Hypersonic Hyper Modules User Manual

by Mark Ovenden

(:wizoo:)

Welcome to the Hypersonic Hyper Modules!

Congratulations and thank you for purchasing Hyper Modules for your Hypersonic workstation.

Hyper Modules are high quality musical instruments that expand the sonic range and functionality of Hypersonic. Having said this, we want you to know that the Hyper Module concept has been designed to provide you with tools that have much more to offer than separate software instruments or conventional sample library expansions.

A Hyper Module is a self-contained software instrument with its own sound generation and individually designed user interface, but unlike a separate software instrument, a Hyper Module shares all the goodies only a workstation has to offer: You can freely combine it with elements from Hypersonic and other Hyper Modules to build impressive and unique combis. When you do a search on the Load page, matching patches from your Hyper Modules are now automatically found. Hyper Modules also benefit from all of the effects and mixer functionality built into Hypersonic.

Have fun,

The Wizoo Team

The following Hyper Modules are currently available (Spring 2004):

US-1: Revisit the rich sound of analog synthesis with this highly customizable, sonically compelling virtual analog/digital synthesizer.

GP-2: In the tradition of the acclaimed VSTi 'The Grand', these two concert grand pianos deliver detailed, 'high definition' realism—yet with unbeatably low CPU/RAM use and loading times.

NB-3: Emulate the legendary organs and rotor cabinets of the '50s, from punchy house bass to roaring valve leads, with this superb virtual tonewheel organ emulation.

Watch out for more Hyper Modules at www.wizoo.com/hypersonic

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System Requirements & Installation

System Requirements (PC & Mac)

Minimum System Requirements

- ❖ Hypersonic 1.0 or higher.
- ❖ Hypersonic USB protection device.
- ❖ A computer compliant with Hypersonic and host software specifications.
- ❖ 150 MB free hard disk space.
- ❖ CD- or DVD-ROM drive for installation.

Installing Hyper Modules (PC & Mac)

1 Make sure the Hypersonic dongle is plugged in.

2 Insert the Hypersonic CD-ROM and—if this doesn't happen automatically—browse the CD.

At this point, you may want to read the 'Read Me First' document on the CD-it may contain later information concerning the installation.

3 Locate the Hyper Module Installer, launch it, and follow the instructions on the screen.

Hyper Module—Protection Key Authorization

Having installed your Hyper Module, you need to authorize the protection key of Hypersonic before launching the program for the first time.

1 Make sure that your computer has a working Internet connection.

Authorization is made 'online'. If your computer isn't connected to the Internet, it's possible to use another computer for the online connection—proceed with the steps below and see the help for the License Control Center application.

Regardless of which computer you use to authorize your copy protection key you must nevertheless run the *Syncrosoft License Control Setup.exe* on any computer where you wish to use Hypersonic.

2 Locate the Authorization Code from the printed card provided with this product.

There is one Authorization Code to authorize the full version of the Hyper Module you have bought, and another to authorize the demo versions. Please choose the Authorization Code for the full version first.

If you have purchased the Hyper Modules Bundle product you will have a single code that authorizes all three Hyper Modules.

3 Launch the License Control Center application (found in the Start Menu/ Applications/Syncrosoft menu for PC and Applications for Mac).

This application allows you to view your USB protection keys and add keys for new applications by downloading licenses.

4 Use the License Control Center Wizard to download a license for the Hyper Module to your protection key. This requires that you enter your Authorization Code—just follow the directions on

screen. If you are uncertain about how to proceed, consult the help for LCC.

5 When the authorization is complete, you are ready to launch Hypersonic with your Hyper Module!

Follow steps 2—5 by using the Demo Authorization Code to authorize the demo versions of all other available Hyper Modules as well.

Important Note About Demo licenses

The demo codes provided allow you to try out all other Hypersonic expansions for free to see if you like them. Be aware that these codes are limited and will expire after Hypersonic has been instanciated (started) 30 times.

Register Your Software

Please take a moment to register at www.wizoo.com/register

This will entitle you to technical support, and we'll also keep you up to date with the latest news and updates.

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Hypersonic 1.1 New Features & Enhancements

In this chapter we'll take a look at the new features available in Hypersonic 1.1.

Programmable Step Sequencer

Probably one of the coolest new Hypersonic features is the addition of a programmable 16-step sequencer to the arpeggio section.

To check it out just:

1 Load a patch.

2 Click *Edit*.

3 Select the *Patch Settings* page.

4 Set the Arpeggiator to *Step Seq*.

5 Click the Arpeggiator section *Edit* button.

Note	Vel	Seq 1	Seq 2
+0	100 %	+94	+84
+0	0 %	+91	-83
+0	0 %	+80	+41
+0	0 %	+55	-47
+2	80 %	+19	+0
+5	100 %	-22	+50
+0	0 %	-55	-58
+7	50 %	-77	+0
+0	100 %	-91	+42
+0	0 %	-100	-50
+0	0 %	-86	+80
+0	0 %	-50	-75
+7	80 %	-13	-42
+9	100 %	+30	+66
+2	70 %	+67	-53
+12	89 %	+86	+28

OK

The Hypersonic step sequencer is very easy to use and an effective and creative patch making tool.

To create your own step sequences for any patch simply set a pitch value for each step (displayed in semitone increments) in the *Note* column and set a velocity amount in the neighboring *Vel* column.

> The Hypersonic 1.1 step sequencer responds to the arpeggio *Rate* and *Steps* controls on the *Patch Settings* page, to allow you to adjust the playback speed and number of steps to be played.

Also displayed on the Step Sequencer edit page are two extra columns, *Seq 1* and *Seq 2*. These allow US-1 users to generate and edit control sequences for use in the powerful US-1 modulation matrix. Control Sequences can be used, for example, to create gating effects, automate panning or to sweep Wavetables—the possibilities are endless.

> For more information, see the 'Control Sequences' section in the US-1 manual.

Random Sequence mode (selected via the arpeggio *mode* menu) randomly selects step sequencer steps.

Sample Selector Display

Another nice addition to Hypersonic 1.1 is the *Waveform* drop down menu for sample elements.
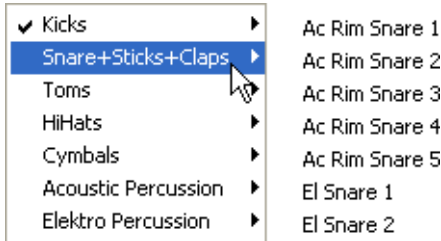
From this drop down list you can choose any sample you like from any category in the complete Hypersonic sample content. This feature is especially handy for customizing or creating drum and percussion kits.

To test this feature:

1 Load a Hypersonic patch that uses sample elements.

A drum kit would be an easy first choice.

2 Click *Edit*.

3 Choose an 'S' (Sample) element from the elements list on the left of the Hyper Display or from the list shown when clicking in the Edit Name field.

4 Click in the new field directly under the knob *Waveform*.

A drop down menu appears with a complete list of all Hypersonic sample banks and samples.

❖ You can also use your mouse wheel to browse through samples. When the current sample is a drum loop, the mouse wheel selects individual loop slices.

New Effects Elements

Hypersonic 1.1 adds some new effects elements to its already comprehensive selection.

Tuned Resonators

This effect uses up to seven resonators tuned to musical pitches to make anything from eerie ambience effects or simple physical models to spring reverb sounds.

❖ *Mix:* Wet/Dry signal mix.

❖ *Bands:* Number of resonators 1—7.

❖ *Root:* Pitch of lowest resonator.

❖ *Detune:* Fine tuning applied to all resonators.

❖ *Spacing:* Pitch interval between each resonator, or turn the control all the way to the right to select a major or minor scale.

❖ *Decay:* Adjusts the decay time of the resonators.

❖ *Low EQ:* Low cut filter, useful for removing rumble when *Root* is set to a low pitch.

❖ *HF Damp:* Damping of the resonators, adjusts the sound from a muted pluck or clunk to a long ringing or whistling.

❖ *Width:* Spreads the resonator outputs across the stereo image.

❖ *Key/Rel:* Shortens the resonator decay time when all notes in the patch have been released, so the added resonance can be played as part of the instrument sound. Turning the knob away from the

center reduces the release time. When the knob is turned to the right the resonator pitches will also track the pitch of the last-played note in the patch.

(Key/Rel is not available when used as a global send effect).

Ducking Delay

This is a delay effect which adapts to the input signal level, so the delay repeats are either attenuated, "Ducked," or accentuated when the input signal is playing.

❖ *Mix:* Wet/Dry signal mix.

❖ *Delay:* Delay time (optional tempo sync).

❖ *Feedback:* Feedback amount.

❖ *Balance:* Ratio of left delay time to right delay time.

❖ *Lo Damp:* Low cut filter to progressively thin the sound of the delay repeats.

❖ *HF Damp:* High cut filter to progressively dull the sound of the delay repeats.

❖ *Depth:* Turn to the left to increase gating of the delay repeats when the input signal is quiet. Turn to the right to increase ducking of the delay repeats when the input signal is loud.

❖ *Thresh:* Sets the threshold at which the Ducking or Gating takes place. When turned all the way to the left, the threshold tracks the input signal levels adaptively.

❖ *Attack:* Sets the onset time of the Ducking or Gating.

❖ *Release:* Sets the recovery time of the Ducking or Gating.

Grain Delay

This is a complex effect that cuts the input signal into small overlapping 'grains' which can then be individually delayed, re-pitched and panned. This produces anything from avant-garde tape splicing effects to completely unpredictable chaos.

❖ *Mix:* Wet/Dry signal mix.

❖ *Delay:* Overall delay time applied to each grain (can be tempo synced).

❖ *Feedback:* Feedback of the output signal to the input.

❖ *Grain:* Adjusts the length of each grain. When turned fully left the grain length tracks the pitch of the last-played note in the patch.

❖ *Pitch:* Adjusts the speed at which each grain is played back:
+200% is one octave up.
+100% is normal pitch and speed.
+50% is one octave down.
+25% is two octaves down.
0% is zero speed, so freezes the input signal level.

Negative settings result in the same pitches as positive settings, but play the grain backwards.

❖ *Pit Mod 1:* Applies a random or alternating offset to Pitch. With a setting of Alt 100% and Pitch set to 0%, the pitch alternates between +100% and −100%, playing the grains alternately backwards and forwards.

❖ *Pit Mod 2:* Applies envelope or sine LFO modulation to Pitch.

❖ *PM Rate:* Adjusts the LFO or envelope tracking speed used by Pit Mod 2.

❖ *Del Mod:* Applies an alternating or random delay time to individual grains.

Remember [Ctrl]-Click sets knobs back to their center position.

❖ *Pan Mod:* Applies an alternating or random modulation to the panning of each grain. For long grain lengths this widens the stereo image, and for short grains produces a distorted, tearing sound.

Step Flanger

This is similar to the normal Flanger effect with the addition of sample-and-hold applied to the delay modulation for rhythmic stepping of the flanger 'pitch'.

❖ *Mix:* Wet/Dry mix.

❖ *Rate:* Sweep rate.

❖ *Depth:* Sweep depth (reduce for more swooshiness).

❖ *Feedback:* Feedback amount.

❖ *Pre Del:* Initial delay. Adjusts the minimum delay time/maximum flange frequency.

❖ *Step Rate:* Adjusts the time between steps and can be tempo synced. With the Rate control set to a slow speed this produces a 'staircase' effect of slowly increasing and decreasing flanger pitch. When Rate is set to a fast speed unrelated to the Step Rate, the steps follow a more random pattern.

❖ *Step Depth:* Mixes between the smoothly varying LFO of the original Flanger effect and the stepped values.

Vintage Filter

This is a multi-mode filter with LFO and envelope modulation of cutoff. Although there are already filters available on each voice in Hypersonic, a different range of effects can be achieved by passing a whole patch through a single filter.

❖ *Mix:* Wet/Dry signal mix.

❖ *Cutoff:* Cutoff frequency of the filter.

❖ *Reso:* Resonance, producing a peak at the cutoff frequency and at high settings the filter oscillates producing a sine wave.

Note that the maximum level of the resonant peak is fixed, so you can vary the relative levels of the filtered signal and the resonant peak by turning the input signal level up or down. If the Vintage Filter effect is used as an insert effect in a patch, this can be achieved with the output level controls of each element or with the MIDI Expression controller (cc 11) which unlike the patch level control is applied before any effects.

❖ *Mode:* Selects either 24dB/oct, 18dB/oct, 12dB/oct or 6dB/oct lowpass filters, or 12dB/oct bandpass or highpass filters. Higher

rolloffs in dB per octave make the filter sharper and remove more of the filtered-out signal.

❖ *LFO Rate:* Controls the LFO rate. The LFO has a very wide range, with a maximum frequency up to 200 Hz, so can be used for 'experimental' burbling or ring-modulation-like sounds.

❖ *LFO Depth:* Controls the amount of cutoff modulation by the LFO, which produces a sine wave when the control is turned to the right or a stepping sample-and-hold waveform when turned to the left.

This control also has a very wide range so can quickly sweep the filter cutoff across the whole audio frequency range.

❖ *Env Depth:* Controls the amount of cutoff modulation by the envelope level.

❖ *Env Mode:* Sets the mode used to follow the envelope level:
Follow—The envelope level is measured from the audio signal which can produce grainy and unpredictable modulations.
A-R—An Attack-Release envelope is triggered by notes played in the patch.
A-S-R—An Attack-Sustain-Release envelope is triggered by notes played in the patch.
LFO Rate—The envelope level controls the LFO rate only.
LFO+Env—The envelope level controls the LFO rate and also modulates the cutoff.

❖ *Attack:* Envelope attack time.

❖ *Release:* Envelope decay/release time.

❖ *Mode:* Switches the filter between mono and stereo operation. In addition to the obvious change in sound when used on stereo sources, in mono mode more processing power is spent on the filter to make the behavior at high cutoff frequencies more 'analog'.

Additional Features Added To Existing Effects

Pitch Shift

Now has an extra digital delay feature added, with control over delay time, feedback, and feedback routing.

Modulate L-R

Now features an additional vocoder mode. Allowing you to apply the frequency spectrum of elements stereo panned to the left to elements panned to the right. The frequency bands of the vocoder cover a wide range to work well with rhythmic sources.

New Element Handling Features

Hypersonic 1.1 includes a few handy time saving element editing features:

Additional Muted FX Elements In All Patches

When you load any Hypersonic patch (old or new) and click *Edit*, you will see that we have added two muted FX elements to the end of the elements list. This is to help you quickly add effects to your patches. Click an effect element and select an effect type from the field displaying *No Effect*.

Easy Element Renaming

To rename the currently selected element in a patch, simply double click in the name field at the top of the *Edit* page, type the new name and hit Enter.

Element Copying

Elements can be copied and pasted by using the usual Ctrl-C and Ctrl-V key commands. Copied elements can be inserted before the currently selected element by pressing [Ctrl][Insert] ([Ctrl][I] on Mac).

Additional Setup Page Features

Hype

The new Hype feature is essentially a 'Mastering' processor which produces a more punchy and bright sound. Many hardware keyboards and modules have this kind of Hyping active under the hood where you can't get your hands on it, but we've given you the control. This feature effects all Hypersonic patches and is active on all outputs.

> Because all Hypersonic settings are saved with your song, you can tweak the Hype to just the amount you like for each project or choose 'Save Defaults' to always have your preferred setting when starting new projects.

Master Tuning

Offsets the pitch by semitones and cents for all Hypersonic patches globally.

> Patches can of course be tuned individually on the Hypersonic MIDI page.

New Master Plug-in Commands

You will find these features by right mouse clicking ([Ctrl]-click on Mac) any-where around the edge of Hypersonic.

Play PC Keyboard

This feature allows you to play Hypersonic patches from your computer keyboard. The currently highlighted Hypersonic part (and any linked parts) will be played. The notes you play are also output via MIDI, allowing you to record them or to use Hypersonic as a MIDI source to play other VST Instruments in your host application.

Hypersonic's musical keyboard now also outputs MIDI information. Your host application must support MIDI output from plug-ins.

❖ The 'C' key plays a C3 note. Keys on the same row play the adjacent white notes.

❖ The 'F' key plays a C#3 note. Keys on the same row play the available black notes.

❖ The 'R' key plays a C4 note. Keys on the same row play the adjacent white notes.

❖ The '5' key plays a C#4 note. Keys on the same row play the available black notes.

❖ The left and right arrow keys transpose the keyboard in octaves.

If your computer keyboard layout is not English or German then some interesting scales may result!

Select Play PC Keyboard mode a second time to disable it.

All Notes Off

Releases all currently playing Hypersonic voices, useful if you have a MIDI jam. This is often called a 'Panic' mode.

Known Issue

Loading existing Hypersonic V1 songs after installing Hypersonic V1.1 in Steinberg hosts

Due to a problem in the Inspector in Cubase and Nuendo, loading songs created using Hypersonic V1 can result in the wrong patches being recalled in Hypersonic V1.1. This will be fixed in the next major update for these hosts.

A temporary solution to this issue is to do the following:

1 Turn off *Receive MIDI Program Changes* in the Hypersonic *Setup* page.

2 Click *Save Defaults.*

3 Reload the song.

Hypersonic will ignore the inspector program change messages.

3

US-1 Ultra Synth

In this chapter we'll check out the US-1 Ultra Synth Hyper Module.

Key Features

❖ High-end audio quality.

❖ Fat and Powerful sound.

❖ Flexible modulation options.

❖ 3 oscillators with analog waveforms, wavetable synthesis, sync, and unison mode.

❖ Multimode filter with oscillator audio modulation and overdrive.

❖ 3 Envelopes.

❖ 3 LFOs.

❖ Expert parameters for detailed adjustment of all sound parameters.

❖ Includes 256 patches hand crafted by professional sound designers.

❖ Multiple US-1 elements per patch.

Getting Started with the US-1

As with all of the Hypersonic Hyper Modules, instant gratification is only a load menu away.

Let's assume that you're already a little familiar with Hypersonic and let's start by loading some US-1 patches.

Loading US-1 Patches

All Hyper Module Patches are displayed at the top of the usual Hypersonic *Load* page.

1 Click the Hypersonic *Load* button to the right of the display area.

2 Open the *Ultra Synth US-1* folder.

3 Double click on a patch from the list.

4 Once loading is complete you can play your patch.

Load & play some more patches.

To quickly preview the patches, try using the standard Hypersonic key commands to load the next or previous patch on the load page –Hold Shift and press Down/Up arrows.

The US-1 Patches

The US-1 Ultra Synth comes armed with 256 professionally programmed patches of many different types, all with the best six Hyperknob settings possible.

❖ Because you will probably want to hear the types of sounds that the US-1 is capable of, we have combined all 256 patches into one large bank which appears at the top of the normal Hypersonic *Load* page.

❖ In addition, all of the 256 US-1 patches are integrated into your normal Hypersonic bank categories. For example the US-1 Synth Basses appear in your usual Hypersonic Synth Basses bank along with your original Hypersonic Synth Basses.

Your new US-1 patches will also respond to the Hypersonic search engine, just like your factory content.
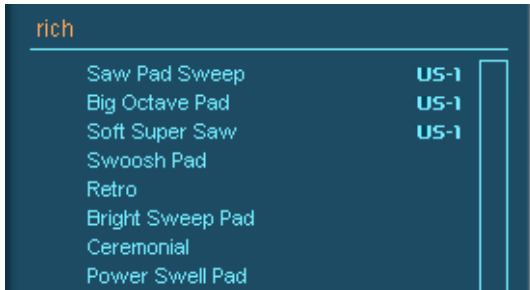
❖ And, just to make life even simpler, Hyper Module patches are always displayed with their own Hyper Module Icon.

❖ You can even use the search engine to find patches from only within the US-1 library.
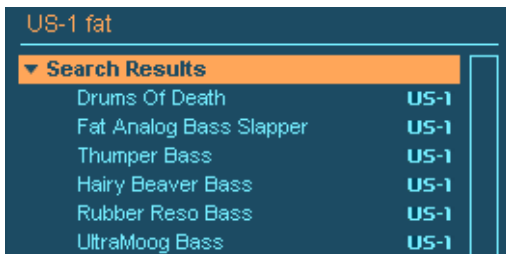
❖ The last patch in the *Ultra Synth US-1* bank is an 'Init' (Initial) patch which contains three US-1s and three effects elements all set to useful default values for easily creating your own patches.

The US-1 User Interface

Ok, we've played some patches, now let's get into some synthesis and see what the US-1 can do.

❖ To see the US-1 User Interface, simply:

1 Load a US-1 patch.

2 Click the *Edit* button to the right of the display area

or

3 click on the US-1 Icon displayed on the right hand side of the patch name in the Hypersonic Part.
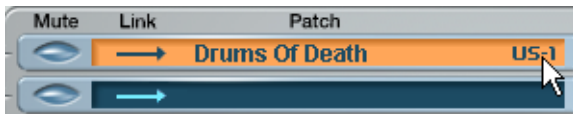
This icon allows you to toggle between the US-1 User Interface and the last display page you were working on in Hypersonic.

The US-1 Edit Pages

At a glance you'll see that the US-1 sports three main programming pages, selectable via the tabs at the bottom of the user interface.
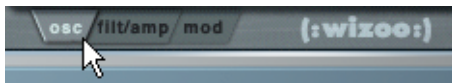
❖ *osc:* short for Oscillators. Here you will find the 3 oscillators, the sub oscillator, noise, wavetables and pitch controls for the US-1.

❖ *filt/amp*: This is the home of the filter controls and the envelopes for the filter and amplifier.

❖ *Mod*: This is the place to go for the virtually limitless modulation possibilities and all the extra 'expert' features of the US-1.

The US-1 Oscillators Page

Why not load the US-1 *Club Rotation* patch (the sixth patch in the *Ultra Synth* bank) so we can try out the US-1 as we go.

OSC 1 & OSC 2

Oscillators 1 and 2 in the US-1 are the two main oscillators. They have identical controls and are able to produce the most varied wave shapes.

Mode & Wave

The *mode* menu and the *wave* knob are very closely related. The *mode* menu selects the basic waveform and the *wave* knob varies this selected waveform.

1 Turn the *mix* knob for oscillator 2 all the way off to the left.

2 Click in the *mode* field for oscillator 1.

This produces a drop down menu for selecting the oscillator 1 wave shape. Why not select each oscillator type as we describe it and test the effect of the *wave* knob as we go.
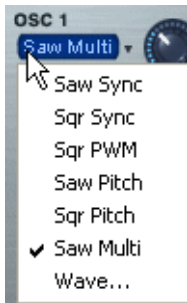
❖ *Saw Sync:* When the *wave* knob is turned all the way to the left a sawtooth wave is produced. Turning the *wave* knob to the right adjusts the sync frequency.

❖ *Square Sync:* When the *wave* knob is turned all the way to the left a square wave is produced. Turning the *wave* knob to the right adjusts the sync frequency.

❖ *Square PWM:* When the *wave* knob is centered a square wave is produced. Turning the *wave* knob to the right reduces the pulse width, turning it to the left widens the pulse width.

❖ *Saw Pitch:* Produces a regular sawtooth wave. The *wave* knob adjusts the oscillator pitch up and down. The oscillator is exactly in tune when the *wave* knob is centered.

❖ *Square Pitch:* Produces a regular square wave. The *wave* knob adjusts the oscillator pitch up and down. The oscillator is exactly in tune when the *wave* knob is centered.

❖ *Saw Multi:* Produces seven sawtooth oscillators simultaneously, for a fat unison sound. The *wave* knob adjusts the detuning of the seven oscillators. When the *wave* knob is all the way to the left, the oscillators are in tune; turning to the right detunes them.

❖ *Wave:* Uses the currently selected wavetable. The US-1 has 44 wavetables. Each wavetable contains 64 single cycle waveforms which can be selected with the *wave* knob or modulated via the mod matrix.

Semi

Changes the pitch of the oscillator in semitone steps.

Cents

Adjusts the fine-tuning of the oscillator in cents.

Mix

Controls the volume of the oscillator.

More About the Wavetables

1 Make sure oscillator 1 *mode* is set to *Wave*.

2 Click on the *wavetable* field.

This is where you select one of the 44 Wavetables available for oscillators 1 & 2.

Let's leave the *Single Cycles* wavetable selected for the time being and see what happens when we play a note and move the oscillator 1 *wave* knob.

As you move the oscillator 1 *wave* knob you'll notice that the wavetables in the *Single Cycles* bank are all very different sounding waveforms, 64 different sounding waveforms actually.

Now let's try a different wavetable, *VoSim Vowels* for example, this wavetable is much more subtle and consistent.

Let's try another, *Classic Bell* for example, which evolves gently from a soft to bright bell sound.

> The 44 Wavetables in the US-1 are varied and versatile and allow totally different waveform colors to be produced by oscillator 1 & 2.

Oscillator 3

Oscillator 3 is designed to add body and color to oscillators 1 & 2. In this area of the User Interface you will also find the sub oscillator and white noise controls.

Oscillator 3 Modes
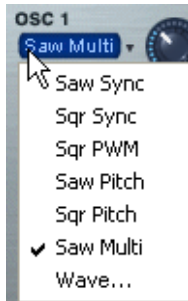
- ❖ *Saw:* Produces a regular sawtooth wave.
- ❖ *Squ:* Produces a regular square wave.
- ❖ *Tri:* Produces a regular triangle wave.
- ❖ *Mix:* Controls the volume of oscillator 3.

    The pitch of the oscillator 3 is always set to the US-1 master octave tuning.

Sub Osc

Adds an additional oscillator, pitched one octave below oscillator 3.

    When oscillator 3 is set to *saw* or *square* then the sub oscillator produces a square wave but when oscillator 3 is set to triangle the sub oscillator also produces a triangle waveform.

Noise

Produces white noise.

The Octave Selector

This simply allows you to transpose up or down by octaves all of the US-1 oscillators with a single mouse click.

The US-1 Filter & Amp Page

Let's take a look at the second edit page of the US-1.

The Filter Modes

The US-1 features eight different high quality filter modes or types. Although the VCF *cutoff* and *resonance* controls are amongst the most important synthesis controls available to you, we'll discuss the types

of filters in the US-1 first, as these radically change the way that *cutoff* and *resonance* influence your patches.
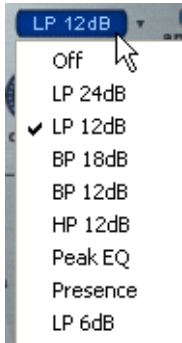
Mode	More Information	Description
LP 24dB	Lowpass 24 dB/Octave filter.	Cuts the frequencies above the cutoff setting with a very steep curve and has the fattest filter sound. This is the filter type most associated with vintage analog synthesizers.
LP 12dB	Lowpass 12 dB/Octave filter.	Cuts the frequencies above the cutoff setting with a shallower curve than the 24dB filter. Using this filter produces a slightly more natural sound and can be useful for acoustic and electric instrument sounds.
BP 18dB	Bandpass 18 dB/Octave filter.	Allows only the frequencies centered around the cutoff to pass through the filter unaffected.
BP 12dB	Bandpass 12 dB/Octave filter.	Allows only the frequencies centered around the cutoff to pass through. The 12dB Bandpass has a gentler curve than the 18dB Bandpass, allowing a wider frequency range to pass through the filter, resulting in a brighter sound.
HP 12dB	Highpass 12 dB/Octave filter.	Allows only frequencies above the cutoff to pass through the filter.

Mode	More Information	Description
Peak EQ	Peak Emphasis Filter.	Adds a resonant peak at the cutoff frequency without or cutting the frequencies above or below. At lower resonance settings this filter can be used like an EQ and at minimum resonance produces a notch at the cutoff frequency.
Presence	High shelf EQ with resonance.	The Presence filter mode boosts the high frequencies above the cutoff point. Increasing resonance while using the Presence filter adds a closely spaced notch and peak at the cutoff frequency.
LP 6dB	Lowpass 6 dB/Octave filter.	Cuts frequencies above the cutoff setting with a shallower curve than the 24 dB and 12 dB filters. Giving a brighter and much more gentle filtering effect.

VCF Cutoff

This knob controls the cutoff frequency of the filter and is one of the most effective controls available in synthesizer programming.

> Turning to the right moves the cutoff frequency higher into the brighter spectrum of your patch and turning it to the left moves the cutoff frequency lower into the bass spectrum.

The way the *cutoff* control shapes your patch is determined by the filter *mode*. The Lowpass filter types only allow frequencies below the cutoff frequency to pass through. The Highpass filters only allow the frequencies above the cutoff frequency to pass through. The Bandpass filters only allow the frequencies surrounding the cutoff frequency to pass through etc.

The filter cutoff is also very often controlled by the filter envelope which allows you to shape the way the filter cutoff changes your patch over time.

Resonance

The *resonance* control boosts the frequencies around the cutoff, resulting in the sound becoming shaper and more pronounced.

In practice, turning up the *resonance* gives you the possibility to make the patch cut through more audibly and to explore the realm of colorful filter sweeps, and FX amongst limitless other possibilities.
Resonance is another of the most effective and essential controls for patch creating and editing.
When the resonance control is set high, you can control the relative level of the resonant peak by reducing the oscillator mix levels.

Analog Filter Mode

The Analog filter mode changes some important tonal characteristics of the US-1 filters. Clicking the *Analog* button to the right of the filter *mode* selector toggles between the digital and *analog* filter states.

When you activate Analog filter mode you will notice:

❖ The resonance control, when used with the *LP24 dB*, *LP12 dB* and *LP6 dB* filters, produces a much more saturated and less shrill tone.

❖ The resonance control, when used with the *Peak EQ* and the *18 BP* filters, accentuates 2 separate frequency peaks. The spread or distance in the frequency spectrum between these peaks is controlled by the *Osc 3 filter mod* parameter (to be found on the US-1 *mod/FE* page, we'll describe this in detail a little later). This arrangement is very useful for producing vowel-like sounds.

Drive

Controls the amount of filter overdrive. The frequency area most affected by this control is in the region of the cutoff and higher resonance amounts accentuate the drive effect.

Using the digital filter mode produces hard clipping distortion and a brighter effect, while the analog filter mode sounds warmer and more gentle.

Keytrack

This knob determines how the cutoff frequency is controlled by the position of notes played on the keyboard. When keytracking is set to a positive value, notes played above C3 will have a progressively higher cutoff setting the higher you play, notes below C3 will have a progressively lower cutoff setting the lower you play.

Set *keytrack* to +100 % for 1:1 tracking of cutoff to pitch.

Vel Sens

Controls the effect that lower key velocities have on the cutoff. Turning the knob to the right reduces the cutoff setting for lower velocity notes. Turning the knob to the left increases the cutoff setting for lower velocity notes.

The Filter Envelope Section

Depth

Controls how much the filter envelope modulates the cutoff frequency.

Positive values mean that the cutoff is modulated upwards by the filter envelope, negative values modulate the cutoff downwards.

Vel Sens

Determines the extent to which the filter envelope modulation depth is controlled by velocity. With a positive setting, higher velocities produce stronger modulation of cutoff by the filter envelope.

To control the filter envelope attack time and decay time with velocity go to the US-1 *mod* page and choose the *FE* (Filter Envelope) view.

Label	Description	Effect
A	Attack time.	Controls the length of time for the filter envelope to open to maximum level.
D	Decay time.	Adjusts the time taken for the filter envelope to reach the sustain level after the attack is completed.
S	Sustain level.	Sets the sustain level of the filter envelope. This is the level at which the filter envelope remains when a key is held and the attack and decay portions are completed.
F	Fade.	This is a less common parameter but a very useful one. Fade controls the time and direction in which the cutoff moves after the sustain level has been reached. Positive fade amounts force the filter envelope to rise to the maximum level, while the amount controls the speed at which this happens. Higher values produce faster times. Negative fade amounts fade towards 0% after the sustain level has been reached. Higher values produce faster times. A fade value of zero disables the fade parameter and the filter envelope cutoff remains at the sustain level for as long as a note is held.
R	Release time.	Controls the time taken after a note is released for the frequency of the cutoff to return to its programmed Cutoff level.

The VCA Section

Vel Sens

Controls the effect of key velocity on the volume of each note played.

Pan

Determines the stereo position of the US-1 element.

Level

Sets the overall volume of the US-1.

Label	Description	Effect
A	Attack time.	Controls the length of time for the amplitude envelope volume to reach a level of 100%.
D	Decay time.	Adjusts the time taken for the amplitude envelope to reach the sustain level after the attack is finished.
S	Sustain Level.	Sets the sustain level of the amplitude envelope. This is the level at which the envelope remains when a key is held and the attack and decay portions are completed.
F	Fade.	Fade controls the time and direction in which the level moves after the sustain level has been reached. Positive fade amounts force the envelope to open to 100%, while the amount controls the speed at which this happens. Higher values produce faster times. Negative fade amounts reduce the volume to 0% after the sustain level has been reached. Higher values produce faster times. A fade value of zero disables the fade parameter and the volume remains at the sustain level for as long as a note is held.
R	Release time.	Controls the time taken after a note is released for the volume of the note to return to zero.

The US-1 Mod Page

The third main editing area in the US-1 can be located via the *mod* tab at the bottom of the User Interface.

The US-1 has endless flexible and sophisticated modulation possibilities for shaping your patches, there are also some extra power user parameters in here for those of you that like to get your hands dirty.
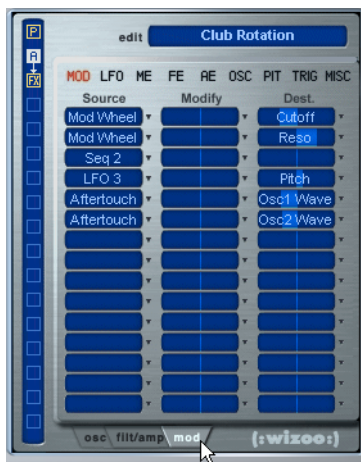
Mod Page

In the US-1 modulation matrix you'll see 3 vertical columns of 15 cells for assigning mod sources, modifiers, amounts and destinations. Sounds a little complicated doesn't it, but actually the mod matrix is pretty easy to master, probably the best way to learn how it works is by using it so let's do a few simple tutorials and check it out.

❖ Load the *Club Rotation* patch (patch six) from the Ultra Synth US-1 folder.

Some Simple Mod Matrix Editing Examples

Adding an LFO for Vibrato

1 Click on the small triangle to the right of the first available cell in the *Source* column.
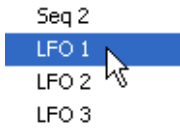
2 Select *LFO 1* from the drop down menu.

3 Click on the small triangle to the right of the *Destination* column in the same line.

4 Select *Pitch* from the drop down menu.

5 Click and drag your mouse on the slider (the blue line under the text) of the destination column to set an amount.

6 Now the pitch is being modulated by LFO 1.

Changing the Mod Wheel Settings to Pitch Bend and Pan

1 Click on the small triangle to the right of the first cell in the *Destination* column that is displaying *Cutoff*.

2 Select *Pitch* from the drop down menu.

3 Set the range by clicking and dragging the slider in the same destination cell.

4 Click on the small triangle to the right of the second cell in the *Destination* column.

5 Select *Pan* from the drop down menu.

6 Set the panning range and direction with the slider in the same destination cell.

7 Now the Mod wheel bends pitch and pans your patch.

Pretty easy huh?

OK let's try something a little more complex.

❖ Reload or reset your Club Rotation patch.

Two More Complex Mod Matrix Editing Examples

Setting a Delayed Vibrato with Slow Attack

1 Click on the small triangle to the right of the first available cell in the *Source* column.
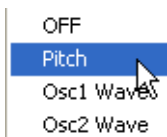
2 Select *LFO 1* from the drop down menu.

3 Click on the small triangle to the right of the *Destination* column in the same line.

4 Select *Pitch* from the drop down menu.

5 Click and drag your mouse on the fader in the *Destination* column to set the amount, +1.61 for example.

6 Click on the small triangle to the right of the *Modify* column in the same line.

7 Select *Delay Ramp* from the drop down menu.

8 Click and drag your mouse on the fader in the *Modify* column to set the amount, +640ms for example.

9 Now your patch will play a vibrato that has a delay and slow attack that starts 640 milliseconds after you play each note.

Setting Up a Control Sequence to Make a Percussive Gated Patch with Autopanning

For more information about Control Sequences see the 'Control Sequences' section below.

❖ Reload or reset your Club rotation patch.

1 Click on the small triangle to the right of the first available cell in the *Source* column.

2 Select *Seq 2* from the drop down menu.

Seq 1 & Seq 2 are control sequence sources.

3 Click on the small triangle to the right of the *Destination* column in the same line.

4 Select *Amp* from the drop down menu.

5 Click and drag your mouse on the fader in the *Destination* column to set the amount, 100% for example.

If you play your keyboard now you will hear a percussive gating rhythm.

6 Click on the small triangle to the right of the next available cell in the *Source* column.

7 Select *Seq 1* from the drop down menu.

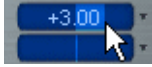**8** Click on the small triangle to the right of the *Destination* column in the same line.
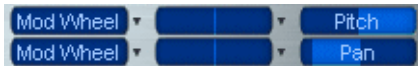
9 Select *Pan* from the drop down menu.

10 Click and drag your mouse on the fader in the *Destination* column to set the amount, −100 for example.

11 Now your patch will play with a percussive gating effect and autopanning.

❖ Those were just a few examples of what the Mod Matrix can do. For a full description of all modulation sources, modifiers and destinations see the 'Modulation Sources, Modifiers and Destinations Table' at the end of the US-1 manual.

Control Sequences

Control sequences are one of the most powerful and creative tools available in the US-1. They allow you to shape and mold your sounds in countless ways, from simply automating panning and creating gating effects to sweeping wavetables and sync amounts or generating luscious evolving pads.

The applications are endless but the principal is simple, a control sequence let's you create and mold the shape of a modulation source that can be applied to any parameter(s) available in the Mod Matrix.

Let's learn by doing.

❖ Load the second patch from the Ultra Synth US-1 patch bank; it's called *Good Vibes*, this patch is already using control sequences.

1 Click *Edit*.

2 Select the *Patch Settings* page.

3 Click *Edit* in the *Arpeggiator* section.

This is what you will see.

Seq 1	Seq 2
+0	+100
+100	+0
-100	-50
+0	+100
+100	+0
-100	-50
+0	-50
-100	-50
+100	+0
+0	+100
-100	-50
+0	+100
+2	-50
-100	-50
+100	+100
+0	-50

❖ Control Sequences 1 and 2 are displayed as columns, each with sixteen step values.

❖ Hold a note down on your keyboard and try randomly changing values in the Seq 1 column, you'll notice that the pitches of the notes being played are changing for the steps that you have edited.

Control Sequence 1 in this patch is modulating pitch in the Mod Matrix.

❖ Now try changing values in the Seq 2 column and you will hear that Control Sequence 2 is modulating the volume and filter.

Probably by now you are starting to see the possibilities, the Control Sequences can be applied to any parameters available in the mod matrix and you can use them many times in any patch.

LFO View

Every US-1 that you use has three identical LFOs (low frequency oscillators). These are most commonly used for vibrato, tremolo and panning etc., but the range of applications for LFOs is unlimited and they are an integral part of most patches.

LFO Wave

Each LFO has a palette of nine different wave shapes.

❖ *Constant:* Full maximum constant value.

❖ *Sine:* Soft smooth curved modulation.

❖ *Triangle:* Soft & smooth sounding like the sine but with pointed peaks and valleys as opposed to curving ones.

❖ *Sawtooth:* Jumps immediately to its peak and then descends in a straight line to the bottom before repeating.

❖ *Square:* Trilling Up/Down Modulation.

❖ *S&H Random:* Random steps.

❖ *S&H Alternate:* Alternating random and low valued steps.

❖ *Random Drift:* Random variations.

❖ *Slow Drift:* Random variations but with only small increments between values.

Sync

Each LFO has five different methods to determine how its speed and phase respond to your notes and tempo.

❖ *Off:* The LFO is free running at the speed set by the rate control.

❖ *First Note:* The LFO is restarted when a note is pressed, if no other notes are held.

❖ *Each Note:* The LFO is restarted whenever a note is pressed.

❖ *Tempo + Note:* The LFO runs in sync with the song tempo and is restarted when a note is pressed.

❖ *Tempo + Beat:* The LFO runs in sync with the song tempo and lines up with the song beats.

Rate

Sets the speed at which the LFO oscillates.

When using tempo sync modes LFO rate is shown in fractions of a beat rather than Hertz.

Phase

LFO phase is the position in the waveform cycle where the LFO is restarted when the LFO is triggered.

Turning the Phase control all the way to the right randomizes the LFO's restart phase.

LFO-3 is polyphonic, which means that each note can have independent LFO phase and speed.

ME View—The Modulation Envelope

The US-1 has a special, fully featured Modulation Envelope for intricate control over many parameters via the mod matrix.
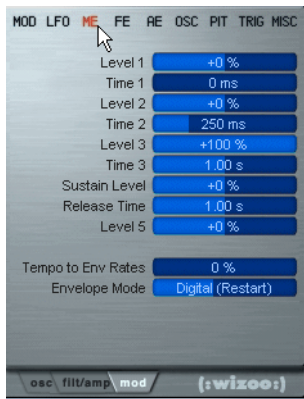
To use the Modulation Envelope in the US-1, simply select *Mod Env* in the *Source* or *Modify* column in the Mod Matrix.

The modulation envelope is a little different to the Filter and Amplitude envelopes because it has five *Level* and four *Time* controls, allowing for very intricate control.

❖ *Level 1:* Sets the initial volume of the Mod Envelope.

❖ *Time 1, 2 + 3:* Control the length of time taken for the envelope to reach Levels 2, 3 and the Sustain Level.

❖ *Sustain Level:* Is the final volume that is reached when a note is held after Levels 1 to 3 and Times 1 to 3 have been completed.

❖ *Release Time:* Is the time taken for the Mod Envelope to reach Level 5, once the note is released.

❖ *Level 5:* Is the final level reached after a note is released.

Tempo to Envelope Rates

This control adjusts to what extent the Time parameters of envelopes 1, 2 and 3 sync to song tempo. Allowing you to adjust your song tempo and have your envelope times adjust by the same amount.

Envelope Mode

❖ *Digital:* Normal Envelope behavior for envelopes 1,2 and 3. Each new voice starts its attack portion from a level of zero.

❖ *Analog:* If a released note is still sounding, new notes begin their envelope attack portion at the level of the previous note, instead of starting at a level of zero.

In Poly mode this only occurs with notes of the same pitch. In mono mode this occurs with all notes played.

FE View—Filter Envelope

The filter envelope controls seen on the top half of this view are simply the same controls for the Filter Envelope shown on the filt/amp page. They have been repeated here for programming convenience.

See the descriptions in the Filt/Amp section of this manual.
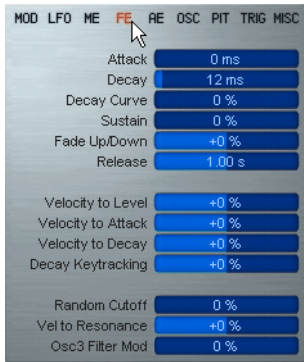
Velocity to Level

Determines the amount that velocity controls the effect of the filter envelope levels on the cutoff. With a positive setting, higher velocity produces deeper cutoff modulation.

This parameter is the same parameter as seen on the *filt/amp* page.

Velocity to Attack

Allows you to control the filter envelope attack time with key velocity. This is a very effective feature particularly for example for pads, whereby you can have a slow attack time for lower velocities and a fast attack time for higher velocities.

Velocity to Decay

Allows velocity to influence the filter envelope decay time.

Decay Keytracking

This control determines how the pitch of the MIDI notes played influences the filter envelope decay time parameter.

This is a very useful feature when for example emulating the behavior of real instruments, where the lengths of notes generally become shorter as the pitch becomes higher.

Random Cutoff

Randomizes the filter cutoff setting for each note played.

Vel to Resonance

Sets the amount that higher velocity values increase the level of the resonance.

Osc 3 Filter Mod

Adds audio rate modulation of the filter cutoff frequency. This adds a 'fuzzy' character particularly at higher resonance settings. The waveform used by oscillator 3 effects the tone of the modulation, as does the filter analog/digital type setting.

AE View—Amp Envelope

The amplitude envelope controls seen on the top half of this view are simply the same controls for the VCA shown on the filt/amp page. They have been repeated here for programming convenience. See the descriptions in the 'The US-1 Filter & Amp Page' section of this manual.
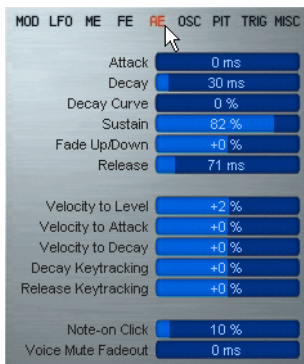
Velocity to Level

Determines the amount that velocity controls the volume of each note played. With a positive setting, higher velocity produces a higher volume.

> This parameter is the same parameter as seen in the VCA on the *filt/amp* page.

Velocity to Attack

Allows you to control the attack time of the amplitude envelope with key velocity. A positive setting produces a faster VCA attack time for higher velocities.

Velocity to Decay

Allows velocity to influence the VCA decay time.

Decay Tracking

This control determines how the key played influences the VCA decay time parameter.

> This is a very useful feature when for example emulating the behavior of real instruments, where the lengths of notes generally become shorter as the pitch becomes higher.

Release Tracking

Allows you to adjust the release times of notes relative to the key played.

Note-on Click

Applies an audible percussive click to the attack of your patch when attack time is zero.

Voice Mute Fadeout

When voice stealing occurs due to polyphony limits being reached or because your patch is set to mono mode, this feature allows you to apply a fade out time to the notes being cut.

OSC View—Extra Oscillator Parameters

In the Oscillator view you will find the extra 'expert' oscillator features described below.
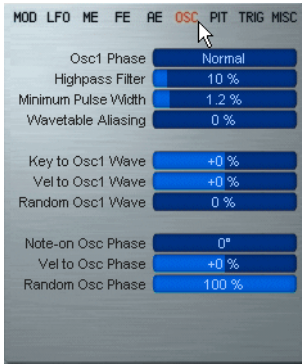
Osc1 Phase

Allows the polarity of oscillator 1 to be flipped, for canceling effects when oscillator 1 & 2 have similar settings.

High Pass Filter

Applies a high pass filter to all oscillators, allowing you to roll off lower or bass frequencies while leaving the main filter available for other purposes.

Minimum Pulse Width

When modulating the pulse width, you will notice that for very small pulse widths the audio will gradually disappear. This feature allows you to set the smallest pulse width that the US-1 patch will play.

Wavetable Aliasing

Adds a harsh digital edge to the wavetable waveforms by reducing their bit resolution. This affects oscillators 1 and 2, when set to wavetable mode.

Key to Osc 1 Wave

Varies the oscillator 1 wave parameter according to the MIDI key position of notes played.

Vel to Osc 1 Wave

Varies the oscillator 1 wave parameter according to Note On Velocity.

Random Osc 1 Wave

Introduces random variation to the oscillator 1 wave parameter.

Note-on Osc Phase

Sets the start position for all oscillator waveforms from which they play for each new note.

Vel to Osc Phase

Varies the start position for all oscillator waveforms in response to note on velocity.

Random Osc Phase

Introduces random variation to the start position for all oscillator waveforms.

> In classic analog synthesizers the oscillators were always free running, this parameter lets you emulate this characteristic by starting the oscillator's phase randomly each time a note is played.

PIT View—Extra Pitch Parameters

In the Modulation page Pitch view you will find the US-1 pitch and glide settings.
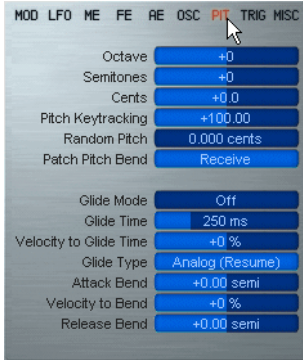
Octave

Offsets the pitch of all oscillators up or down by octaves.

Semitones

Offsets the pitch of all oscillators up or down by semitones.

Cents

Offsets the pitch of all oscillators up or down by cents.

Pitch Keytracking

Determines how the pitch tracks incoming MIDI notes. +100% is normal response. 0% gives a constant pitch across the keyboard.

Random Pitch

Introduces random pitch variations to each individual note.

Patch Pitch Bend

Sets the US-1 to respond to the pitch bend range in the patch settings or to ignore it.

Glide Mode

Glide creates a smooth change in pitch between a previously played note and a newly played note.

The US-1 has four glide modes:

Off: No glide.

Bend Only: Enables the bend settings (described below).

Fingered: Applies glide only when subsequent notes are played legato (i.e. a note is still held when a new note is played).

On: All notes played will pitch glide from the previously played note.

Glide Time

Determines the time it takes for the pitch to glide between subsequent notes played.

Velocity to Glide Time

Allows key velocity to influence the speed of the pitch glide between notes.

Glide Type

The US-1 has two distinct glide types:

Analog: In Analog glide mode the US-1 emulates the behavior of classic analog synthesizers. When no notes are held the glide stops, and resumes gliding when the next note is played.

Digital: When a note is played, glide always starts from the pitch of the previously played note.

Attack Bend

Allows you to set an additional slide in pitch to the attack of your US-1. This can be used as a simple pitch envelope. The bend time is governed by the glide time parameter.

> When used in conjunction with a glide setting, the bend and glide values add together.

Velocity to Bend

Allows key velocity to influence the depth of the attack bend.

Release Bend

Allows you to set an additional slide in pitch when a note off is received.

TRIG View—Trigger Parameters

In the Modulation page Trigger view you will find the parameters that govern whether a note is played or ignored by the US-1.
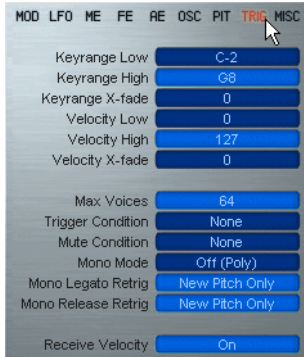
Keyrange Low

Sets the lowest MIDI note that the US-1 will play. All notes below this key are ignored.

Keyrange High

Sets the highest MIDI note that the US-1 will play. All notes above this key are ignored.

> If Keyrange High is set lower than Keyrange Low then notes between these settings are ignored.

Keyrange X-Fade

Sets the number of notes over which the sound fades out, above and below the specified keyrange.

Velocity Low

Sets the lowest velocity value at which the US-1 will play. All velocities below this are ignored.

Velocity High

Sets the highest velocity value at which the US-1 will play. All velocities above this are ignored.

Velocity X-Fade

This has a similar effect to the Keyrange X-Fade but affects velocity.

Max Voices

Sets a polyphony limit for the US-1.

> Polyphony limits can also be set per patch on the Hypersonic MIDI page.

Trigger Condition

Sets the situations in which the US-1 will play incoming MIDI notes.

❖ *Mod Wheel Up:* The US-1 only plays when the mod wheel is set to a value of between 64 and 127.

❖ *Mod Wheel down:* The US-1 only plays when the mod wheel is set to a value of between 0 and 63.

❖ *Sustain Up:* The US-1 only plays when the sustain pedal is up.

❖ *Sustain Down:* The US-1 only plays when the sustain pedal is pressed.

❖ *Odd Patch Note:* The US-1 only plays alternate notes, starting with the first incoming note.

❖ *Even Patch Note:* The US-1 only plays alternate notes, starting with the second incoming note.

❖ *Odd Elem Note:* The US-1 only plays alternate notes that fall within the keyrange and velocity range settings, starting with the first incoming note.

❖ *Even Elem Note:* The US-1 only plays alternate notes that fall within the keyrange and velocity range settings, starting with the second incoming note.

Mute Condition

Sets the situations in which the US-1 will mute existing notes when a new note is received.

❖ *Mute Same Note:* Anytime a note is repeated the previous note is muted.

❖ *Mute Other Elems:* Any notes playing in other elements in the patch are muted.

❖ *Mute Whole Patch:* All other notes playing in the patch are muted.

❖ *Mute Groups 1 to 8:* These are the 8 monophonic exclusive groups for each US-1 patch.

An obvious use for these is controlling monophonic hi hat groups.

Mono Mode

This is where you select whether your US-1 will play polyphonically or monophonically.

❖ *(Off) Poly:* As the name suggests this allows your US-1 to play polyphonically up to the voice limit set in the Max Voices parameter.

❖ *Lowest Note:* Monophonic mode. The lowest of any held notes is always played.

❖ *Highest Note:* Monophonic mode. The highest of any held notes is always played.

❖ *First Note:* Monophonic mode. The oldest of any held notes is always played.

❖ *Last Note:* Monophonic mode. Any new note is always played, regardless of which notes are already held.

Mono Legato Retrig

Determines what happens when notes are played legato in a monophonic mode.

❖ *Start New Voice:* No Legato. The previous voice is muted and a new voice started.

❖ *All Modulation:* The previous voice takes the pitch of the new voice and all envelopes and LFOs are retriggered.

❖ *Filt + Amp Envelope:* The previous voice takes the pitch of the new voice and the filter and amplitude envelopes are retriggered.

❖ *Filt Env:* The previous voice takes the pitch of the new voice and only the filter envelope is retriggered.

❖ *New Pitch Only:* The previous voice takes the pitch of the new voice but no modulation is retriggered.

Mono Release Retrig

Determines what happens when a note is released in a mono mode and other notes are still held.

The modes available in this field act in exactly the same way as described for the Mono Legato Retrig parameter above.

Receive Velocity

When set to *Amp Env Only* all velocity information is ignored for modulation, except by the amplitude envelope.

Misc View—Miscellaneous Parameters
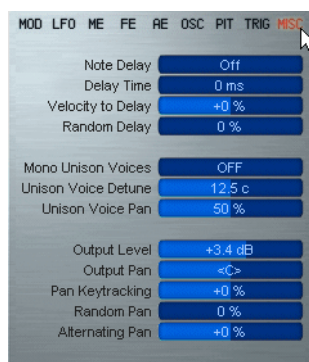
Note Delay

Forces the US-1 to play with a delay set either in milliseconds or fractions of a beat, or only when it receives a MIDI note off.

Delay Time

Sets the delay time for the parameter above.

> In note off mode this controls the fade out time.

Velocity to Delay

Key Velocity controls the length of the *Note Delay* parameter.

Random Delay

Introduces a random variation in the *Note Delay* parameter.

Mono Unison Voices

Determines the number of voices that play in Unison in monophonic modes.

Unison Voice Detune

Determines the detuning width of the Unison voices.

Unison Voice Pan

Controls the stereo spread of the Unison voices.

Output Level

Sets the master volume for the US-1.

Output Pan

Sets the stereo image position of the US-1.

Pan Keytracking

Pans the US-1 voices in the stereo image in relation to the pitch of the MIDI notes played.

Random Pan

A random variation influences the stereo position of each note played.

Alternating Pan

Each odd and even numbered note played will be panned towards opposite sides of the stereo image.

Special MIDI Controller Functions For The US-1

In addition to responding to all of the usual Hypersonic MIDI controllers, the US-1 also responds to:

CC20	Osc1 Mix
CC21	Osc1 Wave
CC22	Osc2 Mix
CC23	Osc2 Wave
CC24	Osc3 Mix
CC25	Osc3 Sub
CC26	Noise
CC27	Cutoff
CC28	Resonance
CC29	Drive
CC30	Out Mix

Only the first US-1 in a patch responds to these special MIDI Controllers.

Modulation Sources, Modifiers, and Destinations Table

The following Table describes briefly how the various modulation sources, modifiers and destinations available in the US-1 Mod Matrix function.

❖ The following sources are available in both the Source & Modify sections of the Mod Matrix.

Function	Description
Constant	A constant unchanging value.
Random	New random values are generated for each note on.
Velocity	Note on velocity.
Key	MIDI key position.
Pitch	MIDI key position including pitch bend and glide.
Mod Wheel	Mod Wheel position.
Aftertouch	Aftertouch value.
Pitch Bend	Pitch Bend wheel position.
Breath Ctl	MIDI Breath Control Information.
Wheel 3	Mod Wheel 3 or CC 3.
Foot Ctl	MIDI Foot Control Information.
Sus Ped	Sustain Pedal position.
Soft Ped	Soft Pedal position.
Knobs 1 to 6	Hyperknobs 1 to 6.
Seq 1	Control Sequence 1 (found in the *Patch Settings/Arpeggio/Edit*).
Seq 2	Control Sequence 2 (found in the *Patch Settings/Arpeggio/Edit*).
LFO 1 to 3	LFO's 1,2 and 3.
Mod Env	Modulation Envelope.
Filt Env	Filter Envelope.
Amp Env	Amplitude Envelope.

❖ The Row sources below are only available in the Source column.

Function	Description
Rows 1 to 15	The value of the output generated by the Mod Matrix row chosen.

❖ The following functions are only available in the Modify section and process the Source value according to the Modify slider value.

Function	Description
Add	Adds or subtracts a constant amount from the source.
Multiply	Multiplies the source by a constant amount.
Drive	Multiplies the source by a constant amount but prevents the output going beyond ±1.0.
Clip +	Limits the maximum value that the source can output.
Clip −	Limits the minimum value that the source can output.
Rect +	Inverts the source signal if it goes above the specified value.
Rect −	Inverts the source signal if it goes below the specified value.
Curve	Waveshapes the source from concave though linear to convex.
Sine	Waveshapes the source using a sine wave.
Exp	Applies an exponential curve to the source.
Log	Applies a logarithmic curve to the source.
Switch	Switches the output between on or off when the source passes the threshold.
Quant 1	Rounds the source values to the specified number of steps. Equal lengthed steps for a saw input.
Quant 2	Rounds the source values to the specified number of steps. Equal lengthed steps for a triangle input.
S+H	Freezes the source signal and updates it at the interval set by the Modify slider.
Drift	Randomly varies the source.
Sine Amp	The source controls the level of a sine wave whose frequency is set by the Modify slider.
Sine Freq	The source controls the fine frequency of a sine wave and the Modify slider sets the coarse frequency.

Function	Description
Lin Ramp	A linear ramp is triggered at note on. The Modify slider sets the ramp time. A positive value produces a ramp up, a negative value a ramp down. The source signal is multiplied by the ramp value.
Delay Ramp	Similar to Lin Ramp but with a delay equal to the ramp length before the ramp begins.
Exp Ramp	Similar to the Lin Ramp but with an exponential shape.
Log Ramp	Similar to the Lin Ramp but with a logarithmic shape.
Tri Env	Similar to the Lin Ramp but followed by a ramp down.
Gate Env	Holds at full value for the time set by the Modify slider then switches to zero instantly. For negative time settings the value is zero and then switches to full.
Log Lag	Slows the rate of change of the source. The rate of change slows as the source value is approached.
Lin Lag	Ramps at a constant rate towards the source value and stops when the source value is reached.
Peak Hold	Tracks the peaks in the source signal and decays slowly towards zero until the next peak is detected.
Diff Hold	Tracks sudden changes in the source signal and decays slowly towards zero until the next peak is detected.

❖ The following are the possible Mod Matrix destinations affected by the source and modifier.

Function	Description
Pitch	US-1 master pitch.
Osc 1 Wave	Wave knob position for oscillator 1.
Osc 2 Wave	Wave knob position for oscillator 2.
Cutoff	Filter Cutoff is modulated.
Reso	Filter Resonance is modulated.
Amp	US-1 Volume is modulated.

Function	Description
Pan	Stereo image position.
LFO3 Rate	Modulates the speed of LFO 3.
Mod Env Rate	All Time parameters for the Modulation Envelope are affected.

The US-1 About Page & Expansion Bay

Click on the small triangle at the bottom of the Hyper display to open the Expansion bay.

❖ You will see that you now have a US-1 chip installed.

Clicking the US-1 chip will open the US-1 'About' page in the hyper display revealing the names of those behind its development.

This page can also be accessed by clicking on *US-1* in the User Interface.

Clicking an empty chip slot takes you to our web page for news and interesting developments for Hypersonic and the Hyper Modules.

4

GP-2 Grand Pianos

In this chapter we'll show you around the GP-2 Grand Pianos Hyper Module.

Key Features

❖ Two natural concert grand pianos.

❖ Seamless character adjustment between soft/natural/bright/hard.

❖ Authentic sustain resonance.

❖ Authentic sounding hammer action.

❖ User adjustable velocity response.

❖ Six preassigned Hyperknobs controlling the most effective editing options.

❖ ECO/MID/XXL selection for optimized performance.

❖ Full integration into Hypersonic.

Getting Started with the GP-2

Getting started with the GP-2 is simple. Let's assume that you are already at least a little familiar with Hypersonic, the first thing you'll want to do is load some patches.

Loading GP-2 Patches

All Hyper Module Patches are displayed at the top of the usual Hypersonic *Load* page.

1 Click the Hypersonic *Load* button to the right of the display area.
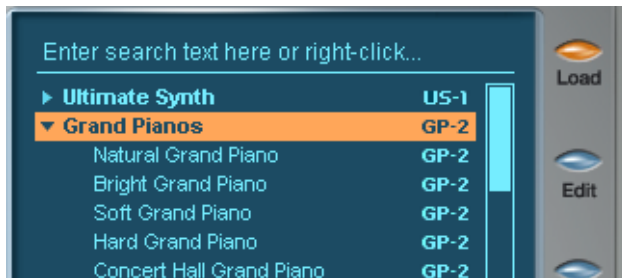
2 Open the *Grand Pianos GP-2* folder.

3 Double click on a patch from the list.

❖ A message *Loading...* will appear in your Hyper display.

❖ Hypersonic checks the copy protection key the first time you load a GP-2 patch in each session, this means that the first time you load a GP-2 piano you will notice a slightly longer loading time than usual.

4 Once loading is complete you can play your patch.

❖ The size (ECO/MID/XXL) of the piano patch loaded will vary depending on your Hypersonic global ECO/Default/XXL selector (the field directly under *Memory used* on the *Setup page*). The default setting is MID. To hear the GP-2 in all its glory set the master memory to XXL.

To quickly preview the patches, try using the standard Hypersonic key command to load the next or previous patch on the load page –Hold [Shift] and press [down/up] arrows.

The GP-2 User Interface

Now that you've loaded and played your first GP-2 piano you'll probably want to check out what the GP-2 Hyper Module expansion looks like and what it offers.

❖ To see the GP-2 User Interface simply

1 Load a GP-2 patch

2 Click the Edit button to the right of the display area

or

3 Click on the GP-2 Icon displayed on the right hand side of the patch name in the Hypersonic Part.
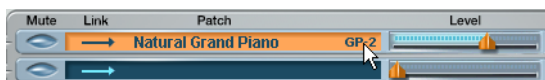
This icon allows you to toggle between the GP-2 user Interface and the last display page you were working on in Hypersonic.

　
The first thing you'll be greeted by is a very simple and uncluttered view, even though there's a lot of action happening under the hood of the GP-2 we wanted it to feel intuitive and easy to use.

Let's check out the features.

Sound Character

The Sound Character section's sophisticated control knob let's you finely adjust the complex response of the GP-2 to suit your musical style or technique in terms of both volume and tone. Four main sound characters are displayed but the Sound Character control knob seamlessly morphs between and beyond these 4 tonal characters, offering endless fine adjustment and control.

❖ Unlike the way sound is edited in samplers or digital pianos, the Sound Character control knob does not merely modify simple parameters such as filter cutoff and velocity sensitivity. Here, a diverse range of tonal properties are varied.

Natural

As the name suggests, the GP-2 plays and sounds just like an acoustic grand.

> Good for classical and jazz styles as well as other musical scenarios calling for natural, realistic sound and authentic response.

Soft

Full volume range with dampened tonal response. Turning the character control knob beyond soft produces a much more exaggerated soft tone.

Good for soft songs, ballads and mood music.

Bright

Full volume range with brighter tonal response and added punch.

Good for solo/melody lines and for playing along with electric/electronic instruments.

Hard

Compressed volume range and brighter tone with extra percussive attack. Turning the character control knob beyond hard produces an exaggerated amount of extra attack.

Good for the kind of in your face, punchy grand piano sounds typical of modern music styles.

Grand Piano Models

The GP-2 Grand Pianos, as the name suggests offers not just one grand piano but actually two completely different grand pianos. Why not try them out now, simply click on the *Model 1* or *Model 2* buttons on the right of the GP-2 and play.

On most computers, reloading or changing model types takes around 3 seconds as there is quite a lot more sample data in a GP-2 piano than in most Hypersonic patches.

Although both grand piano models offer many different sound characters via the sound character knob the actual pianos themselves also have very distinctive sound qualities.

❖ The model 1 piano is quite bright and present with a lot of punch and attack and is great for sticking its head thru a full sounding mix.

❖ The model 2 grand piano has a softer, gentler nature and is more mellow.

❖ Both of the GP-2 piano models have the possibility to change their character quite radically by using the sound character knob. The bright model 1 piano can become mellow, the softer model 2 piano can become brighter and harder. Try playing both and moving the sound character knob.

True Sustain
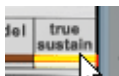
This is a rather sophisticated feature found in only a few very costly digital pianos.

When you play a note on an acoustic grand piano, only the damper of that key is raised. All other strings are damped and to a large extent only the sound of the string hammered by that key is audible.

Say you step on the right pedal (hold or sustain). This causes the dampers of all keys to be lifted from the strings. Now when you hit a key, the vibration of its string causes surrounding strings and the housing to vibrate sympathetically (or resonate). The sound produced by this sonic event could be described as something similar to a harmonically rich reverb.

By its very design, a concert grand gives you that option. So does the GP-2.

Because this feature is so important in creating the natural feeling of a grand piano we have dedicated the first Hyperknob of most patches to the level of the true sustain resonance. To hear what it sounds like try playing some piano with sustain pedal while changing the level of the true sustain with Hyperknob 1.

True Sustain Special mode

Since you've taken the time to read this manual we'll let you in on a little secret, we liked the sound of the true sustain resonance so much that we made it also available in a special mode, aptly called true sustain special mode. If you right click ([Ctrl]-click on Mac) the true sustain button you will notice that it turns blue.

In this special mode the true sustain plays whenever a note is played and not just when the sustain pedal is pressed, becoming an effect something like a reverb very rich in harmonics.

> Check out the GP-2 patch 'True Sustain As Reverb' and you will see that we have assigned an extra Hyperknob to control the Tail Length or release time of the true Sustain.

Velocity Response

Unlike an acoustic grand piano, The GP-2 may be played using a surrogate – your MIDI keyboard. For obvious reasons, you should use a keyboard sporting weighted wooden keys to capitalize on the sensitive and complex dynamic response of the instrument.

Unfortunately, not everyone has this type of keyboard close at hand. Beyond that, response and handling varies from keyboard to keyboard, and every keyboard player's style is unique.

Fortunately, you can adapt the GP-2 to suit your MIDI keyboard and style of play in the Velocity Response display.

The GP-2's Velocity Response display has three default settings:

Soft

The soft velocity response curve is specially designed to produce a softer tone when playing the GP-2 from a normal MIDI keyboard. This curve is also useful when you are using a keyboard that doesn't easily produce lower key velocity values.

Medium

This is the natural response curve and tone for the GP-2 when played by most keyboards.

Hard

The hard velocity response curve is useful to produce a harder tone when using a normal MIDI keyboard and also allows you to play the GP-2 more naturally if your MIDI keyboard doesn't easily produce high key velocity values.

❖ Of course the GP-2 offers also the possibility to simply adjust the curve at any time to fine tune your velocity response with your mouse as required for your song or keyboard.

It's worth mentioning that the *Vel Sens* (Velocity Sensitivity) setting on Hypersonic's *Setup* page will also influence the response of your GP-2 and its velocity curves.

Memory Management

Hypersonic and the GP-2 are extremely effective in terms of RAM usage and speed of loading:

❖ A proprietary sample optimization algorithm is utilized that not only minimizes the size of the sample content on disk, but also in RAM. This technology saves up to 66% of valuable storage space with no loss in audio quality.

❖ When several GP-2 Pianos of the same model are loaded into Hypersonic, they are only loaded once into memory (Memory Sharing). Once a piano is loaded, all subsequent pianos of that model type will load virtually instantly.

❖ You will also notice that once you have loaded a model 1 or 2 grand piano in a session and then deleted it, the next time you load a piano of the same model the loading time will be much faster.

Because there may be situations where you find it convenient to use smaller versions of the GP-2 pianos, (when your system memory is low for example) we have provided XXL, MID and ECO versions of each of the piano models.

❖ Hypersonic's global ECO/Default/XXL selector (the field directly under *Memory used* on the *Setup page*) affects the size of the GP-2

piano factory patches loaded. The default setting is MID. If you save a piano as a User Patch it will always load in the saved size regardless of the Setup page memory setting.
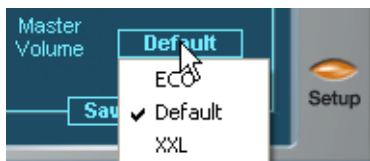
❖ The XXL, MID and ECO memory size in each piano model has been specially designed to give the best sounding results, so the amount of memory saved varies a little between each model and size.
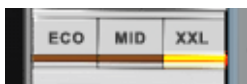
XXL

This utilizes all of the wave ROM for the two grand piano models.

MID

Reduces the size of each piano to approximately two thirds of the XXL size.

ECO

Reduces the size of each piano model to less than one half of the XXL size.

Using the GP-2 in the Real World

In this section we'll give some tips about how to get the most out of the GP-2 in your normal music working environment.

Nice piano but how do I tweak it to my playing style?

Well, of course the obvious tweaks for the GP-2 would be achieved by clicking *Edit* and going directly to the User Interface, choosing a piano model and adjusting the sound character, velocity response etc but we have also done some tweaking ourselves and assigned what we think are the most useful playing parameters to your Hypersonic Hyperknobs. Because one of the most important factors in a grand piano is that it feels great to play, most of the Hypersonic Hyperknobs are dedicated to allowing you to fine tune the way the GP-2 responds to your playing.

Let's see what the most common ones do:

True Sustain—Hyperknob 1

This controls the level of the True Sustain resonance; you can turn it down, off, or exaggerate the level.

> For most patches you will only hear the true sustain of course when your sustain pedal is down.

Velocity To Level—Hyperknob 2

This Hyperknob controls the volume of the GP-2 when you are playing at very low velocity, in effect controlling just how quietly low velocity notes play.

Tone—Hyperknob 3

This allows you an additional control for the tone/filter character of your GP-2 patch, you could for example use a bright piano but turn the tone down to create something completely different to the possibilities available in the GP-2 interface.

Velocity To Tone—Hyperknob 4

This Hyperknob controls the tone of the GP-2 when you are playing at very low velocity, in effect controlling just how bright or soft your low velocity notes sound.

Hammer Noise—Hyperknob 5

This controls the volume of the hammer noise produced when you release the key of a piano. With this Hyperknob you can turn the hammer noise up, down or off completely.

Release—Hyperknob 6

This Hyperknob controls how long the release time is for your piano, you can easily make it more percussive with a fast release or longer and more ambient for example.

> These are just some of the more common Hyperknobs used in the GP-2 patches. You will find many others specially designed to give you maximum control over the most useful parameters for each patch.

How do I layer the GP-2 with something else?

Since the GP-2 is a Hyper Module and operates within Hypersonic you naturally inherit all the usual convenient Hypersonic features and all of the Hypersonic factory library. Layering is fastest and easiest by simply linking parts.

1 Choose and load a GP-2 piano into Hypersonic Part 1.

2 Choose and load a pad into Hypersonic Part 2.

3 Click the Part *Link* arrow in Part 2 and play.
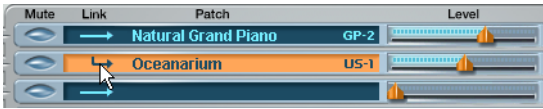
How do I add my own effects to a GP-2 patch?

When you load a GP-2 piano and click *Edit* you will notice that there are already 2 muted effects elements waiting for you at the end of the elements list on the left hand side of the page. Simply click on one and select an effect.

Special MIDI Controller Functions for the GP-2

In addition to the regular Hypersonic MIDI controller response, the GP-2 allows you to adjust the Sound Character knob using MIDI CC# 70.

The GP-2 About Page & Expansion Bay

Click on the small triangle at the bottom of the Hyper display to open the Expansion bay.
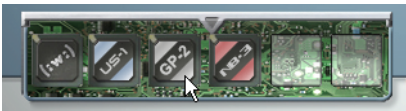
You will see that you now have a GP-2 chip installed.

Clicking the GP-2 chip will open the GP-2 'About' page in the hyper display, revealing the names of those behind the development of the GP-2.

This page can also be accessed by clicking on *GP-2* in the User Interface.

Clicking an empty chip slot takes you to our web page for news and interesting developments for Hypersonic and the Hyper Modules.

5

NB-3 Virtual Tonewheel Organ

In this chapter we'll show you around the NB-3 Virtual Tonewheel Hyper Module.

Key Features

❖ Nine Drawbars.

❖ Unique tonewheel emulation (variable from the original pure sound to dirtier, more complex and electronic timbres).

❖ Fully configurable Percussion section with On/Off, Loud/Soft, Short/Long, 3rd/2nd harmonic.

❖ Adjustable key click.

❖ Virtual rotary speaker cabinet with valve preamp and controls for speed, color and overdrive.

❖ Authentic Scanner vibrato.

❖ Rotor horn display.

❖ Rotary cabinet and scanner vibrato can be used as FX elements in any Hypersonic patches.

❖ Includes 64 patches programmed by Peter Gorges.

Getting Started with the NB-3 Tonewheel Organ

Probably the best way to get acquainted with your NB-3 is to play some patches and check out the features available in the User Interface.

Loading NB-3 Patches

All Hyper Module Patches are displayed at the top of the usual Hypersonic *Load* page.

1 Click the Hypersonic *Load* button to the right of the display area.

2 Open the *Tonewheel Organs NB-3* folder.

3 Double click on a patch from the list.

4 Play your patch.

❖ Load & Play some more patches.

To quickly preview the patches, try using the standard Hypersonic key command to load the next or previous patch on the load page – Hold Shift & press the Down/Up arrows.

❖ The last patch in the *Tonewheel Organs NB-3* bank is an 'Init' (Initial) patch which has all parameters set to useful default values for easily creating your own patches.

The NB-3 User Interface

Now you've seen how easy it is to load and play the NB-3 patches, let's take a look at what the NB-3 Hyper Module looks like and how it works.

❖ To see the NB-3 User Interface simply click the *Edit* button to the right of the Hypersonic display area

or

❖ click on the NB-3 Icon displayed on the right hand side of the patch name in the Hypersonic Part.
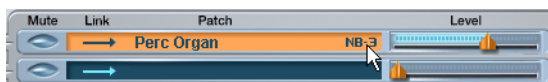
This Icon allows you to toggle between the NB-3 User Interface and the last display page you were working on in Hypersonic.

The NB-3 User Interface is very clean and intuitive but still contains all the features you'll find on a hardware tonewheel organ.

In the following sections we'll find out what the NB-3 features are and how they work.

Drawbars

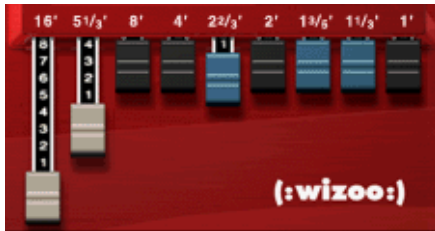As with all classic tonewheel organs, the NB-3 drawbars are probably the first thing you'll want to touch when you create or tweak your patches.

Changing your drawbar settings is as simple as pointing at them with your mouse and moving them up and down.

❖ You will notice that each drawbar has 8 discreet volume settings, just like the classic tonewheel organs, pushing a drawbar all the way to the top turns it off, pulling it down makes it progressively louder.

What are drawbars and what do they do?

On a classic tonewheel organ the drawbars were designed to produce sine waves of different frequencies.

❖ Although in practice these sine waves were a little less than pure, the lower frequency waves were intentionally colored to improve their body and the electronics used to generate the sine waves also colored the sound a little, helping to create the famous character of the classic organs.

When adding these different frequencies or harmonics together, more complex spectra or tones are created.

❖ You will notice that each drawbar is labeled with a number and the symbol ('), the (') symbol refers to feet and is historically derived

from the length of pipe used by pipe organs to achieve specific pitches. We're obviously not hiding any 16-foot slabs of metal tubing in your VST plug-ins folder, but to this day the feet symbol is still very useful because it describes important relationships between different frequencies. Halving the length (in feet) doubles the frequency, raising the pitch by an octave. Doubling the size halves the frequency, lowering the pitch by an octave.

If we consider the 8' drawbar as being the fundamental, then the harmonic relationship of the drawbars are:

Drawbar	Harmonic Relationship	Pitch Relationship
16'	½ the frequency of the fundamental	1 Octave below
5 1/3'	1½ times the frequency of the fundamental	A Fifth Higher
8'	Fundamental	
4'	2nd Harmonic	1 Octave Higher
2 2/3'	3rd Harmonic	1 Octave and a Fifth Higher
2'	4th Harmonic	2 Octaves Higher
1 3/5'	5th Harmonic	2 Octaves and a major 3rd Higher
1 1/3'	6th Harmonic	2 Octaves and a Fifth Higher
1'	8th Harmonic	3 Octaves Higher

Tonewheels

The next most important feature for creating or modifying your NB-3 sound color is the Tonewheels selector.

❖ To select the different Tonewheels turn the wheel to the left of the Tonewheels display

or

❖ left mouse click in the Tonewheels field for the next Tonewheel, right click for the previous one ([Ctrl]-click on Mac).

Tonewheel organs generate their sound by spinning 2-inch metal wheels (tonewheels) mechanically on a drive shaft. Each tonewheel has a number of smoothly shaped teeth around the edge and an electric guitar style coiled pickup, located directly next to it. The tonewheels spinning motion creates magnetic field variations, inducing a fluctuating (sine wave shaped) electrical voltage via the pickups. The frequency a tone wheel produces is determined by a combination of the shape of its edge (varying from a few large curves to many small ones) and the speed at which the wheel rotates (each wheel was driven at a set speed by its own geared cog from the main drive shaft to produce the twelve pitches of the chromatic scale).

Each key on a tonewheel organ keyboard has nine physical electrical contacts, wired directly to the nine tonewheels used to create the sound for each of its nine drawbars.

The NB-3 features ten different Tonewheel waveform shapes. The classic tonewheel organs were only capable of generating a single basic sine wave shape but we have implemented a range of colors to enable you to create a multitude of other organ sounds and colors not normally available in a single instrument.

Here's a table of the waveforms generated by the ten tonewheel types.

Type	Description	Character
Real	Modeled from a handpicked classic tonewheel organ.	For all classic organ registers.
Dirty	Modeled tonewheel organ with exaggerated noise, distortion and tonewheel crosstalk.	To emulate a heavily used tonewheel organ.
Clean	Tonewheels with all imperfections removed.	To emulate an impossibly perfectly maintained tonewheel Organ.

Type	Description	Character
Sine	Pure sine waves.	Produce a brighter and clearer sound, but can become inaudible at low frequencies due to the lack of harmonics.
Soft	Heavily lowpass filtered square wave.	For most transistor organ sounds.
Saw	Heavily lowpass filtered sawtooth wave.	An alternative transistor organ character.
Square	A brighter mildly filtered square wave.	For cheesy organ sounds.
Buzz	Sine wave with additional square wave harmonics to add brightness.	For cutting and fuzzy sounds.
Bright	Bright pulse wave.	For thin and biting transistor organ sounds.
Rich	Sawtooth wave.	A slightly more church organ like sound.

Percussion

Another essential element of tonewheel organs is the percussion. On classic tonewheel organs this is polyphonic but the percussion 'envelope' only retriggers after all keys have been released (it is also only available on the upper manual). These characteristics are of course available in the NB-3 but we have also implemented a few special features for the situations where you don't want to be classic.

Let's take a look at what the percussion controls do in the NB-3.

On/Off

As its name suggests, this switch enables or disables the percussion section. What may not be obvious and is a pretty cool feature, is that right clicking the rocker switch ([Ctrl]-click on Mac) enables *poly* percussion, allowing the percussion to play each time a note is played (ignoring the classic behavior of only allowing percussion to play if all previous notes have been released).

Loud/Soft

This is also quite self-explanatory.

> Like the real thing, the volume of the drawbars is reduced when the percussion is set to Loud to emphasize the difference.

Short/Long

Selects the decay time of the percussion.

3rd/2nd

Sets the percussion to play the second or third harmonic. In classic organs the percussion sound is produced by 'borrowing' either the second or third harmonic signal, which means that for sustained notes the borrowed harmonic does not sound except while the percussion is audible. For flexibility the NB-3 is designed to not steal the second or third harmonic for sustained notes.

> To emulate the classic 'borrowing' behavior simply turn down the drawbar level of the 4' or 2 2/3' drawbars as appropriate.

> You will notice that for many patches, Hyperknob 1 is set to *Key click*. This is to allow you to easily exaggerate or remove the classic key contact click found on tonewheel organs.

Chorus Vibrato

The Scanner Vibrato found in classic tonewheel organs is also featured in the NB-3.

In classic tonewheel organs the Scanner vibrato was achieved by using an electrical time delay line. The delay line is scanned back and forth by a capacitive pickup attached to the main drive shaft of the organ. In effect this produces a gritty sounding vibrato.

❖ The main difference between the Scanner chorus and vibrato is that in the chorus modes, the dry signal is added to the delay line output whereas the vibrato is purely the delay line output.

In the NB-3 we have recreated the three vibrato and three chorus modes of the Vibrato scanner.

V1 & C1

Produce the lightest modulation

V2 & C2

Produce a deeper modulated sound

V3 & C3

Are the deepest and grittiest settings

❖ The good news about the Scanner Vibrato is that when you purchase the NB-3 this effect is also available to be used with any other Hypersonic patch.

Extra Scanner Vibrato Modes

The Scanner Vibrato effect element also has some extra features. To view these simply click in the first FX element in the element list on the left side of the Hypersonic display or click in the name field at the top of the NB-3 User Interface.

Mode

Selects Vibrato 1,2, or 3, Chorus 1,2, or 3 or turns the scanner effect off.

This control duplicates the chorus vibrato control on the NB-3 User Interface.

Rate

 Controls the modulation speed.

Depth

Trims the amount of pitch modulation. The default setting is 1 milli-second.

Grit

Accentuates the stepping between the delay line pickups.

Amp Mod

Increases the signal loss as it travels along the delay line, resulting in more of a tremolo effect.

The NB-3 Rotary Cabinet

No tonewheel organ would be caught dead without a rotary cabinet connected and lurking in the vicinity and the NB-3 of course has a great rotary simulation that won't put you in hospital every time you physically move your music project. When we were designing the NB-3 we decided to add the rotary cabinet as an effect element (*Rotary Speaker 2*) rather than integrate it into the NB-3 User Inter-

face, the reason being that Rotary cabinets are very useful for other types of sounds and not just organs.
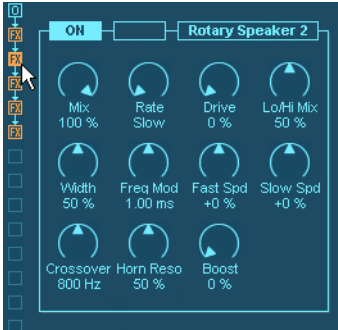
To edit the Rotary cabinet settings:

❖ Click the second FX element in the elements list on the left side of the Hypersonic display

Or

❖ Click in the name field at the top of the NB-3 User Interface.

Rotary cabinets come in many shapes, sizes and configurations. Most systems contain a monophonic amplifier driving a large bass speaker (directed downwards into a rotating drum) and a much smaller treble tweeter (pointing upwards into a rotating horn assembly). Although both the bass drum baffle and treble horn rotate, they are driven by their own two-speed motors and spin at slightly different frequencies. The treble horn, while appearing to be bi-conical has one side plugged as a counter balance to reduce wobble.

The classic rotary cabinet sound comes from the Doppler effect created by the spinning drum and horn and the organ player's skillful use of both fast and slow speeds. The characteristic acceleration to fast and deceleration to slow speeds is also very important to the classic rotary sound and the NB-3 rotary cabinet emulates this.

❖ By the way, did you notice that rotary speaker spinning away in the grill below the chorus vibrato on the NB-3 User Interface?

Mix

Unlike a real rotary cabinet, we give you the ability to control the balance of the rotary and direct signals.

Since the sound of a tonewheel organ changes greatly depending on whether it is played though a rotary cabinet or not, this control is assigned to Hyperknob 2 in most patches.

Rate

Sets the rotary speed to slow (left), stop (center) or fast (right).

The rotary rate control is one of the most important performance features in organ playing so we have assigned it to Hyperknob 3 for most patches and it is also assigned by default to the mod wheel for easy performance control. In its center position Hyperknob 3 sets the rotary cabinet to stop. You can of course assign it to another controller, the sustain pedal for example. To do this simply click in the name field of Hyperknob 3 and select Sustain Pedal. You'll want to disable the sustain pedal's normal hold function though: To do this, from the same drop down menu click *Exclusive*.
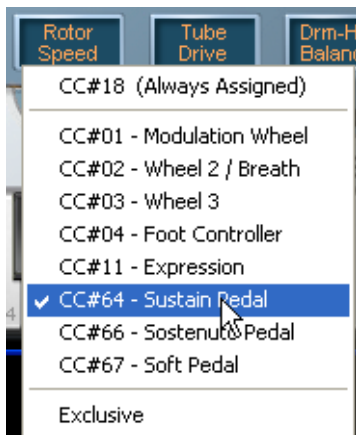
Drive

Allows you to add tube overdrive before the rotary cabinet speakers.

> Being another important sound shaping feature, it's also generally assigned to Hyperknob 4.

Lo/Hi Mix

Controls the volume balance between the low frequency drum and the high frequency horn.

> Generally assigned to Hyperknob 5.

Width

Allows you to set the width of the stereo field.

> Hyperknob 6 in most patches.

Freq Mod

Controls the depth of the Doppler effect due to the spinning horn.

Fast Speed

Adjusts the speed for the fast rotation mode.

Slow Speed

Adjusts the speed for the slow rotation mode.

Crossover

Sets the frequency at which the input signal is split to be sent to the low frequency drum and the high frequency horn.

Horn Reso

Adjusts the coloration of the signal due to the resonance of the high frequency horn.

Boost

Is an additional gain/drive control to make the sound extra dirty.

The Extra NB-3 Effects

Most NB-3 patches include some standard effect elements to get that classic tonewheel organ sound, so you have the flexibility to tweak these to your own taste or even to simply turn them off.

The effects in most patches are:

Parametric EQ: The EQ is there so you can boost or cut the frequencies you like for the patch.

Multiband Compressor: A classic tonewheel organ compresses its volume a little as you add notes and this effect emulates this characteristic. You can tweak it to your taste or remove it.

Reverb: This is simply a small room reverb because you rarely play an organ in anechoic chamber.

Special MIDI Controller Functions for the NB-3

In addition to responding to all of the regular Hypersonic MIDI controllers, the NB-3 also responds to:

CC12 to 20	Drawbars 1 to 9.
CC31	Chorus-Vibrato Mode Switch.
CC66	Percussion On/Off.
CC70	Loud/Soft Percussion Switch.

CC71	Short/Long Percussion Switch.
CC72	3rd/2nd Percussion Select.

The NB-3 About Page & Expansion Bay

Click on the small triangle at the bottom of the Hyper display to open the Expansion bay.
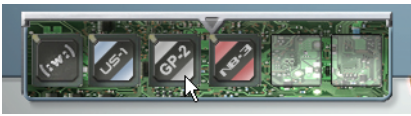
❖ You will see that you now have a NB-3 chip installed.

Clicking the NB-3 chip will open the NB-3 'About' page in the hyper display, revealing the names of those behind the development of the NB-3.

This page can also be accessed by clicking on *NB-3* in the User Interface.

Clicking an empty chip slot takes you to our web page for news and interesting developments for Hypersonic and the Hyper Modules.