

Bill Putnam Jr

Universal Audio's CEO and the man behind much of the direction in the company's analogue and digital products discusses the hardware/plug-in issue, the right ingredients, system modelling, and why it's all just about allowing people to express themselves.

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UNIVERSAL AUDIO WAS founded in the 1950s by Bill Putnam Sr as a natural extension of his success as a recording engineer, studio designer, and inventor. Putnam was a favourite engineer of Frank Sinatra, Nat King Cole, Ray Charles, Duke Ellington, Ella Fitzgerald and many other music icons of the time. The studios he designed and operated were acclaimed for their distinctive sound and provided a fertile environment for his innovations and experiments.

In 2000, Bill Putnam Sr was awarded the Technical Achievement Grammy posthumously in recognition of his multiple contributions to the recording industry including the first use of artificial reverberation, effects sends, and the vocal booth. Universal Recorders in Chicago, United and Western in Los Angeles (now Ocean Way and Cello) all preserve elements of his room designs.

Putnam started three audio manufacturing companies during his career — Universal Audio, Studio Electronics, and Urei — and all three built products that remain widely used decades after their introduction, including the LA-2A and 1176.

In 1999, Bill Jr and James Putnam relaunched Universal Audio and merged with audio software company Kind of Loud Technologies with the goals of reproducing classic analogue recording equipment designed by their father and his colleagues and to research and design new recording tools in the spirit of vintage analogue technology.

'Having grown up in the music industry, we naturally assumed that's where we would remain,' says UA CEO Bill Putnam Jr. 'Jim, a touring musician and recording engineer, and our older brother Scott, a busy studio designer in Southern California, were the first to follow in my father's path. I took a more circuitous direction, working in a number of engineering companies before undertaking my doctorate in Electrical Engineering at Stanford. It was there that I became closely involved in the Center for Computer Research in Music and Acoustics (CCRMA), specialising in signal processing. However, the event that led us to start (or reinvent) Universal Audio was

more serendipitous.

'Our father, Bill Sr, passed away in 1989. When the time came to sell the family home, Jim and I were faced with the Herculean task of cleaning out his workshop and storage areas. At first, we enjoyed sorting out all the old test equipment, boxes of parts and bits and pieces of consoles and half-cannibalised 1176s. But struggling to decide what to do with all of this history and, well, junk was wearing us out. Just as we were about to close the door on the project and retire to a cold beer, Jim came across our dad's old design notebook. We spent the evening poring over his notes, realising that this was the map to every technical problem he'd ever solved. That's when the lights came on and we decided that to bring back Universal Audio and its products was our destiny.

'Jim and I struggled with what to call our company and products. It was important to us that this endeavour be a tribute to our father, as it would not have been possible without him. A little investigating revealed — much to our surprise — that his original company name, Universal Audio, as well as the correct product names were available for use. After all, what could be more suited to authentic, classic reproductions than the original names?

What's special about UA gear?

We take our role as a provider of tools to the creative community seriously. We believe we have a responsibility to our customers to help them realise their creative ideas as best we can. This means making our stuff easy to use, reliable, affordable, and above all, good sounding. It also means answering the phone and treating them with respect when they call and ask us questions. We aren't just out for a fast buck, we believe in the long-view: make our customers happy and keep them happy in a way that's sustainable as a company. Ultimately it's all about the community we live in. We choose to live in a community of artists and creative people: that's who we are and that's who our customers are.

In technical terms, what is it about certain items of old outboard that earns them classic status?

This isn't a technical issue, it's a philosophical issue. The designers understood not just the technology itself, but most importantly how it needed to work within the creative environment. Many pieces of classic gear seem to share an ease of use, with a desired artistic result. The designers followed the Hippocratic Oath: 'First, do no harm.' On an old EQ, the choice of controls might seem quirky, but then you realise it's really hard to make it sound bad. Those choices weren't accidents; they were determined by real audio engineers in real recording situations, not technicians in a lab attaching shiny knobs to a panel. It was about what was right for the creative process and the music, not just what was possible. This focus on quality extended to the choices of components too. Things were built to last, and simplicity was the key. Simplicity requires great components. Like a simple meal of fresh tomato, basil, oil and pasta; with the right ingredients, it can be sublime.

What are the technical processes involved in creating a reissue of a classic processor; how real are the component sourcing issues and how authentic is the result?

Sourcing components is a big deal. I call it forensic engineering. When recreating a processor, we try to keep everything as original as possible. This sometimes involves tracking down parts that have long been out of production. We've gone so far as to track the equipment used to make these parts from the original manufacturer all the way through the decades of company mergers and acquisitions to their new owners and worked with them to remake the original parts on the original equipment.

There is also a synergistic element that we have experienced from the research and analysis required for creation of our plug-ins. For example, there are some subtle programme-dependent effects introduced by the LN (low noise) circuitry that Brad Plunkett developed for the 1176LN. An understanding of these subtle, but important effects came out of our work towards creating a digital model. Intimate understanding of circuit elements and their perceptual impact becomes important in recreating classic gear, both analogue and digital.

You're one of the few companies that reissues classic hardware and also designs plug-in 'equivalents'; isn't there a contradiction in this stance?

Not at all. As mentioned previously, from an innovation perspective these dual pursuits trade off each other in a positive manner.

From the beginning, UA's mission has been to break down barriers between digital and analogue — bring warmth and character to the digital world, and ease of use to the analogue world. Furthermore, we have customers who are most comfortable in a traditional analogue environment and customers who are most comfortable in a modern digital environment. We believe it's our job to help creative individuals within both of these environments be as productive as possible, by giving them the tools that allow them to express themselves as fully as possible with the best results attainable. You want to plug it in, or you want the plug-in? Whatever you like, either way it's not a compromise.

How closely can a plug-in match the sound and performance of the hardware it is based on?

We qualify the plug-ins so they are within unit to unit variation, and match the reference units in double-blind tests. In most cases, the plug-ins are modelled after a highly desired or well known 'golden' unit (like the Fairchild 670 from Ocean Way, or the EMT Plates at The Plant), so they may even outperform a typical unit. All our plug-ins are tested in the studio over a long time period and go through several weeks (sometimes months) of testing and evaluation by a large team of experts before we ship them. Many times, this is the most stressful part, because we get really picky.

What are the technical processes involved in creating a plug-in equivalent of hardware and where are the compromises and limitations?

The first step is to locate the 'golden' reference units and the shop manuals. Next, the circuitry is studied and some preliminary measurements are taken. A DSP model of the system is created and prototyped, and the model's parameters determined from the schematics and measurements. Sometimes there are strange non-linear components that need special attention, and these will be analysed separately before being integrated in the main model. The model's behaviour

meet your maker

is compared to the preliminary measurements and tweaked as needed to match. Once the model is close, detailed measurements are taken and the model's parameters are fitted to them. Listening tests are done over a long interval to qualify and tweak the model before it gets turned into a plug-in.

This process is generally referred to as 'system modelling' or 'physical modelling' and is very different from 'signal modelling', which is used by sample-based algos. Signal modelling makes gross and often inaccurate assumptions about the insides of the box and just tries to emulate the effects on test signals sent through the unit, while system modelling tries to recreate the actual insides of the box, warts and all.

Generally, the compromises are in the extremes of the original unit's behaviour, like noise and overload distortion. Should we model the noise and hum? In most cases the answer is no, but not always. The RE-210 Space Echo needs this to sound authentic. It needs something to chew on so those repeats can build on each other when there's no signal coming in.

Most limitations are imposed by limitations in processing power, and modelling the distortion eats this up faster than anything. Some of our algos can't even run one instance on the fastest native CPUs, while some will only run one instance. We use a DSP because we need this extra horsepower, allowing us to create no-compromise models.

What do all good classic mic preamps have in common from a technical standpoint and how do these properties contribute to the performance?

A good preamp interacts with each microphone to bring out that mic's special character. It's like the wine with the meal. There are preamps that claim to be 'colourless', but this is a fallacy. It's like saying you don't speak with an accent. No accent is an accent by itself! How a mic and preamp interact, and how that combination sits in the mix are special events that must be experienced first-hand. There is no number on a spec sheet that will help you experience this. You simply have to try it and decide for yourself.

It's hard to classify good preamps from a circuit/component/technical standpoint, but generally they all share an attention to detail in the choices of components and their build quality.



For an industry that is meant to be progressive and forward thinking, are we not unhealthy in our continued obsession with vintage equipment?

Yes, to a degree in some cases. It depends whether someone is being overly conservative and is afraid to take a chance on something new, or whether they're simply appreciative of old-fashioned quality and don't think it was broke and needed fixing.

If you're following a trend just because you think

you should, then you're not making your own choices, and you're not in control of your reality. Being out of control is a pretty scary experience, but ironically, this fear only serves to worsen the situation!

If on the other hand, you choose vintage gear because you like the results, you have respect for the way things used to be done, and/or you believe in the idea that we advance by building on the past, then it's a positive thing.

Frankly, a lot of what was sold to us as 'new and improved' simply wasn't, and we need to go back and learn why before we can move forward again. This is not to say innovation isn't happening or isn't possible right now, it's just more difficult in today's business climate than it was in the past, and the market is much less receptive to it.

In the digital world, we look to the vintage gear to learn how to get digital to sound good. This is still a work in progress for everyone in the industry, and innovation often happens only after the fundamentals are mastered. As Archie Shepp once said to my sax player, 'Man, play it strait first. You can't be out if you never been in.' We're still learning how to play digital straight, but our chops are getting pretty good, and so we'll be stretching out a bit more.

Is hardware analogue processing a long-term proposition and where is UA heading with its technology?

Ultimately, it must start and end with analogue. Regardless of how much processing is done 'in the box' you typically start with a microphone, and you need to monitor on speakers. That said, analogue will always have an important role in getting the signal into the computer, as well as providing monitoring.

Digital is making huge strides towards being able to deliver what analogue has been delivering for decades, and while it may catch-up in some areas, it's not all the way there yet, and it can never fully replace it. Our ears and the interaction of sound waves in the physical world are still analogue processes.

Ultimately it really has nothing to do with the technology itself, it only matters how the technology helps people express themselves. If this is best done with analogue circuits, then that's what we'll use. If it's best in some other situation with digital circuits, that that's what we'll use. If it takes a ham and cheese on onion roll, then we'll use that. ■