GHOST VECTOR

User Manual - 6-operator FM, samples, vector motion and TG+ programming

Updated for Ghost Vector 0.10.10: the new interface and the TG-33 / TG-77 views



Ghost Vector is a hybrid vector/FM instrument built around four sound corners, animated movement, deep modulation and a TG-style interface. It is designed for glassy FM tones, sample-based atmospheres, evolving pads, strange keys, eerie digital choirs and playable cinematic textures.

About this edition

This edition covers Ghost Vector 0.10.10: the redesigned interface with its four views (PLAY, TG-33, TG-77 and ADVANCED), the rebuilt Advanced pages, macros that work before you route them, the TG-33 and TG-77 views that play imported hardware voices, MIDI learn and a CLAP build. The six-operator FM engine, RCM, TG+ programming and the user sample slots work as before; user samples are now saved inside projects and presets.

QUICK START

1. Load Ghost Vector in your DAW. Click the preset display at the top to open the preset browser and choose a factory preset, or step through presets with the arrows beside it.
2. Play MIDI notes on the PLAY view. The vector field shows the live blend, and the four corner cards show each corner's wave and share of the mix.
3. Open ADVANCED › CORNERS to edit the sources. A and C are sample corners; B and D are six-operator FM corners.
4. Open TG+ to set Bend and Glide, then reach the FM pitch envelope, operator scaling and phase, the extra routes and the user samples.
5. Open MOTION to draw or randomise the Blend and Drift lanes. Use SYNC and LOOP for tempo-locked movement.
6. Open MOD to route macros, velocity, aftertouch, the mod wheel, LFOs, Blend and Drift to useful destinations. Unrouted macros already do a built-in job.
7. Open FX to finish the patch with Unison, Ensemble, Delay, Reverb, Shimmer, Vector FX and the output character.

Installing

Platform	Where it goes
Windows VST3	Copy GhostVector.vst3 to C:\Program Files\Common Files\VST3 and rescan in your host.
Windows CLAP	Copy GhostVector.clap to C:\Program Files\Common Files\CLAP. It has the same ID as the 0.10.6 CLAP and replaces it.
macOS 11 or later	Run the installer (.pkg): one universal package for Apple silicon and Intel, signed and notarised. It installs VST3 to /Library/Audio/Plug-Ins/VST3, AU to /Library/Audio/Plug-Ins/Components and CLAP to /Library/Audio/Plug-Ins/CLAP. Rescan in your host.
Linux (64-bit x86)	In the unzipped folder run bash install.sh to copy the VST3 to ~/.vst3 and the CLAP to ~/.clap (no sudo), or copy them there by hand, then rescan in your host. Needs glibc 2.30 or newer (Ubuntu 20.04+, Debian 11+, Fedora 32+ …) and X11 or Xwayland.

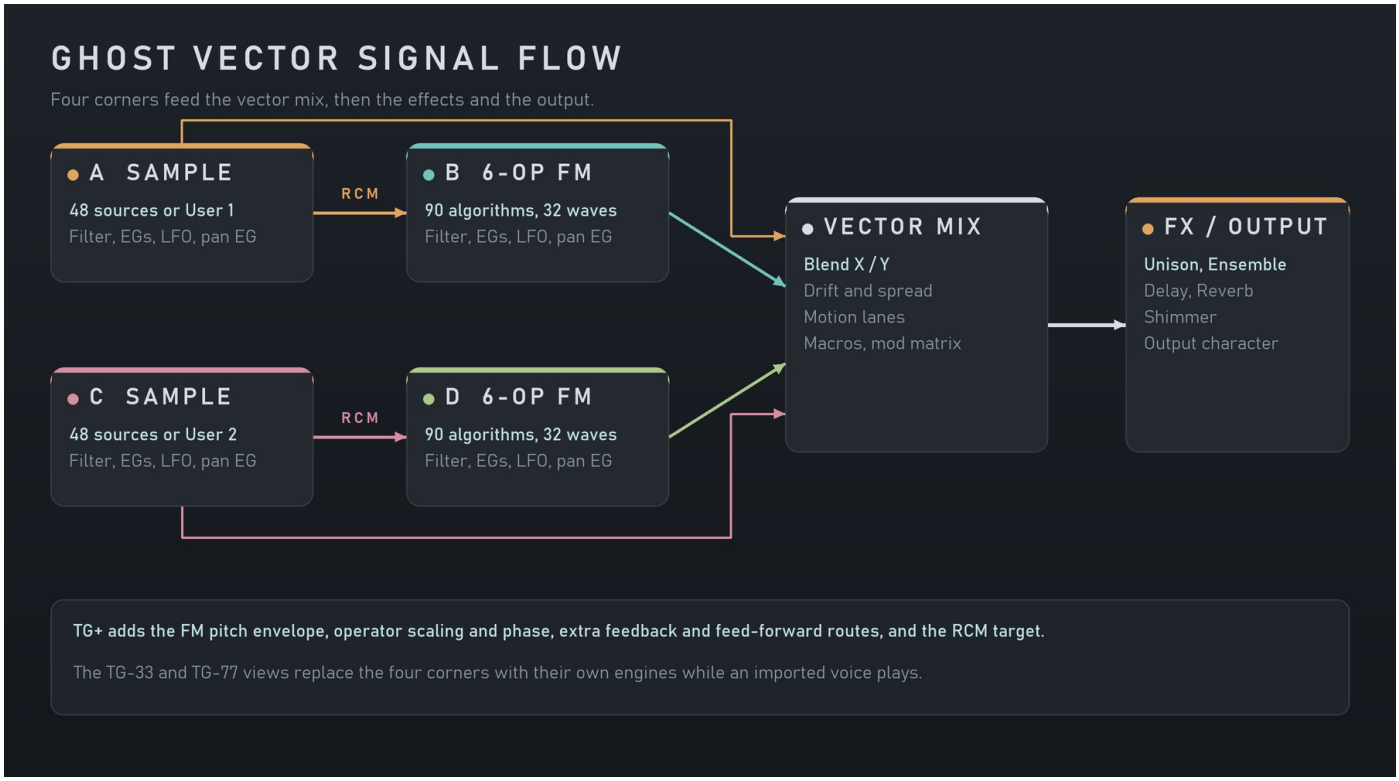
Views and pages

Page	Purpose
PLAY	The four corner cards, the vector field, the motion lane, the eight macros and the output.
TG-33 / TG-77	Play, edit and export an imported TG-33 / SY22 / SY35 or TG-77 / SY77 voice.
HOME	The vector, the four corners' levels, the macros, output, quality and four quick scenes.
CORNERS	Detailed source editing. A/C are sample engines; B/D are six-operator FM engines.
MOTION	Blend and Drift lanes for drawn or randomised movement over time.
MOD	Eight-route modulation matrix with a live routing screen, and micro-tuning.
TG+	FM pitch envelope, operator scaling and phase, extra routes, bend, glide and user samples.
FX	Unison, Ensemble, Delay, Reverb, Shimmer, Vector FX and output character.
ALL	Every parameter of the four-corner engine, one category at a time (Global, Corner A-D, Motion, Mod, FX), with search and an EDITED filter that shows what a patch has changed.

Recommended workflow

Start with a preset, isolate one corner at a time, shape the source, then add controlled movement. Use TG+ for deeper FM behaviour only when the core patch is already balanced.

INSTRUMENT ARCHITECTURE



Four source corners feed the vector engine; sample corners can also modulate their paired FM corners through RCM.

Block	Role
A - Sample	One of 48 internal sources or User 1 / User 2, for body, attacks, choirs, glass, pads and textured material.
B - 6-op FM	Six-operator FM corner with 90 algorithms, 32 waves and RCM input from A.
C - Sample	A second sample source (internal or User 1 / User 2) for contrasting body, transient, noise or air.
D - 6-op FM	Second six-operator FM corner with RCM input from C.
Vector / Motion	Blends the four sources and animates the blend and a controlled drift.
TG+	Adds the FM pitch envelope, operator scaling and phase, extra routes and the RCM target.
FX / Output	Final width, space, spectral lift and output character.
TG-33 / TG-77	Separate engines for imported hardware voices. While one plays, it replaces the four corners, and the effects don't apply.

THE PLAY VIEW



PLAY with "Six Op Aurora" loaded and the motion lane running. The numbers match the table below.

Number	Control
1 View keys	PLAY, TG-33, TG-77 and ADVANCED.
2 Preset display	Category, name and number; USER, TG-33, TG-77 or RND in place of the category when that applies. Click it for the preset browser.
3 Arrows	Step through your user presets and then the factory presets, wrapping round. With an imported bank loaded they step through the bank instead.
4 A / B	Compare two versions of the patch.
5 Undo / redo	Whole-patch history, up to 64 steps.
6 Dice	Click for a new patch; right-click for the musical randomizer.
7 Ghost Vector name	Interface size (70% to 200% of 1200 x 720) and screen colour (Teal phosphor, SY77 blue, TG-33 green).
8 Corner cards	What each corner plays, its share of the mix and its live wave. Sample corners: Level, Cutoff, Attack. FM corners: Level, Index, Feedback.
9 Vector field	Click or drag to set the vector. The ring is the vector you set, the large circle the drift's reach, the dashed curve the blend lane.
10 Status line	Whether the motion lane loops, plays once or is off (SETTING THE VECTOR while you drag), and the vector's X and Y.
11 MOTION	Depth, ON, SYNC, LOOP and Rate for the blend lane.
12 PERFORMANCE	The eight macros, 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.

HOME PAGE



ADVANCED › HOME: the vector, the four corners, the macros, the output and the quick scenes.

HOME gathers what you need while shaping a whole patch: where the vector sits, how loud each corner is, and the macros.

Control	Use
Vector	The vector field: click or drag to set the vector. Mix depth sets how far it moves the mix; Drift depth, Spread (cents) and Drift X / Y set the drift vector.
Corners A-D	Each corner's live wave and level, with Level, Pan, Mute and Solo. The line under the title names what the corner plays: its source, or for B and D its algorithm.
Macros	Eight macro knobs named after their job, with an activity screen. Unrouted macros do a built-in job: Bright, Resonance, FM Depth, Drift, Spread, Space, Echo and Shimmer.
Output / Quality / ECO	Output level (-24 to +12 dB), sample interpolation quality (Draft, Normal or High), and ECO, which limits unison and quality to save CPU.
Quick Scenes	SAVE and LOAD four performance snapshots, including motion and the user samples.
RND ELEMENTS / WILD	Randomise the sample sources and the FM algorithms and waves; WILD uses the full range.

CORNERS: SAMPLE SOURCES A AND C



Corner A, a sample corner. A and C share the same source, filter, envelope and LFO workflow.

A and C provide the tonal body of many patches: choirs, glass, tape-like tones, plucks, resonant sources, dusty keys and hybrid source material. The source list contains 48 internal sounds plus User 1 and User 2.

Control	Musical effect
Source	Chooses an internal source or User 1 / User 2. The screen shows the source's wave with its start, end and loop marked.
Play / Quality	One Shot, Loop or Reverse; Clean, Vintage or Grainy playback.
Start / End / Loop	Start and End set the played region; Loop at and Loop len set the loop.
Tilt / Coarse / Fine	Tilt changes the broad spectral balance; Coarse and Fine tune the corner.
Filter	LP, HP, BP, Notch, Peak, Vowel, Hollow, Nasal, Tilt LP, Air HP, Body and Glass, with Cutoff and Reso.
Filter EG	EG amount (-4 to +4 octaves) with Attack, Decay, Sustain and Release.
Amplitude	Attack, Decay, Sustain and Release, plus Delay, Hold, Key scale and Loop.
Level	Level, Pan, Velocity (how much playing harder raises the level), Key track (how the cutoff follows the keyboard), Mute and Solo.
LFO	Twelve shapes, Rate (Hz, or a note value with SYNC) and Depth.

SAMPLE SOURCE TIPS AND USER SLOTS



Corner C can provide a contrasting sample layer or the source that feeds FM corner D through RCM.

- Use Body, Glass, Vowel, Hollow or Nasal filter modes to give the source a stronger identity.
- Use Tilt for broad balance and Cutoff for the actual filter response.
- Use slower sample envelopes when the FM corners are providing the attack or upper detail.
- Load a file with LOAD USER 1 / 2 on the Source plate, or on TG+, then choose User 1 or User 2 as the source.
- User 1 normally pairs naturally with A and RCM into B; User 2 pairs with C and RCM into D.

User-file recall

User samples are saved inside the project, user presets and Quick Scenes, so they still play after the file is moved. Projects and presets from 0.10.8 and earlier stored only the file's location: if such a file moves, load it again from CORNERS or TG+.

PAN EG



On an FM corner the PAN EG key swaps the operators for the pan envelope; sample corners show it on their own plate.

The Pan EG can be used very subtly for width or more obviously for animated movement across the stereo field. Its screen draws the path, with right at the top and left at the bottom.

Pan EG control	Use
ON	Enables the pan envelope for the selected corner.
LOOP	Repeats the movement for rhythmic, sustained or drone-like patches.
Level 1-4	Pan stages. Negative values move left; positive values move right.
Time 1-4	The time of each stage.
Useful for	Slow pads, ping-pong plucks, choir motion and subtle stereo animation.

Keep the centre stable

For playable keys, use smaller levels so the patch moves without repeatedly leaving the centre of the stereo field.

SIX-OPERATOR FM CORNERS B AND D



Corner B playing “Hex Additive”: the algorithm screen, filter, LFO and all six operators.

B and D provide the metallic, glassy, bell-like, digital and harmonic side of Ghost Vector. They can operate as full voices or as spectral layers behind the sample corners.

FM area	Use
Algorithm	One of 90 routings: Ghost Vector's 45 (stacks, parallel groups, formant networks, feedback structures, additive layouts and split trees) and 45 TG-style ones. The screen draws the routing from the modulators on the left to the carriers on the right.
Operators 1-6	Each operator has Wave, Mode (Ratio or Fixed), Tune, Level and an Attack / Decay / Sustain / Release envelope.
32 waveforms	The first 16 provide TG-style AFM shapes; the second 16 add Glass Fold, Formant, Bell Partial, Comb Teeth, Rotor Harm and other Ghost Vector waves.
Index / Feedback	Index sets the overall FM depth; increase it gradually and rebalance the carrier levels. Feedback adds operator feedback.
Balance	Sets operator 1's level against the other carriers.
LOOP / EG scale	On the Algorithm plate: LOOP repeats the corner's amp envelope, and EG scale speeds it up higher on the keyboard (negative values slow it down instead).
RCM	Injects the paired sample corner into a selected FM operator (set on TG+).
Filter / Level	Tames the harmonic output and sets the corner contribution.
LFO plate	Also holds Velocity, Key track, EG delay and EG hold for the corner.

TG+ ADVANCED PROGRAMMING PAGE



TG+ for corner B, with a pitch envelope, extra routes and some operator scaling set.

Section	What it controls
FM B / FM D	Selects which FM corner is being edited.
Pitch envelope	Depth (-24 to +24 st), Attack, Decay, Sustain and Release, with OP 1-6 keys that choose which operators follow it.
Routing	An extra feedback route, an extra feed-forward route, and the RCM target and depth.
Operator scaling and phase	Key and Velocity scaling, starting Phase, SYNC and 0 HZ for every operator.
Performance and user samples	Bend, Glide and Glide mode; LOAD, CLEAR and the status of User 1 / User 2.

Neutral defaults

Pitch depth, operator scaling and the extra routes default to neutral values, so a patch keeps its signal path until you deliberately raise a control. The per-corner filter envelopes are on each corner's Filter plate in CORNERS.

PITCH BEND, PORTAMENTO AND AFM PITCH EG



The pitch envelope, with only operators 2 and 4 following it.

Performance controls

Control	Behaviour
Bend	Sets the MIDI pitch-wheel span from 0 to 24 semitones. Bend Deadzone on ALL (0-8%, default 2.5%) ignores small wheel offsets around the centre, as hardware does.
Glide	Sets note-to-note glide time, from immediate to 2.5 seconds.
Off	No glide.
Always	Every new note glides from the previous note.
Fingered	Glide occurs only when a new note is played while another note remains held.

AFM Pitch EG

Depth sets a bipolar range of -24 to +24 semitones. Attack, Decay, Sustain and Release define the contour, while the OP 1-6 keys decide which operator frequencies follow it. Selective assignments can move only a modulator, changing the spectrum without bending the entire audible note.

PER-OPERATOR KEY AND VELOCITY SCALING



Every FM operator has its own Key and Velocity scaling, starting phase, SYNC and 0 HZ.

Control	Result
Key = 0	The operator keeps the same programmed level across the keyboard.
Positive Key	The operator becomes stronger toward higher notes and weaker below middle C.
Negative Key	The operator becomes stronger in the lower register and weaker above middle C.
Positive Velocity	Higher playing velocity increases the operator level.
Negative Velocity	Softer playing can emphasise that operator, while hard playing reduces it.
Phase / SYNC / 0 HZ	SYNC restarts the operator at its Phase on every note; 0 HZ holds it at that phase for static waveshaping.

Why scaling matters

Scaling changes the internal balance of carriers and modulators. It can make one patch behave like a dark bass at the bottom, a clear key sound in the middle and a bright metallic tone at the top.

- Start with one operator at a time.
- Use small values for natural keyboard response.
- Scale modulators for timbral change; scale carriers for audible level change.

FLEXIBLE ROUTING AND RCM



The Routing plate: an extra feedback route, an extra feed-forward route and the RCM input.

Route	Use
Feedback from / to	Sends the selected source operator back into the selected target using a stable one-sample memory path.
Amount (feedback)	Sets the strength of the added loop. High values can become aggressive quickly.
Forward from / to	Adds a new modulation connection outside the selected algorithm.
Amount (forward)	Sets the extra path strength and follows the broader FM-depth behaviour.
Ring / cross-mod into	Chooses which FM operator receives the paired sample corner.
Depth	Sets how strongly A modulates B or C modulates D.

Safe programming order

Choose the source and target first, then raise Amount slowly. Reduce Index or operator levels if the new route becomes too dense. Avoid high feedback, feed-forward and RCM depth simultaneously until the patch is balanced.

FILTER EG AND USER SAMPLE WORKFLOW



Corner A's Filter plate with its envelope (CORNERS), and the user sample slots (TG+).

Feature	Function
Filter EG amount	Bipolar -4 to +4 octave movement. Positive opens the filter; negative closes it. Each corner has its own, on its Filter plate in CORNERS.
Attack / Decay / Sustain / Release	Shapes the cutoff contour independently from the amplitude envelope.
LOAD 1 / 2	Loads WAV, AIFF/AIF or FLAC through the available JUCE readers. The Source plate in CORNERS has the same keys.
CLEAR	Empties the slot and updates its status display.
Preparation	Loaded audio is mixed to mono, normalised, sample-rate compensated and capped at 20 seconds.
Recall	The audio is stored with sessions, user presets and Quick Scenes, so the source file may move.

MOTION PAGE: BLEND LANE



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

Blend control	Effect
ON	Turns the lane on or off.
SYNC	Off, the lane runs in Hz; on, it locks to musical divisions.
LOOP	Repeats the lane instead of playing it once.
Mode	Free, Retrig (restarts on each note) or Legato (restarts only after silence).
Rate	Movement speed: 0.01 to 20 Hz, or 1/32 to 8 bars when synced.
Depth	How strongly the lane affects the vector blend.
Smooth	Rounds the movement between points.
Humanize	Adds controlled timing and shape variation.
RESET / RANDOM / WILD	Resets the curves or draws a new lane; WILD allows more extreme movement.
TG-33 / TG 50	TG-33 plays the lane's points with TG-33-style step timing (Step, Step x, Detune, Depth, REPEAT). TG 50 resamples the lane into 50 steps.
Editing	Click empty space to add a point, drag to move it, right-click to delete it.

MOTION PAGE: DRIFT LANE



Drift adds controlled pitch/position instability and spread movement.

Drift control	Effect
Depth	Sets overall drift strength.
Spread	Sets the pitch spread range in cents.
Smooth	Softens jumps between lane points.
Humanize	Adds subtle irregularity.
RANDOM / WILD	Generates a new drift shape, with optional extreme variation.
Path	Shows the resulting drift trace.

Subtle drift is often enough

For playable patches, begin with a small Drift Depth and modest Spread. Large values are best for drones, unstable textures and sound-design patches.

MODULATION MATRIX



MOD with four routings: each curve runs from a source to a destination, as thick as its depth.

Each slot uses a source, destination and bipolar depth. This is where performance controls and internal movement become part of the patch design.

Area	Use
Source	Macro 1-8, Mod Wheel, Aftertouch, Velocity, LFO B, LFO D, Blend X / Y and Drift X / Y.
Destination	Level, Pan, Cutoff and Reso for each corner, Blend X / Y, Drift Depth, B and D FM Depth, Reverb Mix, Delay Mix and Shimmer.
Depth	Sets modulation strength and direction, from -100% to +100%.
Routing screen	Draws every routing; dashed curves pull down. Live bars show the mod wheel, aftertouch, velocity and macros.
Macros	An unrouted macro does its built-in job and shows faintly on the screen while turned up. Routing it replaces that job.
Tuning	Selects alternate scales, the root and master tuning.

- Use velocity to open filters or alter FM balance.
- Use aftertouch for slower expressive changes such as shimmer or reverb.
- Use Blend/Drift as sources when the vector motion should influence the FX bus.

FX PAGE



FX: Unison, Ensemble, Delay, Reverb, Shimmer, Vector FX and the output character.

FX block	Role
Unison	Adds voices (1 to 5), detune, width and mix for pads, keys and thick hybrid tones.
Vector FX / Morph	Biases existing FX behaviour from the vector position. Modes: Vector, Bloom, Orbit and Glass.
BYPASS	Bypasses the whole effects bus, including Vector FX and the output character, for an immediate dry-versus-processed comparison. It stays as it is when you change preset.
Character	Clean, TG Glass, Warm DAC, 12-bit and Tape Dark final colour.
Ensemble	2, 4 or 6 voices, with mix, rate, depth, width, feedback, tone and vector drift. The screen shows the voices moving.
Delay	Tempo-sync or free delay with an LP/BP/HP feedback filter, feedback frequency, width, offset, drive and modulation.
Reverb	Nine types, with FREEZE to hold the tail. The screen shows the tail and how damping darkens it.
Shimmer	Adds upward harmonic lift or downward spectral weight according to pitch.

REVERB, VECTOR FX AND DAC CHARACTER

The reverb names are intentionally direct so the user can choose by musical result rather than technical reference. The algorithms differ in size, density, modulation and tonal balance.

Reverb type	Character
Hall	Broad and flexible. A strong default for pads and cinematic patches.
Room	Tighter and more immediate for keys and plucks.
Plate	Dense and bright for bells, tines and synthetic keys.
Chamber	Rounded and natural without a huge tail.
Space	Large, wide and dramatic for ambient patches and slow motion.
Cloud	Smooth animated tail that suits Vector FX Morph and drifting pads.
Gated	A dense, bright tail that sustains while you play, then cuts off fast.
Reverse	The reverb swells up into each note instead of decaying: a backwards-tape feel.
Crystal	A heavily modulated, detuned tail with a glassy, metallic ring.

Final colour

Use Clean while building a patch, then audition TG Glass, Warm DAC, 12-bit or Tape Dark at the end. If the sound becomes too bright or unstable, return to Clean and reduce FM depth, flexible routing, delay feedback or shimmer before adding colour again.

Vector FX modes

Mode	Vector-linked behaviour
Vector	Balanced movement across Ensemble, Delay, Reverb and width.
Bloom	Upward vector movement expands reverb size, shimmer and soft ensemble motion.
Orbit	Left/right movement bends delay offset/width and increases ensemble motion.
Glass	Brightens and animates the existing FX tone without simply adding more wet signal.

DAC / output character

Mode	Character
Clean	Neutral output path.
TG Glass	Crisp, slightly compacted digital edge.
Warm DAC	Smoother low-level hardware rounding.
12-bit	Subtle stepped converter texture blended with the clean signal.
Tape Dark	Warm saturation with a gentle high-frequency roll-off.

Feedback energy

Bright six-operator FM, flexible routing, delay feedback and shimmer can build energy together. Treat each stage as part of one gain structure rather than turning every intensity control up at once.

THE TG-33 VIEW



The TG-33 view with a voice made for this manual (not a Yamaha voice). Its level vector visits A, C, B and D.

Import a TG-33, SY22 or SY35 voice or bank (.syx or .mid) with IMPORT TG in the preset browser; the file dialog opens in the folder 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 the bank (the display shows the voice's number). The bank is saved with the project. The TG-33 engine plays two AWM and two FM tones, blended by the voice's own recorded level and detune vectors.

Control	Use
Tone cards	AWM tones A and C: Level, Tune and Pan. FM tones B and D: Mod Lvl, Ratio and Feedback.
The diamond	Shows the recorded vector step by step. Drag to take it over (HELD); double-click to release it. CC16 and CC17 move it from MIDI, as on the hardware.
Rate / D Rate	The level and detune vectors' time unit for every step.
LEVEL / DETUNE	Choose which vector the strip shows.
HOLD	Holds the vector where it is, as letting go of the joystick would.
Vector sequence	Each tone's share of the sound across the steps.
Polyphony	16 notes for A-B voices, 8 for A-B-C-D voices.

THE TG-77 VIEW



The TG-77 view with a voice made for this manual (not a Yamaha voice): two AFM and two AWM elements, element 1 selected.

TG-77 and SY77 voices and banks import the same way; SY77 disk .MID files work too. If a voice carries values outside Yamaha's documented ranges, as DX7 conversions often do, its description (hover the preset display) lists them and how they play. 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. Elements that use card waves are silent. The TG-77 drum set covers 61 keys, C1 to C6.

Control	Use
Element cards	Click one to select it. AFM elements: Level, Detune and Shift. AWM elements: Level, Cutoff and Reso.
Centre screen	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 an AWM element's amplitude envelope.
Polyphony	Up to 16 AFM or 32 AWM element voices (an estimate of the hardware's figure).

What these views are, and are not

Edits are applied when you let go of a knob; sounding notes carry on unless the edit changes the number of elements or the voice mode. EXPORT .SYX saves the voice with your edits, and the voice is saved with your project and user presets (an imported bank list is saved with the project only). Ghost Vector contains no Yamaha ROM data or samples: AWM waves are its 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 FM chip is a custom part, but its settings copy the registers of Yamaha's OPZ (the TX81Z's chip), so its laws are modelled on the OPZ: the eight waves and the detune were checked against the TX81Z manual, while its envelope curve and LFO rates are still estimates. The hardware effects are not rendered, and Ghost Vector's own FX don't apply.

PRESETS AND THE FACTORY BANK

The factory bank contains 108 presets in seven categories. Click the preset display to open the browser: search by name or category, filter with the category chips, click a preset's star to make it a favourite, and SAVE your own.

TG+ showcase preset	What it demonstrates
Instant Vector Lead	Wide pitch-bend range, selective operator Pitch EG and Filter EG.
Mercury Finger Glide	Fingered portamento, negative Pitch EG and operator scaling.
Velocity Glass Map	Per-operator keyboard and velocity scaling across register and touch.
Crossfeed Spectre	Restrained feedback and feed-forward routes on both FM corners.
User RCM Portal	User 1/2 source selection and RCM paths into FM B/D; the FM layers remain audible when slots are empty.

- Use presets as starting points. Change one source, one FM wave family and one spatial effect first.
- When a patch feels too busy, mute individual corners and inspect the TG+ routing amounts.
- Loading a preset resets every parameter (except FX Bypass) before applying the preset.

Factory categories

Category	Presets
Additional	17
Pad	24
Key	20
Pluck	16
Bass	11
Drone	12
FX	8

Preset and scene storage

Storage	Use
Factory preset	A fixed starting point from the built-in bank. Host programs follow the browser's numbering: program 0 is preset 001. The factory presets also appear in your DAW's own preset list (VST3 and AU, not CLAP), and picking one there loads it. The last entry, (Custom sound), shows when you are on your own sound; picking it does nothing.
User preset	Stores the whole patch: parameters, motion lanes, the user samples and any hardware voice.
Quick Scene	Captures four fast performance variations inside the current patch, including the user samples.

User RCM Portal

Load a vocal, instrumental, field-recording or synthetic sample into User 1/2, then play the preset again. The new sample becomes both an audible layer and a potential live FM modulator.

SOUND-DESIGN RECIPES

Patch type	Starting recipe
Glassy FM Key	Use a clean sample corner for body, a metallic algorithm in B, moderate FM depth, selective Pitch EG on one modulator, Plate reverb and TG Glass output.
Slow Choir Pad	Use choir/tape/vowel sources in A and C, low FM levels for shimmer, slow Blend motion, gentle Filter EG, Cloud reverb and subtle Ensemble.
Velocity Morph Key	Use operator scaling so high velocity raises one bright modulator while another operator is stronger on soft notes.
RCM Archive Voice	Load a spoken or environmental sample into User 1, select it in A, route A into an operator in B and raise RCM Depth slowly.
Crossfeed Bell	Choose an open algorithm, add a small feed-forward route into a carrier, then use Pitch EG on only the high modulator.
Unstable Archive Drone	Use long envelopes, the Drift lane, Space/Cloud reverb, negative Filter EG, small flexible feedback and Warm DAC or Tape Dark.

Programming strategies

Goal	Useful approach
More expression	Assign Pitch EG to one or two modulators, then use velocity scaling on a different operator.
More register contrast	Use opposite Key scaling directions on two modulators.
More sample identity	Lower the dry sample level slightly and raise RCM Depth so its spectrum influences the FM layer.
More stability	Keep feedback/feed-forward below moderate values and use a darker filter or Clean output while balancing.
More movement	Prefer one clear Blend lane plus subtle Drift rather than randomising every system at once.

A useful order of operations

Source and envelope -> algorithm and operator balance -> filter -> motion -> TG+ advanced routes -> FX. This order makes it easier to hear what each stage contributes.

TROUBLESHOOTING AND PRACTICAL TIPS

Issue	What to check
No sound	Check corner levels and mutes on HOME, the amplitude envelopes, the output level and whether at least one carrier or sample corner is active.
Pitch wheel feels wrong	Check Bend on TG+ and confirm the controller is sending standard MIDI pitch-wheel data rather than a mapped CC.
Unexpected glide	Check Glide mode and Glide. Fingered glide requires overlapping held notes; Always glides every new note.
Harsh or unstable FM	Lower Index, the extra route amounts, RCM depth, operator levels and resonance.
User sample is empty	Projects from 0.10.8 and earlier stored only the file's location (TG+ shows Missing sample). Put the file back, or load it again from CORNERS or TG+.
No audible effects	Check that BYPASS is off, then confirm the individual effect Mix controls are raised. The TG-33 and TG-77 views are dry by design.
A macro does something unexpected	An unrouted macro does its built-in job. Route it on MOD to change that.
Sudden level bursts	Reduce flexible routing, Delay/Ensemble feedback, Reverb Mod/Size and Shimmer.
Too much movement	Lower Mix depth, Drift depth, Spread or lane Depth; turn off WILD.
CPU/load concerns	Turn on ECO, reduce Unison voices and avoid stacking dense reverb/shimmer on every patch.
Program change picks the wrong preset	Programs count from 0: program 0 is preset 001 in the browser.
A knob moves on its own	A controller is MIDI-learned to it. Right-click the knob and choose Forget CC.
Macros do nothing in an older project	Patches saved before 0.10.8 keep unrouted macros silent, shown as Macro 1-8, so they sound as they did. Route them on MOD, or load a factory preset to switch the built-in jobs on.

Known issues in 0.10.10

- Undo does not bring back MIDI-learn assignments, quick scenes or an imported bank.
- The S&H and Smooth Rnd LFO shapes differ from run to run, by design.

Glossary

Term	Meaning
RCM	A sample corner is injected into a selected FM operator as a live modulation source.
Pitch EG	A bipolar envelope that changes the frequency of selected FM operators.
Key scaling	Changes an operator level according to keyboard position.
Velocity scaling	Changes an operator level according to note velocity.
Feedback route	An added loop using a selected operator source and target.
Feed-forward route	An extra one-way operator modulation connection outside the main algorithm.
User sample	A WAV, AIFF or FLAC loaded into User 1 or User 2 and saved with the project.
Carrier	An FM operator whose output is heard directly.
Modulator	An FM operator that changes the spectrum of another operator.
Corner	One of the four sources A, B, C or D.
Vector	The blend position between the four corners.
Hardware voice	A TG-33 / SY or TG-77 / SY77 voice imported from a .syx or .mid file.

MIDI and user-sample checklist

- Keep the pitch wheel centred before loading a patch.
- Use standard pitch-wheel messages rather than mapping the controller to a normal CC.
- MIDI learn: right-click a knob, choose MIDI Learn and move a controller. Right-click again to forget it. The sustain pedal and CC120-127 can't be learned; assignments are saved with the project.
- In the host's automation list each corner's parameters carry its letter ("A Cutoff") and each motion lane's its name ("Blend Rate Hz").
- User 1/2 samples are saved with the project and its presets.
- A project from 0.10.8 or earlier moved to another computer: reload any missing user samples and save it again.

CLOSING NOTES

Ghost Vector is strongest when it is treated as a performance instrument rather than a static preset player. Its character comes from the interaction between four corners, six-operator FM, sample colour, vector movement, modulation, TG+ programming and the final FX/DAC stage.

- Build a simple balanced patch first, then add motion.
- Use PLAY or HOME to keep the four corners under control.
- Use Pitch EG and operator scaling selectively rather than on every operator.
- Use flexible feedback/feed-forward and RCM as added routes, not as substitutes for a well-chosen algorithm.
- Use the FX page to place the sound in space and give it its final colour.
- User samples travel with presets and sessions, so a project keeps its sound on another computer.



The current interface: four views built from the same cards, screens and knobs, with deeper programming on TG+.

Independent design note

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PHANTOMEXPOSURE

Effects and instruments for strange spaces, spectral colour and signal damage.