I NOSTRI TECNICI

Those who breathe the rarefied air of genius seem to approach the world with an open and questioning mind, eschewing traditional concepts for things new and different. Rather than improve, they more often than not redefine. What is it that drives and ultimately differentiates those who are truly extraordinary at design from those who are merely very good? What quality — or qualities — define the soul of genius and elevate it above things merely mortal? Isaac Stern once remarked that in music it was not so much how you play the note, but what you do in the interval.

Another, who clearly had more than a fleeting relationship with this elusive quality said, **"Neither a lofty degree of intelligence, nor imagination nor both together go to the making of genius. Love, love, love, that is the soul of genius"**. That man was Wolfgang Amadeus Mozart.

Genuine breakthroughs often arrive from unexpected quarters at unexpected times, and often from unsuspected sources. They frequently reach us through the work of those who either because they don't know better or because their nature is to be questioning break the rules or test new waters. Clearly things that we characterize as breakthroughs represent more than subtle improvements. They are revolutionary, often cataclysmic, events rather than evolutionary advances.

Looking back to the personalities and events that have shaped the audio industry, breakthroughs undoubtedly came about in this way. They were brought to us by designers who approached a problem without a roadmap — some disarmingly unassuming, others flamboyant — but they had one thing in common. That common denominator seems to have been an absolute ***love*** of music and a ***passion*** for improving its reproduction. And in some small measure perhaps Wolfgang Amadeus Mozart cast it correctly.

Here are some of the pathfinders whose works have defined our industry.

Ed Miller

The name Ed Miller is associated with **Sherwood** Electronic Laboratories, Inc., which he helped to found in 1955. But Miller had already made his mark nine years earlier, at the age of twenty-five, at Radio Craftsmen - a manufacturer of truly classic components, though the name is virtually unknown to current audiophiles of less than middle age. It was there that he solved the ***"drift problem"*** then plaguing FM tuners by introducing an automatic frequency control into the circuit. The basic idea behind **AFC** was already in the engineering textbooks, but he was the first to incorporate it into an FM tuner. Two forces coalesced into a decision when Miller was approached by **Morris Kessler**, president of a small company in Los Angeles known as **SAE** (Scientific Audio Electronics, though the full name is seldom used), whose ten employees produced a line of amplifiers, preamps, and equipment and a digital tuner, and soon became head of the SAE engineering department.

The seeds planted at SAE bore fruit; the company grew, and he was asked to return in 1973. For a time he worked with a young engineer named James Bongiorno, who had replaced Miller during the year-long break from SAE and who designed its present line of amplifiers. They were a formidable team of technical talent.

Tall, lean, and athletic at fifty-five, Miller retains all the enthusiasm for high fidelity sound that drove him in his salad years. His sole hobby is botany, and the results of his work in this area enhance his reputation as a man with an exceptional ability to make things grow.

Pat Cooper

The historic development of **A.E.C.** cartridges extends back to the year 1972, an evolving relationship with Mr. Pat Cooper, and the legendary Decca Mk V — the first “lightweight” version of the Decca cartridge for the then lightweight, low mass tone arms. The founder of Decca Special Products and the engineer responsible for the original Decca cartridge design (very much still in production) and all newer development work was (and is) Mr. Pat Cooper.

Fueled by a passion for music and its faithful reproduction, Pat and his team pioneered several firsts in phono cartridge design, including *“positive scanning”*. Decca cartridges, and their customized **A.E.C**. counterparts, are defined by delicate construction, extreme quality control measures, and a proprietary cantilever design. The Decca cantilever is bonded piece consisting of two different materials — a steel element, acting as spring, and a soft iron part acting as the magnet in the cartridge motor. Because of the miniscule dimensions, the material tolerances, and interactions with undamped tone arms, Decca created and offers their now world famous Decca Int'l arm as an ideal complement. Pat is truly one of the pioneers whose efforts have helped carve a unique niche in the audio industry — all for the love of music.

All these things saw the light of day, not because of a new twist to an existing technology, but because these designers had such a fundamental insight into the basic nature of music and a clear understanding of the challenges faced in faithfully reproducing it. The also shared a love and a passion that was as much the driving force behind their designs as their knowledge and formal schooling. A love of the art balanced by a passion for the science-this seems to define they efforts.

For more than thirty years Audio Int'l has been in the business of distributing not only audio "breakthroughs," but products that represent an obsessive devotion to the shared experience of live music. We have never looked for fancy front panels, nor have we pursued specs for the sake of specs-we have always gone to the heart and soul, music itself, and a component's ability to convey this experience in depth and detail. Audio Int'l is proud to represent itself with a phrase a phrase lifted from the RCA Living Stereo Catalog, **“It's classic, but it's good”.**

Doug Sax

Doug Sax's interest in recording and mastering led him to give up a career as a symphonic trumpet player. Doug first opened the doors at The Mastering Lab in 1967. It was one of the first independent mastering facilities in the world. The Mastering Lab is a state-of-the-art and revolutionary facility with a unique concept of signal flow designed and originally constructed by Doug's brother Sherwood Sax, All of the electronics, from the tape machines to the equalizers, compressor/limiters, and monitor amplifiers are handcrafted. Doug Sax was instrumental in establishing evaluation procedures for listening to different line amplifiers and power-supply designs, as well as pioneering test methods to correctly evaluate the effects of passive components.

Doug is also the co-founder of Sheffield Lab, the audiophile record label that pioneered the modern direct-to-disc LP. Those Sheffield recordings, stand today as benchmarks of sonic purity, particularly direct-to-disc LPs. His early criticism of digital audio, when many in the industry praised the first crude digital systems, led to many technological improvements.

John Ulrick

It was while a design engineer at Litton Guidance and Control Systems in Woodland Hills, CA—one of the nation's leading aerospace contractors—that John worked on servo controlled missile guidance systems; and it was there that he met and developed a friendship with Arnie Nudell, also an avid lover of music. Arnie and John left Litton to found Infinity Systems in the late 1960s and together developed their first groundbreaking product, the Infinity Servo Static I speaker system.

Incorporating servo feedback technology into the woofer design, a concept the company called "electrical suspension," Infinity embarked on a path that included many other "firsts." John and his team

developed and introduced the world's first audiophile digital switching amplifier—a truly groundbreaking product—in the 1970s. Admittedly this introduction date preceded the common availability of parts that could consistently support such an advanced design! But that design has been refined and updated in the years since and is now supported by parts that can meet the demands of an amplifier that switches at half a meg, and this design forms the cornerstone of John's new company, Spectron.

These advances in circuit design were noted by the renowned high end magazine The Absolute Sound – *"the more I listen, the more I find myself re-examining my listening biases and my learned expectations of what recorded music sounds like...."* Stay tuned for more from Spectron.

James Bongiorno

Ampzilla was created by world famous designer, James Bongiorno in 1974. At the time, James was the director of engineering at SAE. Prior to that he had been the director of engineering at Dynaco where he created the renowned Dynaco 400. While at SAE, James conceived the concept of the full dual differential full complementary amplifier topology which has since, for the last 27 years, become the de facto world standard road map for virtually all high end power amplifiers made today. Ampzilla was originally designed as a construction project for Popular Electronics Magazine. However, the response was so overwhelming, after the rave reviews, that James left SAE to found "The Great American Sound Co. Inc." (GAS Co.). The rest was history.

The Ampzilla circuitry was a refinement of the original circuit created at SAE and the subsequent Ampzilla II, for the first time in history introduced the world to servo-controlled amplification. It is interesting to note that servo-control has also become a de facto standard on virtually all modern power amplifiers. Subsequently, James, always searching for new and better concepts, sold his interest in GAS and founded Sumo Electronic Co. Ltd., for the purpose of introducing yet another completely new concept in amplification. Next emerged the four-quadrant full complementary differential balanced power amplifier, "The Power". In addition, James received a patent on a very unique pure Class A power amplifier wherein the bias was controlled by a very clever mechanism which allowed the circuit to REMAIN in pure Class A all the way down to a short circuit.

A condensed version of this circuit has been produced by **A.E.C.** in their models C-21 and C-22 amplifiers - and more is to come.

Oscar Heil

Known for his highly active mind and recognized as one of the world's leading physicists, Oskar Heil was asked by the US government at the conclusion of World War II to head several important projects. His work at this time led to prominent patents in diverse fields of physics. One in particular had a dramatic effect on the world of electronics — that being the invention of the Field Effect Transistor, a device that became the cornerstone of a whole new generation of electronic technology.

But Dr. Heil's deep rooted love was music; and quite understandably he put his inquisitive mind to work solving the inherent problems of acoustic transducers. More patents resulted — this time in the field of electro acoustics — the most noteworthy perhaps relating to the invention of the Heil Air Motion Transformer. In its heyday — the company producing the original Air Motion Transformer, ESS Laboratories—was the beneficiary of some of the highest dollar sales volumes in loudspeaker history. This was the direct result of an acknowledgement by almost every major test organization and music lovers around the world that this design yielded superior sound quality. Today — with the patent being public domain — there are many copies, but none approaching the original in overall performance. And there are still more ideas of Dr. Heil's that have not yet seen the light of day.

Michael Weidlich

Driven by a love of music and a passion for its reproduction Michael left his early training to pursue physics, with a clear eye to acoustical reproduction. It was at this point that he happened onto the works and theories laid down by Richard Heyser.

Finding himself in a position later to co-develop a measurement system for acoustical reproduction purposes he strove to make visible in a meaningful and repeatable way the theories extrapolated years earlier by Richard Heyser. In so doing he found a practical way to put theory into practice and developed crossover concepts that allow multi-channel speakers to act in unison as one perfect piston — thus combining the alluring coherency of a full range driver with all the attendant benefits of the best multiple driver dynamic loudspeakers.

Similar to the concept of "Positive Scanning" in the much heralded Decca cartridges, this loudspeaker technology yields the most direct and exact transfer of the electrical signal into its acoustic analogue. It is now being utilized in products from **A.E.C.** and **ESS** Laboratories and promises to be an important consideration in a whole new generation of loudspeakers to come.

Stewart Hegeman

"The name of Hegeman is to hi-fi what the names of Bentley and Bugatti are in automotive lore. Like those renowned car builders, Hegeman has gained his fame as the creator of "classics". Some of the hi-fi components to which he has contributed…..have become collectors' items".

Popular Electronics

And another publication reported:

"...won him industry-wide recognition as the white-maned wonder of the components field. Virtually every one of his theoretical explorations of electronic sound has evolved into a new design snapped up by manufacturers".

If A. Stewart Hegeman had done nothing else except develop the dome tweeter, his place in hi-fi industry would be assured. In addition to significant theoretical work on loudspeaker dispersion, his accomplishments include the design of the original Dynaco tuner as well as the original Harman Kardon Citation series of amplifiers and preamplifiers, tubed and solid state. Hegeman left Harman Kardon in 1969 to pursue his own designs and market his own products. Unfortunately, he priced his products too low, and the combination of no hype and low (reputedly negative) margins doomed his enterprise. But not, however, before staking out significant theoretical territory, gaining at least two dedicated disciples, and bringing to market a range of designs that continue to be influential decades later.

Giovanni Arigo

Like the others described here, Giovanni Arigo is somebody driven by a quest for the "absolute sound." Utilizing his training and professional experience, with a respectful love of music, he extrapolated from the Field Effect Transistor a circuit utilizing no feedback. In so doing he greatly advanced the art and science of what is possible solid state technology — and created the kind of musicality known heretofore to be exclusively the domain of vacuum tubes.

This design being absolutely new, it was honored with a patent; then implemented in the designs of **A.E.C.** amplifiers. Mr. Arigo now directs the engineering efforts at **A.E.C.**, a company offering a number of groundbreaking zero feedback product designs.