Tom Oberheim Joins The Analog Revival

Designer of the first commercially available polyphonic synthesizer, Tom Oberheim, through his new company Marion Systems, is introducing a new generation to analog sound with faithful reproductions of the products that started it all.

Some guys really know how to make the best of their “retirement.” Tom Oberheim, one of the synthesizer field’s true pioneers, had comfortably stepped away from the music products industry when a curious chain of events lured him back in. Under a new brand, Marion Systems, Tom’s products are exciting the current generation of musicians and shaping today’s pop music a good four decades after they helped define the electronic music category.

Oberheim didn’t have his feet up, exactly, but he had effectively retired from the music products industry and so was “pretty surprised” when in the fall of 2008 a representative of an organization he’d never heard of reached out and offered him an all-expenses-paid trip to Barcelona, Spain. Red Bull Music Academy is a global music institution committed to fostering creativity in music—primarily focusing on EDM—through a world-traveling series of lectures, workshops, performances, and studio sessions. Organizers of its annual convention enlisted Oberheim as a technical guru to address 20-something DJs and EDM artists and producers selected from among several thousand applicants. Not one to turn down a free trip to Barcelona, he accepted the invitation, with no particular expectations, but was pleased to be “remembered” by people who weren’t even born before he had exited the business. In the end, the experience rejuvenated and awakened him to the exploding DJ producer/EDM phenomenon, with its huge audiences, huge remuneration, and huge impact on music-making products. “It turns out these EDM types like old stuff,” Tom quips; “they like analog gear.”

At Red Bull’s request, Tom took with him a small synthesizer module he’d made back in the 1970s and cobbled together a MIDI interface to demonstrate it. After his presentation, several audience members asked where they could buy one. When he returned to his home in northern California, he decided, “just for the fun of it,” to make a few in his garage and “maybe sell three or four a month.” Within two years he had sold over 1,000.

With no proper manufacturing facilities, each one “took forever” to build. But in 2012, encouraged by complimentary emails and inquiries, Tom took the
project another step, resuming work on the Two Voice synth he first put on the market in 1975. Today, fully back in business, he plans to introduce three new products at the 2016 Winter NAMM Show in Anaheim.

Tom Oberheim’s “second act” in the synth business is all the more remarkable considering that he basically backed into it the first time. A native of Manhattan Kansas, he was always fascinated by technology and electronics. As a young boy, on many days after school he visited a radio shop and peppered its owner with questions about, for example, alternative components for his beloved crystal radio. On the man’s suggestion, he built a regenerative radio using a single 6J5 tube and wire wound around a toilet paper tube. On one clear night it picked up a radio station all the way in Virginia. “From that point on,” Tom recalls, “I was hooked on electronics.”

In 1954, Tom began his studies in electrical engineering at Kansas State University, but financial pressures compelled him to leave after three semesters. Limited employment opportunities in Middle America—and, he admits, his youthful sense of adventure and the lure of seeing marquee West Coast jazz musicians—led him to Southern California. Arriving in Los Angeles with just $10 in his pocket, he was hired the next day by Lockheed Aircraft, the first in a long series of progressively more advanced positions that ranged from the work of a “lowly draftsman” and producing printed circuit boards to immersion in digital computer theory, where he “took to binary arithmetic, logic design, and even crude programming like a hungry dog,” as well as a diverse range of contract work for clients including Jet Propulsion Laboratories, Hughes Aircraft, and NASA.

**PLANET OF THE APES?**

Soon after arriving in Los Angeles, Tom enrolled at UCLA, first to study electrical engineering, but quickly changing his major to physics. Juggling nearly full-time work hours with his studies, he eventually received a bachelor of science in applied physics in 1966.

In his final days at UCLA, Tom became friends with fellow student Don Ellis, the groundbreaking trumpeter/bandleader who shared his fascination with musical electronics. Over the years Tom built various pieces of equipment for Ellis including a ring modulator he used on a late 1960s recording. Over the next several years, Tom designed progressively more sophisticated models, eventually catching the ear of Hollywood film composer Leonard Rosenman, who was interested in using one in his score for *Beneath the Planet of the Apes*. Tom isn’t sure if his ring modulators were ultimately used for the film, but, in a scene that would be mirrored decades later at the Red Bull event, several of studio’s musicians asked him if they could buy one.

Encouraged, Tom incorporated Oberheim Electronics in 1969 but spent additional months to refine the product’s design, integrating all needed components into a standalone device he dubbed “Music Modulator.” A technical paper he later presented at an Audio Engineering Society convention read: “The Oberheim Electronics Music Modulator contains a microphone pre-amplifier, a sinewave oscillator, and a balanced modulator all in one compact instrument....”

Music Modulators hit the market in mid-1970. Within six months buyers included Emil Richards, George Duke, Bud Shank, Tom Scott, Gary Coleman,
Ernie Watts, Paul Beaver, Shelly Manne, Oliver Nelson, and Joe Zawinul. The device also caught the attention of Bob Rubin at Chicago Musical Instrument Company (the predecessor of Norlin Corporation), who was marketing manager for the Echoplex, an octave divider system, some fuzztones, and a wah-wah pedal, many under the Maestro brand name. The two firms struck a deal for Oberheim Electronics to build Music Modulators and CMI to sell them to music stores.

Tom next trained his sights on developing the first phase shifting product suitable for performing musicians. Sold though CMI, the Maestro PS-1 Phase Shifter was also a hit.

Seeing new products from Moog and ARP stimulate the market, in 1971 Tom arranged to become an ARP dealer for the Los Angeles area to supplement revenues from his Oberheim Electronics sales. His storefront was the same Santa Monica facility where he was building Maestro Phase Shifters. Tom’s ARP 2600 buyers included top-tier studio percussionist Gary Coleman, Leon Russell, Chicago’s Robert Lamm, Frank Zappa, and Jethro Tull’s Ian Underwood. More importantly, he spent weeks with his first ARP 2600, exploring analog synthesis “backwards and forwards,” joyfully discovering “things like the basic patch, a big, fat three-oscillators drone that sounded like a fleet of B-29s, filter sweeps, keyboard control voltage reversal, sample and hold tricks with noise and different oscillator mixes, on and on.” (He adds that he still admires Alan Pearlman’s great design of the 2600 to this day.)

HOW TO BUILD A SYNTH

This discovery process piqued his interest in building his own analog sequencer that, unlike ARP and Moog synths of the day, also incorporated nascent semiconductor memory technology. The resulting DS-2 Digital Sequencer and its upgraded successor DS-2A interfaced with either an ARP 2600 or Odyssey or a MiniMoog and allowed the user to load the sequence, both notes and timing, by simply playing it on the synthesizer keyboard. The first units were delivered in August of 1973, and the DS-2A remained in the Oberheim product line for four years.

Starting around 1973, Tom set about resolving a particular DS-2 limitation; namely, that once its sequence had been loaded and played back, the musician was left with no synthesizer to play. Using his own knowledge of ARP’s Odyssey, he began designing a minimal synthesizer module that the DS-2 could play while the musician is playing the main synthesizer. The design concept for the module, soon to be called the Synthesizer Expander Module (SEM-1), included: basic circuits for a true analog synthesizer voice; low cost; small size; patch capability; a two-pole, multi-mode filter to complement the standard four-pole filter; and a simple but flexible user interface.

By the end of its 1974 fiscal year, Oberheim Electronics offered five products manufactured for Norlin under the Maestro name—Ring Modulator, Phase Shifter, USS-1 Universal Synthesizer System, Mini-phase, and Filter Sample/Hold—as well as the DS-2
Digital Sequencer, SEM-1 Synthesizer Expander Module, and Two-voice kit for ARP 2600 sold direct. However, citing slumping sales, at the start of 1975 Norlin canceled all of its orders with Oberheim. To generate cash flow, Tom converted some standing Maestro inventory into Oberheim products to sell them direct, but the need for more dramatic action was obvious. “I decided that the time had come to get into the synthesizer business in earnest,” he recalls. “With that, the ideas for the Oberheim Two Voice and Four Voice were born.”

Determined to have prototypes ready to show at the 1975 summer NAMM trade show just four months away, Tom decided to license E-Mu Systems’ scanning keyboard, whose other attractive feature was that it was easily expandable from four voices to six and up to eight. Starting with SEM-1 as its core, he added several performance enhancements—Reset-Continuous, Keyboard Split, Unison mono mode, and Polyphonic Portamento—that contributed significantly to the ultimate success of the Four Voice model. (An Eight Voice model, comprising a Four Voice and an additional four SEM modules, was introduced in 1977.) He also quickly designed an output panel that allowed the gain and pan of each voice to be controlled, followed by a line and headphone amplifier, and contracted construction of a Tolex-covered case.

**THE FIRST POLY SYNTH**

Tom has brought back the Two Voice with Marion Systems. Though very similar to the original in its synth section, the new Two Voice Pro offers numerous upgrades to its sequencer including the ability to: store sequences into flash memory; play two sequences simultaneously; chain sequences into editable songs; edit a variety flash-stored sequence parameters; sync the sequencer to a MIDI clock; etc.

Tom was encouraged by the NAMM crowd’s positive reaction and especially by selling a prototype Four Voice to Stevie Wonder, who at the time was recording *Songs in the Key of Life*. Quickly recognizing that changing patches on the Four Voice was a complex and time-consuming, Tom began developing Polyphonic Synthesizer Programmer module that could externally control key sound parameters.

Despite its minor limitations, the Four

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Voice was gaining ground in both rock and jazz circles. In 1976 Joe Zawinul invited Tom to hear how one of his synths "played a big part" in his latest composition, "Birdland." "I was completely blown away," Tom says. "It was a marvelous teaching experience for me, seeing how a great musician can look beyond the pure technical hardware of such a device as a synthesizer and make great music with it."

Responding to market pressure to create a completely programmable lead synthesizer with four pole filters ("because almost every synth player was looking for the sound of a MiniMoog"), Tom came up the idea for Oberheim's next product: the OB-1 Programmable Lead Synthesizer. With microprocessor technology still just out of his reach, he designed what was basically a one-voice synth that used the VCO circuitry from the SEM-1, the SEM-1 VCF expanded to four pole, and programming circuitry from the synthesizer programmer. Additional features included triangle waveforms, a sub-octave generator, and selection of either two-pole or four-pole filter response.

Introduced in mid-1977, the OB-1 was well received and contributed to rising sales for all Oberheim products, thanks to an impressive artist roster and broad critical acclaim. However, when Dave Smith introduced Sequential Circuits' Prophet 5 at the 1978 NAMM Show signaled big challenges ahead. "It became obvious that unless we did something fast," Tom recalls, "the survival of Oberheim Electronics would be in question." He determined that Oberheim must develop its own completely programmable, microprocessor-controlled polyphonic synthesizer—fast.

Design of the OB-X began in December of 1978 and was finished less than seven months later, just in time to be exhibited at the summer NAMM show in Atlanta. Though he feared that a lackluster show would bring the company to its knees, by the end of the first day he had written enough orders to secure the first six months of production. The following summer the company unveiled the more affordable preset version OB-SX. And in response to the complaints that the OB-X's individual voices "don't sound like a MiniMoog," Tom immediately began working on a new version with both two-pole and four-pole filters, to be called the OB-Xa. Beyond the additional filter, Oberheim made major changes to the OB-Xa's circuitry, and its expanded feature set included memory patches increased from 32 to 120, new split and double modes for the keyboard controller, and a computer interface.

Iconic performances on the OB-Xa give Tom a ready answer for dealers and their customers who, perhaps because they're too young, don't know what a Marion Systems synth sounds like. If they're jazzers, he refers them to Weather Report's "Birdland." If they're rockers, it's Van Halen's "Jump," which is "nothing but an Oberheim synth demo," he muses. "'Jump' is 30 years old, but the moment I play it, even people who weren't born in 1985 recognize it and immediately get what my products are about."

While improving the OB-Xa, Tom proposed partnering with Roger Linn, famous for his digital programmable drum machine. When Linn demurred, Tom set about developing his own, which came to be called the DMX. Collectively the OB-Xa, DMX, and DSX became known as the "Oberheim System," in which the DSX functioned as the main controller, played sequences on the OB-Xa, and delivered a clock signal to the DMX.

COSTLY MISSTEP

With business humming along, in 1985 Oberheim Electronics began developing its new Matrix product line, an ambitious project that overextended the company's finances and forced Tom to declare bankruptcy. "We employed 100 people and did $12 million that year," he recalls. "Then it all went away." He remained on for just a couple of the years in a company owned by a group of lawyers.

In 1987, Tom started a new company, Marion Systems Corporation. With limited resources, an overly ambitious inaugural product—the MSR-2—and the music world moving away from analog technology and toward digital, his initial
effort failed. It’s no wonder, then, that he “didn’t see the [analog synth] revival coming” through the early 2000s, he wasn’t swayed by the launch of Dave Smith Instruments in 2002 and its subsequent success, or that he was initially more bemused than inspired by Red Bull’s invitation to Barcelona. In the end, it was the sheer energy behind the current EDM phenomenon, the exuberance and size of its audiences—some topping 100,000 dancing, jumping souls—and its artists’ sincere interest in his products that clearly have re-energized him.

Aware that most modern EDM artists “weren’t even born when I was still in the business,” Tom attributes their gravitating toward vintage analog synth sounds to a “hobo” effect, born down in the trenches with people who couldn’t afford or weren’t interested in traditional musical training. When they started, they couldn’t afford to pay thousands for new electronic keyboards, so they bought stuff from pawn shops. Most of them didn’t study music so much, but they did study the gear and worked hard to make it do what they want. Anyway, those products, adopted during their formative years, are the ones whose sounds are meaningful to them.”

Another reason EDM artists are interested in analog synths such as the new Marion Systems models is the way their sounds are played. “They can turn a knob to alter a sound, in combination with a bunch of other knobs, creating infinite variations,” says Tom. “On a digital synth you can press a button and get perfect strings, perfect brass...whatever, but it’s going to be exactly the same sound as all the other times he pressed [that button], and exactly the same sound as everyone in his town gets who owns the same synth.” Citing this enhanced opportunity for more personal expression and on-the-fly sound manipulation in the analog realm, he adds that even his Two Voice synth has 20 knobs per module, and there are two modules, “so there’s a lot you can play with.”

And finally, a growing number of musicians are drawn to the quality of truly analog sounds. While admitting that all the basic sounds on his synths could reside on a single computer chip, he points to a parallel in recorded music, where the interest in vinyl is surging “because the listener hears something they like. I know plenty of professional musicians with lots of digital gear and terabytes of playback samples who still prefer the real thing—analog gear with 1970s technology—and even say there’s no comparison.”

Marion Systems is currently selling direct to a select group of retailers and having “great success” with smaller independents who are hip to analog synthesis and modular synthesizers. As production grows, they’ll be sold in stores that have an appreciation for analog synthesis and the musical trends such as EDM that are driving the market.”

And as for Tom, at 79 he’s fully back in business. “After being basically retired,” he says, “I’m back to working my tail off.”

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