_DIST COLDFIRE

ARTURIA
_The sound explorers

Special Thanks

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Product version: 1.0.0

Revision date: 19 August 2022

Special Messages

This manual covers how to use Dist COLDFIRE, provides a comprehensive look at its features, and details how to download and activate it. First, some important messages:

Specifications Subject to Change:

The information contained in this manual is correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications or features without notice or obligation.

IMPORTANT:

The software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high volume or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in your ears, please consult an audiologist.

NOTICE:

Service charges incurred due to lack of knowledge relating to how a function or a feature works (when the software is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owner's responsibility. Please study this manual carefully and consult your dealer before requesting additional support.

Epilepsy Warning – Please read before using Dist COLDFIRE :

Some people are susceptible to epileptic seizures or loss of consciousness when exposed to certain flashing lights or light patterns in everyday life. This may happen even if the person has no medical history of epilepsy or has never had any epileptic seizures. If you or anyone in your family has ever had symptoms related to epilepsy (seizures or loss of consciousness) when exposed to flashing lights, consult your doctor prior to using the software.

If you experience any of the following symptoms: dizziness, blurred vision, eye or muscle twitches, loss of consciousness, disorientation, any involuntary movement or convulsion, while using this software, discontinue use IMMEDIATELY and consult your doctor.

Precautions to Take During Use

- Do not stand too close to the screen. Sit a good distance away from the screen.

- Avoid using if you are tired or have not had much sleep.

- Make sure that the room is well lit.

- Rest for at least 10 to 15 minutes per hour

Congratulations on your purchase of Dist COLDFIRE.

Excellence is placed at the heart of every Arturia product, and Dist COLDFIRE is no exception. Explore the presets, tweak a few controls, get lost in the features - dive as deeply as you like.

Be sure to visit the www.arturia.com website for information on all our other inspiring hardware and software instruments, effects, MIDI controllers, and more. They have become indispensable tools for many visionary artists around the globe.

Musically yours,

The Arturia team

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1. WELCOME TO DIST COLDFIRE

Thank you for purchasing Dist COLDFIRE. This audio effect plug-in for VST, AU, and AAX formats is not just one distortion effect – it's 11 in one! By selecting the appropriate distortion type, you can add anything to your tracks from subtle analog tape saturation to an ear-shearing buzzsaw. All of this benefits from modeling the original distortion sources in every detail using our exclusive TAE® (True Analog Emulation) process.

Beyond that, you get two independent (but identical) distortion buses. Routing sources for the two effects go beyond just serial or parallel to include stereo (each distortion processes a separate channel of the stereo picture), mid-side (one processes the center-panned content while the other handles the difference between the left and right channel), and even an option to process two separate frequency bands.

Then, you can adjust the balance of the effects with the central crossfader, smoothly morphing between them.

Dist COLDFIRE can add subtle harmonics to your tracks or impart that ineffable quality called "warmth." It can add pronounced buzz or completely mangle and transform the sound as well. Most importantly, it can produce any effect in between these two extremes – two times over. It's simple enough to begin using immediately, thanks in particular to our Preset library crafted by some of the music software industry's top sound designers. At the same time, it has enough distortion variations, EQ, dynamics processing, and routing flexibility to keep the pickiest audio engineer engrossed for days.

1.1. What Is Distortion?

If you ask a hardware engineer of home hi-fi products, they'll say, "It's the worst thing ever." Instead, the question here is, what is *musically desirable* distortion?

Technically, distortion is the alteration of an audio waveform from its original state. The most common (and usually unwelcome) type of distortion is *clipping*, which results from increasing the amplitude (volume) of the waveform beyond the sound-generating system's capacity. This results in the tops and bottoms of the waveform being truncated or "clipped" off.

However, distortion can be applied more subtly to a signal in a way that adds harmonics that are pleasing to the ear. What's going on with the waveform isn't necessarily clipping in this case – more of a reshaping that warps it subtly (or not so subtly) compared to what it's *supposed* to look like on an oscilloscope.

Distortion is the product of many variables, but very roughly, there are four types:

1.1.1. Harmonic Distortion

Simply put, this comes from adding new harmonics to an existing signal. This can happen by driving an analog amplifying circuit (like a transistor or vacuum tube) hard but not to the point of clipping, by using a plug-in such as Dist COLDFIRE, and by other means.

Generally speaking, adding both odd and even harmonics will make something sound more like a sawtooth wave. Adding only odd harmonics will push it more towards a square wave. Adding only even harmonics is the subtlest of all, and though not commonly recognized as a distortion effect, a prevalence of even over odd harmonics is a factor in what tube guitar amp enthusiasts consider a "clean but warm" sound. Not to mention, the high-end home hi-fi crowd loves those even harmonics whether they admit it or not.

1.1.2. Intermodulation Distortion

This is what happens when two signals interact and produce a final output that's richer in harmonics than either of the signals individually. In musical terms this can range from pleasing to downright nasty.

1.1.3. Phase Distortion

When a waveform's behavior is non-linear over time, especially with regard to the way it rises and falls and crosses the zero line, that's phase distortion. It turns out you can do a lot by messing with the phase of a signal – Casio built a whole synthesis method around this phenomenon, which is modeled in our CZ V virtual instrument.

1.1.4. Digital Distortion

The bad kind is when an analog-to-digital converter clips because the input is too high, as anyone who worked with early DAWs and audio interfaces knows all too well. The good kind is expressed in bit-crushing effects, which reduces the bit depth of a digitally recorded signal to create a "lo-fi" sonic character associated with 1980s samplers and now sought after.

1.2. Dist COLDFIRE Features Summary

- 11 distortion types:
    - Bit Inverter
    - Bit Crusher
    - Wavefolder
    - Rectifier
    - Waveshaper
    - Transformer
    - Force
    - Tape Saturation
    - Tube
    - Germanium
    - Transistor
- Two independent distortion buses with highly flexible routing
- Master section with input level, output level, color, and dry/wet mix controls.
- Pre- and post-distortion filters for each distortion bus.
- Dynamics section with three modes: compressor, multiband, and limiter.
- Dynamics section is switchable pre- or post-distortion.
- Feedback section
- Advanced modulations section with six sources.
- Each modulation source can be any of the following:
    - LFO
    - Envelope Follower
    - Multi-Segment Function Generator
    - Step Sequencer
- Over 160 Presets in advanced searchable browser.
- Selectable oversampling with Studio and Render modes.
- Windows or macOS compatible in AAX, AudioUnits, and VST formats.

Whether you use Dist COLDFIRE for gentle harmonic enhancement, wild distortion, or anything in between, we hope it opens exciting new creative opportunities for your music!

2. ACTIVATION AND FIRST START

2.1. Compatibility

Dist COLDFIRE works on computers and laptops equipped with Windows 8.1 or later or macOS 10.13 or later. It is compatible with the current generation of Apple M1, M1 Pro/Max/Ultra, and other Apple Silicon processors. You can use it as an Audio Units, AAX, VST2, or VST3 plug-in within your favorite recording software. Dist COLDFIRE is a plug-in only and can't be used as a standalone effect.

2.2. Download and Install

You can download Dist COLDFIRE directly from the Arturia Products Page by clicking either the Buy Now or Get Free Demo options. The free demo is limited to 20 minutes of operation.

If you have not already done so, now is a good time to create an Arturia account by following the instructions on the My Arturia webpage.

Once you install Dist COLDFIRE, the next step is to register the software. This is a simple process that involves a different software program, the **Arturia Software Center**.

2.2.1. Arturia Software Center (ASC)

If you haven't installed ASC yet, please go to this web page: Arturia Downloads & Manuals.

Look for the Arturia Software Center near the top of the page, and then download the installer version for the system you're using (Windows or macOS). ASC is a remote client for your Arturia account, letting you conveniently manage all your licenses, downloads, and updates from one place.

After you complete the installation, proceed to do the following:

- Launch the Arturia Software Center (ASC).
- Log into your Arturia account from ASC's interface.
- Scroll down to the 'My Products' section of ASC.
- Click on the 'Activate' button next to the software you want to start using (in this case, Dist COLDFIRE).

It's as simple as that!

2.3. Working with Plug-ins

Dist COLDFIRE can be used in all major Digital Audio Workstation (DAW) programs including Cubase, Digital Performer, Live, Logic, Pro Tools, Studio One, and more. Plug-ins have numerous advantages over hardware, including:

- You can use as many instances on different tracks as your computer can handle.
- You can automate the plug-in's settings via your DAW's automation feature.
- All settings and changes are saved with your DAW project, letting you pick up right where you left off.

2.3.1. Audio and MIDI Settings

Since Dist COLDFIRE is a plug-in only, these settings are handled in your recording software or DAW. They are generally located in some type of Preferences menu, though each product does things a bit differently. So, consult your recording software's documentation for information on how to select your audio interface, active outputs, sample rate, MIDI ports, project tempo, buffer size, etc.

A note about your DAW's latency (sample buffer) settings. In general, higher settings mean a lower CPU load as the computer has fewer interruptions and longer amount of time to process commands. However, this can result in longer *audible* latency if, for example, recording a new track while listening to playback with Dist COLDFIRE active. On the contrary, lower settings mean lower latency but higher CPU load. That said, a fast, current computer should easily be able to run it – even on many tracks at once – with low latency settings. Of course, this all depends on whatever else is in the project.

Now that you've set up your software, it's time to explore all of the textures – from subtle harmonic enhancement to ear-shearing grunge – that are possible with Dist COLDFIRE!

3. USER INTERFACE

This chapter covers the upper toolbar in Dist COLDFIRE, where the main menu as well as the Preset Browser [p.15] reside. We'll also cover the lower toolbar, which has a number of important utility functions.

What about the main panel where the all the *fun* controls are? We have a whole chapter [p.23] for that!

3.1. Upper Toolbar

Let's start with the Upper Toolbar functions from left to right.

| ☰ DIST COLDFIRE | ‖\ ♡ Dual Band Bass Mojo* | ▲ ▼ A / B A > B | Advanced |
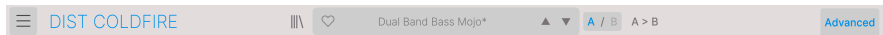
3.1.1. Main Menu
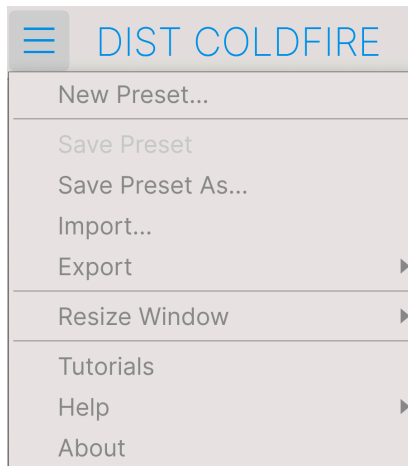
Clicking the "hamburger" icon (three horizontal lines) in the top left corner of the upper toolbar opens a drop-down menu that lets you access several important features related to Presets and useful functions. Let's look at them one at a time.

3.1.1.1. New Preset

Creates a new preset with initialized settings for all parameters.

3.1.1.2. Save Preset

Overwrites the current preset with any changes you have made. This applies only to user presets, so this option is greyed out for factory presets.

3.1.1.3. Save Preset As

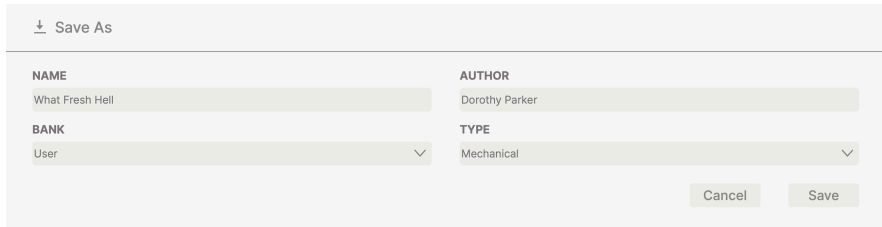Saves the current state of Dist COLDFIRE under a different preset name. Clicking this option reveals a window where you can name your preset and enter more detailed information about it:

Save As	
NAME	**AUTHOR**
What Fresh Hell	Dorothy Parker
BANK	**TYPE**
User	Mechanical
	Cancel Save

♪ The Bank, Author, and Type fields are all useful when searching for presets in the Preset Browser [p.15].

3.1.1.4. Import

This command lets you import a preset file or entire bank stored on your computer. It opens an OS-level navigation box to find the proper files.

3.1.1.5. Export

You can export presets to your computer in two ways – as a single preset, or as a bank. In either case, an OS-level navigation window allows you to specify where to save the file(s).

Export	▶	Export Preset...
		Export Bank ▶

- **Export Preset:** Exporting a single preset is handy for sharing a preset with someone else. The saved preset can be reloaded using the **Import** menu option.
- **Export Bank:** This option exports an entire bank of sounds from the plug-in, which is useful for backing up or sharing presets. Saved banks can be reloaded using the **Import** menu option.

3.1.1.6. Resize Window

Dist COLDFIRE can be resized from 50% to 200% of its default size (100%) without any visual artifacts. On a smaller screen, such as a laptop, you may want to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor you can increase the size to get a better view of the controls and graphics.

This operation can also be performed using keyboard shortcuts. On Mac, use Command +/- to resize the window. On Windows, use Control +/-.

3.1.1.7. Tutorials

> **Explore The Effect**
>
> Introduction
> Main Panel
> Distortion Types
> Advanced Panel - Main Functions
> Advanced Panel - Modulators

Dist COLDFIRE comes with interactive tutorials that walk you through different features of the plug-in. Clicking this option opens a pane on the right side of the window where the tutorials appear. Select one to access step-by-step descriptions that highlight the relevant controls and walk you through the process.

3.1.1.8. Help

Get more help by visiting links to this user manual and Frequently Asked Questions pages on Arturia's website. You will need an internet connection to access these pages.

3.1.1.9. About

Here you can view the software version and developer credits. Click again anywhere on the screen (outside the About window but inside the plug-in) to make this pop-up window disappear.

3.1.2. Preset Browser Access and Name Pane

Clicking the "books on a shelf" button opens the Preset Browser [p.15], which offers a myriad of ways to browse, sort, and organize Presets in Dist COLDFIRE.

III\   ♡   Dual Band Bass Mojo*   ▲ ▼
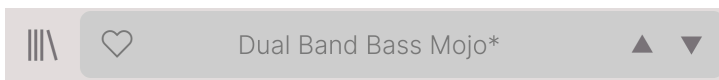
Clicking on the Preset name also opens up quick drop-down menus for selecting Presets outside of the Browser. All things about Presets are covered in detail in the next chapter.

> ℹ Note: A Preset marked with an asterisk (*) as shown here indicates that you've edited it.

3.1.3. A/B Settings and Copy

Each Preset is really two in one. Using the A and B buttons, you can switch between two completely different sets of knob settings in the Main Panel [p.23], including the Advanced Panel [p.40]. These are saved at the Preset level, so you can have different A and B settings for each Preset.

When A is active, clicking **A > B** will copy the A settings to B. When B is active, clicking **A < B** will copy the B settings to A.

> ℹ️ ! If you go to B, change settings, and close your DAW project, A will be replaced by B when you reopen it. B will now be blank. In other words, the most recently changed settings are recalled by the DAW upon reopening – and they're recalled in A.

3.1.4. Advanced Button

Advanced

Near the upper right corner of the top toolbar is the **Advanced Button**. This opens up a panel which we cover in detail in the chapter Advanced Panel [p.40].

3.2. The Lower Toolbar

A number of utility functions reside in the very bottom of the Dist COLDFIRE interface. They're like a good mechanic or plumber: maybe not glamorous, but you're really glad to have them when you need them.

Let's go over them from left to right.

3.2.1. Left Side

Distortion A Drive: Sets the amount of distortion applied to the signal

Lower toolbar, left side

The left half of the toolbar is where the control descriptions appear, telling you what any knob, button, icon, or other control does when you mouse over it.
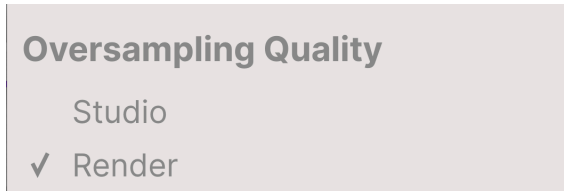
3.2.2. Right Side

The right half of the lower toolbar is home to a number of other very useful functions.

| Quality : | Render | Feedback Mute | Bypass | ↩ | ☰ | ↪ | **4%** |

Lower toolbar, right side

From left to right, these are:

3.2.2.1. Quality

Oversampling Quality

Studio

✓ Render

Lower toolbar, right side

Dist COLDFIRE offers two options for the amount of oversampling it performs when processing your track.

- **Studio**: High-resolution oversampling.
- **Render**: Higher-resolution oversampling.

What's the difference? This is a "better and best" situation. Choosing the *Render* option will allow you to preview your sound at the best quality. However, you may wish to use the *Studio* setting to conserve CPU power and hear the same processing while you work with Dist COLDFIRE alongside many other tracks.

> **Note**: When you perform a mixdown or bounce-to-disk operation in your DAW, Dist COLDFIRE always renders at the chosen quality settings.

3.2.3. Feedback Mute

Since Dist COLDFIRE includes a feedback option – meaning you can control how the distorted signal is fed back into the input of the plug-in – we've included this handy mute button in case things get too wild. Feedback loops can build upon themselves and increase gain well past the levels where you're getting the kind of distortion you *don't* want!

3.2.4. Bypass

This button bypasses the plug-in.

3.2.5. Undo, Redo, and History

When editing a plug-in, it's all too easy to overshoot a sweet spot and then wonder how to get back to where you were. Like all Arturia plug-ins, Dist COLDFIRE offers comprehensive Undo, Redo, and History so that you always have a trail of "bread crumbs."

Use the arrows to go back and forward one control movement or other action at a time.
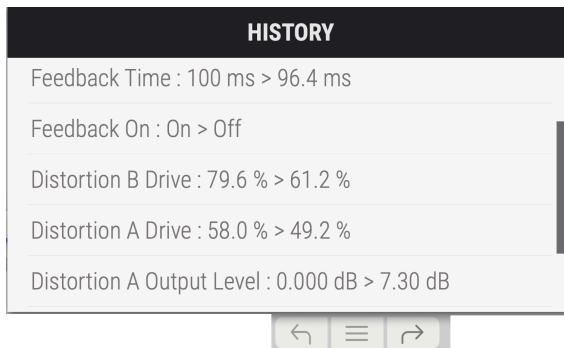
3.2.5.1. Undo

Click the left arrow to revert to the state before the most recent edit you made. You may click repeatedly to undo several edits in reverse time order.

3.2.5.2. Redo

Click the right arrow to redo the most recent edit you undid. If you have undone several, you may click repeatedly to redo them in forward time order.

3.2.5.3. History

HISTORY

Feedback Time : 100 ms > 96.4 ms

Feedback On : On > Off

Distortion B Drive : 79.6 % > 61.2 %

Distortion A Drive : 58.0 % > 49.2 %

Distortion A Output Level : 0.000 dB > 7.30 dB

Click the "hamburger" (three lines) center button to open the History window, as shown above. This provides a step-by-step account of every move you have made in Dist COLDFIRE. Clicking on an item in the list not only re-executes that move – it returns the plug-in to the overall state it was in when you first made that move.

Note that the A and B controls settings within a Preset have separate undo histories.

3.2.5.4. CPU Meter

At far right is the CPU Meter, which displays the overall load Dist COLDFIRE is placing in your computer CPU. Since it deals only with this plug-in, it is not a substitute for the overall CPU metering tools in your DAW.

3.2.5.5. Panic

Mouse over the CPU Meter, and it will display the word PANIC. Click to send an all-sounds-off command. This is a momentary command, so sound will resume if your DAW is still playing. In the event of serious runaway audio (say, from an unrelated delay effect going nuts in a feedback loop), use the FeedBack Mute button or if that doesn't work, stop your DAW playback and disable the plug-in causing the problem.

3.2.5.6. Maximize View Button

If you resize the Dist COLDFIRE window larger and some of its parameters are pushed outside the viewable range of your computer display, you may see this icon in the far lower right corner of the window:


Click it, and the window will resize and re-center to optimize your available screen space.

4. SELECTING PRESETS

Dist COLDFIRE lets you browse, search, and select Presets from a browser-like interface inside the plug-in. You can also create and save your own Presets in the User Bank. Of course, the state of any instance of the plug-in – including the current Preset – is automatically saved when you save your DAW project, so you can always pick up where you left off.

4.1. The Preset Browser
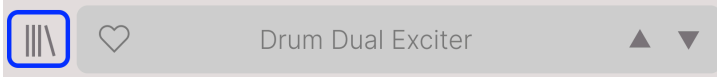
Click the "books on a shelf" icon to access the Preset Browser.

The three main areas of the Preset Browser are as follows:
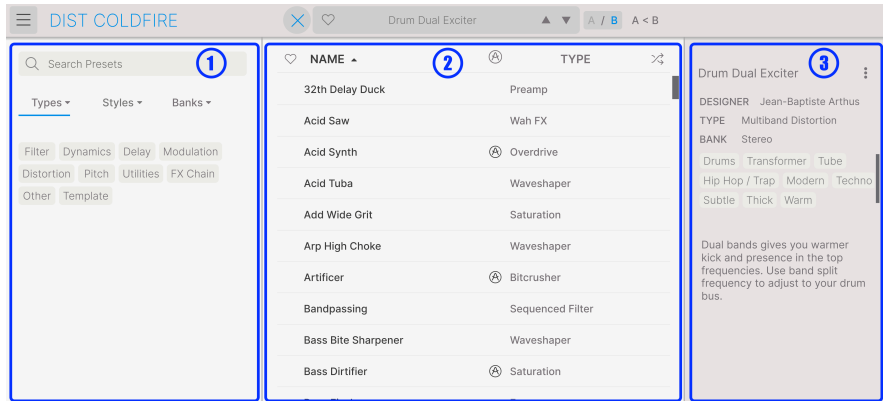
Number	Area	Description
1.	Search [p.16]	Searches for Presets by text entry with filters for Type, Style, and Bank.
2.	Results Pane [p.18]	Displays search results, or all Presets if no search criteria are active.
3.	Preset Info [p.20]	Displays Preset Details; can edit details for Presets in User Bank.

4.2. Searching Presets

Click on the Search field at the top left and enter any search term. The browser will filter your search in two ways: First, simply by matching letters in the Preset name. Second, If your search term is close to that of a Type or Style [p.16] it will include results fitting those tags as well.

The Results Pane will show all Presets that fit your search. Click the CLEAR ALL text to clear your search terms.
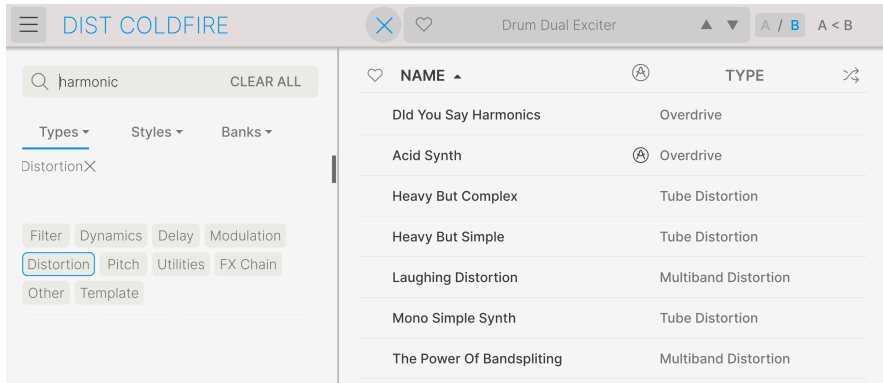
Filter by typing text in the Search field

4.2.1. Using Tags as a Filter

You can narrow (and sometimes expand) your search using different tags. There are two kinds of tags: **Types** and **Styles**. You can filter by one, the other, or both.

4.2.1.1. Types

Types are categories of audio effects: tape, distortion, delay, and so on. With a clear search bar, click the **Types** drop-down to bring up the list of types. Types sometimes include sub-types (especially in more complex Arturia effect plug-ins) but Dist COLDFIRE is relatively simple, so Distortion is the type you will see most often.

You can also select multiple Types using command-click (macOS) or ctrl-click (Windows). For example, if you aren't sure whether the preset you're looking for was tagged with Keys or Pad, select both to broaden the search.

Results columns can be inverted by clicking the arrow buttons to the right of their titles (Name, Type, Designer).

> ♪ You can specify the type when saving a preset [p.9]. That Preset will then show up in searches where you've selected that Type.

4.2.1.2. Styles

Styles are, well … exactly that. Accessed by the **Styles** button, this area has three further subdivisions:
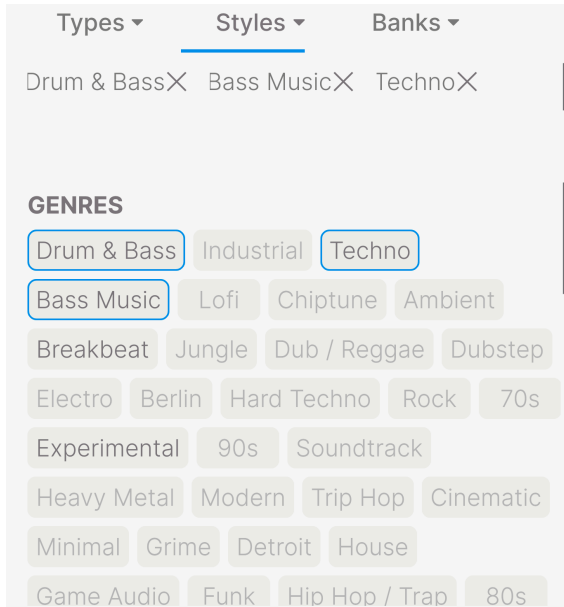
Scroll down to view Genres, Styles, and Characteristics

- *Genres*: Identifiable musical genres such as Ambient, Bass Music, Industrial, etc.
- *Styles*: General "vibe" such as Bizarre, Metallic, Slammed, etc.
- *Characteristics*: Even more detailed audio qualities such as Filtered, Resonant, Mechanical, Noise, and more.

Click any one, and the results will show only Presets that match that tag. Notice that when you select any tag, several other tags usually grey-out and become unavailable.

This is because the browser is narrowing your search by a process of elimination. Deselect any tag to remove it and widen the search without having to start all over again. You can also clear the tag by clicking the X to the right of its text, which appears at the top.

Note that you can search by a string of text, Types and Styles, or both, with the search becoming narrower as you enter more criteria. Clicking CLEAR ALL in the search bar will remove all Type and Style filters as well as any text entry.

4.2.2. Banks

Next to the **Types** and **Styles** drop-down is the **Banks** drop-down, which lets you do your search (using all the methods above) within the factory or user Banks.

4.3. The Results Pane

The central area of the browser shows search results, or simply a list of all presets in the Bank if no search criteria are active. Simply click on a Preset name to load it.

4.3.1. Sorting Presets

Click the **NAME** header in first column of the Results list to sort the results list of Presets in ascending or descending alphabetical order.

Click the **TYPE** header in the second column to do the same thing by Type.

4.3.2. Liking Presets

As you explore and create presets you can mark them as Liked by clicking the heart next to their names. (This icon also appears in the main Preset Name Pane [p.22] Clicking on the heart icon makes all of your liked Preset show up at the top of the results list, as shown here:

A filled-in heart icon indicates a like. An outline indicates a Preset that has not been liked (yet). Click the heart at the top of the list again to return the list to its previous state.

4.3.3. Featured Factory Presets

Presets accompanied by the Arturia logo are factory creations we think really showcase the capabilities of Dist COLDFIRE.

Clicking the Arturia icon at the top of the Results pane causes all featured Presets to appear at the top of the list.

4.3.4. Shuffle Button

This button randomly reorders the Preset list. Sometimes it can help you find the sound you're looking for more quickly than scrolling through the entire list.

4.4. Preset Info Section

The right side of the browser window shows specific information about each preset.
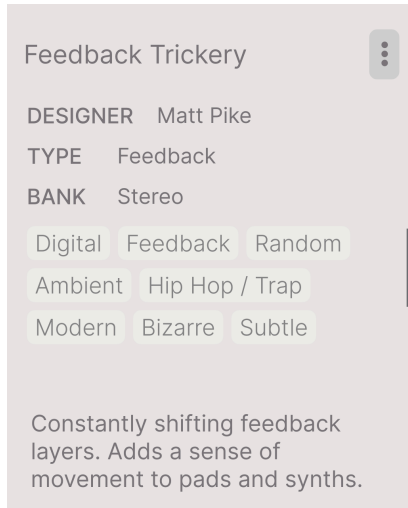
For Presets in the User bank (as the result of a *Save As* operation), you can enter and edit the information in the Preset Info Section and it will update in real time. This includes the designer (author), Type (menu is open in the above image), all Style tags, and even a custom text description at the bottom.

To make the desired changes, you can type directly in the text fields or use one of the pull-down menus to change the Bank or Type. As shown here, you can also use a hierarchical menu to select the Type or even create a new Type or Subtype.
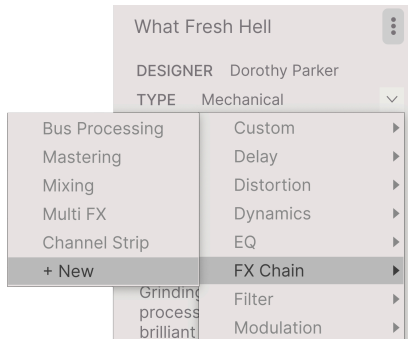
♪ Types and Styles changes you make here are reflected in searches. For example, if you remove the "Ambient" Style tag from a Preset and then save that Preset, it will not show up in future searches for Ambient Presets.

4.4.1. Preset Info Quick Menu

Clicking the icon with three vertical dots brings up a quick menu for Save, Save As, and Delete Preset Operations:

Save

Save As

Delete Preset
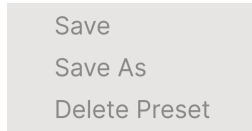
For sounds in the Factory Bank, only *Save As* is available.

4.4.2. Editing Info for Multiple Presets

It's easy to edit information such as Types, Styles, designer name, and text description for several presets at the same time. Simply hold command (macOS) or ctrl (Windows) and click the names of the Presets you want to change in the Results list. Then enter the comments, change the Bank or Type, etc., and save.

♡ NAME ▲	Ⓐ TYPE	⤬	
♥ ColdFire Flanger	Flanger		Multiple Selection (4) ⋮
Long Distance Voice	Overdrive		DESIGNER Multiple Selection
Pentode & Triode Loudness	Mastering		TYPE Multiple Selection
Guitar Weird Effect	Guitar Amp		BANK Stereo
Sh Wah Wah	Sequenced Filter		Acoustic Bass Distorted Feedback Guitar LFO Parallel Resonant Synth Tube
♥ Noisy Sub	Waveshaper		Multiple Selection

4.5. Preset Name Pane

The name pane at top center is always displayed whether you're in the main controls view or the Preset Browser. It displays the name of the current Preset, obviously, but also offers further ways to browse and load Presets. Again, a filled-in heart icon indicates a liked Preset.

4.5.1. The Arrows

The up and down arrows to the right of the Preset name step serially through Presets. This is limited by the results of any currently active search, i.e. the arrows will only step through those Presets. So, make sure any searches are cleared if you simply want to step through all available Presets until you find something you like.

4.5.2. Drop-Down Browser

Click on the Preset name in the center of the upper tool bar to bring up a drop-down "quick browser" for Presets. The first option in this menu is called All Types, and it brings up a submenu of literally every Preset in the current bank.
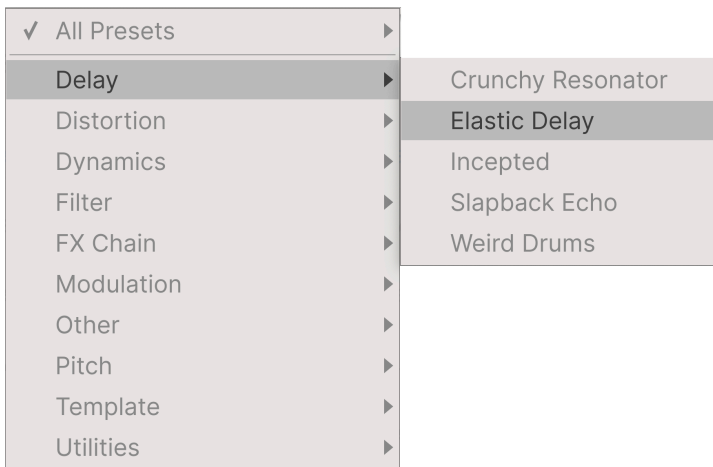
Filter results may differ based on Search criteria

Below this are options that correspond to the Types. Each of these brings up a submenu of all Presets of its Type.

Unlike the up and down arrows, the "All Presets" submenu is independent of search criteria — it simply shows you every Preset available. Likewise for the Type choices below the line, which always include all Presets within that Type.

5. MAIN PANEL

Now it is time to get into the main controls of Dist COLDFIRE, which let you apply the dual distortion buses to your track.

> ℹ Note that we will cover all of the specific Distortion Types [p.29] and their parameters in the next chapter.

5.1. Common Behaviors

Virtually all controls on the main panel (and elsewhere in Dist COLDFIRE) follow a few rules designed to make things more convenient for you, the musician.

5.1.1. Value Pop-Ups
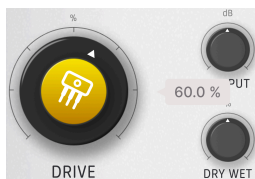
Operate or hover the mouse on any knob, and a pop-up a.k.a. "tool tip" appears, displaying its current value. Note that the plug-in may have to be actively passing signal for these to be visible.

5.1.2. Fine Adjustments

To adjust a control more slowly and therefore more precisely, hold Control or use the right mouse button while operating it.

5.1.3. Parameter Name Display

As mentioned in Chapter 3, operating or hovering on any control will cause its full name to appear in the left side of the Lower Toolbar.

5.1.4. Hover and Scroll

If you have a mouse with a scroll wheel, hover it over any control and then use the scroll wheel to adjust it.

5.1.5. Double Click for Default

Last but not least, you can double-click on any control to return it to its default value.

5.2. Master Section

This section is where you set the input and output levels of Dist COLDFIRE, as well as the dry/wet mix of the effect.

5.2.1. Input and Output

There are two gain controls in Dist COLDFIRE. **Input** sets the level of incoming signal before any of the effect is applied. **Output** sets the level returned back into your track post-processing.

5.2.1.1. Link Button

If the input-output **Link** button is active, increasing the input level will reduce the output level. This is a convenience feature to help avoid clipping.

5.2.2. Color

The **Color** knob functions as a "tilt" EQ. It works like a simplified tone control. Turn the knob to the left for a bassier sound and to the right for a treblier sound. From darkness to brightness, if you like. This slope pivots at 630Hz and has a range of -12 to +12 dB.

With the knob at 12 o'clock, you get a neutral EQ.

Also, it only works on the post-effect output signal. Turn it counter-clockwise to favor lower frequencies and clockwise to hear more higher frequencies in the output of Dist COLDFIRE.

5.2.3. Dry-Wet Mix

As seen in many effects, this knob simply determines the balance of pre-effect and post-effect signal you will hear in your track.

5.2.3.1. Dry-Wet Lock

Clicking the padlock icon will lock the dry/wet mix to the current setting when you change Presets. This can be useful if you would like to experiment with different Presets and distortion sounds while keeping the overall amount of the effect that's applied to your track under control.

5.3. Routing
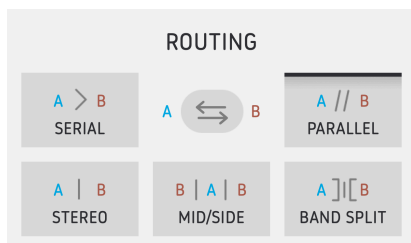
Dist COLDFIRE has very flexible routing regarding the two distortion buses. Imagine having two different distortion pedals on a pedalboard and being able to route signals through them in any way you can imagine. That's what we're trying to achieve here. These are the options:

- **Serial:** The distortion effect in slot A is fed into the one in slot B. Hence, slot B adds more effect to whatever was going on in slot A.
- **Parallel:** Slots A and B are processing your track independently, with separate control over how much each one affects the sound.
- **Stereo:** Slot A processes the left stereo channel and slot B processes the right.
- **Mid Side:** Named for the mid-side recording technique. Slot A processes the center-panned material and slot B processes the difference between the left and right channel.
- **Band Split:** This powerful mode lets slot A and B process two frequency ranges independently. What are the bands? That's determined by the Pre Filter settings described in the chapter about the Advanced Panel [p.40].

5.3.1. A-B Swap

Clicking this button switches the positions of whatever you have selected for the Distortion Types [p.29]. This interacts with routing in an important way: When you swap, B will be affecting whatever A was affecting and vice-versa.

5.4. Crossfader and On-Off Buttons
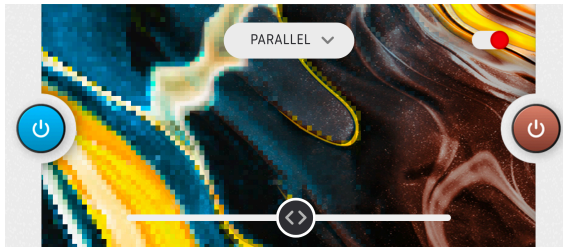
In the central area of the screen, we have a main crossfader that determines how much of each of the two distortion effects you hear. This also interacts with routing, as crossfading towards slot A will reduce the amount of effect you hear applied to whatever aspect of the signal slot B is affecting according to the routing [p.25] settings.

To either side of the crossfader are large On-Off Buttons, which as you may have guessed, simply enable or bypass the distortion effects in slots A and B.

5.4.1. Disable Animations Button

You may notice that when you move the crossfader, the image in the central pane changes to visualize how much of each effect is being applied. Clicking the toggle switch in the upper right corner disables this bit of eye candy. Different stationary images on either side of the display are still shown, depending on the distortion type selected.

You may wish to disable the animations to conserve CPU cycles or to simply keep things more clean looking. Or, you may wish to enable them to have cool visual feedback of your distortion effects. It's up to you.

5.5. Distortion Buses

Dist COLDFIRE provides two effect buses, which behave identically. Therefore, we will describe just one of them here (slot A) since everything about is true of its counterpart.

5.5.1. Pre Filter
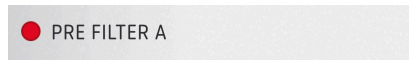
Click the circular icon to engage or bypass the pre-filter, which filters the frequency of the incoming signal to be processed by the chosen Dist COLDFIRE effect.This lets you apply the effect to only certain frequencies in your track. More detailed settings for the pre-filter are found in the Advanced Panel [p.40] chapter.

5.5.2. Distortion Type
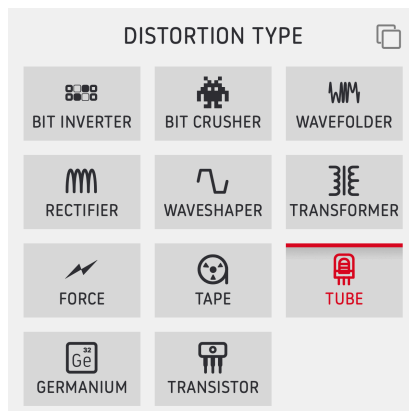
Click the carat icon to bring up this drop-down menu of distortion types.

This is the good stuff – the type of distortion effect you'll be using. There are 11 types in total, which you can select by clicking the downward carat icon next to the name to bring up the menu shown above, or use the **< >** arrows to step through them serially.

With most distortion types, a big knob right in the middle controls the most important parameter, and this and other parameters change depending on the type of distortion you select. To keep this manual fairly tidy, we've devoted a separate chapter [p.29] to all the different distortion types and their settings.

5.5.2.1. Copy Button

Clicking the "overlapping squares" icon in the upper right corner of the menu of distortion type will copy the current distortion effect along with all of its settings to the opposite slot.

5.5.3. Post Filter
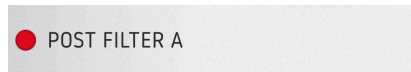
This filter affects the frequency of the signal after it has been processed by the chosen distortion effect. Click the circular icon to engage or bypass it. It is a bandpass filter but with very wide frequency limits. These are determined by settings which are revealed in the Advanced Panel [p.41].

6. DISTORTION TYPES

Dist COLDFIRE offers 11 different distortion algorithms, which can be used in any combination in each of distortion slots A and B. We have harvested these from a number of our own plug-ins in the FX collection but also developed brand new distortion algorithms, not to mention classic hardware that had inherent distortion or character of its own.
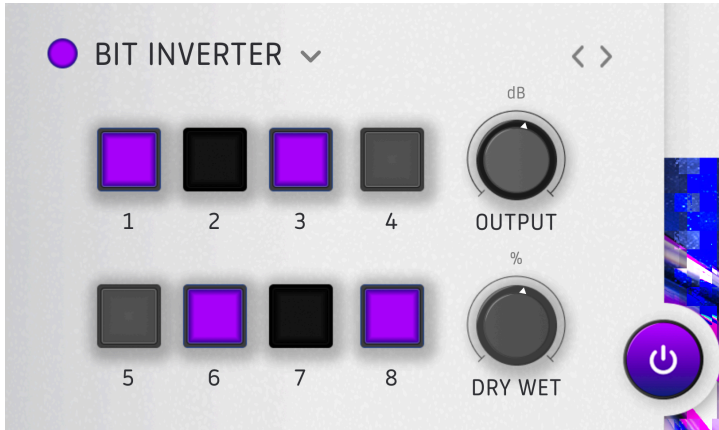
This chapter is intended to make clear all of the parameters of each type of distortion offered in Dist COLDFIRE.

6.1. Bit Inverter

This is a cool way to get a retro, lo-fi digital sound that's a bit different from a Bit Crusher (which we also have in Dist COLDFIRE). The concept is based on the discontinued Biscuit processor by Oto Machines. Believe us when we say, that this distortion type can sound quite surprising!

> ℹ **A word of warning**: When inverting the heavier bits (7 and 8), lower input level creates a louder output level.

Here's how it works. First of all, it quantizes the signal to 8 bits. Then, each of the eight buttons has three different states that change what happens with those bits:

- **Gray:** Normal.
- **Purple:** Inverted, i.e. changes 1 to 0 or 0 to 1.
- **Black:** Muted, i.e. the bit is silent and set at "hard zero."

Using the bit inverter, you can achieve very grinding, chip-tunes style effects on an otherwise pristine audio signal. And we'll get this out of the way right now: With this and many of the other distortion effects in Dist COLDFIRE, it's far more gratifying to play with the controls until you hear a sound you like than to delve too deeply into the theory behind the various distortion effects. So go nuts!

The Bit Inverter effect has two other controls:

- **Output:** Controls the output level into the Post Filter and eventually your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

6.2. Bit Crusher

Bit crushing is the classic way to achieve the sound associated with samplers of the 1980s and other lo-fi digital audio devices. The crusher in Dist COLDFIRE resamples the audio at an adjustable sampling frequency, then reduces the bit depth. Fewer bits mean less resolution for the computer to determine the difference between low and high values. Want to sound like Art of Noise or '80s Kate Bush? This is how you do it.

Here are the controls:

- **Bit Depth:** Adjusts the bit depth from 16 down to 1.5 bits.
- **Aliasing:** Varies the amount of aliasing heard in the signal. With the knob at minimum aliasing, the "lowfiness" will still be huge. Aliasing at a minimum setting usually gives a more *tonal* rate reduction when aliasing at max gives a more *noisy* rate reduction.
- **Frequency:** Sets the resampling rate for the lo-fi downsampling.
- **Jitter:** Introduces variation in the resampling frequency.
- **Output:** Controls the output level into the Post Filter and eventually your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

♪ *Aliasing* was the result of sample rates of early equipment being too low, and introduced new frequencies into the signal after the sample was reconstructed. Musically, these usually manifested as high frequency whistles or squeals in the background. Today, it can recapture that retro vibe, but a little goes a long way!
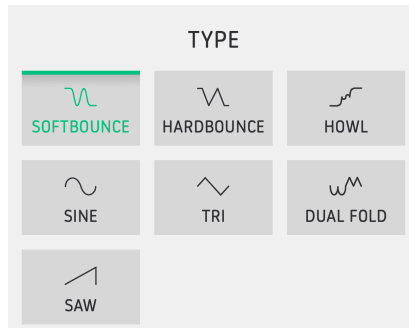
6.3. Wavefolder

Imagine if the waveform of a signal was made of paper. Now imagine that you could fold the peaks and valleys of that paper back in the opposite direction – down for peaks and up for valleys. That's wavefolding in a nutshell. As with every other distortion algorithm it adds more harmonics and (usually) high-frequency content, and can also get buzzsaw-like at extreme settings. Dist COLDFIRE's Wavefolder has three simple settings, but also seven options for how that "paper" gets folded.

- **Drive:** Adjusts the overall intensity of the wavefolding.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

6.3.1. Wavefolder Shape Options

The Wavefolder effect also includes seven options for *how* the folding is done, i.e. what happens to the peaks and valleys of the signal's waveform. Click the submenu to select them. They are ranked from heavy to extremely harsh.

The graphics approximate how each mode folds the waveform. Experiment with them for yourself and listen to the differences!

6.4. Rectifier

In the tube amplifier world, a rectifier is a type of vacuum tube (valve) that converts AC electricity to DC. As an audio effect, it alters the negative part of the waveform, producing a unique type of distortion and waveshaping.

On some sounds, a rectifier may sound like the waveform has been shifted one octave up.

- **Slope:** The most important parameter. This knob essentially changes the amount by which the negative part of the waveform is altered. When Slope is set to 50%, the negative part is mapped to -∞ and does what is called a "half rectifier". At 100%, the negative part of the waveform is mirrored into the positive values and does a "full rectifier" effect.

- **Center:** Determines the point around which the Rectifier changes the slope. This is expressed in amplitude (volume) and goes from -∞ to -3dBFS in the negative values.

- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.

- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

> ℹ **Note**: As a rectifier usually generates a lot of DC, a DC filter is present at the output of the module which re-centers the waveform. And when full rectifying, you will still see negatives values in the waveform, caused by the DC filter.
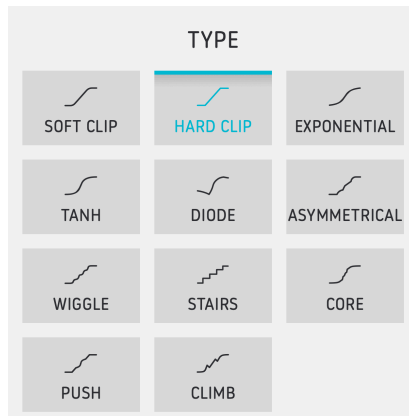
6.5. Waveshaper

The name of the Waveshaper is pretty self-explanatory. Whatever your waveform looks and sounds like going in, the Waveshaper makes it more like something else going out. There are three basic parameters, then 11 waveshaping options.

- **Drive:** Determines the intensity of the alteration applied to the waveform.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

6.5.1. Waveshaper Options

The Waveshaper effect offers 11 different options for how distortion is applied to your waveform. As with the Wavefolder, the graphics in the submenu depict the shape that will be imposed on your wave, making it depart from its original form. *Hard Clip* is certainly the most buzzy, but try all of them to hear for yourself what works best on different source material.

6.6. Transformer

Robots in disguise? Even we can't get Optimus Prime to contribute to your tracks. But we can get the signature saturation of the transformers that make so many vintage mixing consoles and preamps sought after.

- **Drive:** Adjusts the amount of saturation/distortion applied.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

6.6.1. Transformer Types

Two materials were typically used in audio input transformers: nickel and iron. Nickel is great for a little enhancement on your overall mix bus. Iron is ideal for warming up bass frequencies, as the harmonic distortion it creates really tends to happen in the low end.

On both models the distortion gets higher the lower you go in frequency, but the effect is more pronounced on Iron than Nickel.

6.7. Force

This is a saturation module – meaning a subtle form of distortion – taken from our Bus FORCE parallel processing effect plug-in. It is ideal for exciting your overall mix bus in a pleasing way that doesn't sound like "distortion," but also works great on individual tracks. We have the familiar basic parameters, but the real magic lies in the harmonic choices, described below.

- **Drive:** Adjusts the amount of saturation applied.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

6.7.1. Force Harmonics Menu
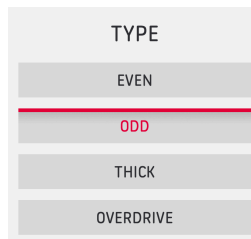
By clicking the submenu just to the right of the effect name, you can select which harmonics [p.4] the Force effect emphasizes.

- **Even:** Emphasizes even harmonics, especially the second harmonic.
- **Odd:** Emphasizes odd harmonics, especially the third harmonic.
- **Thick:** Emphasizes both even and odd harmonics.
- **Overdrive:** More aggressive; takes things more into conventional distortion territory.

6.8. Tape

This option is meant to simulate analog tape saturation, which is generally considered pleasant and desirable. However, at extreme settings it can get nasty, just like a reel of tape in poor condition.

In this algorithm, higher frequencies start to distort earlier, and at high gain settings the sound will go darker and darker.

- **Drive:** Adjusts the amount of analog tape saturation applied.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

6.9. Tube

Vacuum tube saturation and overdrive is what we all want, right? The Tube option in Dist COLDFIRE doesn't just reproduce any vacuum tube, but the input preamp stage we modeled for our Rev PLATE-140 reverb plug-in, which is in turn based on the legendary (and physically huge) studio plate reverb. We have the usual suspects for controls:

- **Drive:** Adjusts the amount of vacuum tube overdrive/saturation applied.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry–Wet:** Determines the dry–wet mix of the effect. This is subservient to the overall dry–wet mix in the master section [p.24].

But then we also have the **Profile** knob, which allows you to select the proportion of pentode- or triode-like tube behavior. The difference is subtle, but it's there!

Pentode generates only odd harmonics while Triode generates odd and even harmonics. With profile at 100% Triode, and just touching the zone where it starts to distort, you will mostly get the second harmonic and nothing else. This is a really nice way to warm things up.

> ♪ In hardware terms, a triode is a vacuum tube that contains three components: a control grid, a plate, and a cathode. A pentode adds two more components: a screen grid and a suppressor grid. These make the tube more efficient. Most hardware tubes are pentodes, but devices in which they are used, such as guitar amps, sometimes have a switch that makes them behave like triodes. Since this reduces their efficiency and output, this is sometimes called a half-power switch.

6.10. Germanium

The Germanium option models the preamp stage of a vintage spring reverb, as emulated in our Rev SPRING-636 plug-in. Germanium was a material used in transistors, and amps and preamps made with them had a distinctively saturated, fuzzy sound. This option models the input stage only, not the reverb itself. The controls are:

- **Drive:** Adjusts the amount of Germanium saturation applied.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

6.10.1. Germanium Modes

You also have a choice of whether the "input stage" of the virtual spring reverb behaves like a mic or line (aux) input, as shown above. We have tweaked this so that selecting *Mic* does not dramatically increase the gain, but only provides the character of the mic input stage.

6.11. Transistor

Another coveted effect noted for the qualities of its input stage was the "outer space echo" tape delay, which we modeled in our plug in Delay TAPE-201. We've brought the saturation and distortion component of that to Dist COLDFIRE. This is a simple algorithm with just the three main parameters:

- **Drive:** Adjusts the amount of transistor saturation applied.
- **Output:** Adjusts the output of the effect into the Post Filter (if enabled) and eventually back into your track.
- **Dry-Wet:** Determines the dry-wet mix of the effect. This is subservient to the overall dry-wet mix in the master section [p.24].

As stated above, Transistor is a simple algorithm, but between all the emulated hardware models used in ColdFire (meaning not competing with the digital algos like wavefolder etc.), this is *the* hardest sounding type.

That's it for the distortion types. Remember, you can have any combination of two, with any routing [p.25] you please. Now, on to the cool filtering settings and modulation options in the Advanced Panel [p.40]!

7. ADVANCED PANEL

Click the Advanced Button [p.11] at the top right of the upper toolbar to open the Advanced Panel, where you will find deeper settings that make Dist COLDFIRE even more flexible. These include adjustments for the Pre and Post Filters, comprehensive dynamics and feedback sections, and sophisticated modulation sources that can be assigned to many parameters within the plug-in.

7.1. Pre Filter Settings
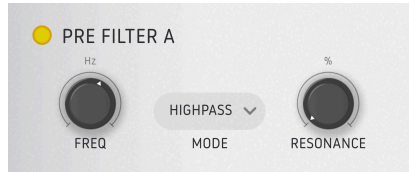
In both slots A and B, the Pre Filter determines the frequencies that get processed by Dist COLDFIRE's effects. It is much like a multimode filter on a good analog synthesizer.

7.1.1. Pre Filter Modes and Controls

In most modes you will see two main controls:

- **Frequency:** Sets the cutoff (or center) frequency of the filter.
- **Resonance:** Adjusts the amplitude of a peak of frequencies right around the cutoff or center frequency.

Clicking the **Mode** menu brings up six options for filter types:
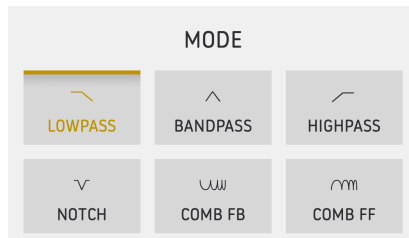
- **Lowpass:** Passes content below the Frequency setting.
- **Bandpass:** Passes content in a range around the Frequency setting.
- **Highpass:** Passes content above the Frequency setting.
- **Notch:** Rejects content in a range around the Frequency setting.
- **Comb FB:** Comb filter (passes and rejects several range of frequencies) in feedback configuration.
- **Comb FF:** Comb filter (passes and rejects several range of frequencies) in feed-forward configuration.

> ℹ️ Note: With either Comb filter option, the Resonance control is replaced by a **Gain** control.

7.2. Post Filter
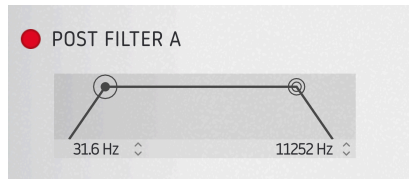
As its name implies, the Post Filter passes or blocks frequencies after they have been processed by Dist COLDFIRE's effects. It works a bit differently than the Pre Filter.

The Post Filter is basically a wide bandpass filter which is "wide open" at 20 to 20,000 Hz. You can adjust its highpass and lowpass cutoffs separately. Either drag the circular icons horizontally, or drag up or down on the numerical fields.

7.3. Dynamics Section

Below the central pane, click on the Dynamics tab to access the Dynamics section (two tabs select between this and Feedback [p.44], described below). Then, click on the right side of the tab (where it says either "Pre" or "Post") to select the type of dynamics processor you would like to use:
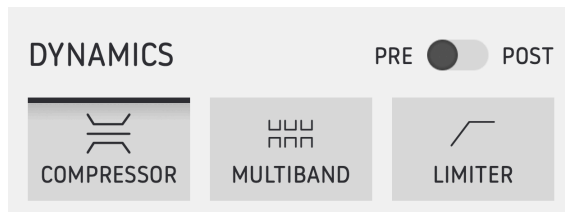
Dynamics processors. Note the pre-post switch in the upper right corner.

7.3.1. Pre–Post Switch

The switch in the upper right of the Dynamics selector pop-up menu selects whether processing is applied before or after the main distortion effect, for *both* slots A and B at once. Since distortion can add gain, this decision can have a large impact on the sound of your track.

7.3.2. Compressor

The punchy Compressor also owes its character to our Bus FORCE plug-in. Compressors are like an extra hand on a fader or volume control, reacting in real time to the level of the signal and reducing gain.

The Compressor features four simple controls.

- **Threshold:** The signal level at which the Compressor begins reducing gain. You can isolate a weak attack transient of a huge sustained sound (like a too soft bass guitar) to add punch or use it to only saturate the transients.
- **Ratio:** Sets how aggressively the Compressor reduces gain once the threshold is reached. Past 50%, the ratio becomes negative.

> **Note**: Negative ratios mean that the sound under the threshold remains "untouched" (as usual), but the louder a sound gets above that, the more its gain is reduced (to a value lower than the initial value, not just attenuated as is the common compressor behavior). In a way, with ratio at max, the sounds that will sound the loudest are the ones which are not "touched" by the compressor (the ones under the threshold value).

- **Time:** This is a combination of what are usually separate controls: Attack and Release. Attack adjusts how quickly the compressor "grabs on" to the sound once the threshold is reached and Release how quickly it "lets go." *Time* adjusts them relative to each other – at zero, Attack is 1 ms and Release is 150 ms; at full, Attack is 200 ms and Release is 1 ms.
- **Makeup Gain:** Increases the post-compression output gain to compensate for excessive gain reduction. Be careful with this!

> **Tip (part 1)**: On sources with dynamics (drums, bass guitars, synths with fast attack times, etc.), you could start in the Pre position with Ratio and Time at max and then adjust Threshold. Threshold will now act as a "selector" of transient information, from high to low energy transients. The level selected on threshold will be the loudest sound you will hear in that setting. **Tip (part2)**: Why not try Compressor with the Bit Crusher on a big drumloop. Lower the frequency of the Bit Crusher and put the Dry/Wet at 50%. Adjust Frequency and the Compressor Threshold to taste and note how only the drum transients get rate reduced while all the body is still clean. It makes for a nice "modern low-fi" sound.

7.3.3. Multiband
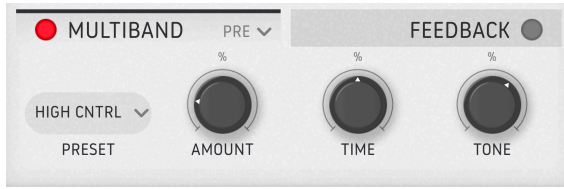
A Multiband dynamics processor is like a compressor but can apply different amounts of compression to different frequency bands in the same signal. The one in Dist COLDFIRE is simplified, having three bands and using presets for different applications:
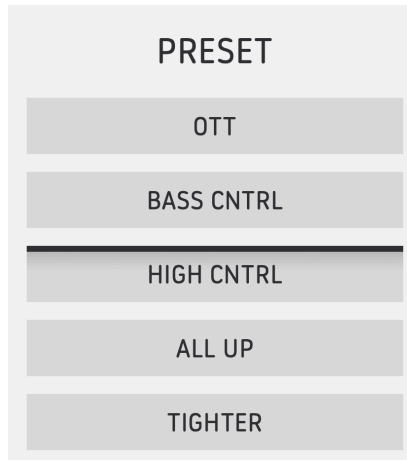
The preset names are fairly self-explanatory – choose the one that seems like it does what you want and then adjust the following controls to taste:

- **Amount:** Sets the overall intensity of the compression.
- **Time:** Offsets the attack and release times that are defined in the presets.
- **Tone:** Adjusts the overall tonal balance while preserving the frequency relationships between the three bands.

7.3.4. Limiter

A limiter is like a compressor but simpler: It sets an absolute "wall" of volume past which no signal is allowed. Short release times will lead to a louder, more compressed, aggressive sound and higher distortion. With longer release times, the sound will be significantly less distorted at the expense of less loudness and more pumping.

Dist COLDFIRE's has three simple settings:

- **Threshold:** Sets the maximum allowed signal level.
- **Release:** Determines how long the Limiter takes to "let go" of the sound once its level drops below the threshold.
- **Output Gain:** Adjusts output level of the Limiter, similar to Makeup Gain for the Compressor.

7.4. Feedback

Dist COLDFIRE allows you to feed back its processed signal into the effect, leading to some potentially wild results.

Please note that Feedback cannot be used in conjunction with the Bit Inverter.

To tune and sculpt the feedback to your precise needs, each control comes with its own menu.

7.4.1. Level

The **Level** knob governs how much signal is fed back into the input of Dist COLDFIRE. Click on the menu icon below the knob to choose which slot is fed back: A, B, or both.

When Both is selected, this section feeds back a mix of the entire A + B architecture, routing included. So it's one feedback loop, not one on each algorithm.

7.4.2. Filter
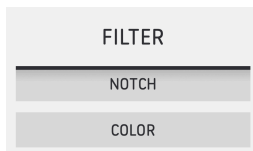
This knob sets the frequency of a filter that determines which frequencies get fed back.

- **Notch** is a notch filter that rejects a preset bandwidth of content around the frequency setting.
- **Color** switches to a filter that's wide open with the knob at 12 o'clock, but becomes a lowpass when turned counter-clockwise and a highpass when turned clockwise.

> ♪ With the feedback level close to max, you can use the notch filter to filter the resonant frequency of the feedback loop and get a more atonal sound.

7.4.3. Time
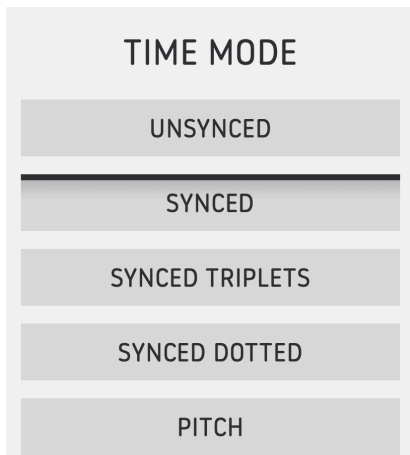
The Feedback section also has an adjustable delay time which can free-run or be synced to your host software's tempo in subdivisions, with the rhythmic options shown above. When set to *Pitch*, the **Time** knob will dial in a specific note instead of a delay time.
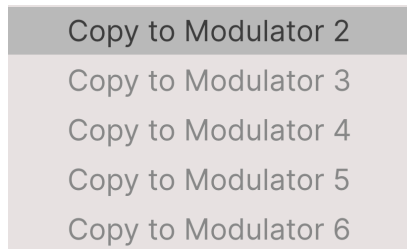
7.5. Modulation

Most parameters in Dist COLDFIRE can be modulated, and the plug-in offers six modulation slots into which you can put any of four source types: an LFO, a multi-segment Function generator, an envelope follower, or a step sequencer.

Click on the drop-down carat icon in any slot's tab to choose a source:
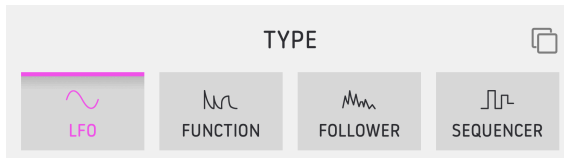

7.5.1. Modulation Copy

Click the "overlapping squares" icon in the upper right of the source selection menu to bring up a submenu that allows you to copy that modulation source, with all its current settings, to any of the other slots.

7.5.2. Assigning a Destination

To pick one or more destination parameters for modulation, click on the right side of the source's tab so that *Assign* is highlighted:
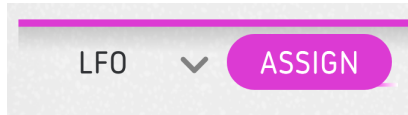
You will now see that white "collars" in the appear around eligible parameters. Click on a destination and drag the mouse and set up a mod range. This range will have the same color as the source, like so:

Drag the mouse on the collar to adjust the modulation depth. You can create positive and/or negative amounts relative to the control's resting position.

As we have noted, you can put any of the four sources in each of the six slots. Now, let's get into detail about what the different sources do.
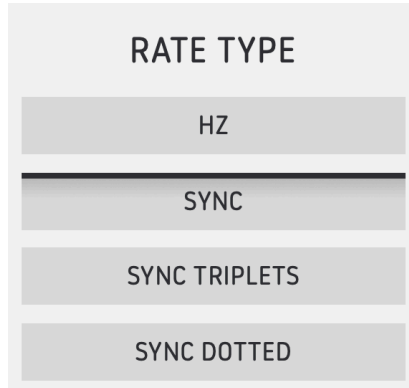
7.5.3. LFO

The LFO is able to morph continuously via its **Waveform** knob from a sine wave to a triangle to a sawtooth to a square. With the knob at 100 percent (clockwise), it becomes a sample-and-hold LFO.
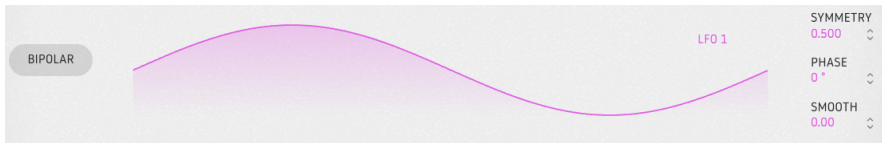
7.5.3.1. Tempo Sync

The LFO **Rate** can free-run or be synced to host tempo in rhythmic subdivisions. Click just beneath the **Rate** knob to bring up the options shown below.


7.5.3.2. Other LFO Parameters

The remaining LFO parameters are:

- **Bipolar:** When active, the LFO sends both positive and negative values. When inactive, the LFO sends positive values only.
- **Symmetry:** Performs waveshaping on the LFO in the time domain. The default (most symmetrical) value is 0.500.
- **Phase:** Adjusts the start position of the LFO in the time domain.
- **Smooth:** Reduces the extremes of the LFO waveform in the amplitude domain. At maximum there is almost no motion.

7.5.4. Functions

The Function generator can be thought of as a highly flexible envelope-meets-LFO. The concept is that you can create any kind of modulation shape you can imagine, then use it to "place a hand" on any parameter(s) you like by assigning destinations.
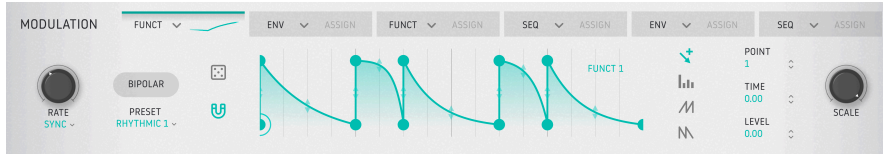

7.5.4.1. Function Presets

Before we create our own functions, click on the Presets field to see the factory selections and get an idea of just how many shapes a function can take. Browse through the presets using the menu.

Function Presets

- Default
- Asymmetrical Saw
- Decay
- Dual Pulses
- LFO Round
- LFO Square
- LFO Triangle
- Quad Decay
- Quad Gate
- Ramp Up
- Rhythmic 1
- Rhythmic 2
- Rhythmic 3
- Rhythmic 4
- Sawtooth Double
- Sidechain
- Save
- Save As

7.5.4.2. Breakpoints

Now it's time to start editing and creating your own functions. Functions are shaped by two factors: *breakpoints* (those little circles), and the curves (line segments) between them. The X axis represents time and the Y axis represents the amplitude of the modulation signal.
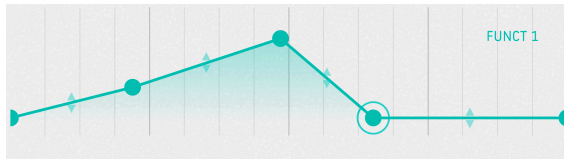
Click anywhere on the visualizer to add a point. Click again to add another. You can add up to 64 points to the Function.

To delete a point, right-click or double-click on it.

> ! The first and final points cannot be deleted or moved horizontally. They may be moved vertically.

7.5.4.3. Moving a Breakpoint

To change the location of a point within a Function, click its circle and drag it. You can move it up or down to adjust its level. Drag it to the left or right to change its time within the Function.

Alternately, you can drag on the following fields to select and move breakpoints along one axis without affecting the other:

- **Point:** Select individual points on the visualizer.
- **Time:** Moves the selected point along the X axis.
- **Level:** Moves the selected point along the Y axis.

7.5.4.4. Changing a Curve

Notice that between any two points, in the middle of the lines that connect them, are up/down arrows. Grab one of these "handles" and gradually move it all the way up or down. The line will warp until it reaches its extreme, at which time it will become completely squared off. The steeper the slope, the faster the change!

7.5.4.5. Drawing Tools

Now, click on one of the drawing tools shown below. These can speed up your Function creation by letting you draw repeating shapes via click-dragging inside the visualizer.

Function drawing tools

- **Draw:** - Creates a single point.
- **Steps:** - Creates a repeating square wave-like pattern.
- **Ramp Up:** - Creates a rising sawtooth pattern.
- **Ramp Down:** - Creates a falling sawtooth pattern.

7.5.4.6. Other Function Parameters

These work much like their counterparts in the LFO [p.47]. The **Rate** knob sets the Function speed, subject to the now-familiar tempo sync options:


Scale determines the overall strength of the Function's effect. At negative values, the curve on the Y axis will reverse until the curve is completely inverted at the value -1.

The other parameters to be aware of are:

- **Bipolar:** When active, the Function sends both positive and negative values. When inactive, the Function sends positive values only.
- **Randomize (dice icon):** You can randomize the amplitude of the function breakpoints by clicking and holding the dice and moving your mouse up and down. Please note that the scaling is different depending on what mouse button you're using.
- **Magnetize (magnet icon):** When active, snaps breakpoints to the rhythmic grid.
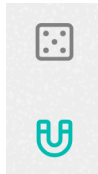
7.5.5. Envelope Follower
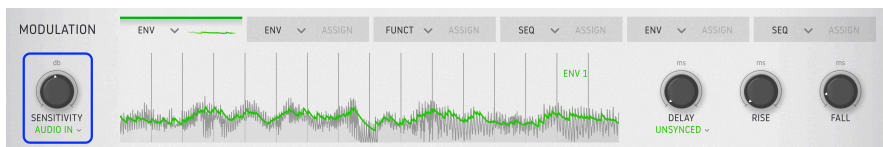
You may have heard of envelope followers in the context of FX pedals or synths. They follow the attack and release of an audio signal's transients, then apply that to some other setting – often a filter cutoff – to get a funky sound. Dist COLDFIRE can also follow the envelope of either its own audio signal or a sidechain input, then turn this into a modulation source. Use the **Sensitivity** knob to adjust the input gain of the envelope follower, then click just beneath it to choose the source of the control audio:
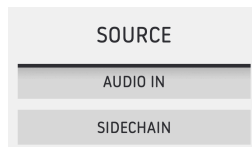
> ℹ️ Note: Sidechain routing will vary based on your DAW, so consult its documentation. A sidechain input can be very useful for keying the envelope follower, and whatever parameter(s) it is modulating, to a musical source such as a kick drum or bass line.

7.5.5.1. Central Display

The important thing to know here is that the thick green line you can see across the top the waveform display indicates the Envelope Follower's output level, while the waveforms underneath represent the level of the incoming audio. Which brings us to ...

7.5.5.2. Rise and Fall
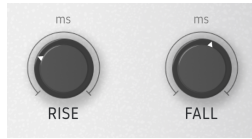
Rise is like the attack knob on a compressor: It sets how long the Follower takes to "grab on" to the incoming audio and translate that into results. On a compressor, those results are gain reduction that follows the overall volume. (That's right — a compressor is also an envelope follower by definition.)

Fall is like the release knob: It determines how long the follower takes to "let go" of audio one it has hold of it.

If these times are set very low or at zero, you will see that the green line in the waveform display follows the waveform exactly. Raise either one by much, and it will diverge from there, as the follower is taking longer to latch onto audio to process.

7.5.5.3. Delay
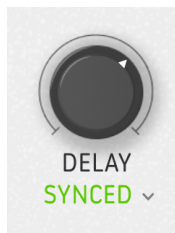
The Envelope follower also has a built-in delay time which, like with the other modulation sources, can free-run or sync to host tempo with triplet and dotted rhythmic options.

7.5.6. Step Sequencer

Dist COLDFIRE includes a 16-step sequencer intended to be used as a modulation source.

It works a lot like sequencers meant for playing notes, only with more modulation-focused options.

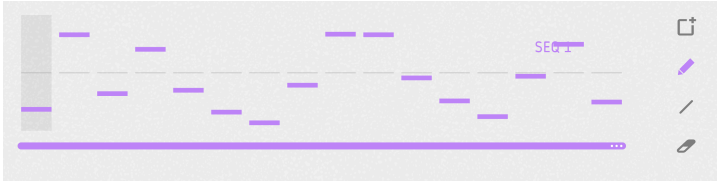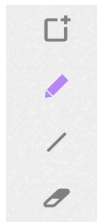### 7.5.6.1. Step Display

This is where you'll create patterns and set play modes. The sequencer is always running, although it need not affect any modulation destination if left unassigned.

At the bottom of the step display is the **pattern length bar**. Drag on it to set the sequence length. Again, you can have unusual step counts relative to your project. Unused steps are greyed-out at the end of the pattern.

To the right of the display are **Drawing Tools**. Simply select a tool and get to clicking and dragging in the central step display! From top to bottom, the tools are:

- **Clear:** Replaces the current sequence with a new, empty one. If you accidentally clear a sequence, you can recover it with the undo [p.13] function in the lower toolbar.
- **Pencil** Lets you adjust individual steps in the sequence by dragging up and down on them. You can also drag sideways and multiple steps will snap to the vertical position of your mouse cursor.
- **Line:** With this tool, when you drag across multiple steps, they are locked in to ascending or descending order with linear changes in value. (You can then change individual steps, however.) This mode is great for creating steady, repeating rises or falls in a destination parameter.
- **Eraser:** Clicking on an individual step will reset it to its default value. You can sweep across multiple steps to reset them all.

To the left of the display are **Play Mode** buttons. These work as in the Rhythm Mode sequencer. From top to bottom, the modes are:

- **Forward:** Steps play in linear fashion from the pattern's beginning to end.
- **Reverse:** Steps play in linear fashion from the pattern's end to beginning.
- **Back and Forth:** Steps play forward and reverse, ping-ponging across the pattern length.
- **Random:** Steps play in random order.

7.5.6.2. Other Sequencer Settings

Step sequencer settings we haven't covered yet are as follows.
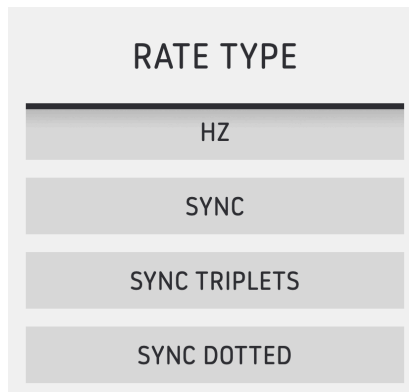
- **Rate:** This sets the rate at which the Sequencer plays the pattern. The familiar drop-down menu below decides whether the rate free-runs in Hertz or is synced to tempo in regular, triplet, or dotted feels.
- **Bipolar:** When engaged, the sequence pattern is bipolar, meaning a "zero crossing" is placed in the middle of the Y axis and step values to either side are positive and negative.
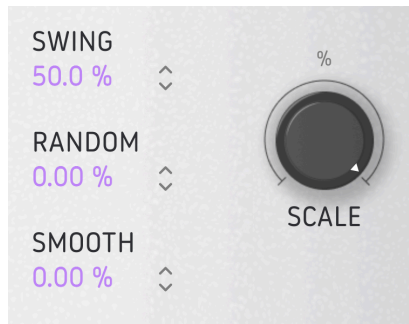
- **Swing:** Adds a swing feel by delaying the second 16th-note within each 8th-note. In other words, it's classic sampled drum machine swing.
- **Random:** Drag to add random variation in the value of each step. Higher settings increase both the probability that any step will be randomized and the amount by which the value can change. The random values reset at the beginning of each pass through the pattern.
- **Smooth:** Drag on this parameter to add a degree of smooth value transition from one step to another. At zero, values jump. At 100%, all possible values between any two steps are covered.
- **Scale:** This scales the overall sequencer output in both positive and negative directions. Its default is 100 percent. At zero, the output is "flatline" and there will be no change to the assigned modulation destination(s).

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