

SECRETS

of Home Theater and High Fidelity®

Power Conditioners

Review: Furman IT-Reference 20i Power Conditioner

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Introduction

I've been suspicious of power conditioners ever since they first appeared – sometime in the Jurassic Park period I think. Just like the science in that movie is a little glossed over, so is the science of AC power glossed over by wild claims for power conditioning products. Besides, when we shell out the big bucks for good hifi a lot of what we're paying for is the power supply. That's why we pick it up before we buy it. A good power supply means a big transformer, which is heavy. And big capacitors which we'd like to see neatly arranged. I was willing to give Furman a try however because for one thing, they got their start in pro-audio.

I don't necessarily think that the pro-audio world has an advantage over the retail audiophile crowd (that's you and me) when it comes to good ears. After all, these are the people who destroy most recorded music with godforsaken compression. And, I've read more than one interview with sound engineers denouncing audiophiles as foolish wasters of money. True enough if all we have to listen to are those overly compressed recordings. Still, there are also some famous audiophiles amongst the philistine sound engineers and the pro-audio world does pay special attention to power. Another kicker for Furman, I saw their power conditioners being used by more than one hifi manufacture at last year's Rocky Mountain Audio Fest.

I was willing to give them a try, but still I was suspicious. What can be done for the power supply that isn't already being done in my expensive components? My current CD player is a Naim CDS2 which comes in two boxes, the CD player (transport and DAC) and the power supply. When this thing was new in 2002 it cost \$11,000. I would hope that at that price there isn't much more that could be done in either of the boxes.

Well there may have been something because Naim followed up with the CDS3 and CD555, the latter of which costs about the same as a nice car.

In spite of my suspicions there were two things that I was sure a good power conditioner could do without stretching the imagination. One is to filter the AC effectively for high frequency noise. There's plenty of it and more every day. This is something that is done to one degree or another by all power conditioners, even by budget power strips. Furman takes some steps to make the filtering linear – that is, even across the frequency spectrum. The other tried and true method for power supply conditioning that I was familiar with was to create balanced AC.

The 120 V AC mains are run to a transformer, the transformer is wound to provide a +60 and a -60V output. These balanced signals become the basis for the mains supply to the components. This is something that is surely not common. It's expensive to do, requiring a large, specially built transformer. The IT-Reference 20i weighs 83 lbs so I have no doubt that there's at least one large transformer in there.

There is one other power supply conditioning trick which is no trick at all – simply regenerate the AC with a dedicated power amp. The inefficiency of this has never appealed to me and it makes it hard to apply to the power amps. Build a power amp to power the power amps? How big would that thing have to be? There's got to be a better way. Some people are now trying it by making the conditioner from efficient Class D amplifiers. Ok, that's worth a try. I have yet to hear that particular trick. Furman doesn't do it.

Those are the power conditioning tricks I knew of, the IT-Reference 20i has a couple more. Furman has something called 'Power Factor Technology'. That's a little bit like claiming to have 'Electricity Technology' as all power circuits have an associated power factor. It has to do with the impedance of the power supply and the reactance of the load.

Similar to your when your power amp has to drive a speaker with an impedance dip at certain frequencies, the source (power amp) is required to produce much more power than is required at other frequencies because of the nature of (reactance of) the load.

In theory, a good power amp is designed to be able to supply whatever current is necessary even for highly demanding speakers that might dip to as low as 2 ohms at some frequencies. Specifically it is the large capacitors that are meant to be the reservoir of power (current) for this

situation. Furman's claim, if I understand correctly, is that even if they are humongous capacitors, able to supply large amounts of current for short bursts, when they are drained quickly the DC supply that your amp's power supply is trying to provide will dip down ever so slightly and the transformer

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and AC mains will be called upon to supply an equally large current to maintain the designated rail voltage. This temporary requirement for large amounts of current is the reason that aftermarket power cords might make a difference in some situations. It's the impedance of the power cord that is making the difference. The Power Factor circuit in Furman conditioners seek to solve this problem with a 'tuned reactance circuit' made up of capacitors able to supply peak currents of over 80 amps.

Well, enough theory. I could go on, if I only I knew more. Impedance is fun to study (I'm serious, really) but if you haven't looked at it in 20 years, memory is impeded. The proof of the audio component is in the listening after all.

In Use

First Impressions I was immediately moved by the improvements in bass in my stereo system. Bass had more authority, weight and texture. That is, notes had more character, overtones. I soon realized that it wasn't just the bass that was improved though. I found the same difference in the midrange as well. I would not say that the high end was altered in this way by the presence of the Furman. There was seemingly a difference in the high end but I only noticed it when (much later) I took the Furman out of my system.

Sparkling Guitar I kept the Furman in my stereo system way past the time I should have been turning in the review. I think this is the most telling aspect of my time with the IT-Reference 20i. I can try to describe the differences in sound, I can try to describe the engineering - badly I'm sure. But I can testify to the fact that I listened to music more after plugging in the Furman. Vinyl sounded better, CD's were way better.

I admit though there was another reason I kept it there for so long, it weighs 83 lbs. It is one of my least favorite pieces of equipment to move. Nonetheless, after I finally got up the courage to lift it up and move it to my home theater system I did a quick repeat of the music I had just been listening to, in this case the new album from M. Ward 'Hold Time' on vinyl, and of course, still, Juliana Hatfield's live CD, 'The Thin White Line'. Immediately I noticed that the high end seemed to have more sparkle without the Furman, if a guitar solo was meant to soar, it was soaring more now that I'd taken the Furman out. But the general presence of noise made me want to switch the whole thing off.

Honestly, the music I was enjoying moments before was like an annoying buzz that I wanted to swat away. After a couple of days I was able to listen sans-Furman again, I attribute this to break in of my ears and brain. But still, it did seem like the high end of guitars soared a bit more than when I had the Reference IT in circuit. Everything else however was muddled. The bass, the voice, the back up vocals, the drums, all a bit merged together. Not good.

Sparkling Faceplate I was able to move the 20i to my home theater system but not without putting a nice scratch in the sparkly part of the front plate. What might look like grain in the photos here is a metallic flake finish in the silver portion of the box, it's nice, subtle enough to not be noticed most of

the time but makes a splash when there's enough light around. This one now has a scratch in it however. I'm sure I did it with my belt buckle. Hey it was a triumph just to lift the thing, now I gotta be careful too? I fixed the scratch in the photos with Photoshop. In real life I don't notice it from most angles so it's not a concern to me, it might be to Furman if I planned to return this unit (more on that later). I bring it up though because it could easily happen to you too if you happen to get one of these.



In my home theater system the first noticeable difference was a pronounced 60 cycle hum coming through the speakers. With the help of Garth Powell from Furman the blame was quickly placed on my Cambridge DVD player and the problem was as quickly resolved by plugging the Cambridge into the same outlet bank as my Outlaw amplifier. All of this is stirring a memory of having this same problem before, with the Cambridge, for some other review that I did. I think this is a scenario that other users of power conditioners would be likely to encounter. Any degree of isolation between various components increases the likelihood of ground loop issues. The primary method for resolving these is not unique to the Furman: unplug things until the offending component(s) is

identified. Then plug that component into the same power source as the main amplifier.

After that was resolved the effects were more like what I heard upstairs. From an audio perspective the instruments (if I was watching/listening to music) had better separation and texture. Small variations in guitar lines for instance on Aimee Mann's 'Live at Queen Anne's Warehouse' were easy to hear and all the instruments had their own space. There's a point in the song 'Save Me' where the guitar player steps up to his mic and contributes some background vocals, without the Furman in the circuit I had to focus to hear his vocal contribution. With the Furman, it was easy, here's the back up singer here, here's Aimee over here. (Aimee and I are on a first name basis, well, she doesn't know me but I call her 'Aimee', I have no idea who that back up singer is).

Even more striking was the difference on with my favorite music DVD 'Tell Me What Rockers To Swallow' by the Yeah Yeah Yeah's. Oh the kids these days. As with the White Stripes there are only two instruments in the Yeah Yeah Yeah's, guitar and drums. But the guitar makes an impressive racket, rich with feedback and overtones - just the kind of thing that can become muddled by a system and it would be hard to know it was happening. With the Furman in my system the difference was profound. There is a logic, a musicality to guitar playing like this but it can get lost by poor recordings and playback equipment. With the Furman it was not lost.

Vision

The other thing I had to look for of course was changes in the picture. I think these are the kinds of changes that most people feel more comfortable reporting because they trust their eyes more than their ears. The effect was very similar to the changes in sound. Edges were cleaned up such that pictures had better depth and were easier to look at. I've been waiting for Blu-Ray players to mature a bit before switching over so I'm still watching DVD's. I use various scenes in The Fifth Element for comparisons, the first 10

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minutes or so and the building diving scene – with the animated Manhattan of the future.

With the Furman there was more depth, easier to watch. I also plugged in Blade Runner just to see what I could see, I ended up watching the whole thing (for the 50th time maybe). I don't know when that has happened for any of the equipment that I've reviewed. Over time I realized that the general effect for my home theater system was less fatigue. Now that the Furman was finally downstairs I was spending more time with that system and less time with my stereo system.

Back to the Stereo

After another long while I reluctantly moved the Reference IT back upstairs. I had an HBO Documentary Films stocking cap lying around - it was swag from this year's Sundance Film Festival. It's an ugly green, not suitable for wearing but it worked nicely tucked into my belt to cover the buckle so no scratches this time. I was especially interested to check out the differences in the high end that I mentioned above. Was I actually losing something in the high end with the Furman?

After plugging it back in and listening carefully I don't think so. I think the difference is this, when the other instruments in the mix are presented at their best, not muddled, the high end is just one of many enjoyable parts. Without the Furman, my stereo still presents the high end about the same as it does when the Furman is in there. But, it does everything else a bit worse. So, when it's not in there the high end tends to stand out and it is a more satisfying piece of the sonic picture to focus on. There's usually only one instrument up there in the stratosphere so there's nothing for it to get confused with.

The rest of the frequency spectrum confirmed what I had heard before. Instruments were separate again and the bass had authority. All the instruments had a subtlety and nuance that I just didn't pick up when the Furman wasn't there.



Conclusions

The Furman IT-Reference 20i does three things to clean up AC: The Power Factor Technology I mentioned above, filtering of high frequency noise and the creation of balanced AC. I don't know which of these items made such a difference in my systems. The kind of differences I heard make me think it is the Power Factor correction but that is the hardest one for me to understand. Doesn't the AC cord still represent an impedance bottleneck even when the Furman is in place?

On the other hand, the differences I heard could also be explained by the other techniques employed in this box. Take the filtering for instance, my house happens to still have one, ancient, cloth insulated, AC line that happens to be the one my computer plugs into. The stereo system doesn't use this line but of course the ground is common. Maybe this line is polluting the AC in my house worse than in most and the Furman is making the improvements I heard by cleaning it up. Maybe it takes all three techniques. There's a certain logic to that.

At this point I don't care, I just want it. I'll buy this guy and when I can swing it I'll look to get another for my home theater system. I'm sure not going to move one unit back and forth. I thought about having one unit to feed

both systems. It would take some serious wiring work to make it happen but Furman's Garth Powell discouraged me from this idea. There is the issue of long power cords but more important is the idea that more isolation between components is the goal, not less.

I think the main thing I should point out is that with the Furman Reference IT-Reference 20i in my stereo system, I wanted to listen to more music. Both CD's and vinyl. With Vinyl, I couldn't get enough. With CD's, about three was my max before fatigue set in. Hey, a power conditioner can't solve everything. I don't think I ever made it past two CD's in my pre-conditioned days. When the Furman was in my home theater system, I wanted to watch more TV, more movies and more music DVD's. 'More TV' has an evil ring to it I know so I leave it to you whether enhancing your home theater system is something you want to do but if you do, the IT-Reference 20i is a great way to do it.

SPECIFICATIONS

- Input: 20 Amp Circuit Required
- Output 12-20 Amp Continuous RMS (All outlets combined)
- Linear Noise Attenuation:
- Transverse (Differential) Mode:
 - >20 dB, 1kHz to 2 kHz
 - >40 dB, 2kHz to 100 kHz
 - >80 dB, 100 kHz to 1 GHz
- Common Mode:
 - >95 dB, 10 Hz to 50 kHz
 - >40 dB, 50 kHz to 1 MHz
- Outlets: 8 Symmetrical Balanced
- 4 Power Factor Technology
- Transient Voltage Surge Protection
- Telco – Cable/Satellite: Less than 1dB Line Loss
- Dimensions: 5.75" H x 17" W x 15.625" D
- Weight: 83 Pounds
- Power Consumption: 8.5 Watts
- MSRP: \$3,499 USA
- Furman Sound