Michael (left) with brother Eben.

Michael Grace

The man behind the technology of Grace Design explains why not all preamps are equal, why quality and longevity is green, and why he doesn't know how to build down to a price.

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Michael Grace dropped out of engineering school after his freshman year to work for a high-end audiophile amplifier company in his home town of Colorado Springs. For six years Jeff Rowland (Jeff Rowland Design Group) was his mentor and he learned much about purist signal path design and critical listening. During this time his younger brother Eben (now his business partner in Grace Design) was becoming an accomplished guitar player and Michael was compelled to learn the art of recording to make demos for Eben's various bands. This led to tinkering with the recording chain and the first mic amplifiers that came out of this were adapted from high performance phono preamplifiers.

In 1990 Michael quit and set out on his own and made a living primarily by doing remote recording and studio maintenance at local studios. He says this gave him a great insight into what breaks and bit by bit he started getting custom equipment orders and some contract design jobs. In 1994 he officially established Grace Design with brother Eben and began production on the original 801 microphone preamplifier. They took the first one to New York for the AES Convention and, since they didn't have a booth, they carried it under their arms and showed it to anyone they could stop in the aisles.

Located in Boulder, Colorado, Grace Design has maintained a steady pace to developing new products and technologies in a product line that has evolved into a definitive collection of microphone preamps predominantly but also with monitoring products.

What is special about Grace products?

I think what is special about Grace products is that they are not designed by a committee to fit a perceived market. Instead they are conceived while working in actual recording environments. Eben and I are both regularly active in recording projects (Eben more in the studio and myself more on location) and this gives us plenty of time to contemplate how we would like things to work whether for improved sound quality, flexibility, or efficiency. As well, having spent plenty of time in live location recording situations I have developed a low patience level for equipment that is not completely reliable. As a result I think our products provide the proper balance of performance, reliability, and flexibility.

Has the choice of components you can use continued to improve?

Yes! I am always amazed at the constant improvements being made in analogue, digital, and passive components. While the improvements are incremental in most cases, when you look at the cumulative effects of many small component improvements across a whole circuit design the results can be surprisingly noticeable. Also, modern manufacturing technology has improved the consistency of the components that we buy which means less hand selecting and fallout during testing. Particularly exciting right now is a new wave of significantly advanced performance amplifier circuits from makers such as Burr-Brown and National Semiconductor. The traditional trade-offs between noise, distortion, and bandwidth are becoming less and less significant.

What defines classic/vintage preamp designs?

First I must state that I am not an authority on classic or vintage designs. But since you asked, I would think that input and output signal coupling transformers surrounding a single-ended amplifier stage was a common configuration before the availability of amplifier designs with high common mode rejection and precision output balancing. Many of the preamplifiers that are considered classic now owe that moniker to the fact that they were well made and are still serviceable today.

What are the variables that you cannot control in a mic preamp?

The two most significant variables that can not be controlled are the microphone output characteristics (coupled with the mic cable characteristics) and the output cable and load characteristics. On the microphone side the mic's source impedance and cable reactance combine to give variable frequency response.

What is the difference between a Grace preamp and a good mass market product?

This comes back to the basic design criteria of performance and reliability but with the addition of longevity. While there are many fine mass market preamplifiers out there I think that to really achieve the highest possible performance and reliability you have to spend more time on the design and more money on the raw materials.

The materials that go into electronics products come at a great cost to our planet in terms of natural resources and energy. I feel it is our duty to build products that will last a very long time. To do this we buy the highest quality components we can and then make sure that the design margins are sufficient that each component will have a

very long life. For instance, the gain switch on our m801 and m201 preamplifiers is a Swiss-made Elma. It probably costs 150x what the gain pot in a mass market preamplifier does but it will still be working flawlessly long after the wiper track on the cheap potentiometer has worn through rendering its host unusable.

Personally I would rather spend five times as much money on a quality toaster and have it last a lifetime than buy cheap ones and discard them as they wear out.

Along these same lines, I always try to design-in appropriate technology that is mature so that the obsolescence curve is as flat as it can be. A pure analogue microphone preamplifier will probably never be obsolete (as long as people like using their old microphones) but this is not true of digital technology. We waited for many years before developing A-D and D-A convertors for our products so they would not be put in the closet to collect dust when the convertor technology changed.

Are we already at the limits of what we can achieve with analogue?

While analogue performance has been approaching the theoretical limits for some time there is certainly a whole landscape of possibilities for controlling classic analogue circuits with digital brains. From simply controlling the gain of a microphone amplifier to creating compressors with DSP side-chain processing analogue circuits are finding enhanced functionality and performance.

Is the lack of truly affordable Grace products a marketing stance or a production reality?

While I would argue that our m101 preamp is truly affordable I can't deny that there are less expensive preamps! But, to answer the question, it is a production reality and more. I have no skills as a designer of products built to a price point and for mass production. This requires a totally different mindset where each design decision is made with the cost and assembly efficiency as the primary criteria. I much prefer to daydream about the absolute best way to do something than the cheapest way.

Also, we build every preamplifier by hand here at our Boulder, Colorado factory. While some components (like circuit board assemblies) are contracted out to local vendors, we control all of the assembly process. We just could not handle the production volume of low-priced, mass-produced products and maintain our current level of testing and quality control.

What's the smart way to appraise the quality and performance of a preamp?

For performance this is, of course, dependant on what type of preamplifier you are evaluating. Is it designed for transparency or is it designed to have a colour or 'vibe'? For the former, if you find yourself forgetting about the preamplifier during sessions and focusing on the music, then the preamplifier is probably doing its job.

As for quality, the first thing I would do is look at the manufacturer's warranty. Will they stand behind it for more than 90 days? ....a year? ...5 years? This is probably a good bellwether as the manufacturer knows what kind of quality has been put into the product. ■