

Stefano Monteferri - Dicembre 2003

BlackNoise AC passive filter

The BlackNoise brand is a newcomer to the Italian market and has seen the light of day thanks to the R & D activity of someone who, even before ending up as a professional in this field, had a great passion for hi-fi - Mr. Roberto Amato. Nowadays, Roberto's technical and project resources are almost entirely devoted to the production of devices acting on the AC line that feeds audio reproduction gear. His aim is to limit, as far as possible, the injection of noise which disturbs the power supply of that gear, in order to place Hi-fi components in the best condition to express all their potential.

It is an approach that attacks audio reproduction problems exactly at what could be called "source level", and it looks like a really wise and sound approach to that specific matter. Now, I cannot tell you if the BlackNoise adventure will continue, but it's surely not wrong to start from the beginning. A beginning that, moreover, seems very thoughtful, since their products are protected by a five-year warranty!

At the moment two models are available which, although featuring the same circuit, have their components differently sized. The bigger model can be connected to devices drawing up to 1000W, while the smaller one, which we are going to analyze here, is "limited" to a maximum absorbed power of 500W. Both can handle peaks (like those generated during switch-on) many times superior to their specs.

Technique

BlackNoise conditioners are totally hand-made and every item is accurately controlled and measured to ensure the promised quality level. Where necessary, external specialized companies are involved, particularly in making the printed circuit board (made of 2mm-thick vetronite, tracks made of 70u nickelled copper, soldering done with 2%-silver nickel) and part of the chassis (a nice blue anodized, 4mm-thick, anti-corrosion aluminium extrusion). Everything is then encapsulated in a self-extinguishing epoxy resin, with benefits for stability and mechanical resistance as well as for vibration reception/transmission.

BlackNoise technology is substantially traditional - a passive R/C/L filter network, of which both calculation criteria and theoretical effects, at least from an electrical point of view, are well known. Yet this manufacturer thinks that passive filter application in audio (effect on and interaction between devices, the mains supply, the audio gear connected to it and the effects on sound) is a matter yet to be completely investigated and understood. Thus they developed and built original hardware for analyzing AC mains supply and its interaction with filters and devices. The use of this hardware and computer aided design was followed by severe listening tests for optimal fine-tuning. A final product was obtained which, according to its producer, combines the advantages of reliability and tradition with small-scale production, hand-made precision and the quality of modern research.

It all ends up with a definitive circuit consisting of 30 elements (polypropylene double-metallized self-healing caps, able to repair themselves in case of holes in the dielectric; toroidal and/or inductors wound with sinterized ferroma-

gnetic material; high stability, high power resistors; Teflon insulating elements which, by way of the reciprocal balance and four progressive filtering stages on neutral and live and two stages on earth, can obtain positive performances in most real-life situations, thus avoiding as far as possible the negative effects that affect similarly-designed gear.

Instead of the more common fuses, BlackNoise sports protection against surges which is connected to a re-settable thermal switch. When this switch is activated the blue LED on the device's faceplate turns off. As said, the model under test can be used with devices whose absorption doesn't exceed a constant load of 500W; yet it can handle switch-on peaks many times greater than the specified rating (we're speaking of several KW). Consider that the thermal switch, unlike mere fuses, can handle temporary surges without breaking. The mains cable, integrated in the unit, is made of very good quality shielded wire. For those of you desiring to filter different gear separately, Roberto is preparing models more specifically designed for digital gear and low-absorption devices (preamplifiers), and a multiple plug, protected against over-voltage only.

The sound of... silence!

Unlike in our regular equipment tests, technical measurements were performed as well as a pure listening test. The quality and characteristics of the AC line were analyzed in different environments in different places, for a brief interval. Quality and characteristics which, it is good to remember, may change significantly at different times during the same day. Straight after, we repeated the same analysis but connecting the measurement gear after the AC filter in order to measure the differences between the two configurations. The collected data are extremely interesting.

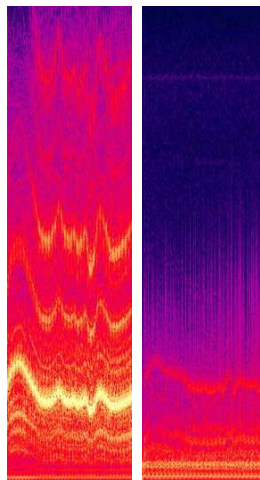


Figura 1

Here we have just a couple of examples amongst the performed tests. Figure 1 shows two pictures. On the left we can see the AC line current spectrum analysis while a domestic appliance (a blender) was in use, connected with a 50m-long mains cable. Noise is higher in the lighter coloured areas and lower in the darker areas. On the right, we have the same situation but with the BlackNoise filter plugged in. As can be noted, compared to the "terrible" situation shown in the former picture, there's a huge improvement in terms of noise reduction. Figure 2 shows AC line current spectrum analysis in the environment in which, in most cases, the use of special power supplies and/or AC line filters or conditioners seems not to produce significant effects (but where, as we'll see, the BlackNoise gave positive listening effects). As you can see from the picture on the left, once the filter is plugged in, there's a noise reduction, particularly in the spectrum area of the highest frequencies (an area in which the BlackNoise showed more efficiency than other similar devices) and an increased level of noise at the lowest frequencies.

The listening test was performed in four different conditions and environments, even several kilometres from one another, in order to be able to analyze a variety of cases and AC line conditions (at least, theoretically). It must immediately be said that the effects were always evident and it was extremely easy to detect the differences in sound introduced by the use of the BlackNoise, given that they were so relevant. This also happened in a specific context (the one cited above and documented by the spectrum analysis) in which the AC line was such that it always greatly limited the perception of the

differences introduced by the use of special mains cable and of different AC filters. After we plugged in the BlackNoise, although we had evidence from our measurement instruments of a pretty significant worsening of some parameters (noise at low frequency), we also reported clear and immediately perceptible improvements in listening - although not at the same level of the ones obtained in other contexts.

So, let's go and analyze those effects on sound that could be classified from the clearly perceptible of the worst condition, to the amazing of all the others.

Low and mid-low range was immediately felt to be more controlled and articulated, so much so that in some cases it even seemed that we had switched to amplification significantly more capable of controlling the membranes of the drivers devoted to this range of frequencies. In the mid-high region there was a relevant smoothing of that harshness that often causes listening fatigue - with, as a side effect, a mid-range that was full, round, fleshy and rich of expression. In the high range,

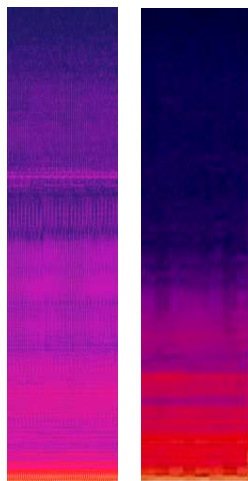


Figura 2

the improvement of the refinement level is notable, and all in a context of superior accuracy and sweetness in reproduction. Substantially, timbres become decisively more relaxing and natural, dense and full of information, with a big benefit in voice rendering, particularly in the pronunciation of hard consonants and sibilants. Maybe the parameter that leaves you most surprised is the restoration of the harmonic content, which is also due to an improvement in silence and of the inter-instrumental blackness, a clear rendering of micro-contrast and of spatial information. Scenic reproduction benefits greatly in terms of precision, air and dimensional development. In particular, I was impressed by the increased sensation of depth; the holography produced improves the rendering of the different sound stages, now more easily identifiable and intelligible, with a greater feeling of plasticity and harmony.

In a situation of improved general cleanness, it is also possible to perceive an improvement in dynamics, with more marked, but also more natural, contrast and a sensation of less background noise. Unlike what commonly happens when devices like this are used (particularly with power amplifiers) - devices which are nonetheless effective and which improve most other parameters - with the BlackNoise there is no feeling of macro-dynamic compression (and this, in my opinion, is a notable added value).

Although it's a common idea that digital gear should be kept separate from analogue, having just one AC filter during this listening test, I always scored the best results with the whole rig connected to the unit. Probably two separate filters could be the final solution, but I can guarantee that even just one filter is extremely effective.

Conclusions

Small, unobtrusive and unusually well refined, this BlackNoise AC filter is extremely valid. Every domestic AC line is almost a case in itself but as far as I could see, in the situations in which it was most effective, the improvements in reproduced sound were of such a high level that sometimes I could hardly recognize the recording I was listening to. I can't exclude that, after its insertion, a fine-tuning of your system may be needed to take full advantage of the quality improvement obtained.

During this test I didn't meet any limitation in the BlackNoise, with the obvious exception of the technical specification (specific limitation in terms of absorption). Moreover, it must be remembered that this filter can be utilized in other domestic applications, for instance Audio-Video rigs and personal computers.

Before you go for component substitution (be they active or passive elements) in your system to improve your audio reproduction quality, I strongly suggest you try plugging in one of these. Once you get rid of AC line noise before the system, with the consequential effects on reproduced sound, you can then intervene, provided you still want to, with some modifications that can be utterly "focused".

Last, but not least, it shouldn't be forgotten that the BlackNoise effectively protects against AC line voltage surges. So, should the improvement in terms of "musical" performance be null (but that, as verified, is not the case), the ability of the BlackNoise to protect a system costing many times its price could easily justify its use.

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