MERIS MERCURY7

500-SERIES ALGORITHMIC REVERB PROCESSOR

By Hugh Robjohns

[HERE'S THE LINK TO THE REVIEW]

With such brilliant software reverbs now available, does this new hardware unit warrant a place in the space race?

As home computers have become more and more powerful, there has been an inevitable drift away from outboard hardware reverberation units and into plug-in-based reverb solutions. Of course, reverb plug-ins — whether algorithmic or convolution-based, vintage emulations or innovative

modern designs — generally offer far more sophisticated and flexible effects than have typically been available with traditional hardware units. They also allow more convenient workflows as settings can be recalled instantly as part of individual song projects, and many parameters can be automated if required. Moreover, with a powerful computer it is possible to run as many separate reverb plug-ins as you like for a project, whereas few project studios have more than a couple of hardware reverb units.

However, recent newcomers to the pro-audio market, American 'boutique audio' manufacturers Meris, are challenging that approach with their new Mercury7 DSP reverberation unit. Designed and built entirely in Los Angeles, this single-channel mono reverb module is designed to fit in the ubiquitous 500-Series rack, and provides a very novel take on the traditional digital reverb concept. The name apparently pays tribute to the original seven astronauts who went into space in the Mercury capsule, and the design inspiration was the soundtracks of some classic '70s and '80s sci-fi films — especially Blade Runner, and the soundscapes Vangelis achieved using mainly Lexicon 224 reverbs which were dark, creepy, and full of personality!

Although there are just two primary reverb algorithms — based on a traditional plate and a large hall environment — the Mercury7 allows considerable manipulation of these algorithms to create a wide and rich variety of reverberant spaces and effects. It also includes some interesting special effects, such as variable modulations, pitch-shifting, vibrato and auto-swell, so it's far more than a straight digital reverb; it is a really effective sound-design tool as well. In fact, Meris "strive to create products that are instruments in their own right, rather than just effects" — and that becomes very obvious as you start using the Mercury7.

INSIDE & OUT

The Mercury7 module occupies one rack slot, and its substantial faceplate is painted a glorious shade of blue. This is an 'open' style module, with the top surface of the main PCB exposed and the rear protected by a full-length metal backing plate. Given the power and flexibility of this unit, I was a little surprised at how sparse the main circuit board is. In addition to the analogue interfacing and converters already mentioned, the actual DSP reverb processing is performed with 32-bit floating-point algorithms, running on a Kinetis K22F 120MHz microcontroller from its 512KB of internal flash memory. A small, unmarked, white, two-pin socket on the board facilitates linking other modules for multi-channel applications, although the appropriate cable is sold separately.

Multiple Mercury7 modules can be linked together for stereo or surround working to generate wide and spacious soundscapes. When linked together, normally the left-hand unit acts as the master and the right-hand slave module follows the settings established on the master automatically. However, should you want to adjust the two units' settings separately you still can, to fine-tune and tailor the stereo spread. Meris currently only sell a stereo-linking cable, but apparently hooking-up multiple units for synchronized surround working is trivially simple, and full instructions are available on request.

Audio quality is assured through the use of a Burr Brown INA137 balanced line receiver and DRV135 balanced line driver for the rack's rear-panel line-level XLR connectors, and the digital conversion is through a 24-bit AKM AK4621EF converter which claims a dynamic range of about 116dB. There should be no powering issues for any API-compatible 500-series rack, as the module's total current demand is less than 100mA.

Looking at the front-panel controls, the unit has a pleasingly analogue feel to it, and — very unusually for a digital reverb unit — there is no LCD display, no program presets, and no parameter values! Instead there's just one large knob, five smaller ones (all conventional pots, rather than endless shaft-encoders), and three illuminated buttons. Unfortunately, though, that delightfully minimalist layout isn't quite sufficient to cope with the Mercury7's remarkable versatility, and so all of the rotary controls have an additional 'Alt' function which is accessed by holding down one of the buttons while simultaneously turning the knob. To keep the front-panel legends clean and simple, these alternative functions aren't marked, but most are logical extensions of the knob's primary function and so are fairly easy to remember.

Currently, there is no user manual as such, just an A5-sized 'Quickstart' sheet, but while that provides enough information to understand what the controls are meant to do, it doesn't give any parameter value ranges. Consequently, all adjustments must be done by ear — although that's no bad thing!

Starting at the top of the module's panel, the largest knob is labelled Space Decay and it adjusts the decay time of sound energy within the virtual reverberation space. The control's alternative mode alters the pre-delay time. In the top-right corner, a button labelled Bypass is illuminated when the unit is generating reverberation, and is unlit when in bypass mode, which seems a backwards to me. However, a very nice feature is that the bypass mode is a straight analogue pass-through, circumventing the converters and DSP completely, and so is latency-free.

Moving down the panel, the next two controls are a knob labelled Mix, and an Algorithm Select button. The Mix knob alters the wet/dry balance as you would expect, but unusually, this is also performed in the analogue domain, once again to ensure that the direct signal is latency-free. (Meris

intend the Mercury7 to be a useful creative tool for musicians playing live, hence the attention paid to ensuring that there is no inherent latency.) The Mix control's Alt mode tweaks the balance between normal reverb reflections and internally pitch-shifted signals when the Pitch Vector mode is turned on (more on that shortly!).

The Algorithm button toggles between the unit's two primary reverb algorithms. The Ultraplate mode is described as an "inspiring and lush plate with a fast build-up", while the Cathedra setting (for which the button is illuminated) is defined as "massive and ethereal with a slow build-up", and is clearly based on a 'large hall' style of environment. Holding this algorithm button down accesses the Alt mode for all the rotary controls.

Next come a Swell button and a rotary control labelled Modulate. Swell engages an 'auto-swell' function which isn't described in the Quickstart guide at all, but it creates a kind of 'dreamy wash' effect in which the attack transients of the input sound are slowed down, a bit like the effect created with a guitar volume pedal. The Swell attack time is controlled as an Alt function from the Pitch Vector knob.

Most algorithmic reverbs incorporate some form of modulation in the reverb tail, partially to mask periodic artifacts in the reverb algorithm, but also to simulate the natural time-domain variations caused by thermal air movements in a real reverberant space. It's unusual for the user to be given control over the modulation, yet that's exactly what Meris have done in the Mercury7. The Modulate knob sets the overall modulation depth of the reverb algorithm, controlling how much 'inner movement' exists in the reverb tail, while the control's Alt function adjusts the primary modulation speed as well. The combination allows extensive control over the character of the reverb — something I found quite fascinating and surprisingly creative!

Undoubtedly, the Mercury7's most unusual control is the next one, labelled Pitch Vector. Its fully counter-clockwise position turns this function off, while turning the control clockwise introduces various degrees of pitch-shifting within the reverb's regeneration processes. The fully clockwise end introduces a Shimmer effect which shifts the regenerated signal up a full octave, while the intermediate positions provide an octave shift down, a micro down-shift, a micro up-shift, and a musical fifth up-shift. The character of these Pitch Vector effects is also dependent on the settings of the Vector Mix (Alt-Mix) control, and both the Hi and Lo frequency damping controls. In some ways, the kinds of effect enabled with the Pitch Vector processing are reminiscent of those that might more traditionally be created with an Eventide Harmonizer, so we're definitely into sound design territory here! As mentioned previously, the Alt mode for the Pitch Vector knob adjusts the Swell mode's envelope attack time.

The last two rotary controls adjust the low- and high-frequency damping within the reverb space, dramatically altering the sonic character of the virtual environment. The Alt mode for the Lo control adjusts the density of the early reflections in the selected reverb algorithm, while the Hi knob's Alt mode adjusts the Vibrato depth — yes, there's a vibrato effect built in to the Mercury7 too, modulating the input signal before it enters the reverb algorithm. Although intended mainly as a guitar effect — the designers are going for a 'Lanois-inspired vibe'! — and with a fixed vibrato speed, it's actually quite a versatile feature for other sound sources, for users who might be wearing a sound-designer hat.

IN USE

The lack of numbered settings around various controls is deliberate: this is a device with which you really do have to 'just use your ears'!

I was provided with a pair of Mercury7 modules and a stereo link cable for this review, and installed them easily enough in a standard API lunchbox rack. The link cable has a coloured sleeve adjacent to one connector to indicate which unit will be the Master in the linked set. Although all the control settings are automatically synchronized between linked units, the user can still override any of them to fine-tune the parameters for the best stereo field effect.

According to Meris, they designed a linkable mono module rather than a true-stereo one because linking independent mono modules brings benefits in terms of crosstalk, noise and DSP performance, and it also allows the flexibility to construct larger multi-channel arrays for surround-sound operations. However, for many real-time performance applications, a mono reverb is all that's needed anyway, so it's also a cost-saving measure for some applications!

Despite having only two notional reverb algorithms from which to choose, the Mercury7 is remarkably versatile and capable of a very wide range of reverb effects, from dark to sizzly, and from a very small room through to a massive cavern, with everything in between. The overall sound character of the algorithms suggests a stronger hint of Lexicon flavouring than TC Electronic or Yamaha, and no one's ever complained about Lexicon reverbs, so why not? Changing the parameters with real knobs feels very natural and, once you are familiar with what each knob (and its Alt function) does, it's actually very fast to find the precise sound wanted or, indeed, to stumble across something completely unexpected but wonderful!

If I'm using typical Lexicon or TC Electronic reverbs my thoughts tend to focus on the numbers when I'm setting pre-delay, high and low decay times, room size, diffusion, and so on. But with the Mercury7 there are no numbers, so it becomes a much more intuitive process of nudging the knobs to arrive at the desired sound, and I quickly came to really enjoy working that way. Ears over eyes: always better!

Looking at Meris' promotional video, it is very clear that the inspiration for the Mercury7 was as much for use as a live-performance guitar effects processor as to serve as a hardware reverb in a project studio. In the latter situation, an external hardware reverb obviously frees up the DAW's processor overhead, while in the former the Mercury7 becomes an extension of the performance because it can be 'played' in real time too. And there is definitely something very satisfying about that real-time direct access control, especially in comparison to mousing over virtual controls on a computer screen.

I'm pleased to report that the sound quality is beyond reproach, both for the analogue path and the digital effects. The reverb algorithms are clean and glitch-free, and produce genuinely wonderful virtual spaces with a massive range of characters as well as some really quite weird and wacky special effects. It's easy to dial in sounds which complement a particular music track, but it's also just as simple to find something unique, a soundscape that almost lives and breathes within the track as its own entity! If you're in the market for an interesting and versatile performance-oriented hardware reverb, the Mercury7 is a must for the shortlist. I'll certainly be very sad to have to unbolt these blue marvels from my rack.

ALTERNATIVES

As far as I'm aware, the Mercury7 is the only 500-series algorithmic reverb module currently available. Moog and JHS both offer all-analogue 'bucket-brigade' delay modules which can be used for very crude reverb effects, and Eventide make a sophisticated digital delay unit. There's also a dedicated spring-tank driver/receiver from Radial, though that requires the addition of an external reverb tank to create reverb.