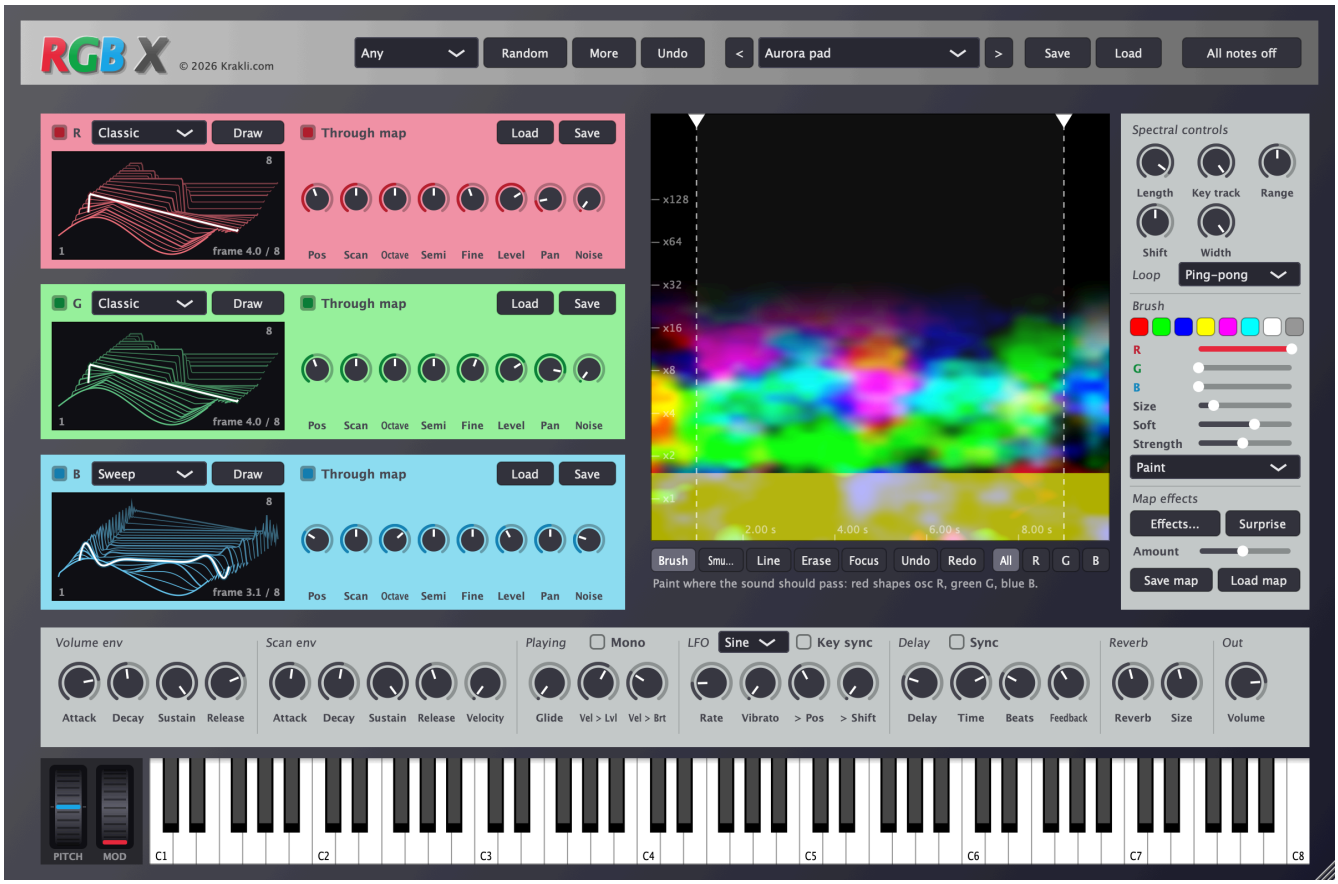
RGB X User Guide

Krakli · 22 November 2026

What RGB X is

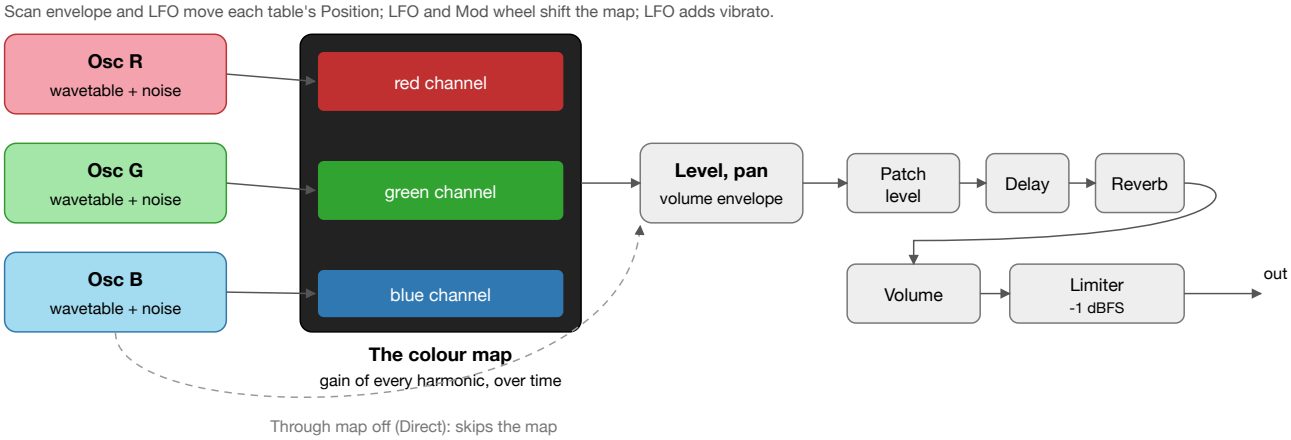
RGB X is a wavetable synthesizer from Krakli in which you paint the sound. It comes as VST3, AU and a standalone app on Mac, VST3 and standalone on Windows, and VST3, LV2 and standalone on Linux. Hosts list it as **RGB X** by Krakli.

It has three wavetable oscillators, named **R**, **G** and **B**. Instead of filters, their sound passes through a **colour map**: a picture with frequency going up and time going across. Each oscillator listens to its own colour, so red paint shapes osc R, green shapes osc G and blue shapes osc B. Wherever the map is bright, that part of the sound passes; wherever it is dark, it is held back.



- **Three wavetable oscillators**, each with up to 256 frames. They can be drawn, built from 73 waveforms including ten kinds of noise, or loaded from Serum, Vital, Surge and other wavetable files.
- **The colour map** in place of filters, painted with a brush or changed with 38 map effects.
- **A Scan envelope** that sweeps each table on every note, plus an LFO and velocity control.
- **Delay and reverb**, a limiter, and levels matched so every patch plays at a similar loudness.
- **12 factory patches**, a **randomiser** that builds new sounds that work, and **patch files** that hold everything.

How the sound is made



Every note does three things.

1. **Each oscillator plays its wavetable.** A wavetable is a set of single-cycle waves, called frames, from frame 1 to the last. **Position** sets which frame plays. Between frames, the wave morphs smoothly.
2. **The map shapes each harmonic.** The note starts at the left edge of the map and moves across it, reaching the right edge after **Length** seconds. At each moment, the brightness of the map's column at every height sets how loud that harmonic is. Low on the map are the low harmonics, starting with the fundamental; higher up are the bright overtones.
3. **The three oscillators are mixed** with their levels and pans, shaped by the volume envelope, then sent through the delay, reverb, Volume and a limiter.

Because the map is a picture of the sound over time, you can see what a patch will do:

- **A pluck** has bright paint at the left that shrinks towards the bottom as it goes right, so the tone dulls as the note goes on.
- **A pad** has bands and clouds spread across the whole length, often with a loop, so the tone keeps drifting.
- **A bell** has paint that fades faster the higher it is, so the overtones die first.

Colours mix as light does. Yellow is red and green together, so it opens both osc R and osc G. Cyan opens G and B, magenta R and B, and white all three. Black closes everything.

The title bar



- **Patch menu and arrows:** choose a factory patch. A patch change lets go of any notes that are sounding and never starts a sound by itself.
- **Save and Load:** save the whole sound as a `.rgbx` patch file, or load one. Patch files hold every setting, the three wavetables (including drawn or loaded ones) and the colour map.
- **All notes off:** silences everything at once, including the delay and reverb tails.
- **Character, Random, More and Undo:** the randomiser, described below.

The oscillators



Each oscillator panel has:

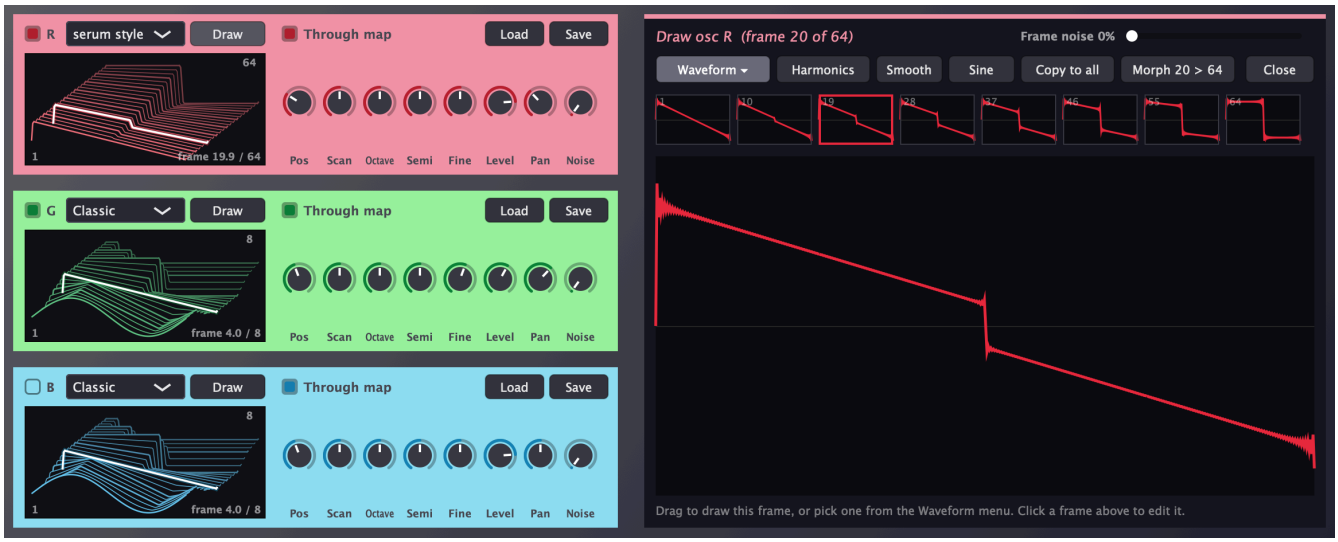
- **The on switch** (the coloured box by its letter).
- **The table menu:** the built-in tables are Classic, Organ, Vocal, Sweep, Hollow, Stack, Digital, Noise and Blank. A drawn table shows as Custom, and a loaded one by its file name.
- **Draw** opens the wave designer (below).
- **Through map:** on, the oscillator is shaped by its colour on the map. Off (**Direct**), it skips the map and plays its wave as it is, held steady. A banner on the waterfall says so. Direct is useful for a clean sub-oscillator under a bass.
- **Load and Save:** read or write a wavetable file (see "Wavetable files"). You can also drop a file onto the panel.
- **The waterfall:** the table drawn as a 3D map, frame 1 at the front and the last frame at the back, in the style of the Fairlight's wave displays. The white line is the current Position. While you play, it follows the newest note, so you can see the Scan envelope and LFO moving through the table. Drag up or down on it to move Position.

The knobs:

Knob	What it does
Pos	Position: which frame of the table plays, from the first (0%) to the last (100%).
Scan	How far up the table the Scan envelope carries Position on each note. Right of centre follows the envelope. Left of centre (shown as "Inv") follows it upside down: the note starts that far up the table, the attack brings it down to Pos, and the decay carries it back up. With no attack, a note starts at Pos and the decay sweeps it up the table.

Knob	What it does
Octave, Semi, Fine	Tuning, in octaves, semitones and cents.
Level	The oscillator's volume.
Pan	Its place in the stereo field. The map's **Width** scales all three.
Noise	How much of the oscillator plays as noise shaped like its wave, rather than as tone.

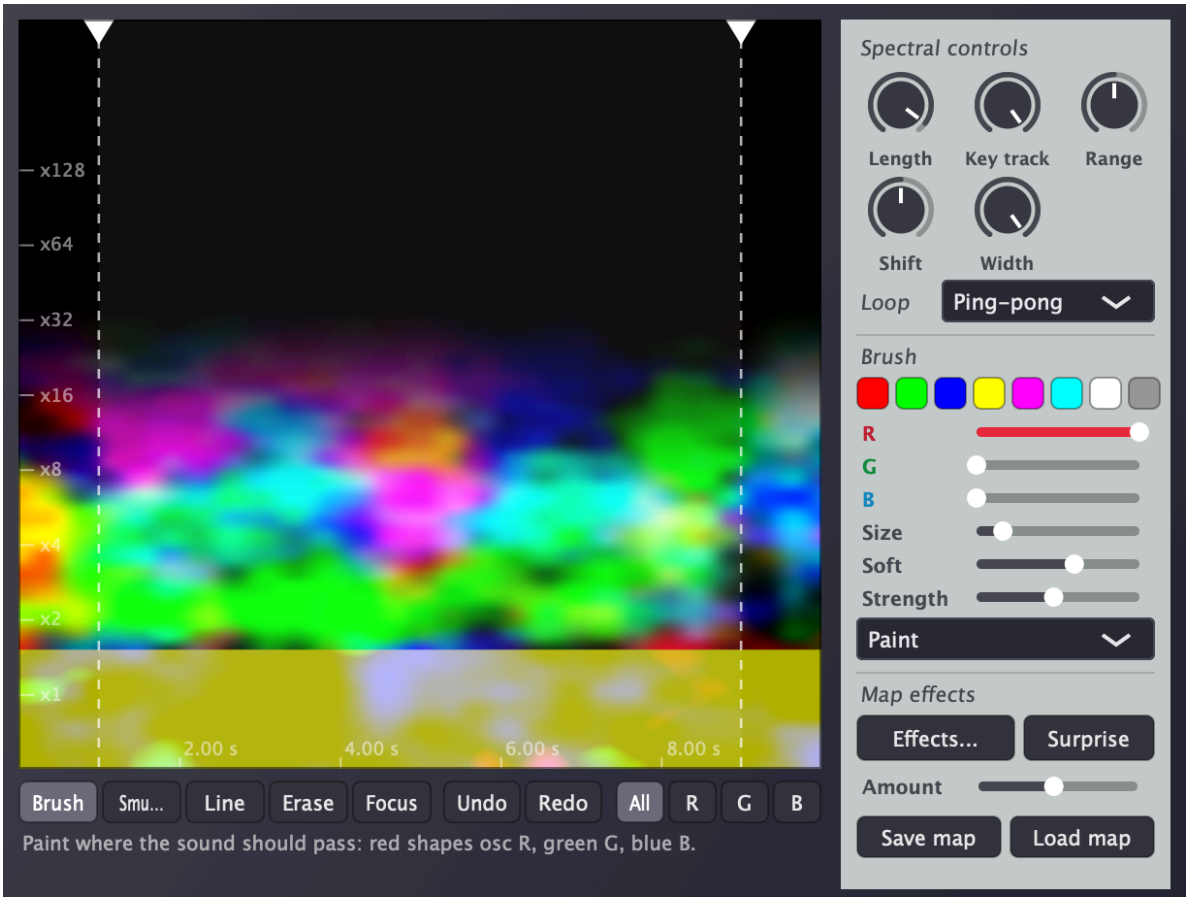
The wave designer



Draw opens the wave designer over the map. It edits the table of the oscillator whose Draw you pressed.

- **The frame strip** shows eight frames spread across the table. Click one to edit it.
- **Drag** in the large area to draw the frame as a waveform.
- **Waveform** chooses between drawing the waveform and putting a ready-made wave into the frame. The ready-made waves are 73 in seven groups: basic shapes, shaped sines, the CK set with 8 harmonics and with all, harmonic series, formants, and ten kinds of noise (white, pink, brown, rumble, bright, breath, low, mid and high bands, and grit).
- **Harmonics** shows the frame as bars, one per harmonic, so you can draw its spectrum instead.
- **Smooth** softens the frame's high harmonics. **Sine** replaces it with a pure sine.
- **Copy to all** copies this frame to every frame.
- **Morph X > N** rebuilds the frames between the one you're editing (X) and the table's last frame (N), so the table morphs evenly from one to the other. Put noise in an early frame and a wave in the last, and the table moves from noise into tone.
- **Frame noise** sets how much of this frame plays as noise. Morph fades it across the frames too.

The colour map



Time runs across the map from left to right, and frequency runs up. The marks on the left show the harmonics (x1 is the fundamental, x2 the octave above, and so on). Read along the bottom, the time marks show seconds. Hover over the map to see the time, harmonic and level under the pointer below it.

Painting:

- **Brush** paints soft dabs as you drag. **Line** paints a straight line from where you press to where you let go. **Erase** paints black.
- **Smudge** moves the paint that's already there, at the pointer, as if it were wet. Choose how in the box under the brush sliders:
  - **Oil** picks up the colour under the brush and drags it along, like a finger through oil paint. It slowly takes on the colours it passes over.
  - **Water** pushes the paint the way you drag, with a wobble, and lets it bleed at the edges, like wet watercolour.
  - **Blur** softens the paint under the brush without moving it far.

Size and **Soft** shape the brush as usual, and **Strength** sets how much each stroke moves. The brush colour isn't used. Dragging bright paint up the map moves those partials up in pitch; dragging it along moves them later in the note.

- **Focus** sets the point that Twirl, Glob, Pinch, Shatter and Hold work around.
- **Undo** and **Redo** step back and forward through changes to the map.
- **All, R, G, B** show all three channels or just one. With one shown, map effects change only that oscillator's channel.

The two markers at the top of the map are the loop start and end. Drag them to move the loop.

Spectral controls

Control	What it does
Length	How long a note takes to cross the map, from 50 ms to 12 s.
Key track	At 100%, rows of the map are harmonics of the note, so the same picture sounds the same on every key. At 0%, rows are fixed frequencies from 20 Hz to 20 kHz, like a fixed filter or formant. In between blends the two.
Range	How deep the map's dark goes, from 24 to 72 dB. Pure black is always silent.
Shift	Moves the whole map up or down by up to 3 octaves. Up is brighter.
Width	How wide the oscillators' pans spread.
Loop	Off: a note stops at the right edge and holds that last column. Loop: it jumps back from the end marker to the start marker. Ping-pong: it travels back and forth between them. Loops run while the key is held; on release the note carries on to the right edge.

Brush

- **Swatches and the R, G and B sliders** set the brush colour.
- **Size, Soft and Strength** set the dab's size, how soft its edge is, and how much each dab adds.
- **The merge menu** sets how a stroke combines with the paint underneath: **Paint**, **Add**, **Lighten**, **Multiply**, **Darken** or **Difference**. Multiply with cyan, for example, closes osc R alone and leaves G and B as they were; Add opens channels further. With **Smudge** chosen, this menu picks Oil, Water or Blur instead.

Map effects

Effects... opens the list of 38 effects in five groups, each applied at the **Amount** below. **Surprise** applies three at random. **Save map** writes the map as a PNG, and **Load map** reads any PNG, JPEG or GIF picture as the map, so photographs and drawings can become sounds.

Group	Effects
Warp	Twirl, Glob, Pinch, Ripple, Shatter, Melt, Scatter, Kaleido, Rise (brighter), Fall (darker)
Time	Smear (sounds hang on), Echo, Stretch (slower), Squeeze (faster), Repeat, Chop (gating), Hold (freezes from the focus on), Reverse, Fade out
Shape	Blur, Sharpen, Glow, Edges, Thicken, Thin, Posterise, Threshold, Invert, Grain, Sparkle, Fade highs
Colour	Rotate (R to G to B), Swap R/B, Split (pulls the oscillators apart in time), Unify, Separate
Map	Fill (with the brush colour), Clear

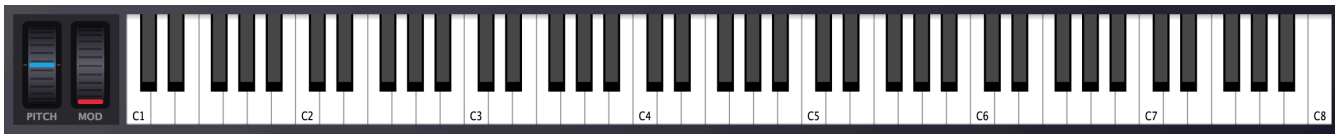
Envelopes, playing, LFO and effects



- **Volume env:** Attack, Decay, Sustain and Release, for the loudness of each note.
- **Scan env:** a second envelope, restarted by every note, that moves each oscillator's Position by its **Scan** amount. **Velocity** lets harder notes sweep further.
- **Playing:**
  - **Mono** plays one note at a time.
  - **Glide** slides between notes.

    - **Vel > Lvl** sets how much velocity changes the level.
    - **Vel > Brt** sets how much it changes the brightness: softer notes read the map lower down, so they come out darker.
- **LFO:**
    - **Shape** is Sine, Triangle or Random.
    - **Rate** sets its speed.
    - **Vibrato** sends it to pitch.
    - **> Pos** sends it to every table's Position.
    - **> Shift** sends it to the map's Shift, sweeping the whole map up and down.
    - **Key sync** restarts the LFO for each note, so every note sweeps the same way from its start.
- **Delay:** a ping-pong delay with mix (Delay), Time and Feedback. With **Sync** on, Beats sets the time in beats of the host's tempo.
- **Reverb:** mix and Size.
- **Out:** Volume. It's yours: patches and the randomiser leave it alone. A limiter at -1 dBFS follows it.

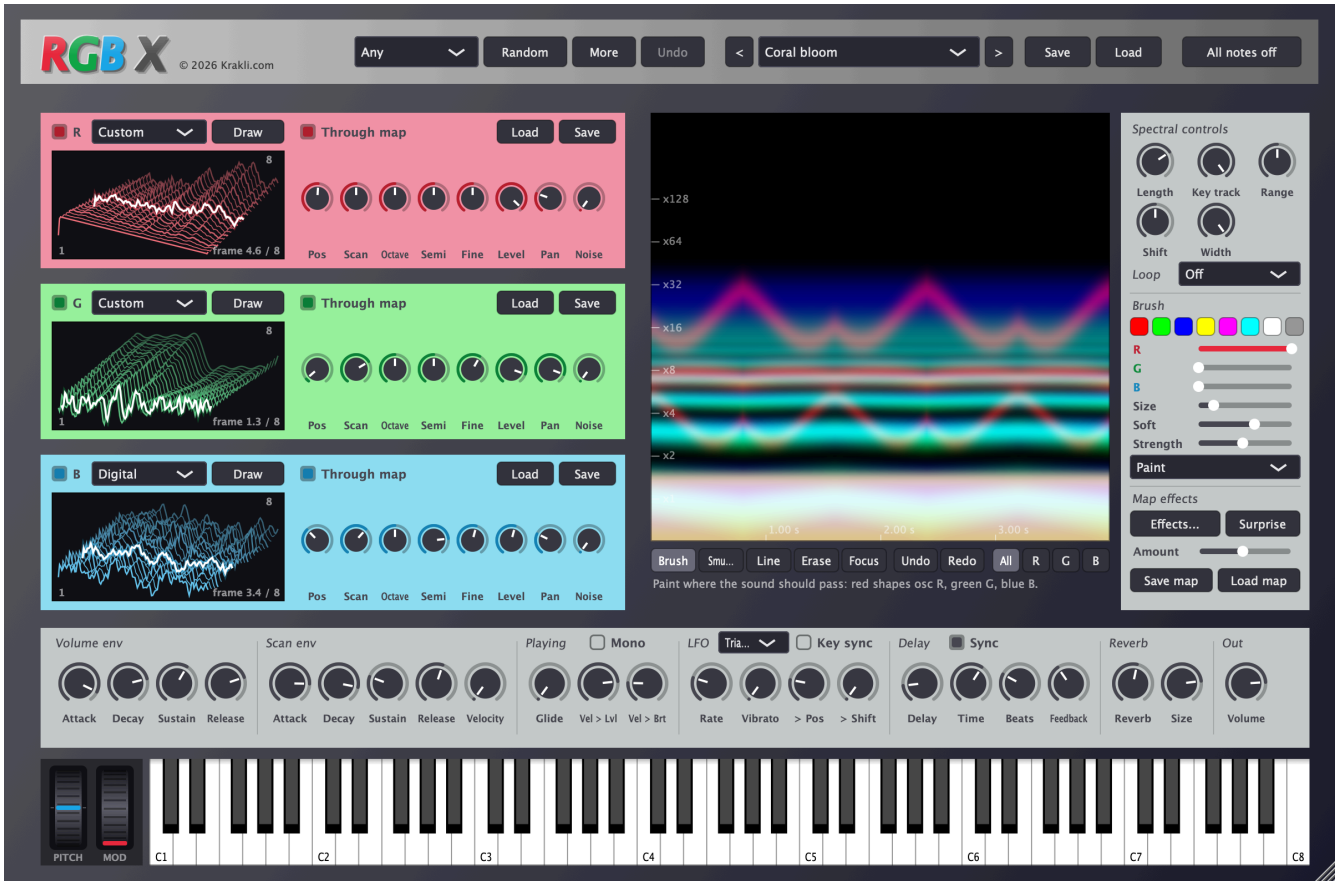
The keyboard and wheels



The on-screen keyboard runs from C1 to C8 and plays like a MIDI keyboard. The **pitch wheel** bends by up to two semitones and springs back. The **mod wheel** shifts the map up by up to two octaves, so pushing it opens the sound. Both also follow MIDI, and the sustain pedal works as expected.

Random sounds

The randomiser sits in the title bar.



- **Character:** choose the kind of sound to make: **Any**, **Pluck**, **Pad**, **Bass**, **Bell**, **Percussion**, **Lead** or **Evolving**.
- **Random:** makes a new sound of that character and gives it a name, such as "Cobalt glass" or "Teal aurora".
- **More:**
  - **Vary a little** and **Vary a lot** nudge the current sound's settings and stir its map gently. Its switches and tuning stay as they are.
  - **Crossbreed with a factory patch** takes each part either from the current sound or from a factory patch.
  - **New part only** renews one part and keeps the rest. The parts are Oscillators, Map, Spectral controls, Envelopes, Modulation and Effects.
  - **Redo** steps forward again after Undo.
- **Undo:** goes back to the sound before the last Random, Vary or Crossbreed.

How it works. Each part is drawn from ranges that suit the character, and now and then a part is taken from a factory patch of the same kind.

- **Oscillators:** built-in tables, or sometimes a new table that morphs between two or three of the 73 waveforms.
- **Map:** painted from recipes rather than at random:
  - plucks and basses get a low-pass that closes over time;
  - pads get drifting bands, colour clouds or harmonic combs;
  - bells get partials that fade faster the higher they are;
  - percussion gets noise bands at fixed pitches;
  - pads and evolving sounds often go through a map effect or two as well.

Checked before you hear it. Every result is played offline first, on a separate copy of RGB X, never the one you are playing. A result that comes out silent, unstable or harsher than the factory sounds is thrown away and

another is tried. The one that passes is levelled with Patch level, so it plays at the same loudness as the factory patches. Each click takes a fraction of a second.

Save a sound you like with **Save**; random sounds are not kept anywhere else.

Wavetable files

Load on an oscillator panel, or dropping a file onto it, reads:

- **WAV, AIFF or FLAC wavetables**, as Serum, Vital, Bitwig and Ableton use: single cycles end to end, usually 2048 samples each. Serum's frame-size tag is read when it's there.
- **Surge `.wt` files.**
- **Single-cycle waveforms** of any length up to 4096 samples, such as the AKWF collection.
- **Any other sound**, cut into 64 frames, each one cycle found by pitch detection, so the table morphs through the sound.

Tables longer than 256 frames are thinned to 256. **Save** writes the table as a WAV with 2048 samples a frame and Serum's tag, so Serum and Vital can read it.

Factory patches

Patch	What it is
Init	One saw through an open map: a starting point.
Copper pluck	Two detuned saws through a low-pass that closes quickly.
Glass bell	Three sines tuned to inharmonic intervals, the higher ones fading first.
Rubber bass	Saw and square an octave down, a fast closing low-pass, and a direct sine sub. Mono with glide.
Snare	A short low body with a band of noise above it, at fixed frequencies.
Breath flute	A triangle with breath noise and a chiff at the start, looping, with vibrato.
Talking pad	Two saws through vowel formants that move across a ping-pong loop.
Aurora pad	Three oscillators through drifting colour clouds, with the LFO moving the tables.
Zap	Bands sweeping up and down: a laser blip.
Hollow keys	Odd harmonics on one oscillator and even ones fading in on the other.
Vowel scan	Osc R sweeps through the Vocal table on each note with the Scan envelope.
Sweep pluck	Two tables swept up from bright to dark by an inverted Scan.

Tips

- **Start from a factory patch or a random one** and change one thing at a time. The map shows you what each change does.
- **To make a sound brighter**, paint higher up, push the mod wheel, raise Shift, or use the Rise effect. **To make it duller**, the opposite: Fall, Fade highs, or paint black at the top.
- **To make a sound last**, use Loop or Ping-pong with long bands, or the Smear effect. **To make it short**, use Fade out or Squeeze.
- **Give each oscillator its own job.** Paint red low and steady for the body, green as moving bands for the character, and blue as short bright marks for the attack.

- **Use Key track 0%** for fixed formants and drums, so the colour stays at the same frequencies whatever note you play.
- **If a sound goes silent**, check that the oscillator is on, that its colour is on the map (show R, G or B alone to see), and that Range is not hiding it.