

Flurry

A hyper-saw virtual-analogue synth with a string machine beside it: up to nine detuned saws, a juicy self-oscillating ladder filter, a STRINGS section with its own ensemble, and lush chorus, delay and reverb.

A Lab plug-in. The Lab is where new GFX plug-ins are built in the open: they may change sound or controls between versions. This is the Lab version of the Stable Flurry: with BLEND at the left it sounds exactly the same. The new part is the STRINGS and ENSEMBLE row.



Overview

Flurry is an eight-voice virtual-analogue synth in the spirit of the late-2000s trance and dance keyboards. Its first oscillator is either a **HYPERSAW** - a stack of up to nine saws, detuned against each other and spread across the stereo field - or a **CLASSIC**

oscillator that turns from saw to square to a narrow pulse, with PWM. A second oscillator, a sub-octave square and noise join it.

The mix goes into a four-pole ladder filter with a saturating input: push its DRIVE for growl, and turn the resonance up to make it whistle and self-oscillate. A second, multimode filter can follow it or run beside it. Distortion can go before or after the filters. After the voices come a chorus, a delay and a reverb (the reverb also hears the delay), a two-band EQ and the GFX output stage, which soft-clips anything above -0.3 dBFS. There are no samples: every sound is synthesised.

Beside the synth sits a **STRINGS** section in the spirit of the 70s string machines. Every note also plays a divider chain: one oscillator and its octaves (16', 8' and 4'), locked together. The strings have their own slow attack and release, their own TONE and an **ENSEMBLE**: three copies of the strings, each swept slowly and shimmering quickly, set left, centre and right. That sweep is what makes a plain saw sound like a string section. BLEND sets the synth against the strings, so Flurry can be the hyper-saw synth, a string machine, or both layered on every note.

Playing it

1. Insert Flurry on a track as an instrument (it has no audio input; it plays from MIDI).
2. Arm the track with a MIDI input and record monitoring on, or draw notes in a MIDI item. It listens on every MIDI channel and passes the MIDI on.
3. Up to eight notes sound at once (set fewer with VOICES; 1 is mono). When the voices run out, Flurry takes over the quietest note that is fading out (or else the oldest), fading it over 3 ms so it never clicks. The voice lamps in the header light as notes sound.
4. Pitch bend covers ± 2 semitones. The mod wheel (CC1) adds up to 50 cents of vibrato from the LFO. The sustain pedal (CC64) holds notes, CC120 / CC123 release them all, and every note is released when REAPER's transport stops.

DRIFT

DRIFT is analogue instability. At 50 % (the standard amount) each voice's pitch wanders slowly on its own by up to ± 20 cents, every note starts up to ± 6 cents off true, and each voice's pulse width wanders a little. The STRINGS run on their own supply, as a string machine did. As its voltage wanders, the whole string section drifts in tune together (up to ± 4 cents), so its notes stay in tune with each other. The ensemble's delays also stretch and shrink by up to 5 %, so its sweep breathes. 0 is perfectly steady; 100 % is twice the standard amount, and a little faster.

Reach for it for

- Huge supersaw leads, chords and anthems
- Wide, slow pads with chorus and a long reverb
- Squelchy, resonant basses and acid lines (VOICES at 1)
- Plucks and keys with a quick filter envelope
- Distorted, gritty synth tones (DISTORTION before the filter)
- Tempo-locked filter wobbles (LFO SYNC)
- String-machine pads, alone or layered under the saws (STRINGS)

Controls

Drag a knob up or down to turn it (hold Shift for fine moves), or use the mouse wheel. Double-click or Ctrl-click returns a knob or fader to its default. Values show while you hover.

The header

Voice lamps	Eight lamps, one per voice, lighting with each voice's level. Lamps beyond the VOICES setting are greyed out.
PRESETS	Opens the preset list, with "Reset all to defaults" at the end.
◀ / ▶	Steps to the previous or next preset, wrapping round.
Preset display	Shows the preset's name. Click it for the preset list too.
S / M / L	Panel size: small, medium or large. The panel also shrinks to fit a smaller window.
?	Opens a pop-up with the design credit, the GFX website and the address of this manual. Click anywhere to close it.

OSC 1

The display shows the oscillator: in HYPERSAW, one bar per saw (its height is its level, its colour where it sits from left to right) with the number of saws and the detune of the outer ones; in CLASSIC, two cycles of the wave with its pulse width and spread.

CLASSIC / HYPERSAW	The oscillator type.
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DENSITY (HYPERSAW)	How many saws, from 1 to 9. Between whole numbers the next saw fades in, so the stack thickens smoothly.
SHAPE (CLASSIC)	Saw at the left, a square at the centre, then the pulse narrows towards the right. In between, saw and square blend.
SPREAD	In HYPERSAW: the detune between the saws (the outer ones up to about ± 90 cents) and how wide they spread across the stereo field - both grow together. In CLASSIC: adds a second copy of the oscillator, detuned up to ± 25 cents and panned apart. 0 is a single centred oscillator.
PWM	How far the LFO moves the pulse width: on OSC 1's pulse (CLASSIC) and on OSC 2's PULSE wave.

FILTER

The display draws the response of both filters together and shows the cutoff and resonance. Drag on it: left and right moves the cutoff, up and down the resonance.

LP24 / LP12 / BP / HP24	The ladder filter's mode: a steep 24 dB low-pass (the classic sound), a gentler 12 dB low-pass, a band-pass, or a 24 dB high-pass.
CUTOFF	20 Hz to 20 kHz.
RESO	Resonance, 0 to 100 %. High settings ring and squelch; near the top the filter whistles on its own (self-oscillates). The bass is partly kept up as the resonance rises.
DRIVE	0 to 24 dB into the filter's saturating input. At 0 it is nearly clean; turn it up for the juicy growl.
ENV	How far the filter envelope moves the cutoff, -100 to +100 % (up to six octaves). Negative values close the filter instead. With VELO up, harder notes open it further.
KEY	Key tracking, 0 to 100 %. At 100 % the cutoff follows the keyboard (centred on middle C).

ENVELOPES

AMP shapes each note's level; FILTER moves the cutoff (by the ENV amount).

A	Attack, 0.5 ms to 5 s.
D	Decay to the sustain level, 1 ms to 10 s.
S	Sustain, the level held while the key is down, 0 to 100 %.
R	Release after the key is let go, 1 ms to 10 s.

OSC 2 / MIX

Wave key	Click for a menu: SAW, PULSE, TRIANGLE or SINE. The pulse follows OSC 1's pulse width (in CLASSIC) and PWM.
SEMI	OSC 2's pitch against OSC 1, -24 to +24 semitones.
DETUNE	-50 to +50 cents, for beating against OSC 1.
1 > 2	The balance between the two oscillators: at the left OSC 1 only, in the middle both at full level, at the right OSC 2 only.
SUB	A square wave an octave below OSC 1, 0 to 100 %.
NOISE	White noise, 0 to 100 %.

FILTER 2

Mode key	Click for a menu: OFF, LP 12, HP 12, BP or NOTCH - a 12 dB multimode filter. Its knobs are greyed while it is OFF.
OFFSET	Its cutoff against the ladder filter's, -4 to +4 octaves. It follows the main filter's cutoff, envelope, key tracking and LFO.
RESO	Its resonance, 0 to 100 %.
ROUTE	SER: the second filter follows the ladder. PAR: both filters hear the oscillators side by side and are mixed together.

DISTORTION

Type key	Click for a menu: OFF, SOFT (a smooth clipper), TUBE (biased and asymmetric, warm), DIODE (one side gives early, raspy), RECTIFY (folds the wave over, adding an octave-up edge) or HARD (a hard clipper). All are anti-aliased and level-matched, so DRIVE changes the character more than the volume.
DRIVE	0 to 36 dB into the distortion.
PRE / POST (FILTER)	PRE distorts the oscillators before the filters, so the filter smooths the result; POST distorts after the filters, for a rougher edge.

LFO

A sine-wave LFO, shared by all voices; the lamp beside the title pulses with it.

SYNC	Locks the LFO to the project tempo. While REAPER plays, it is pulled gently into line with the timeline (never jumping).
RATE	0.02 to 20 Hz, or with SYNC a note value: 4 bars, 2 bars, 1 bar, 1/2, 1/2 dotted, 1/4, 1/4 dotted, 1/4 triplet, 1/8, 1/8 dotted, 1/8 triplet, 1/16, 1/16 triplet or 1/32.
CUTOFF	How far the LFO moves the filter cutoff, 0 to 4 octaves - for wah and wobble.
PITCH	Vibrato, 0 to 100 cents. The mod wheel adds up to 50 cents more.

STRINGS

The display shows the registers in use and the balance of synth and strings, with the strings' envelope drawn below. The knobs are greyed while BLEND is at the synth.

16' / 8' / 4'	The registers, lit = on: an octave below, the note itself and an octave above (8' and 4' are on by default). They all come from the same oscillator, so they stay locked together. With more than one register on, the levels are
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	evened out, so adding one doesn't make the strings much louder. Switching a register fades it in or out over 15 ms.
BLEND	The synth against the strings: at the left the synth alone (the default), in the middle both at full level, at the right the strings alone. The value shows the two levels while you turn it.
ATTACK	How slowly the strings swell in, 1 ms to 5 s (450 ms by default). It is separate from the synth's envelopes, so a quick synth stab can sit over slow strings.
RELEASE	How long the strings ring on after the key is let go, 1 ms to 10 s. The note keeps its voice until both the synth and the strings have died away.
STONE	A low-pass on the strings, 1.1 kHz (dark, distant) to 11 kHz (bright, buzzy). A low cut at 110 Hz keeps the strings from crowding the bass.

The strings don't follow velocity, as the string machines didn't. They do follow pitch bend, the LFO's vibrato and the mod wheel.

ENSEMBLE

The ensemble belongs to the strings only (the synth has its own CHORUS). The display draws its three sweeps, moving as they play, with the speed of the slow sweep.

AMOUNT	0 to 100 %: from the dry strings in the centre to the full ensemble, wide across the stereo field (70 % by default).
SPEED	Both sweeps faster or slower together, 0.5x to 2x. At 1x the slow sweep turns at 0.6 Hz and the shimmer at 6.1 Hz.

CHORUS

MIX	A slow stereo chorus, 0 to 100 %: from a gentle shimmer to a wide, swirling sound. 0 is off.
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DELAY

The display shows the time and STEREO or PING-PONG.

SYNC	Locks the delay time to the project tempo.
PING	Ping-pong: the repeats bounce between left and right. Off: a stereo delay.
TIME	With SYNC: 1/1 to 1/32, including dotted and triplet values. Without: 10 ms to 2 s. Changes glide rather than jump.
FDBK	Feedback, 0 to 95 %: how many repeats. The repeats are darkened and thinned a little each time, and the loop never runs away.
MIX	The level of the repeats. 0 switches the delay off.

SPACE

A reverb; it hears the delay too. The display names the space by its size (ROOM, CHAMBER, HALL or CATHEDRAL) and shows the decay time.

SIZE	The size of the room (larger also means a longer pre-delay).
DECAY	0.2 to 12 s.
DAMP	How much faster the highs die away: more is darker.
MIX	The level of the reverb. 0 switches it off.

MASTER

VOICES	Click for a menu: 1 (mono) to 8 voices. In mono each new note replaces the last (there is no glide).
Display	How many voices are playing and the recent output peak.
LOW / HIGH	A low shelf (around 200 Hz) and a high shelf (around 4.5 kHz), -12 to +12 dB, on the whole output.
VELO	Velocity, 0 to 100 %: how much playing harder makes notes louder and opens the filter envelope further.
DRIFT	0 to 100 %, 50 % by default (see above).

VOL	Output level, -24 to +6 dB.
OUT	The output meter, -48 to 0 dBFS, with a floating peak segment. The red lamp above it lights while the output clipper is working.

Presets

A preset sets every control, effects included.

Init	About six saws with moderate spread, OSC 2 an octave below, a little sub, a 1.8 kHz low-pass with a short filter envelope, light chorus, a quarter-note ping-pong delay and a hall.
Super Lead	Seven wide saws, a brighter filter, soft distortion after the filter, a gentle 5.5 Hz vibrato and a dotted-eighth delay.
Wide Pad	All nine saws spread wide, slow filter and amp envelopes, a slow LFO breathing on the cutoff, plenty of chorus and a large, long reverb.
Juicy Bass	Mono. A saw with OSC 2 an octave down and a strong sub, through a low, resonant, driven ladder with a snappy envelope, and tube distortion. No effects.
Reso Pluck	A detuned pulse-saw with a pulse an octave up, a highly resonant filter snapped open and shut, no sustain, a dotted-eighth delay and a little reverb.
PWM Strings	Two detuned pulses with deep PWM, a detuned pulse on OSC 2, slow attack and release, lots of chorus and reverb.
Classic Brass	Two saws a few cents apart, a filter that swells open over 60 ms, soft distortion and a little vibrato.
Rave Hoover	A dense, fully spread saw stack with a pulse an octave down and sub, LP12 filter, tube distortion, deep 35-cent vibrato and heavy chorus.

Tube Keys	A square with a triangle an octave up, through tube distortion before the filter, with a decaying amp envelope: an overdriven keyboard.
Ice Drone	A spread saw stack with a sine two octaves down and a breath of noise, a resonant band-pass with a low-pass above it, very slow envelopes, a slow LFO sweeping the filter, half-note delay and an 11-second reverb.
Acid Line	Mono. A single saw through a very resonant, driven ladder with a strong, short filter envelope, soft distortion and a dotted-eighth delay.
Digital Grit	A narrow pulse with PWM through a 24 dB high-pass and hard clipping before the filter: thin, buzzy and aggressive.
String Machine	The strings alone: 8' and 4', a 350 ms swell, a long release and plenty of ensemble, in a large hall.
Hyper Strings	A slow, wide saw pad with the strings layered under it an octave down (16' and 8'), darker TONE and a long reverb.
Brass and Strings	Classic Brass with bright strings swelling in behind it: the synth for the attack, the strings for the body.

Tips

- For the classic supersaw, use HYPERSAW with DENSITY near the top and SPREAD about half way, then add CHORUS and SPACE.
- Drag on the filter display to play cutoff and resonance together, like a joystick.
- Set VOICES to 1 for basses and acid lines, so notes never overlap.
- With FILTER 2 on BP or NOTCH and ROUTE on PAR, you get vocal, phasey colours; try OFFSET at +1 or +2 octaves.
- For the string-machine sound, BLEND to the right, 8' and 4' on, AMOUNT high; then bring BLEND back towards the middle to put the saws on top.
- A short synth envelope with BLEND in the middle gives a plucked attack over swelling strings.

- Distortion PRE gives a smoother, filtered grit; POST keeps the full fizz of the distortion.
- With the LFO on SYNC at 1/4 or 1/8 and CUTOFF at 1 - 2 octaves, the filter wobbles in time with the project.

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