

VOIDSCAN AUDIO

PARASITE

USER MANUAL

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CONTENTS

0	Start here	5
	What Parasite is	5
	Install and open	5
	Activate, or run the demo	6
	Your first sound	7
	How this manual is organised	8
1	FM in ten minutes	9
	One oscillator you hear, and one you never do	9
	Ratio: which overtones appear	9
	Index: how many overtones appear	10
	Sidebands, in plain language	10
	The envelope on the modulator	10
	Three things to try	11
	What comes next	12
2	The Main page	13
	Two pages, one instrument	13
	The top bar	14
	The visualiser	15
	The six macros	16
	The effect mini-controls	18
3	The operators	19
	Mod 1 and Mod 2	19
	The Carrier	22
	The Harmo editor	24
	The six algorithms	24
4	Shaping the voice	27
	The filter	27
	Pitch Env	28
	The Macros panel	29
	Global	29
	Vol Shaper	30
5	Modulation	33
	Three LFOs, eight slots each	33
	Assigning: drag and learn	35
	The curve editor	37
	Fast and slow destinations	38
	Tremor, Vein and Flux	39
	Destinations	39

6	Effects	40
	The chain, in order	40
	Delay	41
	Reverb	42
	Liquid	42
	Rubber	43
7	Random and Mutate	45
	What Random does	45
	The padlocks	46
	Mutate and its amount	48
	Workflows	48
	Undo	49
8	Presets, cloud and licence	50
	The browser	50
	Saving	51
	Sending a preset to another user	52
	Cloud sync	53
	Where files live	53
	Your licence	54
	Updates	55
9	Settings, undo and troubleshooting	56
	The menu	56
	Undo and redo	57
	MIDI	57
	Several instances in one project	57
	If something goes wrong	58

A	Parameter reference	60
	Top bar	60
	Macros	60
	Mod 1 and Mod 2	60
	Carrier	61
	Filter	61
	Pitch Env	62
	LFO 1, LFO 2 and LFO 3	62
	Effects: Delay	63
	Effects: Reverb	63
	Effects: Liquid	63
	Effects: Rubber	64
	Vol Shaper	64
	Global	64
	Parameters with no effect	64
	Hidden curve values	65
B	LFO destinations	66
C	Tempo divisions	69
D	The algorithms	70
E	Factory categories	72
F	Files and folders	73
	The installed files	73
	Your data	73
	The log	74
	What is saved where	74
G	MIDI implementation	75

CHAPTER 0

START HERE

This chapter takes one sitting and asks for no theory. By the end of it Parasite is installed, activated, making a sound you chose, and making a sound you did not choose. Everything it mentions is explained properly later; the chapter numbers tell you where.

WHAT PARASITE IS

Parasite is an FM synthesiser. Every voice is built from three oscillators: two modulators, **Mod 1** and **Mod 2**, which you never hear directly, and a **Carrier**, which you do. The modulators push the carrier around, and six algorithms decide who pushes whom. Around that core sit a filter, a pitch envelope, three assignable LFOs, four effects and a drawable volume shaper. Eight voices play at once.

The Main page is one of the things that set it apart: six large knobs, four effect switches and a preset row, built so that you can play and shape a sound without opening anything else. The generator is the other. **Random** builds a complete new patch from scratch every time you press it, drawn from the measured habits of a real preset bank rather than from a dice roll, and **Mutate** nudges the current patch by an amount you choose. Between them they are how most people find their first favourite sound in Parasite.

INSTALL AND OPEN

Parasite runs inside your DAW. There is no standalone application.

On macOS, run the `.pkg` installer. It offers two formats, both selected: VST3, for Ableton Live, Bitwig, Cubase, FL Studio and every other VST3 host, and Audio Unit, for Logic Pro and GarageBand. Deselect the one your DAW does not use if you like; keeping both is harmless. There is no choice of location, because macOS DAWs read from fixed folders:

- `/Library/Audio/Plug-Ins/VST3/Parasite.vst3`
- `/Library/Audio/Plug-Ins/Components/Parasite.component`

You need macOS 11 or later. The same installer covers Apple Silicon and Intel Macs, natively on both.

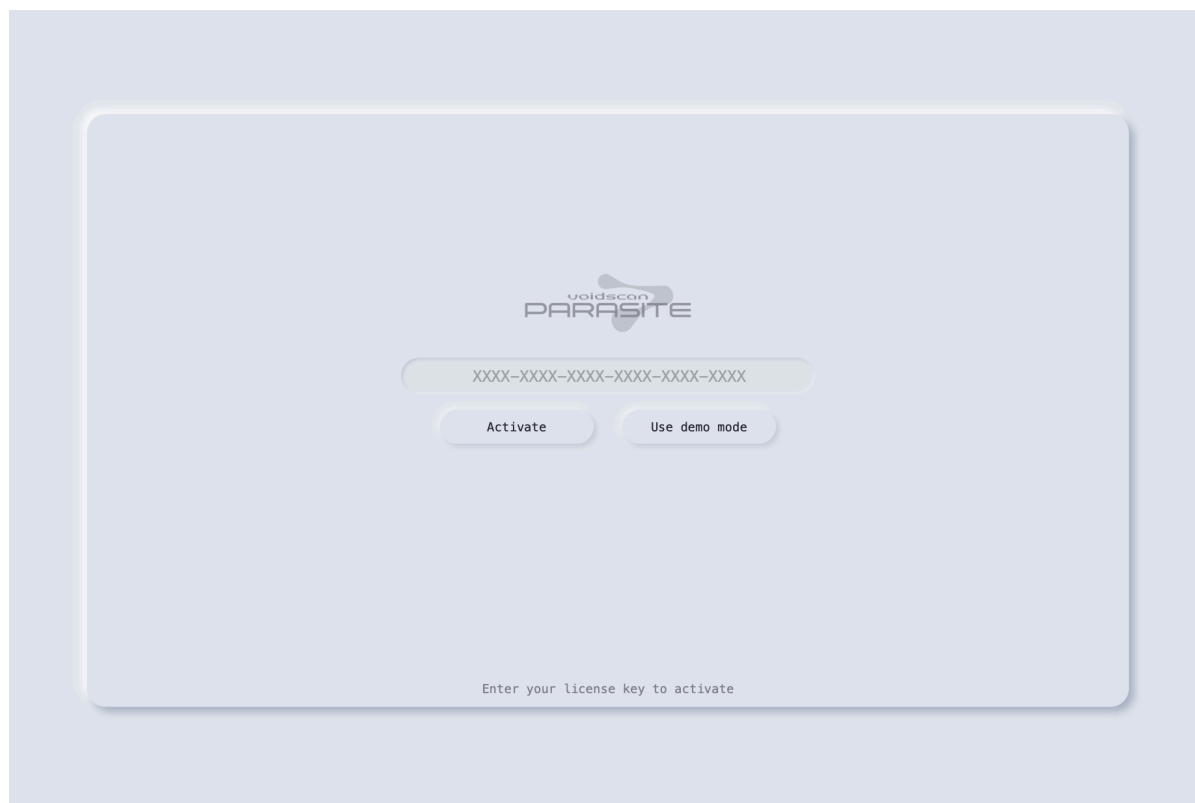
On Windows, run `Parasite-1.0.7-Windows-Setup.exe`. It installs the VST3 and asks for administrator rights, because the default folder is the system-wide one:

- `C:\Program Files\Common Files\VST3\Parasite.vst3`

If your DAW scans a different VST3 folder you can point the installer there. Windows builds are 64-bit only; there is no Audio Unit on Windows, because nothing on Windows hosts one.

Open your DAW, let it scan, and look for an instrument called **Parasite** from **Voidscan Audio**. Insert it on an instrument track. If it does not appear, ask your DAW to rescan its instruments; every DAW has a command for this, usually in its preferences. The window opens at a fixed size, 920 by 615 points; if that is too small for your screen, the menu at the top right has a **UI Size** setting that enlarges it in steps up to 200 percent (chapter 9).

ACTIVATE OR RUN THE DEMO



The activation panel. Type or paste your key into the field; the dashes and capitals are added for you.

The first time the window opens it asks for a licence key. Your key is in your purchase confirmation. It starts with `PARA-` and has 24 characters in six groups of four; type or paste it into the field, in any case and with or without dashes, then press **Activate** or Return. The panel reads "Activating..." for a moment, then confirms. That is the only step that needs an internet connection: it binds the key to this computer once, and Parasite then keeps working offline for a long time (90 days, and chapter 8 explains the rest). The licence belongs to the computer, not to a project or a preset, so every Parasite in every project on this machine is activated from now on.

If you do not have a key yet, press **Use demo mode**. Every control works, with four limits: the sound drops to silence for three seconds every 25 seconds, the **Save** button is greyed out, your own presets are hidden from the browser, and there is no cloud sync or sharing. A pill reading "DEMO - click to activate" sits in the preset row; clicking it brings the key field back, and so does **Activate License...** in the menu.

If a key is refused, chapter 8 lists the reasons and what to do about each.

YOUR FIRST SOUND



The Main page on the Init preset. The preset row runs along the top; Vortex, Helix and Plasma sit on the left, Drive, Fold and Volume on the right, and the four effects along the bottom.

A fresh Parasite is already a sound: it opens on the **Init** preset, a sine carrier with two modulators at modest settings. Play a note and you hear a soft, slightly reedy FM tone. Play two and you hear one: Init is monophonic, and the newest key wins. That is a setting, **Mono** on the Advanced page's Global panel, and chapter 4 covers it; leave it for now.

Now load something made by someone who knew the instrument. Press the **>** button to the right of the preset name. From Init the first press lands on *808 Distorted*, the first bass preset; keep pressing and you walk through the factory bank in category order: Bass, Lead, Pluck, Keys, Pad, Texture, Drums, FX, 153 presets in all. Click the preset name instead and the browser opens: a row of category pills, a grid of names, a single click to hear one, a double-click to load it and close, Escape to go back to where you were. Chapter 8 has the rest.

With a preset you like still playing, turn the six large knobs. **Plasma** rests at its centre; turn it up and the sound brightens, often into harshness, turn it down and it tames. **Vortex** also rests at its centre; turn it down and the sound gathers in towards the note, turn it up and it spreads into something metallic. **Helix** rests at zero; raising it bends the overtones off the harmonic series, from organ to bell, and the pitch climbs with it. **Fold** rests at zero and adds overtones by folding the waveform back on itself; past about 60 percent it stops being a timbre and starts being an effect. **Drive** rests at clean, warms through the first third of its travel and ends in fuzz. **Volume** is what it says. Double-click any of the six to put it back at its resting position. Chapter 2 explains what each of them is doing.

Then press **Random**. Everything changes: the operators, the envelopes, the filter, the LFOs, the effects, all of it, and the preset name now reads "Random". Press it again. And again. When one bites, stop. Cmd+Z (Ctrl+Z on Windows) brings back the patch you had before, so pressing it once too often costs nothing. If a patch is close but not there, the figure-8 control to the left of Random is **Mutate**: click its

left half and the patch shifts by the amount set on its right half, a quarter of the way towards a new roll by default. When you have something to keep, press **Save** (activated copies only), give it a name, and it is yours. Chapter 7 is about this.

NOTE: Random silences any note you are holding, because the new patch has nothing to do with the old one. Mutate does not; it is meant to be used while a chord rings.

HOW THIS MANUAL IS ORGANISED

If you have never programmed an FM synth, read chapter 1 next. It is ten minutes long, explains ratio, level, sidebands and the modulator envelope, and ties each one to a knob you can reach. Every chapter after it assumes you have read it.

If you already know FM, skip to chapter 3, which covers the three operators and the six algorithms in full. Read the macro section of chapter 2 on the way, because Vortex, Plasma and Helix are not standard FM controls and the names tell you nothing.

Chapters 2 to 6 cover the controls in the order the interface shows them: the Main page, the operators, the per-voice shaping (filter, pitch envelope, macros, global, volume shaper), the LFOs, and the effects. Chapter 7 is Random and Mutate. Chapter 8 is presets, the cloud and your licence. Chapter 9 is settings, undo, MIDI and what to do when something goes wrong. The appendices at the back list every parameter, every LFO destination, every tempo division and every file Parasite writes, for the day you need a number rather than an explanation.

CHAPTER 1

FM IN TEN MINUTES

You have heard Parasite by now. This chapter explains why it sounds the way it does, with every idea tied to a knob you can reach. If you already know FM, skim the headings and go straight to the three experiments at the end: they are written against this instrument's actual controls.

ONE OSCILLATOR YOU HEAR AND ONE YOU NEVER DO

Every Parasite voice is built from three oscillators. One of them, the **Carrier**, is the one you hear. The other two, **Mod 1** and **Mod 2**, are modulators: their job is to push the carrier around, and their own sound never reaches the output. Each has its own panel on the Advanced page (press **Advanced** in the top bar to get there).

Start with the simplest case, one modulator and the carrier, because everything else is that case repeated.

Imagine the carrier as a sine wave: a pure tone, no overtones, the duller sound a synth can make. Now imagine something wobbling its pitch. A slow wobble, a few times a second, and you hear vibrato. Speed the wobble up to twenty times a second and you hear a buzz on top of the tone. Speed it up to the pitch of the note itself, hundreds of times a second, and the ear stops hearing a wobble at all. What it hears instead is a new timbre: the sine has grown overtones. That is frequency modulation. A modulator running at audio rate does not make the carrier wobble, it makes the carrier bright.

Strictly, Parasite modulates the carrier's phase rather than its frequency, the way the classic Yamaha synths did. For everything in this chapter the two behave the same, and the word everyone uses is FM.

RATIO WHICH OVERTONES APPEAR

The modulator's speed decides which overtones you get. Its speed relative to the carrier is what counts, not its speed in hertz, and that is what the large knob in each modulator panel sets. It has no name painted under it; it shows a value instead, $\times 1$, $\times 2$, $\times 3$ and so on up to $\times 48$, plus $\times 0.5$ at the bottom. That number is the ratio: a modulator at $\times 2$ runs at twice the carrier's frequency, whatever note you play, and follows the keyboard with it.

Here is the rule worth memorising. When the ratio is a whole number, every overtone the modulation creates lands on a multiple of the note you played. The result sounds harmonic: it has a clear pitch and sits in a chord like a normal instrument. $\times 1$ gives a full, saw-like set of overtones. $\times 2$ gives only the odd ones, hollow and square-like. $\times 3$, $\times 4$ and higher give sparser, brighter, more nasal spectra.

When the ratio is not a whole number, the overtones land between the multiples of the note. The ear no longer hears one pitch with colour on top; it hears a cluster of partials that do not agree. That is the sound of bells, gongs, struck metal, and at the far end, noise. You cannot dial 3.5 on the ratio knob, which only steps through whole numbers, but you can get there with **Fine** (the small knob next to it, reading in cents). A ratio of $\times 3$ plus a Fine setting of about +267ct lands on 3.5. Small Fine amounts are useful on their own: a few cents on a $\times 1$ modulator gives a slow, chorus-like movement rather than a new timbre.

Two knobs on the Main page reshape every ratio at once. **Vortex** rests at the centre, where it does nothing; turn it down and all the ratios collapse towards 1, turn it up and they spread apart. **Helix** stretches every ratio by up to 30 percent, which is the fastest route from "organ" to "bell".

INDEX HOW MANY OVERTONES APPEAR

If ratio decides which overtones you get, **Level** (the knob in each modulator panel that reads a percentage while you hover over it) decides how many. In FM theory this quantity is called the modulation index, which is a measure of how hard the modulator is pushing the carrier. In Parasite it is the Level knob, from 0 to 100 percent, and this manual calls it Level from here on, and "index" only where the idea itself is the subject.

At 0 percent the modulator does nothing and you hear a plain sine. Turn it up a little and the first overtone or two appear: the sine thickens. Turn it up further and more appear, each new one further from the fundamental, so the sound gets brighter and brighter. Level in FM behaves the way a filter cutoff behaves on a subtractive synth, except that instead of uncovering overtones that were already there, it creates them.

There is a catch, and it is what makes FM feel different from a filter. The overtones do not pile up in order. As Level climbs, each one rises and falls in strength on its own schedule, so the fundamental can dip while the third overtone peaks, and a little later the opposite. The timbre churns as it opens. Past a certain point there are so many overtones, so widely spread, that no pitch dominates any more, and the sound tips over into noise and grit. That is where a lot of Parasite's character lives, but it is why "more" has a limit: a modulator at 100 percent is not the brightest version of 50 percent, it is a different and far more chaotic sound.

Plasma, on the Main page, scales both modulators' Level together. It rests at the centre, where it leaves them alone; fully up it quadruples them, fully down it quarters them. It is the knob to reach for when a patch is close but too dull or too harsh.

SIDEBANDS IN PLAIN LANGUAGE

You will meet the word sideband in the rest of this manual, so here is what it means, without the mathematics.

When a modulator at frequency M pushes a carrier at frequency C , the output contains the carrier plus a set of partners arranged symmetrically around it: one pair at C plus M and C minus M , the next pair at C plus $2M$ and C minus $2M$, and so on. These partners are the sidebands. They are the overtones you have been hearing, and the two rules above are really about them: ratio decides where they fall, Level decides how many of them are loud.

Two consequences follow. The sidebands below the carrier eventually reach zero and bounce back up, reflected, which is one reason high Level settings turn harsh even at whole-number ratios. And with two modulators in play, every sideband of one becomes a carrier for the other, so the clusters multiply. The algorithms in chapter 3 decide who modulates whom.

THE ENVELOPE ON THE MODULATOR

Everything so far has been static. This section matters most: it is the difference between an FM sound and an FM instrument.

Every operator panel in Parasite has its own **A**, **D**, **S** and **R** knobs. On the carrier, that envelope shapes loudness, as on any synth. On Mod 1 and Mod 2, it shapes Level. Read the last section again with that in mind: an envelope on a modulator is an envelope on brightness, on how many overtones exist at each moment of the note.

A plucked string is bright at the attack and dull by the end. A brass note starts soft and blooms. A struck bell rings with a clang that decays into a pure hum. All three are the same recipe: a modulator whose Level jumps up and falls away while the carrier holds. In a filter synth you would do this with an envelope on the cutoff, and it would sound like a filter sweeping. In FM the overtones are created and withdrawn, and it sounds like a thing being struck, blown or bowed. No single control in Parasite does as much for a patch as the Mod 1 decay knob.

THREE THINGS TO TRY

Press **Init** in the top bar to start from the Init preset. It gives you a sine carrier, Mod 1 at $\times 2$ and 50 percent, Mod 2 at $\times 1$ and 50 percent, and the Series algorithm, in which Mod 1 modulates Mod 2 and Mod 2 modulates the carrier. Press **Advanced** to see the three panels.

To hear one modulator clearly, you want it talking straight to the carrier with nothing else in the way. Use the $\lt$ and $\gt$ buttons at the far left of the top bar to switch the algorithm to **Parallel**, then turn Mod 2 off with the **On** button in its panel. The Mod 1 header now reads "Mod 1 $\rightarrow$ Car": one modulator, one carrier.



The Mod 1 panel as Init shows it, under Series, so the header still reads Mod 1 $\rightarrow$ 2; after the switch to Parallel it reads Mod 1 $\rightarrow$ Car. The large knob is the ratio, reading $\times 2$; Level reads a percentage while you hover; A, D, S and R shape Level over the note.

1. Hear Level. Hold a note around middle C and turn Mod 1's Level from 0 percent upwards. At 0 you hear the bare sine. By 20 percent it has body. By 50 percent it is bright. Keep going and listen for the point where the sound stops opening and starts to churn, then the point where it stops being a note. Leave it around 40 percent.

2. Hear ratio. With Level at 40 percent, set the ratio knob to $\times 1$ and play. Full, warm, saw-like. Now $\times 2$: hollow, like a clarinet or a square wave. Now $\times 3$: thinner and more nasal, with a different pitch feeling even though the note has not changed. Then set $\times 3$ and turn Fine up until it reads about $+267\text{ct}$: the ratio is now 3.5, and what was a reed is a bell. Play a low note and a high one; the inharmonic version stays metallic across the keyboard because the ratio follows the note.

3. Hear the envelope. Put the ratio back to $\times 1$ and Fine to 0ct , and raise Level to around 70 percent. Now turn Mod 1's **S** knob all the way down and set **D** to around 400 ms. Play. The note starts bright and settles to a sine within half a second, while the carrier's own envelope holds it. That is a pluck, made with no filter at all. Shorten D for a harder attack; raise **A** to a second or so and the same patch becomes a swell. Then press **Random** in the top bar and look at what the generator did to these same knobs.

WHAT COMES NEXT

That is the whole theory you need. Everything from here on is a control: chapter 2 walks the Main page, chapter 3 goes through the three operators and the six algorithms that decide who modulates whom, and chapter 5 is the three LFOs, which can reach every knob mentioned here.

CHAPTER 2

THE MAIN PAGE

The Main page is where Parasite opens and where you can stay for a long time. It holds the preset row, six large knobs that reshape any sound without touching its construction, and the four effects' on switches and mix levels. Someone who never presses Advanced can still load, bend, roll and save sounds from here. This chapter covers every control on it, and the top bar that both pages share.

TWO PAGES ONE INSTRUMENT



The Main page. Top bar, the visualiser in the centre, three knobs each side, the four effect mini-controls along the bottom.



The Advanced page. Ten headed panels: the three operators on the left, Macros, LFO, Filter and Pitch Env in the centre, Effects, Vol Shaper and Global on the right.

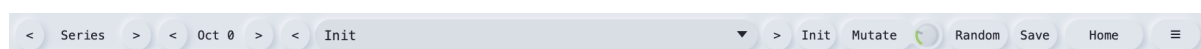
Parasite has two pages and one set of settings. The Main page shows a handful of controls; the Advanced page shows all of them, in ten headed panels. Nothing on the Main page is a separate feature: Vortex, Helix and Plasma are the same knobs as the ones in the Macros panel, Drive, Fold and Volume are the Global panel's, and each effect's Mix is the Mix knob in that effect's panel. Turn one on either page and the other follows.

The button that switches pages is at the right of the top bar, next to the menu. It reads **Advanced** on the Main page and **Home** on the Advanced page. While the preset browser or the Save panel is open it reads **Back**, and pressing it then closes the panel instead; closing the browser this way keeps whatever preset you were auditioning. Switching pages loses nothing: knob positions, the LFO you were editing, an open harmonic editor and the padlocks all survive the round trip.

Which page you see when the window opens is a setting. The first time an instance's window opens it shows the Main page, unless **Open on Advanced Page** is ticked in the menu; close and reopen the same instance's window and it comes back on the page you left it on. The setting is per computer, not per project (chapter 9).

The window is 920 by 615 points and cannot be dragged larger. The menu's UI Size row scales it in five steps, from 100 to 200 percent.

THE TOP BAR



Left to right: the algorithm stepper, the octave stepper, the preset row, the page toggle and the menu. This one was captured on the Advanced page, so the toggle reads Home.

The top bar is identical on both pages. From the left:

The algorithm stepper. The < and > buttons at the far left step through the six FM algorithms, with the current one's name between them: Series, Parallel, Split, Ring, Feedback, Additive, and after Additive the list wraps back to Series. The algorithm decides which operator modulates which; chapter 3 covers all six, and the operator panels on the Advanced page spell the routing out in their headers.

The octave stepper. The next pair of < and > buttons, around a label reading 0ct 0, transposes the whole instrument in octaves, from 0ct -4 to 0ct 4, with no wrap at either end. It applies to the next note you play: a note you are already holding stays where it is. The setting is saved in the preset.

The preset row. From the left: <, the preset name, >, **Init**, the **Mutate** control, **Random** and **Save**.

The arrows walk through presets, and they walk through exactly the list the browser last showed: the same pack, category, favourites and search filters, in the same order, wrapping at both ends. With no filters set that is the whole factory bank grouped by category, Bass first, then your own presets in one alphabetical block at the end. If the current sound is not in that list, because it is Init, a Random roll or a preset you have since deleted, > enters the list at its first entry and < at its last. If a filter leaves the list empty, the arrows do nothing.

Click the preset name and the browser opens in place of the page content (chapter 8). A * after the name means the patch has changed since it was loaded or saved. A small spinner left of the name's chevron means a cloud sync is running.

Init loads the Init preset, the same sound a fresh instance starts with. **Random** replaces the whole patch with a new one and names it "Random"; it silences any held note. The figure-8 control between Init and Random is Mutate: its left lobe, captioned "Mutate", moves the current patch towards a fresh roll when you release the mouse on it, and its right lobe is a knob setting how far, from 0 to 100 percent. It rests at 25 percent; drag it, scroll it, or double-click it to return there. Mutate keeps the preset's name and does not silence held notes. Both are one step in Parasite's undo, so Cmd+Z (Ctrl+Z on Windows) takes you back. Chapter 7 covers the two in depth.

Save opens the Save panel (chapter 8). In demo mode it is greyed out, and hovering it says why.

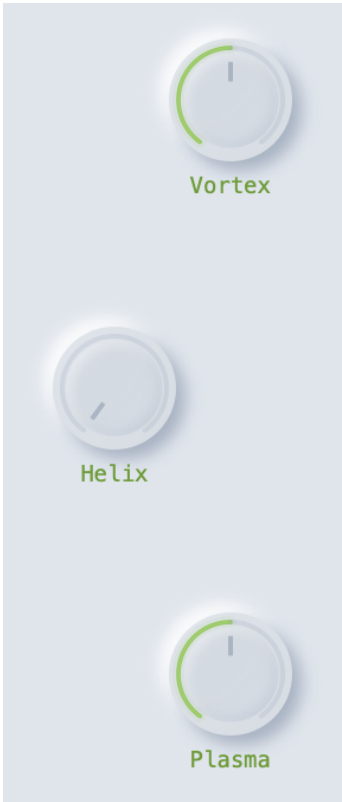
The page toggle, described above, and then **the menu**, the three-line button at the far right. Its items, in order: **Dark Mode**, **Open on Advanced Page**, a **UI Size** row with - and + around the current percentage, then your licence line (the key, masked) with **Deactivate License**, or "Not licensed" with **Activate License...**, then **Sync Presets** and **Manage Account**. The first three are chapter 9; the licence, sync and account items are chapter 8.

When the demo pill or the "MADE WITH NEWER VERSION" warning is showing, it takes a slot between > and Init and the row makes room for it.

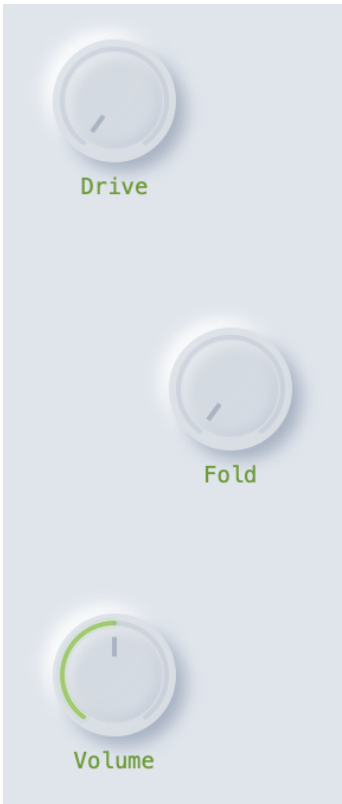
THE VISUALISER

The shape in the middle of the Main page reacts to the sound coming out of Parasite: its spectrum and its waveform drive the movement, and nothing else does. It is not a control. Clicking it, dragging it or playing without sound does nothing to the patch, and it disappears while the browser is open. It is drawn with OpenGL; on the Advanced page it is not drawn at all, so a computer that finds it costly can tick **Open on Advanced Page** in the menu and never pay for it.

THE SIX MACROS



The left side of the Main page: Vortex, Helix and Plasma. Vortex and Plasma rest at the centre, Helix at zero.



The right side: Drive, Fold and Volume. Drive and Fold rest at zero, Volume at 50 percent.

Three of the six knobs operate on the FM itself, before any note has been turned into sound: Vortex, Plasma and Helix. The other three operate on the sound after it exists: Drive, Fold and Volume. On the Main page the knobs carry their names and show no numbers; their twins on the Advanced page show the value while you hover.

Double-click any of the six and it returns to its resting position.

NOTE: This works on every knob in Parasite, not only these six. Resting position is not always zero: Vortex and Plasma rest at their centre, Drive at 1.0x, Cutoff fully open. Right-click and **Reset to Default** does the same thing from the menu.

Vortex

Vortex rests at its centre and, there, does nothing. It acts on the ratios: the x_1 , x_2 , x_3 relationships that set each operator's speed relative to the note (chapter 1). Turn it down and every ratio collapses towards 1, until at the bottom all three operators run at the pitch of the note itself: the FM still colours the sound, but the overtones pull in close and the result is a thick, unison-like timbre. Turn it up and every ratio is pushed apart, until at the top each one is squared: x_2 becomes 4, x_3 becomes 9, and the overtones spread wide and turn inharmonic.

An operator at exactly x_1 has nothing to collapse or square, so Vortex leaves it where it is. An operator in **Fixed** mode (chapter 3) does not have a ratio at all, and Vortex ignores it too. The carrier is an operator too: if its ratio is above x_1 , Vortex changes its pitch along with everything else.

Helix

Helix rests at zero. Raising it stretches every ratio by a fixed factor, up to 30 percent at the top, so an operator at x_2 ends up at $x_{2.6}$ and one at x_3 at $x_{3.9}$. That takes the overtones off the harmonic series in one move, which is the sound of struck metal, bells and detuned strings. Because the carrier is stretched too, the pitch rises as Helix goes up, by about four and a half semitones at full.

Like Vortex, Helix only touches operators that follow the keyboard; anything in Fixed mode ignores it.

TIP: None of the factory presets takes Helix above 65 percent. The top of the range is there, but the interesting sounds are in the lower two thirds.

Plasma

Plasma rests at its centre, where it does nothing. It scales both modulators' **Level** together, the control that decides how many overtones the modulation creates: at the top it quadruples them, at the bottom it quarters them. Reach for it when a patch is almost right but too dull or too harsh; of the six, it is the one that most often turns a tame preset into a snarl. In the Additive algorithm, where there is no modulation, it becomes the volume of the two modulator layers instead (chapter 3).

Drive

Drive rests at its lowest position, 1.0x, where it is transparent. It is a saturation stage, applied to each voice on its own after the filter and the fold, from 1 to 10 times gain: around 2 to 4 it compresses and warms, above 6 it is a fuzz. Because it works per voice, the notes of a chord saturate separately rather than grinding against each other. The knob is not linear; its centre sits at about 3.25x, so most of its travel is spent in the useful range. Parasite does not oversample, so hard drive on high notes adds a gritty digital edge that is part of its character rather than a fault.

Fold

Fold rests at zero. It is a wavefolder: when the waveform would clip, it is folded back on itself instead, which adds overtones in a way that sounds less like distortion and more like a new oscillator shape. It sits after the filter and before Drive in each voice. Up to about 30 percent it brightens; above 30 percent a second fold blends in and the timbre turns metallic; above 60 percent a saturation stage joins it and the sound goes dense and fuzzy. The wet amount tracks the knob, so at 100 percent you hear only the folded signal.

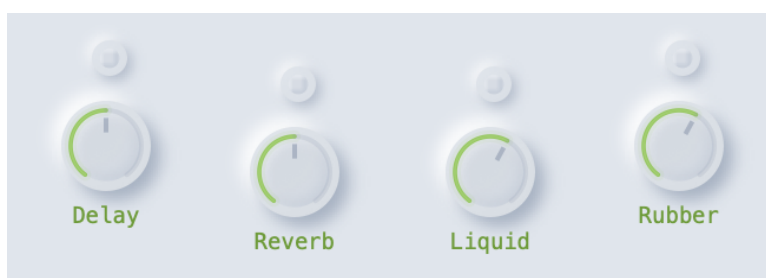
NOTE: Your DAW's automation list calls this parameter "HemoFold". It is the same control.

Volume

Volume is the level of each voice after Drive, from 0 to 100 percent, resting at 50 percent. A slow LFO here gives tremolo (chapter 5), and this is the knob to turn down when a Random roll comes out loud.

All six knobs can take an LFO. The assignment is made on the Advanced page, by dragging an LFO tab onto the knob's twin there, and once made the modulation ring shows on the Main page knob too, where its depth can be dragged like on any other knob (chapter 5).

THE EFFECT MINI CONTROLS



Delay, Reverb, Liquid, Rubber. Each is a switch above a Mix knob above the name.

Along the bottom arc sit the four effects, left to right: **Delay**, **Reverb**, **Liquid** and **Rubber**. Each has an unlabelled toggle that switches the effect on, and below it a knob that sets how much of the effect you hear, from fully dry at 0 percent to fully wet at 100. These are the same On switches and Mix knobs as in the effect panels on the Advanced page, which hold every other setting of each effect (chapter 6).

All four rest off in a fresh instance, with Mix at 50 percent for Delay and Reverb and 60 percent for Liquid and Rubber, so switching one on gives you something to hear at once. Delay and Reverb start from empty when switched on; you never hear a stale tail from the last time. The effects run in a fixed order after the voices are mixed, Liquid, then Rubber, then Delay, then Reverb, and the Vol Shaper comes after all of them. The four Mix knobs can take an LFO like the macros.

TIP: Reverb and Delay off, Liquid on at 60 percent, is a good way to hear what Liquid does on its own: a set of resonances bubbling through the sound, easier to judge without a tail behind it.

CHAPTER 3

THE OPERATORS

The three panels on the left of the Advanced page are the instrument. Everything else in Parasite shapes, moves or decorates what these three produce. Mod 1 and Mod 2 are the modulators, whose job is to push the carrier's phase around and whose own sound you never hear on its own; the Carrier is the oscillator that reaches the output. Chapter 1 explained why a modulator makes a carrier bright rather than wobbly; this chapter goes through every control in the three panels, then the six algorithms that decide who modulates whom. Press **Advanced** in the top bar to see them.

MOD 1 AND MOD 2



The Mod 1 panel in ratio mode. Top row: wave menu, Harmo, Fixed. Middle row: On, the ratio knob reading x2, Fine reading Oct, Level. Bottom row: A, D, S, R.

The two modulator panels are identical, so this section describes Mod 1 and everything in it holds for Mod 2. The top row has the wave menu, the **Harmo** button and the **Fixed** toggle. The middle row has the **On** toggle, the large frequency knob, a smaller knob beside it, and **Level**. The bottom row is the envelope: **A**, **D**, **S** and **R**. Most knobs show their name, and swap it for their value while the mouse is over them; the two frequency knobs show their value all the time.

The waveform

The menu at the top left picks the modulator's waveform: **Sine**, **Saw**, **Square**, **Tri**, **Pulse**, **Custom** or **Noise**. Init starts both modulators on Sine, which is the classic FM modulator: a single partial pushing the carrier gives the clean, countable sidebands chapter 1 described. Any other wave already contains many partials, and every one of them spawns its own family of sidebands, so Saw, Square, Tri and Pulse make the spectrum dense very quickly even at modest Level. They are useful at low Level for thick, buzzy timbres, and past that they turn to noise fast. Pulse is a narrow pulse, high for a quarter of each cycle. Custom plays the 32-bar spectrum you draw in the Harmo editor, described below. Noise replaces the waveform with white noise, so the modulator no longer pushes the carrier in a pattern but at random: the result is a hissy, breathy FM that is good for air, wind and the noisy part of a drum.

If you pick Custom from the menu, the Harmo editor opens on its own so you can draw the spectrum straight away.

The ratio knob and Fine

The large knob in the middle row has no name painted under it. Its label is its value: $\times 1$, $\times 2$, $\times 3$ and so on up to $\times 48$, plus $\times 0.5$ at the bottom of the travel. That number is the modulator's frequency as a multiple of the note you play, and it moves with the note: a modulator at $\times 2$ runs an octave above every note on the keyboard. Init sets Mod 1 to $\times 2$ and Mod 2 to $\times 1$. The knob steps through whole numbers only, and the rule from chapter 1 applies: whole-number ratios give harmonic spectra with a clear pitch, the lower ones full and saw-like, the higher ones sparse and nasal. Your DAW's automation list calls this control "Mod1 Coarse".

Fine, the smaller knob to its right, detunes the modulator from that ratio in cents, from -1000ct to $+1000\text{ct}$, a little under an octave either way, resting at 0ct . Its label shows the value whole; the knob itself moves in tenths of a cent. A few cents off a whole-number ratio gives the sidebands a slow beat, a chorus-like movement that keeps the sound harmonic. Larger offsets reach the ratios the big knob cannot: $\times 3$ plus about $+267\text{ct}$ is 3.5, inharmonic and bell-like; $+700\text{ct}$ is a fifth above, $+1000\text{ct}$ a minor seventh. Both the ratio knob and Fine can take an LFO (chapter 5).

Fixed mode



Mod 1 with Fixed pressed. The ratio knob has become a frequency in hertz and Fine has become Multi, a multiplier in steps of ten.

Press **Fixed** and the modulator stops following the keyboard. The two frequency knobs swap: the large one now reads an absolute pitch, 440 Hz at rest, from 20 Hz to 16 kHz, and the small one becomes **Multi**, a multiplier in steps of ten: $\times 0.0001$, $\times 0.001$, $\times 0.01$, $\times 0.1$, $\times 1$ (where it rests) and $\times 10$. The modulator runs at the large knob's value times Multi, whatever note you play. The large knob is not linear: its centre sits near 1.6 kHz, so the low end gets most of the travel. Above 1 kHz the label switches to the kilohertz form, 1.6 kHz.

A fixed modulator changes the character of a patch across the keyboard. Against a low note its frequency is a high ratio; against a high note the same frequency is a low ratio, so the sound thins out or thickens as you move up, the way a formant does in a voice or the body resonance does in an acoustic instrument. The same mode gives you something else when Multi is turned right down: with Multi at $\times 0.01$ and the large knob between 100 and 600 Hz, the modulator runs at 1 to 6 Hz. Instead of overtones it makes a slow phase wobble inside the FM chain, a different and more organic movement than an LFO on Level. The Random generator uses exactly this trick in some of its rolls.

Neither fixed-mode knob can take an LFO, though both can be automated from your DAW. A fixed operator ignores Vortex and Helix on the Main page, which only act on ratios (chapter 2).

Level

Level sets how hard the modulator pushes the carrier, which is to say how many overtones the modulation creates: the modulation index of chapter 1. It runs from 0 to 100 percent and rests at 50; the label reads the percentage while you hover. At 0 the modulator does nothing. The range is wide on purpose: a single sine modulator at 100 percent is already past the point where the sound stops being a note, so most playable patches live in the lower half, and the upper half is for noise, grit and drums. Plasma on the Main page scales both modulators' Level together, up to four times, and an LFO on Level can push it past the knob's own maximum. In the Additive algorithm Level is the loudness of the modulator as a layer rather than a modulation depth.

The envelope

The bottom row, **A**, **D**, **S** and **R**, is an envelope on Level. It does not shape loudness; it shapes brightness, how many overtones exist at each moment of the note, and chapter 1 argued it is the single most expressive control in FM. Attack runs from 0 to 5 seconds and rests at `10.0ms`; Decay from 0 to 5 seconds, resting at `300.0ms`; Sustain from 0 to 1, resting at `0.700`; Release from 0 to 8 seconds, resting at `300.0ms`. The time knobs are not linear: the centre of A and D is about half a second, the centre of R about 0.8 seconds, so short times get room. Labels read milliseconds below one second and seconds above.

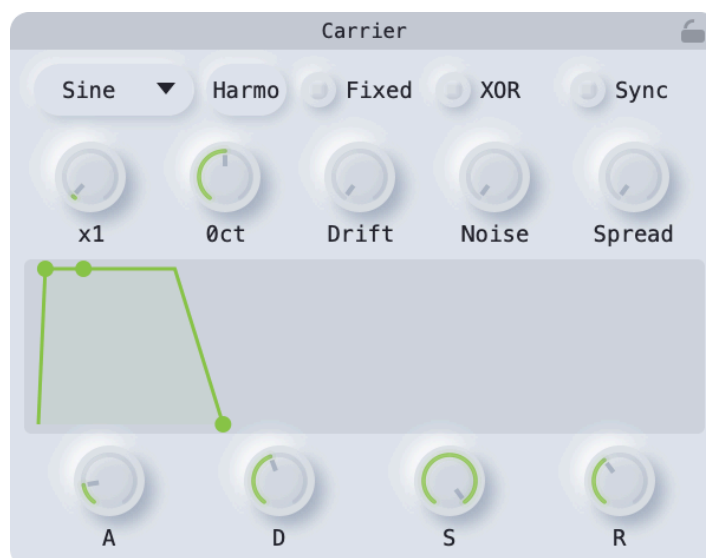
All three ramps are straight lines, not curves. A decay of 300 ms falls at a constant rate from the peak to the sustain level, which is a little more abrupt than the exponential decay of most analogue-style envelopes, and worth knowing when a pluck sounds harder than you expected: lengthen D rather than reaching for the carrier. The envelope always receives the key's release, so Release matters whenever Sustain is above zero. All four knobs can take an LFO, and the **Time** macro in the Macros panel scales A, D and R of every envelope at once (chapter 4).

On

On switches the modulator's contribution on and off. It gates Level, not the oscillator: an operator that is off is still running, it only contributes nothing. In Parallel that means the carrier loses one of its two modulators and keeps the other. In the Additive algorithm it mutes one layer. The **Sync** toggle in the Carrier panel keeps working with Mod 1 off, because the sync pulse comes from the oscillator rather than from its output.

CAREFUL: In Series, Mod 1 reaches the carrier only through Mod 2. Switch Mod 2 off and there is no modulation at all, from either operator: you hear a bare carrier. Switching Mod 1 off instead leaves Mod 2 modulating the carrier as a plain wave. Random turns both modulators back on with every roll.

THE CARRIER



The Carrier panel. Top: wave menu, Harmo, Fixed, XOR, Sync. Then the ratio knob, Fine, Drift, Noise, Spread; the envelope display; A, D, S, R.

The Carrier is the oscillator you hear, and its panel has everything the modulators have, plus five controls of its own: **Drift**, **Noise**, **Spread**, **XOR** and **Sync**. There is no carrier level knob. Its loudness is its envelope times the key's velocity times Volume, so a carrier is as loud as you play it.

Wave, ratio and Fine

The wave menu offers the same seven choices, resting on **Sine**. The difference is that here you hear the waveform directly, so a Saw or Square carrier already has a full set of overtones before any modulation arrives, and FM on top of it thickens fast; a sine carrier is the one that lets the modulators draw the spectrum from nothing. A Noise carrier is a special case: noise has no phase to push, so the modulators do nothing to it and the voice becomes an enveloped, filtered noise source, which is a legitimate way to build a snare.

The ratio knob and Fine work as on the modulators. On the carrier the ratio is heard as pitch: `x2` plays an octave above the note, `x0.5` an octave below, and `x3` a twelfth up. Fine detunes the whole voice. Your keyboard's mod wheel adds up to 100 cents to it, a sharpening you can ride by hand. **Fixed** holds the carrier at an absolute pitch whatever key you press, which is what drum patches want: the same hit from every key, with only velocity changing.

The envelope and its display

The carrier's envelope, A, D, S and R along the bottom, is the loudness of the whole voice. Its ranges match the modulators' and so do its resting values, except Sustain, which rests at `1.000`: a held note stays at full. The note ends when this envelope ends, so its Release is the tail you hear after the key goes up, and nothing a modulator envelope does can outlast it.

The panel draws the envelope above the knobs, and the drawing is itself a control. Three dots sit on the curve: the peak of the attack, the corner where decay meets sustain, and the end of the release. Drag the first left and right to set Attack; drag the second left and right for Decay and up and down for Sustain; drag the third left and right for Release. The horizontal scale is compressed towards the short end so that short times get room to be set. Dragging a dot moves the same four parameters as the knobs, and your DAW records it as automation like any knob move.

Drift, Noise and Spread

Drift adds a slow, random wander to the carrier's pitch, the kind an analogue oscillator has when it is slightly out of calibration. It rests at 0 percent. The wander is a slow wave whose speed itself keeps changing, between a twentieth of a cycle and five cycles a second, and the amount grows with the square of the knob, so up to 50 percent it is a subtle life in the sound and above 50 percent it is audibly loose. It acts on the carrier only; the modulators stay locked, so the overtones keep their relationship to the fundamental. The left and right carrier oscillators drift independently, which also widens the image a little.

Noise crossfades the carrier with white noise, from 0 to 100 percent. It is a crossfade, not an addition: at 100 percent there is no carrier left, only noise. The noise sits inside the voice, so it is shaped by the carrier envelope and velocity like the tone itself, and it is different in the left and right channels, so it widens the sound as it grows. A little Noise under an FM pluck is the breath in a flute or the chiff in an organ; a lot of it, with a short envelope, is a hi-hat.

Spread detunes the right channel's carrier upwards, by up to 15 cents at 100 percent, while the left channel stays where it is. Both channels receive the same modulation, so what you hear is the two carriers beating against each other across the stereo field: a slow widening that gets faster as the knob goes up. It rests at 0 percent.

All three can take an LFO.

XOR

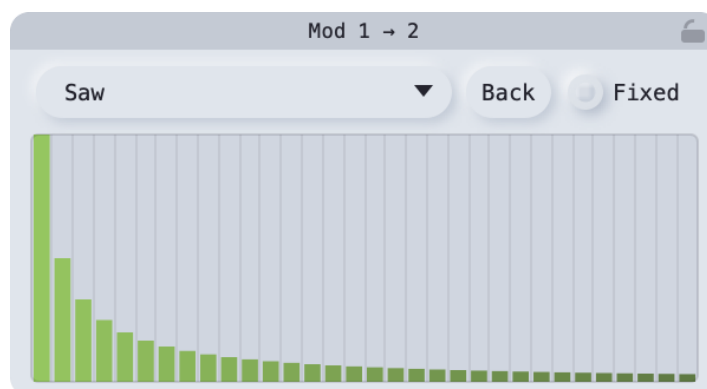
XOR is a toggle, with no amount. On, it quantises the voice to 16-bit and flips its bits against a fixed pattern: a digital mangling of the waveform. The result is harsh and bit-crushed, full of high-frequency grit and a good deal of low-frequency rubbish that Parasite removes right after. It is applied before the filter, so the filter can tame what it adds; a low-pass at a few kilohertz turns XOR from a buzzsaw into a texture. About one Random roll in fifteen switches it on.

Sync

Sync is hard sync: every time Mod 1's oscillator completes a cycle, the carrier's waveform is reset to its start. The carrier's own frequency then sets the shape of each cycle rather than its pitch, and the pitch you hear is Mod 1's. That is the buzzy, ripping timbre of synced analogue oscillators, and it is at its most characteristic when the carrier's ratio is above Mod 1's: set Mod 1 to $\times 1$ and sweep the carrier from $\times 2$ upwards to hear the classic sync sweep.

Sync is independent of everything else about Mod 1: it works in every algorithm, with Mod 1 switched off, and at any Level, because the pulse comes from the oscillator's cycle, not its output. Only Mod 1 can be the source and only the carrier is reset; Mod 2 is never synced.

THE HARMO EDITOR



The Harmo editor, opened from the Saw wave, so the bars fall off as 1, 1/2, 1/3 and so on. 32 bars, one per harmonic, the first being the fundamental. The Harmo button now reads Back.

Each of the three operators has a **Harmo** button, and pressing it swaps the panel's knobs for 32 vertical bars. Bar one is the fundamental, bar two the octave above it, bar three the twelfth, and so on to the 32nd harmonic. The height of each bar is the strength of that harmonic in the waveform. Click or drag across the bars to set them. The waveform is rebuilt from the bars as you draw, and the whole table is scaled so its loudest harmonic is full strength, which means the overall level of the operator does not change with how many bars you raise.

When you open the editor, the bars are filled with the harmonics of the wave currently selected, so you can start from a known shape: Sine gives a single bar, Saw a series falling off evenly, Square and Tri the odd harmonics only, Pulse its own pattern, and Noise, which has no harmonics to show, falls back to a sine. Change the wave menu while the editor is open and the bars refill from the new wave. The first bar you draw switches the wave to **Custom**, which is the setting that tells the operator to play the table; the table itself is saved in the preset.

Press **Back** to return to the knobs. In a modulator panel the bars take the whole panel below the top row, envelope knobs included; in the Carrier panel the A, D, S and R knobs stay visible under the bars, and only the envelope display and the Drift, Noise and Spread knobs hide until you press Back. Opening a preset closes the editor. Every change is a step in Parasite's undo, so Cmd+Z (Ctrl+Z on Windows) walks back through a drawing.

CAREFUL: A modulator's table is played at the modulator's full ratio with no anti-aliasing. High bars on a modulator at $\times 4$ played high on the keyboard will alias into unrelated tones. Keep a modulator's drawing in the first eight bars; the carrier can go higher.

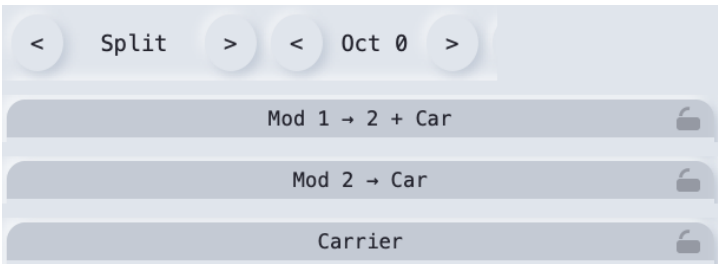
The drawing is not thrown away when you choose a standard wave from the menu: the operator plays the standard wave and the table waits, and choosing Custom again brings it back. What does overwrite it is opening the Harmo editor while a standard wave is selected, because the editor fills the bars from that wave on entry.

THE SIX ALGORITHMS

An algorithm is the wiring between the three operators. Parasite has six, stepped with the **<** and **>** buttons at the far left of the top bar; the name shows between them and the list wraps. You do not have to memorise the routing, because the three panel headers on the Advanced page rewrite themselves to

say it: under Series, as in the Advanced page screenshot in chapter 2, they read "Mod 1 → 2", "Mod 2 → Car" and "Carrier"; under Split the first becomes "Mod 1 → 2 + Car"; under Ring it becomes "Mod 1 × 2"; under Additive all three become "Osc 1", "Osc 2" and "Osc 3".

ALGORITHM	MOD 1 HEADER	MOD 2 HEADER	ROUTING
Series	Mod 1 → 2	Mod 2 → Car	Mod 1 → Mod 2 → Carrier
Parallel	Mod 1 → Car	Mod 2 → Car	Mod 1 → Carrier, Mod 2 → Carrier
Split	Mod 1 → 2 + Car	Mod 2 → Car	Mod 1 → Mod 2 → Carrier, plus Mod 1 → Carrier
Ring	Mod 1 × 2	Mod 2 → Car	(Mod 1 × Mod 2) → Carrier
Feedback	Mod 1 → 2	Mod 2 → Mod 2 + Car	Mod 1 → Mod 2 → Carrier, Mod 2 → itself
Additive	Osc 1	Osc 2	no FM; three layers summed



The headers under Split. The three panels always spell out the routing in force, so the algorithm is readable without opening this table.

Series is the classic three-operator stack and the one Init uses: Mod 1 modulates Mod 2, and Mod 2, now carrying Mod 1's sidebands, modulates the carrier. Mod 1's influence arrives only through Mod 2, so Mod 2's Level sets how much of the whole chain reaches the carrier, and Mod 1's Level sets how complex Mod 2's own waveform is before it does. With Mod 1 low you have a two-operator sound; raising it adds a second layer of sidebands around each of the first. It is the algorithm for sounds that need to go from simple to dense along a single envelope.

Parallel gives the carrier two independent modulators whose pushes add. Each produces its own family of sidebands around the carrier, and the two families do not interact, so you can tune them separately: Mod 1 at `x1` for body, Mod 2 at `x7` for a metallic edge, each with its own envelope. It is the clearest algorithm to learn on, which is why chapter 1 used it.

Split is Series and Parallel at once: Mod 1 modulates Mod 2 and the carrier, and Mod 2, already modulated, modulates the carrier too. It is the densest routing, since the carrier receives the Parallel pair and the Series chain together, and it is the one to pick when a Parallel sound needs more interaction between its two modulators without giving up either one's direct voice.

Ring multiplies the two modulators' outputs together, each shaped by its own envelope, and sends the product to the carrier, scaled by both Levels. Multiplying two waves produces their sum and difference frequencies, so what modulates the carrier is a pair of tones that are usually inharmonic to it: the result is metallic, bell-like, and very sensitive to the two ratios, where a small change in either moves the whole spectrum. Because the two are multiplied, either Level at zero silences the modulation, and either envelope at zero does the same at that moment of the note.

Feedback is Series with Mod 2 also fed back into itself: a share of its own previous output, shaped by its envelope, is added to its phase at a fixed depth. There is no feedback knob; how much you hear of it is set by Mod 2's Level and envelope, since the fed-back signal carries both. A sine with feedback bends

towards a saw, and past a certain depth it breaks up into noise, which is where growls and rasps live. Mod 2's Level between 30 and 60 percent is the range the generator uses for growl. The feedback starts from silence on every new note, so the attack is clean.

Additive switches the FM off. All three operators are heard directly and added together, as three layers: the headers read Osc 1, Osc 2 and Osc 3. Each modulator's Level becomes its volume as a layer, its ratio and Fine become its tuning, and its envelope shapes its own loudness independently of the carrier's. The carrier keeps its own envelope, and the Noise crossfade applies to the carrier layer only; the two modulator layers bypass it. Plasma on the Main page scales the two modulator layers, and Vortex and Helix still act on their ratios, so a detuned three-oscillator stack is one Helix turn away. The two modulator layers are mono: Spread widens the carrier layer only.

Whatever the algorithm, the carrier's Sync toggle listens to Mod 1 regardless of the wiring, and the hidden per-voice Flux wobble (chapter 5) scales both modulators' pushes, whatever route they take to the carrier.

CHAPTER 4

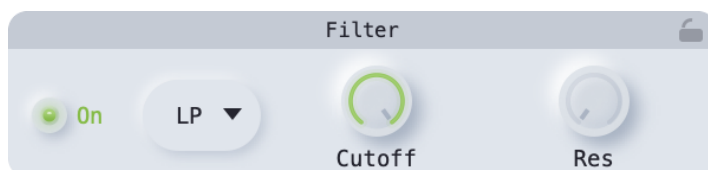
SHAPING THE VOICE

The operators make the sound. This chapter is about everything that happens to it afterwards, inside each voice, before the effects: the filter that takes overtones away, the pitch envelope that bends the start of a note, the macros that reshape the operators from one knob, the Global panel with its drive and fold, and the Vol Shaper, which is a special case because it acts on the whole output rather than on a voice. All five panels live on the Advanced page: Filter and Pitch Env in the centre column, Macros above them, Vol Shaper and Global in the right column.

The order inside a voice matters for what follows, so here it is once. The carrier's output, with its envelope and noise, passes through XOR if it is on, then the filter, then Fold, then Drive, then Volume. After that the eight voices are added together, the four effects run (chapter 6), and the Vol Shaper has the last word.

THE FILTER

FM creates overtones; the filter takes them away. Chapter 1 showed that the modulator's Level behaves like a cutoff that creates harmonics instead of uncovering them. The filter is the conventional tool, and it is useful here for two things FM cannot do on its own: rolling off the harsh top end of a bright patch, and the resonant wobble that half the bass presets in the factory bank are built on.



The Filter panel. The type menu reads LP; Cutoff is fully open.

The filter sits after the operators and after XOR, before Fold and Drive, so whatever you remove here never reaches the wavfolder or the saturation. That is the right place for it: Fold and Drive react to how much signal they are fed, and a filtered signal folds and saturates more gently.

On (Filter) rests on, with the cutoff fully open, so a fresh instance is unfiltered but ready: turn Cutoff down and you hear the effect at once.

The type menu offers four responses, all with a gentle 12 dB per octave slope, which means the filter shades the sound rather than cutting it off dead:

TYPE	KEEPS	REMOVES
LP	lows	highs
HP	highs	lows
BP	a band around the cutoff	both sides
Notch	both sides	a band around the cutoff

LP is the one you will use most, and it rests selected. HP thins a sound out, useful on a lead that is fighting a bass. BP with resonance turns a dense FM spectrum into a vowel. Notch is subtle on a static sound and comes alive when an LFO sweeps it; no factory preset uses it, which tells you there is room to explore.

Cutoff (Filter) runs from 20 Hz to 20 kHz and rests at 20 kHz, fully open. The knob is not linear: its 12 o'clock position is 1 kHz, so the lower half of the travel covers 20 Hz to 1 kHz and the upper half covers the remaining four octaves. The ear hears pitch logarithmically, and most of the musically useful cutoff positions sit below 2 kHz, so the knob spends its travel where you need it. The readout while you hover reads 800 Hz below 1 kHz and 1.2 kHz above. This knob also moves more finely under the mouse than the others, since a few hertz matter at the bottom of its range.

Res (Filter), from 0 to 100 percent, rests at 0. It raises a peak at the cutoff frequency. Up to about 50 percent it adds presence; above that it becomes a ringing tone of its own, and near 100 percent it is a sharp peak, though it stops short of singing on its own. The factory bank pairs a low cutoff with resonance between 55 and 90 percent for its wobbles.

Cutoff and Res both respond to an LFO per sample, so a fast sweep stays clean, and the sweep is applied in the knob's own space: an LFO on Cutoff covers the same number of octaves at the bottom of the range as at the top, which is what makes a wobble sound even instead of lurching through the last octave.

TIP: The wobble recipe from the factory bank: LP, Cutoff around 150 Hz, Res around 70 percent, then an LFO on Cutoff (chapter 5) synced to 1/4 or 1/8 with an amount around 40 percent.

PITCH ENV

A pitch envelope bends the pitch of every note at its start, then lets it settle. With a fast decay it is a kick drum, a tom, a laser, a pluck with a snap at the front; with a slow one it is a siren or a dive. Its A, D, S and R work the same way as the operator envelopes.



The Pitch Env panel. The display reads OFF until the envelope is switched on; it then draws the shape and is not draggable.

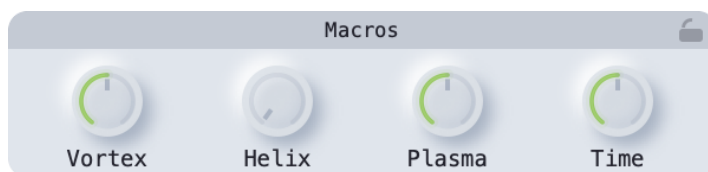
On (Pitch Env) rests off. The display in the panel reads OFF while it is off and draws the envelope when it is on. Unlike the carrier's envelope display, this one is read-only: you set the shape with the knobs.

Amt (Pitch Env) is the size of the bend, from minus 96 to plus 96 semitones, resting at 0; its readout reads +12st or -12st. A positive amount starts the note above pitch and lets it fall to the note you played; a negative amount starts below and rises into it. The four knobs **A**, **D**, **S** and **R** shape the bend over time with the same ranges as the operator envelopes: attack and decay up to 5 seconds, sustain from 0 to 1, release up to 8 seconds. They rest at 1 ms, 150 ms, 0 and 100 ms, which is a fast pitch drop: set Amt to around 24 semitones and you have a kick. Sustain above 0 keeps part of the bend for as long as the key is held, and then Release matters, because the envelope receives the note-off like every other envelope in Parasite. The Time macro, described below, scales this envelope's times along with the others.

NOTE: The total pitch offset of a voice is clamped to 48 semitones either way. The pitch envelope, the pitch wheel, an LFO on Pitch and Tremor all add into that one figure. An Amt of 96 therefore holds flat at the ceiling until the envelope has fallen below half, and only then starts to move, which makes a very long drop sound like a hold followed by a sweep. For a clean drop, stay at or below 48.

THE MACROS PANEL

The three large knobs on the left of the Main page are these same three parameters: **Vortex**, **Helix** and **Plasma** (Macros). Turn one here and the Main page knob moves with it, and chapter 2 describes what each does to the sound. What this panel adds is a readout, since the values show here while you hover, and the fourth macro, **Time** (Macros), which exists nowhere else.



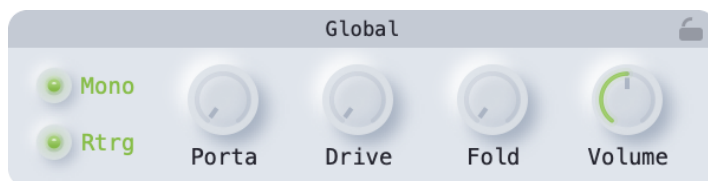
The Macros panel. Vortex and Plasma rest at the centre, Helix at zero, Time at 1.00x.

All four run from 0 to 100 percent, read a percentage while you hover (Time reads a multiplier instead), reset to their resting value on a double-click, and can take an LFO.

Time (Macros) rests at 50 percent, which reads 1.00x, and scales the attack, decay and release of all four envelopes at once: Mod 1, Mod 2, the carrier and the pitch envelope. Fully down reads 0.25x and makes every stage four times faster; fully up reads 4.00x and makes it four times slower. Sustain is untouched. Turn it when a patch is right but plays too slowly for the tempo, or when a pluck should become a pad without touching twelve knobs.

GLOBAL

The Global panel holds the three right-hand knobs of the Main page, Drive, Fold and Volume, with their values visible, plus the voice behaviour that the Main page does not show: mono, phase retrigger and portamento.



The Global panel. Mono and Rtrg rest on; Porta and Fold at zero; Drive at 1.0x; Volume at 50 percent.

Mono (Global) rests on: a fresh instance is monophonic. A new note releases the note before it, with the previous release overlapping the new attack, so legato lines stay connected. Switch Mono off for eight-voice polyphony; when all eight are busy, a ninth note takes over one of the playing voices with a 5 ms fade.

Rtrg (Global) rests on and resets the phase of all four oscillators at the start of every note, so every attack sounds the same. It only has an effect in Mono: polyphonic voices always start from a reset phase. With Mono on and Rtrg off the oscillators keep running from note to note, which makes a legato line smoother and a little less predictable at the attack.

NOTE: There are three toggles labelled Rtrg in Parasite, and they restart three different things. This one restarts the oscillators. The one in the LFO panel restarts the LFO cycle, and the one in the Vol Shaper restarts the volume pattern.

Porta (Global) is portamento, the glide from the previous note to the new one, and it works only in Mono. It rests at 0, which is off, and runs up to 2 seconds; the knob's 12 o'clock position is 0.5 s, so the short, useful glides take up most of the travel. The readout reads 250ms below a second and 1.20s above. The glide always starts from the last note played and follows an exponential curve, fast at first and settling gently.

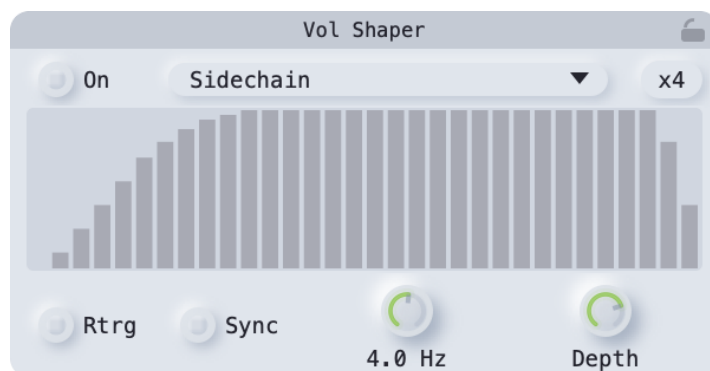
Drive (Global) is the saturation stage chapter 2 describes, from 1.0x, which is clean, to 10.0x, resting at 1.0x with its 12 o'clock position at 3.25x. Here its value is visible while you hover. It is applied inside each voice, after Fold and before Volume.

Fold (Global) is the wavefolder from chapter 2, from 0 to 100 percent, resting at 0, with its value visible here. It sits after the filter and before Drive. The factory bank keeps it modest: the median is 17 percent, and nine presets in ten stay at or below 45 percent. Since 1.0.7 Fold is smoothed, so automating it or driving it with an LFO no longer clicks.

Volume (Global), from 0 to 100 percent, rests at 50 and is the voice's output level after Drive. An LFO on Volume gives a tremolo inside each voice, before the effects, which is the one place in Parasite where you can chop a sound without chopping its reverb tail.

VOL SHAPER

The Vol Shaper draws a loudness pattern over time and plays it on a loop: a sidechain pump without a sidechain, a trance gate, a stutter, a slow breathing. It is a 32-step curve, cycling at a rate you set in hertz or in beats, and it is the last thing in the signal chain.



The Vol Shaper panel as a fresh instance shows it: the Sidechain shape loaded, On still off. An accent playhead runs along the curve once the shaper is on.

Last is the point to hold on to. The Vol Shaper acts on the finished mix, after the delay and after the reverb, not on the voices. So when a gate pattern cuts the volume, it cuts the reverb tail and the delay repeats along with the note. At full depth that is exactly what a sidechained bus does in a mix, and it is what makes the Sidechain shape sound like the real thing. It also means you cannot gate the dry synth and leave the reverb washing over the gaps: for that, put an LFO on Volume (chapter 5), which works inside each voice, before the effects.

A fresh instance carries the Sidechain shape, but **On** (Vol Shaper) rests off, so you hear nothing until you switch it on. **Depth** (Vol Shaper) rests at 75 percent and sets how far the curve ducks: at 0 the shaper does nothing even when on, at 100 percent the volume follows the drawn curve exactly, so a bar at the

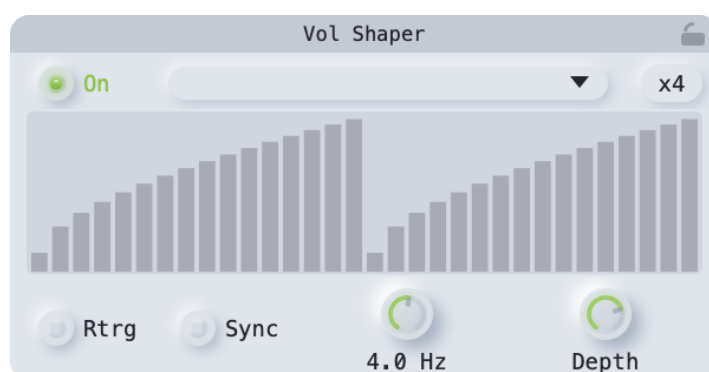
bottom is silence.

The shapes

The shape menu loads one of fifteen patterns into the curve. Each is a starting point to redraw, and loading one is a single undo step. The menu watches the curve: after a preset loads it reads the name of whatever shape the preset carries, and it goes blank as soon as the curve is hand-drawn.

SHAPE	PATTERN OVER ONE CYCLE
Sidechain	fast dip to silence, smooth recovery, small dip at the end
Pump	two tight dips
Trance	first half on, second half off
Choppy	three quarters on, one quarter off
Sine	smooth rise and fall
Saw Down	full at the start, fading to silence
Saw Up	silence rising to full
Bounce	two short hits
Wobble	full, a slow dip in the middle, back to full
Stutter	four quick hits
Breathe	slow fade in, slow fade out
SC Hard	silent first third, ramp up, duck before the end
Swirl	one long burst, then one short
Glitch	irregular hits
Flat	full throughout, no effect

Drawing



A hand-drawn two-cycle ramp with the shaper switched on. The shape menu has gone blank because the curve no longer matches a named shape.

Click or drag in the display to set bar heights; the top is full volume, the bottom is silence at full depth. The **x4** button above the display switches to eight wide bars that each paint four steps, for drawing a rhythm quickly; its caption flips to **x1** to go back to the 32 fine steps. Every edge in the curve is rounded by a 3 ms smoothing, so a hard step does not click, and a step drawn at the very bottom is true silence. Every edit is undoable with Cmd+Z (Ctrl+Z on Windows).

Rate, sync and retrigger

Rate (Vol Shaper), from 0.1 Hz to 20 Hz, rests at 4.0 Hz, with the knob's 12 o'clock position at about 3.6 Hz. The curve plays one full cycle per period, and the readout, always visible, reads 4.0 Hz. An LFO can reach this knob.

Sync (Vol Shaper) replaces the Rate knob with a stepped knob over nine tempo divisions: 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/4T, 1/8T and 1/16T, where T means triplet. One cycle of the curve lasts one division. The first time you switch Sync on it lands on 1/4, a beat, and switching it off then on again returns to the division you had. There are no bar-length divisions here, unlike the LFOs; for a two-bar swell, use Rate. When your DAW provides no tempo, Parasite assumes 120 BPM. The stepped Sync knob is the one knob in this panel an LFO cannot reach.

While your DAW's transport is playing, a synced Vol Shaper follows the song position: beat one of every bar hits the same point of the curve whether you are playing live, looping, or bouncing offline, so the render matches what you heard. When the transport is stopped the curve keeps running on its own, so you can audition the pattern.

Rtrg (Vol Shaper) rests off. On, it restarts the curve at its first step on every note you play, timed to the exact sample of the note-on, so a gated chord always begins on the first hit. With Rtrg on the shaper follows the note rather than the bar, so the song-position anchoring above is switched off. Off, which is how every factory preset was built, the curve free-runs and a note lands wherever the pattern happens to be.

TIP: Sidechain shape, Sync on at 1/4, Depth around 75 percent, and every pad in Parasite pumps with the kick without a sidechain input. Add the Reverb first and listen to the tail duck with it.

CHAPTER 5

MODULATION

A static FM patch is a photograph. Modulation is what makes it move: a cutoff that wobbles in time, a Level that swells over four bars, a delay time that lurches, a pitch that drifts. Parasite does this with three assignable LFOs, each able to reach eight destinations at once, chosen from a list of 64 that covers nearly every knob in the instrument. This chapter is how to use them; it is where the instrument stops being a preset player.

An LFO, a low-frequency oscillator, is a wave too slow to hear as a tone. Instead of reaching the output it turns a knob for you, up and down, cycle after cycle. The three LFOs here are global: one set for the whole instrument, so every voice you play receives the same movement. (Three per-voice wobbles with no knobs, Tremor, Vein and Flux, are the exception, and they get their own section at the end.)

Everything lives in the LFO panel, in the centre column of the Advanced page, and on the knobs themselves.

THREE LFOs EIGHT SLOTS EACH



The LFO panel. Tab 1 is active; the wave menu reads Sine; the value label beside the Rate knob reads 1.0Hz; the count at bottom right, between the - and + buttons, is how many of the eight slots are in use.

The three **1**, **2** and **3** tabs at the top left select which LFO the panel shows. There is one set of controls, re-attached to whichever LFO is active, and every preset load puts the panel back on tab 1. Each LFO has its own rate, wave, sync, retrigger and curve; the eight slots are the list of knobs that LFO moves, with an amount for each.

Rate and sync

Rate (LFO) is how fast the cycle repeats, from 0.05 Hz, one cycle every twenty seconds, to 20 Hz, resting at 1.0 Hz. The knob is not linear: its 12 o'clock position is about 2 Hz, so the slow, musical rates have most of the travel. The value label beside the knob always shows the rate, as 1.0 Hz.

Sync (LFO) locks the cycle to your DAW's tempo. When it is on, the Rate knob becomes a stepped knob over twelve divisions, and the label shows the division instead of a rate:

DIVISION	LENGTH
8 bar	32 beats
4 bar	16 beats

DIVISION	LENGTH
2 bar	8 beats
1 bar	4 beats
1/2	2 beats
1/4	1 beat
1/8	half a beat
1/16	a quarter of a beat
1/32	an eighth of a beat
1/4T	two thirds of a beat
1/8T	a third of a beat
1/16T	a sixth of a beat

A "bar" here is always four beats: Parasite reads your DAW's tempo but not its time signature, so in 3/4 a "1 bar" cycle lasts a bar and a third. The T divisions are triplets. The first time you switch Sync on for an LFO it lands on 2 bar; switch it off and on again and it returns to the division you last had. With no tempo from your DAW, Parasite assumes 120 BPM.

Since 1.0.3 a synced LFO does more than run at the right speed: while your DAW's transport is playing it follows the song position. Bar 9, beat 1 lands on the same point of the cycle every time, whether you are playing live, looping a section, or bouncing offline, so the bounce sounds like the pass you approved. When the transport is stopped the LFO keeps running freely so you can still hear the movement while you edit.

Retrigger

Rtrg (LFO) rests off, and off means the LFO runs continuously: a note played now and a note played a beat later catch the cycle at different points, which is what you want for a sweep that should feel independent of the playing. On, every new note restarts the cycle from the beginning, so each note gets the same movement: the setting for a wobble that must start on the hit or a swell that must start from silence. The restart is placed within one audio buffer of the note, close enough for an LFO. An LFO with Rtrg on follows the note rather than the bar, so the song-position anchoring described above is switched off for it: you chose the note as the anchor.

NOTE: An LFO with nothing assigned to it does not run at all. Its cursor in the display stands still until you give it a slot, which is the quickest way to tell an empty LFO from a slow one.

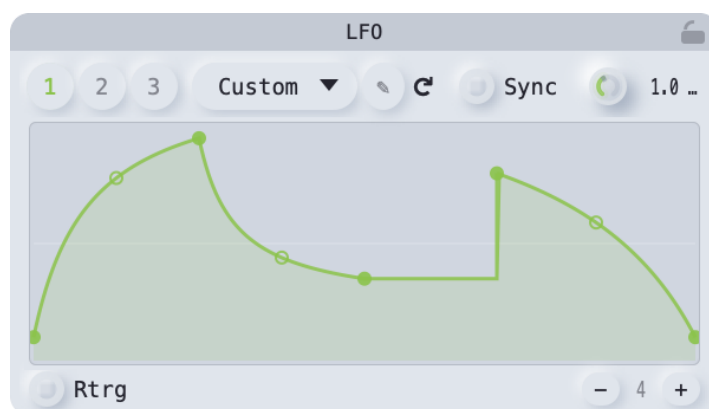
The waves

The wave menu holds seven shapes. Each one is a template loaded into the curve editor, and you can reshape any of them afterwards; the menu only chooses where you start.

WAVE	SHAPE
Sine	a smooth rise and fall
Tri	a straight rise and fall
Saw	a straight rise with an instant drop at the end
Sq	high for half the cycle, low for the other half
S&H	a fixed four-step pattern: 0.2, 0.8, 0.4, 0.6
Custom	a flat line at the centre, a blank page
SawDn	a straight fall with an instant rise at the end

S&H is not random. It is a fixed stepped pattern that you can edit, so a "random" wobble repeats exactly, which is the version that works in a loop. Custom is the blank page for drawing your own shape in the editor below. Changing the wave replaces the whole curve with the new template, as one undo step, so if you have drawn something you want to keep, assign it to another LFO or undo. Since 1.0.7 a wave change also works with the Parasite window closed and under DAW automation.

The slot list

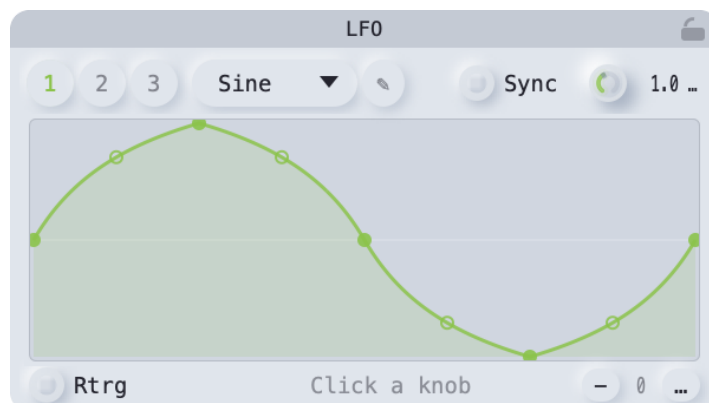


LFO 1 on a custom curve with four of its eight slots assigned: the count reads 4.

The bottom right of the panel holds the slot machinery: a **-** button, a count, and a **+** button. The count is the number of the eight slots in use. **+** starts learn mode, described in the next section, and is hidden once all eight slots are taken. **-** opens the list of this LFO's assignments, each as a destination name and an amount, such as *** Cutoff 50%**; click one to remove it. The **-** button is greyed when the LFO has nothing assigned, and a right-click on **+** opens the same list.

ASSIGNING DRAG AND LEARN

There are two ways to connect an LFO to a knob, and they end in the same place.



Learn mode armed on LFO 1: the + button reads ... and the panel says Click a knob. A drag from a tab lights up the same knobs.

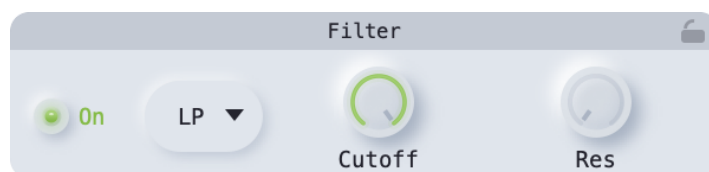
Drag. Press on an LFO's tab button, drag it away, and every knob in the window that can take an LFO lights up. Drop the tab on one of them. The destination lands in that LFO's first free slot with an amount of plus 50 percent, and the knob's modulation ring appears.

Learn. Click + in the LFO panel. The button reads ..., the words "Click a knob" appear beside it, and the same knobs light up. Click a knob and it is assigned, with the same plus 50 percent. Learn mode ends on its own after the click, and you can cancel it by clicking + again, pressing Escape, clicking somewhere that takes the keyboard focus away, switching to another LFO tab, or loading a preset.

Either way, one rule applies: a knob belongs to one LFO at a time. Assigning a knob that another LFO already moves removes the older assignment first.

Which knobs can take an LFO? Every knob on the Advanced page, and the ten on the Main page, with a handful of exceptions: the Freq and Multi knobs an operator shows in Fixed mode, the LFO panel's own Rate knob, the Vol Shaper's stepped Sync knob, and the Mutate amount. A knob that changes caption with a mode still counts as one destination: the Delay's Time knob and its Sync knob share one, so an assignment survives switching the delay between time and sync.

The modulation ring



The Cutoff knob with an LFO assigned. The arc runs from the knob's position as far as the LFO can push it; a tick inside the arc moves with the live value.

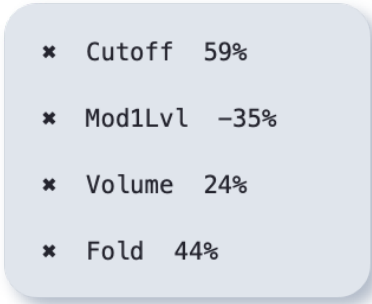
A knob with an LFO shows an arc around its rim. The arc starts at the knob's own position and runs as far as the LFO will push the value: that length is the amount, clockwise for a positive amount, anticlockwise for a negative one. Inside the arc a tick moves with the LFO, showing the value the knob holds at this instant. If the LFO's curve never reaches the top of its range, a hand-drawn shape that peaks at 70 percent, say, the arc is shorter to match, so what you see is always where the value can go.

The arc has two thicknesses. At rest it is thin. When the pointer enters the outer band of the knob, the ring from a little over half the radius out to a little past the rim, the arc thickens: that is the knob telling you that a drag here will change the amount rather than the setting. Drag in that band and the amount moves between minus 100 and plus 100 percent over about 500 pixels; hold Shift for eight times finer. Click and drag nearer the centre and you move the knob itself, as usual. Both halves work from the Main page knobs too.

The amount is not symmetrical, and this is the one thing about the ring worth memorising. The LFO pushes the knob from its own position towards its position plus the amount, and never past it in the other direction. With a positive amount, the knob's setting is the bottom of the movement and the arc shows how far up it goes; with a negative amount the setting is the top. So to wobble a cutoff between 200 Hz and 2 kHz, set Cutoff to 200 Hz and let the amount do the climbing, not the other way round.

CAREFUL: Because the arc starts at the knob, moving the knob moves the whole sweep with it. A vibrato on Pitch with a positive amount pushes the note sharp, never flat; for a vibrato centred on the pitch, use the carrier's Fine knob to tune down by half the amount.

Removing an assignment

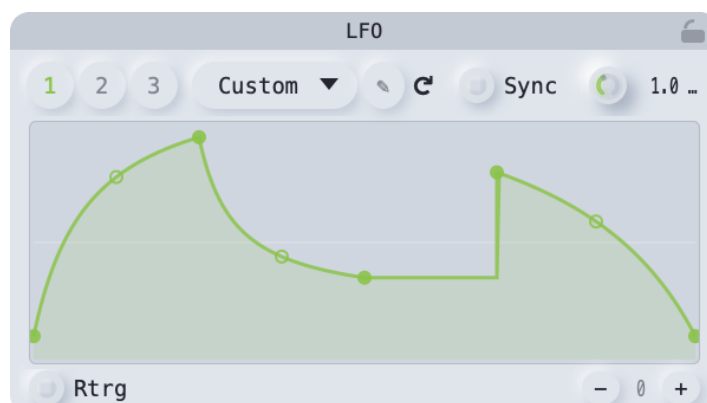


- * Cutoff 59%
- * Mod1Lvl -35%
- * Volume 24%
- * Fold 44%

The list the - button opens: one line per assignment, with its amount. Click a line to remove that assignment.

Three ways, each a single click. Right-click the knob: the menu lists each assignment as * LF01 50%, and clicking the entry removes it. The same menu offers "Reset to Default" for the knob's own value, and, on the Delay's time knob, the switch between time and sync modes. Or open the LFO panel's - list, described above, and click the entry there; the right-click on + shows the same list. A removed assignment leaves its slot empty rather than shuffling the others down, so the count can read 3 while slot 2 is free; nothing depends on the order.

THE CURVE EDITOR



The curve editor on a Custom wave. Solid dots are points; hollow dots bend the segment between them; the flat run followed by a vertical jump is a Step segment. With Sync on, a beat grid appears behind the curve.

The wave display is also the editor, and every wave, Sine included, is edited the same way. The curve is a set of points joined by segments, and the LFO reads it once per cycle from left to right.

- **Move a point.** Drag a solid dot. It moves up and down at a quarter of the mouse speed, for precision, and an interior point also moves left and right between its neighbours. The first and last points share one height, so the loop always wraps without a jump.
- **Bend a segment.** Drag the hollow dot at the middle of a segment: it pulls the curve towards the pointer, up to a hard cap, and moves at mouse speed. The bend is tuned to feel like Ableton's; it is not a simple power curve. Hollow dots are hidden on flat, near-vertical and Step segments, where there is nothing to bend.
- **Add a point.** Double-click on empty space. There is no limit to the number of points.
- **Delete a point.** Double-click an interior point. The two endpoints cannot be deleted.
- **Hold instead of curve.** Right-click a point and choose **Step** for its outgoing segment: the value holds, then jumps to the next point. **Curve** restores the glide. This is how the S&H template is built.
- **Snap to the beat.** When Sync is on, the display shows a grid: four divisions for the ordinary divisions, three for the triplets. Points place freely by default; hold Cmd (Ctrl on Windows) while dragging to snap to the grid.
- **Draw freehand.** Click the pencil at the top of the panel. The curve is resampled into 32 columns and dragging across the display paints their heights, filling in any columns you skip. Click the pencil again to return to points. The pencil never snaps.
- **Start over.** The circular arrow next to the pencil, shown only when the wave is Custom, flattens the curve to a line at the centre.

A cursor runs along the curve while the LFO plays, so you can see where in the cycle a note lands. Every gesture above is one undo step: Cmd+Z (Ctrl+Z on Windows) restores the curve exactly, including after a wave change. The curve is saved with the preset.

TIP: A rising Saw with Rtrg on, assigned to Mod 1's Level, is a brightness swell that restarts on every note. Bend the segment downward with its hollow dot and the swell holds back, then blooms late.

FAST AND SLOW DESTINATIONS

The LFO itself produces one new value per audio buffer, and most of its destinations take that value as it comes: the knob steps once per buffer, which at common settings is somewhere between one and forty milliseconds. For an envelope time, a delay time, a reverb size or an effect's tone, that is inaudible; the sound does not change fast enough for the steps to show.

Ten destinations are different. They are the ones you will modulate fast, and for those Parasite smooths the LFO's value inside each voice with a 5 ms ramp and reads it on every sample, so a 10 Hz wobble on the cutoff is a wobble and not a staircase. The ten are:

- **Pitch, Cutoff and Res**
- **Mod1Lvl** and **Mod2Lvl**, the two modulators' Level
- **Volume** and **Drive**
- **Noise** and **Spread**, on the carrier
- **Fold** (smoothed since 1.0.7; before that it stepped)

This is the difference that matters when a modulation sounds rough. A fast LFO on one of the ten is clean. A fast LFO on anything else, the carrier's Fine tune or a Coarse ratio for instance, is audibly stepped, and the faster the rate and the larger the DAW's buffer, the coarser the steps. Slow those down, or route them through one of the ten instead: for a fast pitch flutter use Pitch, not CarFine.

TREMOR VEIN AND FLUX

Three more LFOs live inside every voice, and they have no knobs anywhere in the interface. Each is a fixed-rate sine with a single amount:

- **Tremor** is a pitch vibrato at 3.5 Hz, up to 2 semitones either way at full.
- **Vein** sweeps the filter cutoff at 2 Hz, up to two octaves either way at full.
- **Flux** is a tremolo on both modulators' Level at 3.5 Hz, so the brightness pulses.

Their amounts rest at 0, and Random leaves them there. You reach them in two ways: as LFO destinations, named Tremor, Vein and Flux in the list, or as DAW automation lanes, where they appear as "Tremor (Pitch LFO)", "Vein (Filter LFO)" and "Flux (Index LFO)". Because they run inside each voice, every note carries its own vibrato from its own start, which the global LFOs cannot do. An assignable LFO on Tremor with a slow rising shape and Rtrg on is the classic delayed vibrato: each note starts straight and wavers in.

DESTINATIONS

The full list of 64 is Appendix B, with the scale each one uses. In broad strokes, an LFO can reach:

- Pitch and tuning: the voice pitch, the Fine and Coarse of all three operators, the carrier's Drift, Porta, and the Pitch Env's Amt.
- The filter: Cutoff and Res.
- The operators: both modulators' Level, the carrier's Noise and Spread, and every A, D, S and R of all four envelopes, sixteen knobs in all.
- The voice: Drive, Fold and Volume.
- The four macros: Vortex, Helix, Plasma and Time.
- The effects: every knob of the Delay, Reverb, Liquid and Rubber panels except their On and PP toggles (chapter 6).
- The Vol Shaper's Rate and Depth.
- Tremor, Vein and Flux.

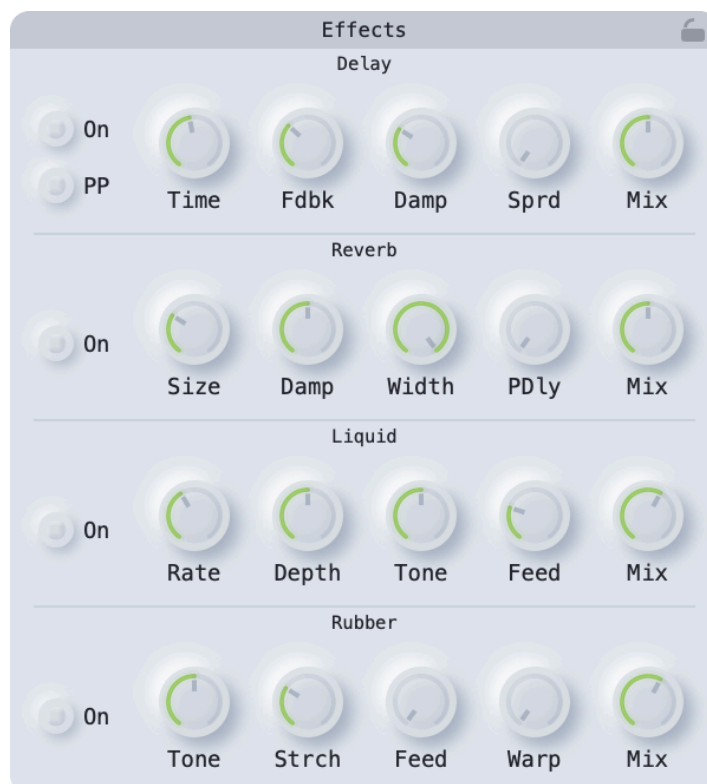
The scales that matter: Pitch moves 2 semitones at full amount, the Pitch Env's Amt a full 96, the Fine knobs 100 cents, the Coarse ratios 24 steps, and Drive the whole of its range. The modulator Levels can be pushed past the top of their knobs, which is a legitimate way to reach harsher sidebands than the knob allows. Every other destination stops at the end of its own range.

CHAPTER 6

EFFECTS

Four effects sit after the voices: a delay, a plate reverb, and two resonators called Liquid and Rubber that are Parasite's own. Each has a mini-control on the Main page, an on/off toggle above a Mix knob, and a full panel on the Advanced page. This chapter takes them in the order the signal meets them, which is not the order the screen lists them, and explains what each one is for before what each knob does.

THE CHAIN IN ORDER



The Effects panel. The four effects are stacked Delay, Reverb, Liquid, Rubber; the signal runs through them in a different order.

Once the eight voices have been added together, the sound travels:

Liquid, then Rubber, then Delay, then Reverb, then the Vol Shaper.

The screen, on both pages, lists Delay first and Rubber last, so keep the real order in mind. It matters because every effect hears what the ones before it produced. Liquid and Rubber resonate the dry synth, and only the dry synth: they never ring on a reverb tail. The Delay then repeats the resonated sound, so a Liquid bubble echoes. The Reverb washes everything, repeats included. And the Vol Shaper, described in chapter 4, chops the finished result, tails and all, which is why a gate pattern on a reverbed pad cuts the reverb with it.

Each effect is a serial insert with its own **Mix**: there are no sends, and the order cannot be changed. Mix is a straight dry/wet blend, so an effect at 0 percent Mix passes the signal through unchanged whether it is on or off. On the Main page the Mix knobs show no value; on the Advanced page they read a percentage while you hover, like every other knob there.

Every effect knob, on all four, is updated once per audio buffer, so a DAW automation curve or an LFO on an effect moves in small steps rather than continuously; for delay times, reverb sizes and tones this is inaudible, and chapter 5 explains why. The four effects also run only on a stereo output: on a mono track they are skipped altogether, and the Vol Shaper is the only post-voice stage that still runs.

NOTE: Switching the Delay or the Reverb on clears its memory, so you never hear a stale tail from the last time it was on.

DELAY

A stereo delay, up to two seconds, with tape-style darkening on each repeat, a ping-pong mode, and a stereo spread that lets the two sides drift apart. Its character comes from **Damp**: with it up, repeats lose their top end one after another and sink into the mix the way a tape echo does, which suits FM's bright transients. With it down the repeats stay as sharp as the note, and a rhythmic delay on a pluck stays crisp.



The Delay panel in time mode: On and PP, then Time, Fdbk, Damp, Sprd and Mix. The Time knob reads 300ms while hovered; in sync mode its division is shown permanently.

On (Delay) rests off. **PP** (Delay) is ping-pong: each repeat jumps to the other side, left, right, left. It rests off.

Time (Delay) runs from 10 ms to 2 seconds and rests at 300 ms. The knob is not linear: 12 o'clock is about 360 ms, so the short slapback times take up most of the travel. While you hover it reads 300ms below a second and 1.20s above.

The same knob has a second mode. Right-click it and choose **Sync mode**, and it becomes a stepped knob over nine tempo divisions: 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/4T, 1/8T and 1/16T, where T is a triplet. The division is written under the knob permanently, so a glance tells you the delay is locked to tempo. The first switch to Sync mode lands on 1/1; **Time mode** in the same menu takes you back to milliseconds. Two seconds is a hard ceiling in both modes: at 60 BPM a whole note is four seconds, and the delay holds it at two.

The Delay's sync is rate only. It takes the tempo from your DAW and sets its time from it, but it does not follow the song position the way the LFOs and the Vol Shaper do, because a delay has no cycle to anchor: a repeat always falls one division after the note that caused it, which is the same live and in a bounce. With no tempo from your DAW it assumes 120 BPM.

Fdbk (Delay) is how much of each repeat is fed back for the next, from 0 to 90 percent, resting at 30. Three or four repeats around 30 percent, a long trail around 70, and at 90 the delay rings on for a long time but never runs away: 90 is a hard ceiling that an LFO cannot push past.

Damp (Delay), from 0 to 100 percent, rests at 30 percent and is the low-pass filter inside the feedback loop described above. 0 is none, 100 is heavy.

Sprd (Delay), from 0 to 100 percent, resting at 0, lengthens the right channel's delay relative to the left, up to half as long again at full. A little gives width; a lot turns a single echo into two that stagger, and with PP on the stagger alternates sides.

Mix (Delay) rests at 50 percent.

An LFO can reach Time, Fdbk, Damp, Sprd and Mix, but not the two toggles. On Time the LFO behaves differently in the two modes: in time mode it moves the time by up to half a second, a chorus-like warble at low amounts and a tape lurch at high ones; in sync mode it steps the delay through neighbouring divisions instead, so the rhythm changes but stays in time.

REVERB

A plate reverb: the studio design that gives a dense, smooth, even tail rather than the discrete echoes of a room. Inside, the tail is kept in gentle motion so long settings bloom instead of ringing metallic, which matters on FM, whose spectra are full of partials that a static reverb would single out. Parasite's reverb is the kind you leave on a pad at a low Mix for the whole song, or push to a hundred percent for an ambient wash. Do not expect an impulse-response room from it.



The Reverb panel at its resting values: Size 30, Damp 50, Width 100, PDly 0 ms, Mix 50.

On (Reverb) rests off.

Size (Reverb), from 0 to 100 percent, resting at 30, is how long the tail lasts: a short room at the bottom, a long plate at the top. It does not change the sound of the attack, only how long it hangs.

Damp (Reverb), from 0 to 100 percent, resting at 50, is the colour of the tail: bright at 0, dark at 100. A bright tail on a bright FM lead quickly becomes hiss, so most patches want this at the centre or above; a dark tail under a pad is where the warmth comes from.

Width (Reverb), from 0 to 100 percent, resting at 100, is the stereo spread of the wet signal, from mono at 0 to full stereo at the top. Pull it back when a reverb is making a bass feel unplaced.

PDly (Reverb) is pre-delay, from 0 to 200 ms, resting at 0 and read as 40ms. It holds the reverb back for that long after the dry sound, so the attack of the note arrives clean and the tail follows. Twenty to forty milliseconds keeps a pluck defined under a large reverb; more starts to read as a slap before the wash.

Mix (Reverb) rests at 50 percent.

An LFO can reach all five knobs. A slow LFO on Size breathes the tail length; one on PDly, with a cycle of a few seconds, moves the tail without touching the note.

LIQUID

Water. Bubbles, drips, a shimmer that moves on its own. Liquid is not a chorus, whatever its ancestry: it is a bank of eight very narrow resonant filters, each tuned somewhere between 200 Hz and 16 kHz, each wandering slowly to a new frequency and switching itself on and off at random. They ring on the sound you feed them and on nothing else. There is no noise source inside, so silence in gives silence out, and the texture belongs to the patch: a sine carrier bubbles differently from a saw.



The Liquid panel. Rate reads a percentage even though it is a speed; Feed is resonance and feedback in one knob.

On (Liquid) rests off.

Rate (Liquid) is how fast the droplets move and switch. Its readout is a percentage that runs from 5 to 300 percent, with the knob resting at 50 percent and its 12 o'clock position at about 79 percent; it is a speed, not a frequency in hertz. Low is a slow lava-lamp drift; high is a boiling kettle.

Depth (Liquid), from 0 to 100 percent, resting at 50, is density: how likely each of the eight droplets is to be active at any moment, and with it how loud the bank is. Low gives sparse single bubbles over the dry sound; high gives a continuous wash.

Tone (Liquid), from 0 to 100 percent, resting at 50, tilts the whole bank: every droplet's band slides down to a third of its frequency at 0 and up to two and a half times at 100. The centre is neutral. Dark droplets on a bass, bright ones on a lead.

Feed (Liquid), from 0 to 80 percent, resting at 20, is resonance and feedback in one knob. Up, each droplet rings longer and feeds some of its output back into the bank, so the texture thickens and starts to sing. The feedback is tied to the input level: when the note stops, the feedback dies with it, so Liquid can never ring forever on its own.

Mix (Liquid) rests at 60 percent.

An LFO can reach Rate, Depth, Tone, Feed and Mix. Since Liquid already moves on its own, the useful LFO targets are Mix, to bring the water in and out, and Tone, to sweep the whole bank up and down.

RUBBER

Rubber is Liquid's dirtier sibling: plastic, latex, a squeak. It shares Liquid's eight resonators but behaves the opposite way: all eight are always on, they are tuned wider and change frequency much faster, and before the bank there is a saturator that gives even a pure sine a crop of harmonics to resonate. The result is dense and chewy, a formant-like vocal texture that sits on the sound rather than bubbling over it.



The Rubber panel. Left to right: Tone, Strch, Feed, Warp, Mix.

On (Rubber) rests off.

Tone (Rubber), from 0 to 100 percent, resting at 50, shifts all eight resonators together, a third of their frequency at 0, two and a half times at 100, neutral at the centre; the same law as Liquid's Tone.

Strch (Rubber), from 0 to 100 percent, resting at 30, is the resonance: how sharply the eight ring. Low is a broad colouring; high is the rubber band, each resonator singing its own note on top of yours.

Feed (Rubber), from 0 to 100 percent, resting at 0, feeds the bank's output back into itself, and like Liquid's feedback it is tied to the input level, so it fades when the note does.

Warp (Rubber), from 0 to 100 percent, resting at 0, does two things at once: it drives the saturator in front of the bank harder, up to five times, and it speeds up how fast the resonators wander, up to more than three times. More Warp is dirtier and more agitated at the same time. At 0 the resonators still move; they never stand still.

Mix (Rubber) rests at 60 percent.

An LFO can reach Tone, Strch, Feed, Warp and Mix. Warp with a slow LFO is the way to make Rubber come and go in waves of agitation while the patch underneath stays put.

TIP: Liquid and Rubber are at their best on a sound with some sustain and a Mix around 30 to 40 percent, where the resonances read as movement inside the patch rather than as a second instrument on top. Pushed to 100 percent Mix, either one turns a plain sine into a sound effect.

CHAPTER 7

RANDOM AND MUTATE

Most synths have a randomise button, and most people press it twice. The first press produces noise, the second confirms it, and the button is never touched again. Parasite's **Random** button (top bar) is built differently, and knowing how is what makes it worth pressing a hundred times. Then this chapter covers the padlocks, which let you roll one part of a patch while keeping the rest, and **Mutate** (top bar), which nudges a patch instead of replacing it.

You already pressed Random in chapter 0. Now that you can read the Advanced page, a roll means something: you can see which algorithm it chose, how it shaped the modulator envelopes, what it did to the filter.

WHAT RANDOM DOES

A press of Random replaces the whole patch with a new one. Every parameter is written: the three operators and their envelopes, the algorithm, the filter, the pitch envelope, the macros, the three LFOs and their curves, the four effects, the Vol Shaper, the Global panel. The name in the preset row changes to `Random`, held notes are silenced so a ringing chord does not carry on with the new ratios, and the whole roll is one undo step.

What it does not do is throw dice. A uniform roll, one that picks every knob anywhere in its range with equal chance, produces a patch that is nowhere in particular: a filter cutoff somewhere around 10 kHz on average, a detune of 37 cents, a drive at 7x, an attack of two seconds on a modulator. Nobody programs sounds like that, which is why uniform randomisers produce noise.

Parasite's generator draws instead from distributions measured across a corpus of hand-made presets, the original factory bank built by its sound designers. For every parameter, the question was not "what is the range" but "where do people actually put this". The answers shape every roll:

- Three quarters of all fine-tune settings in the corpus are exactly zero, and the rest sit on musical intervals: a few cents of detune, a fifth, an octave, a third. A roll never lands on 37 cents.
- A third of the presets have the filter cutoff below 150 Hz, and nearly every one of those routes an LFO to the cutoff. That is the wobble, and the generator reproduces the pair together: a low cutoff is never left static.
- Drive sits at 1x, clean, in a quarter of the presets, and the rest cluster around 2x to 3x. A roll rarely goes above 8x.
- Carrier ratios are anchored to the fundamental: `x0.5`, `x1` and `x2` make up three quarters of the draws, so the note you play is the note you hear.
- Modulator Level has a large chance of being exactly zero on Mod 1 and spreads widely on Mod 2, because in the corpus Mod 2 is the principal modulator and Mod 1 is the seasoning.

The roll starts by choosing a character for the sound, which the generator calls an archetype: Pluck (35 percent of rolls), Stab (25 percent), Lead (25 percent), Pad (10 percent) or Evolving (5 percent). The archetype sets the envelopes, the length of the release, how fast the LFOs run, whether a pitch envelope is likely, and how much reverb the patch wants. The bias towards short sounds is there because a pluck or a stab is playable straight out of a roll, and a four-second pad takes more work to place.

Then, in about three rolls out of ten, the generator applies a recipe: a coupled set of settings that a per-knob draw could never produce together. There are six: a tempo-synced filter wobble, a metallic bell built on the Ring algorithm with one modulator parked at a fixed frequency, a growl on the Feedback algorithm, a vowel built from real formant frequencies, an additive pad on the Additive algorithm with contrasting envelopes, and a slow wobble created inside the FM chain by running a modulator at one to six hertz. Separately, about one roll in six puts a rhythmic gate on the Vol Shaper, always tempo-synced.

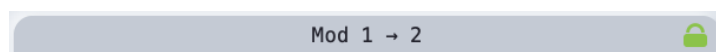
A few things are pinned on every roll. Both modulators are switched **On** (Mod 1 and Mod 2 panels), because a modulator left off from the previous patch is the surest way to get a thin roll. **Sync** (Carrier) is off. **XOR** (Carrier) comes on in about one roll in fifteen. The Delay is on in about nine rolls out of ten, since the corpus treats it as part of the sound rather than a decoration. At the end the generator estimates how loud the result will be and sets **Volume** (Global) to compensate, so a bright patch with drive and fold does not arrive at twice the level of a soft one.

A roll also leaves no leftovers. Whatever it does not engage, it resets: the Vol Shaper table goes back to its default when no gate was drawn, every LFO curve matches the wave the roll chose, every effect is drawn afresh. The only way for anything to carry over from one roll to the next is a padlock.

TIP: With no padlocks set, Random reads nothing from the current patch, so it does not matter whether you press it on Init or on a factory preset. Mutate is the opposite: it starts from what you have.

THE PADLOCKS

Every one of the ten panel headers on the Advanced page ends with a small **padlock**. Click it to lock the panel: the icon closes and takes the accent colour. Click again to unlock. A locked panel is left exactly as it is by Random and by Mutate; everything else is rolled as usual.



A locked header. The padlock at its right end is closed and takes the accent colour; an unlocked one is open and faded.



Three locked panels: Mod 1, Filter and Effects. A closed padlock in the accent colour is locked; an open, faded one is not.

The lock covers precisely what the panel shows, and two panels hold more than they show:

PANEL	WHAT THE LOCK HOLDS
Mod 1	Wave, ratio, Fine, Fixed, Freq, Multi, Level, On, the A D S R envelope, the Harmo table
Mod 2	The same for Mod 2
Carrier	Wave, ratio, Fine, Fixed, Freq, Multi, Drift, Noise, Spread, the A D S R envelope, the Harmo table, XOR, Sync
Macros	Vortex, Helix, Plasma, Time
LFO	All three LFOs: rate, wave, sync, retrigger, every slot, every curve
Filter	On, type, Cutoff, Res
Pitch Env	On, Amt, the A D S R envelope
Effects	All four effects, every knob
Vol Shaper	On, sync, rate, depth, retrigger, the drawn table
Global	Volume, Drive, Fold, Porta, Mono, Rtrg, and the octave selector in the top bar

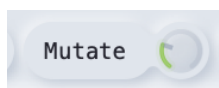
The algorithm is a special case. It is written only when Mod 1, Mod 2 and the Carrier are all unlocked, because changing it redefines what a locked operator is: a modulator under Series becomes an independent layer under Additive, and the lock would no longer be holding the sound you locked.

The lock freezes values and nothing more, which cuts both ways. A lock does not stop modulation arriving from elsewhere: if the LFO panel is unlocked, a roll may still route an LFO onto a knob in a locked panel. The knob's own setting is untouched, but it moves. Lock the LFO panel too if you want the locked panel completely still. And the generator notices when a lock would leave it with a static low-pass filter below 150 Hz and no LFO to move it (the LFO panel is locked and nothing in it already reaches the cutoff): rather than hand you a muffled bass, it draws a brighter cutoff instead.

NOTE: Padlocks belong to the window. They are not saved in the preset or the project, and they are cleared when you close Parasite's window. Set them again when you reopen it.

MUTATE AND ITS AMOUNT

Random replaces. Mutate nudges. It is one control in the top bar with two halves, shaped like a figure 8: the left lobe, captioned **Mutate**, is a button, and the right lobe is a knob that sets the amount.



The figure-8 control, which sits between Init and Random in the top bar. Click the left lobe to mutate, drag the right lobe to set how much.

The amount runs from 0 to 100 percent and rests at 25 percent. Drag the right lobe to change it, or use the mouse wheel over it; double-click it to return to 25 percent. The amount belongs to the window and is never saved.

Click the left lobe (the mutation fires when you release the mouse) and Parasite draws a complete Random patch behind the scenes, then moves your current patch part of the way towards it. How far is the amount. At 0 percent nothing happens at all. At 100 percent the result is exactly what a press of Random would have given you. In between, the rule depends on the kind of control:

- **Continuous controls drift.** A knob moves a fraction of the way towards its target, measured along the knob's travel rather than its raw value, so a skewed knob such as Cutoff travels evenly: 25 percent of the way is a quarter turn, not a quarter of the hertz.
- **Discrete controls flip.** A menu or a toggle (wave, algorithm, filter type, an On button) cannot sit a quarter of the way between two choices, so instead it adopts the new choice with a probability equal to the amount. At 25 percent, roughly one discrete control in four changes; the rest stay exactly as they were.
- **Tables blend.** The Harmo tables and the Vol Shaper table move proportionally towards their targets, so a drawn shape is bent at low amounts, not replaced.
- **LFO curves are jittered,** or replaced outright with a probability equal to the amount.

Mutate never silences held notes, whatever the amount. It is meant to be pressed while a chord rings: the continuous controls inside each voice are smoothed, so those changes glide, and the effect settings step once per audio buffer, as they do under automation. A discrete flip steps the sound, the same step you would hear flipping that menu by hand. The preset keeps its name, with the asterisk that marks a modified patch, and every mutation is one undo step. The padlocks apply to Mutate exactly as they do to Random.

TIP: Mutate at 5 to 10 percent is a different tool from Mutate at 50. Low amounts are a way to find the version of a preset you wish it had been; high amounts are a way to leave it behind gradually.

WORKFLOWS

Three ways to use all of this, in order of how far they take you from where you started.

Roll until something bites. Hold a note or let a short loop play, and press Random on each bar. Listen for one thing only: does the patch make you want to keep it. Most rolls will not, and that is the point of the distributions, which make the good ones frequent enough to be worth the wait. When one does, stop,

open the Save panel and give it a name before you touch anything, because a second press of Random is one undo step away but a tenth is not.

Lock the operators, roll the rest. Load a factory preset whose basic tone you like, lock Mod 1, Mod 2 and the Carrier, and press Random. The operators, their envelopes and the algorithm stay put; the filter, the macros, the LFOs, the effects and the Vol Shaper are drawn fresh around them. This is the fastest way to hear a sound in ten different settings. The reverse works too: lock everything except the operators, and the roll redesigns the tone while keeping your filter movement and effects chain. Each combination of locks is a different question to ask the generator; locking everything but the LFO panel asks "what else could move in this patch".

Mutate in small steps, save the keepers. Set the amount to about 10 percent and press Mutate while playing. If the result is better, press again. If it is worse, press Cmd+Z (Ctrl+Z on Windows) and press Mutate again: the next draw is different. Save every version you want to come back to; the Save panel keeps the name pre-filled and offers to overwrite, or you can add a number. When a sound is close but the attack is wrong, lock everything except the operator panels and mutate; when the tone is right but it sits badly in the mix, lock the operators and mutate the rest.

UNDO

Every press of Random and every press of Mutate is a single undo step. Cmd+Z restores the previous patch entirely, including the Harmo tables, the Vol Shaper table and the LFO curves, and Cmd+Shift+Z brings the roll back. Two presses in a row are two steps. A knob you moved before pressing is its own step, so undoing a roll never takes a hand edit with it. Chapter 9 covers undo in full.

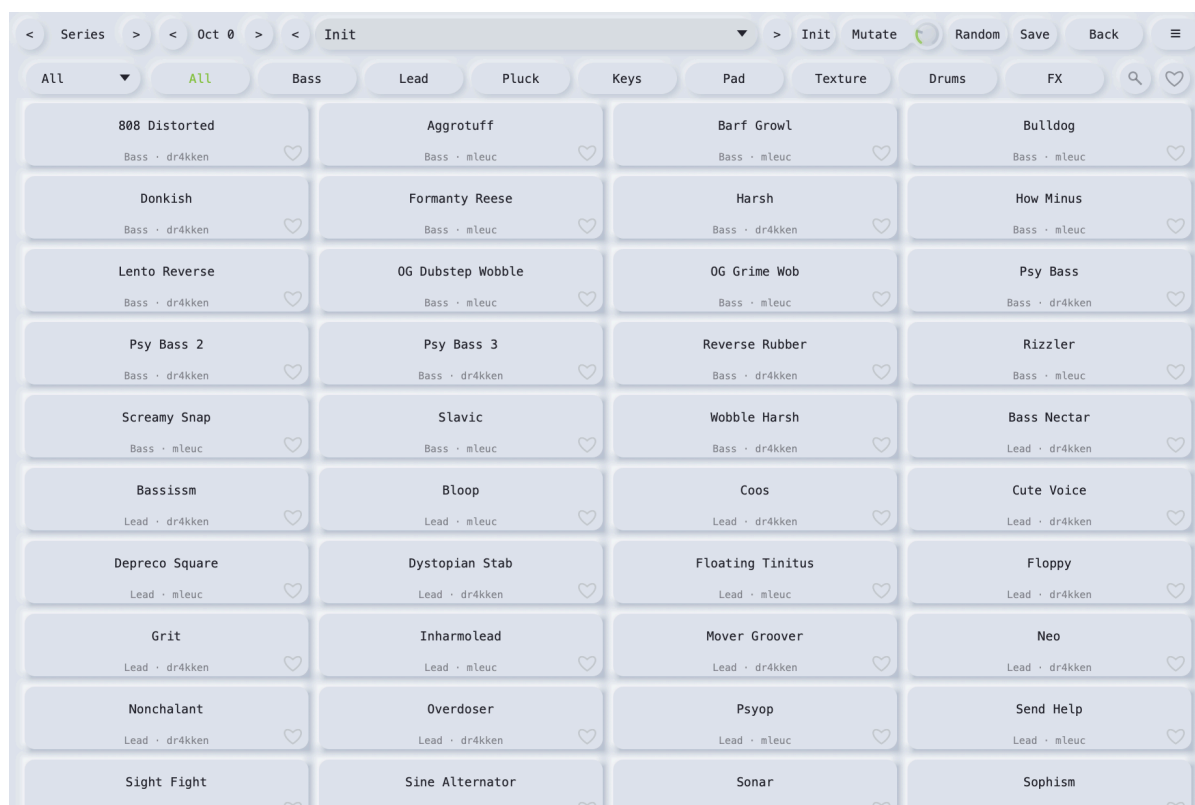
CHAPTER 8

PRESETS CLOUD AND LICENCE

This chapter is about keeping sounds: finding them in the browser, saving your own, sending one to another user, letting the cloud carry your library between machines, and the licence that unlocks all of it. It ends with the update notice. None of it is where the fun is, which is why it comes after the controls, but every item here is something you will need at least once.

THE BROWSER

Click the preset name in the top bar and the browser opens in place of the page content. It is a panel inside Parasite's window, not a separate window, and the visualiser is hidden while it is open. The page toggle at the right of the top bar reads **Back** while the browser is open; clicking it closes the browser and keeps whichever preset you were auditioning.



The browser on the All pill. Pack menu and category pills across the top, the magnifier and heart at the right, the factory cards below, grouped by category with the author under each name. Your own presets follow the factory ones under a User line.

Packs, categories and the two filters

The top row holds, left to right, the **pack menu**, nine **category pills**, the **magnifier** and the **heart**.

The pack menu offers All plus every pack in your library: Factory, User, and any pack assigned on the Voidscaan website, such as an official sound pack or presets another user has sent you. If a remembered pack no longer exists, the filter falls back to All.

The category pills are All, Bass, Lead, Pluck, Keys, Pad, Texture, Drums and FX. On All, the factory presets are grouped by category in that order and alphabetical within each group; on a category pill, the list is alphabetical. Your own presets always form one alphabetical block at the end, under a line labelled User.

Init is never in the list; it has its own button in the top bar.

The magnifier opens a search field across the top of the grid. Type and the grid filters as you type, matching any part of a preset name without regard to case. While the field has the focus, Up and Down move through the grid and audition each card without leaving the field, Enter loads the focused card (or the first result) and closes the browser, and Escape clears the text first, then closes the field if it is already empty, then cancels the browser on a third press. Closing the magnifier clears the query. Filtering never changes what you are hearing: if the search hides the current preset's card, the sound stays and the card goes.

The heart shows favourites only. All four filters combine: a search inside Pad, favourites only, in one pack.

The < and > arrows in the top bar walk exactly the list the browser last showed, filters included, and wrap around at the ends. A search query survives closing the browser, so the arrows keep stepping through the matches until you clear it. If the current preset is not in that list (Init, an unsaved Random patch, a preset deleted meanwhile), > enters the list at the first entry and < at the last. An empty list makes the arrows do nothing.

NOTE: Filters and the search text belong to the window. They are not saved, and closing Parasite's window clears them.

Cards

Presets are laid out four to a row; scroll with the mouse wheel. The card of the preset you are on carries a glowing dot at its top right. A subtitle shows the category, and the author where there is one. Every card has a **heart** at its bottom right that marks the preset as a favourite; favourites are remembered by name, for the whole machine, across every project.

A single click auditions: the preset loads, Parasite plays a middle C for a third of a second, and the browser stays open. A double-click loads the preset and closes the browser. With the grid focused, the arrow keys move by one card or by one row and audition as they go, Enter loads and closes, and Escape cancels: the preset that was loaded when you opened the browser comes back. If you had tweaked that preset before opening the browser, the tweaks survive an open-then-Escape, because nothing is reloaded when the preset has not changed. If that preset has been deleted in the meantime, nothing is loaded over what you are hearing.

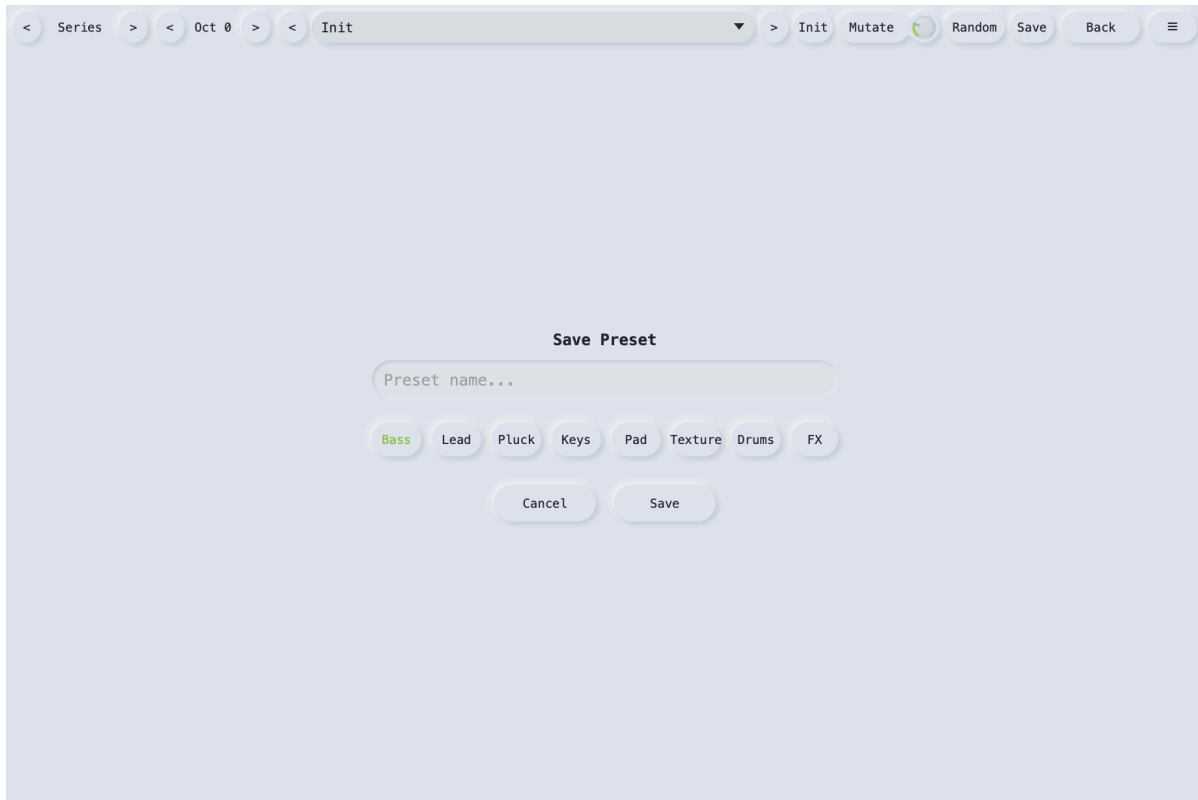
Loading a preset silences held notes and resets the LFO panel to tab 1 and any open Harmo view. A preset saved by a newer version of Parasite than the one you are running is refused with a message at the bottom of the window, and the previous selection stays.

User presets carry a X at their top left. Click it and the card turns into the question "Delete this preset?" with **Yes** and **No**; any other click answers No. Yes deletes the file and records the deletion for the cloud (see below). Factory presets cannot be deleted.

The factory bank holds 153 presets plus Init: 19 Bass, 21 Lead, 7 Pluck, 8 Keys, 18 Pad, 14 Texture, 35 Drums and 31 FX, plus Init.

SAVING

Save (top bar) opens the Save panel in place of the browser. In demo mode the button is greyed out and its tooltip says why.



The Save panel, opened from Init, so the name field is empty and Bass is selected. From a loaded preset the name is pre-filled and selected, so typing replaces it; the category pills choose where the preset is filed.

The panel has a name field, eight category pills and the **Cancel** and **Save** buttons. Return saves, Escape cancels. The name field is pre-filled with the current preset's name, selected so that typing replaces it, and the category pill is pre-selected from the current preset. The pre-fill is there whether or not you have tweaked the patch: a tweaked factory preset is usually a variant you want under a similar name, and a factory preset can never be overwritten anyway. After a press of Random, and on Init, the field is empty and the category rests on Bass.

A name that matches a factory preset is refused: the name flashes red and nothing is saved. A name that matches one of your own presets arms an overwrite. The button changes to **Overwrite**, the title asks "Overwrite existing preset?", and the name turns orange. A second click, or Return, overwrites; editing the name disarms it. An overwritten preset keeps its identity in the cloud, so other machines receive the new version rather than a duplicate.

Saving writes a `.prst` file into your user preset folder (the paths are further down), files it under the pack User with your account username as author, and uploads it to the cloud. The sound is not interrupted: a held chord or a reverb tail carries on, and the saved preset becomes the current one. If the name contains characters a file name cannot hold, the file name is adjusted; the preset keeps the name you typed.

In the top bar, an asterisk after the preset name means the patch has changed since it was loaded or saved. It does not appear on a Random patch, which has no saved form to compare against.

SENDING A PRESET TO ANOTHER USER

Right-click one of your own preset cards in the browser and a small panel opens over the grid, titled Send "name" to: , with a field for the recipient's username, **Send** and **Cancel**. Enter sends, Escape or a click outside cancels. A leading @ is removed for you. Type the recipient's Voidscan username, not their

email address.

The preset must have been saved, so that it exists in the cloud, and your licence must be linked to a Voidscan account; if either is missing, a message at the bottom of the window says which. The panel also checks the name before sending anything: an empty field, a name with an @ or a dot in it (that looks like an email address), or a name with a space are refused with a one-line reason inside the panel. While the request runs the panel reads "Sending...", then "Sent to @name." and closes by itself, or shows the server's reason and stays open with the field focused so you can correct it.

The preset arrives in the recipient's library at their next sync, in a pack that marks it as received. Only your own creations can be sent: factory presets, official packs and presets you received cannot be forwarded.

CLOUD SYNC

With a licence, your user presets are kept in sync with your Voidscan account, and through it with every other machine where you have activated Parasite. There is nothing to switch on.

A sync runs when Parasite loads, when your licence becomes valid, and when you choose **Sync Presets** from the menu. Automatic syncs happen at most once every ten minutes, however many instances you have open; the menu item runs at once. While a sync runs, a small spinner turns inside the preset name button in the top bar, and the browser rebuilds when it finishes.

What a sync guarantees:

- Every preset you save appears on your other machines. An upload that fails, because you were offline or the server was busy, is queued and sent after the next successful sync.
- The server's copy is the reference. A preset file removed by hand from the preset folder is not a deletion; the next sync puts it back. The only deletion that sticks is the one made inside Parasite, with the X on the card. That deletion is recorded locally the moment you confirm it, works offline, and is sent with the next sync, so it holds even if you were without a connection at the time. One exception: if another machine edited the same preset after you deleted it here, the edit wins and the preset comes back.
- If the same preset is edited on two machines between syncs, nothing is lost. The server's version keeps the original name and your local copy is saved beside it as `name (conflict YYYY-MM-DD)`, for you to compare and decide.
- A sync that would delete your whole library, or more than a quarter of it once the library is bigger than ten presets, is refused and noted in the log. This protects against a wrong account or a server fault.

Packs are assigned on the website, not in Parasite: everything you save is filed under User, and a pack change made on the site comes down at the next sync without touching the preset itself.

CAREFUL: Deleting a preset file in Finder or Explorer does not stick; the next sync brings it back. Delete it inside Parasite.

WHERE FILES LIVE

Your presets are ordinary files, one per preset, in `~/Library/Voidscan/Parasite/Presets/` on macOS and `%APPDATA%\Voidscan\Parasite\Presets\` on Windows. Appendix F lists every file Parasite writes, what each one holds, and where the log is.

YOUR LICENCE

Parasite activates with a licence key that begins with `PARA-`. The first time you open it unlicensed, the activation panel fills the window.



The activation panel. Type or paste the key; the dashes are added for you.

Type or paste the key into the field. Letters are made upper case and the dashes inserted as you type; a complete key is six groups of four characters. Press **Activate** or Return. If the key is short, the panel says "Please enter a complete license key." Otherwise it reads "Activating..." while one request goes to the Voidscan server, which binds the key to this computer, and then either "License activated!" or the reason the server gave, in red. Without an internet connection the message is "Could not reach server. Check your internet connection."

The licence belongs to the machine. It is never stored in a preset or a project, so a project you share carries no key, and every instance of Parasite on the computer is licensed at once. The menu shows the key with its middle masked, and **Manage Account** in the menu opens your dashboard at voidscan-audio.com.

Demo mode

The **Use demo mode** button on the activation panel lets you try Parasite without a key. In demo mode the audio fades to silence for three seconds every twenty-five seconds, Save is disabled, your own presets are hidden from the browser, and cloud sync and sending are off. Everything else works. A pill reading `DEMO - click to activate` sits in the preset row; click it to return to the activation panel. Once you have chosen demo mode, Parasite opens straight into it next time, with the pill rather than the full panel.

Deactivating

Deactivate License in the menu frees this computer's place on the key so you can activate another machine. Parasite drops into demo mode at once; **Activate License...** in the same menu brings the activation panel back.

Offline, and when a key is refused

A licensed Parasite keeps working with no internet connection. When online it quietly confirms the licence with the server every two days or so. If the machine stays offline for more than 90 days, or if Parasite was not opened for about four months and its stored licence has lapsed, it starts in a state that needs refreshing: the activation panel appears with the reason written on it, for instance "Your license needs to be refreshed. Connect to the internet and it will be restored automatically." There is nothing to type. Parasite asks the server again at launch and every half hour, and the licence comes back on its own the moment the server answers. A computer whose clock was set far into the future recovers the same way; one whose clock has moved backwards is asked to correct the date and time first.

If activation itself is refused, the message in red is the server's own reason. The usual ones: the key was mistyped (check it against your purchase email), the key is already in use on another computer (deactivate it there, from Parasite's menu on that machine, then try again), or the key has been cancelled, in which case the panel says the licence is no longer valid and gives the address to write to, hello@voidscan-audio.com.

UPDATES

When Parasite's window opens, it checks once a day at most whether a newer version exists. The check is a single request to voidscan-audio.com that sends nothing about you, your machine or your version. If there is a newer version, one popup appears, in one window only however many instances are open.

The popup says "Parasite X.Y.Z is available" with a line about what changed, and offers **Skip this version**, **Remind me later** and **Download now**. Skip is remembered for that version, so the popup will not return until a later one exists. Later brings it back after seven days. Download opens the download link for your platform in your browser. Clicking outside the popup dismisses it for this session. If the check fails, because you are offline or the server is unreachable, nothing is shown.

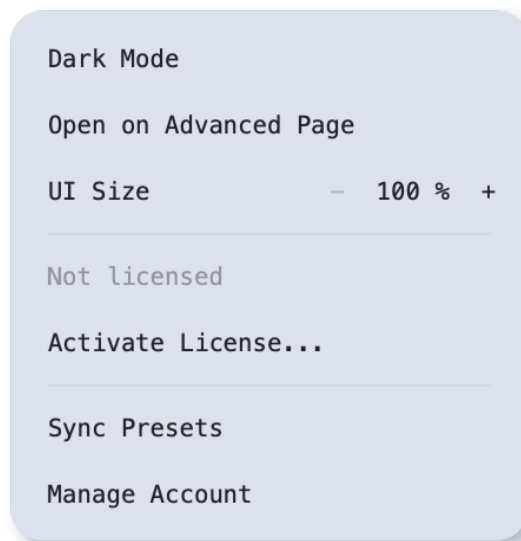
CHAPTER 9

SETTINGS UNDO AND TROUBLESHOOTING

The last chapter covers the menu, the two keys Parasite answers to, what it does with MIDI beyond notes, how several instances in one project share settings, and what to do when something is wrong.

THE MENU

The **menu** button is the rightmost item in the top bar, on both pages. It opens a short list.



The menu, here on an unlicensed copy. Dark Mode and Open on Advanced Page are ticks; UI Size is a stepper; once activated, the licence line shows the key with its middle masked and Deactivate License under it.

Dark Mode switches the whole interface between the light and dark themes. The choice is for the machine, not the project: every other Parasite window in your DAW follows within a fraction of a second, and the next instance you open anywhere uses it too.

Open on Advanced Page decides which page a window shows when it is first opened for an instance. It does not move the page you are on; it takes effect at the next window open. Later windows of the same instance reopen on whichever page they were closed on. The setting is also the answer for a computer where the Main page's visualiser costs more than it should: on the Advanced page no graphics context is created at all.

UI Size is a row with `-` and `+` around the current percentage. The steps are 100, 125, 150, 175 and 200 percent. A step your display cannot fit is greyed out rather than hidden, so the row looks the same on every monitor; the window never grows beyond 90 percent of the usable screen. The new size applies to the window you are in and becomes the default for the next window opened anywhere; windows already open keep their size, which is how two instances can sit side by side at two sizes. The menu closes on the click and the window resizes a moment later.

Below the separator, the licence line reads either `License:` followed by your masked key, with **Deactivate License** under it, or `Not licensed` with **Activate License...** Chapter 8 covers both.

Sync Presets runs a cloud sync now, ignoring the ten-minute spacing of automatic syncs. **Manage Account** opens your dashboard on voidscan-audio.com in your browser.

UNDO AND REDO

Press **Cmd+Z** (Ctrl+Z on Windows) while Parasite's window has the keyboard focus to undo, and **Cmd+Shift+Z** (Ctrl+Shift+Z on Windows) to redo. Those are the only two keys Parasite takes. Every other key press, including the space bar, goes straight to your DAW, so transport and shortcuts keep working with the window in front. When there is nothing left to undo inside Parasite, Cmd+Z falls through to your DAW's own undo rather than doing nothing.

A text field that has the focus (a preset name, the search field, the licence key, a username) keeps its own Cmd+Z for the text you are typing.

Parasite's undo covers everything you change inside its window: knob moves, where a continuous drag is grouped into a few steps rather than hundreds; bars in a Harmo editor; steps and shape presets in the Vol Shaper; every gesture in the LFO curve editor, restored exactly, including after a wave change; a change of LFO wave; a press of Random; a press of Mutate. The first knob you move after loading a preset is an undo step like any other, and undoing it does not flatten the curves and tables the preset brought with it.

Knob moves also reach your DAW's undo, because Parasite reports them as automation gestures. The two histories are separate: Parasite's holds curve and table edits that your DAW never sees, and your DAW's holds everything that happened outside Parasite. If Cmd+Z seems to do the wrong thing, check which window has the focus.

TIP: After a Random roll you dislike, Cmd+Z brings the previous patch back whole, curves and tables included. After a roll you like, save it before you touch anything else.

MIDI

Parasite listens on every MIDI channel and reads notes, velocity, pitch bend (fixed at two semitones either way), the mod wheel, expression and the sustain and sostenuto pedals. Velocity sets the loudness of the note and nothing else, and the mod wheel sharpens the Carrier by up to one semitone. Aftertouch, MPE and program change are ignored: your DAW sees exactly one program, named after the current preset, and cannot select presets by number. Appendix G has the full chart, with what each message does.

SEVERAL INSTANCES IN ONE PROJECT

Each instance of Parasite is its own instrument. Its patch, its page, its padlocks, its Mutate amount and its browser filters are its own, and nothing one instance does to them reaches another. A few things are deliberately shared, because they describe the machine rather than the sound: the dark mode choice, the default UI size, the favourites, the licence, the user preset library, and the update notice, which appears once, in one window, however many instances are open. Changing UI Size in one window does not resize the others; it only sets the default for the next window opened.

IF SOMETHING GOES WRONG

What a message at the bottom of the window means

A red rounded banner at the bottom of the window, shown for eight seconds, is Parasite reporting that something it was asked to do did not happen: a preset file could not be read, a save was refused in demo mode, a preset or a project was made with a newer version. The current sound is never changed by a failed load, so the message is information, not damage.

A banner reading `MADE WITH NEWER VERSION` in the preset row means the project you opened was saved by a newer Parasite than the one you are running. The project loads as it was saved; settings this version does not know about are kept but inactive, and re-saving the project does not discard them. Install the newer version to use them.

Parasite does not appear in my DAW

Check that the files are where your DAW looks. The installer puts them in the system plug-in folders:

- macOS: `/Library/Audio/Plug-Ins/VST3/Parasite.vst3` and `/Library/Audio/Plug-Ins/Components/Parasite.component`
- Windows: `C:\Program Files\Common Files\VST3\Parasite.vst3`, unless you chose another VST3 folder in the installer

Then ask your DAW to rescan its plug-ins, or restart it; most DAWs scan at launch. Look for Parasite among instruments, not effects, and under the maker name Voidscan Audio. Parasite is VST3 and Audio Unit on macOS and VST3 on Windows: there is no VST2, no AAX and no standalone application, so a DAW that only hosts those formats will not find it. On macOS it runs natively on Apple Silicon and on Intel.

My licence says demo

Four causes, told apart by what the activation panel says when you click the `DEMO – click to activate` pill:

- Nothing in particular: the key was never entered on this computer, or you deactivated it. Enter the key.
- "Your license needs to be refreshed", or a line saying the machine has been offline for more than 90 days: connect to the internet and wait. Parasite asks the server at launch and every half hour and restores the licence by itself, with nothing to type.
- A line about the computer's clock having moved backward: correct the date and time in the operating system, then reconnect.
- "This license is no longer valid": the server has cancelled the key. If that is unexpected, write to hello@voidscan-audio.com.

If the sound drops to silence for three seconds at a time, every twenty-five seconds, Parasite is in demo mode; the pill in the preset row confirms it.

My presets vanished

In order of likelihood:

- You are in demo mode. Your own presets are hidden from the browser until the licence is active again; the files are untouched.
- A filter is on. Check the pack menu, the category pill, the heart and the search field; filters survive closing the browser and the arrows in the top bar follow them.

- The preset was deleted on another machine, and the deletion synced. Deletions made inside Parasite are meant to reach every machine on the account.
- A preset deleted by hand in Finder or Explorer has come back instead. That is the cloud restoring it; delete it inside Parasite.

The files themselves are one `.prst` per preset in the user preset folder listed in Appendix F.

The window is the wrong size, or the Main page is slow

UI Size in the menu goes from 100 to 200 percent and is limited to what the display can show. If the Main page's visualiser makes the window sluggish on an older machine, switch on Open on Advanced Page in the menu: the Advanced page uses no graphics acceleration at all.

Where the log is, and what to send

Parasite keeps a log of what it does and of anything that goes wrong:

- macOS: `~/Library/Logs/Parasite/`
- Windows: `%APPDATA%\Parasite\logs\`

The folder holds `parasite.log` and up to four older copies, plus, if Parasite has ever crashed, a file named `crash-` followed by the date and time. When asking for help at hello@voidscan-audio.com, send the whole folder, zipped, together with the name and version of your DAW, your operating system version, the Parasite version you installed, and what you were doing when it went wrong. A screenshot of any message at the bottom of the window helps too.

APPENDIX A

PARAMETER REFERENCE

Every parameter, grouped by panel. "On screen" is the label painted in Parasite; "Host name" is the name your DAW shows in its automation and parameter lists, given only where it differs from the screen. Ranges and defaults are the parameter's own; a fresh instance loads the Init preset, which differs from the defaults on exactly four items, marked "Init:" in the Notes column.

Every parameter below is automatable from the DAW, except the 128 hidden curve values listed at the end. The DAW lists the four Macros first, so that they sit at the top of its automation chooser.

Time knobs (envelope segments, delay time, portamento) read in milliseconds below one second and in seconds above. Percent knobs read **N%**. Where a knob is not linear, the value at its 12 o'clock position is given so you can see how its travel is spent.

TOP BAR

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
< name >	FM Algorithm	Series, Parallel, Split, Ring, Feedback, Additive	Series	See Appendix D
Oct n	Octave	-4 to +4	0	Whole instrument, applied at the next note

MACROS

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
Vortex		0 to 100%	50%	Centre is neutral; also on the Main page
Helix		0 to 100%	0%	Also on the Main page
Plasma		0 to 100%	50%	Centre is neutral; also on the Main page
Time		0 to 1, reads 0.25x to 4.00x	0.5, reads 1.00x	Scales A, D and R of all four envelopes; Macros panel only

MOD 1 AND MOD 2

Identical panels. The host name carries **Mod1** or **Mod2**, and the envelope **Env1** or **Env2**.

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Mod1 On	off, on	on	
wave menu	Mod1 Wave	Sine, Saw, Square, Triangle, Pulse, Custom, Noise	Saw	On screen "Tri" for Triangle. Init: Sine on both
Fixed	Mod1 KB	off, on	off	Host value is keyboard tracking, the inverse of Fixed: KB on = Fixed off
ratio knob, reads xN	Mod1 Coarse	x0.5, x1 to x48	x1	Whole-number ratios only. Init: Mod 1 at x2
Fine	Mod1 Fine	-1000 to +1000 ct, step 0.1	0 ct	Reads whole cents

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
Freq	Mod1 Fixed Freq	20 Hz to 16 kHz	440 Hz	Fixed mode only; 12 o'clock about 1.6 kHz
Multi	Mod1 Multi	x0, x0.001, x0.01, x0.1, x1, x10	x1	Fixed mode only; the "x0" step multiplies by 0.0001
Level	Mod1 Level	0 to 100%	50%	
A	Env1 Attack	0 to 5 s	10 ms	12 o'clock about 0.5 s
D	Env1 Decay	0 to 5 s	300 ms	12 o'clock about 0.5 s
S	Env1 Sustain	0 to 1	0.7	Three decimals
R	Env1 Release	0 to 8 s	300 ms	12 o'clock about 0.8 s

CARRIER

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
wave menu	Carrier Wave	Sine, Saw, Square, Triangle, Pulse, Custom, Noise	Sine	
Fixed	Carrier KB	off, on	off	Inverse of the host value, as for the modulators
ratio knob, reads $\times N$	Carrier Coarse	x0.5, x1 to x48	x1	
Fine	Carrier Fine	-1000 to +1000 ct, step 0.1	0 ct	The mod wheel adds up to +100 ct
Freq	Carrier Fixed Freq	20 Hz to 16 kHz	440 Hz	Fixed mode only
Multi	Carrier Multi	x0, x0.001, x0.01, x0.1, x1, x10	x1	Fixed mode only
XOR	XOR	off, on	off	No amount
Sync	Sync	off, on	off	Mod 1 resets the carrier
Drift	Carrier Drift	0 to 100%	0%	
Noise	Carrier Noise	0 to 100%	0%	Crossfade, not an add
Spread	Carrier Spread	0 to 100%	0%	Right channel up to +15 ct
A	Env3 Attack	0 to 5 s	10 ms	
D	Env3 Decay	0 to 5 s	300 ms	
S	Env3 Sustain	0 to 1	1.0	
R	Env3 Release	0 to 8 s	300 ms	

FILTER

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Filter On	off, on	on	
type menu	Filter Type	LP, HP, BP, Notch	LP	12 dB per octave
Cutoff	Filter Cutoff	20 Hz to 20 kHz	20 kHz	12 o'clock is 1 kHz
Res	Filter Resonance	0 to 100%	0%	

PITCH ENV

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Pitch Env On	off, on	off	
Amt	Pitch Env Amount	-96 to +96 st, step 0.1	0 st	Total pitch offset of a voice is limited to 48 semitones either way
A	Pitch Env Attack	0 to 5 s	1 ms	
D	Pitch Env Decay	0 to 5 s	150 ms	
S	Pitch Env Sustain	0 to 1	0	
R	Pitch Env Release	0 to 8 s	100 ms	

LFO 1 LFO 2 AND LFO 3

One set of controls, switched by the tabs. Host names carry LF01 , LF02 or LF03 .

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
Rate	LFO1 Rate	0.05 to 20 Hz	1.0 Hz	12 o'clock about 2 Hz; shown when Sync is off
wave menu	LFO1 Wave	Sine, Tri, Saw, Sq, S&H, Custom, SawDn	Sine	S&H is a fixed, editable step pattern
Sync, and the sync knob	LFO1 Sync	Free, then 12 divisions	Free	Appendix C; the first switch to Sync lands on 2 bar
Rtrg	LFO1 Retrigger	off, on	off	
slot destination (8 per LFO)	LFO1 Dest1 to LFO1 Dest8	None plus 64 destinations	None	Appendix B
slot amount (8 per LFO)	LFO1 Amt1 to LFO1 Amt8	-1 to +1, step 0.01	0	Drag-and-drop assigns at +0.5

Three further values in this group have no control anywhere on screen and are reached only as LFO destinations, from a preset, or by automation:

HOST NAME	RANGE	DEFAULT	NOTES
Tremor (Pitch LFO)	0 to 1	0	Per-voice pitch vibrato, fixed 3.5 Hz, up to 2 semitones
Vein (Filter LFO)	0 to 1	0	Per-voice cutoff wobble, fixed 2 Hz, up to 2 octaves
Flux (Index LFO)	0 to 1	0	Per-voice modulation-level tremolo, fixed 3.5 Hz

EFFECTS DELAY

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Delay On	off, on	off	
PP	Delay Ping-Pong	off, on	off	
Time	Delay Time	10 ms to 2.00 s	300 ms	12 o'clock about 0.36 s; free mode
sync knob (same place)	Delay Sync	Free, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/4T, 1/8T, 1/16T	Free	Right-click the knob to switch mode; first switch lands on 1/1
Fdbk	Delay Feedback	0 to 90%	30%	
Damp	Delay Damp	0 to 100%	30%	
Sprd	Delay Spread	0 to 100%	0%	Right channel up to 50 percent longer
Mix	Delay Mix	0 to 100%	50%	Also on the Main page

EFFECTS REVERB

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Reverb On	off, on	off	
Size	Reverb Size	0 to 100%	30%	
Damp	Reverb Damp	0 to 100%	50%	
Width	Reverb Width	0 to 100%	100%	0 is mono
PDly	Reverb Pre-Delay	0 to 200 ms, step 1	0 ms	
Mix	Reverb Mix	0 to 100%	50%	Also on the Main page

EFFECTS LIQUID

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Liquid On	off, on	off	
Rate	Liquid Rate	5 to 300%	50%	A speed, not a frequency; 12 o'clock about 79%
Depth	Liquid Depth	0 to 100%	50%	
Tone	Liquid Tone	0 to 100%	50%	50% is neutral
Feed	Liquid Feed	0 to 80%	20%	
Mix	Liquid Mix	0 to 100%	60%	Also on the Main page

EFFECTS RUBBER

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Rubber On	off, on	off	
Tone	Rubber Tone	0 to 100%	50%	50% is neutral
Strch	Rubber Stretch	0 to 100%	30%	
Feed	Rubber Feed	0 to 100%	0%	
Warp	Rubber Warp	0 to 100%	0%	
Mix	Rubber Mix	0 to 100%	60%	Also on the Main page

VOL SHAPER

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
On	Shaper On	off, on	off	
shape menu		Sidechain, Pump, Trance, Choppy, Sine, Saw Down, Saw Up, Bounce, Wobble, Stutter, Breathe, SC Hard, Swirl, Glitch, Flat		Writes the 32 steps; blank for a hand-drawn shape. Init: Sidechain
x4 / x1			x1	Display only: 8 coarse bars or 32
Rtrg	Shaper Retrig	off, on	off	
Sync, and the sync knob	Shaper Sync	Free, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/4T, 1/8T, 1/16T	Free	First switch to Sync lands on 1/4
Rate	Shaper Rate	0.1 to 20 Hz	4.0 Hz	12 o'clock about 3.6 Hz; shown when Sync is off
Depth	Shaper Depth	0 to 100%	75%	0 is a bypass

GLOBAL

ON SCREEN	HOST NAME	RANGE	DEFAULT	NOTES
Mono	Mono	off, on	on	
Rtrg	Retrigger	off, on	on	Oscillator phase reset at note start
Porta	Portamento	0 to 2.00 s	0	Host value 0 to 1, step 0.001; 12 o'clock is 0.5 s; Mono only
Drive	Drive	1.0x to 10.0x, step 0.01	1.0x	12 o'clock 3.25x; also on the Main page
Fold	HemoFold	0 to 100%	0%	Also on the Main page
Volume	Volume	0 to 100%	50%	Also on the Main page

PARAMETERS WITH NO EFFECT

Three entries appear in the DAW's list and do nothing. They exist so that presets from early versions can still be read.

HOST NAME	RANGE	DEFAULT
Mod1 Pitch	-24 to +24	0
Mod2 Pitch	-24 to +24	0
Carrier Octave	-2 to +2	0

HIDDEN CURVE VALUES

The three Harmo tables and the Vol Shaper table are stored as 32 values each, named `MOD1_H00` to `MOD1_H31`, `MOD2_H00` to `MOD2_H31`, `CAR_H00` to `CAR_H31` and `SHAPER_S00` to `SHAPER_S31`, in a group called "Curves (internal)". They exist so that bar and step edits can be undone. They are not automatable and your DAW's automation list does not show them. The LFO curves are stored differently and have no parameters at all.

APPENDIX B

LFO DESTINATIONS

The 64 destinations an LFO slot can take, in the order the slot menu lists them, with None first. "Reach" is how far a slot pushes its target at an amount of +1, measured from the knob's own value: the routing is one-sided, so the target sits at the knob value when the LFO is at its trough and at the knob value plus the reach at its peak. A negative amount pushes the other way. Several slots aimed at one destination add up.

"Smoothing" says how the modulation is applied. Per sample means the value is smoothed inside each voice with a 5 ms ramp and read every sample, so fast rates stay clean. Block means the value steps once per audio buffer, which is fine for envelope times and effect settings and audibly stepped at fast rates.

#	IN THE MENU	TARGET	REACH AT +1	SMOOTHING
0	None			
1	Pitch	voice pitch	+2 semitones	per sample
2	Cutoff	Filter Cutoff	one full knob travel in knob space, limited to 20 Hz to 20 kHz	per sample
3	Res	Filter Res	+1.0, limited to 0 to 1	per sample
4	Mod1Lvl	Mod 1 Level	+1.0, may exceed the knob's maximum	per sample
5	Mod2Lvl	Mod 2 Level	+1.0, may exceed the knob's maximum	per sample
6	Volume	Volume	+1.0, limited to 0 to 1	per sample
7	Drive	Drive	+9, the whole 1x to 10x range, limited	per sample
8	Noise	Carrier Noise	+1.0, limited	per sample
9	Spread	Carrier Spread	+1.0, limited	per sample
10	Fold	Fold	+1.0, limited	per sample
11	M1Fine	Mod 1 Fine	+100 cents	block
12	M2Fine	Mod 2 Fine	+100 cents	block
13	Drift	Carrier Drift	+1.0	block
14	CarFine	Carrier Fine	+100 cents	block
15	DlyTime	Delay Time	+0.5 s in free mode; in sync mode, up to 4 divisions along the list	block
16	DlyFeed	Delay Fdbk	+1.0, the delay's own 90% ceiling applies	block
17	DlyMix	Delay Mix	+1.0	block
18	RevSize	Reverb Size	+1.0	block
19	RevMix	Reverb Mix	+1.0	block
20	LiqDpth	Liquid Depth	+1.0	block
21	LiqMix	Liquid Mix	+1.0	block
22	RubWarp	Rubber Warp	+1.0	block
23	RubMix	Rubber Mix	+1.0	block
24	PEnvAmt	Pitch Env Amt	+96 semitones, limited to -96 to +96	block
25	RevDamp	Reverb Damp	+1.0	block

#	IN THE MENU	TARGET	REACH AT +1	SMOOTHING
26	RevWdth	Reverb Width	+1.0	block
27	RevPdly	Reverb PDly	+200 ms	block
28	DlyDamp	Delay Damp	+1.0	block
29	DlySprd	Delay Sprd	+1.0	block
30	LiqRate	Liquid Rate	+1.0 on the 0.05 to 3 range	block
31	LiqTone	Liquid Tone	+1.0	block
32	LiqFeed	Liquid Feed	+1.0, limited to 0 to 1	block
33	RubTone	Rubber Tone	+1.0	block
34	RubStr	Rubber Strch	+1.0	block
35	RubFeed	Rubber Feed	+1.0	block
36	Porta	Porta	+1.0, read at note start	block
37	E1A	Mod 1 envelope A	+5 s	block
38	E1D	Mod 1 envelope D	+5 s	block
39	E1S	Mod 1 envelope S	+1.0	block
40	E1R	Mod 1 envelope R	+8 s	block
41	E2A	Mod 2 envelope A	+5 s	block
42	E2D	Mod 2 envelope D	+5 s	block
43	E2S	Mod 2 envelope S	+1.0	block
44	E2R	Mod 2 envelope R	+8 s	block
45	E3A	Carrier envelope A	+5 s	block
46	E3D	Carrier envelope D	+5 s	block
47	E3S	Carrier envelope S	+1.0	block
48	E3R	Carrier envelope R	+8 s	block
49	PEA	Pitch Env A	+5 s	block
50	PED	Pitch Env D	+5 s	block
51	PES	Pitch Env S	+1.0	block
52	PER	Pitch Env R	+8 s	block
53	ShpRate	Vol Shaper Rate	+20 Hz, never below 0.1 Hz	block
54	ShpDep	Vol Shaper Depth	+1.0	block
55	M1Coar	Mod 1 ratio	+24 ratio steps	block
56	M2Coar	Mod 2 ratio	+24 ratio steps	block
57	CCoar	Carrier ratio	+24 ratio steps	block
58	Tremor	per-voice pitch vibrato amount	+1.0	block
59	Vein	per-voice filter wobble amount	+1.0	block
60	Flux	per-voice modulation-level tremolo amount	+1.0	block
61	Vortex	Vortex	+1.0, limited	block
62	Helix	Helix	+1.0, limited	block
63	Plasma	Plasma	+1.0, limited	block

#	IN THE MENU	TARGET	REACH AT +1	SMOOTHING
64	MacTime	Time	+1.0, limited	block

Envelope times reached by an LFO are scaled by the Time macro afterwards, like the knobs themselves.

Every knob on the Advanced page accepts an LFO by drag-and-drop except these, which have no destination: the Freq and Multi knobs of the three operators in Fixed mode, the LFO panel's own Rate and sync knob, the Vol Shaper's stepped sync knob (its Rate knob does accept one), and the Mutate amount. The six knobs on the Main page and its four Mix knobs accept an LFO. The Delay's Time and sync knobs share the DlyTime destination, so an assignment survives switching the delay between free and sync mode.

APPENDIX C

TEMPO DIVISIONS

Three controls can follow your DAW's tempo: the LFOs, the Vol Shaper and the Delay. Their lists differ. A "bar" is always four beats: Parasite reads the tempo and nothing else, so a 3/4 or 7/8 time signature does not change the length of "1 bar". Without a tempo from your DAW, 120 BPM is assumed. A T suffix is a triplet.

DIVISION	LENGTH IN BEATS	LFO	VOL SHAPER	DELAY
8 bar	32	yes		
4 bar	16	yes		
2 bar	8	yes		
1 bar, or 1/1	4	yes	yes	yes
1/2	2	yes	yes	yes
1/4	1	yes	yes	yes
1/8	0.5	yes	yes	yes
1/16	0.25	yes	yes	yes
1/32	0.125	yes	yes	yes
1/4T	2/3	yes	yes	yes
1/8T	1/3	yes	yes	yes
1/16T	1/6	yes	yes	yes

The LFO lists the bar lengths as "1 bar"; the Vol Shaper and the Delay list the same length as "1/1".

How each control uses its division:

CONTROL	ONE DIVISION IS	SWITCHED BY	FIRST SWITCH LANDS ON	FOLLOWS THE SONG POSITION
LFO	one full cycle of the curve	the Sync toggle in the LFO panel	2 bar	yes, while the transport plays and Rtrg is off
Vol Shaper	one pass through the 32 steps	the Sync toggle in the Vol Shaper panel	1/4	yes, while the transport plays and Rtrg is off
Delay	the delay time	right-click the Time knob, "Sync mode"	1/1	no, the division sets the time only

"Follows the song position" means that while your DAW is playing, the cycle is anchored to the bar and beat, so a given beat always hits the same point of the curve, live, looping or when bouncing. With the transport stopped the LFO and the Vol Shaper keep running freely so a patch can be auditioned. The Delay's time is limited to its 2 second maximum: at 60 BPM, 1/1 would be 4 seconds and is held at 2.

Switching Sync off remembers the division, so switching it back on returns to the same one. An LFO on the Delay's DlyTime destination in sync mode steps through neighbouring divisions instead of sliding the time.

APPENDIX D

THE ALGORITHMS

The six FM algorithms, in the order the < > selector steps through them (after Additive it wraps to Series). Two of them carry a different name in your DAW's automation lane than on screen. The Mod 1, Mod 2 and Carrier panel headers on the Advanced page spell out the routing of the current algorithm; the arrow in a header means "modulates".

#	ALGORITHM	MOD 1 HEADER	MOD 2 HEADER	CARRIER HEADER
1	Series	Mod 1 → 2	Mod 2 → Car	Carrier
2	Parallel	Mod 1 → Car	Mod 2 → Car	Carrier
3	Split	Mod 1 → 2 + Car	Mod 2 → Car	Carrier
4	Ring	Mod 1 × 2	Mod 2 → Car	Carrier
5	Feedback	Mod 1 → 2	Mod 2 → Mod 2 + Car	Carrier
6	Additive	Osc 1	Osc 2	Osc 3

The routing of each, in words. "Carrier" means both carrier oscillators, left and right, which always receive the same modulation.

Series. Mod 1 modulates Mod 2, and Mod 2 modulates the Carrier. The classic three-operator stack. Mod 1 is heard only through Mod 2, so with Mod 2's Level at zero, Mod 1 does nothing.

```
Mod 1 → Mod 2 → Carrier → out
```

Parallel. Both modulators modulate the Carrier directly; their signals add. Two independent families of sidebands.

```
Mod 1 → Carrier
Mod 2 → Carrier
Carrier → out
```

Split. Mod 1 modulates Mod 2 and the Carrier at once; Mod 2, already modulated by Mod 1, modulates the Carrier too. Series and Parallel at the same time: the densest spectrum of the six.

```
Mod 1 → Mod 2
Mod 1 → Carrier
Mod 2 → Carrier
Carrier → out
```

Ring. The two modulators are multiplied together, each shaped by its own envelope, and the product, scaled by both Levels, modulates the Carrier. Either Level at zero silences the modulation. Sum-and-difference clusters: metallic and bell-like.

```
Mod 1 × Mod 2 → Carrier → out
```

Feedback. Series, plus Mod 2 feeds its own output back into its own phase at a fixed depth. There is no feedback amount knob: Mod 2's Level and envelope set how much is heard. Pushes towards saw-like and then noisy spectra. The feedback is cleared at every note start.

```
Mod 1 -> Mod 2
Mod 2 -> Mod 2 (its own output, one step back)
Mod 2 -> Carrier
Carrier -> out
```

Additive. No FM at all. The three oscillators are heard side by side as independent layers: Mod 1 through its envelope and Level, Mod 2 likewise, and the Carrier through its own envelope. Level and Plasma become layer volumes, the ratio and Fine knobs become layer tunings, and Vortex and Helix still rescale the ratios. The two modulator layers bypass the Carrier's Noise knob and envelope, and a modulator switched Off is a silent layer.

```
Mod 1 + Mod 2 + Carrier -> out
```

Common to all six: Sync (Carrier panel) resets the Carrier from Mod 1 whatever the algorithm, and the Flux value scales both modulators' contribution in every algorithm that uses them.

APPENDIX E

FACTORY CATEGORIES

Eight categories, in the order the browser's pills and the All view use them. Every preset, factory or user, belongs to exactly one; you choose it in the Save panel. The counts are the factory bank as shipped with version 1.0.7, 153 presets in all, plus Init.

CATEGORY	FACTORY PRESETS	WHAT GOES THERE
Bass	19	Low-register sounds meant to carry the bottom of a track, from sub to growl and wobble
Lead	21	Melodic sounds meant to be played on top, sustained or decaying
Pluck	7	Short, percussive notes with a fast decay and little or no sustain
Keys	8	Keyboard-style sounds that work under chords: electric pianos, organs, bell keys
Pad	18	Slow, sustained, layered sounds for chords and beds
Texture	14	Evolving, atmospheric or noisy material that is more sound than note
Drums	35	Kicks, snares, hats, percussion and hits, usually played on one key
FX	31	Risers, impacts, sweeps, glitches and other one-shot effects

Init is not a category you can save into. It is the single starting preset, loaded by the **Init** button and by every fresh instance, and it never appears in the browser's list.

In the All view, factory presets are grouped by category in the order above and alphabetical within each group; on a single category pill they are alphabetical. Your own presets form one alphabetical block after the factory ones, whatever the pill, under the User line.

The category is stored in the preset file and shown as the card's subtitle. Changing it means saving the preset again with another pill selected.

APPENDIX F

FILES AND FOLDERS

Everything Parasite writes to disk, and where. On macOS the data folder is

`~/Library/Voidscan/Parasite/` ; note `~/Library` , not `~/Library/Application Support` . On Windows it is `%APPDATA%\Voidscan\Parasite\` . The log lives elsewhere, listed last. All of these are shared by every instance of Parasite on the machine; none of them is saved in a project.

THE INSTALLED FILES

WHAT	MACOS	WINDOWS
VST3	<code>/Library/Audio/Plug-Ins/VST3/Parasite.vst3</code>	<code>C:\Program Files\Common Files\VST3\Parasite.vst3</code> (the installer lets you choose another VST3 folder)
Audio Unit	<code>/Library/Audio/Plug-Ins/Components/Parasite.component</code>	none
Uninstaller	none; remove the two bundles above	<code>C:\Program Files\Voidscan Audio\Parasite\</code>

YOUR DATA

Paths are relative to the data folder.

FILE OR FOLDER	HOLDS	NOTES
<code>Presets/</code>	Your presets, one <code>.prst</code> file per preset	Cloud-synced. Deleting a file here does not stick; delete inside Parasite
<code>favorites.txt</code>	Favourite presets, by name	
<code>ui_prefs.txt</code>	Dark or light mode	
<code>ui_zoom</code>	The default UI Size for the next window	
<code>open_advanced</code>	Open on Advanced Page; the file exists when the setting is on	
<code>demo_ack</code>	That you chose demo mode, so the activation panel does not fill the window at every open	
<code>license.dat</code>	Your licence, bound to this computer	Deactivating removes it. Copying it to another machine does nothing
<code>cloud_token.dat</code>	The cloud session for your account	
<code>cloud_sync_state.json</code>	Where the last successful sync left off, so the next one asks only for what changed	
<code>cloud_pending.json</code>	Uploads that failed and will be retried after the next successful sync	
<code>cloud_deletions.json</code>	Presets deleted inside Parasite, until the server has acknowledged them	
<code>update_state.json</code>	When the last update check ran, which version you skipped, and when "Remind me later" expires	

THE LOG

WHAT	MACOS	WINDOWS
Log folder	~/Library/Logs/Parasite/	%APPDATA%\Parasite\logs\
Current log	parasite.log	parasite.log
Older logs	parasite.log.1 to parasite.log.4 , rotated at 1 MiB	the same
Crash reports	crash-YYYYMMDD-HHMMSS.log , one per crash	the same

When asking for help, send the whole log folder.

WHAT IS SAVED WHERE

A preset file holds every parameter, the three Harmo tables, the Vol Shaper table, the three LFO curves, and the preset's name, category, pack, author and cloud identity. A DAW project holds the same, plus which preset was loaded so the browser shows the right name on recall.

Neither holds: dark mode, UI size, the page you were on, the padlocks, the Mutate amount, the browser filters and search, favourites, the licence, the LFO tab shown, or an open Harmo view.

APPENDIX G

MIDI IMPLEMENTATION

Parasite receives on every MIDI channel and sends nothing.

MESSAGE	RECEIVED	WHAT IT DOES
Note on, note off	yes	8 voices; a ninth note steals a playing voice, which fades out over 5 ms; every note fades in over 3 ms
Velocity	yes	Linear gain on the voice's output. No curve, no routing to envelopes or modulator levels
Pitch bend	yes	2 semitones up and down, fixed
CC 1, modulation wheel	yes	Adds up to 100 cents to the Carrier's fine tune; shared by all voices
CC 11, expression	yes	Multiplies the voice output; shared by all voices
CC 64, sustain pedal	yes	Holds notes
CC 66, sostenuto pedal	yes	Holds the notes already down
CC 123, all notes off	yes	Releases every note
All sound off	yes	Releases every note
Other controllers	no	
Channel aftertouch	no	
Polyphonic aftertouch	no	
MPE	no	
Program change	no	Your DAW sees one program, named after the current preset
Clock, transport	no	Tempo and song position come from your DAW's transport, not from MIDI clock

Every envelope, including the modulator envelopes and the pitch envelope, receives note off and runs its release. The octave selector in the top bar and the Mono and Porta settings in the Global panel act on the notes as they arrive; a held note does not jump when the octave changes, the next note does.

