PHANTOMEXPOSURE · USER GUIDE

GHOST VECTOR

AWM · AFM · VECTOR SYNTHESIS · VERSION 0.10.10



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1 WHAT GHOST VECTOR IS

Ghost Vector is a vector synthesizer. Four sound sources sit at the corners of a square, and a point inside the square, the **vector**, decides how much of each you hear. Move the point and the sound morphs; let a motion lane move it and the sound evolves on its own.

A
AWM · SAMPLE
A sample corner: one of 48 built-in sources or your own sample, with filter and envelopes.

B
AFM · 6-OP FM
A six-operator FM corner with 90 algorithms and 32 operator waves.

C
AWM · SAMPLE
The second sample corner.

D
AFM · 6-OP FM
The second FM corner.

The corner roles are fixed. Sample A can also modulate FM B, and sample C can modulate FM D (RCM, "real-time convolution and modulation"), so the samples can colour the FM.

Alongside the mix vector there is a second, **drift** vector that detunes the corners against each other, so a held note can widen and shimmer as well as morph.

SIGNAL FLOW

1. Each corner: source → filter (12 types) → amp envelope → pan (with an optional pan envelope).
2. The vector mixes the four corners; drift and unison detune them.
3. A shared effects bus: ensemble, delay and reverb (with shimmer and freeze), biased by Vector FX, then an output character ("DAC").
4. Output level and an always-on safety limiter.

12 voices, each with up to 5 unison layers. Ghost Vector comes as VST3 and CLAP for Windows and Linux, and as VST3, AU and CLAP for macOS; there is no standalone app (section 16).

FOUR VIEWS

PLAY	The four corners, the vector field, the motion lane and the eight macros.
TG-33	Play an imported TG-33 / SY22 / SY35 voice on its own hardware-style engine.
TG-77	Play an imported TG-77 / SY77 voice on its own hardware-style engine.
ADVANCED	Every page and parameter of the four-corner engine.

2 QUICK START

1. **Pick a preset**: click the preset display at the top to open the browser, or step through presets with ◀ ▶.
2. **Play** and drag on the vector field. The percentages at its corners and on the four corner cards show the mix.
3. **Turn MOTION on** to let the blend lane move the vector for you. SYNC locks it to the host tempo.
4. **Open ADVANCED** to change what is in each corner (CORNERS), how the vector moves (MOTION) and the effects (FX).
5. **Click the dice** for a new patch, or right-click it for the musical randomizer. Undo steps back.

> **MACROS WORK STRAIGHT AWAY**
> Each of the eight macros has a built-in job (Bright, Resonance, FM Depth, Drift, Spread, Space, Echo, Shimmer; see section 5). Route a macro on ADVANCED › MOD to give it your own job instead; it then takes the names of what it controls, e.g. "A Cutoff + Reverb Mix".

3 THE PLAY VIEW



PLAY with "Six Op Aurora" loaded and the motion lane running.

1 **View keys.** PLAY, TG-33, TG-77 and ADVANCED.

2 **Preset display.** Shows the category, the name and the preset's number. For your own presets it shows USER, for a hardware voice TG-33 or TG-77, and after a random roll RND. Click it to open the preset browser (section 4).

3 ◀ ▶ step through your user presets and then the factory presets, wrapping round.

4 **A / B** compare.

5 **Undo / redo** (whole patch).

6 **Dice.** Click for a new patch; right-click for the musical randomizer.

7 **The Ghost Vector name** opens the interface size and screen colour menu (section 13).

8 **Corner cards**, A and C on the left, B and D on the right. Each shows what the corner plays, its share of the mix, and its live wave. Sample corners have **Level**, **Cutoff** and **Attack**; FM corners have **Level**, **Index** and **Feedback**.

9 **Vector field.** Click or drag anywhere to set the vector. The ring is the vector you set, and the large circle around it the reach of the drift. The dashed curve is the blend lane's path, and the bright point with its trail is where the vector is now.

10 **Status line**: MOTION · LOOP, MOTION · ONE SHOT or MOTION OFF, with the vector's X and Y on the right.

11 **MOTION. Depth** sets how far the blend lane moves the vector. **ON**, **SYNC** and **LOOP**, and the **Rate** (Hz, or a note value when synced).

12 **PERFORMANCE.** The eight macro knobs, named after what they do. Double-click any knob to reset it.

13 **OUTPUT.** A scope of the output, a level meter, and the **Output** level.

4 PRESETS, COMPARE, UNDO AND THE RANDOMIZER

THE PRESET BROWSER



The preset browser, opened from the preset display.

- **Search presets** filters by name or category. The chips show ALL, FAV (your favourites), the seven factory categories (ADDITIONAL, PAD, KEY, PLUCK, BASS, DRONE, FX), your USER presets, or the BANK you imported last (section 12).
- Click a preset to load it, and double-click to load it and close the browser. Click a preset's star to make it a favourite.
- `SAVE` saves the patch as a user preset. `DELETE` deletes the current user preset. `IMPORT TG` and `EXPORT .SYX` bring in and save TG-33 / TG-77 voices (section 12). `CLOSE` closes the browser.

Factory presets are numbered as the preset display counts them, and also appear in your DAW's own preset list (section 13). User presets are .gvpreset files, on Windows in **%APPDATA%\GhostVector\Presets**. They hold the whole patch: parameters, both motion lanes, the user samples themselves and any hardware voice.

Turning a knob doesn't mark the preset as edited, so the display keeps the preset's name until you load another one or roll the dice.

A / B AND UNDO

A / B keeps two versions of the patch; B starts as a copy of A the first time you switch. **Undo** and **redo** step through whole-patch snapshots, up to 64. One knob turn is one step. The history and the A/B slots live in the plug-in window and aren't saved with your project.

MUSICAL RANDOMIZER

Click the dice for a new patch in the current flavour. Right-click it (or Ctrl-click) for the panel:

- **FLAVOUR**: Bell, Pad, Key, Pluck, Bass, Drone, Texture, Lead or Surprise.
- **Roll Full** builds a fresh patch, **Mutate** nudges the current one, **Undo Last Roll** restores exactly.
- **LOCK SECTIONS**: Sources, FM, Envelopes, Filter, Motion and FX. Locked sections are never changed.
- **MUTATE AMOUNT**: Subtle, Medium, Wide or Extreme.

Output level, quality, pitch bend and tuning are never randomized. A full roll with Motion unlocked also clears the mod matrix and redraws the lanes.



The musical randomizer over the PLAY view.

5 ADVANCED: HOME

ADVANCED has seven pages: HOME, CORNERS, MOTION, MOD, TG+, FX and ALL. The first six are built like the rest of the instrument. Each section is a plate, and most plates have a screen that shows what the section is doing to the sound. Hover any control for its full name.



HOME with "Six Op Aurora" loaded.

VECTOR	The vector pad. Click or drag to set the vector, as on PLAY. The status line shows whether the motion lane is running, and where the vector is. Below it: **Mix depth** (how far the vector moves the mix), **Drift depth**, **Spread** (the drift detune, in cents) and **Drift X / Y**.
CORNER A–D	One plate per corner. The line under the title names what the corner plays: its source, or for B and D its algorithm. The screen shows the corner's wave as it plays, with a bar for its level (empty when muted). Below are **Level**, **Pan**, **Mute** and **Solo**.
MACROS	The eight macros. The screen shows how far each one is turned. A macro you haven't routed on MOD does a built-in job and is named after it (see below). Once you route a macro, it does only what you routed and takes that name instead.
OUTPUT AND SCENES	**Output** (−24 to +12 dB, default −6). **Quality** (Draft, Normal or High) sets sample interpolation. **ECO** limits unison to 3 layers and quality to Normal, to save CPU. **Scenes 1–4**: SAVE stores the current sound, LOAD brings it back. Scenes are saved with the project. **RND ELEMENTS** randomizes the sample sources and the FM algorithms and waves; with **WILD** lit it uses the full range, otherwise it keeps the results musical.

THE MACROS' BUILT-IN JOBS

1 Bright	Opens all four filters, up to 1.5 octaves.	5 Spread	Pans A and C left and B and D right.
2 Resonance	Raises all four filters' resonance.	6 Space	Adds reverb.
3 FM Depth	Deepens the FM on B and D.	7 Echo	Adds delay.
4 Drift	Adds drift detune, up to 70 cents.	8 Shimmer	Adds shimmer.

6 ADVANCED: CORNERS

Choose A, B, C or D in the key tray. A and C are sample corners; B and D are FM corners.



Corner A, a sample corner.

SAMPLE CORNERS (A, C)

SOURCE	The screen shows the source's waveform. The light bars mark the start and end, and the tinted band is the loop. **Source**: 48 built-in sources (choirs and air, mallets and film, rare sources such as Ghost Choir, Dust Bell, Glass Pad, Air Vox, Orbit Pad and Low Glass) or User 1 / User 2. **Play**: One Shot, Loop or Reverse. **Quality**: Clean, Vintage or Grainy. Knobs: **Start**, **End**, **Loop at**, **Loop len**, **Tilt** (tone), **Coarse** and **Fine** tuning.
LOAD USER 1 / 2	Load a WAV, AIFF or FLAC file into a user slot. It is mixed to mono, normalised and limited to 20 s. The sample itself is saved with the project and in user presets, so it still plays if the file moves.
FILTER	The screen draws the filter's response. **Mode**: 12 types (LP, HP, BP, Notch, Peak, Vowel, Hollow, Nasal, Tilt LP, Air HP, Body, Glass). Then **Cutoff** and **Reso**. The filter envelope has **EG amount** (±4 octaves) and **Attack**, **Decay**, **Sustain** and **Release**.
AMPLITUDE	The screen draws the amp envelope's shape. Controls: **Attack**, **Decay**, **Sustain** and **Release**, plus **Delay** and **Hold**. **Key scale** speeds the envelope up higher on the keyboard. **Loop** repeats the envelope.
LEVEL	**Level** and **Pan**. **Velocity** sets how much playing harder raises the level. **Key track** sets how much the filter cutoff follows the keyboard. Also **Mute** and **Solo**.
LFO	The screen draws one cycle of the shape. **Shape**: Sine, Triangle, Saw Up, Square, S&H, Smooth Rnd, Saw Down, Exp Rise, Exp Fall, Pulse 25, Drift Sine or Stepped Tri. With **SYNC** off, **Rate** runs from 0.01 to 20 Hz; with SYNC on it is a note value. Then **Depth**.
PAN ENVELOPE	Moves the corner across the stereo field. The screen draws its path, with right at the top and left at the bottom. **ON**, **LOOP**, four levels (**Level 1–4**, −1 is full left) and four times (**Time 1–4**).

FM CORNERS (B, D)



Corner B playing "Hex Additive": six carriers, each heard directly.

ALGORITHM	The screen draws the routing from left to right: modulators on the left, carriers on the right, and the dot is the output. A brighter box means a louder operator. Operators the algorithm doesn't use are hidden, and a dashed amber loop marks feedback. **Algorithm** lists all 90 routings: Ghost Vector's 45 (such as "Organ Cloud") and the 45 TG-style ones, TG01–TG45. Knobs: **Index** (overall FM depth), **Feedback**, and **Balance**, which sets operator 1's level against the other carriers. Then **Level**, **Pan**, **Coarse**, **Fine**, **Mute**, **Solo**, and the amp envelope's **LOOP** and **EG scale** (key scaling).
FILTER	As on the sample corners.
LFO	As on the sample corners. This plate also holds **Velocity** and **Key track**, plus the amp envelope's **EG delay** and **EG hold**.
OPERATORS	All six operators, three on each side. Each has **Wave** (32: TG-style AFM waves such as Sine, Saw 1, Half Sine and Odd Square, and Ghost waves such as Glass Fold, Formant I, Bell Partial and Rotor Harm), **Mode** (Ratio, or Fixed for a frequency that ignores the key), **Tune**, **Level**, and an envelope: **Attack**, **Decay**, **Sustain**, **Release**.
PAN EG	This key is next to the corner keys and appears only for an FM corner. It swaps the operators for the pan envelope.



PAN EG lit: corner B's pan envelope, on and looping, in place of the operators.

> **MORE FM**
> Deeper FM controls (operator scaling and phase, pitch envelope, extra routing) are on TG+.

7 ADVANCED: MOTION

Two lanes move the sound over time. The **BLEND** lane moves the mix vector, and the **DRIFT** lane moves the drift vector. Choose one in the key tray.



The Blend lane: the X and Y curves, the path they trace, and the lane's controls.

LANE X · LANE Y	One curve per axis, played left to right. Click empty space to add a point, drag to move it, right-click to delete it.
PATH	The path the two curves trace across the vector field, with the live position. **RESET** clears the curves. **RANDOM** draws a random path, using the full range when **WILD** is lit.
ON · SYNC · LOOP	Turn the lane on, lock it to the host tempo, and choose whether it loops or plays once.
Mode	Free (runs continuously), Retrig (restarts on each note) or Legato (restarts only when you play after silence).
Rate · Depth · Smooth · Humanize	Rate is 0.01–20 Hz free, or a note value from 1/32 to 8 bars when synced. Depth sets how far the lane moves the vector, Smooth how smoothly, and Humanize adds random variation.

TG-33 STYLE VECTOR ENVELOPE (BLEND LANE)

The **TG-33** key plays the blend lane's points with TG-33-style step timing. **TG-33 mode** chooses whether the envelope moves the corner mix (Blend) or the drift pitch (Detune). **REPEAT** loops it after its last step. **Step** (10–160 ms) and **Step x** set its timing. **Detune** and **Depth** set how far it moves. **TG 50** resamples the lane into 50 even steps; press it again to restore the freeform lane.



The Drift lane, with its Spread control.

8 ADVANCED: MOD



Four routings: Macro 1 to A Cutoff, the mod wheel to B's FM depth, Blend X pulling the reverb down, and velocity to C's level.

The **modulation matrix** has eight slots. Each routes a source to a destination by a depth from −100% to +100%.

ROUTING	Sources are on the left and destinations on the right. Each routing is a curve in its slot's colour, as thick as its depth, and dashed when the depth is negative. The mod wheel, aftertouch, velocity and macros show their live values as bars. An unrouted macro that is turned up appears as a faint dotted line to its built-in targets.
Sources	Macro 1–8, Mod Wheel, Aftertouch, Velocity, LFO B, LFO D, Blend X, Blend Y, Drift X, Drift Y.
Destinations	Level, Pan, Cutoff and Reso for each corner; Blend X / Y; Drift Depth; B and D FM Depth; Reverb Mix, Delay Mix and Shimmer.

Routing a macro replaces its built-in job and gives it the names of what it controls, such as "A Cutoff". The mod wheel and aftertouch act only through this matrix.

TUNING

Turn **ON** and choose a **Scale**: Equal (12-TET), Just Major, Just Minor, Pythagorean, 1/4 Meantone, Werckmeister III or Kirnberger III. Then set the **Root** and **Master** tune (±50 cents).

9 ADVANCED: TG+

TG+ holds deeper FM controls borrowed from the TG-77 and SY77, the performance settings and the user sample slots. Choose **FM B** or **FM D** in the key tray to pick the corner you edit.



TG+ for corner B.

PITCH ENVELOPE	The screen draws the pitch envelope. **Depth** (±24 st), **Attack**, **Decay**, **Sustain**, **Release**. The **OP 1–6** keys choose which operators follow it.
ROUTING	An extra feedback path (**Feedback from**, **Feedback to**, **Amount**) and an extra feed-forward path (**Forward from**, **Forward to**, **Amount**), on top of the algorithm. **Ring / cross-mod into** and **Depth** set which operator the paired sample corner reaches (A into B, C into D), and how strongly.
OPERATOR SCALING AND PHASE	For each operator: **Key** and **Velocity** scaling, and **Phase**, its starting phase. **SYNC** restarts the operator at that phase on every note. **0 HZ** holds it at that phase for static waveshaping.
PERFORMANCE AND USER SAMPLES	**Bend** (0–24 st, default 2), **Glide** (0–2.5 s) and **Glide mode** (Off, Always or Fingered). **LOAD 1 / 2** and **CLEAR** manage the user sample slots, and the display beside them shows the loaded file's name.

The per-corner filter envelopes that used to be here are now on each corner's Filter plate on CORNERS.

10 ADVANCED: FX



ENSEMBLE	The screen shows the ensemble's voices drifting against each other. Controls: **Voices** (2, 4 or 6), **Mix**, **Rate** (0.05–6 Hz), **Depth**, **Width**, **Feedback**, **Tone**, and **Drift**, which lets the vector's position vary the ensemble's movement.
DELAY	The screen shows the echoes fading. **SYNC** swaps **Time** (20–1500 ms) for a **Division** (1/32 to 1/1). Then **Feedback filter** (LP, BP or HP), **Mix**, **Feedback**, **Tone**, **Mod**, **FB freq**, **Width**, **Offset** and **Drive**.
REVERB	The screen shows the tail, and how damping darkens it. **Type**: Hall, Room, Plate, Chamber, Space, Cloud, Gated, Reverse or Crystal. **FREEZE** holds the tail. Then **Mix**, **Size**, **Damp**, **Width**, **Mod** and **Predelay** (0–180 ms).
SHIMMER, UNISON AND OUTPUT	The screen shows the shimmer's partials and the output character. • **Shimmer**, with its **Pitch** (±24 st, default an octave up) and **Tone**. • **Unison** voices (1–5), **Detune** (0–50 ct), **Width** and **Unison mix**. • **Vector FX** (Vector, Bloom, Orbit or Glass) and its **Morph** bias the effects as the vector moves. • **Character** sets the output stage: Clean, TG Glass, Warm DAC, 12-bit or Tape Dark. • **BYPASS** turns the whole effects bus off, including Vector FX and the output character (DAC), and stays as it is when you change preset.

11 ADVANCED: ALL



ALL showing CORNER B. The amber marks show what "Six Op Aurora" has moved from the defaults.

All 480 parameters of the four-corner engine as knobs, menus and switches, one category at a time.

CATEGORIES Choose **GLOBAL**, **CORNER A–D**, **MOTION**, **MOD** or **FX** on the left; the number is how many parameters it holds. Each category is split into the plates of its own page: a corner's Source (Algorithm on B and D), Level, Filter, Amp envelope, LFO and Pan envelope, plus on B and D the pitch envelope, routing and one plate per operator. The mod matrix has one line per slot.

SEARCH Type part of a name, a plate or a parameter ID. Results come from every category, the numbers on the left show where they are, and clicking a category jumps to its results. Esc clears the search.

EDITED Shows only the parameters the patch has moved from their default, across every category: a quick way to see what makes a sound. An amber mark flags them all over the page; double-click a knob to return it to its default.

Hover any control for its full name and ID. Right-click a knob for MIDI learn.

12 THE TG-33 AND TG-77 VIEWS

These views play a voice from a Yamaha TG-33 / SY22 / SY35 or TG-77 / SY77 that you import yourself, on an engine written to follow those instruments' published documentation. The four-corner engine is replaced while a hardware voice is loaded.



The TG-33 view with a voice whose level vector visits A, C, B and D.



The TG-77 view with a two-AFM, two-AWM voice; element 1 is selected.

The voices in these pictures were made for this guide; they are not Yamaha voices.

IMPORTING A VOICE

- Open the preset browser, press `IMPORT TG` and choose a .syx or .mid file. Ghost Vector switches to the right view for the voice. SY77 disk .MID files are supported. The file dialog opens in the folder you used last time.
- A **bank** is kept whole: its first voice plays, the browser opens on the **BANK** list, and the preset arrows step through it (the display shows the voice's number). It is saved with your project; after another preset, pick a voice from BANK to return.
- `EXPORT .SYX` saves the loaded voice, with your edits, as a single-voice .syx. Hovering the preset display shows the voice's mode and its place in a bank.
- Some TG-77 voices, DX7 conversions especially, hold values outside Yamaha's documented ranges. Each plays from its documented bits and is kept as it was in an export; the display's tooltip says how many there are.
- The voice is saved with your project and in user presets. Switching to PLAY or ADVANCED parks it, and coming back to its view brings it back. Loading a factory preset leaves hardware mode.

TG-33 VIEW

The TG-33 engine plays two AWM and two FM tones, blended by the voice's own recorded level and detune vectors.

- **Tone cards**: AWM tones A and C have **Level**, **Tune** and **Pan**; FM tones B and D have **Mod Lvl**, **Ratio** and **Feedback**. Each card's screen draws the tone.
- **The diamond** shows the recorded vector, step by step. Drag on it to take the vector over (HELD); double-click to release it. CC16 and CC17 move the vector from MIDI, as on the hardware.
- **VECTOR**: **Rate** is the level vector's time unit for every step, and **D Rate** the detune vector's. `LEVEL` and `DETUNE` choose which vector the strip shows. `HOLD` holds the vector where it is, as letting go of the joystick would.
- **VECTOR SEQUENCE** draws each tone's share of the sound across the steps.

TG-77 VIEW

The TG-77 engine plays up to four AFM and AWM elements: six-operator AFM with the voice's own routing, two filters per element, and the drum set. The TG-77 has no vector, so its elements play together.

- **Element cards**: click one to select it. AFM elements have **Level**, **Detune** and **Shift**; AWM elements have **Level**, **Cutoff** and **Reso**.
- **The centre screen** shows the selected element's algorithm (click an operator to select it) and that operator's amplitude envelope.

- **FILTER 1**: **Cutoff**, `LPF` / `HPF` / `THRU` and **Reso**. **OPERATORS**: the six operators' output levels, or for an AWM element its amplitude envelope (Rate 1–4, Release, Level 2).

> **WHAT THESE MODES ARE, AND ARE NOT**
>
> You can edit an imported voice with the knobs in its view. Each change is applied when you let go of the knob; notes that are sounding carry on, except when the change alters the number of elements or the voice mode. Ghost Vector contains no Yamaha ROM data or samples: AWM waves are Ghost Vector's own stand-ins, so voices sound related to, but not identical with, the hardware. Values the documentation doesn't give are estimates. The TG-33's custom FM chip copies the registers of the OPZ (the TX81Z's chip), so its laws follow the OPZ; envelope curve and LFO rates are estimates. The hardware effects are not rendered: these modes are dry, and Ghost Vector's own FX don't apply. Micro-tuning and TG-77 card waves aren't supported.

Polyphony follows the hardware: up to 16 AFM or 32 AWM element voices on the TG-77, and 16 notes (A-B voices) or 8 (A-B-C-D voices) on the TG-33.

13 MIDI, HOST AND DISPLAY

- **Notes and velocity** play the 12 voices. **Pitch bend** uses Bend Range (0–24 st, default 2) with a small dead zone. The **mod wheel** and **aftertouch** act through the modulation matrix. The sustain pedal is supported.
- **Host preset list**: the 108 factory presets also appear in your DAW's own preset list (VST3 and AU, not CLAP), in browser order; picking one loads it. The last entry, **(Custom sound)**, shows when you are on your own sound and does nothing when picked.
- **MIDI learn**: right-click any knob and choose **MIDI Learn**, then move a controller; from then on it sets that knob over its whole range. Right-click again to learn another controller or to forget it (**Forget CC**). The sustain pedal (CC64) and CC120–127 can't be learned. Assignments are saved with the project. Besides learned controllers, only CC1, sustain and all-notes-off are used outside the hardware modes. MPE isn't supported.
- **Automation**: all 480 parameters can be automated. A corner's parameters carry its letter and a motion lane's its name, so the host lists "A Cutoff", "D Op3 Level" or "Blend Rate Hz".
- In the TG views, note, bend, controllers and channel pressure go to the hardware engine; the TG-77 follows the voice's own controller assignments.

SIZE AND SCREEN COLOUR

Click the **Ghost Vector** name at the top left. **Interface Size** offers Compact (70%), Small (85%), Standard (100%), Large / 1440p (125%), 4K (150%), 4K Large (175%) and Maximum (200%); hosts that allow resizing keep the window's 5:3 shape between 70% and 200%. **Screens** sets the screens' colour: Teal phosphor, SY77 blue or TG-33 green. Size, colour and favourites are remembered for every project on your computer.

14 WHEN SOMETHING FEELS OFF

IF YOU HEAR THIS	TRY THIS FIRST
A macro does something unexpected	An unrouted macro does its built-in job (section 5); route it on ADVANCED › MOD.
Mod wheel or aftertouch do nothing	Route them in the modulation matrix.
A knob moves on its own	A controller is MIDI-learned to it. Right-click the knob and choose Forget CC.
The dice made no difference	A hardware voice is loaded. Load a preset, or switch to PLAY, to hear the four corners.
A user sample is missing	Projects and presets before 0.10.10 saved only its location. Put the file back, or load it again.
The FX don't work on a TG voice	Hardware modes are dry by design.
Too much CPU	Turn on ECO on HOME, lower Quality, or use fewer unison voices.

15 FACTORY PRESETS

108 presets in seven categories, in browser order. Loading one resets every parameter (except FX Bypass) before applying the preset.

CATEGORY	PRESETS
Additional (17)	Six Op Aurora · Hex Bell Garden · Ghost Hex Choir · Deep Feedback Hex · Broken Hex Lantern · Tidal Glass Key · Pulse Cathedral · Gated Ice Garden · Stagger Bell Choir · Ghost Machine · Instant Vector Lead · Mercury Finger Glide · Velocity Glass Map · Crossfeed Spectre · User RCM Portal · Adaptive Crystal Atlas · Dual RCM Phase Forge
Pad (24)	Glass Reliquary · Choir Drift Field · Ashen Memory Wash · Cold Air Index · Hollow Breath · Vapor Bloom · Tape Memory Index · Spectral Sweep · Basalt Choir Lens · Cyan Memory Plate · Glasswire Atrium · Aerial Fault Choir · Koto Under Ice · Tines Behind Rain · Orbit Organ Sleep · Harmonic Salt Veil · Rotor Glass Cathedral · Null Vowel Station · Gated Cathedral · Vowel Choir Morph · Hollow Wind Pad · Struck Ice Cathedral · Static Bloom Engine · Zero Phase Lanterns
Key (20)	Glass EP Directory · Operator Bell Keys · Glass Mallet · Broken Organ · Crystal Celesta · Reed Stack · Phosphor EP · Wire Choir Keys · Null Glass Tines · Phase Koto Echo · Solar Bell Organ · Bowed Cyan Tines · Comb Teeth Choir · Lo-Fi Stair Keys · Reverse Bloom Keys · Morph Sweep Lead · RCM Hybrid Voice · Phase Locked Tines · Detuned Zero Keys · Keyboard Spectrum Loom
Pluck (16)	Harp Under Glass · Operator Pluck Stab · Dust Bell Pluck · Broken Step Apparatus · Metal Pluck · Spectral Pingdrop · Scrape Harp · Rain Circuit Pluck · Shard Compass · Tiny Choir Pings · Metal Vow Atrium · Bell Partial Rain · Gated Pluck Engine · Crystal Bell Rain · Convolution Bells · Crosswired Hammer Choir
Bass (11)	Sub Cellar · Operator Growl Bass · Reese Drift · Pluck Bass · Hollow Sub Drone · Dust Engine Bass · Ash Circuit Low · Basalt Pulse · Dust Saw Undertow · Sub Pulse Archive · Reverse Sub Swell
Drone (12)	Endless Room Tone · Clouded Harmonics · Metal Resonance · Spectral Mass · Frozen Choir Memory · Blue Service Menu · Orbiting Choir Dust · Phase Split Lantern · Crystal Harmonics · Frozen Glass Field · Slow Machine Vigil · Null Choir Reliquary
FX (8)	Number Station · Black Glass Sink · Pressure Riser · Granular Haze · Unstable Blackout · Cold ROM Weather · Clouded Operator · Black Glass Directory

16 INSTALLING

PLATFORM	WHAT TO DO
Windows (64-bit)	Copy **GhostVector.vst3** to **C:\Program Files\Common Files\VST3** and **GhostVector.clap** to **C:\Program Files\Common Files\CLAP**.
macOS 11 or later	Run the installer (.pkg): one universal package for Apple silicon and Intel, signed and notarised. It installs the VST3 to **/Library/Audio/Plug-Ins/VST3**, the AU to **/Library/Audio/Plug-Ins/Components** and the CLAP to **/Library/Audio/Plug-Ins/CLAP**.
Linux (64-bit x86)	In the unzipped folder run **bash install.sh**: it copies the VST3 to **~/.vst3** and the CLAP to **~/.clap** (no sudo). Or copy them there by hand. Needs glibc 2.30 or newer (Ubuntu 20.04+, Debian 11+, Fedora 32+ …) and X11 or Xwayland.

Then restart your host or rescan plug-ins, and load Ghost Vector as an instrument. There is no standalone app.

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