

# "Hands On: Eventide H3500"

Other than a digital reverb, have you ever seen, experienced or used anything that you would call an effects unit? You have? I don't believe you. I don't believe you, that is, unless you have used an Eventide H3000 or H3500. Anything else, no matter what proud title it gives itself, is not an effects unit. Eventide's top-of-the-range H3500 is to normal effects what Gareth Blackstock's salmon mousse is to fish paste. If you believe what I say, two questions you are probably asking right now are, "How much does it cost?" and, "Why haven't I heard of it before". If you are indeed asking the first question then I'm afraid you probably can't afford it. The H3500 is only for those who can afford not to count the cost (or sensible people prepared to hire it as and when necessary). The answer to the second question is just a little more complex.

Some time ago in Sound on Sound I reviewed the Eventide H3000 when it was fresh out of the laboratory. At the time, Eventide were most famous for their pitch changers. Indeed, the word 'Harmonizer' is their trade mark. The H3000 made its mark as a very good pitch changer, with a couple of reverb programs thrown in for good measure. But most of us don't really need a very good pitch changer, we need something that does the job to an adequate standard, and many multi-effects units make a good enough attempt at pitch changing for anything else, particularly at the H3000's price, to be overkill. Over the years however, a quiet revolution has been going on. Eventide have been adding to the factory programs supplied with the H3000, in its various versions (which include the H3500) and they have made the unit into probably the most wonderful effects unit on Earth. Where the H3000 had a very basic range of factory programs on its introduction, the H3500 now has a total of four hundred and four, developed from twenty-three basic algorithms.

The Eventide H3000 comes in a variety of versions. You may be excused for thinking that the H3000, H3000S, H3000B, H3000SE and H3500 are different models. In fact they all have the same mainframe and one can be upgraded to another by the addition of extra factory presets in ROM and/or add-on hardware. Let me give you a quick run-down:

## **H3000S Studio Ultra-Harmonizer**

Yes, the full name is a bit of a mouthful. I can't see the producer

saying, “Let’s add some Eventide H3000S Studio Ultra-Harmonizer to the vocal” when all he means is, “Let’s thicken it up a bit”. The H3000S has eleven basic algorithms from which are developed fifty-seven standard factory presets and another forty-eight known as the ‘Steve Vai Preset Collection’ which apparently were designed for Whitesnake’s ‘Slip of the Tongue’. Apparently in the US this constitutes a recommendation.

## **H3000SE Studio Enhanced Ultra-Harmonizer**

When you’re bored with the range of sounds that the H3000S can offer (probably after a long long while), you’ll want to upgrade to the SE version. Considered as a model in its own right rather than an upgrade, the SE has seventeen algorithms and two hundred factory presets. Maybe I should stress at this point that when I say ‘factory preset’ I don’t mean something that can easily be developed from the original algorithm with just a bit of knob twiddling as you do with something like a Yamaha SPX model (no disrespect). If you could mount these presets in a frame they would be on display in the Museum of Modern Art. With some effects units, a tour round the presets is like ‘yeah - yeah - yeah’. With an Eventide, it’s ‘Wow - WOW - WOW!’

## **H3000B Broadcast Post Production Ultra-Harmonizer**

Eventide advise that this is just the model for you if you want to simulate a Four-Headed Grinchosaurus in your on-air booth! Broadcast users tend to want equipment that does the job and is simple to use, so with fourteen algorithms and seventy-two factory presets tailored to broadcast requirements engineers should be able to get the result they want. One particularly interesting feature is the TimeSqueeze algorithm. This adds control over the speed of an audio recorder to the pitch changer, so if you have a jingle which overruns at thirty-two seconds and you want it to be twenty-nine, all you have to do is enter the current running time then enter the running time you want it to be. The H3000B will adjust the recorder’s speed and convert the audio to the proper pitch. Don’t tell this to your jingle composers though - make them work for their money!

## **H3500 Dynamic Ultra-Harmonizer**

OK, let’s get serious. This is the mega monster of the H3000 range and, apart from TimeSqueeze, which requires an upgrade,

can do just about everything any of the other versions can do. As far as physical appearance and basic operation go, it's pretty much the same as any of the other versions so what you read here will be generally applicable. On the front panel you will see two red buttons which you won't use very much (one is for setting the input and output levels, the other is the effect in/out button), four soft keys, three buttons, a soft knob and a numeric keypad. Actually the soft knob is anything but - it feels like an offcut from an apprentice's lathe. Sometimes however, truly professional equipment is a little rough around the edges. The display isn't very big by modern standards, but it is bright and as informative as it can be for its size.

My suggestion to a novice operator, as you will be the first time you come across one in a studio, is to try and get hold of a list of the factory presets. There is a quick reference guide which briefly describes all the presets (four hundred and four of them remember). When there so many presets available it takes far too long to try them all out - over an hour at ten seconds apiece. I think the next step in the development of equipment has to be some means of preset management so you are not reliant on the presence of a piece of paper or booklet to find quickly the preset that suits your purpose. Maybe the opening screen of the H4000, if and when it appears, should say, "What sort of effect do you fancy?", and guide you through to the right one.

Of course, the first thing you'll want to do with the H3500 is to try out the presets. Press the Program button and take the knob for a spin - you'll see the preset names flashing by in the display. When you have found one that takes your eye, press the load soft key. That is the leftmost key which in the current operating mode will have 'load' shown above it in the display. You're bound to have selected something interesting, but when you can tear yourself away try another preset selection technique: hit the Program key then press the up arrow or down arrow on the keypad until you find the right program (or just key in a number), then press the Enter (ENT) button. Numeric keypads are not popular with everybody, but for most purposes you don't have to use this one if you don't want to. If you do want to enter delay times - for instance - numerically then just punch them in. Any mistakes can be cancelled by the CXL key. Numeric entry, once you get used to it, is far quicker than keeping a nudge button, like you see on most equipment, pressed down until the correct value comes along. By the way, the other soft key in the display shown during program load operation is called 'Origin'. This displays the algorithm from which the preset was made. Just the thing for doing a bit of 'reverse engineering' - figuring out how a sound was created so that you can more easily make your own.

Once you have tried all the factory presets (probably half a day later) you will obviously want to see how you can tailor them to your own ends. This is where the Parameter button comes in. Give it a gentle press and you will see that the four soft keys have changed their function. Unfortunately with a small display like this, the parameter names are abbreviated, but if for example you have selected Preset 101 'Layered Shift', then the soft keys will read '1 coarse', '1 fine', '1 delay' and '1 fdback'. It doesn't take too much imagination to realise that you are dealing with the left channel and you are being invited to adjust the coarse and fine pitch shift, the delay and the amount of feedback. Just hit the appropriate soft key and adjust via the knob or keypad. Pressing the Parameter button repeatedly will bring further easily usable parameters to your attention. Eventually you will tire of all this (I think we are talking about some years into the future) and you will be ready to call yourself an expert on the H3500. This is good, because among the parameters of each program you will find the so-called Expert mode (one day equipment will be so complex that you have to work your way up through a series of levels, like on your GameBoy!). Expert mode opens up another world of parameters which - take my word for it - are pretty tricky. Obviously Eventide's programmers are messing about in Expert mode all the time, and they get good results. But for mere mortals - and people who want some time left over for making music - will probably miss out on these delights. Still, you now know they are there, but don't say I didn't warn you about the time you can spend.

You may have noticed another button in between Program and Parameter, called Function. Some programs may have so-called Soft Functions where the knob has been assigned to control one or more parameters, hopefully to make controlling the program a bit easier. Although not all presets have Soft Functions, although you can add them yourself, the Function button opens up all the possibilities of MIDI control. If you want to see what comprehensive MIDI control looks like, take a look at the 'MIDI Control' panel. If you're not keen on Soft Functions and MIDI Control - but you should be! - then there is also an internal Function Generator. The function generator is a low frequency oscillator which can produce various waveforms and triggered functions. The function generator has a myriad of uses, but it's an area where you really have to understand what you are doing to get any sensible results. I suspect that only one H3500 user in a hundred will achieve any real fluency, although it is obvious from the factory presets that amazing original sounds are available if you really want them.

## **The Algorithms**

I bet when you first got into music you never expected to have to understand long words like 'algorithm'. The simplest parallel I can think of is a recipe from a cookbook, an algorithm for making Yorkshire puddings perhaps. To extend my analogy, from these basic algorithms, you can alter the quantities of the ingredients - the parameters - but not the ingredients themselves. Let me finish my brief tour of the H3500 with a short description of each of the algorithms from which the four hundred and four factory presets are derived.

### **Diatonic Shift**

This algorithm has two pitch shifters which understand the rules of musical harmony, so you can set a scale and the H3500 will adjust the semitones as necessary to fit in with a major or minor key, or indeed a harmonic pattern you have developed yourself. Diatonic Shift is mono in, stereo out, so you can set intervals of a third and a fifth and produce proper three part harmonies from a single input.

### **Layered Shift**

This is another mono in, stereo out algorithm and provides two separate pitch shifted outputs, this time without harmonic intervention - just a straight ratio. The range of shift is -24/+12 semitones and, like Diatonic Shift, the degree of pitch change can be modulated for really wacky effects (or just subtle thickening if you prefer).

### **Dual Shift**

This has two completely independent pitch shifters and is best used to process two mono signals at the same time. If you want stereo pitch shifting then you should turn to...

### **Stereo Shift**

Pitch shifting is a intricate business and sometimes, understandably, it affects the timing of the signal. If you had two pieces of pitch shifting equipment in separate boxes and thought you could use them to process satisfactorily a stereo signal then you would soon be thinking again. The deglitching circuitry in this algorithm takes both channels into account and makes sure that both stereo image and mono compatibility are maintained. Of course, the parameters of both channels are adjusted simultaneously.

### **Reverse Shift**

This is where the ultimate in subliminal messages starts. If you want to achieve a Parental Advisory sticker on your CD then just speak a few innocent words into this. Your speech will be chopped up into segments and the segments played in reverse and pitch shifted. If you follow Eventide's recommendation, you'll add variable splice length and feedback to this and become the subject of legal attention in the US in no time at all.

### **Swept Combs**

We are moving away from simple pitch shifting and into other realms of effects. Here we have effectively six digital delays, each with control over delay (up to 0.25s), modulation and feedback. The 'combs' part of the title refers to the comb filtering effect produced when a signal is mixed with a delayed version of itself. Comb filtering simply means a series of very deep notches in the response. The fun starts when you start to modulate the centre frequencies of these notches, and if you enter expert mode then you will find that each delay is separately adjustable.

### **Swept Reverb**

Let Eventide describe this one... "You're in a cathedral. There is a wonderful sound ringing through the air. Now the room starts to move while you stay still. It moves forward, side to side, up and down and then around in circles and somersaults." The sixties had nothing on this!

### **Reverb Factory**

Just one of the H3500's 'factory' algorithms, this is where you can get your hands dirty and manufacture the sound you want. This one consists of six delays, gate, EQ and reverb. You should be able to achieve a good variety of gated reverbs here with powerful control over initial reflections. You get to control twenty-five parameters here, including Expert mode.

### **Ultra Tap**

This uses a tapped delay line - a delay line with a number, in this case twelve, of sequential outputs and a diffuser. The aim is to give a dense field of delays, with the timing and relative strengths of the delays being user adjustable.

### **Long Digiplex**

It sounds like a name for something clever, but this one is really simple. It's just a delay with feedback, similar to just about any

digital delay you are likely to come across. To make it just that little bit more special Eventide have added a Glide function which allows the delay time to be changed manually, smoothly and without glitches.

### **Dual Digiplex**

As above but here there are two separate delay lines.

### **Patch Factory**

This algorithm contains a pitch shifter, two tunable filters (low pass, high pass or band pass), two delay lines and a white noise generator. You can connect these modules together in pretty much any way you like to produce results that are “only limited by your imagination”. I would say that this is one for the experts, although non experts will fully appreciate the various factory presets that have been based on this algorithm.

### **Stutter**

Just when you have thought of, designed and painstakingly constructed a clever effect, put it on a record and sold a million copies (you hope!) someone will put it into a box and give the whole world access to it. Paul Hardcastle’s ‘19’ effect may currently be old hat, but with an H3500 you are ready for its revival in a couple of years time.

### **Dense Room**

This is probably the densest reverb on the H3500. If you are a prospective purchaser and are wondering just how good the H3500 is as a reverb unit then listen to this one. It’s definitely good, better than many, but it’s not going to replace a top-of-the-range Lexicon just yet. An interesting idea is the control of the position of the sound source within the simulated room. We are used to mixing in a bit of reverb to give the required effect, but wouldn’t it be nice if more units offered the means effectively to choose a room and mic position?

### **Vocoder**

Yes, the Electric Light Orchestra is back! The vocoder is a fascinating tool which superimposes the harmonic characteristics of one sound onto another. One way to do it is to direct the sound of your guitar through a plastic tube into your mouth and mic it up. You can get your guitar to talk as long as you don’t mind losing a few fillings. Another way to do it is to buy or hire an Eventide and dial up Algorithm 115. The left input is for the

sound you want to process, the right input is for the 'articulating' signal.

### **Multi-Shift**

This pitch shifter is optimised for very small pitch shifts without noticeable artifacts. It also has an additional delay tap for each pitch shift channel giving four outputs which can be panned anywhere in the stereo field. Although optimised for small shifts, the total range is plus or minus three octaves.

### **Band Delay**

Another multitap delay line, this time with each tap connected to a separate band pass filter. The outputs of the filters are combined in a stereo mixer. MIDI control allows easy setting of the centre frequencies of the filters by playing notes on a keyboard.

### **String Modeller**

This algorithm can create sounds of its own! Short delays with feedback are used to create resonators which give a sound similar to singing into a piano with the sustain pedal down (something I like to do at least once every day!). The pitches of the six notes can be controlled via MIDI, so you can play the H3500 like a synthesiser from your keyboard.

### **Phaser**

Why do old analogue foot-operated phasers give a better sound than high quality digital effects units? An interesting conundrum, but Eventide have obviously taken a lesson and produced a phaser which sounds good and lacks the old vices of noise and too-obvious 'swooshing'.

### **Studio Sampler**

Not a replacement for your S1000 (or S3000 even) but a convenient way of taking 11.8 seconds of stereo material from your multitrack master and playing it in further down the line. If you buy the dfx/e version of the H3500 (yet another upgrade) you get 47.5 seconds of stereo which should be enough for - almost - anyone.

### **Mod Factory 1 and 2**

This is where it all goes crazy. The Mod Factories offer a wide variety of tools, techniques and tricks, and it's up to you to do

something with them. I could take a couple of pages describing these alone but you really have to see the unit in the flesh to appreciate what they can do. Here are the building blocks which can be patched together in almost any way, just think of what you can do with them... two sweepable delays, two state variable filters, two low frequency oscillators, two envelope detectors and two amplitude modulators. And in Mod Factory 2, two each of sweepable filtered delays, detuning pitch shifters, amplitude modulators, one low frequency oscillator and one envelope detector.

### **Buy it or Hire it?**

You could buy several average effects units for the cost of one Eventide H3500, but do you want to have just average effects on your work? This unit really is the dog's naughty bits and you owe it to yourself to try it out, or perhaps one of the other H3000 variants. If you can't afford to buy but are serious about your recording, then check out the hire companies (most of which, unfortunately for 85% of the population, are centred in London) who will let you have one for a day for a sum which should fit in with your budget a little more comfortably. I can assure you that you are going to like this unit a lot.

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## **H3500 Factory Presets**

### **100-123 Basic Effect Algorithms**

These are the basic algorithms, building blocks upon which the rest of the factory programs are based. Note that Algorithm 113 - TimeSqueeze - is not included in the standard H3500.

### **425-493 Percussion and Other Presets**

These are written specially for drums, guitar and bass. Includes distortion effects.

### **500-534 Chorus/Flange/Thickeners**

This group of effects contains choruses, flanges, micro-pitch shifts and other very useful thickening types of effects.

### **535-554 Delay Effects**

Echoes, recirculating delay lines, multi-tap delays and other delay based effects.

### **555-589 Large Reverbs**

Large halls and other immense spaces are found here.

### **590-604 Alternative Reverbs**

This group contains reverb-like effects including gated and reverse reverbs.

### **605-629 Pitch Shift Effects**

The more extreme pitch shift effects are found here, including the diatonic pitch shifters.

### **630-674 Unique/Filter Effects**

Many dramatic filtering effects are found here, in addition to other 'indescribable things' (Eventide's words!).

### **675-689 Tone Generators**

This group of effects generates sounds. Look here for a tuning tone, or for MIDI triggered sound synthesis.

### **690-699 MIDI Controlled Effects**

In this group the programs are specifically designed to be used with MIDI.

### **750-786 Custom Presets**

Special presets for recording, post production and music written by Eventide's friends in the music industry.

### **800-899 Mod Factory**

These presets provide delay ducking, BPM delays, sweeps, compression, manual flanging and more.

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## **MIDI Control**

Many of the parameters of the H3500's programs can be controlled by various types of MIDI event. Not just velocity or aftertouch but all these...

- Mod wheel

- Pitch wheel
- Pitch wheel (positive direction only)
- First note played and pitch wheel
- Last note played and pitch wheel
- Highest note and pitch wheel
- Lowest note and pitch wheel
- Note offset and pitch wheel
- Quantity of notes down
- First note velocity
- Last note velocity
- Highest note velocity
- Lowest note velocity
- Velocity of a specific key
- First note pressure
- Last note pressure
- Highest note pressure
- Lowest note pressure
- Pressure of a specific key
- Global pressure
- Last note released
- Release velocity of a specific key
- Velocity and release
- Breath controller
- Foot controller
- Expression controller
- Other controllers
- Damper pedal
- Portamento pedal
- Notes down threshold
- Last note velocity threshold
- Global pressure threshold
- MIDI clock frequency
- MIDI clock period

Believe it or not this is only a selection. I wouldn't expect anyone to understand what each one can do without a full description and the machine hooked up and ready to go, but I'm sure you must be tempted by the possibilities.