Tyrell N6

User Guide

2025 beta

Heckmann Audio GmbH • Berlin

Introduction

Installation

Go to the TyrellN6 webpage, scroll down until you see the Mac/PC/Linux download links for the latest version of the plugin (v3.0). Download the compressed file, unzip it, run the executable installer file and follow the on-screen instructions.

The Story

In 2009 the German online magazine for musicians, Amazona, set out to develop the a 500 Euro analogue synthesizer by discussing with its readers about which features they would like to see. A collaboration with Behringer was moving too slowly, and Amazona moved to Plan B: Ask Urs (u-he) to create a software version of what they had already sketched out. Thus TyrellN6 was born...

Read the entire story in German here: https://www.amazona.de/from-tyrell-n6-to-deepmind-12/

Online Resources

For downloads, news articles and support, go to the u-he website
For lively discussions about u-he products, go to the u-he forum at KVR
For friendship and informal news updates, go to the u-he facebook page
For u-he presets (commercial and free), go to u-he preset library
For video tutorials and more, go to the u-he youtube channel

To keep this user guide concise, the standard u-he preset browser is not covered here. However, Tyrell's browser has the same functionality as the one in most other u-he software products. Here's a direct link to the **Hive 2** user guide—scroll down a page and click on **Preset Browser**: https://uhe-dl.b-cdn.net/manuals/plugins/hive/Hive-user-guide.pdf. 13 pages of detailed info!

Team u-he 2025 (Q4)

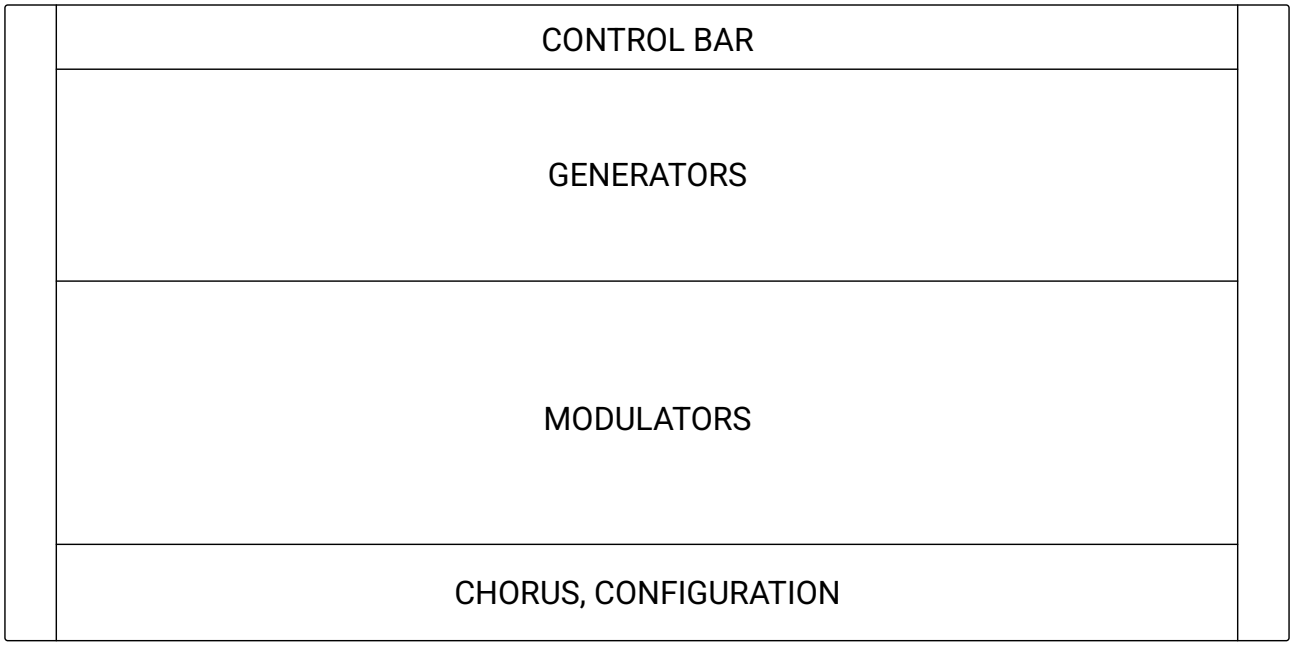
Urs Heckmann (concepts, code); Jayney Klimek (accounting, procuration); Howard Scarr (sound design, user guides, grump); Sebastian Greger (UI design, 3D graphics); Jan Storm (framework, hardware code); Oddvar Manlig (business development); Viktor Weimer (customer support, sound design); Thomas Binek (QA, betas, customer support); Henna Gramentz (accounting, customer support); Frank Hoffmann (framework, browser); Alf Klimek (studio, voiceovers); Sebastian Hübert (media creation); David Schornsheim (framework, CLAP); Kay Knofe (hardware development); Tim Fröhlich (more code); Sadjad Siddiq (DSP); Petros Karagkounidis (web development); Simon Schrape (web development), Max Steimel (DSP); Henry Lau (accounting, customer support); Mine Hahn (DSP), Vadim Zavalishin (filter design, DSP).

Team Tyrell

Peter Grandl & Mic Irmer (concept); Ryo Ishido & Marcus Steinlechner (GUI design); Stephen Gries (Tyrell hardware design); Bojan Milivojević & Tibor Devai (original user guide and proofreading)

The User Interface

The window is divided into 4 main areas:



Knobs, Sliders, Selectors

All knobs and sliders react consistently to **left-click & drag** as well as to rolling the **mouse wheel**. For fine adjustments, hold down SHIFT before moving the knob / slider.

A **double-click** on a knob or slider recalls the parameter's default value.

Left-clicking on a **selector** opens the options menu. Rolling your **mouse wheel** while hovering over a selector scrolls through the options. Note that, while many of the selectors offer a list of values or mode options, about half of them specify a modulation source.

Right-clicking opens a context menu containing the functions *Lock*, *MidiLearn / MidiUnLearn:*

Lock ensures that the value will not change while switching presets. Locked parameters appear with a yellow padlock icon. Note: You are still free to adjust the the parameter value!

MidiLearn assigns hardware controls on your MIDI keyboard etc. to knobs, sliders or selectors in Tyrell. *MidiUnLearn* removes assignments. Note that MIDI assignments are global: They are not saved per preset, but are automatically loaded the next time you open an instance of Tyrell.

GUI Size, Text Antialiasing, Gamma

You can resize the window by right-clicking anywhere in the background and selecting an option from the list. The sizes range from 600 x 300 pixels (50%) to 2400 x 1200 pixels (200%).

Text Antialiasing switches the smoothing of labels and values on/off. Normally left on—only in rare cases will switching it off improve readability.

Gamma determines overall brightness.

The Panels

Control Bar

The bar along the top of the Tyrell window hosts a range of global parameters plus a few utility functions. From left to right these are...

u-he Badge

Clicking on [**u-he**] opens a popup menu containing links to Tyrell's documentation folder (which includes this user guide), to the u-he homepage, to our user support forum as well as to our presence on various social networks.

DETUNE

This knob fine-tunes the overall pitch of the current preset within a range of +/– 50 cent. If VOICES is set to 2 or above, it detunes the unison voices against each other instead.

TRANSPOSE

Switches the overall pitch of the preset in semitones within a range of +/– 24.

Data display

The display has several functions, most of which have to do with presets...

It usually shows the name of the current preset. Clicking on the display itself lets you select a preset from the current directory.

While you are editing a preset in *Tyrell*, the data display shows the parameter's name and value. After a few seconds of inactivity, it will show the name of the preset again.

To **initialize** a preset, right-click on the data display and select *init*.

Presets

The small button labelled *presets* to the right of the data display replaces the main panel with a preset browser. The basic functions are self-explanatory–open a folder in the left panel, select a preset in the centre panel. For those who wish to read everything there is to know about the u-he standard preset browser**:** https://uhe-dl.b-cdn.net/manuals/plugins/hive/Hive-user-guide.pdf.

Triangles

The small left and right pointing triangles step through presets.

Save

Initiates the process of saving your preset: A dialog box lets you name your preset and add details (author, description, usage) which will appear in the PRESET INFO panel (see Hive's user guide).

OUTPUT

The main volume control. Set values above 100 to boost inherently quiet signals.

VCA

If you select *Gate* here, the volume of a note will jump instantaneously from zero to maximum upon playing a key, then instantaneously back to zero upon releasing the key. If you choose *ADSR1* the volume will follow the shape of ENV 1.

MODE (voice mode)

The *poly* option is of course polyphonic, *mono* is monophonic with retrigger, *legato* is monophonic without retrigger. In *duo* mode, oscillator 1 only responds to the lowest played note while oscillator 2 only responds to the highest played note. Both oscillators will play the same note if only one note is being played. For more about envelope triggering see the Envelopes section.

VOICES (unison count)

This selector determines how many voices will play in unison when a single key is pressed. While adjusting the number of unison voices, please bear in mind that *Tyrell*'s polyphony is fixed at 8 voices, and this cannot be changed. For example, if the *Voices* selector is set to *2*, you will be able to play 4 notes simultaneously before you run out of polyphony. The fewer voices used, the more CPU power you will save.

If the *Voices* selector is set to 2 or more, the *Detune* knob changes its function: Instead of acting as a fine tune knob for the entire preset, unison voices are detuned against each other in both positive or negative directions.

Unison voices do not have **stereo spread** by default. However, there is a hidden parameter called *VCA1: Pan,* which is a little tricky to use: Find a preset that has this parameter selected in one of the Matrix target slots, e.g. *Chemtrails*. Now, lock that matrix target, initialize the preset and save it as a template preset for future use. Unlock the matrix target again. Make sure that the number of voices is 2 or more, select *StackVoice* as a modulation source for *VCA1: Pan* and dial in the desired amount of stereo spread!

DRIFT

This option introduces subtle imperfections to the oscillator tuning: a slow wavering that mimics the behavior of vintage analog synthesizers.

OSC MOD

The oscillator **modulation** section:

VIBR (vibrato)

This slider sets the amount of vibrato (cyclic pitch modulation), for both oscillators as well as for the sub-oscillator. It is 'hardwired' to LFO 1. Note: In the initialize preset you will only hear vibrato when you push the modulation wheel (see the LFO 1 settings).

PW (pulse width)

Adjusts the pulse width for both oscillators (but not for the sub-oscillator, which is fixed at 50%). Does not affect the sawtooth. At maximum this is a 50% **duty cycle** (ratio of upper pulse width to pulse duration), at minimum almost 100%.

PW set to maximum (10) – 50% duty cycle

PW set quite low (2) – about 90% duty cycle

PWSRC (pulse width source)

Selects a modulation source for pulse width(s). Note that all modulation targets in Tyrell offer the same set of modulators:

None, Modulation Wheel, Pitch Wheel, Control A, Control B, Gate, Velocity, Pressure (aftertouch), KeyFollow1/2, Alternate, Random, StackVoice, ADSR1/2, LFO1/2.

PITCHB. (pitch bend range)

Selects positive and negative pitchbend range in semitones, from 0 to 24 semitones in both directions. On MIDI keyboards, pitchbend is usually controlled via a sprung wheel or stick.

SOFTSYNC

This feature synchronizes oscillator 2 (the 'follower') to oscillator 1 (the 'leader'). Whenever the leader restarts its cycle, the follower's phase is reset, ensuring that both oscillators technically play at the same frequency. However, the follower's irregular cycle often creates complex timbres, giving the impression of a harmonic note or two.

The sync effect is highly dependent upon the tuning of oscillator 2 (*Tune 2*).

Setting *Soft Sync* to maximum results in hard sync—the two oscillators are fully synchronized, regardless of any phase difference or the tuning of the follower. Lower values can create interesting "unstable" sounds.

GLIDE / GLIDE OFST

Glide, a.k.a. portamento smoothens pitch transitions between consecutive notes. The GLIDE knob controls the time it takes for the pitch to glide from one note to the next, maintaining a constant duration regardless of the interval between notes. GLIDE OFFST (offset) shifts the glide time of oscillator 2, making it shorter or longer relative to oscillator 1.

OSCILLATORS

Waveforms, tuning and frequency modulation...

SHAPE 1 / SHAPE 2

SHAPE 1 for oscillator 1 offers a blend between **sine** at 1.00, **triangle** at 2.00, rising **saw** (aka ramp) at 3.00, and **pulse** wave at 4.00. Note that the SUB oscillator (see MIXER below) is always a square.

Oscillator 2 offers a blend of two waveforms controlled by SHAPE 2 knob: **rising saw** and **pulse**.

TUNE 2

Offsets the tuning of the oscillator 2 relative to the pitch set by TRANSPOSE. The range is from 0 to +24 semitones.

FINE

A fine tune control for oscillator 2 with a range of +/- 50 cents.

T-MOD 1 / T-MOD 2

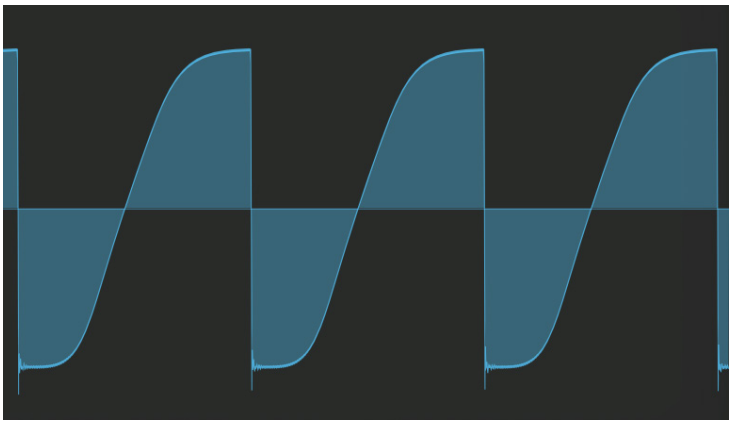
These control pitch modulation depth for oscillator 1 (including the SUB) and for oscillator 2, respectively. The modulation sources are specified by clicking on SOURCE 1 and SOURCE 2.

Tip: The T-MOD 1 knob can act as a tune parameter for oscillator 1 if its modulation source is set to **Stack Voice** (assuming you don't set VOICES above 1).

MIXER

The *Mixer* controls the amount of each audio source fed into the filter.

As *Tyrell* was designed to mimic the behaviour of analog synths, these levels affect filter overdrive. Although labelled 0 to 10, the range is actually *-100* to *+25 dB*, with overdrive starting around 0.00 (8 on the vertical scale).



pure sawtooth at maximum level = plenty of distortion!

OSC1 / OSC2

The levels of the two main oscillators.

SUB

The level of the sub-oscillator (a square wave pitched one octave below oscillator 1).

NOISE

Noise output level—see MISC a few pages down.

RING

Ring modulator output level of the—see MISC a few pages down.

FEEDB.

Feedback from the output of the filter, providing yet more distortion.

FILTER

Tyrell features a self-oscillating multimode filter with a unique *mix spread* parameter...

CUT (cutoff)

The **cutoff frequency** above and/or below which—depending on the filter's mode—the signal is attenuated. The range of the slider is 20 Hz (minimum) to 20 kHz (maximum).

RES (resonance)

Resonance is an internal feedback loop that emphasizes the cutoff frequency. Tyrell's filter is also capable of self-oscillation, like analogue hardware filters. Internal feedback causes the filter circuitry to act like a sine oscillator. Self-oscillation with no input starts when RES is at about 80.

MIXSPR (mix spread)

This is probably the most unique feature of the entire synth. Its function depends on the settings of the VCF MODE and VCF POLES selectors...

VCF MODE

LP/HP	A **lowpass** and a **highpass** filter in parallel, with *MIXSPR* balancing the two. With MIXSPR at minimum the filter output is 100% lowpass; in the centre it is 50% lowpass plus 50% highpass, and at maximum it is 100% highpass.
BP	The **bandpass** combines LP and HP in series, removing frequencies above **and** below the cutoff point. If VCF POLES is 12 dB/Oct, the MIXSPRD slider is unused. If VCF POLES is set to 24 dB/Oct, MIXSPRD shifts the frequency of a **second bandpass** upwards. if VCF POLES is set to 36 dB/Oct a **third bandpass** appears, and MIXSPRD shifts its frequency downward. Push RES up for **vocal formants,** but try not to overdrive the filter, otherwise the vocal effect is reduced.

VCF POLES

Determines the steepness of attenuation: 12, 24 or 36 dB per octave. This setting fundamentally affects how MIXSPRD works when **BP** (bandpass) is selected. See VCF MODE above for details.

MOD 1 / MOD 2

MOD 1 and MOD 2 both adjust the amount of cutoff modulation from their respective SOURCE. These knobs are bipolar i.e. you can set negative values.

KEYFOLLOW

KEYFOLLOW controls the amount of Cutoff modulation from MIDI note number. At 100% the cutoff point will track the notes on your keyboard almost perfectly. Key Follow in the filter pivots around MIDI note 72, an octave above middle C. All other notes modulate the cutoff up or down while the pivot note remains fixed.

MISC

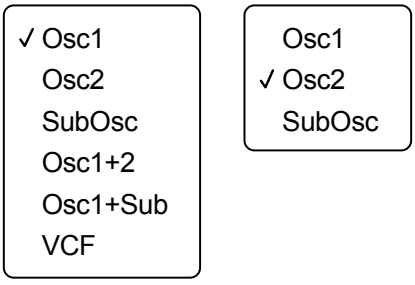
Miscellaneous settings...

NOISE

The knob blends between **white** (cold) and **red** (warm) noise. At the centre (2.00) is **pink** noise.

RING MOD, INPUT SRC

A *ring modulator* multiplies two signals, outputting the sum and difference of their frequencies. Depending on the relationship between those frequencies, the result can be rather enharmonic i.e. clangorous! The two selectors labelled RING MOD and INPUT SRC offer the following options:



Tip: Especially the **VCF** option here can be used to create some very gnarly sounds!

LFO1, LFO2

Two identical **Low Frequency Oscillators** used as general-purpose modulation sources. Note that LFO 1 is “hardwired” to the vibrato function (see VIBR).

Waveform

The unlabelled selector at the top left of each LFO panel offers *sine*, *triangle*, *saw up*, *saw down*, *sqr hi-lo* (square wave starting high), *sqr lo-hi* (square wave starting low), *rand hold* (stepped random wave) or *rand glide* (smooth random wave).

SYNC

The basic ‘speed mode’. SYNC offers non-synchronized times measured in seconds (*0.1*, *1s* or *10s*) as well as a long list of values synchronized to song tempo, including dotted times (50% longer) and triplets (3 in the space of 2).

RATE

Shifts the LFO speed relative to the selected SYNC. The range is from -5 to +5.

DELAY

Sets the rate at which the LFO is faded in. The range is from instantaneous to about 2 seconds.

PHASE

Sets the position (along the waveform) at which the LFO will be triggered each time a note is played, with a range of 0° to 360°. The value is irrelevant if RESTART is set to *random*...

RESTART

Selects a rule for how the LFO's phase will be reset...

sync	LFOs of all voices are synchronized to the host application, so they all adopt the same phase. Unlike *single* mode (see below), the phases can still be modulated apart by a polyphonic source such as *Velocity*, *KeyFollow* or *Random*.
single	All voices share the same LFO, which is restarted at the next MIDI note after all previous notes have been released.
gate	Notes restart the LFO for each voice independently at the specified PHASE.
random	Notes restart the LFO for each voice independently at a random phase, ignoring the value of PHASE.

RATE MOD

The speed of each LFO can be modulated locally by setting a SOURCE and turning the associated RATE MOD knob up or down. Note: LFO 2 can only modulate LFO 1 rate via the Matrix.

DEPTH MOD

LFO amplitude modulation depth. Set this to **minimum** for unmodulated i.e. full output, or maximum for complete control via the selected SOURCE.

If '*none*' is selected as SOURCE, turning DEPTH MOD up will **lower** the LFO's output as you are effectively multiplying it by "a certain amount of zero". You may find this counterintuitive at first!

Example: If you want your modulation wheel to control vibrato depth, set the LFO1 source to *ModWhl* and turn DEPTH MOD up to maximum. If you then turn MOD DEPTH down a little, a certain amount of LFO will remain unmodulated, resulting in a constant, subtle vibrato.

Note: LFO 2 can only modulate LFO 1 depth via the Matrix...

MATRIX

The **modulation matrix** consists of two not so clearly defined sub-sections: XS – MOD OSC 1 and below that, the actual modulation matrix.

XS – MOD OSC 1

Cross modulation: Similar to e.g. an LFO modulating pitch or pulse width, but at **audio rate**.

DEPTH

How strongly oscillator 1 modulates the DEST (destination) VIA a secondary modulation source...

VIA

Secondary modulation source for 'shaping' the amount of modulation. Try ModWhl or LFO2 first, until how it works becomes clear.

DEST

The **destination** selects a target for cross modulation by oscillator 1.

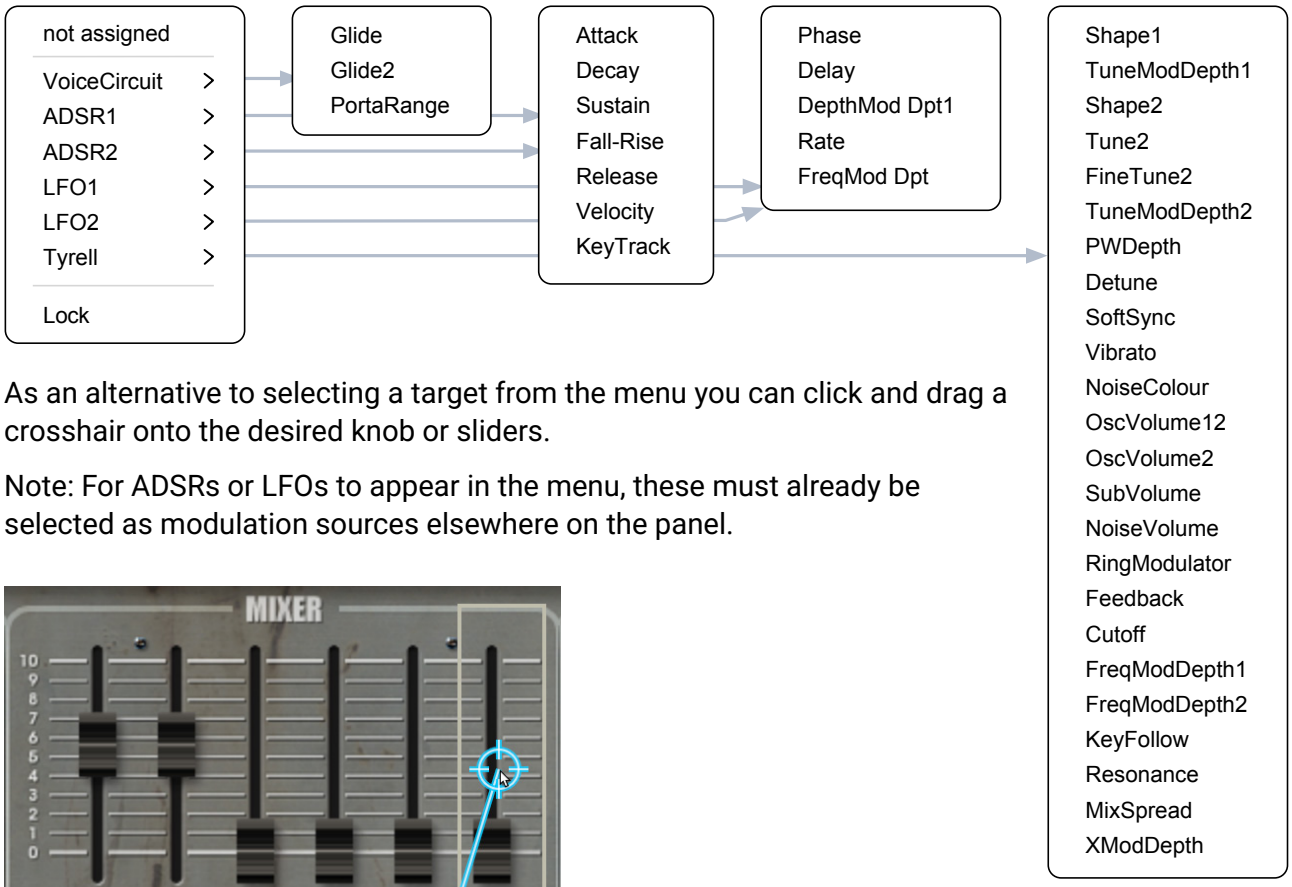
Osc2 FM	oscillator 2 frequency.
Osc2 PWM	oscillator 2 pulse width
FilterFM	filter cutoff

2 MATRIX SLOTS

MATRIX TARGET

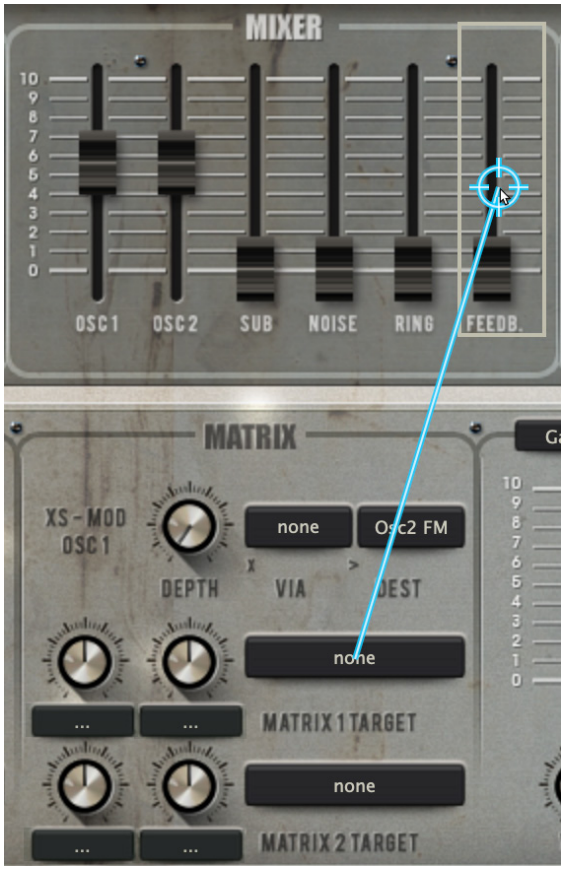
The modulation matrix consists of two slots, each with a primary and secondary VIA source plus binary depth control, and the TARGET. It is used to modulate almost any parameter (knob or slider) in Tyrell, including cross modulation DEPTH and all knobs in the CHORUS section.

Quirk in the current version: the Chorus parameters do not appear in the menu—you will need to make the connection via drag & drop (see below).



As an alternative to selecting a target from the menu you can click and drag a crosshair onto the desired knob or sliders.

Note: For ADSRs or LFOs to appear in the menu, these must already be selected as modulation sources elsewhere on the panel.

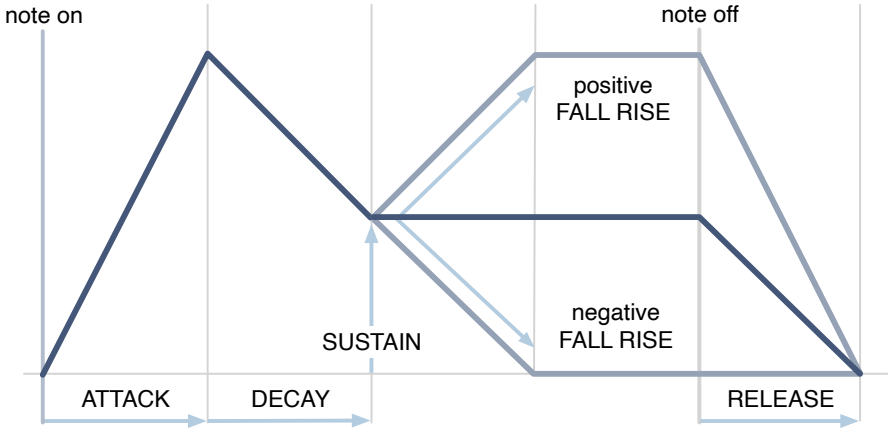


using drag & drop to select a target

Envelopes

The last two modulation sections on the *Tyrell N6* panel are the envelope generators. Although they appear to be typical 4-stage envelopes, there are a few extras...

Envelope 1 is labeled 'VCA' as it is hardwired to the virtual 'Voltage Controlled Amplifier', controlling the volume contour of each note. However, ENV1 can be used to modulate any other parameters!



The four sliders should be familiar from most other synthesizers:

Attack (**A**)

The time it takes for the envelope to rise from zero (or the Init value) to maximum

Decay (**D**)

The time it takes to drop from maximum to the Sustain level

Sustain (**S**)

The level after Decay. Normally remains at that position until the note is released

Release (**R**)

The time it takes to drop to zero after a note is released.

VELO (velocity)

For dynamic envelopes—keyboard velocity scales the envelope's output level. If ENV1 is modulating additional parameters, those will also be affected.

KEYTRK (key tracking)

Originally scaled all envelope times based on MIDI note number, but ever since version 2.0 was released it actually scales them via velocity. This was never reported, so we left it as-is for now!

FALL RISE

This setting radically changes the behavior of the sustain—see the image above. If set to the 0.00, the sustain stage remains flat. Negative FALL RISE values cause the sustain to fall to minimum, whereby larger negative values mean a more rapid fall. Conversely, positive FALL RISE values cause the sustain to rise to maximum, with larger values leading to a more rapid rise.

Trigger

The unlabelled selector next to the ENV label determines how the envelope is triggered. ENV 1 has four options, while ENV 2 has five.

Gate If the voice MODE (in the control bar) is set to *poly,* an envelope is triggered for each note, and sustained until the note is released.

If the voice MODE is set to *mono* the envelope is triggered like in *poly* mode except when *Attack* and *Release* times are non-zero AND notes overlap:
In such cases the envelope is triggered for each new note starting where the envelope of the previous note left off. We call that a "singing envelope".

If the voice MODE is set to *legato*, the envelope will only be retriggered for the first note in a run being played without any gaps (this is called 'legato' playing).

If the voice MODE is set to *duo* the triggering is like *mono* while single notes are being played, but like *legato* while 2 notes are being played.

Single This option is only available for envelope 2.

If the voice MODE (in the control bar) is set to *poly,* the envelope will be triggered for each note played non-legato, regardless of the release time (R). If the notes are played legato, they will share the same envelope until all notes in that legato run have been released.

If the voice MODE is set to *mono*, *legato* or *duo* the triggering behavior is the same as *Gate* (see above) in *legato* MODE.

Loop *T*he envelope will continuously run through its stages in a loop, for as long as a key is pressed. NOTE: If the sustain (S) is at minimum or the FALL RISE knob has a negative value, the release (R) stage will not be included in the loop. Similarly, if the sustain is at maximum, the decay (D) stage will be skipped.

LFO1 / LFO2 The envelope is retriggered with each new LFO cycle. Tip: Interesting rhythmic patterns can be achieved by modulating LFO PHASE.

Chorus

Like most chorus effects, the one in Tyrell is based on a short delays (20–50ms) modulated by a dedicated LFO.

On/Off

The unlabelled button on the left activates/deactivates Chorus.

Type

Like in Diva and Hive, there are three flavours: *Classic*, *Dramatic* or *Ensemble*. The first two are variations using the same algorithm, while *Dramatic* offers a stronger detuning effect. *Ensemble* sounds similar to the circuitry found in old 'string machines'.

RATE / DEPTH / WET

LFO speed, modulation amount and dry/wet mix.

Modulation Sources

MIDI Sources

ModWhl	Modulation wheel, MIDI CC #01
PitchW	Pitch wheel (or stick)
Control A	MIDI CC #02 (breath) by default, but can be changed in the configuration
Control B	MIDI CC #11 (expression) by default, but can be changed in the configuration
Gate	A simple organ-like envelope with almost instantaneous attack and release
Velocity	MIDI velocity
Pressure	Channel pressure or polyphonic aftertouch (whichever is being received)
KeyFollow	Modulation per MIDI note plus any GLIDE; The pivot note is D3
KeyFollow 2	Modulation per MIDI note plus any GLIDE OFST; The pivot note is D3

Internal Sources

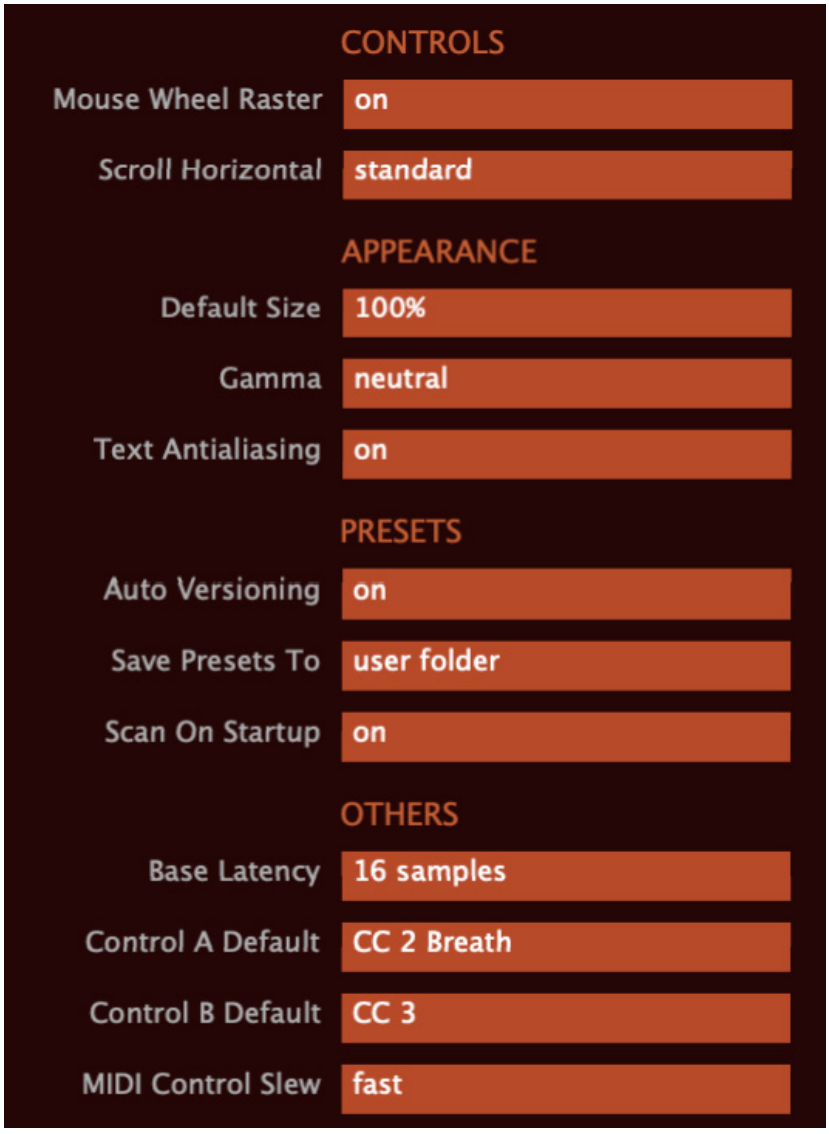
Alternate	Flips between opposite extremes (e.g. 100 and -100) with each note
Random	Each played note gets a new random value
StackVoice	The index of unison VOICES; Use this source to split modulation depth between individual unison voices, or as a constant when VOICES is set to 1
LFO 1 / 2	The low frequency oscillators
ADSR 1 / 2	The envelopes

CONFIGURATION

At the bottom right of of Tyrell's window you will see this panel:

Clicking on the cogwheel icon opens the configuration window:

To see these settings, roll your mouse wheel (any future versions will improve this feature):



CONTROLS

Mouse Wheel Raster

If your mouse wheel is rastered (you can feel it clicking slightly as you roll the wheel), set this option to ‘on’ so that each little click increments the value in sensible steps.

Scroll Horizontal

The direction of scrolling within the presets panel.

APPEARANCE

Default Size

The GUI size for each new instance. You can temporarily change the GUI size without opening the Preferences page by right-clicking anywhere in the background.

Default Skin

Sets the selected skin as the default. This will not appear if alternative skins are not available.

Gamma

Effectively the UI brightness. It can take a moment before the new setting takes effect.

Text Antialiasing

Smoothing of labels and values. Normally left on—only in certain special cases will switching this off improve readability.

PRESETS

Auto Versioning

If switched on, an index is appended to the preset name and automatically incremented each time you save it. For instance, saving ‘Space’ three times in a row would give you three files: ‘Space’, ‘Space 2’ and ‘Space 3’.

Save Presets To

The user folder option prevents Tyrell from saving presets into the Local folder. Instead, they will land in the User folder (or a subfolder if selected).

Scan On Startup

Whether the preset library should be scanned and the database recreated when the first instance of Tyrell is started, e.g. when you reopen a project.

OTHERS

Base Latency

If you are certain that your audio system – hardware as well as software – uses buffers that are a multiple of 16 samples in size (please refer to the appropriate documentation), you can safely disable base latency. Otherwise leave it set to the default 16 samples to prevent crackles.

A new Base Latency setting will only take effect when the host allows e.g. on playback or after switching the sample rate. Reloading Tyrell also works.

ABOUT THOSE BUFFERS

Internally, Tyrell processes audio in chunks of n x 16 samples. Such 'block processing' reduces the CPU load and memory usage of all our plug-ins. If the number of samples to be processed is e.g. 41, Tyrell processes the first 32 and keeps the remaining 9 in a small buffer (16 samples is enough). Those 9 samples are then processed at the start of the next call… and so on. The extra buffer is only necessary if the host or audio driver processes 'unusual' buffer sizes. In the many host applications that process buffers of e.g. 64, 128, 256 or 512 samples (all multiples of 16), try switching it off so that Tyrell can process latency-free.

Control A/B Default

Apart from the modulation wheel, the list of modulation sources used to include two fixed MIDI controls: Breath (CC#02) and Xpress (CC#11). While retaining backwards compatibility, we replaced those with the user-definable Control A and Control B sources.

MIDI Control Slew

Determines the strength of parameter smoothing for the following performance controls: pitch bend, modulation wheel, Control A, Control B and Pressure. With MIDI Control Slew set to *off*, Tyrell is more responsive to modulation wheel data (for instance), but performance control can sound rather grainy. The *Fast* setting is a good compromise between responsiveness and smoothness. Note that the *Slow* option is adaptive: Whenever the incoming control data jumps suddenly between values that are further apart, no slew is applied.