

# POWER

## FACT & FICTION

Pulling apart the fluff from the fact...

**DAVID HELPLING** wonders what a difference a bit of cabling and power regulation can make to sound quality, and so begins down the road of discovery to find the truth of what really powers sound.

I have what I think is some rather exciting news about just what squeaky clean power can do for the world of pro audio, from the major studio to the closet rocker. With my best intentions put forth to achieve the best sound possible, can it be true that I have fallen short of studio genius? Sadly it seems that much of the studio equipment that I love so much has one thing in common... something that I thought was taken care of. Just about everything benefits significantly from good, clean electricity! And apparently my little rack mount power strips aren't coming close to honouring my fleet of special machines. So I have been in the throws of researching, listening to, and exploring power regulation, balanced power, filtering and surprisingly, cables. In my quest, it seems that all roads have a common end. I am out to prove that this is not an esoteric or status subject, but a link that has been overlooked by many and embraced by few. But first I need proof. What is fact, and what is fluff?

### Voltage Regulation

The first link in the power theory is protection (from electrical abnormalities and power spikes coming down the wire)... but substantial proven audio benefits are what I'm really after. So does a good voltage regulator at the top of your power chain make things sound better? Coincidentally (or not), every engineer we met with for this feature was using the exact same voltage regulator – the Furman AR-15 II. There must be a solid reason for this? My first stop was to the studio of Howard Givens – audio engineer, artist, and general sound guru with Spotted Peccary Music, InsightEPK, True Systems, and Stereotypes Audio. He had this to say about regulation: "Our power path has always started with a Furman AR-15 Voltage Regulator/Line Stabilizer that then feeds several Furman multi-outlet Power Conditioners. Their attention to detail

in power conditioning and power supply is unparalleled. The AR-15 will protect all other equipment down the line – especially your balanced power unit. Some may not directly relate it to better sound but a stable stream of regulated voltage will definitely prolong the life of most audio gear."

After researching voltage regulators I tested the power here in my studio. I was shocked to see a fluctuation in voltage from as low as 114V to as high as 124V throughout the day. Furman was gracious enough to send us several different units for testing which included an AR-15 II, and while I haven't experienced a malfunction in the past I can't help but feel that all of my gear is a good deal happier with the stable stream of voltage that the AR-15 II is now providing. It will take an input voltage from the extremes of 97V to 137V, and transform it to a constant 120 volts of AC power – protecting your audio gear from AC line voltage irregularities such as sags, brownouts, or over-voltages (all of which can cause sensitive electronic equipment to malfunction or sustain damage). One side observation about Furman products is their appearance – they are rather plain black boxes with the proper indicators and switches necessary for operation. I have taken notice that the fancier units with a barrage of blinking lights and LED readouts are rarely found in the high-end studios. It is the classic rule – the more a product looks like it is trying to impress you, the more it needs to rely on its good looks. I think the AR-15 II would be a wise step towards protecting the equipment in any studio.

### Balanced Power

Regardless of whether or not you use a voltage regulator in your system, it seems that an important part of any great sounding studio is balanced power. But what the heck is balanced power? In much the same way that balanced audio lines can reduce the pickup of hum and other types of electromagnetic interference (EMI), the use of balanced AC power lines in sensitive audio installations can make an enormous difference in system noise and signal integrity. Power distribution here in North America, unfortunately, is not balanced. The standards currently in





can't apply a rule and say that it's always going to work the same for everyone.

I've heard differences with balanced power when it's been put into major studios that were having strange problems with ground issues or softness in the low frequencies.

Then after going to a balanced system, the entire sound was appreciably better. So it seems like balanced power is just one more step towards getting the cleanest possible power to the equipment.

In my thinking, it's one of the most important investments that anyone can make in a recording studio or an audio production environment."

### A Cass Case

A proven case study in balanced power is the mastering facility of Cass Anawaty. In Portland Oregon Cass specialises in high-resolution stereo and surround mastering for major clients: "The obvious benefits in a balanced power setup are the actual rejections and cancellations that occur, but the real impact that I see in my facility

is the increase in headroom. When performing multiple digital to analogue and analogue to digital conversions and processing via an analogue signal chain, the conversion needs to be as clean as possible. Most people are aware of this but they don't usually think of it in terms of power. With reduced oscillations on the line you have a lower noise floor, and you can actually see this on the meters... in analogue or digital gear – and that equals more headroom in my business.

With the current state of convertors you are already losing bits to the noise-floor within the convertors themselves, so anything you can do to preserve any amount of headroom is always a very positive thing."

"Many of the power strips suggest that they perform some sort of RFI or EMI rejection, but I've found that I get an even cleaner signal by using a balanced power system. As a mastering engineer I get a lot of different material from

different studios, and I can almost tell which ones are running a clean power scheme versus ones that are not. The differences I heard after going to balanced power were drastic. I can turn my monitors up to full power and not hear any noise at all – I would classify it as a 20% improvement in my noise floor, and that is a very important 20%."

"I am working with a classical harpist in a mastering capacity and she is worried about having to re-record her record. She sent me a track containing actual radio chatter somewhere around -40Db full-scale – you can't do anything with that – the track is ruined. If the studio that recorded that had balanced power and proper conditioning their client wouldn't have to be searching out other recording studios to redo the work – and I hear stuff like that quite a bit."

### Balancing The Benefits

I myself have been running the Furman IT-20 II in my studio for a few weeks now and I am blown away by the audible reduction in noise floor. I experienced the exact same thing that Cass

*"There will be no bench tests, specs, and measurements – I want to hear the golden-eared professionals tell us what they hear, or don't hear, in a different cable."*

claimed with my ADAM studio monitors. My Apogee convertors and True Systems microphone preamplifiers are benefiting from balanced power as well. When I started researching for this feature I didn't even know what balanced power was, or how it worked. To think that for the last ten years I've been running only a small Furman PL-8 power conditioner! Who would think that the positive impacts of balanced power would be so dramatic and obvious? Any passionate engineer,

musician, or sound designer would be foolish not to look into a balanced power system – especially those who have invested much time and money into creating a great sounding room with high-end gear.

### Power Cables

*Are you going to tell me that a different power cable can make things sound better...? I know that this topic enrages some and fascinates others, but*

► use were derived from practices established over a century ago, employing a three-wire distribution scheme in which branch circuits have a hot wire and a neutral wire, with the neutral tied to a third wire connected for safety to an earth ground. This unbalanced scheme can create significant hum in audio circuits. The current flowing in the hot wire induces hum in any other nearby wires, which may carry vulnerable low-level audio signals. This low level noise then becomes part of the audio itself.

In a balanced power conditioner (in our case a Furman IT-20 II) a centre-tapped isolation transformer allows the AC power feeding a studio to be balanced at its source. The current-carrying wires then are no longer 'hot' (120V) and 'neutral' (0V), but two 60V lines of opposite polarity whose difference is 120V. This type of power, when run around a room, does not induce hum into nearby audio wiring, because the two conductors induce equal and opposite voltages that cancel each other out. Similarly, ground currents are all but eliminated by the same common-mode cancellation effect. Even further, the Furman IT-20 II features a centre tap ground lift, which may reduce ground induced noise even further. I asked Mr. Givens to share his thoughts on balanced power: "More than any other area it seems that audio production really needs good clean power. Whether it's in the analogue world or in current digital studios, good clean power is essential and it really does affect the quality and the definition of the sound. Going to a balanced system may not be appreciated in everybody's setup. Again it's one of those things where you

► I've heard far too many stories about fancy power cables to not explore this topic. Audiophile cabling has always been a heatedly debated topic – from speaker and line cables to, yes, IEC power cables. Since I am out to prove what is fact and what is fluff, it is my duty to put these cables to the test. Now I am not a scientist or a mathematician... I am an artist and audio engineer. There will be no bench tests, specs, and measurements – I want to hear the golden-eared professionals tell us what they hear, or don't hear, in a different cable.

If you take a look on the Internet for audiophile power cables, one name will surface more than any other – Analysis Plus. Analysis Plus is an innovator in audio cable design whose customers include major names in high-end audio and home theatre equipment. In addition to being electrical engineers these guys are also audiophiles – so the cables should be awesome right? I won't go deep into engineer geekiness but several things including skin effect, current bunching, hollow oval cable solution, braided conductor advantage, characteristic impedance complexity,

and frequency blurring are involved in the design of these cables (all of which are rather fascinating and available in the Analysis Plus White Paper 'Report 981'). The folks at Analysis Plus were nice enough to send us several different pairs of their Oval series IEC power cables for testing. As a side note, I must mention that these are by far the coolest looking cables I have ever seen.

I now recall seeing these exact cables powering many of the high-end manufacturers' studio monitors at winter NAMM in January. Now I think I know why.

I sat down with San Diego's own Jon Jenkins – sought after voice talent, recording artist, record producer, and audio post engineer. We brought a pair of the Power Oval 2 IEC power cables with us for him to try out. When the topic of power cables came up Jon immediately mentioned Analysis

Plus, and had a related story to tell: "Actually I just replaced my studio monitor's speaker cables with the Analysis Plus Oval 12's and the difference was very noticeable. There was an increased depth of field and a tighter low end – more 3D – everything just became clearer – so I understand the difference that a cable can make."

After listening to a variety of different mixes and projects he was working on with the Analysis Plus power cables in use, I asked the big question: "So honestly... can you hear a difference?"

"Yes – the same type of changes

I heard with the speaker cables were happening here – just in a more subtle way. The three dimensional soundstage, the more defined low end – certain things just kind of came to life. The centre channel image and vocal presence was more defined. This kind of stuff can be really important for monitoring – trying to hear all of the details you can for quality critical audio. I'm on the mic every week recording and mixing promos, bumpers and spots for major sports and movie networks – having an accurate and good sounding system is very important. Also having good clean power for my tube mics and microphone pre-amps is a key part of getting a great sound – I have only been using the Furman stuff for a couple of years but I love it – it is a serious part of my set up."

### The Other Side

Being an audiophile consultant and co-designer of high-end professional audio products, Howard Givens has been exposed to his fair share of this topic from both sides... and the sort of controversy surrounding it: "Cables do definitely sound different – there is no question about that. People in the HiFi world have certainly known this and people have even been discovering in Pro Audio that you can really hear those differences. With all of the factors that go into what makes a cable sound different it often comes down to the subjective aspects of your particular situation... essentially, do you like what this cable is doing in this application?"

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"We found that power cords tend to make the most amount of difference when related to high-current situations like amplifiers. So even though there is an amplifier built into the speaker it definitely has a different current demand. After replacing the standard IEC power cord that came stock with my ADAM monitors with the Analysis Plus Power Oval 10, it was really obvious that the sound improved – the clarity, we heard more definition in the lows, we could make out more details in the sound. When going back to





▶ listening with the stock IEC cable the transparency was greatly diminished.”

**Is This Fluff?**

Wow – these guys are really hearing what a replacement power cable can do – on top of everything else that has been done in their setup to improve the sound quality! Apparently this is not fluff... but wait just a second – Cass Anawaty had a different reaction from the results of his tests:

“To be honest... I didn’t notice a difference in my studio – I read the white papers and some of the other materials that they have. I certainly understand that the shielding they are using could result in some RFI/EMI rejection in some sense, but since that is not a problem that I have in my studio I didn’t notice a benefit along those lines. Audiophile power cables and audio cables are a hotly debated topic – as far as I am aware there have never been any scientific studies that have validated any claims of an improved

audio experience or even one that is necessarily different. Everybody owns their own experience... during the time I had with the Analysis Plus IEC power cables and the different techniques I used to try to detect a difference, and I just didn’t hear one.”

**'Ear Anything Different?**

So, we have two very experienced engineers, one that heard a difference, and one that didn’t. Could it be that Cass’ studio is so perfectly powered and outfitted that these cables aren’t noticed? I suppose that leaves a certain air of mystery here. It was time to put the Power Oval 2 cables to test in my room. More than the improved precision in the stereo image and the focused bottom end, I instantly noticed something different in the placement of good vocal recordings in the centre channel relative to the rest of the mix. Now this was a very subtle change, but a change nonetheless. I switched the cables back and forth several times to ensure that this was no

placebo effect, and there was definitely something different in the sound. I would not consider it measurable by any means that I could think of – though I don’t think I quite have the ears that these other engineers do. One thing I could prove was the cell phone interference that I almost always get from my wife’s Apple iPhone. It’s similar to the Imperial Probe Droid’s transmission in The Empire Strikes Back (though hardly as cool). With the Power Oval 2 cables connected I could not get the classic interference to rear its ugly head. I spoke with an engineer at Analysis Plus and they attribute this to the low inductance and braided shield on the power cable itself among other things. Power cables – who knew?

After spending so much time with these engineers and learning of the profound advantages of power regulation and balanced power, I have added the Furman units to my studio setup – how could I not after Cass’ measurements and discoveries? The upgraded Analysis Plus cabling is pretty darn cool too... I may be forced to have a few of those on my key components... after all, every bit helps when audio is your well being. **AM**

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**INFORMATION**

- Ⓜ [www.analysis-plus.com/index.html](http://www.analysis-plus.com/index.html)
- Ⓜ [www.furmansound.com/](http://www.furmansound.com/)

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