

INTERPHASE CARTOGRAPH

PHASE-DISTORTION SYNTHESIZER · VERSION 2.0.2



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01 What it is

Interphase Cartograph is a synthesizer built on the interactive phase distortion (iPD) idea of the Casio VZ-1 and VZ-10M. Pairs of modules make a **line**, and the way the two modules in a line interact (mixing, phase-distorting, ring-modulating, and more) is where most of the sound comes from.

In **Classic** mode it has the VZ's own architecture: four lines, eight modules, eight waveforms and eight-stage envelopes, with the VZ's measured behaviour available through the **VZ response** and **VZ rate** switches. **Extended** mode goes beyond the hardware: six lines, twelve modules, 24 waveforms, nine line modes, twelve-stage envelopes, a Transfer filter and a Motion envelope.

SIGNAL FLOW

1. Each module: a waveform, its pitch and its own multi-stage envelope.
2. Each line: two modules combined by the line mode; optional cross mod from the previous line.
3. The lines are mixed (level and pan per line), then, in Extended, through the Transfer filter.
4. Patch vibrato and tremolo, the LFOs, macros and the mod matrix act on all of it; unison stacks the voice.
5. A linked limiter at the output.

FORMATS AND INSTALLING

Interphase Cartograph is a VST3 and CLAP instrument on Windows, macOS and Linux, and an AU on macOS. There is no standalone app. The window is 922 × 640 at 100% and scales from 75% to 200% at a fixed shape.

SYSTEM	FORMATS	INSTALLING
Windows (64-bit)	VST3, CLAP	Copy Interphase Cartograph.vst3 into C:\Program Files\Common Files\VST3 and Interphase Cartograph.clap into C:\Program Files\Common Files\CLAP.
macOS 11 or later	VST3, AU, CLAP	One universal installer (.pkg) for Apple silicon and Intel, signed and notarised. It installs into /Library/Audio/Plug-Ins: VST3, Components (the AU) and CLAP.
Linux (64-bit x86)	VST3, CLAP	Unzip, open a terminal in the folder and run bash install.sh . It copies the plug-ins to ~/.vst3 and ~/.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 and rescan plug-ins.

02 Quick start

1. **Open the Browser** (top right) and pick a preset: click once to audition, double-click to load. Or step with ◀ ▶.
2. **Play**. The status bar shows the voice mode and how many voices are sounding.
3. **Shape the sound** with the six **Macros** on the right: Brightness, Movement, Attack, Depth, Body and Release. Centre (50) leaves the patch as programmed.
4. **Go deeper** in the Voice editor: choose a line on the left, a module along the top, then its wave, pitch, level and envelope.
5. **Roll the dice** for a new patch; the "..." beside it sets the flavour and what to keep.

CLASSIC OR EXTENDED?

The button in the header switches the whole engine. Switching is non-destructive: Extended settings stay stored while you are in Classic, but they are played the Classic way (section 4).

03 A tour of the window



Extended mode, Voice editor, "Glottal Filter Choir", Cyan display.

- 1 ◀▶ step through the presets of the current bank, wrapping round.
- 2 🎲: roll a new patch with the current randomizer settings.
- 3 "...": randomizer options: flavour, mutate or full, locks.
- 4 ■ stops all voices.
- 5 Classic / Extended.
- 6 Patch name.
- 7 Undo / redo (100 steps; Ctrl+Z, Ctrl+Y or Ctrl+Shift+Z).
- 8 Save the patch as a user preset.
- 9 Display colour: Amber, Cyan, Violet, Pearl, Verdigris or Sakura, for every instance.
- 10 Browser: browse, import and manage presets.
- 11 Signal routing: each line's on/off, mode, level, pan and cross mod (section 5).
- 12 Routing diagram: a live picture of the lines; hover for a description, click to edit a line.
- 13 Tabs: Voice editor, Filter and Motion (Extended), Mod matrix, Pitch env, Patch mod, Arp, Tuning.
- 14 Module tabs and waveform bank.
- 15 Pitch and Amplitude of the selected module.
- 16 Envelope editor.
- 17 Macros.

18 Unison and the engine-rate switches Alias-free and VZ rate.

19 LFO 1 and LFO 2.

20 **Status bar:** version, preset position, voice mode, sample rate and voices. Click the voice readout for the machine voice limit and the Operation controllers.

04 Classic and Extended

	CLASSIC	EXTENDED
Lines / modules	4 (A–D) / 8	6 (A–F) / 12
Waveforms	8	24, with a Shape slider
Line modes	Single, Mix, Phase, Ring	+ TZFM, AM, Pulsar, Entrain, String
Envelope stages	8	12
Tabs	6	8 (+ Filter, Motion)
Simple AHDSR view	yes	no

EXTENDED SETTINGS IN CLASSIC

Switching to Classic keeps the Extended settings stored but plays them the Classic way: Extended line modes play as Ring, Extended waves play as NOIS2, Shape is centred, and the filter and Motion envelope are off. Switch back to Extended and everything returns.

WAVEFORMS

WAVE	CHARACTER
SINE	The VZ's pure wave.
SAW1–SAW5	VZ phase-distorted cosines; higher numbers are brighter.
NOIS1 / NOIS2	White noise; noise multiplied by a sine.
TRI · TRAP · PULSE · RAMP · BLADE	Extended. Shape sets trapezoid shoulder, pulse width, ramp curve, blade peak.
FOLD · BLUE · RES II	Folded sine (Shape = amount); bright noise; a resonant decay (Shape = resonance).
CHEB · GLOT · STEP · FRACT	Chebyshev harmonic picker (Shape picks harmonic 1–8); vocal-cord pulse, pressed to breathy; stepped sine; in-tune fractal wave (Shape = roughness).
IMPLS · SYNC · WALSH · DRWBR	Alias-free impulse for exciting strings and filters; hard-synced saw (Shape = ratio); Walsh functions; drawbar organ registrations.

05 Lines and line modes

Each row of **Signal routing** is one line: **On**, the line mode, **Level** (L) and **Pan** (P), and on lines B–F **Cross mod**. On the VZ, lines are mixed purely by their module levels, so keep Level at 99 for an authentic balance. Double-click a slider to reset it.

MODE WHAT HAPPENS

Single	Only the odd module sounds.
Mix	Both modules, each with its own pitch and envelope.
Phase	The VZ's iPD. The odd module runs as the exciter and sets the pitch; the even module is the waveshaper you hear, and its level is the output level. M1 sets how much, M2 is what you hear; M2's pitch has no effect.
Ring	The even module plus the ring product, so M1 sets the ring amount.

TZFM	Extended. Through-zero FM: M1 bends M2's frequency through zero. Only M2 is heard.
AM	Extended. Amplitude modulation; the carrier is heard even at zero depth.
Pulsar	Extended. M1 sets the note and a grain window; M2 plays one cycle per grain, so its pitch acts as a formant. Take M1 below 20 Hz for rhythm.
Entrain	Extended. Coupled oscillators: close pitches lock, wider ones slip and beat. M1's depth is the coupling.
String	Extended. A waveguide string: M1 plucks, strikes or drives it; M2 is the string (its pitch, level × envelope = sustain, Shape = brightness, wave = material).

Cross mod feeds the previous line's output into this line's phase. The source line is still heard: switch it off to use it purely as a modulator (the diagram says so).

06 The Voice editor

Choose a module with the tabs along the top (the line badges above them show which line each pair belongs to), then its waveform.

Pitch	Coarse ±127 st · Fine ±50 ct · KeyFol 0–100% · Detune ±50 ct.
Amplitude	Level 0–99 · VelSns 0–31 · AfterT 0–7. The "..." button opens velocity curve, amp sensitivity and Module enabled.
Envelope	8 or 12 stages, each with Rate and Level 0–99 (rate 0 is about 30 s, rate 99 about 1 ms).

EDITING ENVELOPES

- Drag a node: up and down sets Level, left and right sets Rate. Hold Shift, Ctrl or Cmd for 4× finer moves.
- Double-click a node to type its Rate and Level. Click a column to select that stage.
- The panel on the right shows the selected **STAGE** with its Rate, Level and **Curve** (Linear, Exp, Log, S-curve).
- **DRAG X**: NATURAL (drag right lengthens the stage) or LEGACY. **SENSITIVITY**: COARSE, NORMAL, FINE or ULTRA. Both apply to every instance.
- **SUSTAIN STAGE** sets where the envelope holds; **LOOP ON** loops a range of stages (a green bracket shows it); **TIMINGS** shows the attack, release and total.
- **Copy / Paste / Reset** move rates and levels between modules.
- In Classic the **Simple** view gives a five-knob AHDSR (Attack, Hold, Decay, Sustain, Release) that writes into the stages.



A 12-stage envelope with its loop switched on.

07 Filter

Extended only. One Transfer filter per voice, after the lines are mixed. Switch it **On** (off, it costs nothing) and choose a mode:

Clean A 2- or 4-pole state-variable filter (24 dB button), LP to BP to HP.

Transfer The resonance loop runs through a VZ wave, so every wave rings with its own colour. Self-oscillates from about 0.87 resonance.

Sieve A key-tracked comb: Damping, Sharpness, Spacing.

Phase Six allpass stages with feedback: Centre, Feedback, Spread.

Knobs (names change with the mode): **Cutoff**, **Resonance**, **Character**, the **LP-BP-HP** morph, **Key tracking**, **Velocity**, **Motion** (from the Motion envelope) and **FM**. Below: the **Resonance wave** picker and its Shape, **Line sends** A-F (which lines go through the filter) and **Line FM** (a line that modulates the cutoff; it can be a muted line).



08 Motion

Extended only. A bipolar envelope of up to 12 stages that modulates per note. Each stage has Time (or a tempo Sync value), Level (–99 to 99) and Curve; set **Stages**, the Start level, **Sustain**, a **Loop** with a repeat count, and **Retrigger** (Note, Legato or Free). Drag nodes on the graph; the mouse wheel over a stage changes its curve.

Four **routes** send it to module level, pitch or shape, line level, all modules (pitch, shape, drive), or the filter's cutoff, resonance and character.



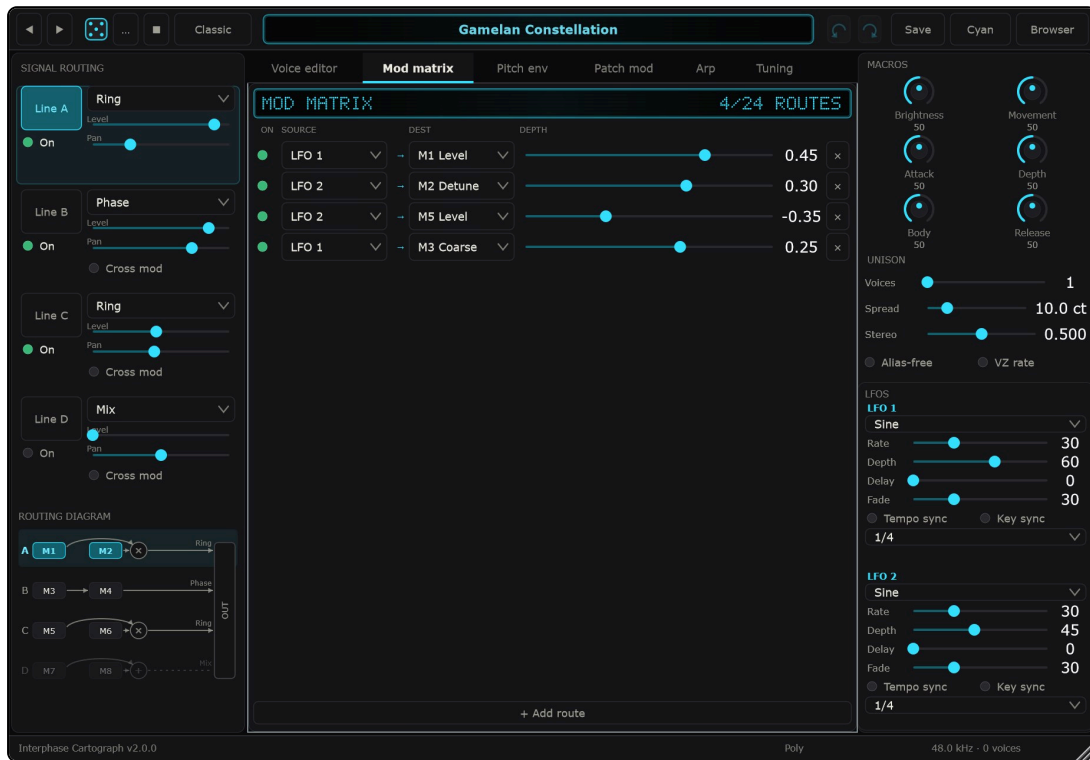
09 Mod matrix

Up to 24 routes. Press **+ Add route**, then choose a Source, Destination and Depth (–1 to +1); each row has an on/off switch and an × to remove it.

Sources Velocity, Aftertouch, Pitch Bend, Key Track, LFO 1, LFO 2, Env 1–12 (the module envelopes), Macro 1–6, Mod Wheel, Motion Env.

Destinations Level, Coarse, Fine and Detune of each module; Line A–F level; LFO 1/2 rate and depth; Master Vol; Filter cutoff, resonance and character.

The matrix is global: velocity and key track come from the last note played. The mod wheel does nothing until you route it here.



Four routes: both LFOs on module levels and detune, LFO 1 also on M3's coarse tuning.

10 Pitch env

One global pitch envelope with the same editor as the modules. Level 50 is no shift. **Depth** (0–63 st) turns it on; at 0 it does

nothing. Vel Sns with its Curve scales the depth by velocity; Rate Vel speeds up stages flagged for velocity rate.



An 8-stage bipolar pitch shape with sustain at stage 4.

11 Patch mod

The patch's own **VIBRATO** → **PITCH** and **TREMOLO** → **AMP**, separate from LFO 1 and 2. Each has a Wave (Triangle, Saw Up, Saw Down, Square, Sine, Smooth Rnd, Exp Up, Exp Down, Trapezoid), Depth (0 is off), Rate, Delay, Multi (a separate LFO per note) and Tempo sync.

GLOBAL / VOICE: Total Lvl, Octave (± 2), Voices (polyphony 1–16), Mode (Poly, Mono, Legato), **VZ response** (section 16), Glide with Time, Legato only and Const rate.



12 Arp

Arp On, Pattern (Up, Down, Up-Down, Down-Up, As Played, Random), Tempo sync with a Division, or a free Rate (0.1–30 Hz), Octaves (1–4), Gate and Swing. The screen previews the pattern on an example chord and locks to the host transport.



Up-Down over two octaves, 1/16, gate 80%, swing 30%.

13 Tuning

Choose a system (12-TET, Just Intonation, Pythagorean, Quarter-comma Meantone, Kirnberger III or Custom) and a root. Click a note on the keyboard and drag its bar to retune it by hand (this switches to Custom); double-click resets. Tuning is saved with

your project but not in presets.



Pythagorean, rooted on C4.

14 Macros, Unison and LFOs

Macros **Brightness** (high shelf), **Movement** (vibrato and tremolo), **Attack** and **Release** (first and release stage rates), **Depth** (Phase/Ring interaction), **Body** (low shelf). Centre (50) is neutral; double-click resets.

Unison **Voices** 1–8, **Spread** 0–50 ct, **Stereo**.

Alias-free 2× oversampling; cleaner at higher CPU.

VZ rate Renders at the VZ's own 39.06 kHz so bright notes alias exactly like the hardware. Overrides Alias-free.

LFO 1 / 2 Sine, Triangle, Saw Up, Saw Down, Square or S&H; Rate, Depth, Delay, Fade; Tempo sync with a division; Key sync. Both are global; route them in the Mod matrix.

15 Presets, browser and randomizer

129 factory presets in Pads, Bells, Keys, Textures, Leads, Drones, Bass, Weird, Plucks, Percussion and SFX (29 Classic, 100 Extended), plus your own and imported banks.

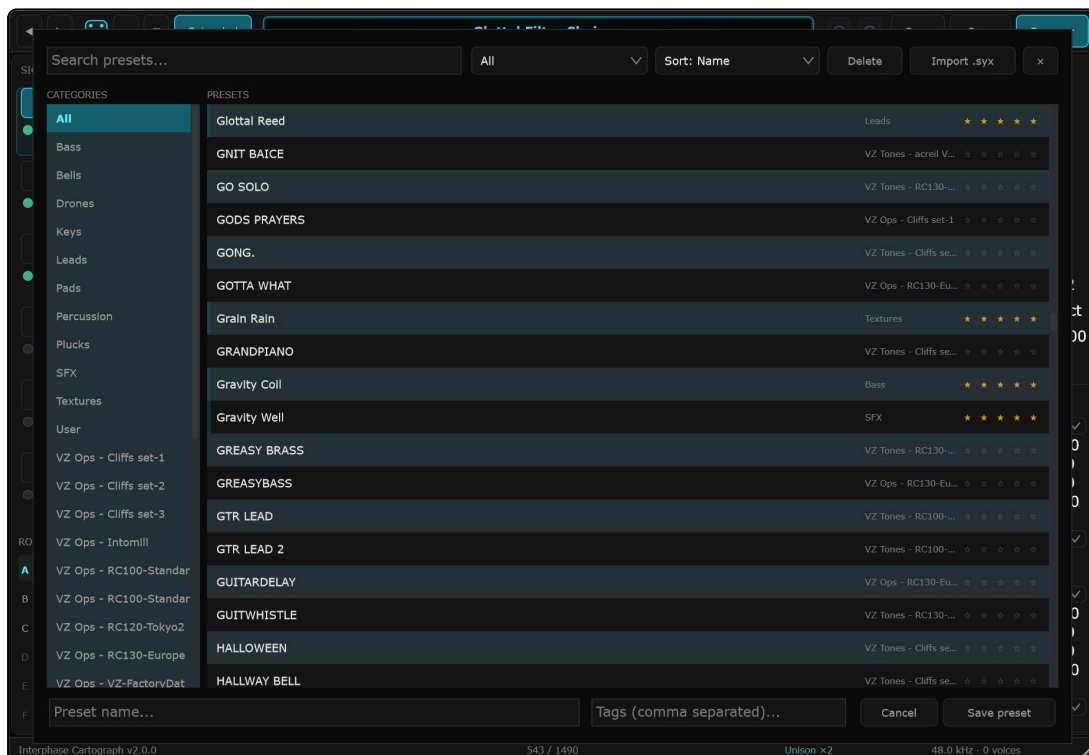
The **Browser** has a search box (name, tags and author), a category filter, sorting by name, category or rating, star ratings, **Import .syx** and **Delete** (your own and imported presets only). Single-click or Up/Down auditions; double-click loads and closes. The save row at the bottom names and tags a new preset.

Save in the header asks for a name and tags and stores the preset in the User category, in Documents\Interphase Cartograph\Presets\User.



The randomizer options.

The dice rolls a full new patch. The "... " panel sets the flavour (Bass, Keys / EP, Pad, Lead, Bell, Pluck, Texture, Weird, Surprise Me), what to keep (Oscillators, Envelopes, Modulation, Routing, Pitch / tuning) and offers **Mutate current**, **Full random** and **Undo**. Weird can switch to Extended unless Routing is locked. Each roll is one undo step.



16 VZ SysEx and the VZ switches

Import .syx in the browser reads Casio VZ-1 / VZ-10M SysEx dumps: single voices, and 64-tone banks with their 64 operation memories. Tones are filed as "VZ Tones - *bank*", operations as "VZ Ops - *bank*". Re-importing a bank replaces it. There is no SysEx export.

VZ response Plays the patch with the VZ-1's measured behaviour: envelopes at a constant dB per second, the hardware's Phase/Ring depth curve, its velocity law and pitch-envelope speed. On for new and imported patches; off for factory presets and randomizer rolls.

VZ rate Renders at 39.06 kHz like the hardware. On for imports. Adds a small latency.

The emulation is hardware-faithful but not bit-exact; it was measured against recordings of real VZ voices. An imported operation layers four tones; the editor shows and edits the first.

NO CASIO DATA

Every waveform is computed. Interphase Cartograph contains no Casio ROM or sample data. Casio, VZ-1 and VZ-10M are trademarks of Casio Computer Co., Ltd., used here only to describe compatibility; Interphase Cartograph is an independent Phantomexposure product, not affiliated with or endorsed by Casio.

17 MIDI, host and files

- Velocity, polyphonic aftertouch and channel pressure are used; the mod wheel acts only through the Mod matrix. Sustain (CC64) and the all-notes/all-sound-off messages are handled. Program change is not used.
- Pitch-bend range (default ± 2), the bend dead zone and Master Volume are host parameters only.
- The status-bar voice menu sets a machine voice limit for every patch, and which controllers drive imported Operations (DEF WHEEL 2, default CC 2; FOOT VR, default CC 4).
- On Windows, presets live in Documents\Interphase Cartograph\Presets; editor preferences in Documents\Interphase Cartograph\ui-settings.xml; the display colour in %APPDATA%\Interphase Cartograph.

18 When something feels off

IF YOU HEAR THIS	TRY THIS FIRST
A line sounds wrong in Classic	It uses an Extended mode or wave, which Classic plays as Ring or NOIS2. Switch to Extended.
Phase mode ignores M2's pitch	By design: in Phase, M2 is a waveshaper; M1 sets the pitch.
Mod wheel does nothing	Route Mod Wheel in the Mod matrix.
Pitch env does nothing	Raise Depth above 0.
A cross-mod source line is audible	Switch that line's On off: it still drives the next line.
Bright notes alias	VZ rate is on (as on the hardware). Turn it off, and try Alias-free.
Tuning lost after loading a preset	Tuning is saved with the project, not in presets.
Fewer voices than expected	Check the machine voice limit in the status bar and the patch's Voices.