress** on IEC mains socket, problems with **room** behind devices. Obviously, if your rack is placed two feet off the wall and if you don't change your equipment often, this is less important. Please give a glance at the two pictures in this article and to the title one to better understand this issue. Flexibility is the very strength of the extra flexible Italian Job mains cord, which I suggest to always have at hand for temporary or cramped connections, and of the **good compromise SBL** capable of bending tight especially in its two-wires version.

- We are talking about **fine tuning** here, that means small improvements in already tuned up, above entry-level setups. But what if you placed your speakers atop the library, if your neighbours don't

allow you to listen to your Home Theatre, if your amplifier's been recovered from a Jap - '95 rack or you use a PlayStation as a CD Player? Well, in that case you'd better keep your PC Cable, money and time because you don't need other stuff. If you don't have your own setup yet (we've seen this happen around, too) or if it isn't properly installed and burned in, don't even contemplate mains cords upgrades.

I left three BlackWires connected to my stereo three – blocks amplifiers while I swapped another one with TTS on the player because of its good matching, and made an invitation to dance for my…

Almost straight plug in for TTS. The tape does not insulate anything, it just keep ferrite in its place. IEC cord plug is filled with silicon that, unfortunately, cannot be painted – but safety comes first.

BlackWire isn't really thin either, but it's quite flexible. It shows reliable components and good-level finishing.

Test: mains line filtering

As I was saying before, I did some testing with two IEC mains socket filters, using them with my CD Player since their limited capability made them suitable for this machine only. For this reason you'd better not install them in your socket block or on power amplifiers. I experienced no effect except for a very slight improvement in soundstage detailing and an alike worsening of sibilants in both filters; maybe a number of filters must be tested hoping to hit bull's eye for "that" specific device, but I'm not that optimistic about it. No changes with the clamp ferrite on and off.

Then I skipped to **BlackNoise**, curious about testing different filtering combinations – something I never had the occasion to try since I always had installed one single filter at a time.

I started from the **TV set** that proved insensitive to filtering, then I plugged my **digital disc player** to the Extreme, that is specifically designed for sources. **Video DVD** moving images seemed a bit more seamless, like if chipsets were better-greased gears. The same effects – but on a truly small scale – came out with **Playstation** graphics.

Source filtering brought in an overall **Home Theatre** improvement because of a little image upgrade and a large **soundtrack** enhancement. In fact, I got clearer speeches with more defined and space-located **voices**, more space among players, more **sound** harmonics (spectacular the realism of arrows hitting Romans' shields in "The Gladiator" opening battle). Almost a class shift for my player. At this point I also put under filter (500 and 2500) my **multi-channel amplifier** switching the subwoofer with its on-board power unit off to make the former work full-range.

I didn't spot out any dynamics choking (maybe some trace with the 500 that disappears switching the subwoofer on) but neither major improvements: maybe you can't achieve top current cleanness from a machine filled with digital sections: you'd better give up and filter the source only.

Let's go ahead with **two-channel stereo** CDs and SACDs. The effect is amazing, soundstage broadens but does not lose realism, and especially musicians are more stable in space like if their image got more defined putting wider background areas in sight.

Harmonic content and refining increase, the matter sounding (drum leather, wood, strings) becomes evident, micro dynamics make sound more sparkling.

But more than this, I experienced a sensation difficult to explain: it was like if all instrument's **timber generally got better** bringing reproduction close to reality, both in good and bad aspects.

One more visual comparison: it was like if one eliminated a dominant colour from a digital picture with Photoshop: before doing it you didn't quite realise that colour was there; after, you wonder how could you have liked that picture earlier. Quasi - player category shift here too, (that already was doing well and works in a tuned-up system). Then **I added the 500 to my preamplifier**, and got another leap ahead in the above-seen direction, this time dynamics in general gets benefited too (but… didn't filters choke? These ones don't). I take the Extreme away from the player, it's definitely been a backwards step but **the 500 filtering the preamplifier only** gives me a good one–third of the earlier two–filter configuration performance.

It was time to check the layout advised by the manufacturer for my setup, **the 500 only, for player and preamplifier**. I was rather sceptical about that since the two devices "see" each other once they're connected that way, being filter's plugs in parallel: I was afraid of noise and other interference from the digital components of my Philips player. On the contrary, the outcome was barely distinguishable from the one I had got with two filters, and this shows that it was correct to rely on the self-defence ability of my preamplifier and on balanced connections.

On another gear set things may have been different – and another filtering solution would probably have been suggested as well. In order to get at least another assessment please go see in this same issue the filter-only test carried out by my colleague Francesco Bollorino with a significantly different setup.

Next step, **power amplifiers-only filtering with a 2500**. Here I unwillingly performed a blind test: all BlackNoise models look the same and I mistakenly connected the power amplifiers to the 500 instead of the 2500. "Hey" I thought after some minutes "it's true they choke dynamics!" Check-and-try, a doubt arouse, I read the plate and understand the mistake (that I fixed with stickers on each filter's model). The good thing is that I had another proof I'm not keen to be misled by placebo effect. With the 2500 I had another step forward and once again in the above-mentioned parameters, but in my case it cannot be compared to the one obtained filtering source and preamplifier. I guess it would have been larger with less "protected" gear. I obviously couldn't miss a session with player, preamp and power amps plugged to **three different filters together**. What can I say? A true leap upwards, but I must point out I was deploying (on an already optimised electric mains line) filters worth more than 1,200 Euro. Not to mention the set of four mains cords that are worth 340 Euro (inconveniences of multi-stage amplifiers compared to integrated ones).

I carried out one last test with the **2500 stand-alone** for my whole Audiovideo system, after all it was ok but the improvement experienced focusing on digital source was larger than the small widespread improvements.

I agree with the manufacturer, **the most sensible thing** to do would be to use only one filter, a 500, filtering player and preamplifier. It would deliver three quarters of the top performance at a less-than-one -third cost.

As a last test, I installed my **B electricity line** and watched movies and listened to music, going through my tests once again starting from PC Cable, first with mains cords then with mains filters.
Well, nothing makes you understand the value of a well-done upgrade more than downgrading from it, I wished to scream "Gimme my A line back!"

Tests taken with "B" line confirmed previous results but on a smaller scale, filters had almost the same effect than with "A" line. Dynamics was constrained: mains filters clean electricity up but cannot make it appear were it can't reach. Cleaner current due to filtering brought some minor micro dynamics improvement anyway.

Good components for B electric mains line, but changing it with a dedicated and optimised one costs little and is essential for mains current quality.

Let's make some **assessments** about mains filters test and about this experience in general.

- Get your **mains line** optimised, it's worth your efforts and you'll strip alibis off mains cords, filters, and gears.

- At **price/performance ratios** like these, I surely suggest considering the purchase of a mains filter. I don't find it correct to call devices like these "accessories", or limiting them within the boundaries of bad electric mains line treatment. They truly become part of the setup, and give further value even to healthy and well tuned up systems.

- In general terms filtering improves overall power supply, removing what I call "the constant noise carpet" or "the colour dominant", which damage the whole listening session. Contemplating filtering to kill lamps switch-on "tocs" is expensive and is an overshooting (it's faster to intervene on the contact that originated the problem).

- If you go for filtering but have **tight budget**, do the following: for the electricity line reaching the filter, save on shielding but not on gauge and continuity (the **Italian Job** will suit you). For the electricity line from the filter to your devices, use inexpensive but shielded mains cords (an **SBL** for instance).

- Proper installing is the one with better mains cords after the filters.

- Never buy a filter **randomly**, without knowing if and for what purposes you need it. Ask for advice from the manufacturer or from an older owner.

- Modulus configuration allows targeted interventions and those who want to follow the way of filtering can follow a **step by step** purchase.

- Well chosen mains cords or filters can be taken with you **from setup to setup**.

- Always keep in sight **the limit** beyond which money spent for mains cords and/or filters could bring better results if spent elsewhere in your system.

Good components for B electric mains line, but changing it with a dedicated and optimised one costs little and is essential for mains current quality.

I have some doubts left, about subwoofers filtering for instance (Systems and Magic advises not to do it), while I'm pretty sure that a good mains cord would be a fine companion for them. I also would like to go in-depth with projectors and phono preamplifiers filtering.

I wonder whether plugging a phono pre to a good mains filter would have on it the same positive effects of a factory-built dedicated mains power supply.

This would allow good money saving since the same filter could work with the CD player.

Should anybody carry out these latter tests, or have tested mains cords and filters following a thorough protocol, please let us know: everybody's experience widens our shared **knowledge base,** and broad data bases are essential to our hobby.

Let us hear from you about your own experience, I told you mine.

References
Mains cords tests (Italian):
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