u-he

BAZILLE

Modular PD & FM Synthesizer

USER GUIDE

VERSION 1.1.2

22. Jul 2021

U-HE • HECKMANN AUDIO GMBH • BERLIN

Introduction

To follow this user guide it helps if you already know a thing or two about patching modular synths, as well as the basics of FM and PD (phase distortion) synthesis. If you have any questions that an Internet search can't answer, please feel free to post a message in our user forum at KVR!

Installation

Go to the Bazille product page at u-he.com, download the appropriate installer for your computer and unzip the compressed file. Open the *Bazille* folder and start the installer app.

The only demo restriction is a mild crackling that occurs at irregular intervals after about two minutes of use. The demo is otherwise fully functional. Those crackles disappear after you have entered a serial number. For more information, refer to the *ReadMe* file included with the installer.

CPU usage and audio quality

As a polyphonic modular synth, Bazille can be quite CPU-hungry. Monophonic operation without voice stacking should be fine, even on older computer systems. Activating *Multicore* causes Bazille to distribute voices across available CPU cores, which can allow more voices to be played without overloading the CPU. This works well on processors such as i5 or i7, but it is always worth checking whether Bazille uses more CPU with *Multicore* on or off. Also, some host applications include their own multicore support, and activating both can lead to poorer performance.

Note: Due to inherent technical limitations of the synthesis method, Bazille's PD-based oscillators are prone to aliasing. If you have Bazille installed on a high-performance system you should try activating the **HQ** (higher quality) option.

A Better Bazille

Early Bazille adopters should notice some improvements in this version, especially the powerful new preset browser. The minor fixes include much better envelope LFO-triggering. Although this particular fix affects several older patches, we feel that it was worth implementing, especially in such a "geek machine" as Bazille. See the full explanation in the Tips & Tricks chapter.

Resources

File locations (default)

Win

patches (local)	*C:\Users\YOU\Documents\u-he\Bazille.data\Presets\Bazille*
patches (user)	*C:\Users\YOU\Documents\u-he\Bazille.data\UserPresets\Bazille*
preferences	*C:\Users\YOU\Documents\u-he\Bazille.data\Support\ (*.txt files)*
microtuning	*C:\Users\YOU\Documents\u-he\Bazille.data\Tunefiles*
alternative skins	*C:\Users\YOU\Documents\u-he\Bazille.data\Support\Themes*

Paths containing non-standard characters are not supported. If a previous installation into the *VstPlugins* folder did not cause file permissions problems, you can safely reinstall there.

Mac

patches (local)	*Macintosh HD/Library/Audio/Presets/u-he/Bazille/*
patches (user)	*Macintosh HD/Users/YOU/Library/Audio/Presets/u-he/Bazille/*
preferences	*Macintosh HD/Users/YOU/Library/Application Support/u-he/com.u-he.Bazille...*
microtuning	*Macintosh HD/Library/Application Support/u-he/Tunefiles/*
alternative skins	*Macintosh HD/Library/Application Support/u-he/Themes/*

Online resources

- For downloads, news articles and support, go to the u-he website
- For lively discussions about u-he products, go to the u-he forum
- For friendship and informal news, go to the u-he facebook page
- For video tutorials and more, go to our youtube channel
- For soundsets and bundles, go to u-he soundsets
- For 3rd party presets, go to Patchlb

The u-he team 2021 (Q3)

- Urs Heckmann (boss code, concepts)
- Jayney Klimek (office management)
- Howard Scarr (user guides, presets, necessary grump)
- Rob Clifton-Harvey (IT admin, backend development)
- Sebastian Greger (GUI design, 3D stuff)
- Jan Storm (framework, more code)
- Alexandre Bique (all things Linux)
- Oddvar Manlig (business development)
- Viktor Weimer (support, presets, the voice)
- Thomas Binek (QA, bug-hunting, presets)
- Henna Gramentz (office supervision, support)
- Frank Hoffmann (framework, new browser)
- Alf Klimek (tagging, rock-stardom, studio)
- Sebastian Hübert (media, synthwave)
- David Schornsheim (more code)
- Stephan Eckes (yet more code)
- Luca Christakopoulos (communication design)

Special thanks

- Clemens Heppner and Sascha Eversmeier for their contributions during development
- Everyone who contributed presets!
- Brian Rzycki for maintaining the original patch library

Synth Overview

Click on the SYNTH tab at the top left. This arrangement of modules was designed to minimize the lengths of patch cords required for two independent layers of *2 oscillators → filter → output:*
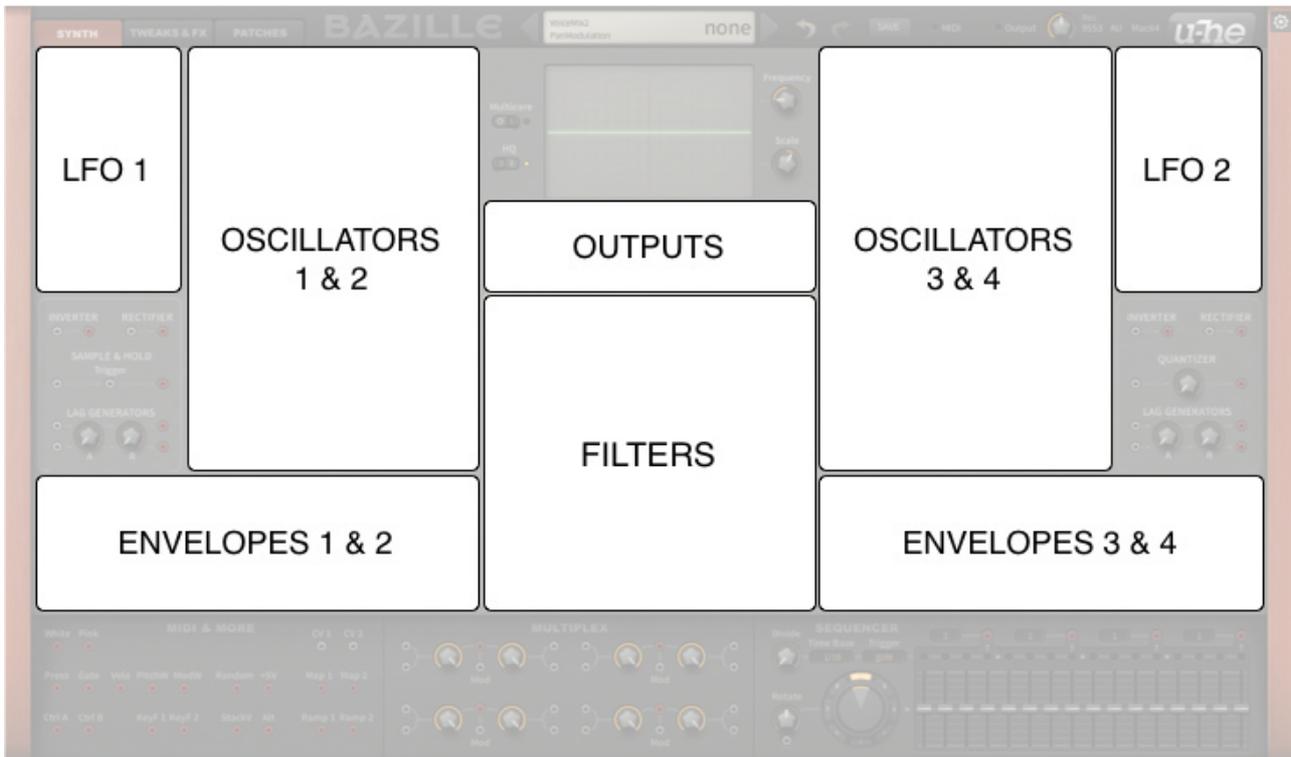
Basic synthesis panels in the SYNTH window

Basic synthesis panels

In the centre below the data display and oscilloscope are the **output** and main **filter** panels. On either side are four audio **oscillators**, flanked by two **LFO**s (low frequency oscillators). Beneath the oscillators are the four **envelope generators**.

Signal processor and modulation panels

Beneath each LFO is an unlabeled panel containing the following **signal processors**:

- 1 x sample & hold (left panel only)
- 1 x quantizer (right panel only)
- 4 x lag processors (in pairs, with shared attack and release times)
- 2 x inverters, 2 x rectifiers

At the bottom left is a panel called **MIDI & MORE** containing several modulation sources (wheels, key velocity etc.) plus two noise sources.

Although most of the patching is achieved with virtual cables, several parameters have a fixed set of modulation sources which are available in drop-down menus (see *Selectors* on the next page). That's where the pair of CV (control voltage) inputs come into play: Anything you plug into a CV socket can be used to modulate the LFOs, envelopes, mapping generators or filters 3 & 4.

The **MULTIPLEX** panel bottom centre contains four identical 'multiplex' units. Unlike the standard 'multiples' in analogue modular synths, these can be used as mixers, ring modulators, amplitude modulators and more. Owners of Bazille's little cousin ACE should be in familiar territory here!

At the bottom right is the **MODULATION SEQUENCER** with which you can morph or step through up to 8 snapshots of 16 steps each, splittable via the 4 outputs ("taps").
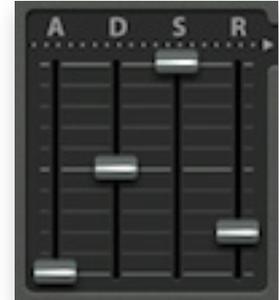
GUI Components

This section is an introduction to the basic components of Bazille's user interface.

Knobs and sliders

There are two types of controls: *unipolar* and *bipolar*. Unipolar knobs and sliders only allow positive values, while the *bipolar* knobs and sliders allow negative values, often within a range of -100 to +100.

The image above shows the two oscillator tuning controls – the *Tune* knob is clearly unipolar and the *Modify* knob is bipolar. Envelope sliders are unipolar (despite the central line), while sequencer sliders are bipolar.

All knobs and sliders allow the following methods of adjustment:

- **Coarse control**: Click+hold with the left mouse button, then drag up and down.
- **Fine control**: For 0.01 steps, hold down one of the SHIFT keys beforehand.
- **Mouse wheel**: If your mouse has a scroll wheel you can hover over the knob/slider and roll the wheel. For fine control hold SHIFT at any time. If your mouse wheel is rastered (it has subtle 'clicks'), go into the Preferences and switch on the *Mouse Wheel Raster* option.
- **Reset to default value**: Double-clicking a knob reverts to a useful default value, often zero.

Selectors

The orange-on-black text fields contain a list of options. Note that some of them also serve as labels for the accompanying knob**.**

Click on a selector to open the list, or roll your mouse wheel to scroll through the options.

Sockets and cables
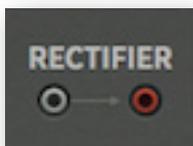
Bazille's modules are connected together ('patched') using virtual cables. The sockets are colour-coded: inputs are grey while outputs are red .

To make a connection, drag and drop between an output socket and an input socket (either direction will work). Outputs will happily accommodate several cables, while inputs accept just one (any existing connection is replaced).

As a rule you can't connect two inputs together, but there's one exception: Dragging a cable from an unused input to one that is already in use creates a '**daisy-chain**'. The source will be patched to both inputs. Try it!

By clicking on active sockets, you can…

- **move inputs**: drag+drop the input end to a different input socket.
- **duplicate cables**: shift+drag the input end to create another cable from the same output.
- **move outputs**: right-click on the output end, drag+drop onto a different output.
- **remove cables**: either double-click the input end, or drag+drop away from the socket.
- **change cable colour**: click on the input end of the cable until it appears in the desired colour. If you double-click by mistake (removes the cable), click on the UNDO button.

Parameter locking

Right-clicking on any knob, slider or selector lets you 'Lock' that parameter. You can still adjust the value, but it **won't change when you switch presets**. To unlock again, right-click and untick 'Locked'.

While individual parameter locking is great for keeping the Microtuning or Fine tuning fixed while changing presets, it is less suitable for sequencer values, for instance, as locking them all would mean working with 8 x 16 = 128 locks! Future versions of Bazille might include panel locking.

GUI size and skin

Right-clicking anywhere in the background opens a context menu containing the user interface size options as percentage and width x height in pixels.

The menu also lets you choose between at least two alternative interface designs ('skins'). The 'GearPorn' option shows all synthesis parameters on a single page - try it! However, this user guide was written assuming that you are using the 'Original' skin. Both these settings are temporary. For permanent settings, see the Preferences page.

Computer keyboard

The following modifier keys are used in the mapping generators and the patch browser:

Mac / macOS	PC / Windows
shift = shift, ⇧	**shift** = shift, ⇧
opt = option, ⌥, alt, alternate	**ctrl** = control
cmd = command, ⌘, apple…	**alt** = alternate

MIDI Specialities

Multichannel MIDI

This feature supports a growing class of expressive 'performance' instruments that can send each note via a separate MIDI channel. For Bazille to respond correctly, the host application needs to route multiple MIDI channels to a single instance of Bazille. Each voice will then react *individually* to the performance controls pitch bend, aftertouch, mod wheel, Control A and Control B. See About MIDI CC in the Configuration chapter.

While multichannel MIDI is being received, voice modes *Poly*, *Mono* and *Legato* are practically identical: Bazille behaves like (up to) 16 mono synths with the same sound. Note that the maximum number of *Voices* (see TWEAKS) still applies as voices can still be stolen across multiple channels. The *Duo* mode is not channel-aware i.e. all MIDI channels are merged. Single trigger modulation sources (e.g. LFOs with Phase mode set to 'single') will listen to the channel of the first voice being played.

Poly pressure (polyphonic aftertouch)

As well as the more common **channel aftertouch**, Bazille recognizes and reacts appropriately to polyphonic aftertouch – each note (e.g. within a chord) will receive separate aftertouch data.

MTS-ESP

Bazille now supports Oddsound MTS-ESP, a system for microtuning multiple plug-ins within a DAW environment. The freeware 'Mini' version is all you need to get started. MTS-ESP can be overridden by activating Bazille's own microtuning, for instance with the .tun file *Default Scale*.

The Control Bar

Along the top is a bar containing page switches, the data display plus a few global elements:

Page switches

SYNTH....................patching, all basic parameters
TWEAKS & FX........filters 3 and 4, maps, extra envelope settings, global settings, effects...
PATCHES................the preset browser / librarian

Data display

The Data Display normally shows the name of the current patch. Clicking on the triangles to the left and right steps through patches. Clicking on the patch name lets you select a patch in the current directory. While editing a patch it shows the parameter name and value for a few seconds before reverting to the patch name.

New feature: If you drag a Bazille preset from elsewhere (e.g. your desktop) and drop it onto the data display, that preset will be loaded but not automatically saved anywhere. See Drag & Drop.

Initialize

To load a simple template, right-click on the data display and select *init* (initialize). If you want to start from scratch every time you open an instance of Bazille, save this under the name *default* into the Local root directory.

Undo / Redo
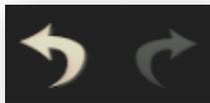
Use the UNDO / REDO arrows to fix recent mistakes. Although the number of undo steps is limited to 10, you can even undo a change of preset: So switching presets before saving doesn't mean losing your work!

Save

Stores the preset into either the currently selected folder or the User folder, depending on the *Save Presets To setting* (see Preferences). To select a different folder, click on PATCHES and navigate in the directory. Then click on [Save], give your preset a suitable name and enter any details you would like to appear in the INFO area of the browser. Please avoid using the following characters: (\ / ? % * : " > < =).

Right-clicking on [Save] opens a menu with a choice of file formats. **h2p** is our standard cross-platform format, while **h2p extended** includes extra readable information. The **native** option is the standard format of your system (*.fxp* for VST and AAX, *.aupreset* for Audio Units).

MIDI

To the left of this label is an indicator which flashes whenever MIDI data is received.

Output

The main volume control and signal / overload indicator (turns red if you overload the output).

Revision number

Please quote this number when you report any trouble to our support.

The u-he badge

Clicking on the **u-he** badge opens a menu containing links to this user guide, to the Bazille documents folder, to our homepage, to our support forum at KVR and to our presence in various social networks (Twitter, Facebook, YouTube).

At the bottom of the u-he badge menu is the entry *Install Soundset…* Unless you are running Linux, you should not need this – see Installing Soundsets a few pages down.

Multicore / HQ

To the left of the oscilloscope are two switches:

Multicore causes voices to be distributed across multiple CPU cores, which usually allows more voices to be played simultaneously. This works well on recent processors such as the Intel i5 and i7, but performance can even be reduced if your CPU is older. Note: Some hosts have their own multicore support, and activating both can lead to poorer performance. In such cases, please switch either Bazille's or the host's multicore option off.

HQ switches various algorithms over to higher quality versions, but this comes at the cost of much higher CPU usage. The two options as they appear in the data display are called 'Good' and 'High' – the former is almost always good enough, there's no need to waste CPU for little or no gain.

These two elements are in the oscilloscope panel because there wasn't enough room for them in the control bar (where they arguably belong).

Oscilloscope
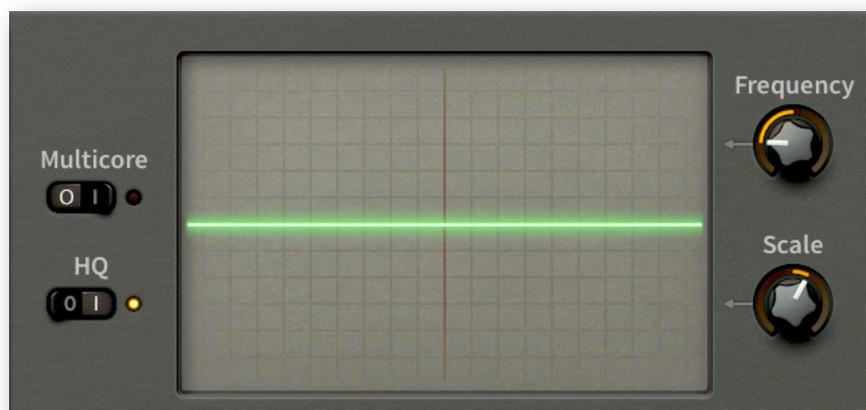
Oscilloscopes were always useful tools for synthesizer sound design, and that's reason enough to include one in Bazille. You can check and adjust waveforms, monitor the effects of audio-rate modulation or filtering, view envelope shapes etc.. Or watch it purely for entertainment!

The oscilloscope shows a mono sum of both outputs, pre-effects. The trigger is synchronized to MIDI notes as well as to zero-crossings, and is also updated whenever a longer scan is completed.

As synchronization is automatic, Bazille's oscilloscope requires very few controls: The **Frequency** knob adjusts horizontal resolution while **Scale** adjusts vertical resolution. Perfect synchronization is not always possible, so try playing a different key.

eco, fast, glow, fire, wind

A right-click in the oscilloscope window lets you switch the style: *glow, fire* and *wind* add different fade-out effects at the cost of some extra CPU. These modes are also a bit more sluggish than *eco* or *fast*. To minimize CPU-usage, choose the *eco* option.

This setting is temporary. To make it permanent, change the 'Oscilloscope' option in Preferences.

Preset Browser

Overview

Bazille presets are sometimes called **patches**, a term borrowed by modular synth pioneers from 19th/20th century manual telephone exchanges. For obvious reasons: Calls were connected in a similar fashion using large jack socket matrices (disconcertingly called *switchboards*).

You can load any preset in the current folder by clicking on the data display and selecting from the menu, or step through all presets by clicking on the arrow symbols either side of the data display. However, no self-respecting synthesizer wouldn't include a browser, and Bazille is no exception – click on the [PRESETS] button at the top left…

Most of the GUI is replaced by a set of three connected panels: Folders appear on the left, presets in the centre and information about the currently active preset on the right. If you can't see the folders 01 to 10, click on the triangle to the left of *Local*. If you can't see the PRESET INFO pane, click on the button in the top right and activate *Show Preset Info*.

The Local root directory contains a representative selection of presets copied from the subfolders (but without the tags). Immediately after loading a preset by clicking on its name you can step through all the others using your computer's cursor keys.

Default preset

Whenever Bazille starts it checks whether the Local root contains a preset called *default*, which is then loaded instead of the demo sound. Note that *default* will not appear in the browser.

Extra sounds

Any commercial soundsets we distribute directly (for instance The Bazille Cookbook) will appear in *.uhe-soundset* format. See Installing Soundsets a few pages down.

Directory Panel

If you don't see this panel on the left of Bazille's Presets browser, click on the DIRECTORY tab.
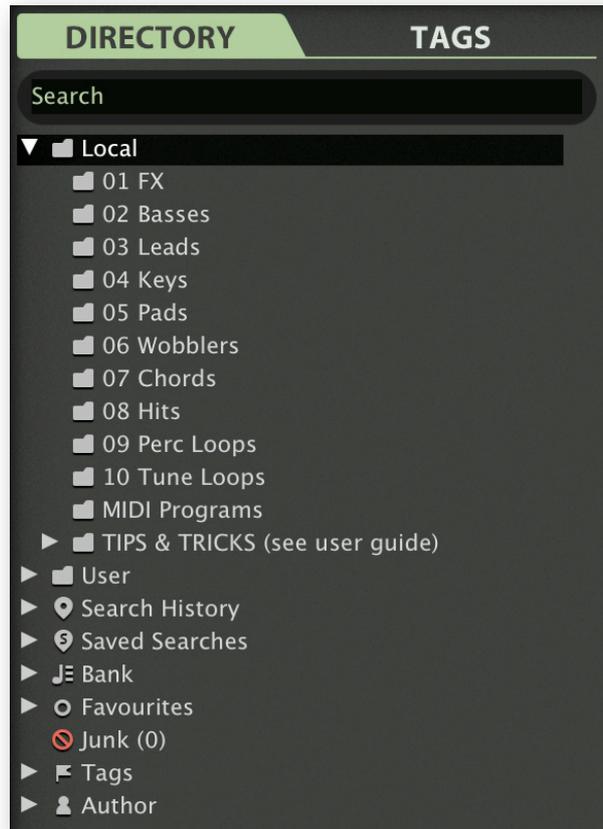
Local

Bazille's factory presets are sorted into folders 1 through 10. We recommend that you do not add or remove any presets here, but save all your creations in the User folder (see below).

MIDI Programs

Local also contains a folder called 'MIDI Programs'. All presets (up to 128) present in this folder will be loaded into memory when the first instance of Bazille starts. 'MIDI Programs' can then be switched via Program Change messages. As the MIDI Programs are accessed in alphabetical order, it's best to prefix each name with an index '000 rest-of-name' to '127 rest-of-name'.

IMPORTANT: Unlike regular presets, MIDI Programs can't be added, removed or renamed on the fly. Changes will only take effect after the host software is restarted!

The MIDI Programs folder can contain up to 127 sub-folders of 128 presets, switched via MIDI Bank Select messages (CC#0) preceding the Program Change message. The MIDI Programs folder itself is bank 0, sub-folders are addressed in alphabetical order starting with bank 1.

When Bazille receives a program change, it will display the bank and program numbers to the left of the preset name e.g. '0:0' for the first preset in the first bank. In certain hosts, however, the first bank / preset is designated '1' instead of the correct '0'. To avoid another possible source of confusion, please make sure that there are no junked presets in the MIDI Programs folder! All files there will be adressed, even those that are hidden.

User

This is the best place for your own creations as well as third party soundsets. You can either select the User folder immediately before saving the preset, or set a global preference which ensures that it will always be saved there – see the Preference *Save Presets To*.

Tip: To find out where the User folder resides on your computer, hold down option (Mac) or ctrl (Windows), right-click on the User folder and select *Show in Finder / Explorer.*

Smart Folders

The other folders do not contain files, but display the results of querying a database of presets. The content is therefore dynamic i.e. it will change whenever the underlying data changes.

> You can **drag & drop** any smart folder content onto e.g. 'User' or the desktop (see External Drag & Drop) to create folders containing real copies of those presets!

Search History

Click on this folder to display the results of past searches (maximum 10). If you want the search results to be more permanent, right-click and select *Save Search...* – see below. To remove all searches from the list, right-click on the 'Search History' folder and select *Clear*.

Saved Searches

This folder contains searches that have been saved via right click from the Search History. To remove individual saved searches, right-click on the search and select *Delete*.

Banks

These smart folders reference metadata about preset origin – the version of the factory library or the name of the soundset with which the preset was installed. See Preset Info below.

You can even create your own custom banks: Drag & drop one or more presets onto the 'Bank' folder then enter a suitable bank name into the dialogue box.

To remove Bank attributes from selected presets, either drag & drop them onto the 'no Bank' folder you will see at the bottom of the Bank list, or right-click on the Bank and select *Remove Presets from Bank*. Empty Banks will disappear.

Favourites

8 smart folders, colour-coded - see Presets context menu a few pages down. Presets dropped onto a Favourites folder will be marked as such. Only one Favourite colour/number can be set per preset. The Favourite status can be removed from all presets of one particular colour / index by right-clicking on the 'Favourite' folder and selecting *Remove All Favourite (n) Marks*.

Junk

A smart folder pointing to *junked* presets (see 'Presets context menu' on the next page). Files dropped onto this folder will normally disappear from the browser, but you can select *Show Junk* in the Presets context menu.

Like Favourites, Junk can be exported/imported (as *Junk.uhe-fav*). See External Drag & Drop.

Junk marks can be removed globally by right-clicking on the Junk folder and selecting *Remove All Junk Marks*. If hidden, all junked presets will reappear in the browser.

Tags

Smart folders for each Category/Subcategory, Features and Character tag. Presets dropped onto these folders will adopt the corresponding tag. Presets dropped onto the '[no Tags]' folder will have all Category/Subcategory, Features and Character tags removed.

Author

Smart folders for each Author. Tip: Instead of signing each of your creations, you could sign just one of them, then select them all and drag onto 'Author/(You)/'. As the process cannot be undone, please use this feature with caution! See the paragraph about Internal Drag & Drop a few pages down.

Directory context menu

Right-click on any folder within 'Local' or 'User' to open this menu:

```
Refresh
Create New…
Rename…
Open in Finder *
─────────────────────
Move to Trash
─────────────────────
On Open Expand to      ▶
─────────────────────
✓ Show Folder Icons
```

Refresh

Update the contents of the browser.

Create New…

Insert an empty subdirectory.

Rename…

Edit the folder name.

Open in Finder ⁄ Explorer:

Opens a system window for the currently selected folder. If you hold down the *option* key (Mac) or *ctrl* key (Windows), this entry will change to *Show in Finder / Explorer* and the folder will be highlighted instead of opened.

Move to Trash / Recycle Bin

Moves the selected folder and all its contents to the trash.

On Open Expand to

The options here determine how deeply the browser will open any sub-directories whenever the GUI is opened or the *Refresh* function is called. The first option (*none*) collapses all folders, while the final option (*all levels*) reveals all nested folders.
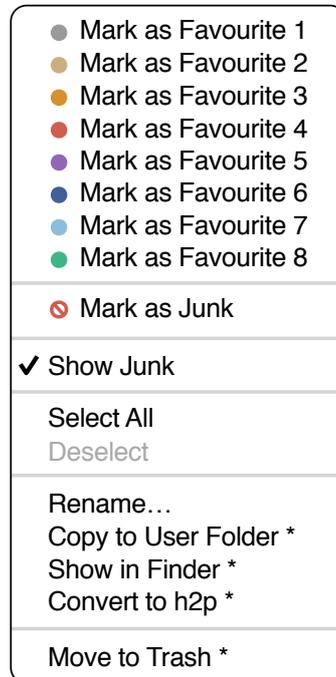
Show Folder Icons

Unselecting this hides all icons in the directory except the Junk symbol.

Presets Panel

The central, unlabelled area of the browser displays all presets in the current folder. Click to select.

Presets context menu

Right-click to open a menu containing functions that can be applied to individual presets.

```
● Mark as Favourite 1
● Mark as Favourite 2
● Mark as Favourite 3
● Mark as Favourite 4
● Mark as Favourite 5
● Mark as Favourite 6
● Mark as Favourite 7
● Mark as Favourite 8

🚫 Mark as Junk

✔ Show Junk

Select All
Deselect

Rename…
Copy to User Folder *
Show in Finder *
Convert to h2p *

Move to Trash *
```

Mark as Favourite

Choose one of eight 'Favourites'. The selected entry will be replaced with *Unmark as Favourite*.

Mark as Junk / Show Junk

Instead of deleting presets, you can mark them as 'junk' so that they disappear from the browser. Activate *Show Junk* to display junked files and mark them with a STOP symbol.

Select All, Deselect

See 'Multiple Selection' on the next page.

Rename

Use this function to change the name of a preset.

Copy to User Folder / Duplicate

The entry here depends on the status of the Save Presets To preference as well as on the location of the source preset(s) i.e. whether they are in the Local or the User folder. Selected presets are copied with a number appended to the name, which increments (just like the *Auto Versioning* option) so that no preset can be overwritten by mistake.

Show in Finder / Explorer

Opens a system window for the right-clicked file. In smart folders only, holding down an *option* key (Mac) or *ctrl* key (Windows) replaces this entry with *Show in Browser*, which shows the currently selected file in its original location within Bazille's browser.

Convert to native / h2p / h2p extended

Converts presets into the format previously selected via right-click on the [SAVE] button.

Move to Trash / Recycle Bin

Immediately moves the selected preset(s) to the system trash.

Restore

While in the browser you can audition presets without losing track of the one that was previously loaded: Click the [Restore] button to get back to where you were before entering the browser.

Scan / ready

In the top right of the presets panel is a dark rectangle normally labelled 'ready'. Whenever you use the refresh function (see the Directory context menu on the previous page), this turns into a progress indicator while the preset database is being refreshed. The process should only take a few seconds, even for a very large preset library.

Multiple selection

A block of adjacent presets can be selected via shift+click, and individual presets can be added to the selection via cmd+click (Mac) / alt+click (Win). Presets can be moved to a different folder via drag & drop (see below). To deselect, either click on an unselected preset or choose *Deselect* from the context menu.

Internal Drag & Drop

You can drag and drop single or multiple files from the preset panel onto any folders in the directory panel. Files dragged onto regular folders will be moved unless you hold **opt** (macOS) or **ctrl** (Windows), in which case they will be copied instead. Files dropped onto smart folders will adopt the attribute of that folder: For instance, you can set the Author or Favourite status of several presets at once.

External Drag & Drop

To manage your preset library externally you can drag presets and folders between Bazille's browser and your desktop (or any system window).

On the Mac most Finder operations will automatically update the browser. Updating might not be immediate when using multiple formats or multiple host applications, but all it usually takes is a click on the GUI or in the directory tree (sets focus to the clicked instance of Bazille).

On Windows systems, a manual *Refresh* (see Directory context menu) will be required before changes to the contents of the browser appear.

Another little helper: If you drag a Bazille preset from e.g. your desktop and drop it onto the Data Display, it will be loaded but not automatically saved.

Exporting smart folders

Drag any smart folder onto the desktop to create a new folder containing those presets. Drag an entry from your Search History, or the Category 'Duo', the Favourites or one of the Authors.

Exporting favourite / junk status

You can export Favourite status, all at once or individually: Shift+click and drag the 'Favourites' folder onto the desktop to create a file called *Favourites.uhe-fav*. Similar for sub-folders: If you shift+click and drag e.g. 'Favourites 5', this will create a file called *Favourite 5.uhe-fav.* The same method works for Junk status, creating a file called *Junk.uhe-fav*. Such files can be imported into Bazille's browser on a different computer (for instance), via drag & drop onto or anywhere within the Favourites folder, or to the Junk folder.

Note that importing *.uhe-fav* files from another computer will only work 100% correctly if all preset names and locations are identical on both computers!

Preset Info

The panel to the right displays information about the selected preset. If you can't see this panel, click on the "triple bar" [≡] button in the top right corner and tick *Show Preset Info*.

> ✔ Show Preset Info
> ✔ Show Tags in Preset Info

Below the preset name you should see its path (from /Local or /User), the Bank and the Author (which also appear as Smart Folders.

DESCRIPTION and USAGE text is entered immediately before saving a patch. CATEGORIES, FEATURES and CHARACTER are the tags for the current preset (see Tagging). You can remove or add tags directly – see Tagging via PRESET INFO.

If you prefer to see less information, hide the tags only or the entire PRESET INFO panel.

The **FLAG** button opens the Tagging window – see the next page.

Installing Soundsets

All soundsets we distribute ourselves will (eventually!) be available in *.uhe-soundset* format. Third parties are also encouraged to use this package format for their own commercial soundsets (for details please contact our support team).

Standard Method

To install, drag & drop the *.uhe-soundset* file into Bazille – anywhere will work. The soundset should appear in the 'User' folder. If a soundset with the same name already exists in that location, any modified files will be backed up and the location of the backup file will be displayed.

Alternative Method

Soundsets in *.uhe-soundset* format can also be installed by clicking on the u-he badge, selecting *Install Soundset…* from the menu and navigating to the *.uhe-soundset* file. This option is especially useful for Linux, as the browser version for that platform does not support drag & drop.

Regular Folders

Folders containing Bazille presets can be manually copied or moved into the 'User' folder. You might have to refresh the browser (see Directory context menu) before they appear there. A refresh is generally necessary in Windows but not in macOS.

Note: As *.uhe-soundset* files are basically ZIP-compressed folders, you can rename them i.e. replace the long file extension with *'zip',* then extract the presets as well as the accompanying documentation.

Tagging

Tags are elements of metadata, information added to presets so you can find them more easily.

IMPORTANT

Tags are updated automatically – clicking on the [SAVE] button isn't required! The main advantage is that presets don't have to be saved every time you edit a tag. The main caveat is that you should only edit tags after saving your preset.

For instance, if you decide to edit tags while creating a 2nd version of an existing preset, please remember that you are actually changing the tags in the original preset!

The Tagging Window

Either click on the FLAG icon or right-click on the [SAVE] button and select *Tag this Patch*:

CATEGORIES describe a preset by analogy to instrument types or typical usage, and each one has an appropriate set of subcategories.

FEATURES are technical classifications.

CHARACTER tags are pairs of opposites from which you can choose only one.

Tagging via PRESET INFO

You can even edit tags without opening the tagging window: In the PRESET INFO panel, right-click on the *Category*, *Features* or *Character* and select or unselect tags from the menu.

Note that this method only works for individual presets. If you right-click on an existing tag, the first option in the menu becomes *remove tag*.

The function *Create Search from Tags* at the top of the menu finds all presets with exactly the same set of *Categories*, *Features* and *Character* tags. See the next page for more about search functions.

Tagging via smart folder

You can tag multiple presets by drag & dropping them onto *Tags* smart folders. To remove all tags, drag & drop presets onto the *[no Tags]* smart folder.
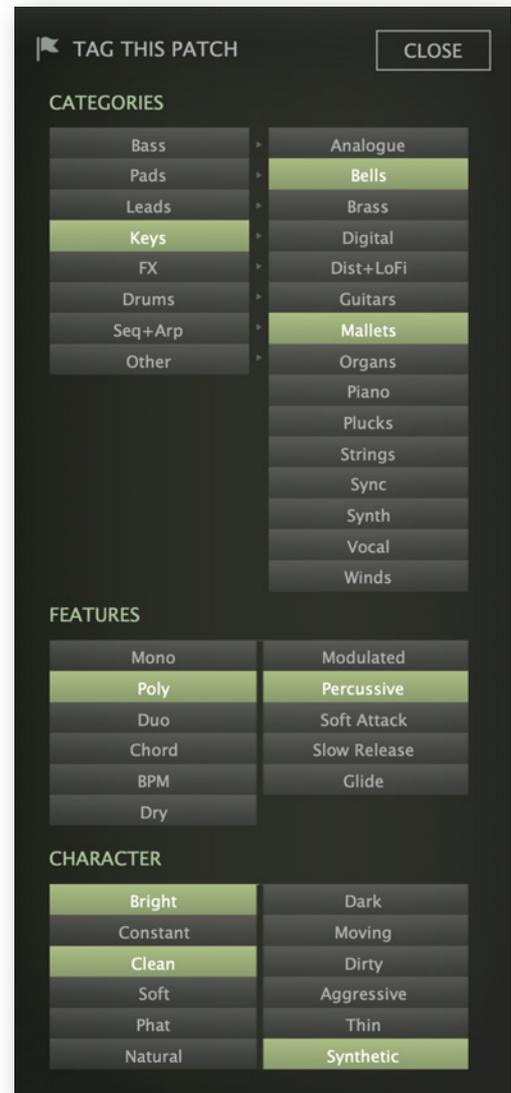
Search Functions

Search by Tags

Click on the TAGS tab to open this view. The buttons here let you set up complex search criteria according to existing tags with just a few mouse clicks:
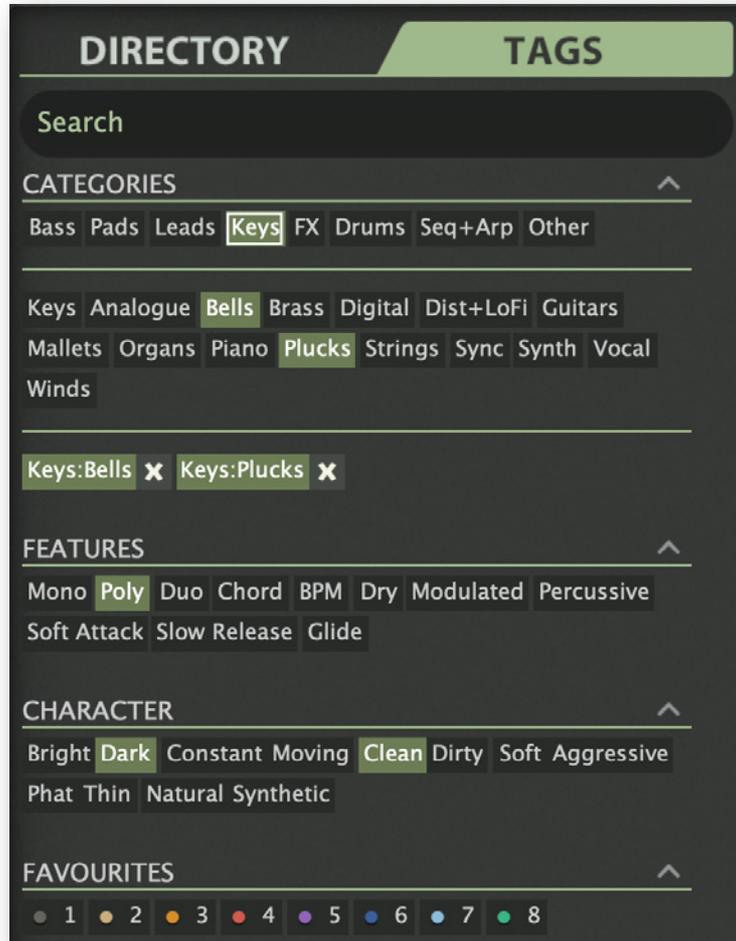
Below the Search field are four sets of buttons (CATEGORIES, FEATURES, CHARACTER and FAVOURITES). The first three correspond to the tags in the tagging window (see the previous page), while the bottom row lets you find any presets you have tagged as *Favourites*.

Clicking on the [^] icon to the right of each heading hides all options for that set of tags.

Categories and Subcategories

Each Category has its own set of subcategories which appear below the main categories. Click on [Leads] and see them appear. Not selecting a subcategory here means "show me presets tagged with any subcategory". Selecting the top-left subcategory (which has the same name as the category) means "show me presets tagged without any subcategory".

You can select multiple categories without specifying subcategories if you hold cmd (Mac) or alt (Windows) while clicking on the category button. Try that with the [Keys] button.

Completed category + subcategory tags appear below the subcategories as buttons with 'off' switches [X] so that you can add other main categories by simply clicking on them.

Features, Character and Favourites

Unlike multiple Category tags which expand the search, these types **restrict** the search. Let's find all "moving" and "thin" presets with a slow release: Click on the TAGS tab. Select the [Keys] category, the [Slow Release] feature, then the [Moving] and [Thin] characters.

Summary / Recap

In the DIRECTORY panel, specify a search path via double-click. In the TAGS panel, select Category tags. Add others if required to extend the search, but pleae remember to hold cmd (Mac) or alt (Windows) if you want to retain category tags that don't specify a subcategory. Select Features, Character and/or Favourites tags to refine the search. If you restricted the search path (to e.g. */Local/06 Wobblers*), remember to exit it afterwards by clicking on the [**X**].

Search by Text

The **Search** field below the DIRECTORY and TAGS tabs lets you find presets according to a text string. The search normally looks into the preset name, author name, DESCRIPTION and USAGE (see the INFO panel). The search is not case-sensitive. Quotes are not required unless you need to include spaces. After entering some text, hit [Return].

To restrict the search to a particular path e.g. Local/06 Wobblers, double click the 06 Wobblers folder. This path will appear beneath the Search field instead of the preset folders, and you will only see smart folders. (If the specified path contains sub-folders, these will also appear):

The grey-green field in the above image is the **search path**. The [^] button to the left moves it up one level, in this case to /Local. The [X] button to the right sets the search path to the default Local plus User (i.e. all Bazille presets), and the preset folders become visible once again. Alternatively, you can navigate directly to any higher level by right-clicking on the path.

Try a text search: Enter three or four letters then hit [Return]. For instance, *star* will find all files containing the text string 'star' (e.g. mustard or starters). Entering "star wars" (with the quotes) would find e.g. Battlestar Warship, if such existed in the presets.

Syntax

Scope

You can limit the scope of the search to just the preset name or other parts of the PRESET INFO by using name (preset name), author, desc (description) or use (usage) followed by a colon. For instance, *author:the* finds all presets by sound designers whose author names contain 'the'. Similarly, *desc:space* will find all presets with the word 'space' in the description.

Logic

AND requires that presets contain both words. The AND is implicit, but can be written explicitly if you prefer: For example, entering 'star AND wars' is the same as entering 'star wars'.

OR means that presets must contain at least one of the words.

NOT excludes the following word e.g. star NOT wars would find 'star' but not 'star wars'.

Oscillators

Bazille is highly unusual for a modular synth. Although the filters are traditional analogue models, the oscillators are unashamedly digital: They combine the two technologies that made digital synthesis affordable (and analogue synths suddenly unfashionable!) in the 1980s – **FM** (frequency modulation, more correctly 'phase modulation') and **PD** (phase distortion).

Also included is another unusual process we call *Fractalize* (fractal resonance), which can create very 'cutting' sounds from tamer waveforms, with a similar result to the classic *sync* effect.

Bazille's oscillators are unique, but the underlying technology means that they are more prone to aliasing than those in our other synths. The amount is noticeably less than in the original hardware, however, and we believe the compromise between CPU usage and aliasing is close to optimum.
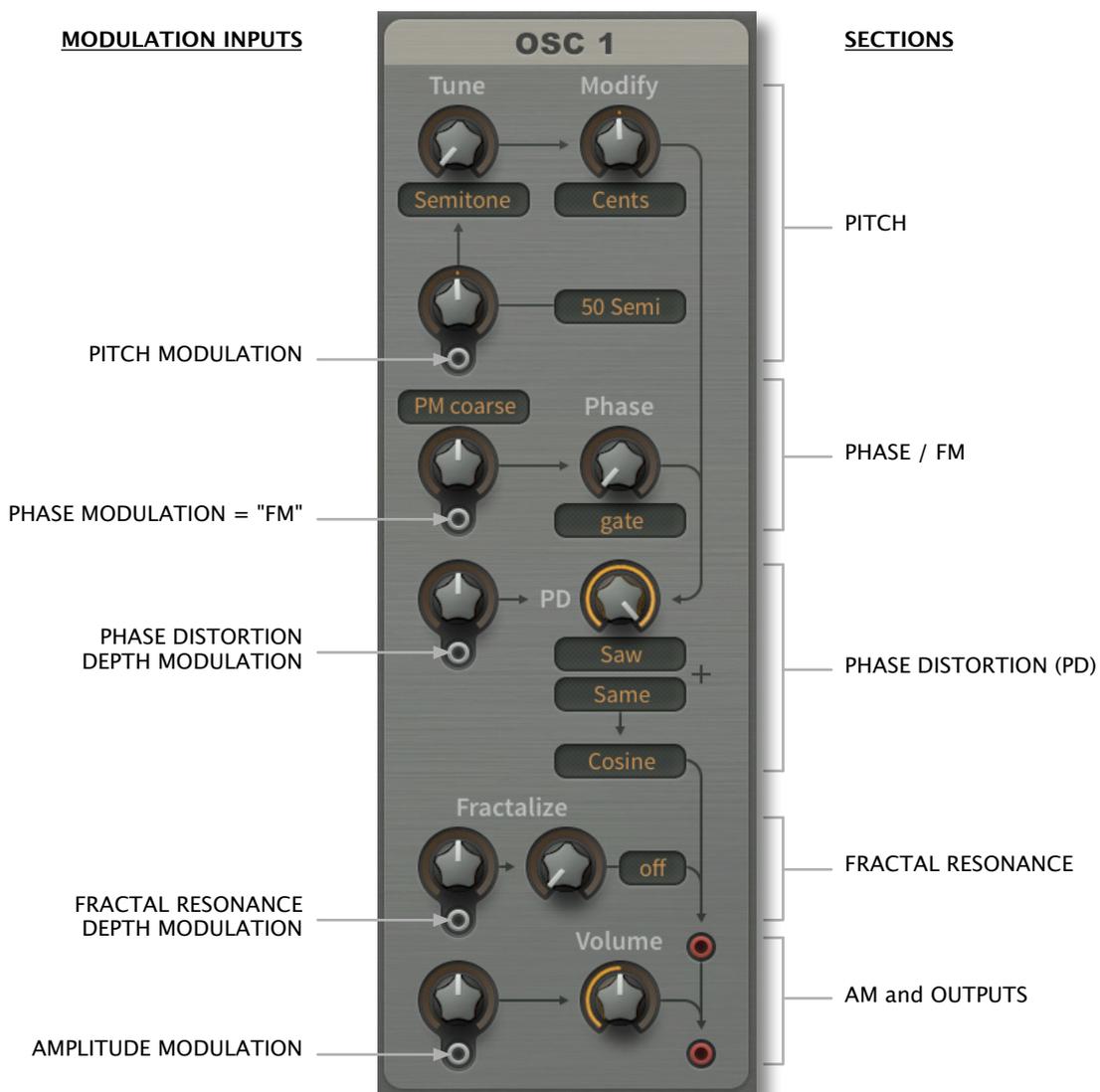
5 different types of modulation, one for each of the 5 sections

The main oscillators are very powerful signal generators which can even be used as LFOs (as the frequency range starts at zero Hertz).

The oscillator panel has five distinct sections, each with a modulation input. The next few pages deal with each of these sections separately – let's start at the top, with PITCH...

Pitch

Together, the knobs labeled *Tune* and *Modify* control the oscillator's basic pitch. Both have mode selectors that make the oscillators suitable for a wide variety of functions e.g. as FM operators, undertone generators or even as host-synchronized LFOs...

Tune

A value between 0.00 and 24.00 – the selector determines how this value is interpreted. The first 3 modes are for generating regular notes, as they automatically switch 'key follow' on:

Semitone...............maximum 24 semitones above standard pitch.

Overtone ....the first 24 harmonics in the overtone series. Note that octaves are not evenly spaced, they are at precisely 1.00, 3.00, 7.00 and 15.00.

Undertone............the first 24 undertones (often called 'subharmonics'). Again, octaves aren't evenly spaced but are at -1.00, -3.00, -7.00 and -15.00. For details about the undertone series, go here: http://en.wikipedia.org/wiki/undertone_series.

In the last two modes, the oscillator frequency isn't affected by which MIDI notes you play, as 'key follow' is disabled. Tip: Whenever you need an LFO with plenty of modulation options, use one of the main oscillators in *Hertz* or *Clocked* mode instead of a regular LFO:

Hertz......................0 to 24Hz, but can be greatly extended via multiply (see Modify below). Note that selecting just one PD waveform or setting a pure sine wave will double that frequency. See the Wave selectors description a few pages down.

Clocked..................sync-to-host 'division factor'. 1.00 mean a whole note, 4.00 a quarter note etc.. For technical reasons the synchronization isn't 100% perfect, so you might have to retrigger the notes every now and again.

Modify

A value between -50.00 and 50.00. Again, the selector specifies how this is interpreted. The *Modify* knob can affect oscillator tuning in one of four ways:

Cents......................detune by +/- 100 cents (each integer step is actually 2 cents).

5 Hz ....detune by +/- 5 Hertz (tuning is independent of the MIDI note).

Beats ....similar to 5 Hz, but host-synced e.g. +4.00 = one extra cycle per quarter note.

Multiply...................multiply or divide by a constant (e.g. -8.00 will divide the frequency by 8). All values between -1.00 and -0.01 are interpreted as 1.00.

Tune modulation (unlabeled)

The amount of pitch modulation from a signal connected to the socket. Often called 'cross modulation' when the modulator is also an audio-rate oscillator. The range is selectable:

Cents......................+/- 50 x 2 cents i.e. plus or minus a semitone

5 Semi....................+/- 5 semitones

50 Semi ....+/- 50 semitones

Phase / FM

Bazille's oscillators are capable of all kinds of 'FM' sounds by plugging an audio-frequency source into the **phase** modulation input. 'FM synthesis' is a bit of a misnomer, as this technology was actually based on phase modulation (see Wikipedia articles on FM synthesis and Yamaha DX7).
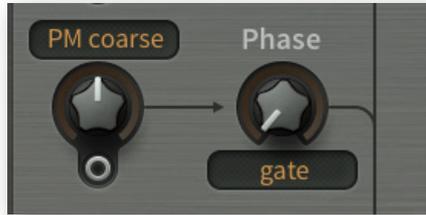
Phase

The righthand knob adjusts the basic phase position i.e. where in its cycle the waveform will start whenever a note is played. The range is usually 720° i.e. 2 cycles, but this is reduced to 360° when different waves are combined (the pitch drops an octave). The value of Phase is irrelevant when the mode is set to *random,* as in the above image.

The oscillators in most analogue synths are free running i.e. the phase is never reset. Because the oscillators in digital synths aren't computed until a note is played (otherwise the CPU would be busy computing inaudible sounds), the initial phase needs to be defined:

random ....Resets the oscillator to a random phase each time a note is played.

gate..............................Resets to the value of Phase each time a note is played so that all notes will start with the same phase (if Phase isn't being modulated).

catch............................Each oscillator gets its phase from where the most recent voice left off – for a better 'free running' effect despite voice rotation ('round robin').

Phase modulation (with mode selector)

The bipolar knob on the left adjusts the amount of phase modulation (or frequency modulation, depending on the modes) from a signal connected to the socket.

The first 3 options are for regular phase modulation (DX-type "FM") with different depth ranges. As modulation in these modes only affects phase, the overall pitch of the oscillator is preserved:

PM fine ....for subtle phase modulation

PM medium................for typical "FM" uses, including self-modulation ('operator feedback')

PM coarse ....for maximum phase modulation

The next two options offer linear FM in two ranges. As modulation adds to the frequency here, the overall pitch is only preserved if the modulating waveform is symmetrical:

lin 100Hz.....................linear FM, 0 to 100Hz

lin 1kHz........................linear FM, 0 to 1000Hz

The last two options offer relative FM. In this mode, modulation multiplies the frequency. Again, the overall pitch is only preserved if the modulating waveform is symmetrical:

rel fine..........................relative FM: oscillator frequency * (1 +/- 0.5 * modulation)

rel coarse....................relative FM: oscillator frequency * (1 +/- 5 * modulation)

The linear and relative modes are unusual in that they offer 'through-zero FM'. Hardware modules with this feature (e.g. Cynthia *Zeroscillator*) are quite popular in the modular synth community, as the wave can run "backwards". Example: if a 100Hz oscillator is linear frequency modulated with -1000Hz, it will run backwards at 900Hz.

Phase Distortion

Following in the footsteps of FM (frequency modulation) synthesis, PD (phase distortion) was the second method of skewing sine waves developed during the 1980s. If you are interested in details, start with the Wikipedia articles about Phase distortion synthesis and Casio CZ synthesizers.

Whenever you start a fresh instance of Bazille, a version of the *init* patch is automatically loaded. In this version, PD is set to maximum, resulting in a bright sawtooth-like wave. Try turning PD all the way down (as in the above image) for a pure sine wave, then modulate the phase distortion by connecting e.g. envelope 2 to the socket and turning up the modulation amount.

PD

The *PD* knob on the right controls the nominal amount of phase distortion.

PD modulation (unlabeled knob)

The bipolar knob on the left sets the amount of modulation from whatever signal is connected to the socket.

Wave selectors (upper 2 selectors)
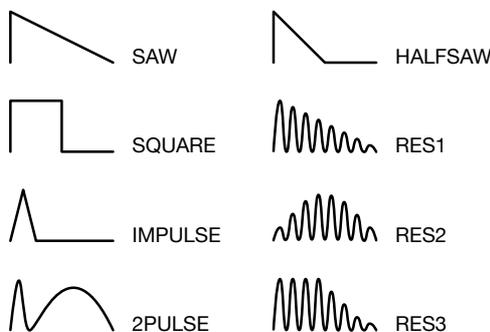
The selectors below the PD knob specify a pair of alternating (see below) non-linear phase functions.

The first five modes (*Saw, Square, Impulse, 2pulse, Halfsaw*) are simple, they need no explanation.

In the 3 'Res' modes, multiple sine waves are packed into differently-shaped 'windows'. The number of cycles in the window is controlled by the *PD* parameter.

Note that most wave combinations will be an octave lower than single waves (*Same* in the lower selector).

Here are two of the many possible wave combinations:

SAW + SQUARE   IMPULSE + RES2

Shape (lower selector)

Sets the basic oscillator waveform before it is phase distorted:

Cosine..................for regular phase distortion i.e. the above waves
TapMap1/2............a mapping generator as basic waveform

Fractal Resonance

Fractal resonance is similar to *Res* (see *Wave Selectors* above), but acts on the composite wave.

Multiple cycles of the waveform are 'packed' into the wave specified by the selector, which then serves as a kind of 'window'. Watch the effect of fractal resonance in Bazille's oscilloscope. For example, here is a square wave packed into a triangular window:

Fractalize

The righthand knob controls the number of cycles of the original wave in each 'window'. The small selector specifies the shape of that window: *Off, Saw, Tri* and *Max* roughly correspond to none, Res1, Res2 and Res3 waveforms (see the previous page).

The bipolar knob on the left sets the modulation depth of a signal connected to the socket.

Outputs

There are two signal outputs at the bottom of the oscillator. The upper one is always at full volume, while the lower one can be attenuated and modulated...

Volume

The righthand *Volume* knob controls the nominal level of the lower output, before modulation...

Volume modulation (unlabeled)

The bipolar knob controls the modulation depth of a signal connected to the socket.

LFOs

At the top left and top right of Bazille's window are two dedicated low frequency oscillators. Each has 3 parallel outputs at the bottom of the panel. Note that LFO 1 is also responsible for vibrato.

Unipolar (+)

'Unipolar' causes the LFO's waveform to be shifted upwards so that it only delivers positive values instead of oscillating around zero. LFO amplitude is halved. Tip: If you are using LFO1 for typical vibrato, you would usually want this switched off.

Rate

A value between -5.00 and 5.00 – the selector specifies how this value is interpreted. The first 3 options are absolute times measured in seconds (0.1, 1 or 10), all the others are synchronized to host tempo. The five options with 'dot' in the name are *dotted* (50% is added to the cycle length), and those with 'trip' in the name are *triplets* (3 cycles occupy the space of 2).

0.1s to 10s............absolute times: 1/10th, 1 or 10 seconds at Rate = 0.00.
1/64 to 8/1.............synchronized to host tempo

To set up a vibrato rate of 5Hz, for instance, use '1s' mode with Rate at 2.50. Or '0.1s' with the Rate set to -1.00. It's not worth thinking about a conversion formula here – just use your ears!

Note that Bazille's LFOs can be forced well into the audio range via *Rate Mod* 'trickery'…

Rate Mod

The depth of rate modulation from a source chosen in the selector.

Wave

This knob affects the basic LFO waveforms in the following ways:

triangle..................from falling saw though triangle to rising saw
pulse......................pulse width from 1% through 50% to 99% (approximate values)
random..................smoothness control

For more LFO waveforms, try modulating the LFO's own amplitude recursively (i.e. from the same LFO). Or better: Use one of the main oscillators in *Hertz* or *Clocked* mode instead.

Phase

This knob adjusts the phase position at which the waveform will start whenever a note is played. The options in the selector are:

sync ....no restart, the LFOs for all voices remain in phase unless modulated apart
gate........................restarts to the value of *Phase* whenever a new note is played
single.....................like sync, but restarts whenever a non-legato note is played
random..................restarts at a random phase whenever a new note is played

Delay

Fades the LFO in from zero, with ramp times ranging from immediately to about 20 seconds.

Amp Mod

This knob adjusts the amount of LFO level modulation from a source specified in the selector.

That higher values result in lower LFO output may be counter-intuitive, but you are actually controlling the **degree of attenuation** here: Whatever the modulation source, you will always get maximum output from the LFO when *Amp Mod* is set to minimum. If you ever need to lower the overall LFO output, set the source to 'none' and turn the Amp Mod amount up.

Outputs (Triangle, Pulse, Random)

All three LFO output sockets can be used in parallel – try mixing them together in a Multiplex. Note that the *Wave* parameter affects all three waveforms at the same time.

Filters

Bazille's filters have several properties normally associated with analogue hardware. For instance, they can be overdriven without getting too harsh. Also, close to where self-oscillation starts (about 50 to 55), there are surprising opportunities for 'weird and wonderful' sound design.
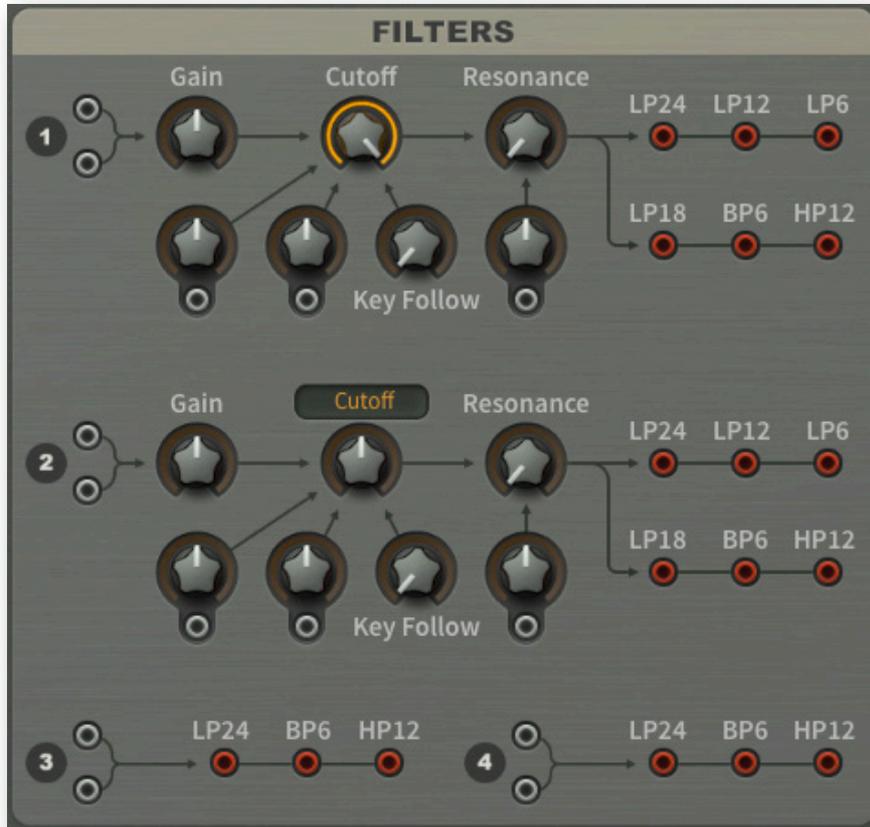
the main filter panel

The cascade filter architecture lets you access several filter types in parallel, like in some hardware synths. In Bazille, however, all filter types are resonant and can even self-oscillate.

Note: All controls for are located in the TWEAKS & FX page.

Gain / inputs

Filter input level (negative values) as well as overdrive amount (positive values). Like the main OUTs, each filter has two audio inputs. Note: Bazille's filters have not been 'tamed'!

Cutoff

Filter 1: Cutoff frequency is measured in semitones from 0.00 to 150.00 for a total range of about 12 octaves. The modulation range is also +/- 150 semitones.

Filter 2: Instead of a simple positive-only cutoff, filter 2 has a bipolar control with 3 modes:

Cutoff ....like filter 1 except that you can set cutoff 'below zero' (to be modulated upwards).

Offset ....adopts filter 1 cutoff modulation, with the cutoff shifted up or down. This means that filter 2 cutoff can be directly modulated by up to four sources: two adopted from filter 1 plus two within filter 2.

Spread ....similar to *Offset*, but any cutoff modulation also affects filter 1 *in the opposite direction*. If you are only using one filter, its cutoff can be directly modulated by up to four sources (two are adopted from the 'unused' filter).

Cutoff modulation (unlabeled)

Each of Bazille's four filters includes a pair of general-purpose cutoff modulation controls and inputs. Patching an envelope to one and an LFO to the other would be the obvious thing to do, but please remember that you can even use audio-rate sources for filters 1 and 2…

Try everything, experiment!

Key Follow

Key follow causes the cutoff to track MIDI notes, with a variable amount. As in all other u-he synthesizers, key follow pivots around E3 (MIDI note 52). This is the only note that remains unaffected, whatever the value of *Key Follow*.

Resonance

The resonance range is 0.00 to 100.00. Although self-oscillation can start around 50.00, the actual amount of resonance depends on the *Gain* setting (see previous page), so quite a generous range above that amount was necessary.

Resonance modulation (unlabeled)

The resonance can be modulated by any signal attached to the socket.

Outputs

Filters 1 and 2 have six outputs each, all of which can be used at the same time:

LP24..................24dB per octave (4-pole) lowpass
LP12..................12dB per octave (2-pole) lowpass
LP6 ....6dB per octave (1-pole) lowpass

LP18..................18dB per octave (3-pole) lowpass
BP6....................6dB per octave (1-pole) bandpass
HP12.................12dB per octave (2-pole) highpass (inverts the signal!)

Tip: The BP6 and HP12 signals are generated by adding or subtracting parts of the basic 4-pole lowpass model and unprocessed signal. When *Gain* is set too high, filter distortion scuppers the simple addition / subtraction, introducing frequencies well below the cutoff point. So if you want clean highpass or bandpass it is best to set the *Gain* around 0 or even negative.

(3) and (4)

Filters 3 and 4 are only slightly simpler than the other two. The differences are:

- Only LP24, BP6 and HP12 outputs.
- Resonance cannot be modulated.
- Cutoff modulation is limited to sources in the selector menu. To modulate filter 3 or 4 cutoff from a source not in that list (e.g. the sequencer), patch the desired source into one of the CV sockets first, then select that CV as your modulator.
- Only the input and output sockets of filters 3 and 4 are available in the SYNTH view – the controls and switches are located in the TWEAKS & FX page. If you would prefer to see everything in a single panel, try the 'GearPorn' skin (see Preferences).

Envelopes

Bazille has 4 identical envelope generators, any one of which can be selected as "amp envelope" in the output modules, or connected to any input you like.

To reduce clutter in the SYNTH page, controls we thought the average user would adjust less often while creating patches have been relegated to the TWEAKS & FX page.

A D S R

Bazille's envelopes are based on the familiar ADSR type i.e. they have the standard parameters **A**ttack time, **D**ecay time, **S**ustain level and **R**elease time. Of course there are a few interesting extras under the hood…

Rate Mod

Envelope speed modulation. If you select KeyFollow as source and dial in a negative amount, the envelopes of higher notes will be shorter, which is typical of plucked acoustic instruments.

Remember that envelopes can even modulate their own rates and amplitudes. This 'recursive modulation' can deliver some unusual envelope shapes.

Fall/Rise

This causes the normally flat sustain stage to either fall (with negative values) or rise (positive values). Fall/Rise values closer to the centre mean a slower rate. Note: There's a parameter in the TWEAKS & FX page called F/R Range which limits how far the sustain will fall or rise.

Amp Mod

The amount that the envelope's output is modulated by the selected source.

That Amp Mod is bipolar opens up a few unusual possibilities: For instance, if the source is also bipolar and you set a negative modulation amount, the envelope output can actually increase beyond its normal limit. Experiment with an unconnected CV2 first, then LFO2 triangle.

Velocity

This knob scales the envelope level via MIDI velocity, so lower velocities result in lower levels.

Outputs

At the end of the synthesis chain there's always an amplifier unit, otherwise you wouldn't hear anything! In analogue synthesizers this is often a VCA (Voltage Controlled Amplifier). The output VCAs in polyphonic synths usually have dedicated envelopes, while Bazille offers you a choice.

Even modular synths should be stereo, so Bazille gives you two channels with pan controls:

the two Output panels

Parallel inputs

Each output channel has two signal inputs, which are summed together. Like in the filters, having dual inputs here saves the multiplex units for more worthy tasks.

Volume

A level control with envelope selector. Choose any of the envelope generators (*Env 1* to *Env 4*) or Gate (a simple 'maximum sustain' envelope with short attack and release).

Note that the ultimate volume control is actually the *Output* knob in the upper bar.

Pan

Either the stereo pan position, or pan modulation depth if a source other than *none* is selected.

Processors

The panels below each LFO contain various signal processors which will accept any kind of input, control or audio. See the [Processor tricks](#) for practical examples.

The two processor panels, with Sample & Hold on the left, Quantizer on the right

Inverter

Simply inverts the phase of the input signal. Modulation wheels go down instead of up etc..

Rectifier

Full wave rectification: all negative values become positive.

Sample & Hold

Each time the Trigger signal passes through zero in the positive direction, a 'sample' is taken of the input signal, and this 'voltage' is held until the next trigger arrives. Of course you should immediately patch noise to the input, an LFO to the trigger, and the output to either oscillator pitch modulation or filter cutoff!

Lag Generators

Similar to Glide, the lag generators can be used for smoothing out any signal. The attack (A) and release (R) knobs give you independent control over positive and negative transitions. To familiarize yourself with these controls, try processing a square LFO modulating oscillator pitch. Then you could try using a lag generator as a primitive lowpass filter.

Each panel contains two lag generators, with shared attack and release times.

Quantizer

Signals are effectively forced towards discrete, equally-spaced 'voltages' i.e. steps. The central knob controls the number of those steps.

MIDI & More

At the bottom left of the SYNTH page is a panel containing nothing but sockets…

noise outputs   **CV inputs**

MIDI control sources   **internal control sources**
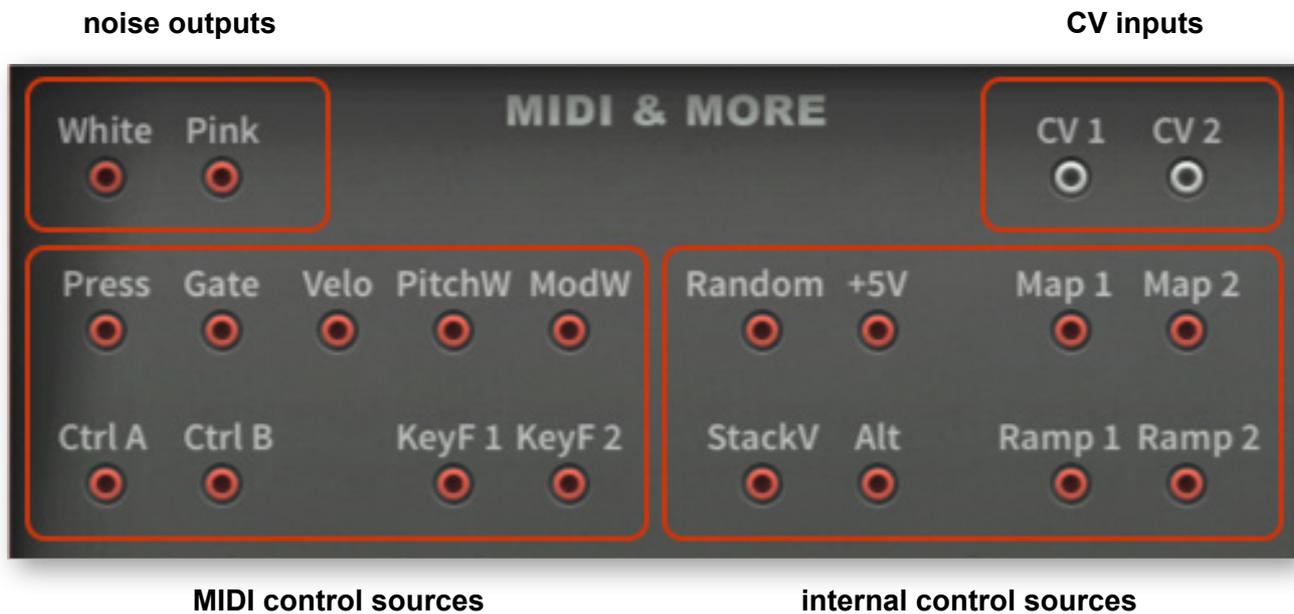
Noise

Two differently coloured noise sources: *White* is a full-range random audio signal suitable for bright percussion or 'steam' sounds etc.. *Pink* contains more low frequencies, and is probably the better choice for wind/wave effects or low-frequency 'grunge'.

Tip: An absolute classic… Noise → Sample & Hold (triggered by LFO) → pitch or cutoff.

MIDI Control Sources

The lower left half of the panel contains MIDI data output sockets:

Press / Gate / Velo / PitchW / ModW

As well as generating MIDI note messages (which include *Gate* and *Velocity*), most MIDI keyboards also have a pitchbender (PitchW) and a general-purpose modulation control (ModW). These two are usually implemented as a pair of wheels, but some have joysticks, touch ribbons etc. instead. More fully-featured MIDI keyboards also send aftertouch i.e. channel pressure or poly-pressure (Press).

Ctrl A / Ctrl B

These are user-definable MIDI performance controls set by default to Breath (MIDI CC#02) and Expression (MIDI CC#11) – see Preferences.

KeyF 1 / KeyF 2

Two multi-purpose key follow modulation sources, both comprising MIDI note number plus pitchbend and glide. There are two of these so you can set a glide rate offset for all even-numbered modules, which is included in *KeyF 2*. For more details, see Glide.

Note: Bazille's pivot note is the E below middle C i.e. MIDI note 52. Below this particular note, KeyF 1 and KeyF 2 send negative values, while above it they send positive values.

Internal Control Sources

The lower right half of the MIDI & MORE panel are internally generated sources:

Random

A (single) random value for each played voice.

+5V

A constant 'voltage'. For instance, you can use *+5V* to create DC offsets which affect filter distortion characteristics, or to push parameters beyond their normal ranges.

Stack Voice

A modulation source derived from the voice number within a stack. Identical with +5V when the Stack parameter (TWEAKs & FX / VOICE panel) is set to 1, +5V and -5V when *Stack* is set to 2, and +5V / 0V / -5V when *Stack* is set to 3. This simplicity ends with *Stack* settings of 4 and above, although the limits will always be +5V and -5V.

Alt

Alternates i.e. toggles between +5V and -5V for each successive note.

Map 1 / Map 2

See Mapping Generators in the TWEAKS & FX page.

Ramp 1 / Ramp 2

Additional simple envelopes / LFOs. See Ramp Generators in the TWEAKS & FX page.

CV Inputs

Although control-rate modulation targets (LFO and envelope rates / levels, pan) would normally only accept control-rate sources, Bazille includes a pair of inputs that inject any signal you like into the modulation source drop-down menus.

The CV inputs are particularly useful for pre-processed (e.g. added, multiplied, lagged etc.) control-rate sources, but patching audio-rate signals into a CV can also lead to interesting results. However, please keep in mind that the CV path is updated much more slowly than audio-rate.

Multiplex

The little 'multiple' modules you can find in most analogue modular systems are simple mix/split devices, often just four sockets bridged together. As most modular synths have a very limited number of inputs and outputs per module, multiples are very important – without them it would be difficult to modulate more than one parameter at a time from e.g. an envelope generator, or plug more than one or two audio signals into a filter.

As Bazille's output sockets can accommodate several cables, the humble multiple underwent a serious redesign at u-he, emerging as something so flexible that we had to rename it MULTIPLEX.
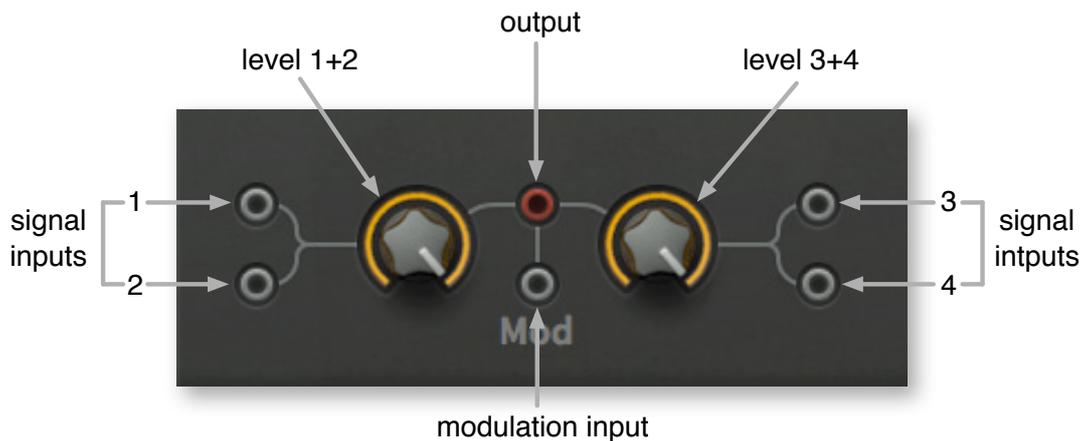
Here are a few examples of what you can do with a *Multiplex*:

Simple mixing / attenuation

The most obvious use of a multiplex is to mix up to four signals. It acts like a regular 4-socket buffered multiple, but with a level control for each pair... and as many outputs as you like!

Ring modulation (RM) / fade in

Ring modulation as audio effect is traditionally used for bell-like sounds, robot voices etc.. In the above example, the signal connected to input 1 is being ring modulated (multiplied) with the signal connected to the Mod (modulation) input. Note: Swapping the regular input signal with the Mod signal will make no audible difference.

Whenever a cable is connected to the *Mod* input, the lefthand knob crossfades from the 'dry' sum of inputs 1 and 2 to the RM signal. In our example, the lefthand knob is at maximum, meaning that the output (the red cable) carries the ring modulated signal only. The value of the righthand knob is irrelevant here, as inputs 3 and 4 are not being used.

As RM is simple multiplication, this configuration can be used for fading signals in. Whatever is connected to the lefthand inputs can be faded in by whatever is connected to the Mod input. Try e.g. using the modulation wheel to fade in the amount of Ramp controlling oscillator pitch.

Amplitude modulation (AM) / fade out

Another classic synthesizer effect like RM – simply use inputs 3 and 4 instead of 1 and 2. In addition to the RM sidebands, the AM output also contains the original signal (but amplitude-modulated, of course). The knob on the right crossfades from the original to the AM signal.

RM can be written as $y = a * mod$, and AM as $y = a * (1 + mod)$. In Bazille's multiplex, however, AM is actually $y = a * (1 - mod)$. There's a good reason for that 'minus' sign...

Like in RM, the level of one signal is controlled by another, but in this case it is inverted – the 'minus' symbol in $y = a * (1 - mod)$. The upshot is that this configuration can be used for fading signals out. Whatever you connect to the righthand inputs can be faded out by whatever you connect to the Mod input. Try e.g. using the modulation wheel to fade out the amount of Ramp controlling oscillator pitch.

Unipolar crossfade

crossfade using a unipolar modulation source

In this example, the modulation signal (green) controls the mix between inputs 1 and 3. If e.g. the modulation wheel is connected there, it will crossfade smoothly between inputs 1 and 3, with complete separation at the extreme values.

Bipolar crossfade

crossfade using a bipolar modulation source

Using bipolar modulation signals for crossfading is less straightforward. To get 100% separation at extreme values you will need to set the lefthand knob to 50.00 and bridge the lefthand inputs to double the level.

Modulation Sequencer

At the bottom right of Bazille's window is a panel containing a dial and 16 sliders. It's a good old step sequencer, isn't it? Well, not quite – though it can be made to behave like one...
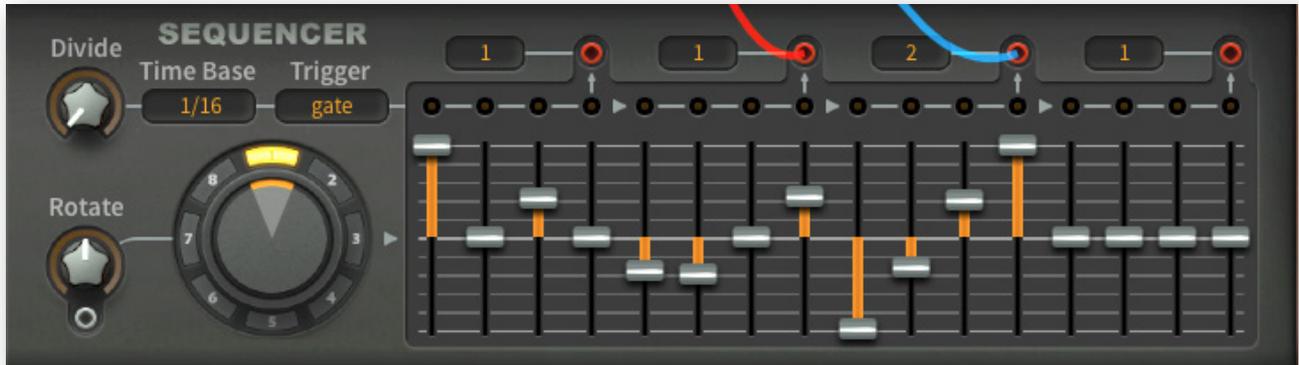
the control sequencer, with two of the outputs ('taps') in use

Bazille's sequencer is quite different from the usual step sequencer. Firstly, it is polyphonic i.e. each played note can trigger its own instance of the sequence. Secondly, it was conceived as a complex source of cyclic modulation, so it doesn't trigger envelopes directly (see the instructions for Envelope Triggering via Modulation Sequencer).

Divide, Time and Trigger

The controls in the top left of the panel determine the speed, and how the sequencer is triggered:
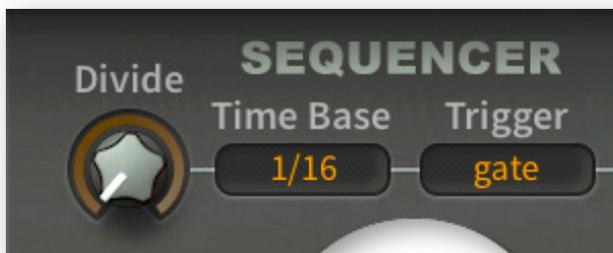
Divide

The *Divide* knob accelerates the sequencer by dividing the *Time Base* by up to 16.

Time Base

Specifies a time base like in the LFOs, but with only the 1/16, 1/1 and 1s options.

Trigger

This parameter specifies how sequences are triggered:

free ....the sequence is started at a somewhat random position for each played note
sync..................the sequence is synchronized to host tempo – chords will be played 'lockstep'
gate ....the sequence is restarted for each played note – broken chords remain 'broken'

Snapshot Dial / Rotate

The large dial is the 'snapshot control center'. It combines several functions and indicators:

Snapshot selectors 1 to 8

currently selected snapshot

realtime snapshot position indicator

snapshot position pointer

snapshot position control

rotation modulation input

rotation modulation amount if socket used, auto-rotate speed if socket unused

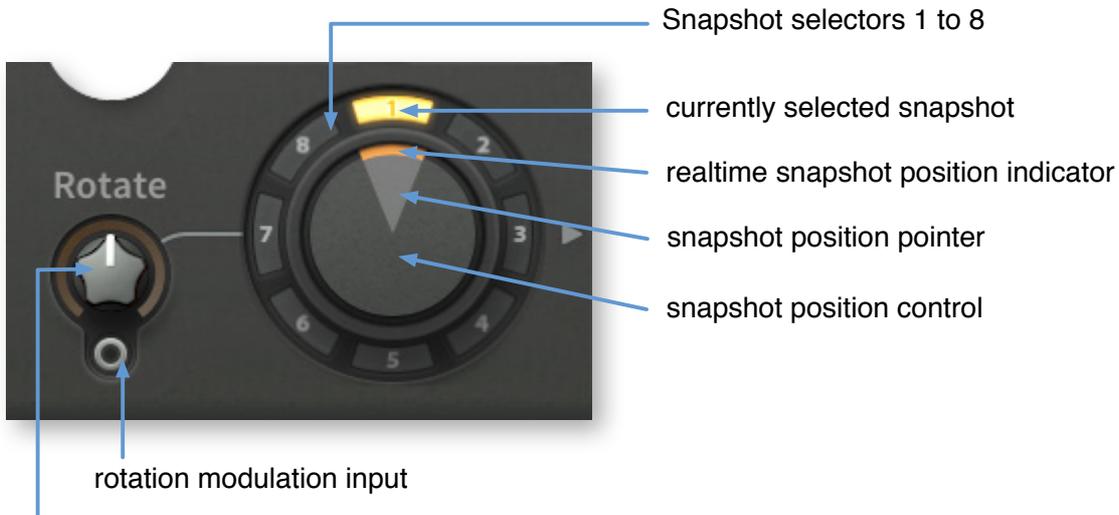Clicking on one of the 8 **snapshot selectors** in the outer rim activates that snapshot for editing via the 16 sliders. Double-clicking on a snapshot selector also moves the current snapshot position.

Snapshot context menus

Right-click on a snapshot selector for the following:

copy ....copies (reads) a snapshot
paste........................pastes (writes) a previously copied snapshot
interpolate.............fills in all snapshots between the right-clicked one and the currently selected one, interpolating the slider values (→ means interpolate clockwise and ← means interpolate anti-clockwise). If you want to copy snapshot 1 to all the others, *copy* from 1, *paste* to 2, right-click on 2 again and *interpolate* →.

Right-clicking in the centre of the dial gives you an *Autoselect* option: When this is switched on, moving the snapshot position control also selects the closest snapshot.

Rotate

Rotate lets you morph through the 8 snapshots in one of two ways. If a signal is connected to the socket it will cause the dial to rotate, and the *Rotate* value specifies by how much.

If the socket is left empty, however, the snapshot position will rotate **automatically**, and the Rotate knob will control the speed of rotation relative to host tempo instead. 1.00 here means 1 snapshot every 2 bars, and 8.00 means 8 snapshots every 2 bars. For anti-clockwise rotation, use negative values.

Snapshot Values

To the right of the dial are 16 sliders used for editing the data in each snapshot:

tap speed factor   4 taps (output sockets)

16 bipolar sliders
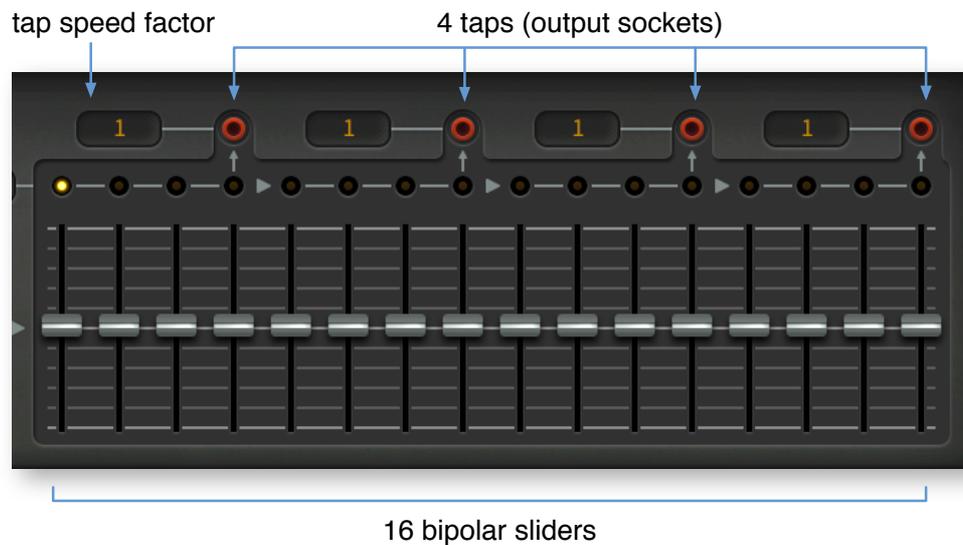
16 sliders

Select a snapshot with the dial, then edit its values using the sliders.

Tip: If you are using the sequencer for standard pitches, the easiest way to get precise semitones is to set the oscillator pitch modulation amount to 50.00 and the sequencer sliders to double whatever transposition you want: Up a wholetone would be +4, up a fifth (7 semitones) would be +14, down an octave would be -24 etc..

4 tap outputs

The four output sockets let you divide the sequencer into shorter sections, which can then be used to modulate different target parameters. Each section can run at a different speed...

4 tap speed factors

The lengths of steps in each tap can be multiplied by setting this number higher than 1. Note that the speed factors of unused taps are simply ignored. To compensate for doubling the speed factor you can also double the value of Divide.

Envelope Triggering via Modulation Sequencer

Although the sequencer was conceived primarily as a complex modulation source, it would have been a shame not to have allowed it to trigger envelopes somehow. Here's how…

ModSeq

The list of envelope trigger options (see the envelope panels in TWEAKS & FX) includes two 'ModSeq' entries: ModSeq1 means the leftmost used tap, while ModSeq2 means the next used tap along. When envelopes are set to one of these options, the slider values are interpreted as gates with velocities.

Here's an example of how the modulation sequencer might appear while triggering envelopes:
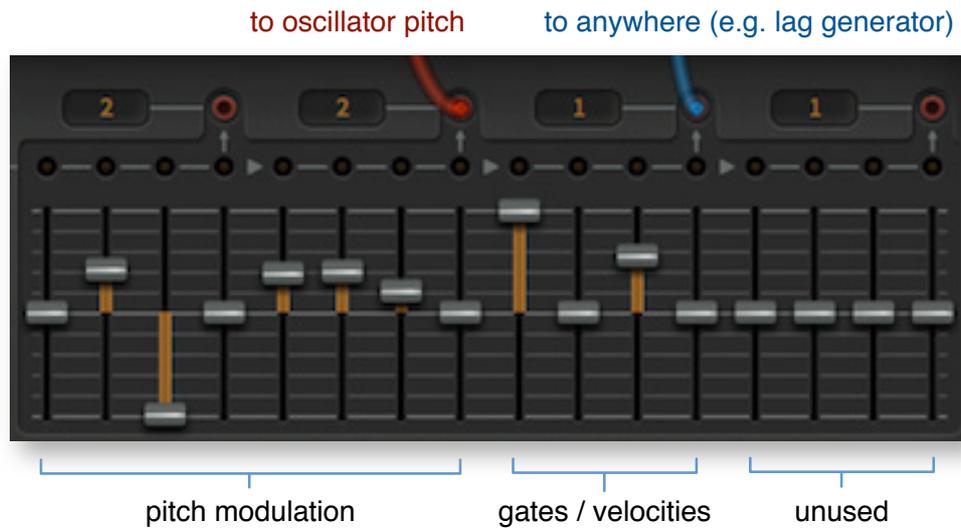
The first 8 values control oscillator pitch via the red cable, while the blue cable is connected to a dummy input e.g. the righthand lag generator. **Important:** That second tap must be connected to something (anything!), otherwise *ModSeq2* remains undefined.

Gates and velocities

When envelopes use the *ModSeq* option, positive values are interpreted as GATE ON including velocity, while zero and negative values are interpreted as GATE OFF without velocity.

Please note that envelope velocity now comes from the sequencer instead of from incoming MIDI notes. Of course regular MIDI note-on velocity is still available in the MIDI & MORE panel.

As gates also need to be closed, the 'ModSeq' part of the pattern will usually have to be set at least twice as fast as the rest. Have a look at the above image: The speed factor of the tap used for oscillator pitch is set to 2 while the speed factor for the envelope trigger (Tap3) it is set to only 1 – twice as fast. Although the Tap1 speed factor is also set to 2, this value is irrelevant as Tap1 is not being used in this patch.

Again: To compensate for halving the overall speed, simply double the value of Divide.

Tweaks & FX

Overview

This view combines what we call 'TWEAKS' (all parameters that wouldn't fit comfortably into the SYNTH panel) with the Distortion, Delay, Phaser and Spring Reverb effects (FX):

the TWEAKS & FX page

Everything in the upper row has to do with voice allocation and/or tuning, with the oscilloscope, Multicore and HQ switches retained from the SYNTH page in the centre.

In the second row down are the two mapping generators.

The third row contains the extra envelope parameters, filters 3 and 4, and two ramp generators.

The bottom row contains four effects panels, with the effect configuration switches to the left. The effects are described in a separate chapter.

Voice

The top lefthand panel contains six options that affect how each voice is created:

Mode

poly ....polyphonic
mono ....monophonic, each new note retriggers the envelopes
legato ....like *Mono*, but doesn't retrigger until a space is left between consecutive notes
duo ....duophonic, oscillators 1 and 3 are 'lowest' *Priority,* 2 and 4 are 'highest' priority

Priority

Note: This parameter only applies to *Mono* and *Legato* modes – it is otherwise ignored.

last ....plays the most recent note (typical of digitally controlled synths)
lowest ....plays the lowest note (most classic USA mono-synths)
highest ....plays the highest note (EMS, most classic Japanese mono-synths)

Voices

Sets the maximum number (2-16) of voices before note-stealing occurs. Mainly used to guard against audio glitches while playing CPU-intensive patches.

Note that in practice, the maximum number of playable voices is less when the amp envelopes have longer release times, and/or if you are stacking multiple voices...

Stack

Sets the number of unison voices. In *Poly* mode, higher *Stack* values will not only seriously reduce maximum polyphony, but will also eat your CPU for breakfast! For how to make effective use of this feature, see stack voice tuning and (especially) the stacking tricks.

Drift

While *Drift* is switched on, all voices are slightly detuned against each other, resulting in less static-sounding chords and stacks.

Soft Attack

Softens the first few milliseconds of all envelopes in order to minimize clicks. Depending on your envelope settings, switching *Soft Attack* on can give your patch more (!) punch.

Pitch

The second panel specifies pitch bend ranges, vibrato depth and pitch offset (transposition):

PB up / down

Most MIDI keyboards include a performance control called a 'pitch bender' (often a centre-sprung wheel) which is used for bending the overall pitch up and down. Bazille's *PB up* and *down* selectors specify the up and down ranges independently, from 0 to 24 semitones then 36 (3 octaves) or 48 (4 octaves).

In the MIDI & MORE panel as well as in the modulation source menus for LFOs, envelopes and mapping generators, this control is called *PitchW* (the W stands for 'wheel').

Vibrato (LFO 1)

Adjusts the amount that LFO pitch modulates all 4 oscillators. For typical performed vibrato, set the LFO1 amp modulation source to *ModWhl*, and turn its depth up to maximum.

Transpose / Fine

The *Transpose* selector shifts the overall pitch in semitone steps with a range of +/- 24, and the *Fine* knob adjusts it in cents within a range of +/- 1 semitone. Note that neither *Transpose* nor *Fine* work in realtime (i.e. during a note), but only when a new note/voice is played.

Glide

The next panel controls 'portamento' – the slurring of pitch / cutoff between consecutive notes:

Amount

Amount sets the basic speed of the Glide for all oscillators and filters (in fact anything that uses key follow).

Offset 2 & 4

Offset 2 & 4 is added to even-numbered oscillators and filters only, as well as to the modulation source *Key2* (KeyFollow2). This means you can set up two different glide amounts, depending on which modules you choose. Here are a few examples:

To make the glide a bit faster for oscillator 2 than for oscillator 1, turn Amount up to e.g. 30, then turn Offset 2 & 4 down to e.g. -15.

To make the glide only apply to filter cutoff, patch oscillators 1 and 3 into filter 2, turn glide *Amount* down to zero, adjust *Offset 2 & 4* to e.g. 35 and set *Key Follow* in filter 2 to 100.

Mode

time ....the glide always takes the same time, whatever the distance between notes

rate ....the glide is proportionally longer when notes are further apart, and shorter when they are closer together

Range

Glide 'strength', a u-he speciality. Lower values shift the start of each glide closer to the target note, which can cause unusual or subtle intonation effects.

Stack Voice Tuning

The 8 knobs set a pitch offset for each stacked voice (range +/- 2 octaves). See stack above.

Stacking and detuning voices against each other can be used to thicken up sounds, or for creating one-note chords. For fine detuning, hold down the SHIFT key before adjusting values.

Note: The modulation source *StackV* can be used for any per-voice offsets you like, e.g. panning, LFO or envelope rates, cutoff...there's plenty of room for creativity here!

Microtuning

Bazille supports the widely-used TUN format. With a bit of searching, you should find hundreds of tables online, most of them free. Put all your .tun files into the following folder:

Win   *C:\Users\YOU\Documents\u-he\Bazille.data\Tunefiles* (local for Bazille only)
Mac   *Macintosh HD/Library/Application Support/u-he/Tunefiles/* (global for all u-he plugins)

Clicking on the long selector opens a floating browser containing the .TUN files (you might have to refresh the list via right-click first). After selecting a microtuning file, remember to switch it on!

Mapping Generators

Bazille's two mapping generators are lists that can hold up to 128 values. They can be used either for processing modulation sources, or as oscillator waveforms via the TapMap option.
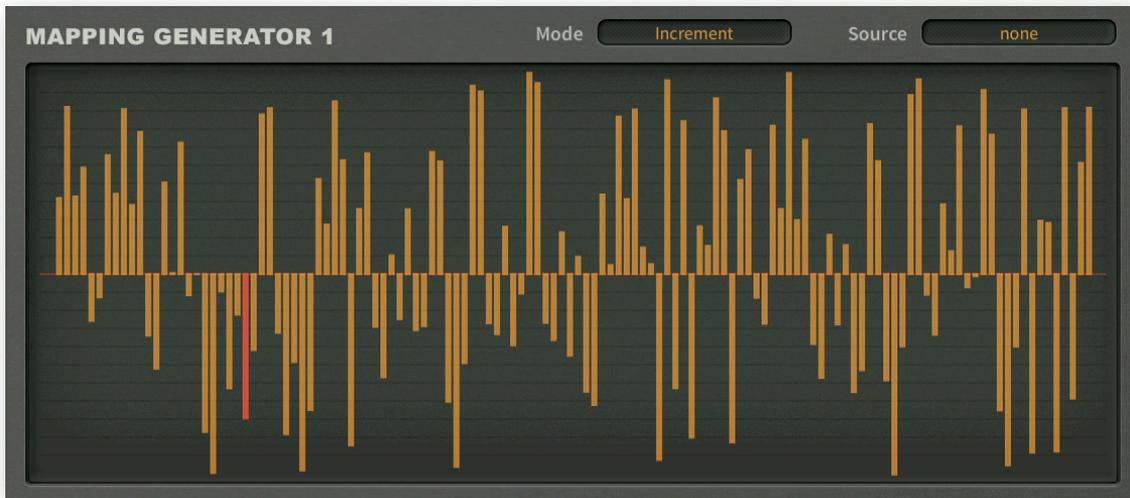
maps can have up to 128 steps, and the drawing tools help you create custom shapes

Mode

The lefthand *Mode* selector specifies the basic function:

Key..............................128 MIDI notes, like a programmable key follow. Short maps will repeat e.g. use only 12 values for consistent offsets across all octaves.
Map Smooth..............modulator values interpolated for smooth transitions
Map Quantize............modulator values, no interpolation for more immediate transitions
Increment...................consecutive notes step through all values in the map

Note: The two *Map* modes aren't active unless you define a modulation source…

Source

The righthand selector specifies the modulator to be processed in one of the *Map* modes. This setting is ignored in the *Key* and *Increment* modes.

Drawing and Selection

To edit a map, simply draw in the windows by clicking and dragging. If you want to draw straight lines, hold down **ctrl** (Win) or **opt** (Mac) beforehand. Note for Mac users: The ⌥ key was once labelled *alt* and more recently *option.* For this user guide, we decided to shorten it to it **opt**.

To highlight a selection, hold down the **SHIFT** key: the functions (see below) are restricted to a selection (if one exists). To deselect everything, either click in the background i.e. away from the selection, or choose 'deselect' from the *selection* sub-menu of the context menu.

Context menu

Right-click on a Mapping Generator's window to open a long list of editing tools. The current implementation is rather 'geeky': Future versions might use selector fields and buttons instead. For now, just remember that **shift** is used for selection and **alt** (Win) or **cmd** (Mac) is for applying the selected draw option.

Copy / Paste ....copies the current map to the clipboard, or replaces the current map with a previously copied one.

Shapes...................creates a *ramp*, *triangle*, *sine*, *cosine*, *root, quadric,* or transforms the map via *spectralize* (see below).

Alt / Cmd-Draw....sets the draw mode to *erase*, *scale* (multiply), *shift* (move) or *warp* (bend)*.* To apply the function, hold down **alt** (Windows) or **cmd** (Mac) before clicking in the edit window.

Selection ....applies functions to the current selection: *Invert, Shift Left, Shift Right, Select every 2nd / 3rd / 4th.* If nothing is currently selected, only the three 'every' options will appear in the sub-menu.

Reverse ....flips the current selection horizontally

Invert......................flips the current selection vertically

Randomize ....adds a random offset to all selected values

Soften......................removes abrupt transitions

Normalize..............expands vertically to minimum / maximum

Make Unipolar .....shifts all values into the positive, rescaling if necessary

Straighten ....draws a straight line for the selection / window

Reset ....sets all values in the map to zero

Quantize...............adjusts values to an equal-spaced grid. Tip: Select 12 here and use the map for pitch modulation (also set the modulation depth in the oscillator to 12)

2–128....................sets the number of values used in the map

Copy	
Shapes	▶
Cmd-Draw	▶
Selection	▶
Reverse	
Invert	
Randomize	
Soften	
Normalize	
Make Unipolar	
Straighten	
Reset	
Quantise 4	
Quantise 6	
Quantise 8	
Quantise 12	
Quantise 16	
Quantise 24	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
16	
24	
32	
48	
64	
96	
128	
Lock	

Spectralize

Especially useful for [TapMap](), the *spectralize* function (in the *shapes* submenu) interprets the map data as levels of partials in the harmonic series. With random phases set per partial, these are transformed into the corresponding waveform and the number of values automatically set to maximum (128). See the [additive synthesis]() tip at the very end of this user guide.

Envelope Extras

These four little panels contain a few extra envelope parameters:

Snappy

This switch makes the Decay and Release more exponential. Although it drops faster at first, it slows down considerably so that the envelope will often seem longer overall:

F/R Range

See also Fall/Rise. This parameter limits how far the sustain phase can fall towards zero or rise towards maximum. *F/R Range* sets a percentage of the difference between the *Sustain* value and zero or maximum, like in these examples:

Fall/Rise	F/R Range	Sustain	Level after F/R
negative values	50 %	80	40
	25 %	80	60
positive values	50 %	80	90
	25 %	80	85

In this table, the level of the envelope after F/R is either half way (50%) or a quarter way (25%) between the value of *Sustain* (set to 80 here) and maximum (100) or minimum (0).

Trigger

Envelopes can be triggered / gated by sources other than incoming MIDI notes:

Gate .... Gated by incoming MIDI notes only

Loop .... Like *Gate*, but automatically restarts at the end of the Release stage

LFO1/2 .... Gated by an LFO: Wave adjust the gate length, Phase positions it in time. For more details see Envelope Triggering via LFO.

ModSeq1/2 .... Triggered by the modulation sequencer. *ModSeq1* is the leftmost used tap, *ModSeq2* is the next used tap to its right. For details, see Envelope Triggering via Modulation Sequencer.

Filters 3 and 4

Although the panels for filters 3 and 4 look different from those in the SYNTH page, the parameter set is almost the same:

Note: In filters 3 & 4 the amount of resonance cannot be modulated, the cutoff modulation sources are selected instead of patched, and they only have LP24, BP6 and HP12 outputs (see Filters).

If you need to modulate filter 3 or 4 cutoff from something not available in the source menu e.g. the sequencer, patch that signal into one of the CV sockets, and select that CV as modulation source.

Ramp Generators

If you find that four envelopes and two LFOs aren't quite enough, you should take a look at the ramp generators, which can fulfill either of those roles (and a bit more):

Up / Hold / Down / Rest

The ramp is not a simple linear attack-release (AR) type envelope, but an attack-hold-decay (AHD) with an 'off' time. Its closest relative is the 'trapezoid' envelope in the EMS *Synthi A* and *VCS3*.

Up is the attack time, after which the signal stays at maximum for a period set by *Hold*, followed by is the release time *Down*.

Rest specifies the time before the ramp repeats: If Rest is set to maximum, the ramp is a 'one-shot' envelope. To make it repeat after the same time as 100% *Hold,* set Rest to precisely *99.99%.*

Clock Mode sets the Ramp values either to seconds, or to a factor relative to host tempo (1/4, 1/1 or 4/1) without full synchronization i.e. ramps are only triggered by MIDI notes, not at bars/beats.

Effects

At the bottom of the TWEAKS & FX page are four effect panels: DISTORTION, DELAY, PHASER and SPRING REVERB:

FX Control

The block on the left is used for switching and re-ordering the four effects. Click to switch an effect on (bright, like in this image) or off (dark). Click and drag up or down to reorder the effects.

Distortion

Bazille's *Distortion* unit creates traditional tube as well as transistor-type saturation. It can emulate a complete guitar amp including the speaker cabinet. Tip: You can use the Distortion effect as a fairly clean EQ if you keep the input level down.

The basic signal flow is:

input amp → pre tilt filter → distortion → post tilt filter → post filters → output amplifier

Input

Sets the gain (decibels) at the input, and therefore how hard the input amp is driven.

Output

Sets the gain at the output, and therefore how hard the output amp is driven. Note that there is a final soft-clipping stage, which can create some extra distortion when turned up 'too high'.

Type

Tube Class A	Simulates a complete tube preamp. 'Class-A' means a single vacuum tube with DC bias that creates odd and even harmonics. Due to the asymmetry of the curve, class-A distortion sounds relatively warm.
Tube Class AB	Simulates a preamp with a pair of tubes in a 'push-pull' configuration, resulting in symmetrical distortion without any even harmonics.
Tube 2 Stages	Simulates a preamp with two class-A stages in series. Like simple class A, this also creates odd and even harmonics, but the results are richer and more dynamic. This mode applies internal filtering and feedback for more sonic complexity. Note: High gain settings will give you extra bass.
Hard Clip	Simply chops the top and bottom off the waveform.
Rectify	Full-wave rectification – the negative half-wave becomes positive, and DC is removed from the resulting waveform.
Foldback	Foldback distortion is similar to soft-clipping, but increasing the gain doesn't slam the signal against the 'ceiling'. Listen out for strange intermodulation effects in this mode!

Pre Tilt

A low and high shelving combination EQ is applied to the input, and *Pre Tilt* makes the distortion frequency-dependent (at zero, the response remains flat). Negative values tend to strengthen the bass and weaken the treble, while positive values have the opposite effect.

Post Tilt

Balances the tone after the distortion, e.g. to compensate for *Pre Tilt*.

Center Freq

Combined low and high shelf cutoff frequency control.

Post Filter

Dual-Band Shelf	A simple corrective EQ: a low shelf at 100Hz, and a high shelf at 10kHz.
Guitar Cab 4x12	Emulates the frequency response of a certain popular speaker cabinet, producing its typical mid-range focussed sound. Includes the peaks and troughs caused by cabinet resonance, as well as close-mic effects.

Low / High

In *Dual-Band Shelf* mode, they control the gains of the shelving filters. In *Guitar Cab 4x12* mode they set the amount of cabinet resonance (i.e. bass response and speaker 'edge').

Delay

A host-synchronized stereo delay with 'tape wow' and filtered feedback:

Center / Left / Right

Delay times relative to host tempo, separate for each stereo channel. Precise integer values are semiquavers (16ths).

Center defines the overall Feedback time. This is unusual, it means that you can set a repeat rate without actually hearing that particular 'tap' – simply turn *Center Vol* down to zero.

Volume

Level controls for the center tap and for the left / right taps (together).

Wow

Emulates slow tape 'wobble', ranging from subtle / spacey to almost seasick!

HP / LP

These are separate cutoff controls for the highpass and lowpass filters within the feedback path. For the damping effects typical of tape delays, increase *HP* and decrease *LP*.

Feedback

The amount of regeneration within the delay circuit. 100.00 will give you an infinite loop if HP is set to minimum and LP to maximum – well worth trying out!

Dry

The level of the unprocessed signal.

Phaser

Bazille's *Phaser* emulates two classic stomp-boxes, but also includes a host-syncable motion LFO.

Type

The *Stoned* option is pure but very 'trippy', the *Flanged* option is highly resonant – particularly dramatic when applied to very bright or noisy sounds.

Rate

Motion LFO speed. If *Sync* is switched on, the value is measured in beats ('quarter notes') so the rate gets slower as the value increases. Example: For one cycle every 3 bars in 4/4 time, set *Rate* to 12.00 (3 times 4). If *Sync* is switched off, the rate gets faster as the value increases, with a range of about once every 30 seconds up to about 5Hz.

Depth

Motion LFO depth. Turn this down for more subtle or even static effects.

LFO Phase

Offset 0° to 360° for the LFO. Especially useful for positioning the 'curve' of the phasing effect when the LFO is synchronized (see *Sync* above).

Wet

Balance between the unprocessed and processed signal.

Sync

Synchronizes the Phaser's LFO to the host tempo. Note: When switched on, only very low Sync values will give you a fast motion LFO. See also *LFO Phase* above.

Center

Offsets the basic delay(s) at the heart of this effect. To get a 'feel' for this parameter, turn Feedback up, Depth down to minimum, then sweep Center between 0 and 100.

Feedback

Controls the degree of resonance.

Stereo

Offsets the phase of the motion LFO between the left and right channels. Note: If the phaser Type is set to *Stoned*, the stereo effect is actually reduced by turning Stereo beyond -25 or +25.

Spring Reverb

And finally... a spring reverb! This is a highly unusual effect to be modeled in a synthesizer. The idea was to offer a kind of reverb that was (oddly) suitable for Bazille sounds, something that could add a special sheen not available in other synths. Bazille's spring reverb emulates a typical dual spring system, with junctions near the middle. So here it is, complete with 'shake' effect:

Note that spring reverberation sounds very different from standard room or hall-type reverb effects. The distinct delay patterns result directly from the spring lengths and their nominal delay times (34ms & 41ms here). Also, springs create frequency-dependent dispersion, as high frequencies travel for a longer time than low frequencies.

Tone

A simple tilt-type tone control, from dark to bright. You should try extreme values here, although real spring reverb is normally quite flat but with few high frequencies.

Decay

Controls the amount of natural damping occurring at both ends of the springs as well as at the junction in the middle. Of course minimum *Decay* means maximum damping.

Drive

Transducers are non-linear devices, so they can be overdriven. *Drive* simulates the inherent non-linearities of real spring reverb units.

Tension

How tightly the springs are mounted in the reverb tank. Looser springs oscillate at lower frequencies, the sound is less dense and dispersed. Conversely, tighter springs oscillate at higher frequencies, the sound is more dense and dispersed.

Width

Stereo separation between the two springs – physical differences between them become more apparent. When *Width* is set to maximum, the two spring systems are hard-panned to the left and right channels. The most faithful, 'true' spring reverb sound is monaural (0% width).

Dry / Wet

Separate volume controls for the untreated (dry) and processed (wet) signals.

Shake

Simulates the 'thunder' effect of knocking the unit – the springs hit the metal walls of the tank.

Configuration

Click on the cogwheel icon at the top right to open the global configuration pages, where you can adjust the UI size and brightness as well as connect Bazille parameters to MIDI continuous controllers.

A vertical row of 4 buttons will appear: Close [X], MIDI Learn [L], MIDI Table [≡] and Preferences [tools]. Right-click within the row of buttons to set the current page as default.

MIDI Learn

Bazille can be remote-controlled / automated via MIDI messages from a hardware controller unit or from the sequencer program. Click on the configuration button and select the 'L' icon…
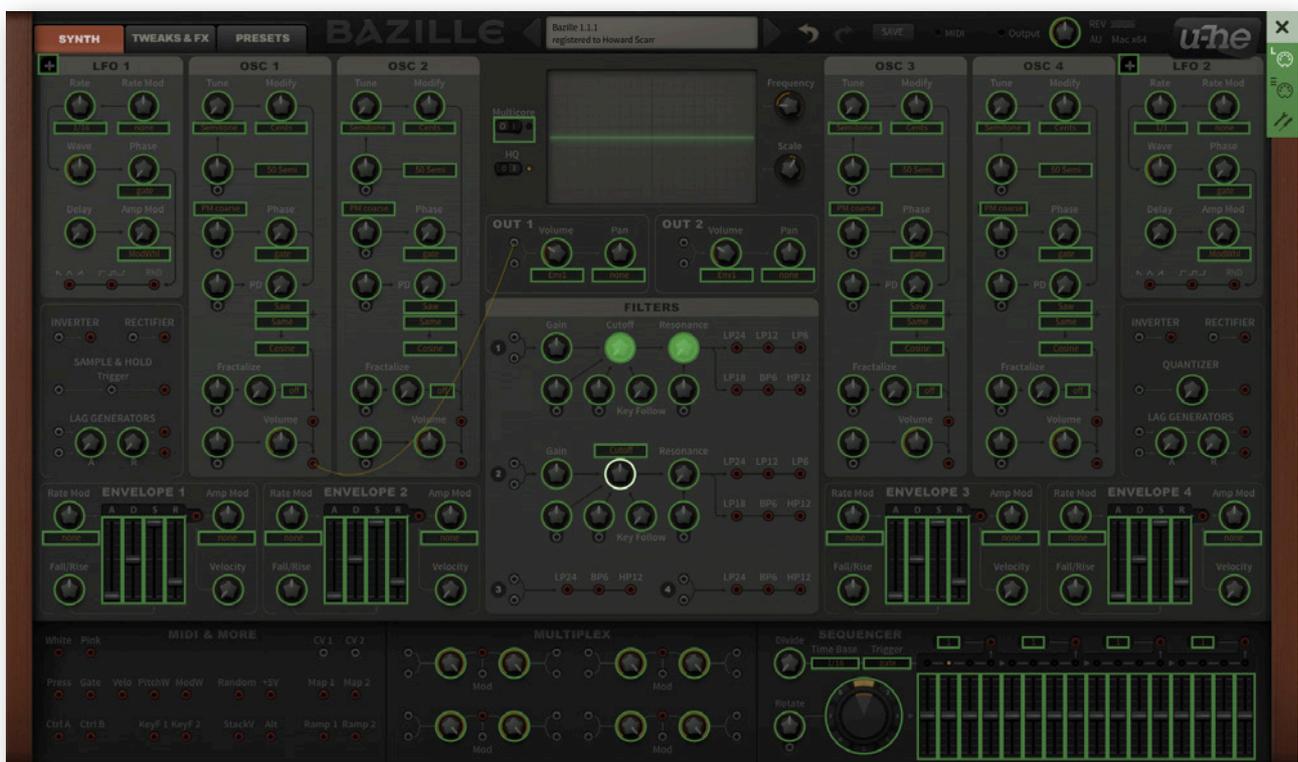
The MIDI Learn window is an overlay with all MIDI-learnable elements appearing as selectable outlines. Controls that are already assigned appear filled (like the Filter 1 cutoff and resonance controls in this image), and the currently active control is highlighted (like Filter 2 cutoff here). Note that the SYNTH and TWEAKS buttons remain active, you don't have to exit the configuration pages to access all parameters.

Try it: Click on Filter 1 cutoff and send some MIDI CC data (move a knob or slider on your MIDI controller) — the connection is made instantly, and applies to all instances of Bazille.

About MIDI CC

Now officially 'Control Change' (no longer 'Continuous Controller'), MIDI CC is a multi-purpose message format used for editing and performing presets.

Note: CC isn't the only kind of MIDI performance data. There are other message formats for note on/off (including velocity), pitch bend and two kinds of aftertouch.

Although the MIDI Manufacturers Association (MMA) was kind enough to leave most of the CC numbers undefined, two of them have specific meanings which are also recognized by Bazille:

CC#01 = modulation wheel
CC#64 = sustain pedal

Bazille version 1 also offered the sources Breath (CC#02) and Expression (CC#11), which we have replaced with the user definable 'Control A' and 'Control B'. See Preferences below.

You don't actually need a breath controller (for instance) or an expression pedal to make use of CC messages. Most of the names are simply convention these days: you can use anything that can send a CC, e.g. a knob on your MIDI keyboard or a controller lane in your MIDI sequencer.

MIDI Table

Click on the configuration button and select the [≡] MIDI icon button to open an editable list of all current MIDI CC assignments:
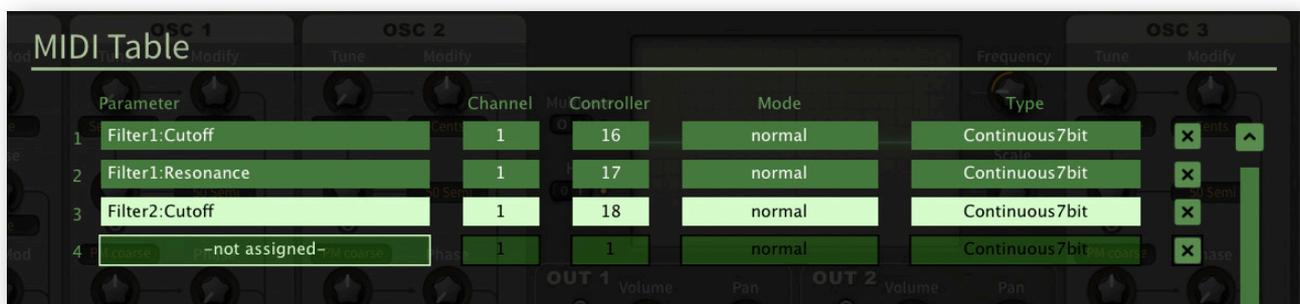
Parameter

The first field displays/selects one of Bazille's many parameters, which are sorted into sub-menus. Click on the 'Add' button at the bottom and experiment with this option.

Channel / Controller

The next two fields are for MIDI channel and CC number.

Mode

Specifies the range and/or resolution of values.

Normal ....full range, continuous
Integer...................................full range, whole numbers only
Fine...0.01 steps between the two integers closest to the current value

Type

Specifies the type of hardware (by far the most common is Continuous 7-bit).

Encoder 127..........................'relative mode' endless rotary controls that repeatedly send the CC value 1 when turned in the positive direction, or 127 (interpreted as -1) when turned in the negative direction
Encoder 64............................'relative mode' endless rotary controls that repeatedly send the CC value 65 when turned in the positive direction, or 63 when turned in the negative direction
Continuous 7-bit ....7-bit MIDI CC (normal resolution, most common)
Continuous 14-bit................14-bit MIDI CC (high resolution, rare)

Removing Assignments

To remove individual assignments click on the small [X] to the right of each line. To remove all assignments click on the [Delete All] button at the bottom of the MIDI Table window.

Preferences

Click on the cogwheel then the 'tools' icon to open the Preferences window:

CONTROLS

Mouse Wheel Raster

If your mouse wheel is rastered (you can feel it clicking slightly while you roll the wheel), set this to 'on' so that each click increments the value in sensible steps.

Scroll Horizontal

Any preset folders that contain more files than can be displayed in the window can be scrolled pagewise via mousewheel etc.. Opinions differed as to which wheel direction should move to the bottom of the list, so we made this optional!

APPEARANCE

Cable Opacity

solid, *see-thru*, *x-ray* or *ghosted*

Cable Style

thick, *slim*, *line*, *hair* or *natural*

Default Size

The GUI size for each new instance.

Default Skin

Selects one of currently 2 skins and sets this as the global default. Bazille experts are likely to favour the *GearPorn* skin, as all parameters appear in a single window.
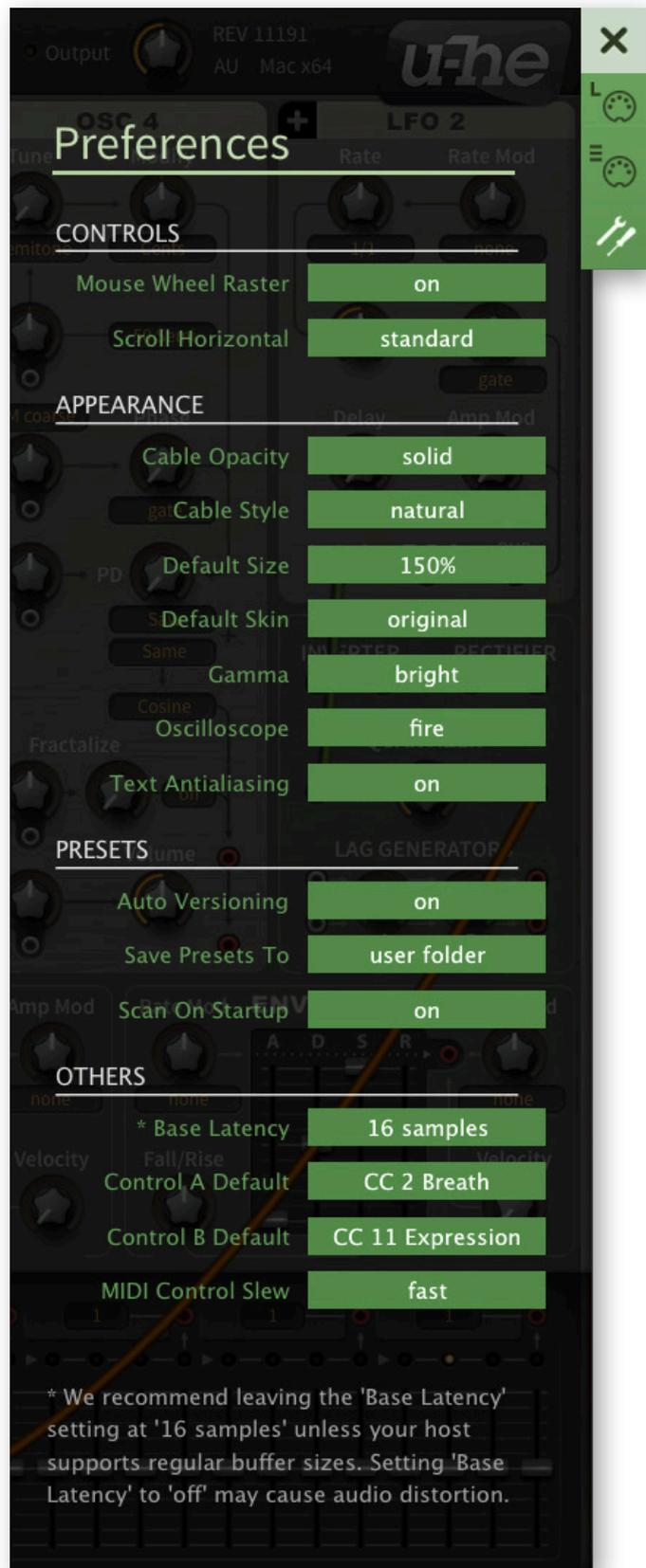
Gamma

Controls overall brightness.

Oscilloscope

Sets a default effect. See Oscilloscope.

Text Antialiasing

Smoothing of labels and values. In rare cases, switching off improves readability.

PRESETS

Auto-Versioning

If this option is switched on, a numeric index is appended to the preset name and automatically incremented each time you save under the same name.

Save Presets To

Choosing the *user folder* option causes all saved presets to land in the User folder instead of the currently selected one.

Scan On Startup

Whether the preset library should be scanned and the database recreated when the first instance of Bazille is started, e.g. when you reopen a project.

OTHERS

Base Latency

If you are certain that your audio system – hardware as well as software – uses buffers that are a multiple of 16 samples in size (please refer to the respective documentation), you can safely disable Bazille's base latency here. Otherwise leave it set to '16 samples' to prevent crackles.

Note that a new Base Latency setting will only take effect when the host allows e.g. on playback or after switching the sample rate. Reloading Bazille will always work.

Internally, Bazille processes audio in chunks of n x 16 samples. This so-called 'block processing' method significantly reduces the CPU load and memory usage of all our plug-ins.

For example. if the number of samples to be processed is 41, Bazille will process the first 32 and keep the remaining 9 in a small buffer (16 samples is big enough). Those 9 samples are then processed at the start of the next call… and so on.

The extra buffer is only necessary if either the host or the the audio driver processes 'unusual' buffer sizes. In the many host applications that process buffers of 64, 128, 256 or 512 samples (all multiples of 16), try switching it off so that Bazille can process latency-free.

Control A/B Default

The list of modulation sources in the previous Bazille version included two more fixed MIDI controls: Breath (CC#02) and Xpress (CC#11). While retaining backwards compatibility, we replaced these with user-definable Control A and Control B sources.

MIDI Control Slew

This option lets you change the strength of performance control smoothing applied to pitch bend, modulation wheel, Control A, Control B and Pressure. The default setting is 'fast'.

Tips & Tricks

The next few pages are chock full of more or less useful programming techniques, several of which were kindly supplied by early adopters of Bazille. Somemay seem too obvious, while others are so twisted that they will take a good while to grasp!

Most of the tricks have corresponding example presets you will find in the TIPS & TRICKS folder. But first, some advice...

General Tips

Less CPU

Although classic modular synths are single-voice, Bazille offers up to 16 at the same time. Go easy on your CPU, use *legato* or *mono* mode (TWEAKS & FX / VOICE / *Mode*) unless you really need polyphony, or set *Voices* to only 4 if that's enough. Keeping the maximum polyphony low also means you can set longer envelope release times without overtaxing your system.

Try switching *Multicore* on. If the CPU usage doesn't drop at least a bit, switch it off again.

Experiment

It's all too easy to limit your options by basing your patches on typical 'fixed architecture' synth signal flow. *Three LFO-wobbled oscillators sent through a pair of filter in parallel, with envelopes modulating both cutoff frequencies* isn't really pushing Bazille into new territory.

Bazille is a true modular synthesizer, it begs you to *connect an almost-self-resonating bandpass filter into an oscillator's phase modulation input, use that oscillator to modulate the resonance while a sampled & held triangle from a pressure-driven mapping generator modulates the rate of an LFO multiplied with the oscillator's output*. Or similar!

Keeping it clean

Before calling your patch 'ultimate final', and while you still understand the spaghetti you have just cooked, it's a good idea to remove unused cables and even set unused parameters back to their defaults (if you're so inclined). Neat and tidy patches are much easier to understand and improve when you revisit the patch.

Like in hardware modular systems, there's no cure-all for cable spaghetti. If you have a choice, connect neighbouring modules together in preference to more distant ones.

Re-use modulators

Sending one modulation source to multiple destinations can make patches more rhythmically coherent and manageable. For instance, you could use an LFO's square for one modulation (e.g. pitch), its triangle for another (e.g. cutoff), highpass-filtered lagged square for a third (e.g. Fractalize) and rectified triangle for a fourth (e.g. oscillator volume).

Performance controls (wheels, pressure, velocity) modulating several parameters at the same time can make your patch react to your playing more like a real (acoustic) instrument.

Future reference

Whenever a certain behaviour isn't 100% clear, read the appropriate section of this user guide again, and if necessary devise minimalistic experiments to test how things work.

Remember: You can jump between chapters by clicking on the links at the bottom of each page, or jump to the start of each chapter using the links at the top of each page.

The TIPS &TRICKS folder contains example patches for most of the following techniques.

Oscillator Tricks

DX-type 'FM'

Load *init* and turn OSC1 'PD' up to maximum. Patch the lower OSC 2 output to OSC 1 phase modulation input (*PM coarse*) and turn the amount up to about 50. Play a note: You should hear a bright 'digital' waveform. Turn OSC 1 'PD' back down to zero for a pure sine carrier like in the original DX – the tone becomes less bright, more hollow.

Patch envelope 2 into OSC 2 volume modulation input (near where the two cables cross each other), turn the knob up to about 50 and take the Volume all the way down. In envelope 2, drag the sustain (S) slider down to minimum and Velocity up to maximum. The patch should sound a bit like a simple DX piano already. Adjust ENV1 and ENV2 release times (R) to taste.

Switch OSC 1 and OSC 2 Tune modes (currently *Semitone*) to *Overtone*. Now experiment with different overtone relationships by adjusting the Tune value in both oscillators. You could also try some tune modulation from an LFO or whatever. Then create a second layer using oscillators / envelopes 3 and 4... Finally, switch the Tune mode of one of both oscillators back to Semitone and experiment further!

Ponder this: Bazille is actually capable of 8-operator FM by using all four oscillators plus four self-oscillating filters.

Sub-oscillators

It's very easy to add a phase-locked 'sub-oscillator' in Bazille: Select *Saw* as your fractal wave, but leave the amount at zero. Note: *Tri* delivers great bass, and *Max* is, perhaps surprisingly, the most subtle option when applied to a sawtooth (turn the amount up a tiny bit for some grit).

Alternative: Instead of (or as well as) using fractal resonance, try setting the lower PD waveform to something other than *Same*.

PWM 1 (tip by 3ee, xh3rv, adrian b)

Bazille's oscillators don't offer *Pulse Width Modulation* directly, but you can get there using a Mapping Generator: Select 2 steps (only) for map 1, set one of the values to maximum and the other to minimum. Select *Saw*, *Same* and *TapMap1* in your oscillator. Move the PD knob and watch how this affects the pulse width. Leave the PD knob at 30, patch LFO2 triangle output to the PD modulation input and turn the amount up to 30.

• For a more analogue feel, set the LFO and OSC phase restart options to *random*
• Try different combinations of oscillator waveforms
• Remember that *TapMap* oscillators will alias more than *Cosine*

PWM 2 (tip by xh3rv)

The classic Minimoog™ method doesn't use a map or LFO, but needs two sawtooth oscillators. Invert and detune one of them for a rich PWM effect. Instead of (or as well as) detuning, you can use phase modulation for a wide variety of PWM-type effects.

If you don't want the start of each note to sound exactly the same (you probably don't), make sure that at least one oscillator's Phase mode is set to either *random* or *catch*.

PWM 3 (tip by xh3rv)

This trick also uses a pair of oscillators, but works by audio-rate phase modulation i.e. 'FM'. Take a square wave and patch a sine of the same pitch into its phase modulation input. Your 'pulse width' control is the level of the sine wave, which you can modulate with e.g. an LFO.

PWM 4

The Quantizer method: Load *init*, patch OSC1 sine wave to a Multiplex. Send a unipolar triangle LFO to that same Multiplex. Finally, send the mixture via Quantizer left at minimum to one of the outputs. Insert a lag generator between LFO and Multiplex to smooth the effect.

Wobbly teeth

Yet another PWM-type effect, but this time for sawtooth:

* Load *init*
* Restrict *Map1* to 64 values, create a ramp (/shape/ramp), then set it back to 128 values
* Switch oscillator 1 shape from Cosine to *TapMap1*
* Patch LFO2 triangle to the PD socket, set both the modulation amount and PD amount to 40
* Select LFO2 mode 1s and adjust the rate to taste
* Also try *2pulse* PD instead of Saw

To save an LFO, you could try using a Ramp as modulation source instead (Up=60, Hold=0, Down=60, Rest=0). As the Ramps are unipolar, set the PD amount to 0.00 and PD modulation depth to about 80. You could even use a regular oscillator in *Herz* mode, but a triangle as modulator for PWM-type effects usually sounds smoother than a sine wave.

Multiple squares (tip by sendy)

Select 6 or 8 steps and create a multi-cycle square wave by setting the values of alternate steps to minimum and maximum. Apply phase distortion for a 'ringing guitar' feedback sound, then try different waveforms... so many possibilities!

Triangles

Load *init*, set Mapping Generator 1 to a triangle wave (right-click / shapes / triangle). In OSC 1 select the *TapMap* option instead of the default *Cosine*, and leave the PD amount at minimum. Then try sweeping the PD value and selecting different oscillator shapes. With *Cosine* and the PD knob at maximum (beyond the screech), *Res II* also delivers a triangle wave. However, low notes sound buzzy, and even moderately high notes will seriously 'alias'.

Other waveforms 1 (tips by xh3rv)

First, there's the classic FM method of turning the sine wave into a kind of sawtooth by making an operator phase-modulate itself. Perhaps more useful in Bazille is the triangle-ish to square-ish waveform you can get by rectifying the oscillator's raw output before it goes to the phase modulation input. Set the mode to *PM Medium*, with a modulation depth +15.00.

While you're at it, you could also experiment with **amplitude** modulation feedback: Connect the raw oscillator output to it's own volume modulation socket, and try different modulation amounts. All of which raises the obvious question: what is negative 'self-fractalization' capable of?

Other waveforms 2 (tip by sendy)

Quirky filter: Use a 128-step triangle as your *TapMap* wave. Set OSC 1 to Impulse and Res III. Connect the oscillator's lower output to filter 1 as well as to the rectifier. Send the rectified signal through a Lag Generator with both knobs at 0.8, and from there to the PD modulation input, value 38.00.

Filter 1 Gain = 23.50, maximum cutoff, Resonance = 30.50. Connect LP18 to Out 1, play some deep bass notes and turn PD amount up and down. Sounds like a very quirky filter! The next step could be to control PD level from the modulation wheel and use an envelope to 303-ize it...

Oscillator as LFO

For low frequency modulation purposes, the main oscillators are arguably more flexible than the dedicated LFOs. Set the Tune mode to either *Herz* or *Clocked,* and start experimenting.

Tip: if you want a fairly slow, non-synced LFO, switching the modify mode to *Multiply* and setting the amount to -10 gives you a better *Tune* range.

Oscillator as waveshaper (tip by urs)

For more gnarly and different oscillator waves, try the following: Set an oscillator's Modify mode to *Multiply* it's 0.00 value "freezes" the oscillator. This is your waveshaper. Now connect another oscillator to the phase modulation input with the mode set to *PM coarse* or *Lin 1kHz.* Turn up the phase modulation and PD levels, then play and watch the 'scope. Experiment with various waveforms for the waveshaper as well as the driving oscillator.

LFO Tricks

More lively LFO

The easiest way to inject a bit of 'life' into an LFO is to select *Rnd* as the rate and/or amplitude modulator, with the amount(s) set to about 0.20 max. Recursive modulation strikes again!

Global envelope

The organ 'percussion' effect only happens on newly played notes after any other notes have all been released. Although Bazille doesn't have such 'global envelopes', you can use the *Delay* of a very slow LFO in single mode to emulate one. The Delay is your ramp, which you can re-shape using a mapping generator if you like. Set the LFO's *Phase* to 50 or above.

Alternatives to LFOs

If two LFOs are not enough, remember that you can always use oscillators, looped ramps or envelopes instead. Each of these alternatives has its own advantages / specialities.

Filter Tricks

Self-oscillation

You can play notes just using filters by setting the Resonance and Key Follow both to maximum, and Cutoff fairly low e.g. +12.00. Experiment with all 6 filter types. Caution: self-resonating filters can get very loud, so it's best to turn the volume down first!

Especially the lower notes are slow to self-resonate, and a short impulse is often necessary to kickstart the resonance. Patch an unused envelope into one of the filter inputs, and pull all the sliders down to minimum except the Decay. Adjust the Attack, Decay and filter Gain for various flute sounds.

More cutoff modulation

Both main filters allow **four** freely definable cutoff modulations, but only if you use one filter at a time. Try this: Change filter 2 cutoff mode to *Spread*, and connect whatever you like to the cutoff modulation sockets in the **currently unused** main filter. If filter 2 is your unused one, note that the extra control works in the opposite direction. Confused? Just try it, and maybe read all about the [cutoff modes](#) again.

Filter Ping (tip by justin3am)

Feed any impulse-type signal (pulse LFO, gate, short envelope) into a filter with fairly low gain and the resonance set to just below self-oscillation – usually somewhere around 50.00. This can result in interesting tuned percussion sounds, especially if you also modulate the cutoff with an audio signal. Note: the 'ping' decay also depends on input gain and cutoff.

Filtering control signals

Lowpass filters are basically audio-rate lag processors with extras – so there's nothing stopping you from using them to process control signals.

DC-removal

Try using a high-pass filter to remove DC from modulation sources (but remember that the HP filter inverts signals). For an alternative using a lag generator, see *Processor Tricks* below.

Filter FM

Remember that you can also patch audio signals into the cutoff modulation sockets, not only envelopes and LFOs etc.. You can even use the very same signal you are feeding into the filter, or e.g. the bandpass (BP) output of the same filter.

Notch filter (tip by xh3rv)

Try this for a polyphonic phasing effect: Mix a dry signal with a BP-filtered, inverted version of the same signal. Frequencies within the band are removed from the original, resulting in 'notch filtering''. The filter can't really make use of Gain or Resonance, it isn't quite as versatile as a parametric EQ's notch, but it looks like a fairly tight 24db attenuation at the cutoff point.

Comment by **lectrixboogaloo**: Try an LP instead of the BP... instant alternative HP filter.

HP bass boost

A good old trick worth mentioning here: A highpass filter can be used to boost low frequencies. Set *Cutoff* to minimum, *Key Follow* to maximum, *Resonance* to about 30, then adjust the Cutoff.

Negative cutoff?

For extra-punchy filter envelopes, take the cutoff 'below zero' first by connecting +5V to a cutoff modulation input (remember that the main filters have up to 4 cutoff modulation inputs).

Stacking Tricks

Height

You can make huge one-finger chords by stacking a couple of voices after setting up simple chords with 3 or 4 oscillators. Here's an example that sounds great with *Stack* = 2 and *Voice 2* detuning = 7.00.

Set *Tune* (Semitone) as follows:

OSC 1	+0.00	root
OSC 2	+7.00	perfect 5th
OSC 3	+15.00	minor 3rd
OSC 4	+22.00	minor 7th

Width

As mono or legato patches are unlikely to make excessive demands on your CPU, it's always worth checking whether your mono/legato patch sounds better with stacked voices than without. Tip: You can easily pan two voices apart by setting *Alternate* or *StackVoice* as the Pan source.

Depth

Clever use of the *Stack Voice* modulator is key to making the most of Bazille's stacking feature. Use it to pan voices apart, to multiply LFO rates, to shift cutoff or even the sequencer's *Rotate* value (is the mind boggling already?)

Mapping Tricks

2-step maps

Even tiny maps can be useful. For instance, if you want the output of your modulation wheel to suddenly 'jump' in the middle of its throw, set 2 steps, switch the mode to *Map Quantize* and the source to ModWhl. If you want offsets in a two-voice stack e.g. for panning, set the mode to *Increment* (no source is required) and the two map values to maximum and minimum. For three-voice stack offsets, however, you will need to set the source to *StackVoice*.

12-step maps

For key offsets which are the same in any octave, select *Key* mode and a 12-step map.

128-step maps

This is the maximum map size, and is usually the best choice for smooth or complex shapes. But even 128 is not the limit....

256-step map (trick by tasmodia)

The clou is to toggle between two complete maps using a square-wave LFO. Set both maps to *Map Quantize* mode (assuming you want steps) and the sources to *LFO1 Tri*. Turn LFO1 *Wave* to maximum for a rising saw which will 'scan' through both maps. Connect the maps to the left and right inputs of a multiplex. Now inject a unipolar square from LFO2 into the *Mod* input of the multiplex. Set LFO2 speed to exactly half that of LFO1 – the output of that multiplex will alternate between the two maps.

MapGen bit-crusher (tip by 3ee)

Choose a *TapMap* waveform in your oscillator, set the PD value to minimum, right-click the map and select shapes / triangle (for example). Right-click again and select *quantize 8*. Also try *make unipolar*, then *Quantize 4*. If you wish to 'bit-crush' the regular waves, select the cosine instead of the triangle.

Additive synthesis (spectralize)

Load *init*, set OSC1 to 'TapMap', then right-click in Mapping Generator 1 and select *Reset*. Right-click again and select e.g. '9'. Raise just two or three of the values (e.g. 2, 5 and 9). Right-click once more and select *Shapes / Spectralize…*

The *Spectralize* function interprets the map as the levels of partials in the harmonic series and transforms them into the corresponding waveform!

Processor Tricks

Quantizer bit-crusher (tip by 3ee)

As well as making control-rate signals steppy, the *Quantizer* can also be used as a 'bit-crusher' effect for audio signals. Use low values, but note that 1.00 can often result in silence.

Quantizer octave transpose

The Quantizer can be used to keep oscillator pitches within a certain range across the entire keyboard – here's how: Connect *KeyF 1* to the Quantizer, set the quantization to 4.00. Connect the Quantizer to a frequency modulation input set to *50 semi* mode, with amount -48.00. An octave transposition will occur every 16 semitones.

Invert/Lag DC removal

As an alternative to high-pass filtering, you can remove the DC (direct current) component from a control signal by mixing the original signal with an inverted and lag-processed version of itself.

Double triangle

Rectifying a triangle wave doubles the frequency but doesn't alter the shape.

Smoother when faster (tricks by 3ee)

If you want your LFO modulation to be more subtle as you increase the speed, send the LFO (e.g. square wave) through a Lag Generator and experiment with the attack and release values.

A similar trick also works for audio signals. Keep the attack and/or release values low – anything above 2.00 is probably too high. Such a primitive lowpass filter is good enough to tame the higher frequencies of signals used as modulators (for e.g. FM or fractal resonance).

1-shot envelope

As the +5V modulation source is restarted for each MIDI note but does not release, you can use the attack of a lag processor to turn it into a 1-shot ramp. The same applies to 'Velo', which gives you a velocity-sensitive 1-shot envelope.

Multiplex Tricks

See the <u>multiplex</u> section of this manual for some less exotic uses.

Extra inverter (tip by urs)

If you have already used up both inverters but still have a free multiplex, try this: Connect +5v to the *Mod* input, and the signal you want to invert to one of the righthand inputs.

Multiplex gain (tip by justin3am)

To boost weaker signals, try feeding the output of a multiplex back into one side, with the signal you want to boost connected to the other side. Be careful with the feedback level, as things can get out of control very suddenly!

Half-wave rectification (tip by justin3am)

Mixing a rectified signal 50/50 with the original gives you the top half of the wave only. Tip: Half-wave rectified sine can sound like a mellow organ.

Balancing two modulators

This trick lets you add vibrato via modulation wheel and/or pressure, but without increasing the vibrato depth when you happen to apply both at the same time.

red = pressure, green = mod wheel

It works by using one of the two modulation sources to crossfade between the other source and itself. In this example, Pressure is not only connected to one of the 4 regular inputs, but also to the Mod socket.

TOC

Sequencer Tricks

See also [Envelope Triggering via Modulation Sequencer](#).

Precise pitches

While using the sequencer for conventionally tuned patterns, getting all the steps perfectly tuned can be tricky at best, and downright tedious at worst. The following method (already mentioned in the chapter about the sequencer) ensures that you only need to set integers.

Set the oscillator pitch modulation amounts to the maximum +50 and double the transposition you want at each step. A few examples:

minor third (3 semitones)   = *6.00*
major third (4 semitones)   = *8.00*
fourth (5 semitones)   = *10.00*
fifth (7 semitones)   = *14.00*
octave (12 semitones)   = *24.00*
octave+fifth (19 semitones)   = *38.00 etc..*

Jump rotation – two snapshots only

Rotation is normally smooth, but if you want to **jump** automatically between two snapshots, it's probably easiest to use a *Ramp* generator as a 'square wave' source of synchronized rotation (unlike LFOs, ramps are always unipolar, so rotation is positive-only).

If the ramp mode is set to *4/4 sync*, you can jump twice per bar by setting the *Hold* and *Rest* parameters both to 50.00. To jump only once per bar, set *Hold* and *Rest* to 100.00 and 99.99 respectively, and *Down* to 0.01. The latter isn't really necessary, but let's not get lazy now!

Jump rotation – more than two snapshots

If you want the sequencer to jump between more than two snapshots, use either the Quantizer or a Mapping Generator to process your rotation modulator:

Using the Quantizer

Load *init*, drag a cable from *ModW* to the *Quantizer*, and another from the *Quantizer* to *Rotate*. Set the *Rotate* and *Quantizer* values both to precisely 7.00. Play and hold a note, move your modulation wheel and watch how the realtime position indicator moves. Now try LFO 2 instead of the modulation wheel... tricky, isn't it?

Using a Mapping Generator

This method has the advantage that you can jump between snapshots in any order you like: Load *init*, drag a cable from Map 1 (in the MIDI & MORE panel) to the *Rotate* input and set the Rotate value to 7.00. Go to TWEAKS & FX, right-click in Mapping Generator 1 and restrict the map to 8 values. Right-click again and select *ramp* from the *shapes* sub-menu. Right-click once more and select *make unipolar*. Set the source to *ModWhl* and the mode to *Map Quantize*. Go back to the SYNTH page, hold down a note, push the mod wheel... and watch how the dial moves through all 8 snapshots.

What was that about jumping around any order you like? Try this: Expand the map to 32 steps, edit the values, *make unipolar* and *Quantize 8*. Set *Rotate* to 8.00. After trying the modulation wheel, select *LFO2 Tri* as your map source. Slow LFO 2 down to 8/1 (If it needs to be slower, change the rate to -1.00, -2.00 etc..) and set its *Wave* parameter to maximum. The sequence will repeat after jumping 32 times.

Jump rotation - sequencer section

You can even use a section of the sequencer itself as a source of rotation. For an example, check out the preset "HS Berlin Beauty" – the section set to 8 beats is connected to the *Rotate* input. As you can imagine, this technique can (and probably will) get crazy-complicated if snapshots have different patterns in the section that is used for rotation.

Wave sequencing (tip by kcd1961)

The sequencer can be used to cycle between signals e.g. oscillators. Open the example patch 'Wave Sequencing' and study the multiplex panel: The first tap switches between the left and right inputs of the upper multiplex units, while the second tap toggles between their outputs.

Envelope Tricks

Envelope triggering via LFO

As mentioned on page 4, this feature has been improved. As of version 1.1.1 you can shift the phase of LFO triggers in a **precise and dependable** way: The Phase knob shifts the repeats in time, while Wave controls the width of the gate from 0% to 100%. Note that there is no retriggering at either of those extremes.

If the Phase value is smaller than the Wave value, there is also a trigger each time Bazille receives a MIDI Note On. This means that you can now use both LFOs to retrigger two envelopes, and offset the Phase of one of them for interesting rhythms. Tip: Process LFO waveforms using mapping generators, then modulate e.g. pitch and cutoff.

All factory presets with LFO-triggered envelopes have been checked and adjusted to suit the new behaviour, but you might find that one or two of your own LFO-triggered patches no longer work as expected. If a previously repeating patch no longer repeats, try setting the Phase of the offending LFO to minimum first, then adjust Wave.

FX Tricks

Distortion as EQ

As long as you keep the input level low, you can use the Distortion as a fairly clean equalizer.

Phaser as Resonator

You can use the Phaser for strong, static colouration by setting its LFO *Depth* to zero then adjusting *Center* and *Feedback* to taste. Works best with the 'Flanged' *Type*.

As the *Stereo* knob offsets the phase of the internal LFO per stereo channel, without any LFO modulation it won't do anything here. However, you can effectively shift the range of *Center* by turning up the LFO *Rate.* Call that a quirk!